ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK- RE Parks

IREDA

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ABBREVIATIONS

RE	Renewable Energy
GW	Giga Watt
INDCs	Intended Nationally Determined Contributions
GDP	Gross Domestic Product
FDI	Foreign Direct Investment
VGF	Viability Gap Funding
LC	Letter of Credit
MNRE	Ministry of New and Renewable Energy
IREDA	Indian Renewable Energy Development Agency Limited
MT	Metric Tonne
CO2	Carbon Dioxide
NIWE	National Institute of Wind Energy
CPSU	Central Public Sector Unit
UT	Union Territory
WB	World Bank
GoI	Government of India
SISPP	Shared Infrastructure for Solar Parks
PIA	Project Implementing Agency
PV	Photo Voltaic
ESMF	Environmental and Social Management Framework
SECI	Solar Energy Corporation of India Ltd.
SF6	Sulphur Hexaflouride
TL	Transmission Line
RoW	Right of Way
EMF	Electro Motive Force
CSPTCL	Chhattisgarh State Power Transmission Corporation Limited
BESS	Battery Energy Storage System
AC	Alternating Current
DC	Direct Current
MoEFCC	Ministry of Environment Forests & Climate Change
EHS&S	Environment Health Safety & Social
EIA	Environment Impact Assessment
CPCB	Central Pollution Control Board
NOC	No Objection Certificate
LA	Land Acquisition
SPPD	Solar Park Project Developer
REPPD	Renewable Energy Park Project Developer
RFCTLARR Act	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act,2013
ESMS	Environmental & Social Management System
ADB	Asian Development Bank
AfD	Agency Françoise de Development (French Development Agency)
IFC	International Finance Corporation
FI	Financial Intermediary
IPDP	Indigenous Peoples Development Plan
RAP	Resettlement Action Plan
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau (German Credit Institute for Reconstruction)
EMP	Environment Management Plan

ESIA	Environmental & Social Impact Assessment
ESMP	Environmental & Social Management Plan
ESDD	Environmental & Social Due Diligence
DPR	Detailed Project Report
REPD	Renewable Energy Project Developer
CGWA	Central Ground Water Authority
GRM	Grievance Redressal Mechanism
PAP	Project Affected Persons
R&R	Rehabilitation & Resettlement
GAP	Gender Action Plan
IPDP	Indigenous People Plan

1 PROGRAM OVERVIEW

1.1 India's Renewable Energy (RE) Program

As per the National Statement by Hon'ble Prime Minister Shri Narendra Modi at COP26 Summit in Glasgow on 02 Nov 2021.
India, despite being 17 % of the world's population, whose responsibility has been only 5 percent in emissions, has left no stone unturned to show that it has fulfilled its obligation towards Climate Change. Today the whole world believes that India is the only big economy which has delivered in letter and spirit on the Paris Commitment.
India ranks 4th in the world in installed renewable energy capacity. India's non-fossil fuel energy has increased by more than 25% in the last 7 years and now it has reached 40% of our energy mix.
To deal with this global challenge of climate change, India gives five commitments/ nectar elements, 'Panchamrit'

First- India will take its non-fossil energy capacity to 500 GW by 2030.

Second- India will meet 50 percent of its energy requirements from renewable energy by 2030.

Third- India will reduce the total projected carbon emissions by one billion tonnes from now till 2030.

Fourth- By 2030, India will reduce the carbon intensity of its economy by more than 45 percent and

Fifth- by the year 2070, India will achieve the target of Net Zero.
These 'Panchamrits' will be an unprecedented contribution of India to climate action.

The measures being taken by the Government to achieve the target, of renewable energy, inter-alia, include:

- Permitting Foreign Direct Investment (FDI) up to 100 percent under the automatic route
- Fiscal and financial incentives such as Capital Subsidy, Viability Gap Funding (VGF), Accelerated Depreciation benefits etc.
- Raising funds from bilateral and multilateral financial institutions
- Mandating requirement of Letter of Credit (LC) as payment security mechanism by distribution licensees for ensuring timely payments to RE generators
- Setting of Solar Parks to provide land and transmission on plug and play basis
- Notification of standard bidding guidelines to enable distribution licensee to procure solar and wind power at competitive rates
- Laying of transmission lines under Green Energy Corridor Scheme for evacuation of power in renewable rich areas
- Setting up of Project Development Cell for attracting and facilitating investments in domestic manufacturing
- Loan limits for renewable energy have been increased (doubled) as per RBI's revised priority sector lending guidelines

The Ministry of New and Renewable Energy (MNRE) is the nodal Ministry of the Government of India for all matters relating to new and renewable energy. The broad aim of the Ministry is to develop and deploy new and renewable energy to supplement the energy requirements of the country.
The Indian Renewable Energy Development Agency Limited (IREDA), a Government Company established in 1987 as a Non-Banking Financial Institution, has been extending financial assistance through innovative financial mechanisms for projects generating electricity and / or energy through renewable energy sources, generally referred to as green energy.

RE energy has tremendous benefits over conventional energy as it is clean and renewable energy, reduces greenhouse gas emissions, reduces oil imports, saves foreign exchange, avoids fossil fuel dependence and most importantly helps in achieving energy security of the country. As per estimates, on an average, every MW of solar energy abates around 1500 MT of CO2 every year for entire life of the project.

Cumulative total of Grid Interactive Renewable Energy installed in India is approaching 100 MW with more in the pipeline. Solar & wind energy have the major share in this capacity[1] . Small Hydro, Waste to energy & Bio Energy are the other contributors to the cumulative RE Capacity.

National Institute of Solar Energy has assessed the Country's solar potential of about 748 GW assuming 3% of the waste land area to be covered by Solar PV modules. Solar energy has taken a central place in India's National Action Plan on Climate Change with National Solar Mission (launched on 11th January 2010) as one of the key Missions. The Mission targets installing 100 GW grid-connected solar power by the year 2022. In order to achieve this target, Government of India have launched various schemes to encourage generation of solar power in the country like Solar Park Scheme, VGF Schemes, CPSU Scheme, Defence Scheme, Canal bank & Canal top Scheme, Bundling Scheme, Grid Connected Solar Rooftop Scheme etc. With technological improvements, economies of scale and reduction in solar cell/ module prices solar tariff in India is now competitive and has achieved grid parity.

Wind is an intermittent and site-specific resource of energy and therefore, an extensive Wind Resource Assessment is essential for the selection of potential sites. The Government, through National Institute of Wind Energy (NIWE), has installed over 800 wind-monitoring stations all over country and issued wind potential maps at 50m, 80m and 100m above ground level. The recent assessment indicates a gross wind power potential of 302 GW in the country at 100 meter above ground level. Most of this potential exists in seven windy States as given below:-

Table 1-1 : Wind Potential in India

S. No.	State	Wind Potential (MW)
1	Gujarat	84431.33
2	Rajasthan	18770.49
3	Maharashtra	45394.34
4	Tamil Nadu	33799.65
5	Madhya Pradesh	10483.88
6	Karnataka	55857.36
7	Andhra Pradesh	44228.60

Source: - MNRE Website

The Government has issued 'Policy for Repowering of the Wind Power Projects' to promote optimum utilisation of wind energy resources by creating facilitative framework for repowering. 'National Wind-Solar Hybrid Policy' has been issued to provide a framework for promotion of large grid connected wind-solar PV hybrid system for optimal and efficient utilization of transmission infrastructure and land, reducing the variability in renewable power generation and achieving better grid stability. The 'National Offshore Wind Energy Policy' has been notified to enable optimum exploitation of offshore wind energy in the country.

1.2 Concept of Solar Parks and Ultra-Mega Solar Power Projects Scheme

Solar power projects can be set up anywhere in the country, however the scattering of solar power projects leads to higher project cost per MW and higher transmission losses. Individual projects of

[1] Source MNRE

smaller capacity incur significant expenses in site development, drawing separate transmission lines to nearest substation, procuring water and in creation of other necessary infrastructure. It also takes a long time for project developers to acquire land, get change of land use and various permissions, etc. which delays the project. To overcome these challenges, the scheme for "Development of Solar Parks and Ultra-Mega Solar Power Projects" was rolled out in December 2014 with an objective to facilitate the solar project developers to set up projects in a plug and play model.

The scheme envisages supporting the States/UTs in setting up solar parks at various locations in the country with a view to create required infrastructure for setting up of solar power projects. The solar parks provide suitable developed land with all clearances, transmission system, water access, road connectivity, communication network, etc. The scheme facilitates and speeds up installation of grid connected solar power projects for electricity generation on a large scale.

All the States and Union Territories are eligible for getting benefit under the scheme. The capacity of the solar parks shall be 500 MW and above. However, smaller parks are also considered where contiguous land may be difficult to acquire in view of difficult terrain and where there is acute shortage of non-agricultural land.

The solar parks are developed in collaboration with the State Governments and their agencies, CPSUs, and private entrepreneurs. The implementing agency is termed as Solar Power Park Developer (SPPD). There are currently eight modes for selection of SPPDs. The scope has been expanded in Modes 7 & 8 to include other RE parks viz. Solar/Wind/Hybrid/other.

The RE park will provide a huge impetus to RE energy generation by acting as a flagship demonstration facility to encourage project developers and investors, prompting additional projects of similar nature, triggering economies of scale for cost reductions, technical improvements and achieving large scale reductions in Greenhouse Gas emissions.

1.3 Description of 'Shared Infrastructure for Solar Parks' project of World Bank: Components 1 & Component 2

World Bank (WB) intends to partner in the efforts of the Ministry of New and Renewable Energy (MNRE) / Indian Renewable Energy Development Agency (IREDA), Government of India (GoI) to rapidly scale-up the RE installations in the country through a long-term engagement in the program.

The 'Shared Infrastructure for Solar Parks' (SISPP) project of WB will support the MNRE's Solar Park Scheme for installing large-scale, grid-connected solar/ RE parks. Indian Renewable Energy Development Agency (IREDA) is the borrower and the nodal project-implementing agency (PIA) for this project. IREDA through the state Project Implementing Agencies (referred as 'State PIAs'), which are the solar park developers, will utilize project funding to develop the enabling common infrastructure (such as, power pooling sub-stations, as well as intra-park transmission infrastructure, access roads).

The objective of the Project is to increase solar/ RE generation capacity through the establishment of large-scale solar/RE parks in the country.

1.3.1 Project Component

Component 1: Shared Infrastructure for Solar/RE Parks

Providing Sub-Loans to Implementing Agencies of Selected States for the planning and construction of shared infrastructure facilities within their Selected Solar/RE Parks (e.g. access roads, water supply and drainage, telecommunications facilities, evacuation and allied infrastructure), as well as transmission lines connecting the internal pooling stations to the external sub-stations of these Selected Solar/RE Parks.

Component 2: Technical Assistance

(a) Strengthening the institutional capacity of IREDA, the State Nodal Agencies in the Selected States where Selected Solar Parks are located, as well as the respective Implementing Agencies, in order to build their core competencies in human resource and business planning, project monitoring, procurement and contract management, environmental and social safeguards monitoring and implementation, financial management, and the assimilation/integration of information technology in their daily operations.

(b) Developing the pipeline of solar/RE parks projects through supporting, inter alia, prefeasibility studies, site identification, social and environmental assessment, techno-commercial studies, and other preparatory activities.

(c) Providing technical assistance to IREDA, the State Nodal Agencies and the Implementing Agencies for, inter alia, the identification of sectoral needs, the dissemination of knowledge, and the piloting of innovative financial solutions in order to successfully achieve solar energy targets by 2022.

1.3.2 Eligible sub project typologies under component 1

Ultra Mega Solar Power Park Sub Projects: Two solar parks at Rewa and Mandsaur, both in Madhya Pradesh are the current beneficiary parks under the project.

New types of sub projects viz. Wind/ Hybrid (Solar Wind) Power Park Sub Projects/Floating Solar Sub Projects / Battery Energy Storage Sub Projects are also now eligible for funding.

The technologies which introduce more possibilities of extracting maximum power from a limited resource are Hybrid Power Plants where solar panels and wind turbines can perform in the same defined space without interfering much in each other's functionality. Due to the intense investment already made in the established solar or wind power plants, the limit of production can be further optimized by introducing solar panels in existing wind farms or adding wind turbines in existing solar farms or plan a hybrid (wind and solar) for a new power plant. This will give rise to a more constant power generation as solar panels cannot produce power during the night whereas; the wind turbines can work in the day and as well in the night. Likewise, during times when wind speed is not adequate for power generation while the solar radiation is strong.

Another major leap in renewable energy sector is the floating Solar PV Panels; this technology has explored the possibility of introducing power plants on vast surface of water bodies. Research indicates these floating solar PV plants are more efficient system when compared with similar capacity plants operating on land due to reduced heating of the panels. Additionally, the percentage of water surface covered by the PV panel helps reduce the evaporation losses of the water body.

Battery Energy Storage applications integrated with other RE generation technologies offers benefits of time shifting, capacity firming, ramp rate control, and frequency regulation.

1.4 Introduction to Environmental and Social management Framework (ESMF)

The environmental and social management framework being prepared for utility scale Solar/RE Park projects shall aid in screening, assessment, management of environmental and social impacts at an early stage in project planning. This document shall act as guidance for satisfactory assessment and

management of environmental and social impacts at sub-project level through appropriate measures during the planning, design, construction and operation phases of various investments. The framework will identify the adverse environment and social impacts and provide specific guidance on the policies and procedures to be followed for environmental and social assessment along with roles and responsibilities of the implementing agencies.

The document consists of a set of methodologies, assessment procedures and measures to facilitate adequate environmental and social risk & impact management related to the proposed solar UMPP / RE parks financed by World Bank Group

1.5 Objective of Environmental and Social Management Framework (ESMF)

This ESMF will be used to identify the Environmental and Social impacts of each sub-project and mitigate those impacts/issues through design integration. The overall goal of the ESMF is to ensure that decision making in subsequent stages of the project is informed and influenced by environmental and social considerations for each of the sub-projects, many of which are still to be identified. It aims to integrate environmental and social concerns into the project's design and implementation and to exclude any Category A (high impact) project investment under this program.

In order to achieve this, main objectives of the ESMF are:

i. To establish clear procedures and methodologies for the environmental and social planning, review, approval and implementation of subprojects to be financed under the Project;
ii. To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to subprojects;
iii. To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF;
iv. To establish the Project funding required to implement the ESMF requirements; and
v. To provide practical information resources for implementing the ESMF.

The ESMF framework has been prepared based on the sample data collected from secondary sources. Secondary data on Environment and Social aspects and their existing regulatory framework for the proposed sub-project has been detailed in the subsequent chapters.

1.6 Structure of ESMF Report

The document essentially comprises of the following sections:

i. Social and Environmental Baseline for sample sub-projects
ii. Environment and Social Regulatory Framework applicable for the program
iii. Screening process / Impacts & Risks
    a. Environment Management Framework
    b. Resettlement Policy Framework
    c. Indigenous People Policy Framework
    d. Gender and Social Inclusion
iv. Public Disclosure and Grievance redress mechanism
v. Project Appraisal, Monitoring and Reporting Arrangements
vi. Institutional Arrangements
vii. Training and Capacity Building

2 BASELINE- CASE STUDY OF SUB-PROJECTS

The following subsections & case studies help in identification of the likely environmental and social impacts of the investments in sample sub-projects. This will facilitate early evaluation of such adverse impacts and integrate suitable mitigation measures during planning stage itself. The sub-projects are expected to be spread across the states of Madhya Pradesh, Jharkhand, Uttar Pradesh & Karnataka and may extend to other states in later phase of development. The bank financing would mainly be in development of land and basic infrastructure for generation of RE power and infrastructure development. The ESMF document has been prepared based on review of sample case studies carried out for:

Solar Park Projects at Rewa (Madhya Pradesh), Mandsaur (Madhya Pradesh) and Pavagada (Karnataka) sites covering secondary data on different environmental and social components and issues coming out during consultation with different stakeholders. The objective of the above exercise was:

i. To establish environmental and social baseline condition for the sites at a broad level
ii. To understand type and distribution of environmentally and socially sensitive features in and around the proposed sites
iii. Preliminary identification of environmental and social impacts likely to be triggered due to the project activities
iv. To assess the applicable regulations and policies
v. Consultations with the project affected persons

a. Hybrid Solar-Wind Power Park Sub Project (Anantapur, Andhra Pradesh)/Battery Energy Storage Sub Project (Chhattisgarh) funded by World Bank innovative technologies in the renewable energy sector Line of Credit (LOC), in partnership with SECI. Secondary data for these projects was available in public domain/ shared by WB/SECI. In line with objectives of LOC to demonstrate application of innovative technologies at large scale & disseminate the learnings & best practices with stakeholders, we have drawn freely on the information & would like to acknowledge WB & SECI for the same.

b. For Wind Power Projects/ Floating Solar/ Transmission Line & associated infra, Generic Environmental & Social issues to be considered are mentioned.

2.1 Baseline case study of Sub-Projects

Baseline study of identified states for the preparation of ESMF document.

Table 2-1: List of Parameters under Sample Case Study of Solar Parks

Sr No	Particulars	PAVAGADA (Karnataka)	REWA (Madhya Pradesh)	MANDSAUR (Madhya Pradesh)
1	Project Villages Location	Thirumani, Balasamudra, Vollur, Kyathaganacherlu, Rayacharlu	Badwar, Barseta Desh, Barseta Pahar, RamNagar Pahar and Etar Pahar	Gujarkhedi (uninhabited) and Runija Villages; Sitamau
2	Tehsil	Pavagada	Gurh	Mandsaur
3	District Name / State	Tumkur, Karnataka	Rewa, Madhya Pradesh	Mandsaur, Madhya Pradesh
4	Location Coordinates	14°13'N to 14°20'N 77°23'E to 77°30'E	24°27'1"N to 24°29'47" N 81°31'38"E to 81°37' 31"E	24°4'30"N to 24°- 6'-10" N 78°45'50"E to 75°46'-30"E
5	Climatic Zone	Warm & Humid	Humid subtropical climate zone	Semi-arid climate
6	Average Elevation	800 meter above MSL	360 meter above MSL	380 meter above MSL
7	Road Accessibility	MDR to Taluk Headquarters; SH to Tumkur	National Highway – 75; *Connecting Rewa town (north side) and Sidhi town (south side)*	Ajmer-Lebad (Indore) NH-79 & Mhow-Neemuch SH-31

8	Nearest Airport	Bengaluru Airport (200 kms)	Allahabad Airport (160 kms)	Udaipur Airport (209 kms)
9	Nearest Railway Link	100 km at Anantpur (Andhra Pradesh) and 140 km at Bellary Junction (Karnataka)	Rewa (30 kms – aerial distance) – district headquarters	Suwasara Station Around 20 Km
10	Land Availability	4850 ha land to be pooled on long-term lease basis (30 year) from private owners	A total of approx.1500 Ha land acquired (164.231 and 138.758 Ha are private land and 1255.697 hect. is government revenue land)	553.6 Ha approximately
11	Key Social Issues	• Loss of livelihood for landless labourers working in agricultural fields. • Annual Lease rentals low as compared to similar land procurements in other areas • Loss of access rights to common property resources	• Involuntary resettlement and loss of livelihood • Loss of access rights • Relocation of built up structures • Impact of labour influx • Loss of livelihood for landless labourers working in agricultural fields.	• Loss of land and livelihood. • Crop damages • Impact of migrant labour influx • Loss of access and common property (grazing land) • Restrictive use of land due to transmission line • No displacement
12	Key Environmental Issues	• Protection of existing surface water resources / natural drainage. • Presence of wildlife in vicinity. • Waste management including hazardous waste disposal • Pre-construction stage activities impacting topography, drainage and slope. • Water recycling / ground water recharge considering scarcity of water resource. • Permanent change of land use • Removal of vegetation and trees • Channelization and levelling/grading of land • Potential hindrance to movement of fauna across the site • Health safety of the workers & nearby community, • Movement of vehicles/ machinery leading to noise/ dust • Common infra/ built up area on previously open land can alter water recharge to ground • For Associated Facilities viz. TL & Substations. Installation of towers and right of way will result in restrictive use of land. Electrical hazards	• Protection of existing surface water resources / natural drainage. • Waste management including hazardous waste disposal. • Pre-construction stage activities impacting topography, drainage and slope. • Water recycling / ground water recharge considering scarcity of water resource. • Permanent change of land use • Removal of vegetation and trees • Channelization and levelling/grading of land • Potential hindrance to movement of fauna across the site • Health safety of the workers & nearby community, • Movement of vehicles/ machinery leading to noise/ dust • Common infra/ built up area on previously open land can alter water recharge to ground • For Associated Facilities viz. TL & Substations. Installation of towers and right of way will result in restrictive use of land. Electrical hazards from TL & Substation Collision and electrocution of birds with	• Protection of existing surface water resources / natural drainage. • Waste management including hazardous waste disposal. • Pre-construction stage activities impacting topography, drainage and slope. • Water recycling / ground water recharge considering scarcity of water resource. • Permanent change of land use • Removal of vegetation and trees • Channelization and levelling/grading of land • Potential hindrance to movement of fauna across the site • Health safety of the workers & nearby community, • Movement of vehicles/ machinery leading to noise/ dust • Common infra/ built up area on previously open land can alter water recharge to ground • For Associated Facilities viz. TL & Substations. Installation of towers and right of way will result in

		from TL & Substation Collision and electrocution of birds with TL. Alignment to avoid Water Bodies	TL Alignment to avoid Water Bodies	restrictive use of land. Electrical hazards from TL & Substation Collision and electrocution of birds with TL Alignment to avoid Water Bodies
13	Water Requirement	72 Million litres per cleaning of PV Panels	Estimated at 1.55 MLD	5-6 KL /MW/ wash
14	Proposed capacity	2000 MW, fixed tilted solar panels	750 MW, fixed tilted solar panels	250 MW, fixed tilted solar panels
15	Site Conditions	A few scattered trees, almost flat to sloping hard surface	A few scattered trees, almost flat to sloping hard surface	Largely flat and rocky land, seasonal cultivation in case of good monsoon
16	Power evacuation	POWERGRID's 765kV station at Madhugiri (aerial distance 70 kms)	Vindhyachal - Jabalpur 400 KV line (airborne distance of 30 kms)	400 kV Mandsaur- Sitamau substation
17	Soil Characteristics	Red sandy soil and red loamy soil	Rich clayey to gravelly, mixed red and black soil	Deep Medium Black Soil

Table 2-2: List of Parameters under sample case study of Hybrid/ Battery/ Floating

Sr No	**Particulars**	**HYBRID (Wind – Solar)**	**BATTERY with Solar**
		Anantapur (Andhra Pradesh)	**Rajnandgaon (Chhattisgarh)**
1	Project Villages Location	Ramagiri and Muthuvakuntla	Dhaba, Khoka, Rangakhetra, Amlidih, Dhundera, Orebabandh, Giragaon, Tolagaon, Margaon and Dhudwa
2	Tehsil	Ramagiri	Dongragaon and Rajnandgaon
3	District Name / State	Anantapur, Andhra Pradesh	Rajnandgaon, Chhattisgarh
4	Location Coordinates	Latitude 14^0 21' 29.7"N to Longitude 77^0 31'18.9"E	Latitude $21^0$5'32.89"N, Longitude $80^0$50'30.37"E
5	Climatic Zone	Semi-arid climate	Tropical (Hot and Humid)
6	Average Elevation	Varies between 470 m to 517 msl	250 m to 330 m above msl
7	Road Accessibility	10 Km from NH 44	NH – 6 is passing very close to project site.
8	Nearest Airport	Bengaluru Airport (187 Km)	Raipur Airport (95 km)
9	Nearest Railway Link	Nearest Railhead from the site location is Dharmavaram (31 Km)	Nearest railhead from the site location is Rajnandgaon Station
10	Land Availability	900 acres approximately	377 Ha approximately
11	Key Social Issues	The project site is mainly located on government and assigned land. There is no settlement in the proposed area. The tentative alignment of transmission line passes through mainly private lands but does not encounter settlement areas. However, all the affected persons whose assigned land will be affected belongs to BPL category	The project site is located on government land. There is no settlement in the proposed area. Some of the key issues are • Loss of access • Alteration of surface drainage will impact downstream water body • Loss of common property • Restrictive use of land due to Transmission Line • Impact of migrant labour influx
12	Key Environmental Issues	• Protection of existing surface water resources / natural drainage. • Waste management including hazardous waste disposal. • Preconstruction stage activities impacting topography, drainage and slope. • Water recycling / ground water recharge considering scarcity of water resource • Permanent change of land use	• Protection of existing surface water resources / natural drainage. • Waste management including hazardous waste disposal. • Preconstruction stage activities impacting topography, drainage and slope. • Water recycling / ground water recharge considering scarcity of water resource • Permanent change of land use

		• Removal of vegetation and trees • Channelization and levelling/grading of land • Potential hindrance to movement of fauna across the site • Health safety of the workers & nearby community, • Movement of vehicles/ machinery leading to noise/ dust • Common infra/ built up area on previously open land can alter water recharge to ground • For Associated Facilities viz. TL & Substations. Installation of towers and right of way will result in restrictive use of land. Electrical hazards from TL & Substation Collision and electrocution of birds & TL Alignment to avoid Water Bodies • Battery storage & disposal	• Removal of vegetation and trees • Channelization and levelling/grading of land • Potential hindrance to movement of fauna across the site • Health safety of the workers & nearby community, • Movement of vehicles/ machinery leading to noise/ dust • Common infra/ built up area on previously open land can alter water recharge to ground • For Associated Facilities viz. TL & Substations. Installation of towers and right of way will result in restrictive use of land. Electrical hazards from TL & Substation Collision and electrocution of birds & TL Alignment to avoid Water Bodies • Battery Storage & Disposal
13	Water Requirement	Estimated at 330 KL/day	Estimated at 105 KL/day
14	Proposed capacity	160 MW	100 MW(AC) Solar PV Project (200MWp DC capacity) along with 50MW/150 MWh BESS
15	Site Conditions	Undulated land rocky strata with scanty bushy vegetation and without any habitation	Undulated land rocky strata with scanty bushy vegetation and without any habitation
16	Power evacuation	400 KV line Hindupur substation Total distance from Ramagiri wind solar hybrid power 45 Km. The actual alignment yet to be established	Through overhead 132kV transmission line of length 33 km approx. to the nearest 132 kV CSPTCL's Substation at Thelkadi, Chhattisgarh
17	Soil Characteristics	Sandy and black cotton soil	Deep black soil, yellow soil

Table 2-3: Indicative and Generic Environment and Social Key issues of Wind Energy Projects

Sr No	Particulars	Wind Energy Project
1	Key Social Issues	• Impacts on land (Permanent or Temporary) • Impact on Indigenous communities • Impact on Aesthetics and tourism, if any • Impact on Health and Safety (includes structural safety of project infrastructure, life and fire safety, public accessibility and management of emergency situations) • Impact on local Employment • Accidental Impacts (Blade throw and Natural Disaster) • Impact of Labour Influx/Migrant workforce • Impact on Community access to assets like- grazing land, river, pond, forest collections etc.
2	Key Environmental Issues	• Impacts on the physical environment (such as noise or visual impact). • Biodiversity (affecting birds and bats, for instance) • The construction of access roads for the siting of wind facilities in remote locations may result in additional risks, including adverse impacts on biodiversity and induced access to relatively inaccessible areas • Interference with ecological corridors and faunal migration routes mainly through ecological disturbance leading to displacement or exclusion of birds and collisions of birds with wind turbines • Topographical change; Loss of vegetation from clearing (at times including protected areas) will possibly accentuate soil erosion • Landscape and Visual impacts • Noise • Shadow Flicker • Water Quality

Table 2-4: Indicative and Generic Environmental and Social issues under Floating Solar PV

Sr No	Particulars	Floating Solar PV Projects
1	Key Social Issues	• Impacts on communities during land acquisition and construction phase • Impacts due to Traffic road • Workers Health and Safety • Community Health and Safety • Access restriction • Lose of Moorage area • Disturbance in Fishing activity
2	Key Environmental Issues	• Long-term effects on water quality are not well • established • Potential to reduce algae growth • Potential to reduce water evaporation • Potential impact on aquatic ecosystems • Impacts on temperature stratification and on dissolved oxygen levels due to shading of water • Impacts on aquatic habitat resulting from shading • Impacts on water quality and aquatic fauna/flora due to leaching from materials • Impacts on water quality and aquatic fauna/flora from accidental release of oils and or lubricants of boats used during maintenance activities or detergents in panel washing • Impacts on aquatic habitat as a results of installations in shallower (littoral zone) and benthic zone (bottom of reservoir) due to mooring systems or disturbances from placement/movement of underwater electrical cables (i.e. increased turbidity) • Impacts that could occur from exposure to EMF associated with underwater electrical cables • Impacts on water feeding and surface diving birds while hunting at the water surface or pursuing fish or foraging underwater. • Impacts from the creation of waste (replacement parts)

Table 2-5: Indicative and Generic Environmental and Social issues under Transmission lines and Associated Infrastructure

Sr No	Particulars	Transmission Lines & Associated Infrastructure
1	Key Social Issues	• Impacts on land (Permanent or Temporary) and Impact on Non-titleholders within RoW corridor • Impact on Vulnerable household • Impact on Indigenous communities • Impact on Aesthetics and tourism, if any • Impact on Health and Safety (includes structural safety of project infrastructure, life and fire safety, public accessibility and management of emergency situations) • Impact on local Employment • Impact of Labour Influx/Migrant workforce • Impact on Community access to assets like- Agriculture land, river, pond, forest collections etc.
2	Key Environmental Issues	• Installation of towers and right of way will result in restrictive use of land • Electrical hazards from TL & Substation Collision and electrocution of birds with TL • Alignment to avoid Water Bodies & bird breeding areas • Potential impact on physical resources, topography during construction and loss of tree cover which would lead to erosion, landslips and landslides in hilly areas causing topographical impacts creating gullies, ridges etc.) • Levelling of soil, vehicular emissions impacts air quality/noise levels in the area. Cutting of trees, soil erosion will impact terrestrial ecology of the area • Ground and surface water quality, aquatic ecology may be affected due to surface soil run-off, dripping of oils from engines of digging machines

		• Unsafe erection of tower can result in injuries to the workers and residents in the area. Untrained workers can lead to more accidents and fatalities • Contamination of land and or nearby water bodies by transformer oil, fuels, chemicals, battery water etc. can occur during erection and operation due to leakage or accident • Short circuits, fire due to improper connectivity, overload or accident impacts of SF6 leakage from the transformer circuit breakers

The detailed description of the baseline case studies on environmental and social parameters for Solar Power, Solar – Wind Hybrid Project, Battery Storage System is attached in **Annexure-1.**

3 NATIONAL AND STATE REGULATORY FRAMEWORK

India has developed a fairly comprehensive regulatory framework to address environmental and social concerns in relation to development projects. Its wide-ranging enactments cover almost all major issues that need to be addressed in the course of development of infrastructure from a social and environmental perspective. In India the Ministry of Environment, Forests and Climate Change (MoEF&CC) is the apex administrative body for (i) regulating and ensuring environmental protection; (ii) formulating the environmental policy framework in the country; (iii) undertaking conservation & survey of flora, fauna, forests and wildlife; and (iv) planning, promotion, co-ordination and overseeing the implementation of environmental and forestry programmes. Law of the land on EHS&S as applicable to RE Projects is mostly similar to other industrial projects, RE's inherent EHS&S friendly nature allows for concessions to be given on exacting EHS&S requirements without compromising with their intent, to encourage ease of doing business, a case in point being the exemption from EIA given by competent authorities to RE Projects. This section describes regulations, statutory guidelines and obligatory standards that are applicable to the social and environmental performance of the project.

3.1 Applicable E&S Regulations

As per MOEFCC

i. Solar PV Power Projects & Development of Solar Parks do not require an Environmental Clearance under the EIA Notification, 2006 and as amended.
ii. Disposal of PV cells attracts provisions of Hazardous waste (Mgmt. & Transboundary Movement Rules) 2016
iii. The development of Solar Parks shall attract the provisions of Water (Prevention & Control Of Pollution) Act, 1974 & Air (Prevention & Control Of Pollution) Act, 1981 i.e. they require Consent to Establish & Consent to Operate

Central Pollution Control Board (CPCB) in March 2016 classified Solar power generation through solar photovoltaic cell, wind power and mini hydel power (less than 25 MW) in the new category of White industries which is practically non-polluting & there shall be no necessity of obtaining Consent to Operate for White category of industries. An intimation to concerned SPCB / PCC shall suffice.

Certain states have made necessary changes viz. Under Madhya Pradesh Pollution Control Board (MPPCB) Notification no. 4551 dated 27.12.2016, Solar Parks are listed under White Category and do not require Consent to Establish/Operate & as per amendment vide G.S.R 178 dated 1st March 2019, projects do not require HW authorisation as the projects do not require consent to establish and consent to operate under white category provided Hazardous Waste and other wastes generated from the project shall be given to the actual user, waster collector or operator of the disposal facility in accordance with CPCB guidelines. Solar PV power projects will be exempted from obtaining any NOC/Consent for establishment under pollution control laws from AP Pollution Control Board.

The evacuation related activities (responsible for laying power evacuation line, connectivity to national grid and NOC from relevant departments) would need to be considered separately for environmental and social impacts. The relevant regulation pertaining to the project activity has been discussed as under.

Table 3-1 : Regulatory Framework

Acts/Rule/ Policy	Year	Objective	Applicability to Projects	Responsible Agency
Environmental (Protection) Act as amended	1986	To protect and improve the overall environment	All environmental legislation is covered in this umbrella Act	MoEFCC GoI; CPCB; State Pollution Control Board
Environment Impact	2006	To provide environmental clearance to new development activities	Applicable Only for sub-projects located in Eco-Sensitive Zone	State Environmental Impact Assessment Authority(SEIAA)

Acts/Rule/ Policy	Year	Objective	Applicability to Projects	Responsible Agency
Assessment Notification		following environmental impact assessment		
Indian Forest Act	1927	To check deforestation by restricting conversion of forest areas into non-forest areas.	In case of acquisition of Reserved Forest Area or Protected Forest i.e. If RE Project and Transmission line pass through Forest Areas then it will attract the provision of Forest Conservation Act requiring Forest Clearance	State Forest Department / MoEFCC, Regional Office
The Forest (Conservation) Act	1980			
The Forest (Conservation) Rules	1981			
Wild Life (Protection) Act	1972	To protect wildlife through creation of National Parks and Sanctuaries.	For projects located inside the boundary of Wildlife Sanctuary or National Park/Tiger reserves.	State Forest Department and National Board For Wildlife, GoI.
National Forest Policy (Revised)	1952/ 1988	To maintain ecological stability through preservation and restoration of biological diversity.	For clearing of forest/ felling of Trees	Forest Department, GoI
Biological Diversity Act	2002	An Act to provide for conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto.	If Project area under bio-reserves	MoEFCC: , National Biodiversity Authority and State Biodiversity Boards
Water (Prevention and Control of Pollution) Act	1974	To control water pollution by controlling discharge of pollutants as per the prescribed standards.	NOC for establishment and operation during construction.	State Pollution Control Board
Air (Prevention and Control of Pollution) Act	1981	To control air pollution by controlling emission of air pollutants as per the prescribed standards.	NOC for establishment and operation during construction	State Pollution Control Board
Ancient Monuments and Archaeological Sites and Remains Act	1958	Conservation of cultural and historical remains found in India.	For the project located within 300 m from such features	Archaeological Dept. GOI, Indian Heritage Society and Indian National Trust for Art and Culture Heritage (INTACH).
Batteries (Management and Handling) Rules	2001	The Act defines the requirements for disposal of used batteries for bulk users. The developers in sub-project would be likely bulk users.	Yes, if batteries are used for storage of power before being supplied to the national grid.	State Pollution Control Board
The Electricity Act	2003	Laws relating to generation, transmission, distribution, trading and use of electricity, promotion of efficient and environmentally benign policies.	The projects involving national grid connectivity	Power Grid
MSIHC Rules	1989	Ensure Proper storage of Hazardous Chemicals	Applicable in case of storage and Import of Hazardous Chemical	CPCB
Solid Waste/ E-waste/ Construction & demolition Waste/Plastic Management Rule	2016	Ensure Proper Segregation & disposal of Solid waste/ E- waste/ Construction & demolition / Plastic Wastes as per norms	Projects involving wastes of such types	CPCB/ SPCB/ Local Authority

Acts/Rule/ Policy	Year	Objective	Applicability to Projects	Responsible Agency
Ozone Depleting Substances (regulation and Control) Rules	2000	To control and reduce the use of Ozone depleting substances to protect the Ozone layer	Applicable to RE Projects where air conditioning units installed	Secretary, MoEFCC
The Central Electricity Authority (Technical Standards for Connectivity to the Grid) Amendment Regulations	2013	Guidelines for Grid Connectivity (Technical Standards) for RE projects Compensation payments for transmission (ROW)	Applicable for RE and Transmission line projects where the national grid connectivity is involved.	Ministry of Power, Central Electricity Authority (CEA),
Noise-Pollution (Regulation and control) Rules	2020	To control noise levels and maintain it to the standards prescribed for various areas like residential, commercial or silent zones by CPCB	Noise abatement during construction time and compliance under the rules to maintain stipulated standards.	CPCB, SPCB
Guidelines/Criteria for Evaluation of Proposals/Requests for Groundwater Abstraction, 2020 as amended	1986	To prevent unauthorized abstraction of Ground water.	If Ground Water is Abstracted	Central Ground Water Authority
Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010; and Central Electricity Authority (Safety Requirements for Construction, Operation and Maintenance of Electrical Plants and Electric lines) Regulations, 2011	2010, 2011	These regulations provide technical standard for construction of electrical lines and safety requirements for construction/ installation/protection/operation/maintenance of electric lines and apparatus.	The Project should comply with the requirements of these regulations.	Central Electricity Authority (CEA)
Acts and Regulations governing LA & Social Issues				

Acts/Rule/ Policy	Year	Objective	Applicability to Projects	Responsible Agency
Right to fair compensation and transparency in land acquisition, rehabilitation and Resettlement Act	2013	Fair compensation for acquisition of immovable assets; Resettlement of displaced population due to LA and economic rehabilitation of all those who are affected due to land acquisition.	For acquisition of private land for RE parks as is the case in Rewa	Administrator (As per act),Municipality/Municipal corporation, District Magistrate, Sub-Divisional Magistrate & Revenue Department
MP Consent Land Purchase Policy	2014	The government agencies requiring land for various infrastructure projects can acquire land with the mutual consent of the land owners as it saves time, ensure timely payment of land value to owners and the procedures are less cumbersome.	The policy will facilitate speedy and timely acquisition of land	Land purchase committees of concerned department and Competent Authority
Karnataka G.O. on Land Reforms / Land Lease	2014	The GO aims to facilities the transfer and conversion of agricultural land for Solar PV projects on long term lease basics	These incentives help in reduction of overall timeframe for clearance.	SPPD
Seventy Third Constitution Amendment Act,	1992	The Act enables participation of Panchayat level institutions in decision-making and implementation of the project.	Yes, for any sub project located in panchayat area	Department of Panchayati Raj, State Government
The Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act	2006	Grants legal recognition to the rights of traditional forest dwelling communities, partially correcting the injustice caused by the forest laws. Makes a beginning towards giving communities and the public a voice in forest and wildlife conservation	Yes, if sub-project is located in customary forest land including reserved and protected forests; protected areas and also community forest.	Ministry of Tribal Affaires, GOI and State Schedule tribes welfare Department
Guidelines issued by Ministry of Power for payment of compensation towards damages caused by tower and Right of Way for transmission lines	2015	To determine compensation Tower base area impacted due to installation of tower / pylon structure; and compensation towards diminution of land value in the width of Right of Way (RoW) corridor due to laying of transmission line and imposing certain restrictions	Any sub project that includes transmission line or as an associate facilities for the project	District Magistrate/Concerned Corporation/Municipality/Local body or the State government

3.2 Indian Labour Laws

The Government of India has repealed the non-useful Labour Laws, now 29 Labour Laws have been codified into 4 Labour Codes (4 laws in the Wage Code, 9 laws in the Social Security Code, 13 laws in The Occupational Safety, Health and Working Conditions Code, 2020 and 3 laws in the Industrial Relations Code). The Developer shall undertake the requisite license from Labour Commissioner prior to initiation of any works onsite. Some of these are directly relevant during the construction stage of the proposed sub-projects:

Table 3-2 : Indian Labour Laws and their Applicability

Applicable Acts Labour	**Coverage Provisions**
Minimum Wages Act 1948	The act ensures minimum wages for each category of workers
Child Labour (Prohibition and Regulation) Act, 1986	Prohibits employment of children below 14 years of age
The Factories Act, 1948	Ensures Health and safety considerations of workers
Workmen's Compensation Act, 1923	Ensure fair compensation in case of injury by accidents during the course of employment
Contract Labour (Regulation and Abolition) Act, 1970	Ensure basic welfare measures to be made available to the contract workers by the employer
The Building and other Construction Workers Act, 1996	Ensure safety measures at construction work site and other welfare measures such as canteens, first-aid facilities, ambulance, housing accommodation for Workers near the Workplace etc
Payment of Wages Act, 1936	Ensures regular payment by laying down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers
Equal Remuneration Act, 1979	The Act provides for payment of equal wages for work of equal nature to men and women workers and not for making discrimination against Female employees
Payment of Bonus Act, 1965	The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages
New Labour Codes	
The Occupational Safety, Health And Working Conditions Code, 2020	An Act to consolidate and amend the laws regulating the occupational safety, health and working conditions of the persons employed in an establishment and for matters connected therewith or incidental thereto. 143. (1) The following enactments shall stand repealed on and from the dates the notification referred to in sub-section (2) of section 1 is issued, namely:— (a) The Factories Act, 1948; (b) The Plantations Labour Act, 1951; (c) The Mines Act, 1952; (d) The Working Journalists and other Newspaper Employees (Conditions of Service) and Miscellaneous Provisions Act, 1955; (e) The Working Journalists (Fixation of Rates of Wages) Act, 1958; (f) The Motor Transport Workers Act, 1961; (g) The Beedi and Cigar Workers (Conditions of Employment) Act, 1966; (h) The Contract Labour (Regulation and Abolition) Act, 1970; (i) The Sales Promotion Employees (Conditions of Service) Act, 1976; (j) The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979; (k) The Cine-Workers and Cinema Theatre Workers (Regulation of Employment) Act, 1981; (l) The Dock Workers (Safety, Health and Welfare) Act, 1986; (m) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996
The Code On Social Security, 2020	An Act to amend and consolidate the laws relating to social security with the goal to extend social security to all employees and workers either in the organised or unorganised or any other sectors and for matters connected therewith or incidental thereto 164. (1) The following enactments are hereby repealed, namely:— 1. The Employee's Compensation Act, 1923; 2. The Employees' State Insurance Act, 1948; 3. The Employees' Provident Funds and Miscellaneous Provisions Act, 1952; 4. The Employment Exchanges (Compulsory Notification of Vacancies) Act, 1959;

	5. The Maternity Benefit Act, 1961; 6. The Payment of Gratuity Act, 1972; 7. The Cine-Workers Welfare Fund Act, 1981; 8. The Building and Other Construction Workers' Welfare Cess Act, 1996; 9. The Unorganised Workers' Social Security Act, 2008. (2) Notwithstanding such repeal,— (b) the Employees' Provident Funds Scheme, 1952, the Employees' Deposit Linked Insurance Scheme, 1976, the Employees' Pension Scheme, 1995 and the Tribunal (Procedure) Rules, 1997 framed or made under the Employees' Provident Funds and Miscellaneous Provisions Act, 1952 and the rules, regulations and schemes made or framed under the Employees' State Insurance Act, 1948, shall remain in force, to the extent they are not inconsistent with the provisions of this Code for a period of one year from the date of commencement of this Code; (c) any exemption given under any enactments so repealed shall continue to be in force till its validity expires or it ceases to be in operation under the provisions of this Code or till any direction is made thereunder for such purpose
The Industrial Relations Code, 2020	An Act to consolidate and amend the laws relating to Trade Unions, conditions of employment in industrial establishment or undertaking, investigation and settlement of industrial disputes and for matters connected therewith or incidental thereto. 104. (1) In the notification issued under sub-section (3) of section 1 for the commencement of any provision of this Code, the Central Government may specify that the provisions of— (a) the Trade Unions Act, 1926; (b) the Industrial Employment (Standing Orders) Act, 1946; and (c) the Industrial Disputes Act, 1947, shall stand repealed with effect from the date appointed in the notification in this behalf and the remaining provisions of the enactments referred to in clauses (a) to (c) shall remain in force till they are repealed by like notifications in the like manner.
The Code On Wages, 2019	An Act to amend and consolidate the laws relating to wages and bonus and matters connected therewith or incidental thereto 69. (1) The Payment of Wages Act, 1936, the Minimum Wages Act, 1948, the Payment of Bonus Act, 1965 and the Equal Remuneration Act, 1976 are hereby repealed.

3.3 Land Availability / Procurement for Sub-projects

The private land shall be procured as per the RFCTLARR Act, 2013 "The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act", which stipulates mandatory consent of at least 70% of affected people for acquiring land for Public Private Partnership (PPP) projects and 80% for acquiring land for private companies. It also requires that payment of compensation for the owners of the acquired land will be four times the market value in rural areas and twice in urban areas. It also stipulates that the land cannot be vacated until the entire compensation is awarded to the affected parties. The law has the provision that the companies can lease the land instead of purchasing it. Besides, the private companies will have to provide for rehabilitation and resettlement if land acquired through private negotiations is more than 50 acres and 100 acres in urban and rural areas, respectively.

The review of sample Solar Park sub-projects in two states shows the following applicable state legislations. In the state of Madhya Pradesh, the selection of available government land parcels has been given priority and private land acquisition has been only limited to ensuring site contiguity whereas the state of Karnataka has adopted a long term lease model wherein private land parcels are acquired on a 30 year lease to developer for generation of solar power. For this, the state of Karnataka has modified the land reforms act

and formulated a policy to facilitate the setting up of a solar UMPP / Park. Under the "Land Allotment Policy", the Govt. of AP has made provision to allot revenue land for solar & wind energy projects. The Govt. of AP provides deemed "Non- Agricultural" (NA) status for solar & wind energy projects. Chhattisgarh Renewable Development Agency will assist projects in getting govt. land under the Sate solar policy
Ownership of Waterbodies is usually with the respective state governments either directly or through their specialized agencies/ irrigation department. Project proponent for utilization of water body for Floating Solar Project may sign water body lease agreement. State policies for solar power generation- Examples:

3.3.1 Madhya Pradesh State Solar Policy

GoMP notified its policy "Implementation of Solar Power based Projects in Madhya Pradesh, 2012 (Policy 2012). The Policy 2012 has defined the maximum limit of land as 3.0 Hectares per MW for land use permission for government land, if available, for setting up Solar Power Plant in Madhya Pradesh. In case of land owned by Revenue Department or any other State Government Department, the New & Renewable Energy Department shall take possession of the land and subsequently give permission for use of land to the concerned Developer (whose project has been accorded administrative approval). For procurement of private land the state Government could adopt "Consent Land Purchase Policy of the GoMP" dated November 12, 2014. The Policy provides for procurement of minimum required private land for the project/ part of the project from the owners with the mutual consent. The owner shall be paid consideration amount which shall include amount for land as per the prevailing Collector Guideline Rates and the amount equal to value of immovable assets on the procured land. The land owner shall also be eligible for one time consolidated amount equal to the consideration amount payable in the form of rehabilitation grant.

3.3.2 Karnataka State Solar Policy 2014- 2021

Under this policy, it is proposed to meet the solar power capacity addition targets through different segments which are Grid connected utility scale projects and grid connected roof top projects. The following are the key features relevant to the current baseline study:

i. As per the policy document, GoK contemplates to facilitate the conversion of land for solar projects by amending section-95 of the Land Reforms Act.
ii. GoK contemplates time bound permissions and for vesting Deputy Commissioners with full powers to approve purchase of agricultural lands u/s 109 of Land reforms Act for Development of Solar projects.
iii. As per the policy, developers will be allowed to start project execution without waiting for formal approval on filing application for conversion of agricultural land for setting up of solar power projects on payment of specified fees.
iv. Solar PV projects shall be exempted from obtaining clearances of pollution control board as per the Karnataka Solar Policy 2014 – 2021.

In addition to the above two states, various other states have also notified their state specific solar policy, these include:

Table 3-3 : State potential solar policy

Sr No	State	Solar Policy
1.	Andhra Pradesh	Andhra Pradesh Solar Power Policy, 2018
2.	Chhattisgarh	Chhattisgarh State Solar Energy Policy, 2012-17
3.	Gujarat	Gujarat Solar Power Policy,2021
4.	Haryana	Haryana Solar Power Policy, 2016

5.	Jharkhand	Jharkhand Solar Policy, 2015 notified on 10thAugust, 2015
5.	Himachal Pradesh	Himachal Pradesh Solar Power Policy, 2016
6.	J&K	J&K Solar Power Policy notified on 18.03.2013
7.	Karnataka	i) Karnataka Solar Policy, 2011-16 notified on 01.07.2011 ii) Karnataka Solar Policy, 2014-21 notified on 22.05.2014
8.	Kerala	The Kerala Solar Energy Policy 2013 was approved vide G.O. (P) No. 49/2013/PD dated 25.11.2013
9.	Madhya Pradesh	Madhya Pradesh Solar Power Policy, 2012 notified in 2012
10.	Odisha	Draft Solar Policy,2013 notified in 2013
11.	Rajasthan	Rajasthan Solar Energy Policy, 2019
12.	Tamil Nadu	Tamil Nadu Solar Energy Policy, 2019
13.	Telangana	Telangana Solar Power Policy 2015
14.	Uttarakhand	i) Uttarakhand Solar Energy Policy, 2013 notified on 27.06.2013 ii) Amendment dated 01.10.2015

Table 3-4 : State potential wind policy

Sr No	State	Wind Policy
1.	Gujarat	Gujarat Wind Power Policy-2016
2.	Rajasthan	Rajasthan Policy for promoting generation of electricity from wind, 2012 & Wind and hybrid Energy Policy, 2019
3.	Maharashtra	Comprehensive Policy for Grid connected Power Projects based on New and Renewable (Nonconventional) Energy Sources – 2015
4.	Tamil Nadu	Tamilnadu Renewable Energy Policy 2014-2020
5.	Madhya Pradesh	Wind Power Project Policy, 2012 (As Amended on 21st February 2013)
5.	Karnataka	Draft Karnataka Renewable Energy Policy 2016-22
6.	Andhra Pradesh	Andhra Pradesh Wind Power Policy – 2018
7.	Telangana	Telangana Wind Power Policy, 2016 (Draft)

Table 3-5 : State potential wind solar hybrid policy

Sr No	State	Wind Solar Hybrid Policy
1.	Gujarat	Gujarat Wind Solar Hybrid Power Policy, 2018
2.	Rajasthan	Rajasthan Wind and Hybrid Energy Policy, 2019
3.	Maharashtra	Not Available
4.	Tamil Nadu	Not Available
5.	Madhya Pradesh	Not Available
5.	Karnataka	Draft Karnataka Renewable Energy Policy 2016-22
6.	Andhra Pradesh	Andhra Pradesh Wind-Solar Hybrid Policy – 2018
7.	Telangana	Telangana Wind Power Policy, 2016 (Draft)

Table below presents a comparative of the various state solar policies in India. Water requirements have not been dealt in any of the policies and land availability has been the prime responsibility of the developer.

Table 3-6 : Key Points on Solar Power Policy

Sl.No	Policy	Capacity	Cross Subsidy Charge	Wheeling Charge	Bank Guarantee	Metering	Land
1	Gujarat Solar Power Policy 2015	Maximum of 50% of sanctioned load	Exempted	As applicable to normal open-access consumers; 50 % rebate given to projects registered under REC	INR 25 lakhs per MW	As per Central Electricity Authority	Developer responsible for obtaining the land for setting up and operating solar power project
2	Andhra Pradesh Solar Power Policy, 2015	Power plants with capacity 1000 KWp allowed at single location	Exempted	Exempted	Information Not Available	Apply online to Discoms for installation of meters	Developer responsible for obtaining the land for setting up and operating solar power project

3	Chhattisgarh State Solar Energy Policy 2012	Information Not Available	Exempted	As per CSERC regulations	Information Not Available	Information Not Available	Developer responsible for obtaining the land for setting up and operating solar power project
4	Rajasthan Solar Energy Policy 2014	Information Not Available	Information Not Available	Exempted	INR 10 lakhs per MW	Discom will develop a suitable and comprehensive consumer friendly IT application for metering	Developer will be allowed to purchase agriculture land for developing solar power plant in accordance with provisions of Rajasthan Imposition of Ceiling on Agriculture Holding Act, 1973; Other private land may be acquired under Ceiling Act, 1973
5	The Karnataka Solar Policy 2014-2021	Between 1 MW – based on transmission evacuation capacity	Charges applicable as per KERC norms	Charges applicable as per KERC norms	INR 3 lakhs – INR 5 lakhs per MW	Information Not Available	Information Not Available
6	Policy for Implementation of Solar Power based projects in Madhya Pradesh	0.025 MW – 100 MW	Exempted for a period of 10 years	A grant of 4% is given by the state, while the remaining is borne by developer	INR 5 lakhs per MW	Developers will install metering equipment at their own cost. They will be according to stipulations made by MPPTCL	Information Not Available
7	Tamil Nadu Solar Energy Policy 2012	Information Not Available	100% exemption for a period of 5 years	As per orders of Tamil Nadu Electricity Regulatory Commission	Information Not Available	Information Not Available	Information Not Available

Table 3-7 : Key Points on Wind Power Policy

Sl.No	Policy	Capacity	Cross Subsidy Charge	Wheeling Charge	Bank Guarantee	Metering	Land
1	Gujarat Wind Power Policy, 2016	35000 MW	**Captive consumers:** No waivers **Third party sale:** 50% concession	**Captive consumers:** 1. Wheeling of power site to consumption level below 66KV, wheeling charges shall	@Rs 5 lacs/MW to GETCO	Each WTG shall have ABT complaint meter which will monitor by GEDA and GETCO	GEDA land for setting up and operating wind power plant

Sl.No	Policy	Capacity	Cross Subsidy Charge	Wheeling Charge	Bank Guarantee	Metering	Land
				be applicable @50% 2. More than one location shall be charged at 5paisa per unit **Third party sale:** No waivers			
2	Rajasthan Wind and Hybrid Energy Policy, 2019	2000 MW	-	**Hybrid:** 50% concession for captive/third party sale for 7 years from project commissioning **Hybrid + storage:** 75% concession for captive/third party for a period of 7 years from project commissioning	@Rs 5lac/MW without interest within one month and @9% per annum for 3months from the date of issue of In-principle clearance	-	**1.Government land** allotted as per Land Revenue Rules,2007 1.1 Allotted government land area to developer (3hectare/MW) 1.2 RREC will recommend to DC for allotment of Govt land on submission of security deposit @Rs 1 lacs/MW 2. **Private land** shall be acquired as per Rajasthan Tenancy act, 1955 and land revenue act, 1956 and the rules 3. Government land(150m by 150m) shall be given for Temporary monitoring station on lease for 3years at DLC rate
3	Policy for Renewable energy sources, Maharashtra 2015	5000 MW	-	-	-	-	-
4	Madhya Pradesh wind power project	5500 MW	-	MPERC	@Rs 1 lacs/MW (1st stage) & 0.5% of the project cost shall be	MPPTCL/related Distribution Company shall be installed as per MP	Permissions required under different

Sl.No	Policy	Capacity	Cross Subsidy Charge	Wheeling Charge	Bank Guarantee	Metering	Land
	policy, 2012 and its amend 2013				deposited(2nd stage), 30days of Financial Closure	electricity supply code, 2004	category of land i. **Government land** shall be acquired as per circular F-16-14/2013/Seven/Gov.2 A , dated 30-05-2013 ii. **Forest land** acquired as per guidelines issued by Forest (Conservation)act,1980 iii. **Schedule tribes land** can be taken under provision mentioned in the section 165(b) of MP land revenue code
5	Draft Karnataka Renewable Energy Policy 2016-22	2915 MW	Relevant charged as determined by KERC	Charges as determined by KERC	@Rs 1lacs/MW	Project developer shall install Remote Transmitting Unit (RTU) for transferring data to SLDC. Meter Readings shall be taken by KPTCL/ESCOMs	Permissions required under different category of land i. **Government land** shall be acquired as per circular RD 78 LPG 2009 dated 4.1.2011 ii. **Forest land** would be acquired as per F. No: 11-113/2008 FC dated 30.12.2008
6	Andhra Pradesh Wind Power Policy,2018	44229 MW	As per APERC approved rules, order, regulations and Term and conditions	As per APERC approved rules, order, regulations and Term and conditions	@Rs 2lacs/MW	-	Land will procured as per New Land Allotment Policy
7	Telangana Wind	-	100% Exemption	-	-	-	Conversion charges would

Sl.No	Policy	Capacity	Cross Subsidy Charge	Wheeling Charge	Bank Guarantee	Metering	Land
	Power Policy, 2016		for 5yrs as per TSERC				be Agricultural Land (Conversion for Non-agricultural Purposes) Act 3 of 2006 amended

Table 3-8 : Key Points on Wind Solar Hybrid Power Policy

Sl.No	Policy	Capacity	Cross Subsidy Charge	Wheeling Charge	Bank Guarantee	Metering	Land
1	Gujarat Wind Solar Hybrid Power Policy, 2018	5500 MW (Wind) & 1650 (Solar) **achieved**	**Captive consumers:** No waivers **Third party sale:** 50% concession	**Captive consumers:** 50% concession to captive consumers **Third party sale:** No waivers **Hybrid Project Developers** may charge 5paisa/unit for more than one locations	@ Rs. 3 lacs/MW for Type-B projects to GETCO	Developer shall install ABT compliant meter as per GERC regulations Type B projects, GETCO will be responsible for installing the meters	As per Gujarat Waste Land Allotment Policy
2	Rajasthan Wind and Hybrid Energy Policy, 2019	3500 MW BY 2024-25	-	**Hybrid:** 50% concession for captive/third party sale for 7 years from project commissioning **Hybrid + storage:** 75% concession for captive/third party for a period of 7 years from project commissioning	@ Rs 5lac/MW without interest within one month and @9% per annum for 3months from the date of issue of In-principle clearance	-	i. **Government land** allotted as per provision of Rajasthan land revenue rules, 2007 and RREC will recommend to DC for Govt land on submission of security deposit @Rs 3 lacs/MW ii. **Private land** acquired as per Rajasthan Tenancy act, 1955, Land Revenue act, 1956 and their rules ii. Land can also be acquired directly from Khatedar through provisions of Ceiling Act,1973
3	Maharashtra Wind Solar Hybrid Policy	NA	NA	NA	NA	NA	NA
4	Madhya Pradesh Wind Solar Hybrid Policy	NA	NA	NA	NA	NA	NA

5	Draft Karnataka Renewable Energy Policy 2016-22	6000 MW by 2022	-	As per CEA regulations 2006 and amendments	@ Rs. 1lacs/MW	Project developer shall install Remote Transmitting Unit (RTU)	**Government land** shall be acquire as per circular No. RD 78 LPG 2009,dated 4.1.2011 **Private land** shall be taken through direct purchase or lease (30years)from land owners **Forest Land** should issue facilitation letter vide letter No. F.No: 11-113/2008 FC dated 30.12.2008
6	Andhra Pradesh Wind Power Policy,2018	5000 MW	50% waived for third party sale projects set up within the state	Upto 50% exemption in transmission and wheeling charges for new projects developed within the state	@ Rs. 2lacs/MW to NREDCAP	ABT meter shall be installed	**Category I –** Allotment of revenue land as per New Land Allotment Policy **Category II –**
7	Telangana Wind Solar Hybrid Policy	NA	NA	NA	NA	NA	NA

Note: - NA indicates policy not available

3.3.3 Land Reforms Act – Karnataka

The Karnataka Land Revenue (Amendment) Act, 2015 (12th August 2015) states that "(10) If any occupant of any agriculture land assessed or held for the purpose of agriculture wishes to divert such land or part thereof for the purpose of setting up of solar power generation in accordance with Karnataka Solar Policy 2014-21 issued in G.O EN 21 VSC 2014 dated 22.05.2014 which has been approved by State and Central Government and which has been approved by the Competent Authority, the permission applied for conversion of such land shall be deemed to have been granted for that purpose so long as they use for purpose for which permission is granted subject to payment of the conversion fine and all such other fees payable if any, in this regard."

If the government revenue land is recorded as forest land with small and minor trees in the revenue records or it is defined as a forest land as per Revenue Department, then the applicant will have to take permission, as per provisions of Forest Conservation Act 1980, from concerned authorities.

3.4 Relevant World Bank Group Safeguard Requirements

The implementation of the World Bank Operational Policies seek to avoid, minimize or mitigate the adverse environmental and social impacts, including protecting the rights of those likely to be affected or marginalized by the proposed project. Based on the information collated by the consultants during the baseline study, following OP's are likely to be triggered and would require adequate measures to address the safeguard concerns.

Table 3-9 : World Bank Safeguard Requirements

World Bank Safe Guard Policies	Objective	Applicability	Safeguard Requirements
OP 4.01 Environmental Assessment	The objective of this policy is to ensure that Bank financed projects are environmentally sound and sustainable.	The environmental issues will be addressed adequately in advance. An integrated Environmental Screening and Environmental Assessment (EA) with Environmental Management Plan (EMP) will be developed to manage environmental risks and maximize environmental and social benefits wherever it is applicable.	EIA and/or EMP required.
OP 4.04 Natural Habitats	The policy recognizes that the conservation of natural habitats is essential for long-term sustainable development. The Bank, therefore, supports the protection, maintenance and rehabilitation of natural habitats in its project financing, as well as policy dialogue and analytical work. The Bank supports and expects the Borrowers to apply a precautionary approach to natural resources management to ensure environmentally sustainable development	This policy may be triggered by the Project due to activity requiring forest/ wildlife lands, locating close to the natural habitats with the potential to cause significant adverse impact or degradation of natural habitats whether directly (through construction) or indirectly (through human activities induced by the project).	EIA and EMP required
OP 4.36 Forests	This policy focuses on the management, conservation, and sustainable development of forest ecosystems and resources. It applies to project that may have impacts on (a) health and quality of forests; (b) affect the rights and welfare of people and their level of dependence upon forests and projects that aim to bring about changes in the management, protection or utilization of natural forests or plantations, whether they are publicly, privately or community owned. The Bank does not support the significant conversion or degradation of critical forest areas or related critical natural habitats.	Impact of construction activities on Forest areas required to be taken care of. Generally diversion of reserve forest will be avoided, however the roadside trees along state highways being declared as protected forest, and roadside tree felling will attract the provision of Forest (Conservation) Act. The forest related issues, avoidance/ minimization of forest loss and its management should be integrated with EA study and EMP.	Forest land diversion Application has to be prepared and submitted to forest department. The issue of forest loss and its mitigation/compensatory measures is required to be integrated in EIA study and EMP.
OP/BP 4.12 Involuntary Resettlement	The objective of this policy is to avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs. Furthermore, it intends to assist displaced person in improving their former living standards; community participation in planning and implementing resettlement; and to provide assistance to affected people, regardless of the legality of title of land	There will be need for limited land acquisition resulting in: relocation or loss of shelter, loss of assets or access to assets; loss of income sources or means of livelihood. This policy applies to all components of the project that result in involuntary resettlement, regardless of the source of financing including projects that are carried out, or planned to be carried out, contemporaneously with the project.	Resettlement Action Plan in consultation with the community and project authorities

World Bank Safe Guard Policies	Objective	Applicability	Safeguard Requirements
OP/BP 4.10 Indigenous People	This policy aims to protect the dignity, right and cultural uniqueness of indigenous people; to ensure that they do not suffer due to development; that they receive social and economic benefits	This policy may be triggered if there are indigenous people in the project area; when potential adverse impacts on indigenous people are anticipated; and if indigenous people are among the intended beneficiaries.	Indigenous people development Plan
OP/BP 4.11 Physical Cultural Resources	This policy aims at assisting in the preservation of cultural property, historical, religious and unique natural value-this includes remains left by previous human inhabitants and unique environment features, as well as in the protection and enhancement of cultural properties encountered in Bank-financed project	This policy may be triggered by sub-projects where cultural property, historical, religious and unique natural value-this includes remains left by previous human inhabitants and unique environment features may be affected due to project.	Application has to be prepared and submitted to Archaeological department in case any impact is envisaged due to the project. The impact on such features should be integrated with EIA study and included in EMP
Safety of Dams (OP 4.37)	This policy relates to dam safety	This policy may be triggered by sub-projects where construction or maintenance on dams is required	Study and their impacts should be included in ESIA report
Projects on International Waterways (OP 7.50)	This policy relates to International Waterways	This policy may be triggered if sub-project activities will be carried out inside or associated with any international waterways or the project will impact any of such waterways	

3.5 IFC Performance standards

As per the proposed implementation arrangements under the project, the private developer shall play a lead role in the success of the project implementation and shall be undertaking the setting up of infrastructure for energy generation. The IFC performance standards apply to private sector projects and provide instruments to manage the operations of projects in an environmentally and socially acceptable manner. The following performance standards are likely to be applicable:

Table 3-10 : Applicability of IFC Performance Standards

Performance Standards	Applicability
Assessment and Management of Environmental and Social Risks & Impacts / Performance Standard 1	● Yes ○ No
Labour and Working Conditions / Performance Standard 2	● Yes ○ No
Resource Efficiency and Pollution Prevention / Performance Standard 3	● Yes ○ No
Community Health, Safety, and Security / Performance Standard 4	● Yes ○ No
Land Acquisition and Involuntary Resettlement / Performance Standard 5	● Yes ○ No
Biodiversity Conservation and Sustainable Management of Living Natural Resources / Performance Standard 6	○ Yes ● No
Indigenous Peoples / Performance Standard 7	● Yes ○ No
Cultural Heritage / Performance standard 8	○ Yes ● No

3.6 Categorization of Projects as per IFC guidelines

As part of its review of a project's expected social and environmental impacts, IFC uses a system of social and environmental categorization. This categorization is used to reflect the size of impacts understood because of the client's social and environmental assessment and to specify IFC's institutional requirements. The categories used by the IFC are:

- Category A Projects: Projects with potential significant adverse social or environmental risks or/and impacts that are diverse, irreversible or unprecedented;
- Category B Projects: Projects with potential limited adverse social or environmental risks or/and impacts that are few, generally site-specific, largely reversible and readily addressed through mitigation measures;
- Category C Projects: Projects with minimal or no adverse social or environmental risks or/and impacts, including certain financial intermediary (FI) projects with minimal or no adverse risks;
- Category FI Projects: Business activities involving investments in financial institutions (FIs) or through delivery mechanisms involving financial intermediation. IFC therefore categories the project primarily according to the significance and nature of its impacts.

IFC defines the project's area of influence as the primary project site(s) and related facilities that the client (including its contractors) develops or controls associated facilities that are not funded as part of the project (funding may be provided separately by a client or a third party including the government), and whose viability and existence depend exclusively on the project and whose goods or services are essential for the successful operation of the project; areas potentially impacted by cumulative impacts from further planned development of the project; and areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location. The area of influence does not include potential impacts that would occur without the project or independently of the project. With respect to the intensity of impacts due to project activities on environment, resources, biodiversity, labours and community, the project can be categorized as Category B (as per IFCs categorization of projects), which specifies that this project is expected to have limited adverse environment and social impacts, which can be mitigated by adopting suitable mitigating measures. Detailed Review of applicability is given in **Annexure – 2**.

4 IMPACT IDENTIFICATION PROCESS AND METHODOLOGY

Renewable energy projects are considered as the most environmentally benign and socially acceptable projects. However, IREDA being a responsible financial institution has adopted Environmental and Social Safeguards Policy (E&S Policy). As a result of this policy, Environmental and Social Management System (ESMS) has been developed to identify and mitigate whatever minimal impacts the projects have. The current version of ESMS came into force in 2019.

IREDA's financing stems from its own sources, lines of credit from international funding institutions (ADB, AfD, EIB, JICA, KfW, World Bank, etc.) and bonds. The international lenders have their own established environmental and social (E&S) policies and guidelines that must be followed when funding projects using the respective lines of credit. This system will also help IREDA to conform with the lenders' E&S policies and guidelines. The ESMS is primarily based on International Finance Corporation (IFC) Performance Standards, ADB Safeguard Policy Statement (2009), World Bank's E&S Framework and World Bank Group's General Environmental Health and Safety Guideline (EHSG) as well as the EHS Sector Guidelines. ESMS is designed to be "universally applicable" (as far as feasible) to address the various lender requirements; the same basic procedures described in this ESMS will therefore be applied regardless of the funding source. The requirements of the ESMS are also in line with applicable Indian laws and regulations at national, regional and local levels.

With an intention to avoid any divergence/ overlap between this ESMF & current IREDA ESMS; the following have been given due consideration / need to be clarified upfront for this particular WB funded project on Shared Infrastructure

- Category FI: This proposed project is classified as Category FI by WB as it involves investment of Bank funds through a financial intermediary (IREDA)
- Our current project is appraised as per Operational Policies/ Bank Procedures of WB.
- As per IREDA & WB agreement ESMF is Guiding policies/principles, acceptable standards and procedures for: (a) the screening of Project investment activities and the identification of any adverse or positive social and environmental impacts caused, or expected to be caused, on account of their implementation, including any Displaced Persons arising from the carrying out of such activities, or any impacts, whether prejudicial or benign, caused or likely to be caused to Tribal Groups; and (b) the preparation of their prescribed ESIA(s), EMP(s), IPDP(s) and/or RAP(s), thus ESMF becomes a document to guide selected/ to be selected Implementation agencies/ Sub borrowers (borrowers from IREDA) on the E&S considerations for this Project
- ESMS is the set of policies, procedures, tools and internal capacity at IREDA to identify and manage the environmental and social risks posed by the funded projects, thus ESMS becomes a document to guide IREDA on E&S considerations of all projects
- ESMS & ESMF are complementary documents having a single purpose to ensure E&S considerations are fully incorporated in this project & references shall be given to establish necessary linkages
- ESMF documents shall be revised, updated or supplemented from time to time with the prior written concurrence of the Bank for this project & similarly ESMS also shall be strengthened in line with Multilateral Development Bank (MDB) requirements from time to time. It is the intention of IREDA to develop necessary capabilities at REPPD/ Implementation agencies/ sub borrower's level so that they can further enhance this Project specific ESMF.

IREDA follows a robust framework to ensure environmental and social safeguards in the projects funded by IREDA. This includes various forms/checklists and formats to be completed at different stages of the

project. The E&S Safeguard Process is integrated within the project financing cycle of the project as shown in the figure below.

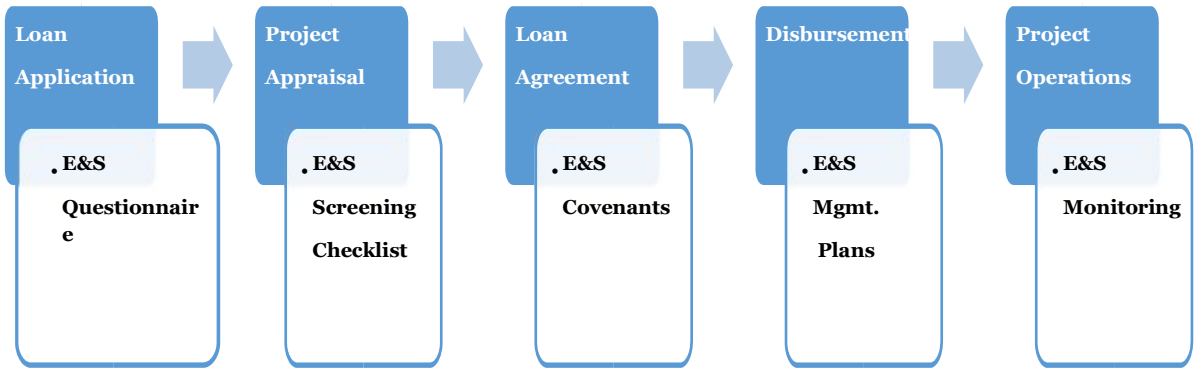
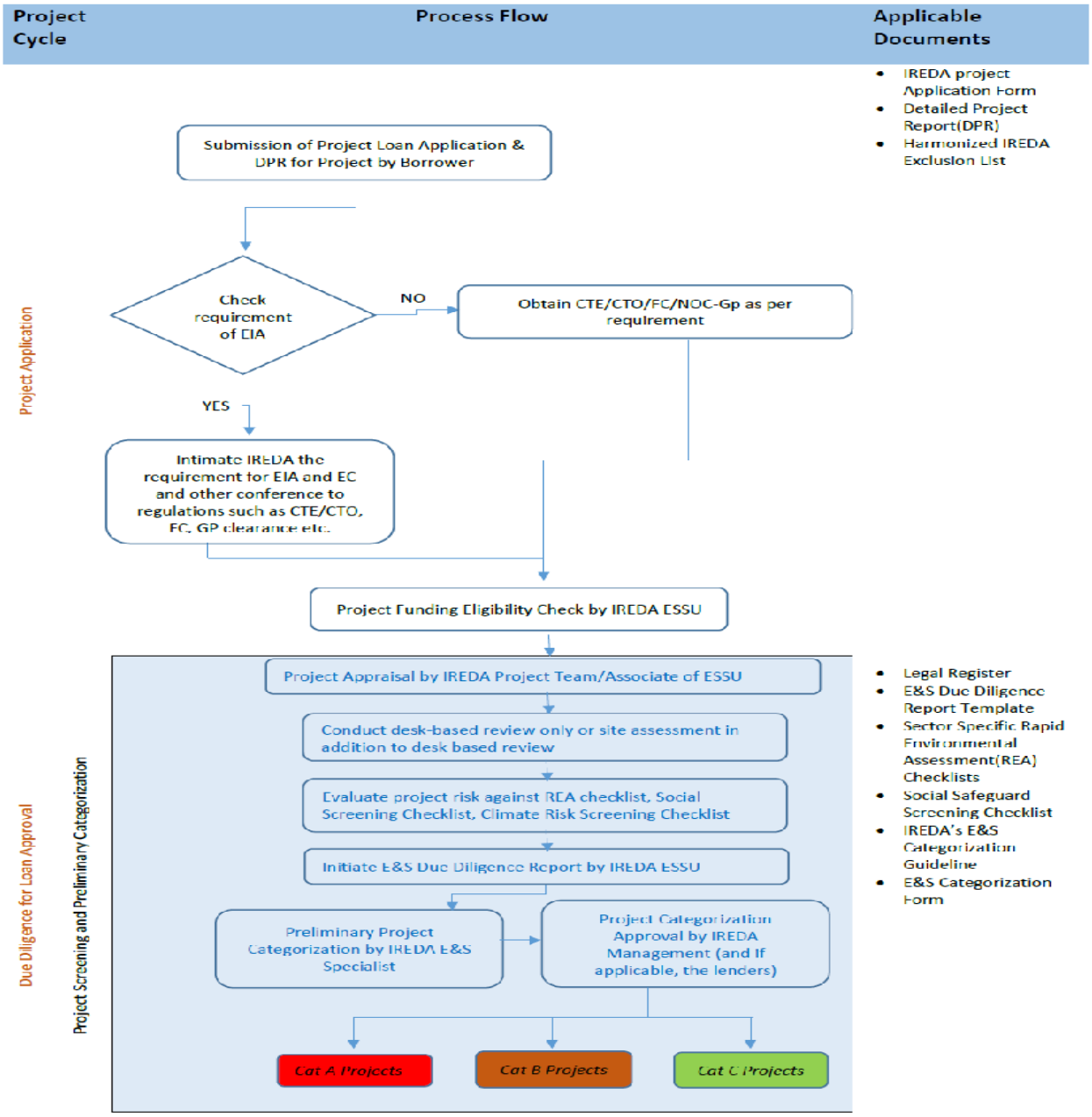


Figure 4-1 : E&S Interventions in IREDA'S Loan Application Process



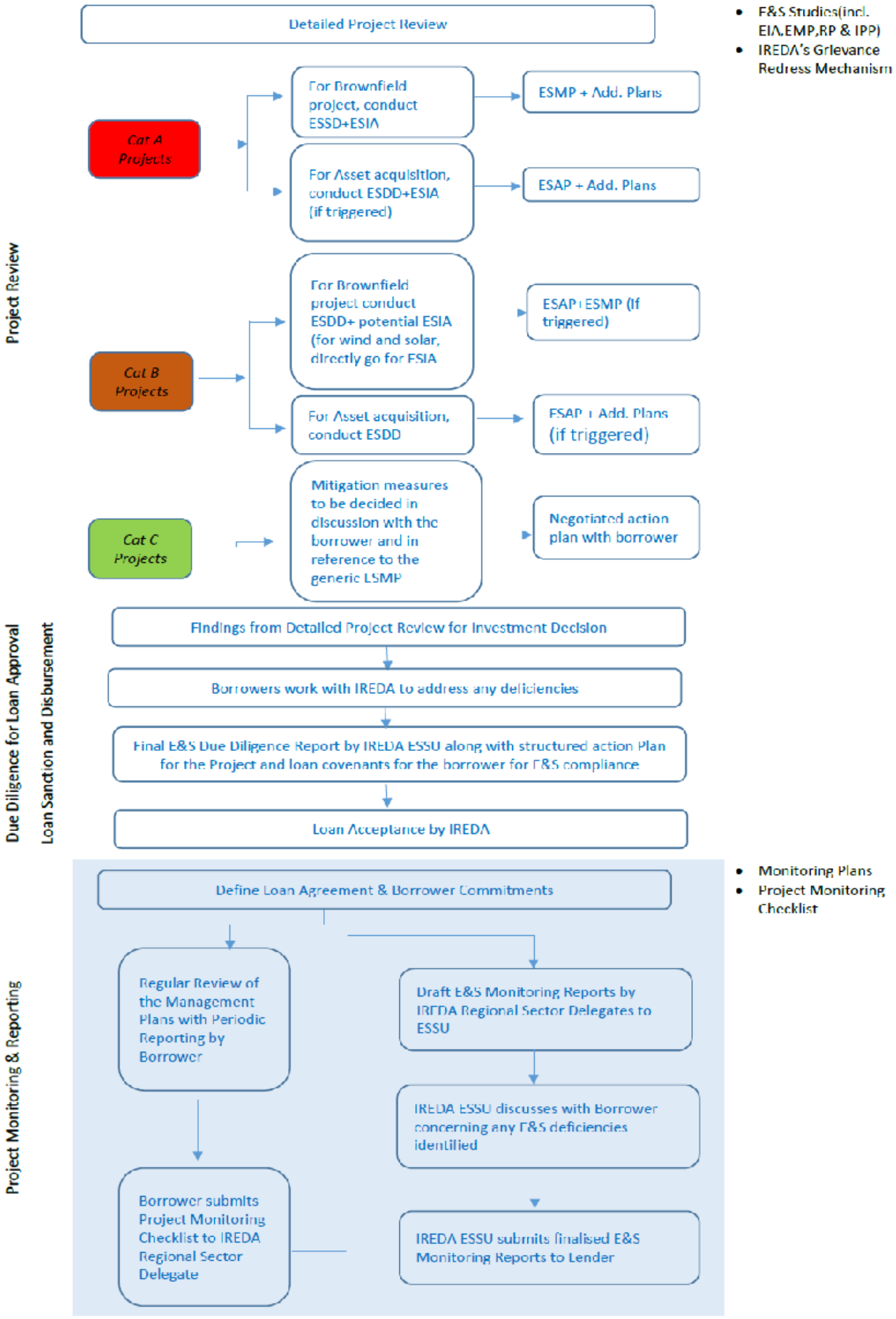


Figure 4-2 : Flow chart showing in detail E&S Interventions on Loan Application Process

IREDA expects all sub projects to be screened by implementation agency/ Sub Borrowers/REPPD based on the step-by step process beginning with the screening/ due diligence stage. On the one hand the screening

checklist will help identify sub-projects which have substantial social and environmental impacts requiring appropriate mitigation measures, whereas on the other hand it will help identify sub-projects which have insignificant environmental and social consequences and the environmental review process could be limited in scope.

The project will use a structured approach to environmental and social management to allow the project development process, follow the hierarchy of avoidance, minimization, compensation/mitigation for negative impacts and enhancement of positive impacts where practically feasible and advantageous. The overall process is depicted in a flow chart below:

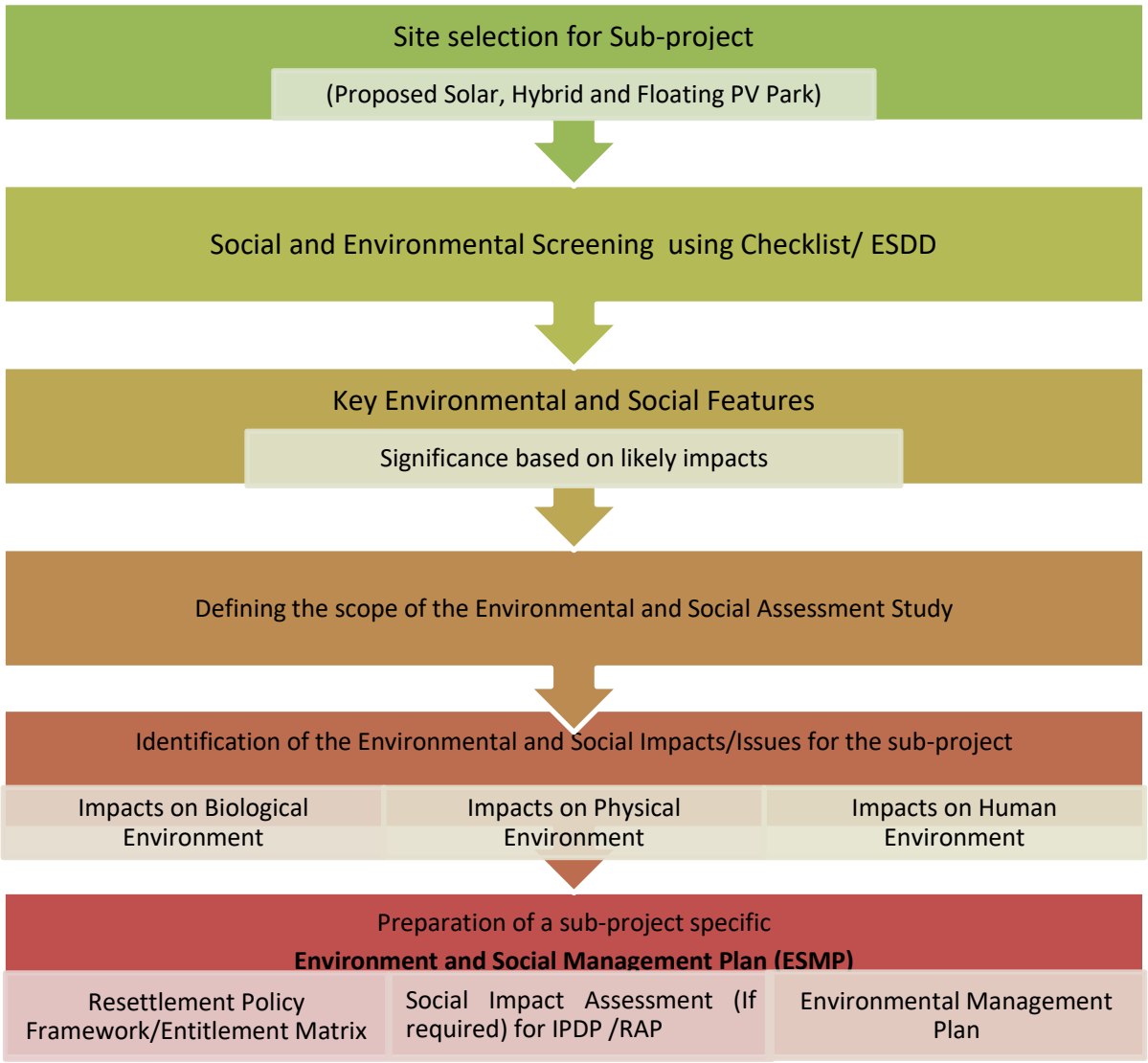


Figure 4-3 : ESMF process for Implementing agencies/ Sub Borrowers/ REPPD

Following sections describe what needs to be done at each stage of the overall project life – sub-project selection, design of the project-supported interventions, implementation of the project activities, and reporting on progress.

4.1 Screening

This step will involve review of the available environmental information about the sub-project and its surrounding areas. It would help identify issues to be verified during reconnaissance site visits and also provide a preliminary idea regarding the nature, extent, and timing of environmental issues that would need to be handled during the subsequent stages. It will also help identify opportunities for avoidance

and/or minimization early in the project cycle so that the design process can be informed appropriately. The steps to be followed include the following:

i. Confirm the presence of environmentally sensitive areas from secondary sources or preliminary site observations.
ii. Verify the extent of applicability of GoI, and World Bank policies in sub-project activities
iii. Identify potential negative and positive impacts; provide clarity on which issues need to be investigated more comprehensively during preparation of Environmental & Social Impact Assessment that will be done during the design stage.

This should help with sequencing of sub-projects, and factoring in timelines like those associated with regulatory clearance processes into project implementation.

The process of preparing the environmental and social screening checklist and scoping will typically cover:

i. Describing the need for the project, i.e. the issues or problems to be addressed.
ii. Describing the proposed project.
iii. Identifying the potential environmental and social impacts of the projects and analysis of alternative options .
iv. Undertaking a preliminary evaluation of the potential environmental and social impacts of the project or options.
v. Identification of various stakeholders & Consultation meetings with the different stakeholders on potential Environmental or Social impacts on the project. The purpose of the meeting is to understand their views and likely issues/problems before finalising the proposed sub-project.
vi. Selecting a preferred project option or short list of options. The appraisal of the available DPR / Feasibility study reports should be included from an environmental and social perspective.
vii. Identifying the planning approvals, which are likely to be required from MOEFCC, SPCB and other regulatory agencies.
viii. Determining the type, scope and project category of EIA study. ToR for an Environmental and Social Assessment Study of the preferred option or a short list of options.

While more extensive data is likely to be required for E&SIAs, some data on baseline conditions will generally be required for screening to compare the environmental and social impacts of project options and to assess the extent of any environmental and social impacts.

The robustness of screening will often be dependent on the quality of data on baseline conditions and the assessment of projects induced environmental and social impacts. The assessment of baseline conditions should take into account:

i. Past trends in environmental and social quality
ii. Community preferences and competing demands for resources
iii. Other current or proposed development programs in the project area.

Good maps are generally required to indicate the spatial relationship between the sources and receptors. Secondary source of information's from Google Earth and other open source satellite imagery data can also be very useful in indicating changes in land use and other environmental features and their environmental and social impacts due to the development of proposed projects. The Screening/ ESDD and preparation of ESDD Report will inform Implementation Agency/ Sub Borrower/REPPD of environmental and social impediments that needs to be addressed while executing the project.

The ESDDR shall comprise of (i) a description of the sub-project and its components (ii) an environmental and social profile of the sub-project areas and the proposed project facilities (iii) an Environmental and Social Screening (iv) an analysis of environmental and social issues associated with the project.

Implementation agency/ Sub Borrower/ REPPD will primarily be responsible for the preparation of ESDDR and ESMP and overall management of their implementation.

The following checklist/ format useful in preparation of ESDD report will help identify the screening components that need to be investigated in detail during the preliminary stages of evaluation or to conclude that insignificant adverse impacts are anticipated. This screening criteria is applicable for Wind/ Solar/ Wind Solar Hybrid & RE with Battery Energy Storage Systems. An example of use of similar checklists for preparing ESDD is available as **Annexure -3**.

Table 4-1: Environment and Social Checklist

S. No.	Environmental & Social Features	Status / Availability in & around site (10-kms)	Significance (based on likely impact)	Remarks / Description
Physical Environment				
	Drainage pattern / Conditions			
	Surface Water Resources			
	Erosion Prone stretches			
	Slope percentage			
	Topography			
Biological Environment				
	National Park / Wildlife Sanctuary			
	Non-NP/WLS areas			
	Migratory routes			
	Reserved Forests			
	Large Trees / Woodland			
	Protected Forests			
	Presence of endangered species (Flora/ Fauna)/ habitat areas			
	Ecologically sensitive areas			
Human Environment				
	Settlements / Built-up Environment			
	Sensitive Receptors			
	Drinking Water sources			
	Physical cultural Resources – Religious			
	Physical cultural resources – community			
	Underground utility lines like electricity lines, pipelines for gas, etc.			
	Agricultural land parcels / land fertility levels			
	Defence Installations / Airports			
	Damage to existing infrastructure, public utilities, amenities etc.			
	Presence of Indigenous / vulnerable			

	communities			
Social Environment				
	Involuntary acquisition of private land leading to loss of shelter and livelihood			
	Any loss / reduction of access to traditional dependent communities (to areas where they earn for their primary or substantial livelihood).			
	Impact on common property resources			
	Adverse impacts to women, including economic and safety concerns			
	Involuntary land taking resulting in loss of income; livelihood; sources of livelihood; loss of access to common property resources and / or private residential and/or property resources.			
	Any specific gender issues			
	Impact of labour influx on local community			
	Possible conflicts with and/or disruption to local community			
	Significant issues raised by the stakeholders during consultation			

More detailed checklist **(Annexure -4)** is also given for highlighting the information which can be collected upfront so that E&S considerations are included from the project planning stage itself. This information is required to be submitted by Sub Borrower/ Implementation Agency for processing of their loan applications in line with IREDA ESMS procedures i.e. IREDA ESMS technology specific forms/ checklists (Refer Annexures of ESMS document available at IREDA website).

Since there is limited prior experience at present in working on MW-scale Floating Solar PV (FSPV) plants, separate criteria have been developed to guide the deployment of this innovative technology within this project. These would be applied for selection, preparation, and implementation of FSPV sub-projects. These are included in **Annexure - 5**.

The results based on the screening checklist/ ESDD will help identify the scope of the ESIA study and timeframe required for obtaining the regulatory clearances (if any). The environmental and social safeguard screening/ESDD shall occur during the project preparation stage as a soon as the fairly accurate site location is known for the sub-project. The formulation of the sub-project specific ToR shall be done based on the screening outputs highlighting environmental and social components that require detailed assessment during the ESIA stage. A generic ToR for ESIA study is attached in **Annexure- 6** for similar RE sub-projects.

Rapid EIAs can rely on data collected in one season (other than the monsoon season) to facilitate a speedier assessment process. Rapid EIAs are generally acceptable if the analysis of environmental and social impacts is sufficient for the purposes of selecting a preferred project option and determining appropriate measures

for mitigating environmental and social impacts, which is usually the case in Solar/ Wind/ Hybrid RE projects.

The outcome of a Rapid EIA process will sometime determine if a Comprehensive EIA is required and, if this is likely, then it will often be more efficient to prepare a Comprehensive EIA from the outset viz. Comprehensive ESIA (relying on data covering 12 months) may be required for Floating Solar PV as long term effects of coverage of large parts of water bodies & its interaction with local environment are still being explored.

REPPD will responsible for preparation of ESIA and related ESMP reports. IPDP & RAP may also be applicable in certain subprojects based on ESIA study & in such cases these have to be prepared by the REPPD.

4.2 Environmental and Social Assessment

The ESIA is the most commonly used tool to ensure that environmental and social aspects are considered during decision making – by influencing design to avoid /minimize, and where unavoidable mitigating the residual adverse impacts and/or enhancing positive impacts. It also provides a platform for getting views from stakeholders including the directly affected population to improve the design. Detailed guidance regarding the EIA/SIA contents is available in the OP4.01 /OP 4.12 of World Bank. The key steps in preparing the ESIA would involve:

i. Defining the scope in line with the already completed screening, and the Operational Policies of the World Bank. The template ToR provided in **Annexure- 6** shall act as a guidance document.
ii. Obtaining information from primary or secondary sources regarding the current conditions of environmental and social features within the influence area of the sub-project. Generally, the impact zone for environmental impacts is considered as 10 kms/5 Kms buffer along the proposed site whereas for the social impacts, it is considered up to 2 kms buffer along the proposed site or even lesser depending upon the location of PAP/ settlements / land parcels that are likely to be impacted due to the project either directly or indirectly.
iii. Carrying out effective stakeholder consultations, including along the proposed sub-project impact zone. This shall also include landless labourers / marginalized communities whose livelihood may be impacted due to sub-project.
iv. Identifying feasible alternatives for proposed layout changes, use of alternative technologies etc. in close collaboration with the Design team.
v. Identifying and estimating quantitatively (to the extent possible), key impacts and classify these for ease of understanding and determination of significance (by severity, duration, project phase, etc.)
vi. Critical biodiversity assessment, evaluation of the eco system services and requirement of a biodiversity action plan.
vii. Selecting measures that can help manage these impacts in cost effective manner – reduce the negative ones; and enhance positive ones and estimate the residual impacts, including those that may need further study.
viii. Clarifying the institutional arrangements, any capacity building needs, and resource requirements including grievance redress mechanism and budget as part of the preparation of environmental and social management plan.

The following will be the outline contents for each ESIA under the project:

i. Executive Summary
ii. Project Description
iii. Policy, Legal and Institutional Framework

iv. Current (Baseline) Environmental & Social Status
v. Potential Environmental & Social Impacts
vi. Analysis of Alternatives
vii. Stakeholder Consultations, including Community Consultations / Public Disclosure
viii. Environmental & Social Management Plan (including additional studies, if any)
ix. Gender mainstreaming
x. Grievance Redressal Mechanism
xi. RAP / IPDP (if required) depending upon the likely R&R impacts else would be addressed under the EMP document.
xii. Recommendations and Conclusion
xiii. Annexes (including data sources, List of EIA preparers, consultation details, etc.)

4.3 Probable Environmental & Social Impacts

Environmental and social impact analysis of a project (or project options) consists of comparing the expected changes in the biophysical and socio-economic environment with and without the project.
Based on the information available for the selected case studies / sub-projects for the preparation of ESMF, key environmental issues / impacts identified that would require detailed investigations during the ESIA stage are listed below. A summary of the issues and potential impacts is presented in the following paragraphs to guide preparation of sub-project ESIA and ESMPs.

4.3.1 Impacts on Natural Physical Environment

The proposed Renewable Energy projects will require excavations for laying foundation, water for construction and operation stage, area for storage of spare parts/ equipment etc. The physical environment would be used differently at construction and operation stages.
The site climatic conditions are an integral part of the impact assessment, where the resource used for the project purpose will be used judiciously and conserving, replenishing techniques for these resources would be at utmost priority. The ESIA study should provide a detailed assessment for all the resources required for the project.

4.3.2 Impacts on Visual Environment

The concern for the impact on visual environment is predominant in wind power projects where the height of the wind turbine is often found to be at a 50/80/100/120 meter height. The movement of the wind turbine and the motion at which it moves can be harmful for the exposed sensitive receptors. The preferable locations for most of the high-density wind areas are in the hilly regions or forested land, thus a higher probability of blocking or hampering scenic value of the place.

4.3.3 Impacts on Biological Environment

Wherever forest land is acquired for RE projects would require the appropriate clearance procedures to be adopted for conversion of land use / compensatory land allocation.
Most of the Solar Parks projects are expected in remote / barren land parcels with minimal tree cover. The protection of existing tree cover is crucial in such areas and should not lead to removal of trees. This may lead to increased dust in these areas. Minimum alteration to existing ground cover in such sites is a chosen strategy. In case of Wind power plants, there is probability of high wind density area falling under forest land with heavy tree coverage,

all necessary precautions for safety buffer etc. should be considered while planning such power generation facilities.

The proposed RE parks would be completely fenced entities with controlled access thereby minimizing the risks of wild animals getting wounded. The ESIA study shall establish the wildlife species paths/ habitat if any applicable in and around the proposed site. E.g. Deer has been spotted by the villagers in close vicinity of the proposed RE park site. The ESIA study shall establish the status of wildlife in vicinity of the proposed site and adequate mitigation measures to ensure no conflicts / poaching occurs during the various stage of project development.

There will not be any anticipated impacts on the ambient air quality. The sub project are likely to have minor impacts due to increased noise levels during the construction phase.

4.3.4 Impact on Archaeological/Protected Monuments and Cultural Properties

Although unlikely, but cultural properties in the form of memorial stone in different shape and sizes, graves, sacred tree, etc. can be encountered during the site selection or may be during construction stage as a chance find. A “chance finds procedure” shall be in place to stop works and require investigation by an appropriate agency in case of such findings.

4.3.5 Impacts on Intangible Culture

The impact has to be identified and mitigation strategy should be in place before start of any civil work.

4.3.6 Impacts on Land Use & Water

There will be change in the land use in project site especially after construction of access road, installation of Wind Turbine/ Solar Park, Pooling Sub-Station, Stockyard & Site Office etc. All of the above components will require the clearing of vegetation/ trees to a certain extent apart from grubbing and excavation. Vegetation removal could result in wind blown dust which could constitute an in direct visual impact.

The disposal of debris materials in haphazard manner will not only hamper the aesthetic look of the area but at the same time they are potential contaminant for the surrounding land.

Excavation is required for establishment of solar panel, erection of wind turbine, trench and road construction other infrastructure etc. in the RE park.

To establish tower for transmission line excavation is required

i. Some land would be needed to establish site offices and construction camps, labour camps. These will require temporary land acquisition for a short period
ii. There could be loss of crop during installation of towers and stringing. Transmission Line ROW over standing crops/ settlements/ forested areas/ water bodies to be avoided to the extent possible.
iii. General community may be impacted due to access restrictions/easements, increased movement of vehicles.

The RE parks will require water for construction and operation stage. The water for construction stage would be a one-time requirement whereas the requirement of water during the operations stage would be a continuous one.

Most of the proposed sub-projects would be in remote areas with arid conditions and scarcity of water generally. The ESIA study should provide a detailed assessment of the water

requirements during the operations phase along with an adequate assessment of the existing available water resources. For floating solar projects, the impact on aquatic bodies is yet unknown and needs to be investigated in detail in ESIA

4.3.7 Impact of labour Influx

During construction phase, it is expected that 250-270 labourers working at site for solar park with capacity of 250MW. The workforce consists of migrant males that can be potential risk for host population. Specifically, influx of labour force can lead to -

i. Risk of spread infectious diseases among labourers and local community
ii. Risk of sexual exploitation and abuse / sexual harassment (SEA/SH)
iii. Risk of Gender based violence
iv. Business opportunities to supply construction camps

4.3.8 Impacts on Human Environment & Settlement Infrastructure

Based on the review of sample projects, each MW of solar power requires 5 acres of land and A typical footprint (direct surface area of impact which last the life of the facility) for a single WTG of 1.5 MW / 2 MW is calculated based on the size of the blade lengths. For a 40 meter to 45-meter blade length, an area of approximately 100 meters by 100 meters (1 hectare) is required. This includes the area occupied by the wind turbine pads, sub stations, service buildings and other supporting infrastructure facilities. An area of approximately 1 Ha (100 meters x 100 meters) is acquired for setting up a single unit WTG (1.5MW). Additionally, there is a radius of restriction which is calculated as (tower height plus (+) 0.5 times the blade diameter) wherein there are height restrictions for buildings / vegetation to ensure safety of the WTG. Based on the review of the RE project, land is made available either on lease or through direct purchase. This may adversely impact on the livelihood of the family owner. During the review of the sub-projects, it has also been found that there may be adverse economic impacts on small businesses/traditional and small- scale / farmers/ individuals informally working in the structure/site/area either on temporary basis or permanently. The ESA study and RAP should provide a detailed assessment of such PAP's and suggest appropriate mitigation measures. The options to offer job in the solar park based on the individual capability / experience should be a chosen strategy.

The sub project may lead to removal of residential / commercial structures either temporarily or permanently. The ESIA need to identify such impacts and Resettlement Action Plan shall be prepared in line with agreed RPF in case of any adverse impact on the structures whether residential or commercial. Based on the case studies, proposed Renewable Energy sub-projects may affect its surrounding infrastructures (roads, sewerage, utilities etc.). Transmission Line ROW over standing crops/ settlements/ forested areas/ water bodies to be avoided to the extent possible.

Noise-producing activities viz. blasting, piling, construction of roads and turbine foundations, and the erection of turbines may affect nearby communities.

The proposed sub-project site may include fencing/tracks /pathways which are frequently used by the local villagers while performing their day-to-day activities. Such tracks need to be clearly identified during the ESA stage in consultation with the local stakeholders so that the same can be included into the project layout plan or alternative route / tracks may be identified if it is unavoidable.

The above generic impacts identified shall need to be mitigated to minimize or eliminate negative impacts. The following sub section provides a brief on the generic ESMP measures:

4.4 Environmental & Social Management Plan

An Environmental & Social Management Plan (ESMP) is the key document focused on implementation, after the potential impacts have been identified. It ensures that the project impacts are reduced to an acceptable level during implementation of the sub-project. Thus, ESMP becomes the document for ensuring that all the preceding analysis is used to preserve/improve overall environmental quality within the influence area of the project.

The ESMP should be sub-project specific, clearly and concisely describing adverse impacts, selected management measures to bring it to an acceptable level and timelines for implementing these measures. It should also clarify roles and responsibilities among the various stakeholders including REPPD, Contractors etc. A contract specific ESMP would facilitate integration with the bidding documents for the Developer. The building blocks of an ESMP are:

i. Potential adverse impacts identified and mitigation measures to be adopted, together with conditions within which one or other measure would apply and their integration with phases – Pre-construction, Construction/ Implementation and Operation
ii. Enhancement plans for positive impacts
iii. Monitoring Plan with indicators, mechanisms, frequency, locations,
iv. Budgetary allocations for all the above activities.
v. Institutional arrangements for each activity and mitigation measures.
vi. Implementation schedules for each activity and its integration with the sub-project implementation timelines.
vii. Reporting procedures, including for redressing grievances related to environmental and social issues.

A summary of the likely issues and potential impacts & mitigation measures is presented in the following table to guide preparation of upcoming ESMPs as more sub-projects get identified. The generic ESMP is only a guideline document and would require addressing the sub-project anticipated impacts & proposing mitigation measures:

Table 4-2: Generic Environmental and Social Management Framework

Activity	Potential Environmental & Social Impacts	Proposed Mitigation	Institutional Responsibilities
Pre-Construction Stage	Loss of land / and other physical assets	• Carrying out analysis of alternatives to avoid / minimize involuntary taking of land and other physical assets. • Compensation at replacement value / direct purchase on willing buyer – willing seller basis • R&R assistance as per the entitlement matrix of this RPF	REPPD
	Loss of livelihood	• R&R assistance as per the entitlement matrix of this RPF • Preferable employment with developer • Alternative livelihood options and training for skill enhancement • CSR activities to be undertaken by developer will ensure alternative livelihood opportunities	RE park project developer/REPD/Contractor

Activity	Potential Environmental & Social Impacts	Proposed Mitigation	Institutional Responsibilities
	Loss of Access rights	• Project to ensure through analysis of alternatives that access enjoyed by the community remains intact. • In case of unavoidable circumstances, alternative access will be provided.	RE park project developer
	Loss of Common property resources	• To the extent possible will be avoided • Impacted CPR's will be replaced by the project.	REPPD
	Loss of forest land and resources due to location of the project in forest areas	• As far as forest area to be avoided for establishing the project • If the project is passing through forest area, the necessary permission/ clearance to be obtained from the Forest department prior to start of construction activities. • Tree felling for the project should be avoided to the possible extent. However, if tree felling is unavoidable, then permission for felling of trees to be obtained from the forest department. • Compensatory plantation to be done against the tree felling as per rule The condition of the forest clearance/ tree felling permission to be strictly complied.	REPPD
Construction Activity Site Preparation	Soil Erosion; Alteration of natural drainage; Construction Impacts • Noise and Vibration • Soil Erosion • Air Quality • Solid Waste • Hazardous Materials • Wastewater Discharges • Contaminated Land • Occupational Health and Safety • Community Health and Safety • General Site Hazards • Disease Prevention • Traffic Safety	• Construction facilities to be placed 500 meters from water bodies, natural flow paths; • Minimize cut & fill operations, the site clearing and grubbing operations should be limited to specific locations only. • Any disruption of socially sensitive areas with regard to human habitation and areas of cultural significance will be avoided. • The existing slope and natural drainage pattern on the site should not be altered. • Trees on private lands; if felled or damaged during construction operations, compensation shall be paid to the owner as determined by the forest/horticulture departments. • The contractor shall ensure that site preparation activities do not lead to disruption of activities of the local residents. • Noise during construction should be limited to protect people living nearby. • Avoiding or minimizing project transportation through community areas	REPPD/ REPD/ Contractor

Activity	Potential Environmental & Social Impacts	Proposed Mitigation	Institutional Responsibilities
		• Reducing or preventing erosion by: o Scheduling to avoid monsoons (i.e. carrying out construction during the dry season) to the extent practical o Contouring and minimizing length and steepness of slopes o Mulching to stabilize exposed areas o Re-vegetating areas promptly o Designing channels and ditches for post-construction flows o Lining steep channel and slopes (e.g. use jute matting) • Excavated areas should be adequately fenced and security should be deployed to prevent wildlife intrusion into these areas; • Minimizing dust from open area sources, including storage piles, by using control measures such as installing enclosures and covers, and increasing the moisture content • Providing portable spill containment and clean up equipment on site and training in the equipment deployment • Adequate portable sanitation facilities serving all workers should be provided at all construction sites. • Construction activities should be restricted to designated area. On completion of construction activities, land used for temporary facilities such as Contractor office, stockyard, labour camp should be restored to the extent possible to pre-existing levels; • Ensure proper cover and stacking of loose construction material at site to prevent surface runoff and contamination of receiving water body; • Ensure that waste generated from construction sites and camp sites are not disposed into adjacent water bodies • Machinery and construction equipment that may be in intermittent use to be shut down or throttled down during non-work periods; Low noise equipment shall be used as far as practicable; • Training of workers in lifting and materials handling techniques in construction, personal fall arrest systems • Cleaning up excessive waste debris and liquid spills regularly	

Activity	Potential Environmental & Social Impacts	Proposed Mitigation	Institutional Responsibilities
		• Wearing appropriate PPE, such as safety glasses with side shields, face shields, hard hats, and safety shoes • Controlling vehicle traffic through the use of one-way traffic routes, establishment of speed limits, and on-site trained flag-people wearing high-visibility vests or outer clothing covering to direct traffic • Using inspected and well-maintained lifting devices that are appropriate for the load, such as cranes, and securing loads when lifting them to higher job-site elevations. • Controlling site-specific factors which may contribute to excavation slope instability including, for example, the use of excavation dewatering, side-walls support, and slope gradient adjustments that eliminate or minimize the risk of collapse, entrapment, or drowning • Providing safe means of access and egress from excavations, such as graded slopes, graded access route, or stairs and ladders	
Construction Activity	Noise from construction works	• Construction activity shall be restricted to daytime as far as possible to avoid disturbance to surrounding areas. • Wherever required, personal protective equipment such as ear plugs, earmuffs, helmets etc. should be provided to the persons working in high risk areas.	REPPD/ REPD/ Contractor
Construction Activity	Dust	• Construction machinery shall be properly maintained to minimize exhaust emissions of CO, SPM and Hydrocarbons. • Dust generated as a result of clearing, levelling and site grading operations shall be suppressed using water sprinklers. • Dust generation due to vehicle movement on haul roads / access roads shall be controlled through regular water sprinkling.	REPPD/ REPD/ Contractor
Construction Activity	Safety Issues	• Prevent entry of unauthorized personnel and proper storage and control of hazardous materials on site. • The site shall be secured by fencing and manned at entry points	REPPD/ REPD/ Contractor
Laying of transmission lines	Exposure to safety related risks Impacts on Natural Habitats & Settlements	• Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of	RE Park Project developer/Contractor/ CTU/ STU (Central or State Transmission Utility)

Activity	Potential Environmental & Social Impacts	Proposed Mitigation	Institutional Responsibilities
		supervision at sites ● ROW over Natural Habitats/ Water Bodies/ Settlements/ standing crops to be avoided to the extent possible ● Construction work and anthropogenic movement should be restricted near any major water bodies to reduce the impact on aquatic bird species (resident or migratory); ● Construction activities and transportation should be avoided during peak ecological activity i.e. dawn (5:30 am to 7:30 am) and dusk (5:00 pm to 7:00 pm). Night-time activities should be kept to a minimum; ● Areas with pre-existing nests, ground-roosting sites and burrows should be avoided for construction related work to reduce the impact on local fauna; ● Excavated areas should be adequately fenced and security should be deployed to prevent wildlife intrusion into these areas;	
Water for Construction	Conflicts with existing users due to scarcity of resource base.	● A detailed assessment of the available resources and consent of the local panchayat for withdrawal of water from existing surface water sources shall be taken. ● If ground water is withdrawn, adequate approvals from the CGWA / GWB / SPCB department, need to be undertaken before setting up bore wells.	REPPD/ REPD (Developer)/ Contractor
Road safety and traffic management plan	Increase in road accidents	● The movement of heavy machinery and equipment's shall be restricted to defined routes. ● Proper signage's to be displayed at major junctions. ● Road diversions and closures to be informed well in advance to the local residents. ● Vehicular movement to be controlled near sensitive locations viz. schools, colleges, hospitals identified along designated vehicular transportation routes.	REPPD/ REPD(Developer)/ Contractor
Base Camp Construction Activity – Labour Camp Management	Influx of migrant labourers Conflicts with the local residents Issues related to SEA/SH (sexual exploitation and abuse / sexual harassment)	The labour camps will be managed as per the labour management plan agreed in ESMP. The labour management plan will also contain the plan for (i) labour accommodation, (ii) facilities to be provided in the camp, (iii) measures to avoid gender-based violence, (iv) COVID 19 protocols to be followed, and (v) awareness generation on HIV/AIDS and other issues. A grievance mechanism will be developed for all workers to report and register and occupation health and	REPPD/ REPD (Developer)/ Contractor

Activity	Potential Environmental & Social Impacts	Proposed Mitigation	Institutional Responsibilities
		safety related issues. The mechanism will also state ways to resolve the same. Additionally, requirements on occupational health and safety, in keeping with the World Bank Group's Environmental, Health, and Safety Guidelines (EHSG) will be followed The contractor will preferably engage the local labour force except for the labourers requiring special skills and the non-availability of such skilled laborers from the local area. Awareness raising of laborers/ workers on societal norms, taboos, and other cultural practices Organise awareness creation and educational programs for all workers and the general public on the behavioural changes required to prevent the spread of HIV/AIDS and other STDs The 'Labour Influx and Construction Workers Campsite Management Plan' will be prepared and implemented Project to assess and manage labour influx risk based on risks identified in the ESIA. Depending on the risk factors and their level, appropriate site-specific Labour Influx Management Plan and/or a Workers' Camp Management Plan. The project will incorporate the ESMP into the civil works contract. The responsibilities for managing these adverse impacts will be clearly reflected as a contractual obligation, with a mechanism for addressing non-compliance. Employment of any person under 18 years of age will be strictly prohibited. The contractor will maintain a labour register with name, age, and sex with supporting document (preferably copy of Aadhar card or voter's ID card). This will be monitored by the Environmental and Social office of contractors. Contractor and labourer will sign a code of conduct to maintain good manners with the community and avoid Gender Based Violence Project will undertake awareness raising program for the workers and community on the risk of labour influx.	
Waste Management	Land and water pollution due to indiscriminate waste disposal	Preparation of a waste management plan covering the following aspects • Construction and commissioning of solar park • Temporary accommodation facilities for labour • Waste generation from equipment maintenance / vehicles on-site. • The scrap material generated from erection of structures and related construction activities will be collected and stored separately in a stack yard and sold to local recyclers.	REPPD/ REPD/ Project developer/ Contractor

Activity	Potential Environmental & Social Impacts	Proposed Mitigation	Institutional Responsibilities
		• Hazardous waste viz. waste oil etc. will be collected and stored in paved and bounded area and subsequently sold to authorized recyclers. • Applicability of the Hazardous Waste Management Rules	
Cleaning of solar panel	Wastage of water Generation of waste water	• Necessary permits for use of water, including groundwater where applicable, shall be obtained in advance of beginning of operations. • The use of water to be minimized through recycling of used of water for cleaning • The waste water to be properly channelized through drains and stored in settling tank • The unusable water can be utilized for irrigation purpose in landscaping or in neighbouring agriculture field. Rainwater harvesting facilities will be provided at site to collect the rainwater which should be utilized for ground water recharging and storing for cleaning purpose	SPPD & SPD (Developers)
Handling and management of Battery Energy Storage System	Land contamination Water Contamination Health Hazards due to random disposal of Battery wastes and E-wastes	• All the non-functional batteries to be stored in a safe place following the norms stipulated in the batteries (Management and Handling) Rules, 2001. The waste batteries to be handed over to the authorised vendors/recyclers. • A record of such practices to be maintained at site office. • All the electronic wastes should be disposed of as per E-waste (Management) Rules, 2016. • All the safety precautions in storage, handling and disposal of battery energy storage systems will be adopted as per safety consideration, which is enclosed as **Annexure- 7**	SPPD & Developer
Operation of wind turbine	Collison of Birds due to wind turbine Noise from Operation of Wind Turbines	• Standard practice on turbine blades shall be considered to enhance visibility. • Marking overhead cables and transmission poles using deflectors and avoiding use of areas of high bird concentrations, especially for species vulnerable to collision. • Where possible, installing transmission cables underground in accordance with existing best practice guidelines for underground cable installation. Otherwise if possible, install overhead cables with proper insulation to avoid bat and bird electrocution through body touch. Install bird deflectors on overhead transmission cables at selected points wherever possible.	REPPD/ REPD (Developer)/ Contractor

Activity	Potential Environmental & Social Impacts	Proposed Mitigation	Institutional Responsibilities
		• The illumination within the project area should be bare minimum and be within the acceptable limits, particularly during night hours. This will help in undisturbed activities of nocturnal species like rodents, bats and owls. • Some bird reflectors can be fitted at relevant places to divert low-medium and medium-high flying bird species during day time. • Feasibility of fixing of bird deflector on the turbine to avoid perching of birds near blades can be worked out, especially raptor species which prefer to perch at higher points. • Use turbines with improved airfoil designs to reduce noise & Operating turbines in reduced noise mode. An Avifaunal Expert to be appointed during operation stage for assessment of incidence of bird collision and train the staff at site to address the incidents of bird hit / injury.	

The site specific ESMP would need to be prepared for specific sub-projects. An ESMP document should include:

i. Lists of all project related activities and impacts, for each stage of the development of Projects, i.e., for the design, construction and maintenance stages
ii. A list of regulatory agencies involved and their responsibilities
iii. Specific remedial and monitoring measures proposed for each stage
iv. A clear reporting schedule, including discussion of what to submit, to whom, and when
v. Cost estimates and sources of funding for both one-off costs and recurring expenses for implementation of the EMPs.

ESMP shall deal with the construction and operations stage of the sub-project. The extent and timing of mitigation actions should be based on the significance of the predicted impacts.
Some mitigation measures can be incorporated into the design of the project and can largely resolve the potential impacts of a project, e.g., drainage, access roads. Other measures require an on-going implementation plan to ensure that proposed actions are carried out at the correct times, that environmental measures such as slope protection are maintained, and that prompt remedial actions are taken when the initial measures are not fully effective.

4.5 Resettlement Policy Framework

The Resettlement Policy Framework (RPF) provides guidance for preparation of Resettlement Action Plan (RAP) based on the degree of impacts as identified during ESIA. The project specific RPF has been prepared based on the provisions of Right to Fair Compensation and transparency in land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013 subject to subsequent supplements by state governments and World Bank Operational Policy 4.12 on involuntary resettlement.

Broad Principles

The Policy 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 restore their previous standard of living and livelihood. It is also the endeavour of the REPPD that the resettlement should be minimized and avoided, wherever possible by exploring all alternatives project designs.

These guidelines detail out the assistance in re-establishing the homes and livelihoods of the Project Affected People (PAP) during the course of sub projects.

i. All information related to resettlement planning, and implementation will be disclosed to all concerned
ii. The principles of mutual consent and negotiated settlement will also be used for land acquisition.
iii. 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 Entitlement matrix.
iv. 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.
v. 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.
vi. 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.
vii. Three tier appropriate grievance redress mechanism has been established at project level to ensure speedy resolution of disputes.
viii. 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.
ix. All consultations with PAPs shall be documented and continued till the Implementation of the project.
x. As required, a Resettlement Action Plan will be prepared including a fully itemized budget and an implementation schedule.

The broad principles of the Resettlement and Rehabilitation (R&R) policy are as given below;

i. All negative impacts including displacement should be avoided or minimized wherever feasible by exploring all viable alternative project designs.
ii. Where negative impacts are unavoidable, efforts should be made either to improve the standard of living of the affected persons or at least assist them in restoring their previous standard of living at no cost to them.
iii. Ensure people's participation during the course of the project cycle.
iv. Effort should be made towards the enhancement of the positive impact of the projects.

The project will broadly have three impacts that require mitigation measures. These are:

i. Loss of immovable assets viz., land, house, commercial establishments wells, ponds etc.
ii. Loss of livelihood or income opportunities viz. for agriculture labours, helping hands in commercial establishments etc.
iii. Impact on the community in terms of loss of common property resources.

The first two categories represent direct impacts on an identified population. The people likely to be affected will be surveyed and registered, and project monitoring and evaluation will compare long term impacts against baseline socio economic data.

The third category represents a group impact, where gains and losses of a group oriented nature are not quantifiable in terms of impact on the individual. Mitigation and support mechanism will be collectively oriented, and the monitoring will focus on impact on such groups.

The provisions of Rights to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 and in case the State Government has specific policies for mutual consent and negotiated settlement, the provisions of such policy could be used subject to their adherence to the provisions are within the broad framework of the Act and the World Bank Safeguard Policies.

i. Support will be extended under the broad principles of this policy to meet the replacement value of the assets and loss of livelihood.
ii. The policy further recognizes extension of support to non-titleholders for the loss of livelihood and replacement value for assets other than land.
iii. The common property resources will be replaced as far as feasible and if not then assistance will be provided at replacement value to the group.

The implementation of RE projects would involve transportation of equipment during the installation phase and all efforts will be made during implementation to minimize any disturbance in the daily activities of the local people.

Before taking possession of the acquired lands and properties, all compensation, resettlement and rehabilitation would be made in accordance with this policy.

In case of displacement, resettlement sites will be developed as part of the project. In such circumstances care should be taken so that there is no/or minimum adverse social, economic and environmental effects of displacement on the host communities and specific measures would be provided in the Resettlement and Rehabilitation Action Plan (RAP) to mitigate any such impacts.

Before taking possession of acquired land, sufficient time would be provided to harvest the crop.

The implementation of the R&R Action Plan will be synchronized with the execution of works under the project.

The project will ensure that no civil works are initiated before compensation and assistance to affected population has been provided in accordance with this policy.

The resettlement and rehabilitation (R&R) benefits for tribal families is as under:

i. Each Project Affected Family of ST category shall be given preference in allotment of land.
ii. Tribal PAFs will be re-settled as per RAP feasibility close to their natural habitat in a compact block so that they can retain their ethnic/linguistic and cultural identity
iii. The Tribal Land alienated in violation of the laws and regulations in force on the subject would be treated as null and void and-the R&R benefits would be available only to the original tribal land owner.

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 publication of preliminary notification u/s 11(I) of RFCTLAR Act, 2013 & for the Non-Titleholders cut-off date would be the date of Census Survey.

Project Affected Person: Person who is affected in respect of his/her land including homestead land and structure thereon, trade and occupation due to construction of the project

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.

Projected Affected Family: Family includes a person, his or her spouse, minor children, minor brothers and minor sister(s) dependent on him. Provided that widows, divorcees and women deserted by families shall be considered separate family;

Explanation - An adult of either gender with or without spouse or children or dependents shall be considered as a separate family for the purpose of this framework.

Land Owner: Land owner includes any person -

Whose name is recorded as the owner of the land or building or part thereof, in the records of the authority concerned; or

Any person who is granted forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 or under any other law for the time being in force; or

Who is entitled to be granted Patta rights on the land under any law of the State including assigned lands; or any person who has been declared as such by an order of the court or Authority.

Marginal Farmers: Marginal farmer means a cultivator with an un-irrigated land holding up to one hectare or irrigated land holding up to one half hectare, or as may be defined by the concerned state government.

Small Farmer: Small farmer means a cultivator with an un-irrigated land holding up to two hectares or irrigated land holding up to one hectare, but more than the holding of a marginal farmer, or as may be defined by the concerned state government.

Encroacher: A person who has trespassed Government/ private/community Land, adjacent to his or her land or asset to which he/she is not entitled and who derives his/her livelihood and housing there from prior to the cut-off date.

Squatter: A squatter is a person who has settled on publicly owned land for housing or livelihood without permission or who has been occupying publicly owned building without authority prior to the cut-off date.

Landless/Agriculture Labour: A person who does not hold any agriculture land and has been deriving his main income by working on the lands of others as sub-tenant or as an agriculture labour prior to the cut-off date.

Below Poverty Line: A household, whose annual income from all sources is less than the designed sum as fixed by the planning commission of India, will be considered to be below poverty line (BPL).

Vulnerable Person: The Vulnerable group may include but not be limited to the following:

Those people falling under Below Poverty line category as defined by the state government.

a) Member of Scheduled caste/tribe community/other backward community.
b) Women Headed households.
c) Senior citizen-person above the age of 60 years.
d) Landless
e) Village artisan

4.6 Social Impact Assessment Process

Based on the screening, the sub project will identify and conduct survey of Project affected families likely impacted. Survey will identify the socio-economic status of the PAPs. RE park project developer (REPPD) is responsible for carrying out the SIA study.

i. SIA evaluates a project's potential social risks and impacts in the project area of influence, examines the alternatives (including no project scenario), identifies measures to mitigate the social impacts and improvement of benefits throughout project implementation. Wherever feasible, preventive measures would be undertaken.
ii. The REPPD/borrower is responsible for carrying out the SIA. SIA shall start by the preparation of draft project documents (DPRs)/ Feasibility Report (after pre-feasibility

report) ideally so that the findings/mitigation measures can be incorporated early on into the design.

iii. SIA will include collection of both secondary and primary data. The primary data will be collected through household surveys of potentially impacted persons, consultation and focus group discussions with the general public and other stakeholders.

iv. The opinion of the stakeholders and public shall be incorporated in the project through specific public consultations with prior notice.

v. In addition, the draft SIA/ *as a part of ESIA* shall be made available in a public place in English and local language as well; accessible to affected groups and local NGOs.

vi. Implications of the available legislations and regulatory requirements and the requirements of the operational policies of the World Bank are also to be reviewed as part of the SIA. The SIA report shall meet the requirements of national and state level legislations and disclosure requirements of the World Bank.

vii. SIA report shall include an Executive summary, Introduction / Project background, Project Description including review of alternatives (including no-project scenario), review of Legislations, Baseline social conditions, Impact Evaluation, Public consultation details, Management and Monitoring Plan, implementation schedule and budget.

viii. The final SIA report in English with a non-technical summary in respective local language, shall be disclosed as per applicable disclosure policy; in the websites of the implementing agencies and will be made available in places accessible to the local people.

After completion of the SIA study, project will prepare draft RAP to minimise and mitigate the adverse impacts as identified during survey.

4.7 Resettlement Action Plan

In case the sub-project requires involves land acquisition against compensation or loss of livelihood or shelter, the REPPD shall ensure that a satisfactory RAP has been prepared under the ESA study and shared with the affected person and the local community. The REPPD/REPD/Contractor shall not start the works until compensation and assistance has been made available in accordance with the framework.

RAP document 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 World Bank approval before the sub-project is accepted for World Bank financing.

i. Sub-projects that will affect more than 200 people due to involuntary land taking and/or physical relocation and where a full Resettlement Action Plan (RAP) must be produced.

ii. Sub-projects that will affect less than 200 people will require an abbreviated RAP.

iii. The above plans will be prepared as soon as subproject is finalized, prior to Bank's approval of corresponding civil works bid document.

iv. 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.

Every- Resettlement Action Plan (RAP) prepared shall contain the following particulars.

i. The extent of area to be acquired for the project, the name(s) of the corresponding village(s) and the method employed for acquiring land with the relevant documentation.

ii. Village wise or municipality wise list of project affected families and likely number of displaced persons by impact category

iii. 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;
iv. Socio-economic survey of affected people including income/asset survey of PAPs.
v. A list of agricultural labourers in such area and the names of such persons whose livelihood depend on agricultural activities;
vi. 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;
vii. Information on vulnerable groups or persons for whom special provisions may have to be made;
viii. A list of occupiers; if any.
ix. A list of public utilities and Government buildings which are likely to be affected;
x. A comprehensive list of benefits and packages which are to be provided to project affected families by impact category;
xi. 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;
xii. Details of the basic amenities and infrastructure facilities which are-to be provided for resettlement;
xiii. The entitlement matrix;
xiv. The time schedule for shifting and resettling the displaced families in resettlement zones;
xv. Grievance redressal mechanism;
xvi. Institutional mechanism for RAP implementation;
xvii. Consultation strategy; a disclosure plan and a capacity building plan
xviii. Monitoring and evaluation indicators and mechanism;
xix. Budget; and
xx. Any other particulars as the Administrator for Resettlement and Rehabilitation may think fit to include for the information of the displaced persons.

The RAP should be developed based on the Right to Fair Compensation and transparency in land Acquisition, Rehabilitation and Resettlement Act, 2013 including subsequent amendments; other applicable state regulatory requirements and World Bank Operational Policy 4.12 on involuntary resettlement. States have formulated various legislations pertaining to direct purchase of land / land for land exchange options, etc. which shall be applicable depending upon the location of the sub-project.

4.8 R&R Benefits for Project Affected Families

The resettlement and rehabilitation (R&R) benefits shall be extended to all the Project Affected Families (PAF) whether belonging to below poverty line (BPL) or non-BPL. The details are provided in the entitlement matrix. Contractor will ensure that access to residences or business or agricultural land is not blocked during construction phase. The easement rights for the villagers shall be ensured while planning the layouts for the RE parks. The NGO responsible for RAP implementation and M&E consultants will bring it to the notice of project authorities if contractor fails to do so.

Table 4-3: Entitlement Matrix

S. No.	Application	Definition of Entitled Unit	Entitlement	Details
A. Loss of Private Agricultural, Home-Stead & Commercial Land				

1	Land for RE Project	Titleholder family. and families with traditional land Right	Compensation at Market value, Resettlement and Rehabilitation	a) Land for land, if available Or Cash compensation for the land at Market value, which will be determined as provided under section 26 of RFCTLARR Act 2013. b) The land if allotted will be in the name of both husband and wife. c) If post acquisition, residual land is economically unviable, the landowner will have the choice of either retaining or sell off rest of the land. d) Refund of stamp duty and registration charges incurred for replacement land to be paid by the project; replacement land must be bought within a year from the date of payment of compensation to project affected persons. e) Subsistence allowance of Rs. 47,000 as one- time grant f)One- time grant of Rs. 6,50,000 or annuity g) Compensation at market value for loss of crops if any
	Private land on lease	Titleholders / PAPs with assigned land	Lease rent	a) Annual Lease Rent as per pre agreed rate with the landowners giving consent for sparing their land for the project b) Provisions regarding the increase in lease rent on predetermined rates and timeframe c) In case of structure loss, provisions of B(2) will be applicable
B. Loss of Private Structures (Residential/Commercial)				
2	Loss of Structure	Title Holder/ Owner	Compensation at Market value, Resettlement & Rehabilitation Assistance	a) Cash compensation for the structure at Market value which would be determined as per as per section 29 of the RFCTLARR Act 2013. House under Indira Awas Yojna in rural area or Rs 50000 in lieu of and house under IAY in urban area or Rs 100,000 in lieu of. The house if allotted will be in the name of both husband and wife. b) Right to salvage material from the demolished structures. c) Three months' notice to vacate structures. d) Refund of stamp duty and registration charges for purchase

				of new alternative houses/shops at prevailing rates on the market value as determined in (a) above. Alternative houses/shops must be bought within a year from the date of payment of compensation. e) In case of partially affected structures and the remaining structure remains viable, additional10% to restore the structure. In case of partially affected structures and the remaining structure becomes unviable additional 25% of compensation amount as severance allowance. f) Subsistence allowance equivalent to Rs. 47,000 as one time grant. g) Each affected family getting displaced shall get a one-time financial assistance of Rs 65,000 as shifting allowance. h) Each affected family that is displaced and has cattle, shall get financial assistance of Rs 32,500 for construction of cattle shed. i) One time grant of Rs. 65,000 as resettlement assistance j) Each affected person who is a rural artisan, small trader or self-employed person and who has been displaced (in this project owner of any residential-cum commercial structure) shall get a one-time financial assistance of Rs 32,500 for construction of working shed or shop. k) One time grant of Rs. 6,50,000
3	Structure	Tenants/ Lease Holders	Resettlement & Rehabilitation Assistance	a) Registered lessees will be entitled to an apportionment of the compensation payable to structure owner in case the lessee has erected any part of the structure as per applicable local laws. b) In case of tenants, three months written notice will be provided along with Rs 65,000 towards shifting allowance.
C. Loss of Trees and Crops				
4	Standing Trees, Crops	Owners and beneficiaries (Registered/ Un-	Compensation at market value	a) Three months advance notice to project affected persons to

		registered tenants, contract cultivators, leasehold ders & sharecroppers		harvest fruits, standing crops and removal of trees. b) Compensation to be paid at the rate estimated by: i) The Forest Department for timber trees ii) The State Agriculture Extension Department for crops iii) The Horticulture Department for fruit/flower bearing trees. c) Registered tenants, contract cultivators & leaseholders & sharecroppers will be eligible for compensation for trees and crops as per the agreement document between the owner and the beneficiaries. d) Un-registered tenants, contract cultivators, leaseholders & sharecroppers will be eligible for compensation for trees and crops as per mutual understanding between the owner and the beneficiaries.
D. Loss of Residential/ Commercial Structures to Non-Titled Holders				
5	Structures on Government land	Owners of Structures or Occupants of structures identified as per Project Census Survey	Resettlement & Rehabilitation Assistance	a) Non vulnerable encroachers shall be given three months' notice to vacate occupied land b) Vulnerable encroachers will be provided cash assistance at replacement cost for loss of structures as described in section 29 of the RFCTLARR Act 2013. c) Any encroacher identified as non-vulnerable but losing more than 25% of structure used will be paid cash assistance at replacement cost for loss of structures. The amount will be determined as per section 29 of the RFCTLARR Act 2013. d) All squatters to be paid cash assistance for their structures at replacement costs which will be determined as mentioned in section 29 of the RFCTLARR Act 2013. e) All squatters (other than kiosks) will be eligible for one time grant of Rs 47,000 as subsistence allowance. f) All squatters other than Kiosks will be given shifting allowance of Rs

				65,000 per family as one time grant for a permanent structure and Rs. 30,000 for a semi-permanent structure and Rs. 10,000 for a temporary structure. g) Each affected person who is a rural artisan, small trader or self-employed person assistance' of Rs 32,500 for construction of working shed or shop. h) In case of Kiosks, only Rs. 5000 will be paid as one time grant.
E. Loss of Livelihood				
6	Families living within the project area	Title Holders/ Non-Title holders/ sharecroppers, agricultural labourers and employees	Resettlement & Rehabilitation Assistance	a) Subsistence allowance of Rs. 47,000 as one time grant. (PAPs covered under 1(f), 2 (f) and 5 (e) above would not be eligible for this assistance). b) Training Assistance of Rs 10,000/- for income generation per family. c) Temporary employment in the project construction work to project affected persons with particular attention to vulnerable groups by the project contractor during construction, to the extent possible and preference in the employment of semi-skilled and unskilled jobs in the project with adequate training for the job.
F. Additional Support to Vulnerable Families				
7	Families within project area	As per definition of vulnerable	Resettlement & Rehabilitation Assistance	One time additional financial assistance of Rs. 65,000. Squatters and encroachers already covered under clause 5 are not eligible for this assistance.
G. Loss of Community Infrastructure/Common Property Resources				
8	Structures & other resources (e.g. land, water, access to structures etc.) within the project area	Affected communities and groups	Reconstruction of community structure and common property resources	Reconstruction of community structure and Common property resources in consultation with the community.
H Temporary Impact During Construction				
9	Land & assets temporarily impacted during construction	Owners of land & Assets	Compensation for temporary impact during construction e.g. damage to adjacent parcel of land / assets due to movement of	Compensation to be paid by the contractor for loss of assets, crops and any other damage as per prior agreement between the 'Contractor' and the 'Affected Party'.

			vehicles for transportation of equipment's, machinery and construction activities for infrastructure development.	
I.	**Resettlement Site**			
10	Loss of residential structures	Displaced titleholders and non-titleholders	Provision of resettlement site/ vendor market	Resettlement sites will be developed as part of the project, if a minimum of 25 project displaced families opt for assisted resettlement. Vulnerable PAPs will be given preference in allotment of plots/flats at the resettlement site. Plot size will be equivalent to size lost subject to a maximum of provision given in RFCTLARR Act 2013. Basic facilities shall be provided by the project at resettlement site as per the provisions given in the Third Schedule of RFCTLARR Act 2013. Similarly, if at least 25 displaced commercial establishments (small business enterprises) opt for shopping units, the Project Authority will develop the vendor market at suitable location in the nearby area in consultation with displaced persons. Basic facilities such as approach road, electricity connection, water and sanitation facility, will be provided in the vendor market by the project. Vulnerable PAPs will be given preference in allotment, of shops in vendor market. One displaced family will be eligible for only one land plot at resettlement site or shop in the vendor market.
J.	**Govt Land on lease/ assigned land**			
11	Lessees/ Assignees	Land Owners/ Titleholders	Annual Lease rental for use of land	a) Cash compensation as per the circle rate for assignees b) R&R Assistances as applicable to Titleholders c) Provisions related to loss of structure/ trees/crops as per the provisions of Section B and / or D as applicable.
12	Agricultural Labour	Non-Title holders/	Annual Lease rental for use of land	Lease amount paid to landowner will be deducted from the compensation of landowner and returned to the lease holder.

		sharecroppers,agricultural labourers and employees		Lease holder will receive Rs. 47,000 as one time grant.

4.8.1 Resettlement Unit Costs

The RE project shall adopted the unit costs for R&R assistance as available in LARR Act, 2013. The Consumer Price Index for Agricultural labourers (CPIAL) has increased by 30%[2] during the period between January 2014 to December 2019. All these units are presented in table below.

Table 4-4: Resettlement Unit Costs applicable to Project

Entitlement	Unit rates as of January 2014 (in INR)	Revised as of December 2019 (rounded off to nearest INR)
Livelihood assistance (Lump sum)	5,00,000	6,50,000
One-time assistance for loss of Cattle shed/petty shop	25,000	32,500
One-time assistance for displaced artisan/small traders/small shops	25,000	32,500
Transportation / Shifting assistance for displaced	50,000	65,000
Subsistence allowance for displaced @ INR 3000 per month for 1 year	36,000	47,000
One-time Resettlement Allowance	50,000	65,000

Any other monetary allowance other than those listed above will be indexed to year of payment prior to payment It will be revised price index

4.8.2 Livelihood Restoration/Enhancement Framework

Each PAPs whose income or livelihood is affected by a sub project will be assisted to improve or at least restore it to pre-project level. Income restoration schemes will be designed in consultation with affected persons and considering their resource base and existing skills. Project will identify the number of eligible PAPs/DPs and will conduct training need assessment in consultations with the affected persons so as to develop appropriate income restoration schemes.

i. The Project with support of specialised agency will examine local employment opportunities and produce a list of possible income restoration options. Suitable trainers or local resources will be identified by the project in consultation with local training institutes. Disadvantaged and vulnerable households will get special assistance in this regard. The project will also facilitate affected person access to Government schemes that could help them to restore income and livelihood. In addition, the entitlement matrix provides for one-time income restoration allowance.
ii. The project will form women self-help groups and provide short-term skills training including life-skills training to women SHGs.
iii. During construction phase of the project, contractor will give preference to local population for skilled Project to the extent possible.
iv. Mobilizing women PAPs and linking them to short-term skills training offered at district-level ITIs in construction, food processing, food-packaging and other relevant sectors, develop strategies to improve roll-out of training programs and facilitate linkages to markets and producer companies.

[2] https://pib.gov.in/newsite/PrintRelease.aspx?relid=105121

4.9 Gender equality and Social Inclusion

Mainstreaming gender equity and empowerment shall be a focus area in the project. In the sub projects, activities related to livelihood restoration will address women's needs. A Gender Development Framework is being designed under the project as part of this ESMF which will help in analysing gender issues during the preparation stage of sub project and design interventions. At the sub project level, gender analysis will be part of the social assessment and the analysis will be based on findings from gender specific queries during the primary data collection process and available secondary data. The quantitative and qualitative analysis will bring out sex disaggregated data and issues related to gender disparity, needs, constraints, and priorities; as well as understanding whether there is a potential for gender based inequitable risks, benefits and opportunities. Based on the analysis, the specific interventions will be designed and if required gender action plan will be prepared. The overall monitoring framework of the project will include sex disaggregated indicators and gender relevant indicators.

In order to make the project more inclusive and participatory, it is required that women associate themselves in different activities which they find feasible. This approach of inclusion and equity, specifically involvement and engagement of women will be helpful to attain social justice and reduce marginalization of women and empower them to avail maximum benefit from the project.

Thus, incorporating gender and other social issues in the development projects helps to improve project performance and facilitate the achievement of the Bank's goal of poverty reduction. A gender approach in the overall project framework takes care of key gender issues and brings in parity in association and participation of women and minimizes the gap between males and females at the project level. A gender approach is also a way to comprehend the impacts on the women beneficiaries and ensures equality in project induced wellbeing.

During the social assessment, consultations should be organized with different stakeholders to understand gender issues and possible measures that can help women in ensuring their participation in the overall process. The assessment helped to identify certain key issues pertaining to women and their involvement in different livelihood activities as well as other activities, which will directly or indirectly impact their lives.

4.9.1 Policy Provision

Table 4-5: Policy Provision for Preparing Gender Action Plan

Directions in Constitution

The constitution of India provides provisions to secure equality in general and gender equality in particular. Various articles in the Constitution safeguard women's rights by putting them at par with men socially, politically and economically. The Preamble, the Fundamental Rights, Directive Principles of State Policies (DPSPs) and other constitutional provisions provide several general and special safeguards to secure women's human rights. The Preamble to the Constitution of India assures justice, social, economic and political; equality of status and opportunity and dignity to the individual. Thus, it treats both men and women equal.

The policy of women empowerment is well entrenched in the Fundamental Rights enshrined in our Constitution. For instance:

1. Article 14 ensures to women the right to equality;
2. Article 15(1) specifically prohibits discrimination on the basis of sex;
3. Article 15(3) empowers the State to take affirmative actions in favour of women;
4. Article 16 provides for equality of opportunity for all citizens in matters relating to employment or appointment to any office. These rights being fundamental rights are justifiable in court and the Government is obliged to follow the same.

Directive principles of State Policy also contains important provisions regarding women empowerment, and it is the duty of the government to apply these principles while making laws or formulating any policy.

Though these are not justifiable in the Court but these are essential for governance nonetheless. Some of them are:

1. Article 39 (a) provides that the State to direct its policy towards securing for men and women equally the right to an adequate means of livelihood.
2. Article 39 (d) mandates equal pay for equal work for both men and women.
3. Article 42 provides that the State to make provision for securing just and humane conditions of work and for maternity relief.

Fundamental Duties

Fundamental duties are enshrined in Part IV-A of the Constitution and are positive duties for the people of India to follow. It also contains a duty related to women's rights. Article 51 (A) (e) expects from the citizen of the country to promote harmony and the spirit of common brotherhood amongst all the people of India and to renounce practices derogatory to the dignity of women.

Other Constitutional Provisions

Through the 73rd and 74th Constitutional Amendment of 1993, a very important political right has been given to women which is a landmark in the direction of women empowerment in India. With this amendment, women were given 33.33 percent reservation in seats at different levels of elections in local governance i.e. at Panchayat, Block and Municipality elections. Thus, it can be seen that these Constitutional provisions are very empowering for women and the State is duty bound to apply these principles in taking policy decisions as well as in enacting laws.

Specific Laws for Women

The Government of India has repealed the non-useful Labour Laws, now 29 Labour Laws have been codified into 4 Labour Codes (4 laws in the Wage Code, 9 laws in the Social Security Code, 13 laws in the The Occupational Safety, Health and Working Conditions Code, 2020 and 3 laws in the Industrial Relations Code). Some specific laws, which were enacted by the Parliament in order to fulfil the Constitutional obligation of women empowerment are;

1. The Equal Remuneration Act, 1976.
2. The Dowry Prohibition Act, 1961.
3. The Immoral Traffic (Prevention) Act, 1956.
4. The Maternity Benefit Act, 1961.
5. The Medical termination of Pregnancy Act, 1971.
6. The Commission of Sati (Prevention) Act, 1987.
7. The Protection of Women from Domestic Violence Act, 2005
8. The Prohibition of Child Marriage Act, 2006.
9. The Pre-Conception & Pre-Natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994.
10. The Sexual Harassment of Women at Work Place (Prevention, Protection and) Act, 2013.

Above mentioned and several other laws are there which not only provide specific legal rights to women but also give them a sense of security and empowerment.

International Commitments

India is a part of various International conventions and treaties which are committed to secure equal rights of women. One of the most important among them is the Convention on Elimination of All Forms of Discrimination against Women (CEDAW), ratified by India in 1993. Other important International instruments for women empowerment are: The Mexico Plan of Action (1975), the Nairobi Forward Looking Strategies (1985), the Beijing Declaration as well as the Platform for Action (1995) and the Outcome Document adopted by the UNGA Session on Gender Equality and Development & Peace for the 21st century, titled "Further actions and initiatives to implement the Beijing Declaration and the Platform for Action". All these have been whole-heartedly endorsed by India for appropriate follow up.

National Policy for Woman

In the year 2001, the Government of India launched a National Policy for Empowerment of Women which was revised in the year 2016. The National Policy for Women, 2016 (draft) having the vision of "A society in which, women attain their full potential and are able to participate as equal partners in all spheres of life and influence the process of social change". The objectives of the policy are

1. Creating a conducive socio-cultural, economic and political environment to enable women enjoy de jure and de facto fundamental rights and realize their full potential;
2. Mainstreaming gender in all-round development processes/programs/projects/ actions;
3. A holistic and life-cycle approach to women's health for appropriate, affordable and quality health care;
4. Improving and incentivizing access of women/ girls to universal and quality education;
5. Increasing and incentivizing work force participation of women in the economy;
6. Equal participation in the social, political and economic spheres including the institutions of governance and decision making;
7. Transforming discriminatory societal attitudes, mindsets with community involvement and engagement of men and boys;
8. Developing a gender sensitive legal-judicial system;
9. Elimination of all forms of violence against women through strengthening of policies, legislations, programs, institutions and community engagement;
10. Development and empowerment of women belonging to the vulnerable and marginalized groups;
11. Building and strengthening stakeholder participation and partnerships for women empowerment;
12. Strengthen monitoring, evaluation, audit and data systems to bridge gender gaps.

World Bank's Approach

The World Bank's approach to promoting gender equality makes all staff responsible for ensuring that the Bank's work is responsive to the differing needs, constraints, and interests of males and females in client countries. Gender equality is now a core element of the Bank's strategy to reduce poverty. There is a clear understanding that until women and men have equal capacities, opportunities and voice, the ambitious poverty-reduction agenda set out in the Sustainable Development Goals will be difficult to achieve.

4.9.2 Issues of Significance

The participation of beneficiaries and focus on poverty reduction are two other key determinants of the effectiveness and sustainability of any project. Any project must address the constraints on women's participation in project design, construction, and monitoring and evaluation (M & E). The project will also focus on the linkage between gender and poverty, by identifying, for example, relation between the household income and occupation of the women of the household. Three major tools are used to identify and deal with gender issues in the project cycle: gender analysis, project design, and policy dialogue.

i. Gender analysis should be an integral part of the initial social assessment at the screening stage itself. The issues identified can be scaled up during the feasibility and detailed analysis can be carried out during the project preparation stage.
ii. The project designs should be gender responsive based on gender analysis and should be included in the SIA document. The findings and recommendations from the gender analysis during project planning and feedback from beneficiaries during implementation must be discussed thoroughly to determine the need for further action.
iii. Consultations will be organized with different stakeholders to understand gender issues and possible measures that can help women in ensuring their participation in the overall process. The consultations helped to identify certain key issues pertaining to women and their involvement in the proposed interventions.

4.9.3 Gender Action Plan

Three major tools are used to identify and deal with gender issues in the project cycle: gender analysis, project design, and policy dialogue. Gender analysis will be an integral part of the initial

social assessment at the screening stage itself. The issues identified can be scaled up during the feasibility and detailed analysis can be carried out during the project preparation stage. The project designs will be gender responsive based on gender analysis and will be included in the SIA report. The findings and recommendations from the gender analysis during project planning and feedback from beneficiaries during implementation will be discussed thoroughly to determine the need for further action. Listed below are the key action points:

a) General Check list

i. Identify key gender and women's participation issues.
ii. Identify the role of gender in the project objectives.
iii. Prepare terms of reference (TOR) for the gender specialist or social development specialist of REPPD
iv. Conduct gender analysis as part of the overall Social Assessment.
v. Draw up a socioeconomic profile of key stakeholder groups in the target population and disaggregate data by gender.
vi. Examine gender differences in knowledge, attitudes, practices, roles, status, wellbeing, constraints, needs, and priorities, and the factors that affect those differences.
vii. Assess men's and women's capacity to participate and the factors affecting that capacity.
viii. Assess the potential gender-differentiated impact of the project and options to maximize benefits and minimize adverse effects.
ix. Identify government agencies and nongovernmental organizations (NGOs), community-based organizations (CBOs), and women's groups that can be used during project implementation. Assess their capacity.
x. Review the gender related policies and laws, as necessary.
xi. Identify information gaps related to the above issues.
xii. Involve men and women in project design.
xiii. Incorporate gender findings into the project design.
xiv. Ensure that gender concerns are addressed in the relevant sections (including project objectives, scope, poverty and social measures, cost estimates, institutional arrangements, social appendix, and consultant's TOR for implementation and M & E support).
xv. List out major gender actions.
xvi. Develop gender-disaggregated indicators and monitoring plan.

b) Core Requirement for Mainstreaming Gender

i. All data should be disaggregated by gender, caste, ethnicity, location, and age
ii. Issues of division of labour, access to resources and decision-making power (who is doing what, who has access to what, who makes the ultimate decision) have to be assessed for their gender differential impact on women and men of different social identity groups.
iii. Assessment of policies, programs, institutional arrangements, human resources issues, and M&E system has to be done from a gender perspective of the project, project authorities and community groups.

4.9.4 Key Activities in Project Cycle

The involvement of women groups in the identification of impacts and opportunities through project activities shall form the basis for the preparation of gender sensitive project activities. The procedure to be followed and process and outcome are presented in the following matrix.

Table 4-6: Opportunities for Involvement of Women during Project stages

Project Stages	Key Activities	Responsibility

Planning Stage	• Identify gender concerns/issues related to the project with due consultation with women group • Organize women stakeholders' meetings to inform about the project activities, its benefits and key expectations from the project. • Sensitize and discuss the project and its components. • Sensitize other stakeholders on gender concerns/issues; • Identify key areas of constraints that may be improved through the project; • Prepare project component wise activity plan where women can be engaged in different project activities.	Social Development Specialist; implementing agencies; REPPD/IREDA
Implementation Stage	• Implementation of provisions of project activity specific plan addressing gender concerns as per the GAP; • Monitoring engagement of women in different project activities, skilled and unskilled works; • Monitor safety and security measures of women in work and camp sites; • Monitor women specific provisions and facilities created in the project site and camps. • Supervising adherence to wage payment norms	Social Development Specialist; implementing agencies; REPPD/IREDA; M&E Agency
Post-Implementation Stage	• Continuation of activities initiated under the project; • Monitoring sustenance of project inputs and its benefits accessed by women	Social Development Specialist, M&E agency, REPPD/IREDA

4.9.5 Monitoring Gender Action Plan

The indicators, frequency, and agency recommended for monitoring are presented in the table below.

Table 4-7: Monitoring Indicators for Gender Action Plan

Aspects	Monitoring Indicators (Process and Outcome)	Frequency	Monitoring Responsibility
Economic	• No. of women engaged in different activities and their proportion to the total workforce; • Days of engagement of women in different wage / non-wage activities and proportional days of engagement in comparison to their male counterpart; • Growth in income of women due to such engagements; • Reduction in no. of days of migration (if migrating earlier); • No. of women having additional/new market oriented employable skills for self-engagement; • No. of women accessed different govt. schemes/provisions including beneficial enrolment in agricultural interventions; • Improvement in asset holding of women (productive and household assets).	• Planning Stage: for the base line data • Half yearly Monitoring • Mid Term Review (MTR) • Final Impact Assessment	REPPD Third party Monitoring along with REPPD
Social	• Improvement of association of women in local institutional and decision-making process (membership, management position, etc.);	• Planning Stage: for the base line data • Half yearly Monitoring • Mid Term Review (MTR) • Final Impact Assessment	REPPD/IREDA Third party Monitoring

4.9.6 Implementation Arrangements

The preparation, implementation, and monitoring of the Gender Action Plan (GAP) is the responsibility of the project implementing entities. The Social Development specialist, at the REPPD/IREDA level, will facilitate and supervise this process of preparation and implementation of the Action Plan. All efforts will be made to coordinate and work with associated line departments and other department, more specifically the Women and Child Development

department, State Livelihood Mission, Panchayati Raj, and Rural Development department to help dovetailing with their development programs for the socio-economic development of women.

4.10 Indigenous Peoples Policy Framework

The Indigenous People (IPs) in India are categorized as tribal who often become vulnerable in development projects because of their cultural autonomy which is usually undermined and also because this group endure specific disadvantages in terms of social indicators of quality of life, economic status and usually as subject of social exclusion. The term "Indigenous Peoples" is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees:

i. Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
ii. Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories
iii. Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and
iv. An indigenous language, often different from the official language of the country or region.

Legal Provisions

The Constitution of India, Fifth Schedule (Article 244) provides for the administration and control of Scheduled Areas[3] and Scheduled Tribes (areas and tribes needing special protection due to disadvantageous conditions).

The provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996 lays down process to be followed for acquisition of land in Scheduled V Areas. The Act under sub-section (1) of Section 4 provides for mandatory consultation with the Gram Sabha before any land acquisition proceedings can be undertaken.

Project shall avoid adverse impact on such areas to the extent possible. Where unavoidable, it will consult the concerned Gram Sabha / Panchayat for obtaining their broad support and resolution for initiating land acquisition as per the provisions of the Act and OP 4.10.

Some of the issues directly or indirectly related to Indigenous People sub-projects could be:

i. Loss of agriculture income
ii. Loss of employment of daily wagers in farms.
iii. Loss of shelter
iv. Loss of community facilities
v. Physical displacement

Other Issues:

i. Low level of agriculture productivity
ii. Lack of employment opportunities
iii. Low income levels
iv. Poor health
v. Low level of education
vi. High levels of debt

[3] https://tribal.nic.in/DivisionsFiles/clm/ScheduledAreas.pdf

4.10.1 Objective of IPDPF

The key objective of the IPDPF is to give special attention and focus to the tribal issues and concern during the planning and implementation of the project. This Framework is to be adopted on a full scale in the Scheduled areas and as deemed necessary in the other areas.

Thus, the objectives of the IPDPF are to ensure that

i. The tribal populations are adequately and fully consulted by the project;
ii. Tribal take part in the entire process of preparation implementation and monitoring of project activities;
iii. Project benefits are equally accessible to the tribal living in the project area; they are provided with special assistance as per prevailing laws and policies because of their culture identities and to minimize further social and economic imbalances within communities;
iv. Developing an institutional and implementation arrangements as well as capacity building measures for the implementation of the IPDPF, associated disclosure mechanisms and addressing any grievances; and
v. Monitoring and reporting arrangements, including mechanisms and benchmarks appropriate to the project. This includes a grievance redress mechanism has also been developed to resolve grievances, if any.

4.10.2 Process for preparation of IPDP

The following steps for preparation of IPDP to be implemented by Project (Social Specialist) in consultation with the community.

The RE Park Project Developer would be responsible for conducting SA and the development of an action plan with the help of indigenous community and organizations working for them. The SA will gather relevant information on demographic, social, cultural; economic and networking aspects of each household and needs of the community as a whole. The information on individual household will be collected through household survey whereas, community based needs will be assessed through group discussions with the community as a whole as well as in discussion with the community leaders and government and non-governmental officials working in the area on tribal issues. The discussion will focus on both positive and negative impacts of the sub project. The suggestion and feedback of the community on the design and planning of the sub project will also be documented.

Table 4-8: Steps for Preparation of IPDP

Action
Information disclosure Prior to the SIA, the project will disseminate project information to all stakeholders through various means, such as mass media, project brochures/posters and a dedicated project site on the internet.
Screening A screening will be conducted in order to determine if tribal families or communities are present or have collective attachment in the area of influence of the proposed projects. Where tribal communities are found to be present or have collective attachment in the area of influence of the project, it is to be noted that the OP 4.10 will be triggered and the following steps will be taken even if no negative impact is likely to occur. The identification of tribal families/communities will be as per OP 4.10. The determination as to whether a group is to be defined as indigenous peoples is made by reference to the presence (in varying degrees) of four identifying characteristics:

- Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
- Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
- Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and
- An indigenous language, often different from the official language of the country or region.

Social Assessment (SA) and Free, Prior and Informed Consultations

If based on the screening, the Bank concludes that Indigenous Peoples are present in, or have collective attachment to, the project area, social assessment will be conducted to evaluate the project's potential positive and adverse effects on the Indigenous Peoples, and to examine project alternatives where adverse effects may be significant. The social assessment will:

- Identify key stakeholders of affected tribal community and establish an appropriate framework for their participation in the selection, design, implementation, and monitoring and evaluation of the relevant project activities;
- Assess the demographic, socioeconomic, cultural and other relevant characteristics of affected ethnic on and near the project sites, establish social baseline and identify potential barriers to their full participation in benefiting from project activities;
- Review relevant legal and institutional framework applicable to tribal community;
- Assess, based on free, prior, and informed consultation with the affected tribal community, the potential impact of project activities and, where adverse impacts are identified, determine how they can be avoided, minimized, or substantially mitigated;
- Propose specific measures to ensure that affected tribal people will, meaningfully and in a culturally appropriate manner, participate in project activities, benefit from the project, and mitigate and mitigate negative impacts; and
- Develop institutional arrangements and implementation procedures to assist tribal farmers to voice grievances and have them addressed in ways that are socially sound, in line with the procedures described in this IPDPF.
- In case of any project which incorporates modernization/expansion or augmentation of any existing infrastructure which involved any displacement when constructed, the nature, scale and scope of displacement are to be assessed as part of the due diligence. The current state of the livelihood of the formerly displaced tribal population is also to be assessed.
- The breadth, depth, and type of analysis in the social assessment shall be proportional to the nature and scale of the proposed project's potential effects on the tribal community, whether such effects are positive or adverse.

Free Prior Informed Consultation and Participation: **To ensure such consultation, it is necessary to:**

- establish an appropriate gender and intergenerationally inclusive framework that provides opportunities for consultation at each stage of project preparation and implementation among the affected tribal communities, any organization that works for the tribal community if any, and other local civil society organizations (CSOs) identified by the affected tribal communities;
- use consultation methods appropriate to the social and cultural values of the affected tribal communities and their local conditions and, in designing these methods, gives special attention to the concerns of tribal women, youth, and children and their access to development opportunities and benefits; and
- provide the affected tribal communities with all relevant information about the project (including an assessment of potential adverse effects of the project on the affected tribal communities) in a culturally appropriate manner at each stage of project preparation and implementation.

The project before proceeding with the intervention will ensure that affected tribal communities provide their broad support to the project. Where there is such support, the project will prepare a detailed report that documents:

- the findings of the social assessment;
- the process of free, prior, and informed consultation with the affected tribal communities;
- additional measures, including project design modification, that may be required to address adverse effects on the tribal and to provide them with culturally appropriate project benefits;

- recommendations for free, prior, and informed consultation with and participation by tribal communities during project implementation, monitoring, and evaluation; and
- any formal agreements reached with tribal communities.

***Mechanism for FPIC*:**

When a project affects tribes, project will carry out free, prior, and informed consultation with affected communities about the proposed project throughout the project cycle, taking into consideration the following:

- advanced notice will be given to the affected community along with project information that will include the scope of the proposed project; probable impacts (both positive and negative) in the local language. The date and timing of consultation will vary based on the availability of community members;
- the consultation target audiences would be existing tribal organization or any CSO working for tribal community; tribal elders, community headmen, and tribal opinion makers, women, and youth. Consultations will be carried out in a public space that is accessible to all;
- the consultation process will start once the sub project is identified and will be a continuous process to ensure that the tribal community fully understands the project and their concerns and recommendations are incorporated into the project design. The consultations may be repeated and will continue even during the construction stage; and
- Project will maintain the record of the consultation process.

Preparation of Subproject specific IPDPs:

If the screening of an individual subproject identified in the IPDPF indicates that tribal communities are present in, or have collective attachment to, the area of the subproject, project will ensure that, before the subproject is implemented, a social assessment is carried out and an IPDP is prepared in accordance with the requirements of this framework.

Disclosure:

The social assessment report and draft IPDP will be made available to the affected tribal communities in an appropriate form, manner, and language. Post finalization of the IPDP, the document is also made available to the affected tribal communities in the same manner as the earlier draft documents.

4.10.3 Tribal Inclusion Approach

The project will have exclusive strategic focus for greater inclusion and representation of tribal in scheduled areas and their active association in project interventions. The strategy proposed for inclusion of tribal communities is discussed below.

Table 4-9: Project Approach and Strategy for IPDP

Project Stages	Project Approach and Strategy	Expected Outcome
Preparatory Phase	• Discussion with tribal families / farmers of the project area in general and exclusively in scheduled areas on project component and activities; • Identifying key issues in the way of their greater involvement and benefitting from the project intervention; • Preparing a priority list of actions, based on the identified issues and interest of tribal farmers / families of the project area. • Preparing cluster specific plan of action for better inclusion of tribal in different activities that are feasible for their greater participation.	• Key intervention areas are identified and guidelines prepared for improved participation of tribal in general • List of actions finalized for implementation to ensure greater involvement and participation of tribal by activities
Implementation Phase	• Implementing priority actions that are finalized during preparatory phase; • Initiatives for convergence with tribal development schemes of Government at the village / block level; • Priority action in inaccessible scheduled areas (project village) for establishment of infrastructures (such as community market places, community toilets, safe	• Participation of tribal in different activities implemented under the project; • Project supported infrastructure and services in less accessible scheduled

	playgrounds) that are planned under the project, based on feasibility; • Equal opportunity to dispersed tribal (living in a mixed community) for accessing project benefits, as per the plan under entitlement coverage; • Ensuring greater participation of tribal community in activities / sub-activities taken up under each component / sub-components of the project; • Taking measures, adhering to the scope of the project, to build the capacity of tribal people in maintaining public assets as per the project requirements; • Monitoring of actions taken under the project for inclusion of tribal by project component / sub-components and initiating corrective measures accordingly; • Documenting success and learning from different initiatives undertaken by the project that ensures greater participation of tribal.	areas / tribal dominated areas; • Inclusion of tribes and their active involvement ensured with better operational and management capabilities;

4.10.4 Gender Issues among Tribes

The tribal women play an important role in the community and family development. Women normally constitute half of the total population. These women mostly work as agricultural labourers and share equal burden with men. In IPDP, therefore, efforts should be made to create an institutional framework to make gender sensitive decisions. Project in consultation with Department of Women and Child Development should identify Women Self-help Groups (WSHGs) within project associated villages and together identify awareness programs on "women's role in development and maintenance of public assets".

4.10.5 Entitlement

Based on the Operational Policy 4.10 of the World Bank and as one of its significant R&R requirements; special provisions for the Scheduled Tribes (ST) has been made in the project R&R Policy (apart from the general compensation and assistance to be received as Project Affected Persons (PAPs) of proposed project activities for loss of assets. Apart from compensation at replacement value and R&R assistance for any adverse impact, each Tribal family will be entitled to additional benefits as a one-time grant.

4.10.6 R & R Benefits for Tribal Project Affected People

The resettlement and rehabilitation (R&R) benefits for tribal families is as under:

i. Each Project Affected Family of ST category shall be given preference in allotment of land.
ii. Tribal PAFs will be re-settled as per RAP feasibility close to their natural habitat in a compact block so that they can retain their ethnic/linguistic and cultural identity
iii. The Tribal Land alienated in violation of the laws and regulations in force on the subject would be treated as null and void and-the R&R benefits would be available only to the original tribal land owner.

4.10.7 Indigenous Peoples Plans (IPDP)

On the basis of the SIA and free, prior and informed consultation conducted as part of the process, a Indigenous Peoples Plan (IPDP) should be prepared. An IPDP should include the following elements:

i. The description of the project objective and activities, in particular on project activities that will be conducted for the site;
ii. A summary of the SIA including the results of the free, prior, and informed consultation with affected tribal communities and verification of their broad community support for the project;
iii. Description of potential negative impacts and measures to address them;
iv. A framework to ensure that affected tribal communities can meaningfully participate in the project activities, and in the process to minimize and mitigate negative impacts.
v. Mechanisms through which affected tribal communities are able to voice concerns and grievances and have them addressed;
vi. Mechanisms and benchmarks for monitoring, evaluating, and reporting on the implementation of IPDP; and
vii. The financing plan for IPDP implementation.

4.10.7.1 Suggested Format for IPDP

The suggested format for the IPDP is as follows:

i. Description of sub projects and implications for the indigenous community
ii. Gender disaggregated data on number of tribal households by impact category
iii. Social, cultural and economic profile of affected households
iv. Land tenure information
v. Documentation of consultations with the community to ascertain their views about the project design and mitigation measures
vi. Findings of need assessment of the community
vii. Community development plan based on the results of need assessment
viii. Modalities to ensure regular and meaningful consultation with the community and participatory approach
ix. Institutional arrangement and linkage with other national or state level programmes
x. Institutional mechanism for monitoring and evaluation of IPDP implementation and grievance redress
xi. Implementation Schedule and cost estimate for implementation

4.10.8 Approval and Disclosure

Once the draft IPDP(s) and the associated SA Report(s) are drafted, they will be submitted to REPPD for review and approval. REPPD will translate them into relevant local languages, make them available on its website as well as in locations accessible to affected tribal communities, and consult them with affected tribal communities for comments. REPPD will also disclose them on REPPD webpage, finalize them considering the comment received, and submit them to the Bank for review and clearance. The Bank will disclose the IPDP(s) through the Info shop as well as at the country office website.

4.10.9 Monitoring and Evaluation

Throughout the implementation of the project, the Social Expert of REPPD will monitor the project compliance with Bank safeguard policies. The expert will visit at least on a monthly basis since the planning until two months after the completion of civil works at the project sites and meet the affected tribal communities. Upon the completion of a IPDP, the expert will carry out a IPDP completion assessment to confirm that all measures under this IPDP have been fully implemented and that the negative impacts on tribal communities have been adequately addressed.

Monitoring group will be created in each tribal inhabited project area which will ensure that all actions would be undertaken in line with this IPDP and, in case of irregularities, contact the REPPD/IREDA. The participatory social audit will be conducted facilitated by Social Expert, whereby community will be encouraged and facilitated to report outstanding issues and air grievances. The minutes of the meeting will be prepared, and measures should be taken to address the recorded issues (during meeting with officials) in the subsequent annual cycle.

All implementing agencies will have an IPDP focal point that will regularly supervise and monitor IPDP implementation. These focal points will report to CEO, REPPD on IPDPF related matters and request the support of the Social Expert if needed. S/he will travel to the sites and spot check if the actions are taken and information provided in conformity with the IPDPF.

4.10.10 Monitoring & Evaluation

The REPPD will set up an internal monitoring system comprising its own staff, tribal people to monitor the IPDP implementation. Monitoring indicators will be established. In addition, an external independent monitoring agency will be employed by REPPD. Some of the relevant indicators for monitoring of both physical and financial progress are listed below as a guideline:

Table 4-10: Monitoring and Evaluation Indicators

Sl. No.	Monitoring Indicators	Methods to asses and measure
A.	**Indicators for Physical Progress**	
1	No. of ST beneficiaries villages / settlement	Through concurrent monitoring and independent evaluation.
2	No of ST households benefited	
3	Total No. of ST beneficiaries provided project employment	
4	No. of ST women provided project employment	
5	Total No. of ST beneficiaries provided training for employment	
6	No. of ST women provided training for employment	
7	No. of community facilities constructed in villages with ST population	
B.	**Indicators for Financial Progress**	
1	Total amount spent	Review of Project developer documents and concurrent monitoring
2	Amount spent on construction of community assets	Review of Project developer documents and concurrent monitoring
3	Amount spent on training and capacity building activities for employment generation	Review of Project developer documents and concurrent monitoring

4.10.11 Key Elements of IPDP and Participatory Approach

The key elements in an IPDP include:

i. All development plans for indigenous people should be based on full consideration of the options and approaches that best meet the interests of the communities.
ii. Scope and impact be assessed and appropriate mitigation measures are identified
iii. Project should take into account the social and cultural context of affected peoples, and their skills and knowledge relating to local resource management
iv. During project preparation, formation and strengthening of indigenous peoples organization; communication to facilitate their participation in project identification, planning, execution and evaluation should be promoted.
v. In case REPPD is not capable of preparing and implementing IPDP, experienced community organizations / NGOs can be involved as intermediaries.

4.10.12 Participatory Approach for Preparation of IPDP

The main thrust of IPDP is to address the developmental issues of the project taking into consideration the marginality status of tribal community. The IPDP will offer developmental options addressing community based needs of indigenous people while respecting their socio-cultural distinctiveness. The IPDP aims at strengthening the existing capacity of the affected tribal community. The strategy of IPDP therefore would be to promote participation of the tribal people, initiating and identifying people's need, priorities and preferences through participatory approaches. Therefore, the action plan for a particular village will be prepared by the community themselves. These plans would be prepared on yearly basis.

Participatory Rural Appraisal (PRA) initiates the process of people's participation, facilitating decision-making through mutual discussion and direct consultation. Participatory approach is intended to promote participation of all stakeholders creating development opportunities for the affected community. It is therefore, mandatory that appropriate PRA tools along with Focus Group Discussion (FGD) is employed to initiate participation in IPDP for collection of qualitative data. The areas of enquiry would mainly include:

i. Identification of tribal groups
ii. Access to natural resources, likely impact on land ownership and land distribution, share cropping and lease holder
iii. Participation in the livelihood security component of the project
iv. Employment and income generating opportunities in agriculture, trade and business and services
v. Poverty
vi. Women and Gender relation
vii. Felt needs and community organization

With a view to assess the life patterns of the affected indigenous population and to prepare IPDP consistent with community and region specific background, pertinent baseline information shall be collected, compiled and analyzed. The baseline information on socio-economic characteristics including land tenure, land holding categories, occupational pattern, usual activity status, income – expenditure pattern, access to natural resources, health status, literacy level, age structure, gender, marital status, etc. shall be collected in order to facilitate the planning process. The baseline data shall be collected through pre-tested structured schedules.

The most important component of IPDP is to assess the type and magnitude of impacts, both positive and negative on the tribal communities. The assessment of impacts on tribal population in the projects shall focus on the probable consequences of the project according to specific criteria / indicators.

The indicators may include:

i. Access to natural resources (such as forest, grazing land, weekly markets, etc.)
ii. Job opportunities through wage labour within or outside agriculture
iii. Employment and income generating opportunities in agriculture, trades, services and business
iv. Tribal community rights, institutions, values and way of life
v. Social infrastructure and public services such as sources of water, health facilities, schools, etc.
vi. Reduction in political power, marginalisation and social disarticulation
vii. Changes in farming methods, cropping pattern, crop yield, income, expenditure pattern, etc.

One major activity during the course of the survey would be to identify, various community specific developmental needs linked to their socio-economic and cultural life. The needs shall be identified for infrastructure development and community service facilities such as weekly markets, drinking water facility, sanitation, health facility, schools, community halls, post office, watershed structure, drainage, etc.

4.10.13 Implementation Issues and Strategy

It is envisaged that proper implementation of IPDP is possible only through community participation. The participatory approach will ensure:

i. Promotion of community concern and involvement
ii. Proper organization and management of resources
iii. Setting up of criteria and fixing criteria and procedures for project execution are done at the grass root level
iv. Identification, selection and strengthening of implementing agency at the grass roots level

Steps will be taken to ensure that (i) tribal community participates in the project, (ii) is fully aware of their rights and responsibilities; and (iii) are able to voice their needs during IPDP preparation. The community would be encouraged to prepare their own plan that caters to the needs of the community.

Appropriate people's organization and forum need to be built up and strengthened to ensure effective peoples representation and empowerment in the process of selection of specific community development activities and their execution. The conventional top down approach to project implementation through prevailing bureaucratic framework, need to be reoriented for the framework of participative administrative structure to respond to bottom up initiatives based on participatory process for informed community participation and empowerment.

IPDP as a means of sustainable development is based on the strategy of using culturally appropriate, socially acceptable and economically viable opportunities for livelihood of the tribal community including farmers, agriculture and non-agriculture labour, women and wage earners. The strategy includes:

i. Participation of tribal community in plan preparation, formulation and implementation by strengthening their existing tribal social, political and community organizations through required legislative measures, positive administrative responses and people's mobilization.
ii. Strengthening women's traditional role in subsistence economy through organization, capacity building for leadership and skills improvement, access to non timber forest produce (NTFP), while bringing about greater sharing of household responsibilities between men and women.
iii. Keeping in view the strong bondage of the tribal community with land and forest, subsistence practices, traditional culture and ways of life, the strategy may create space for innovative policy measures through appropriate legislation / executive actions. Such innovative policy responses may cover any aspect of their needs from food security, income generating activities, right over forest produce, community health measures or any such issue as generated by the community in course of their participation in the plan process.
iv. Involvement of non-governmental organization (NGO) as an interface between the government and the tribal community to "bind" and strengthen their organizations,

develop a mechanism for redress of grievances and facilitate their being a "stakeholder" in the institutional arrangements for IPDP.

Non-governmental organizations (NGO) are "secondary stakeholders" who can facilitate the participation of "primary stakeholders"-the tribal community. The NGOs must have a clear understanding of the socio-economic, cultural and environmental context of the project.

The social and community organizations of tribal population will be identified to strengthen and involve them in participatory process of IPDP. The IPDP will develop a linkage with the structure and the process of tribal development administration so that the tribal communities can enjoy more benefits. The NGOs will also provide the important interface between tribal administration and the community.

Grievance Redress Mechanism: Apart from project GRM, a specific grievance mechanism will be established for indigenous people. A district level grievance redressal cell will be constituted to address the grievances of the tribal community.

Members of GRC: The cell will be constituted by the project developer in the concerned project districts. The GRC will be represented by the representatives of tribal PAPs and also non-tribal, the village head, NGOs contracted for the implementation of RAP and any other opinion leader from the concerned village. It will be chaired by a retried officer, who served as principal/judges/ Deputy commissioner/Additional DC, etc.

Functions of the Cell: The district grievance cell will conduct a meeting in the first week of every month to hear the grievances from the PAPs. All the complaints will be forwarded to the concerned department/officials within 15 days from the date of receiving the complaints. The issues resolved/addressed by concerned officials within 45 days from the receipt of the complaints.

The committee shall submit a monthly report to the RE park project developer for the reference regarding the issues received and the cases disposed and forwarded . In case aggrieved person is not satisfied by the verdict given by GRC, he or she is entitled for approaching the judiciary.

4.10.14 Gender Issues among Tribes

The tribal women play an important role in the community and family. Women normally constitute half of the total population in any project area and for survival tied themselves to land and forest. These women work as agricultural labourers. Even in agricultural household, women share with men the burden of agricultural operations like transplanting, weeding, harvesting, threshing, winnowing, etc. The concentration of women in agricultural and allied activities is due to the decline of rural industries leading to large-scale reduction of labour force within non-agricultural sector.

In IPDP, therefore, efforts will be made to (i) create an institutional framework to make gender sensitive decisions. SPPD in consultation with SRCA and Women and Child Welfare Department shall constitute Women Interest Groups (WIGs) within a village and Gender Advisor Committee at district and state level, (ii) women members would be trained for upgradation of skills to initiate viable irrigation related income generation activities for their economic empowerment. In addition women members will be trained in fisheries, animal husbandry, value addition to NTFP, development of kitchen garden, home orchards; production of mushroom, rice-cum-fish culture, or any other locally required trades that can help them to generate additional income, (iii) through training, women members will be provided information to make them an active participant in various developmental activities.s. The activities include (a) provide information

on developing a WIG sub plan, (b) linking with other women's development programmes of line department, and (iv) NGO will focus on women's need for social development.

4.11 Construction Labour Management Plan

For a typical 750 MW solar power project in its preliminary phase of execution, It is envisaged that during construction phase of the project, labourers for various jobs such as civil, mechanical and electrical works will be hired through authorised manpower agencies. The labour requirement will range from 250-270 workers during normal operations which can reach upto 300 workers during peak construction activities. Therefore, it is also envisaged that many of the labourers will be employed from outside the region and will therefore, be migrant labourers and hence, accommodation will be provided. These migrant labourers will be accommodated in a temporary campsite within the project area. The construction of all three modules can start simultaneously which can lead to increase in migrant labour at a given point of time. This could result in stress on local resources, disruption in community relations, and movement of labours.

4.11.1 Objectives

The influx of migrant labour will have both negative and positive impacts on the nearby community and local environment. The labour will be accommodated in temporary campsite within the project boundary which can have significant interface with the nearby community. However, the influx of migrant workers would lead to a transient increase of population in the immediate vicinity of the project area for a limited time. This would put pressure on the local resources such as roads, fuel wood, water etc.

Hence, a plan has been designed to demonstrate the:

i. Potential impacts associated with influx on the host population and receiving environment are minimized;
ii. Provision of safe and healthy working conditions, and a comfortable environment for migrant labour; and
iii. To ensure compliance with the IFC PS 2and 4 and national labour laws;
iv. IFC Performance Standards

International Finance Cooperation (IFC) Performance Standard 2- Labour and Working Conditions is specific to labour and working conditions. This Standard focuses on the protection of the basic rights of workers, fostering constructive worker-management relationships, as well as promoting fair treatment and the provision of a safe and healthy workplace. The basic provisions for migrant workers under PS 2 are enumerated below:

i. As per the provisions of PS 2, the client shall identify migrant workers engaged through third party and ensure that they are engaged on substantially equivalent terms and conditions to non-migrant workers carrying out similar work (if any);
ii. The Developer shall ensure provision of adequate accommodation, transportation, and basic services including water, sanitation, and medical care for the workers working on that project;
iii. The compensation paid to the migrant workers should be non-discriminatory and the principle of equal opportunity and fair treatment to be followed; and
iv. Wastewater, sewage, food and any other waste materials are to be properly handled, in compliance with local standards– whichever is more stringent – and without causing any significant impacts to the biophysical environment or surrounding communities.

IFC PS 4 – Community Health, Safety and Security carries health and safety through to the community environment. The objectives of the Performance Standard are:

- To minimise and manage health and safety risks to local communities; and
- To ensure that the project does not harm community health and safety.

4.11.2 General Requirements

All migrant workers are envisaged to be accommodated in temporary campsite within the project area. If migrant workers are accompanied by their families, provisions should be made accordingly. Guidance on Workers Accommodation developed by IFC and EBRD is also referred for inclusion of requirements for labour camp to be established by developers during construction phase of the project. Developer(s) shall ensure implementation of the following measures to minimise the potential negative impacts of worker accommodation and workers on local communities.

Cleanliness: Pest extermination, vector control and disinfection are to be carried out throughout the living facilities in compliance with local requirements and/or good practice.

Complaints and incident reporting: A formal Complaints Procedure will be implemented to ensure timely and transparent response to complaints as received from labour.

Labour education: The workforce will be sensitized to local social and cultural practices through provision of an induction course for all employees that stipulates expected behaviour;

Labour behaviour in campsite provided: A Code of Behaviour governing appropriate behaviour in the accommodation facilities to be kept in place and to be strictly enforced. The Developer shall ensure implementation of the "rules of engagement" between labours living in campsite and community and shall be implemented by construction contractors for all engaged labours. A code of conduct has been developed and has been annexed with the report.

Labour Compensation and Accommodation: Client shall ensure that labours are provided with benefits such as annual leave, weekly rest day, etc. Accommodation to be provided for the construction labour which cover facilities (including catering facilities, dining areas, washing and laundry facilities etc.) and supporting utilities.

4.11.3 Hiring and Recruitment Procedure

The manpower contractor shall, wherever possible, locally recruit the available workforce and shall provide appropriate and requisite on job and EHS training as necessary. The following general measures shall be considered for the workforce during their employment tenure:

- REPPD should include a code of conduct relating to the accommodation to be signed with the contract Document of developers.
- The contractor shall not employ any person below the age of 18 years nor will have any forced labour;
- The construction labourers will be provided with documented information regarding their rights under national labour and employment law such as but not limited to Factories Act, Minimum Wages Act, Trade Unions Act and Workmen's Compensation Act;
- First priority for employment of labour should be given those impacted by the project such as landowners who have lost land;
- No discrimination shall be done by the construction contractor with respect to recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, termination of employment or retirement, and disciplinary practices;
- The contractor to ensure that work hours are set at eight hours a day, 48 hours a week, with a weekly rest day for all engaged labours;

- Every labour is entitled for maximum of only two hours a day as Overtime (OT) work. OT pay is twice the hourly remuneration;
- Client shall ensure equal wages for male and female workers for work of equal nature or value is maintained;
- A grievance redress mechanism for workers shall be put in place by the contractor to raise workplace concerns. The workers will be informed about the grievance mechanism at the time of recruitment; and
- The Developer shall ensure that their contractors develop and implement a procedure to review the performance of their sub-contractors.
- The procedure developed should include regular inspection of the camp sites, maintaining information pertaining to labours sourced by sub-contractors;

4.11.4 Worker's Accommodation

The Developer will supervise and monitor the activities performed by their contractor and accommodation facilities provided in campsite. The following measures shall be provided:

- The labour will be provided with accommodation on twin sharing basis made of insulated material and locally available building material, etc.;
- The migrant workers with families shall be provided with individual accommodation comprising bedroom, sanitary and cooking facilities;
- The units will be supported by common latrines and bathing facilities duly segregated for male and female labour;
- Adequate number of toilets shall be provided in the accommodation facilities. A minimum of 1 unit to 15 males and 1 unit for 10 females shall be provided;
- The contractor shall provide a canteen facility for the construction workers and the food will be of appropriate nutritional value and will take into account religious/cultural backgrounds;
- All doors and windows shall be lockable and mobile partitions/curtains shall be provided for privacy;
- Facilities for the storage of personal belongings for workers shall be provided within the campsite only;
- Dustbins shall be provided for collection of garbage and will be removed on a daily basis;
- It is also required to provide first aid box in adequate numbers; and
- Ventilation should be appropriate for the climatic conditions and provide workers with a comfortable and healthy environment to rest and spend their spare time.

4.11.5 Security

The contractors shall put in place the following security measures to ensure the safety of the workers. The following measures shall be incorporated:

- Access to the campsite shall be limited to the residing workforce;
- The contractor shall be responsible for deploying adequate number of guards;
- Adequate, day-time night-time lighting shall be provided;
- The security personnel shall be provided with training to respect the community traditions and in dealing with, use of force etc.; and
- The rental accommodation shall be provided with firefighting equipment and portable fire extinguishers.

4.11.6 Provisions for Drinking Water

Access to an adequate and convenient supply of free potable water is necessity for workers. The domestic water supply shall be made available by the contractor.

- Safe drinking water conforming to the IS 10500:2012 for drinking water shall be provided;
- Private tanks can be utilized for provision of drinking water for the migrant labours;
- The direct usage of water from bore well should not be allowed and water shall be adequately treated;
- The Developer(s) should regularly monitor the quality of drinking water available. In case of noncompliance with the Drinking Water Specifications, additional treatment shall be provided or alternative sources of water supply shall be arranged; and
- All tanks used for the storage of drinking water are constructed and covered as to prevent water stored therein from becoming polluted or contaminated.

4.11.7 Cooking Arrangements

The construction phase will involve engagement of large number of migrant people in the project area for a limited time. Hence, there shall be requirement of provision of cooking facilities (kitchen) as listed below:

- Places for food preparation are designed to permit good food hygiene practices, including protection against contamination between and during food preparation;
- Adequate personal hygiene including a sufficient number of washbasins designated for cleaning hands with clean, running water; and
- All kitchen floors, ceiling and wall surfaces adjacent to or above food preparation and cooking areas are built using durable, non-absorbent, easily cleanable, non-toxic materials;
- Food preparation tables are equipped with a smooth, durable, easily cleanable, non-corrosive surface made of non-toxic materials.

To ensure that the fuel need of labourers in the project area does not interfere with the local requirements, necessary arrangements for supply of fuel wood to the labourers shall be done by the contractor. Fuel requirement for cooking purposes are only to be met by fuel wood that to be purchased only from authorized vendors only.

4.11.8 Wastewater Generation

There will of generation of wastewater from the campsite. About 80% of water used shall be generated as sewage/wastewater. Developers shall ensure that the campsite are equipped with septic tank and soak pit for disposal of sewage. It is also recommended that the storm water and sewage system should be separate. The surface water drainage shall include all necessary gutters, down pipes, gullies, traps, catch pits, manholes etc. Sanitary and toilet facilities are constructed of materials that are easily cleanable. Sanitary and toilet facilities are required to be cleaned frequently and kept in working condition.

Solid Waste Management: The municipal solid waste generated from campsite will mostly comprise of compostable wastes like vegetable matters (kitchen waste) and combustible waste like paper, cans, plastic and some non-degradable waste like glass/glass bottles. Improper disposal of solid waste will lead to environmental degradation and health hazards to labour as well as nearby community.

The following measures shall be adopted by contractors for ensuring effective management of solid waste:

- The solid wastes of domestic nature generated shall be collected and stored separately in appropriate containers with proper sealing on them;
- Separate bins with proper markings in terms of recyclable or non-recyclable waste shall be provided in the houses and kitchen premises in sufficient numbers for collection of garbage;
- Food waste and other refuse are to be adequately deposited in sealable containers and removed from the kitchen frequently to avoid accumulation; and
- The contractor shall identify the nearest municipal solid waste storage facility and tie up with the concerned urban local body for disposal of waste at frequent intervals.

4.11.9 Medical Facilities

Effective health management is necessary for preventing spread of communicable diseases among labour and within the adjoining community. The following medical facilities shall be provided by contractors for the construction workers:

- A first aid centre shall be provided for the labour within the construction site equipped with medicines and other basic facilities;
- Adequate first aid kits shall be provided in the campsite in accessible place. The kit shall contain all type of medicines and dressing material;
- Contractor shall identify and train an adequate number of workers to provide first aid during medical emergencies;
- Regular health check-ups shall be carried out for the construction labourers every six month and health records shall be maintained;
- Labours should have easy access to medical facilities and first aider; where possible, nurses should be available for female workers;
- First aid kits are adequately stocked. Where possible a 24/7 first aid service/facility is available.
- An adequate number of staff/workers is trained to provide first aid; and
- Information and awareness of communicable diseases, AIDS etc. shall be provided to workers.

4.11.10 Recreation Facilities

- Basic collective social/rest spaces are provided to workers.
- Facilities like a common television can be provided in labour camps

4.11.11 Inspection of Accommodation Facilities

Campsite shall be inspected at frequent intervals to ensure that the facilities are well organized and maintained to acceptable and appropriate standards by the Developer. The key areas are:

- Daily sweeping of rooms and houses shall be undertaken;
- Regular cleaning of sanitary facilities shall be undertaken;
- The kitchen and canteen premises shall be established under good hygiene conditions;
- Daily meal times shall be fixed for the labour;
- Smoking and alcohol consumption shall be prohibited in the workplace;
- Water logging shall be prevented at areas near the accommodation facilities and adequate drainage is to be provided; and

- Checklists pertaining to the daily housekeeping schedule shall be maintained and displayed at houses, toilets and kitchen.

To limit the impact due to cumulative labour onsite during construction phase, developers shall provide adequate labour camp which should be appropriate for its location and be clean, safe and, at a minimum, meet the basic needs of workers.

- Developers should assess the location of labour camp, that it should not be constructed in immediate vicinity of any drainage channel;
- It should be ensured that the labour camp(onsite)should have basic amenities such as electricity, drinking water, health& sanitation facility, kitchen and rest room;
- All tanks used for the storage of drinking water are constructed and covered as to prevent water stored therein from becoming polluted or contaminated and all the migrant workers will be instructed accordingly;
- Employers should ensure that accommodation which is provided is not overcrowded and does not pose a risk to the health and safety of workers;

4.11.12 Impact of influx of migrant labourer

- The contractor will preferably engage the local labour force except for the labourer's requiring special skills and the non-availability of such skilled labourers from the local area.
- Awareness raising of labourers/ workers on societal norms, taboos, and other cultural practices
- Organise awareness creation and educational programmes for all workers and the general public on the behavioural changes required to prevent the spread of HIV/AIDS and other STDs
- The 'Labour Influx and Construction Workers Campsite Management Plan' will be implemented
- Project to assess and manage labour influx risk based on risks identified in the ESIA. Depending on the risk factors and their level, appropriate site-specific Labour Influx Management Plan and/or a Workers' Camp Management Plan.
- The project will incorporate the ESMP into the civil works contract. The responsibilities for managing these adverse impacts will be clearly reflected as a contractual obligation, with a mechanism for addressing non-compliance.
- Employment of any person under 18 years of age will be strictly prohibited. The contractor will maintain a labour register with name, age, and sex with supporting document (preferably copy of Aadhar card or voter's ID card). This will be monitored by the Environmental and Social office of contractors.
- Contractor and labourer will sign a code of conduct to maintain good manners with the community and avoid GBV
- Project will undertake awareness raising program for the workers and community on the risk of labour influx

4.11.13 Avoiding Gender Based Violence

- Contractor will prepare and implement robust measures to address the risk of gender-based violence that include
  - ✓ mandatory and repeated training and awareness raising for the workforce about refraining from unacceptable conduct toward local community members, specifically women;

- ✓ informing workers about national laws that make sexual harassment and gender-based violence a punishable offence which is prosecuted;
- ✓ introducing a Worker Code of Conduct as part of the employment contract and including sanctions for non-compliance (e.g., termination), and (iv) contractors adopting a policy to cooperate with law enforcement agencies in investigating complaints about gender-based violence.

- Additional measures can aim to reduce incentives to engage with the local community by providing workers with the opportunity to spend their time off away from the host community, where feasible with a small transport allowance, ideally allowing workers to regularly return for brief visits to their families, spouses, and friends, or to visit nearby urban centres that provide a variety of legal social opportunities. For workers who need to travel further it may be attractive to forego weekends off in exchange for longer breaks that would allow for such home leave travel

4.11.14 Contractor's and Borrower's Responsibilities

Within 30 days from the appointed date, the Contractor shall prepare and submit 4 hard copies and 1 soft copy of Labour Influx and Worker's Camp Management Plan to the concerned REPPD that addresses specific activities that will be undertaken to minimize the impact on the local community, including elements such as worker codes of conduct, training programs on HIV/AIDS, etc. A Workers' Camp Management Plan addresses specific aspects of the establishment and operation of workers' camps.

This Labour Influx and Worker's Camp Management Plan will include:

Mandatory and repeated training and awareness raising for the workforce about refraining from unacceptable conduct toward local community members, specifically women;

Informing workers about national laws that make sexual harassment and gender-based violence a punishable offence which is prosecuted;

Introducing a Worker Code of Conduct as part of the employment contract and including sanctions for non-compliance (e.g., termination), manual scavenging, engagement with local residents, child labour, non-discrimination, harassment of co-workers including women and those belonging to SC and STs and other minority social groups,

Contractors adopting a policy to cooperate with law enforcement agencies in investigating complaints about gender-based violence.

Training programs on HIV/AIDS and other communicable diseases,

Workers' Camp Management Plan addressing specific aspects of the establishment and operation of workers' camps provided the Local Body/ Executing Agency is unable to cater to the demand for affordable housing for this additional workforce in terms of rentals, hostels, apartments, etc.; and complaint handling Mechanism at the project level

Additional measures that aim to reduce incentives to engage with the local community by providing workers with the opportunity to spend their time off away from the host community, where feasible with a small transport allowance, ideally allowing workers to regularly return for brief visits to their families, spouses, and friends, or to visit nearby urban centres that provide a variety of legal social opportunities. For workers who need to travel further, it may be attractive to forego weekends off in exchange for longer breaks that would allow for such home leave travel.

While clear and decisive measures by the contractor are critically important, the effectiveness of these measures often depends on complementary actions by the Borrower. Those are typically focused on public administration and law enforcement, such as:

reinforcing local police in a remote setting, where services may not be sufficiently staffed or equipped to maintain public order after the influx;

ensuring that complaints about gender-based violence are taken seriously by local law enforcement, which may be supported by deploying female officers to the project area, and

participating in training with workers to demonstrate the presence of government authority in the project area.

5 CONSULTATION AND PUBLIC DISCLOSURE

5.1 Introduction

The Consultation process envisages involvement of all the stakeholders' at each stage of project planning and implementation. The RE Park Project Developer will be responsible for ensuring participation of the community at sub-project level. Consultations are undertaken with potentially affected people to understand their views/concerns, taking into account perspectives from different social groups, women and men, to obtain their inputs regarding environmental and social issues, and to take these into account during the preparation of the plans that would be executed before the developers start working on the site. Involvement of the community is not limited to interactions with the community but also disclosing relevant information pertaining to the project tasks.

RE Park project developer would be in-charge and would seek to ensure that the consultations are useful to the affected groups, are non-discriminatory by social status, and supplemented with timely and relevant information.

These consultations would focus on:

i. RE Park Project developer will ensure the minutes of public consultation meetings (local language) disclose in websites and share hard copy to concern department
ii. Identify and involve local community and stakeholders to incorporate their feedbacks in EMP for Sub-projects
iii. Disseminate information regarding redressing of grievances related to the sub project

5.2 Sub-project Consultations

The consultants team had conducted FGD's / stakeholder consultations in selected villages in the sub-project locations of Mandsaur, Rewa & Pavagada involving the team social experts, community mobilizer and other key experts to gauge the stakeholder perception about the sub-project. A total of 15 local level consultations were carried out in the selected 10 villages. The stakeholders included land owners losing land and landless labourers. Team ensured participation of women members in each consultation.

The key issues and concerns identified during the consultations included:

i. Are these project going to provide any benefits for the local people especially in terms of employment
ii. Whether local people will get employment
iii. Whether solar panels will have any impact on the health of the people and the crops being grown in the area.
iv. What will be the rate for land payable to the land owners (in case of Rewa)
v. What is the mechanism to ensure timely payment of lease rent for land being pooled for solar project (in case of Pavagada).
vi. What will be the fate of agricultural labour that do not own land and are dependent on land owners for labour work on agricultural land owned by big farmers?
vii. How would the RE project developer ensure that the noise / dust / labour camps setup during the construction phase of the project does not impact the local village community?
viii. Will the construction activity have any adverse impacts on our existing surface water resources?

Table 5-1: The details of the consultations are provided below:

Location for Consultation	Issues Covered / Raised by participants	How it would be addressed
Proposed Solar Park Site - Pavagada		
Selected five villages: Thirumani,	Opportunity for employment generation for the village land owners and the agricultural	The local community members will be preferred for employment during

Balasamudra, Vollur, Kyathaganacherlu, Rayacharlu	labour - Semi-skilled / unskilled	construction. Those losing livelihood will be provided opportunities for alternative livelihood.
Number of stakeholders consulted : 70 stakeholders	The annual lease rate is low in comparison to adjoining areas for similar projects	Rates will be finalized in consultation with the local community and district administration. Additional public disclosure about the criteria for calculation etc. to be made known to stakeholders.
	What other benefits for the village / land owners	Developers will carry out developmental activities in the villages as part of CSR. The activities will be identified in consultation with the community.
	Stakeholder expects better power supply situation in villages after the implementation of solar power plant	The government may consider to include a small percentage of power produced by the developer to be allocated for the local population or alternatively, the conditions could be included in the agreements for the developer to install roof-top solar power panels for the local villagers as part of the CSR budget of the company
	What would be the payment schedules and how will the timely payments be ensured	The lease will be paid annually with an increment of 5% every two years. Project to make community aware about the mechanisms to be put in place for ensuring timely payment of lease rentals payable to them.
	Impact of dust on standing crops during construction phase	Contactor will ensure watering of construction site / tracks on regular basis.
Proposed Solar Park Site - Rewa		
Selected five villages: Badwar, Barseta Desh, Barseta Pahar, RamNagar Pahar and Etar Pahar	What will be the rate for acquiring land	The land owners will be paid double the circle rate as per the provisions of the state policy.
Number of stakeholders consulted : 85 stakeholders	What impact the project will have on the surrounding areas due to radiation.	The solar panels do not have any adverse impacts on the health due to radiations. The Project will undertake awareness campaigns about the solar panels and how it works on regular basis.
	How will the access to the private land parcels ensured which are not included in the solar park	The easement rights shall be ensured while preparing the detailed layout plans for the solar park.
	Impact on surface water sources	It will be ensured that the existing drainage and surface water bodies are not altered during construction stage. Water from such sources should only be withdrawn after getting NOC from local panchayat.
	What will happen to our houses falling within the proposed site?	Project will prepare a resettlement action plan which will provide for mitigation measures for all adverse impacts including relocation. The impacted structures will be compensated at replacement value.
	Access to forest area for collection of NTFP	Project to ensure that community has access to forested areas.
Solar Wind Hybrid 160 MW Anantpur		
Location for Consultation	Issues Covered / Raised by participants	How it would be addressed
Selected Villages: Ramagiri &	Participants were concerned about the safety of local population staying along the	Community Health & Safety considerations have been in- built for

Muthavakontla	proposed project area.	contracts during construction & operation of project. Regular monitoring will be ensured.
	Concerns were raised with regard to amount and mode of compensation. Participants suggested that compensation be paid in one single instalment so that the amount can be used in a fruitful manner.	Compensation will be as paid as per govt. policies
	They raised concerns regarding the remaining land area after using part of the land for project	The residual land if economically unviable will be either purchased by the project or PAP will be given additional grant as suggested in entitlement matrix of ESMF
	Revenue officials expressed their apprehensions regarding court cases by PAPs. It was suggested that this could be prevented if affected person are taken into confidence and are appraised about the benefits and compensation package well in advance.	Safeguards measures incorporated in project ensure that PAPs are informed & consulted about project & its socio economic benefits. Information is provided in local language at prominent locations Public Consultations are held to disclose project related safeguards documents, take feedback of stakeholders & to solicit support Grievance redressal mechanisms are put in place at project & higher levels, information regarding same shall be prominently displayed at project location.
	A majority of the PAPs wanted employment opportunities generated for the local population during the project cycle.	Depending on the skill sets, local community will be given preference over outsiders during project life cycle.

5.3 Mechanism for Consultation

The Consultation Framework envisages involvement of all the stakeholders at each stage of project planning and implementation. Involvement of the community is not limited to interactions with the community but also disclosing relevant information pertaining to the project tasks. Community participation shall be ensured at the following stages:

5.3.1 Sub Project identification stage

To sensitize the community about the sub-project and their role

5.3.2 Planning Stage

For disseminating information pertaining to the sub-project, work schedule and the procedures involved; finalization of project components with identification of impacts, entitled persons, mitigation measures; and Grievance Redressal mechanisms to be adopted

Dissemination of project information to the community and relevant stakeholders is to be carried out by project developer at this stage of the project initiative. The community at large shall be made aware of the project alternatives and necessary feedback is to be obtained. Community and other stakeholders should be involved in the decision making to the extent possible. Information generated at this stage should be documented for addressal of queries arising out of the Right to Information Act, 2005.

Consultations with Project Affected Persons and their profiling are mandatory as per the requirements of SIA and preparation of RAP. This needs to be done as socio-economic and census surveys as part of the ESA study. Consultations with respect to cultural aspects are to be carried

out as part of the Social Impact Assessments for all alternatives and the selected alternative sub-project option.

5.3.3 Construction / Implementation Stage

Consultations as part of the implementation stage would be direct interactions of the implementation agency with the Project Affected Persons. These would comprise of consultations towards relocation of the PAPs, relocation of cultural properties and impacts on common property resources (CPRs) such as places of religious importance, community buildings, trees etc.

With the implementation of the R&R provisions in progress, consultations and information dissemination is to be undertaken among the affected persons to let them know the status of the project. It also involves R&R issues through GRM.

5.3.4 Stakeholder Engagement plan

SEP is the process of developing appropriate management strategies to effectively engage stakeholders throughout the lifecycle of the project, based on the analysis of their needs, interests and potential impact on project. The relevant stakeholders and their mode of engagement with delegation of authority for implementation of SEP should be defined by the RE park project developer and prepared accordingly as a part of ESMP.

5.4 Stakeholder Mapping

IREDA lends funds for renewable energy projects and its borrowers are responsible for implementation of the projects on ground. Therefore, all the components of this ecosystem are direct/ primary or indirect/ secondary stakeholders of IREDA. IREDA intends to have regular consultations with its direct stakeholders & use its influence to ensure all consultations at indirect stakeholder level are held in line with established best practices. The figure below shows the possible stakeholders.

Figure 5-1 : Stakeholder Category

At Sub Project Level: Through the formal and informal consultation at project sites, following stakeholder mapping has been done, identifying their interests concerned with the project activities.

Table 5-2: Stakeholder Mapping

Stakeholder Category	Interests	Potential/Probable impacts
Primary stakeholders		

Project affected people	Access to the facility, Project entitlement, Time-bound delivery of benefits, enhanced quality of life	(+/-)
Beneficiaries	Access to the facility, Project entitlement, Time-bound delivery of benefits, enhanced quality of life	(+/-)
Secondary stakeholders		
MNRE, IREDA, RE Park Project Developer, RE Project Developers Contractor, Village Panchayat	Project implementation, Contracting; Project management, Monitoring and evaluation	(+/-)
NGOs, CSOs, Research institutes	Development, Community participation, and Community welfare	(+/-)

Each of these stakeholders will be part of the consultation process and their views will be incorporated in to the project design. The key stakeholders can be grouped into two categories viz., primary and secondary. Their respective roles are presented below:

5.4.1 Primary Stakeholders

5.4.1.1 Project Affected Persons (PAPs) have the following roles:

i. Participate in public meetings and identify alternatives to avoid or minimise displacement
ii. Assist RE Park Project developer in developing and choosing alternative options for relocation and income generation.
iii. Participate in census and socio economic survey.
iv. Provide inputs to entitlement provisions, thus assisting in preparation of the resettlement action plan
v. Participate in grievance redress as members of grievance redress cells (GRC)
vi. Decide on relocation and management of common properties
vii. Labour and other inputs in the project
viii. Members of implementation committee

5.4.1.2 Beneficiaries and Host Population has the following roles:

i. Assist Developer in planning CSR activities in the villages.
ii. Provide inputs to site selection
iii. Identify possible conflict areas with PAPs
iv. Assist in identification and design inputs for IG (income generation) schemes
v. Manage common property
vi. Participate in local committees.

5.4.2 Secondary Stakeholders

5.4.2.1 RE park developer, Village Panchayat has the following roles:

i. Establish separate cell for environment and social development
ii. Notification at various stages for land acquisition and joint measurement of land to be acquired along with the revenue department
iii. Design and approval of resettlement policy

iv. Coordinate with line departments such as telephone, state electricity board, and forest department for shifting of utilities and cutting of trees.

v. Participate with NGOs in verification survey of PAPs and categorisation of PAPs

vi. Participate in consultations with PAPs and beneficiaries

vii. Coordinate with local community in identifying land for relocation of common property resources

viii. Coordinate with civil construction contractor to relocate common property resources

ix. Coordinate with revenue department for facilitating disbursement of compensation and resettlement and rehabilitation assistances

x. Monitoring of physical and financial progress

xi. Participate in training programmes for income restoration.

xii. Consult with panchayat and block office to facilitate inclusion of PAPs' name for poverty alleviation schemes of government of India.

5.4.2.2 NGOs have following roles:

i. Develop rapport with PAPs and Executing Agencies
ii. Verification of PAPs
iii. Consultations with the affected community.
iv. Assess the level of skills and efficiency in pursuing economic activities, identify needs for training and organise programmes either to improve the efficiency and/or to impart new skills
v. Assist and guide PAP in receiving R&R assistance and benefits under the policy
vi. Motivate and guide PAP for proper utilisation of benefits under R&R policy provisions
vii. Assist PAPs in obtaining benefits from the appropriate development programmes.
viii. Complete the consultation at the community level and provide support by describing the entitlements to the entitled persons (EPs) and assisting them in their choices
ix. Accompany and represent the EPs at the Grievance Redress Committee meeting.
x. Assist EPs to take advantage of the existing government housing schemes, employment and training schemes.
xi. Promote location specific Community Based Organisations (CBOs) of PAPs to handle resettlement planning, implementation and monitoring.
xii. Create awareness among PAPs of health and hygiene.

5.5 Information Disclosure

The mechanism of information dissemination should be simple and be accessible to all. Two of the important means that have been followed until now include briefing material and organization of community consultation sessions. The briefing material (all to be prepared in local language) can be in the form of (a) brochures (including project information, land requirements and details of entitlements including compensation and assistance to be given to the PAPs) that can be kept in the offices of local self-government (municipal office in case of urban area and gram panchayat office in case of rural area) and RE Park Project developer; (b) posters to be displayed at prominent locations and (c) leaflets that can be distributed in the impacted zone of the sub project. Consultation meetings should also be organized at regular intervals by the project developer to acquaint the PAPs of the following:

i. Timeline and progress of the project;
ii. Information on compensation and entitlements;

iii. Information on land acquisition and market valuations of property;
iv. Time line for acquisition.

Also, opinion and consensus of the community needs to be sought for common and cultural property relocation. Information disclosure procedures are mandated to provide citizen centric information as well as all documentation necessary for addressing any queries under Right to Information Act that came into effect from October 2005. A computer based information management systems shall be employed to disseminate information pertaining to the project. Disclosure of information will enhance governance and accountability specifically with respect to strengthening of monitoring indicators to help the World Bank monitor compliance with the agreements and assess impact on outcomes.

This Information Disclosure Policy is intended to ensure that information concerning the Renewable Energy project activities will be made available to the public in the absence of a compelling reason for confidentiality. Information shall be provided in a timely and regular manner to all stakeholders, affected parties, and the public. Access by the public to information and documentation held or generated by project developer will facilitate the transparency, accountability, and legitimacy as well as operations overseen by it. As a part of its disclosure policy, all documents shall be made available to the public in accordance with relevant provisions of the RTI Act, except when otherwise warranted by legal requirements. A designated Information Officer shall be responsible for ensuring timely and complete dissemination in accordance with this policy.

5.5.1 Information to be disclosed

Table below specifies the type of additional information and frequency of dissemination for projects which are financed either from domestic or donors' funds.

Table 5-3: Documents Disclosure

Topic	Documents to be Disclosed	Frequency	Where
Resettlement, Rehabilitation and Land Acquisition	Resettlement Action Plan (RAP).	Once in the entire project cycle. But to remain on the website and other disclosure locations throughout the project period.	World Bank's IDU/Info shop On the website of RE Park Project developer, The RE Park Project developer would make the RAP available at a place accessible to displaced persons and local NGOs, in a form, manner, and language that are understandable to the PAPs in the following offices: DM's Office State and District Libraries Local municipal and *gram panchayat* office Office of the contractor
	Resettlement & Rehabilitation Policy translated in local language	Once in the entire project cycle.	Distributed among Project Affected Persons (PAP)
	Information regarding impacts and their entitlements in local language	Once at the start of the project and as and when demanded by the PAP.	Through one-to-one contact with PAPs. Community consultation List of PAPs with impacts and entitlements to be pasted in the RE Park Project developer office and website
	R&R and LA monthly progress report.	10th day of every month	Website of RE Park Project developer. Hard copy in the office of contractor in local language
	RAP Impact Assessment Report	At midterm and end of the RAP implementation	RE Park Project developer website in local language.
	Land Acquisition notifications	As required under the RFCTLARR Act 2013	RE Park Project developer, website. Hard copy in the office of contractor in local language

	Grievance redressal process.	Continuous process throughout the project cycle.	World Bank's IDU. On the web sites of RE Park project developer Hard copies in local language in the following offices: DM's Office Local municipal and *gram panchayat* office Office of the contractor PAPs to be informed on one to one contact
Public Consultation	Minutes of Formal Public Consultation Meetings	Within two weeks of meeting	On the web sites of RE Park project developer Hard copies in local language in the following offices: DM's Office Local municipal and *gram panchayat* office Office of the contractor
Environmental Management Plan	Construction Schedule including movement of heavy machinery	Before the start of the project construction phase	On the web sites of RE Park project developer Hard copies in local language in the following offices: DM's Office Local municipal and *gram panchayat* office Office of the contractor
	Hazardous Waste Disposal		On the web sites of RE Park project developer Office of the contractor

In addition to the information specified in the table, the following information shall also be displayed /disseminated, wherever applicable.

i. Project specific information need to be made available at each contract site through public information kiosk/ Notice Board displaying IREDA funded project
ii. Project Information brochures shall be made available at all the construction sites as well as the office of implementation agency and the office of Engineer in charge.
iii. Reports and publications, as deemed fit, shall be expressly prepared for public dissemination e.g., English versions of the SIA and RAP and Executive Summary of SIA and RAP in local language.
iv. Wherever civil work will be carried out a board will be put up for public information which will disclose all desired information to the public, for greater social accountability.
v. All information will be translated into local language and will be disclosed to the public through the Panchayat, District Magistrate's office, concerned project offices, websites of RE Park project developer.

The following key issues and concerns on new technology are anticipated during the consultations of floating/ Battery/ wind /Hybrid technology sub projects:

i. Will there be any impact on water bodies due to Implementation of new technologies (Floating PV)
ii. Will there be any safety concerns for nearby communities when wind turbines are operated?
iii. What will be the effect on fishing/other community earnings/ livelihood, dependent on the water bodies?
iv. Will the new technology (Floating PV), restrict the use of water (by local populations/ animals) at the proposed project
v. Will the new technology disturb the aesthetic/ visual importance of the place?
vi. What benefits will these projects bring to the area?

vii. Will the projects lead to increase in pollution of water/ land?

viii. Employment opportunities for locals & Land related issues (compensation for land taken over by project/ access to frequently used paths) may be highlighted by PAPs

ix. Will electricity access be available/ firm supply of electricity ensured for the villages in vicinity of project?

6 INSTITUTIONAL STRUCTURE/IMPLEMENTATION

6.1 Introduction

For successful implementation of Environmental and Social safeguards, Institutional setup plays a vital role. Applicable national policies by MNRE allow various modes/project proponents to be REPPD, for this specific project of shared infra to be funded by WB/IREDA, RE Power Park Developer (REPPD) ideally would be set-up as a JV Company between the state and Centre government agencies viz. RUMSL- a Joint Venture Company of Madhya Pradesh Urja Vikas Nigam Limited (MPUVN), and Solar Energy Corporation of India (SECI),to streamline decision-making and provide more autonomy for project execution and delivery.

6.2 Sub-project Execution Structure

Indian Renewable Energy Development Agency Limited has been finalized as nodal project implementation agency (PIA) for the project. IREDA has put in place an Environment and Social Management System (ESMS), the objectives of which are to:

i. avoid any direct, indirect, and potential adverse environmental and social impacts/risks of projects that it supports;
ii. minimize or mitigate adverse environmental and social impacts/risks;
iii. ensure that minimization or mitigation of environmental and social impacts and risks meet the requirements of laws and regulations of GOI and states, and environmental and social safeguard requirements of MDB;
iv. guide IREDA and borrowers in preparing projects for appraisal by IREDA, and in monitoring, reporting, and in undertaking corrective actions, if any;
v. ensure that effective mechanisms are in place for safeguard compliance during project implementation, and to undertake corrective actions, if required; and
vi. develop institutional capacity among sub-borrowers for safeguard compliance.

The implementation arrangement for the sub-projects is depicted in the figure below:

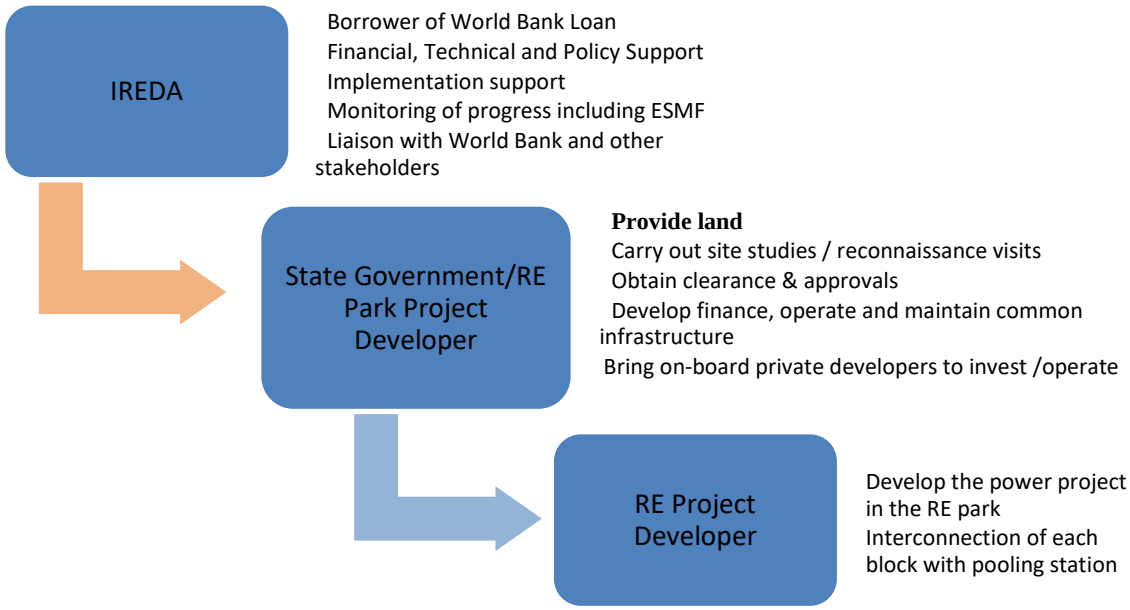


Figure 6-1 : Implementation Arrangement for RE Parks

6.2.1 Role of State Government

Land for setting up of the RE Park will be identified by the State Government unless the implementing agency has its own land. In order to provide for such a large tract of contiguous land, the State Government may prioritize the use of government waste/ non-agricultural land in order to speed up the acquisition process. The use of private land shall be minimized. The price of the land is to be kept as low as possible in order to attract the developers and, therefore, the site should be selected in such a manner so that inexpensive land can be made available. If land cannot be made available in one location, then land in few locations in close vicinity may be taken. Possibility of using cold and hot deserts, sides of highways can also be actively explored. The park must have at least 5 acres per MW towards installation of solar projects and will give opportunity for use of all technologies in a technologically agnostic fashion.

All infrastructural requirements outside the park such as connecting road, provision of water supply, electricity, etc. to make the park functional, will be the sole responsibility of the concerned State Government/State Renewable Development Agency.

6.2.2 Role of RE Power Park Developer (REPPD) / JV Company

The Implementing Agency of RE Park is designated as the RE Power Park Developer (REPPD). The REPPD will be nominated by the State Government//State Renewable Development Agency for development of solar/RE parks as per the procedure given in the Scheme for the solar/RE park. The REPPD is tasked with acquiring the land for the Park, maintain it, leveling it wherever considered desirable and allocating the plots for individual projects.

The REPPD will be responsible for creating the internal transmission network on behalf of the solar project developers. This network will connect with the Intra State Transmission System (ISTS) or State Transmission System. The transmission network within the solar park will be captive / dedicated transmission system of the RE project developers of the park. Following are the essential responsibilities of REPPD:

i. Acquisition of land;
ii. Getting land related all clearances and plotting of land;
iii. Developing approach road to the solar park and access road to each plot;
iv. Developing internal transmission system and maintaining it;
v. Making arrangement to connect to the grid i.e. ISTS or State Transmission Network;
vi. Flood mitigation measures like flood discharge, internal drainage etc.;
vii. Required power during construction;
viii. Telecommunication facilities;
ix. Providing water supply (minimum essential quantity i.e. 5-6 KL /MW/ wash). In every 50 MW, the SPPD will provide one water point and the further water distribution grid will be developed by the SPDs as per the layout (technical design) of the allotted project

Following are the optional responsibilities of the REPPD:

i. Levelling and development of land (to be avoided as far as possible).
ii. Construction of offices, housing and common building infrastructures.
iii. Forecasting, Scheduling
iv. O&M or related functions.
v. Solar radiation data

vi. Metalled road to all plots and within plots to each array
vii. Maintenance of internal power supply and water supply.
viii. Security
ix. Operations & maintenance and waste disposal
x. Technical support services (consultancy etc.)
xi. Make water harvesting arrangements in the parking consultation with other state agencies
xii. Measures to monitor water table in consultation with relevant state agencies

The above mentioned (in particular the underlined activities) roles and responsibilities of the REPPD are likely to have some adverse impacts on the environment which need to be mitigated and ensured that the appropriate mitigation measures are included as part of the civil works contracts / EMP.

6.2.3 Roles and Responsibilities of Social & Environmental Officer - REPPD

Most of the RE parks are located in remote areas, and development of RE parks may relocate the people or affect their livelihood. For upliftment of people and community development, there is a need for Rehabilitation and Resettlement (R&R) of Project Affected People (PAP) with the objective that standards of living of the PAP improves or at least regain their previous standards of living.

The proposed organization structure for RAP/ESMP implementation is presented in figure 3. The CEO of the REPPD will have overall responsibility for implementation of sub-projects and identification of developers. An "environmental and social development expert" or separate experts for Environment & Social shall be recruited as part of REPPD and will report to the CEO of REPPD. Expert is overall responsible for EMP and RAP Implementation, coordinating and liaising with government organization as well as the World Bank with respect to different social and environmental issues. Expert will also be responsible for progress monitoring of Environmental and social safeguards during project construction and execution stage and submission of monthly report (during construction stage) and quarterly report (during operations stage) on ESMP compliance to the funding Agency.

The roles and responsibilities of the Social and Environmental Expert/s shall be:

i. Prepare TOR for any studies required and qualitative dimensions to the implementation of RAP/ ESMP;
ii. Participate in and facilitate consultations with stakeholders
iii. Participate in project meetings and report on the issues related to environmental management and social safeguards to provide for any mid-course corrections that may be required based on situation on the ground
iv. Assist PAPs to resolve their grievances
v. Coordinate on the training and capacity building initiatives
vi. Review contract documents to ensure that ESMP provisions related to works are included in the contract documents
vii. Act as a resource person in trainings based on experience on implementing this project and previous relevant work
viii. Oversee and report to CEO on implementation of ESMP provisions included in the works contract for each sub-project in the state
ix. Liaison with state administration for land acquisition/procurement and implementation of RAP

x. Report progress, highlighting social issues not addressed, to provide for mid-course correction.

xi. Assist PAFs in approaching the grievance redressal mechanism

xii. Carry out other responsibilities as required from time to time

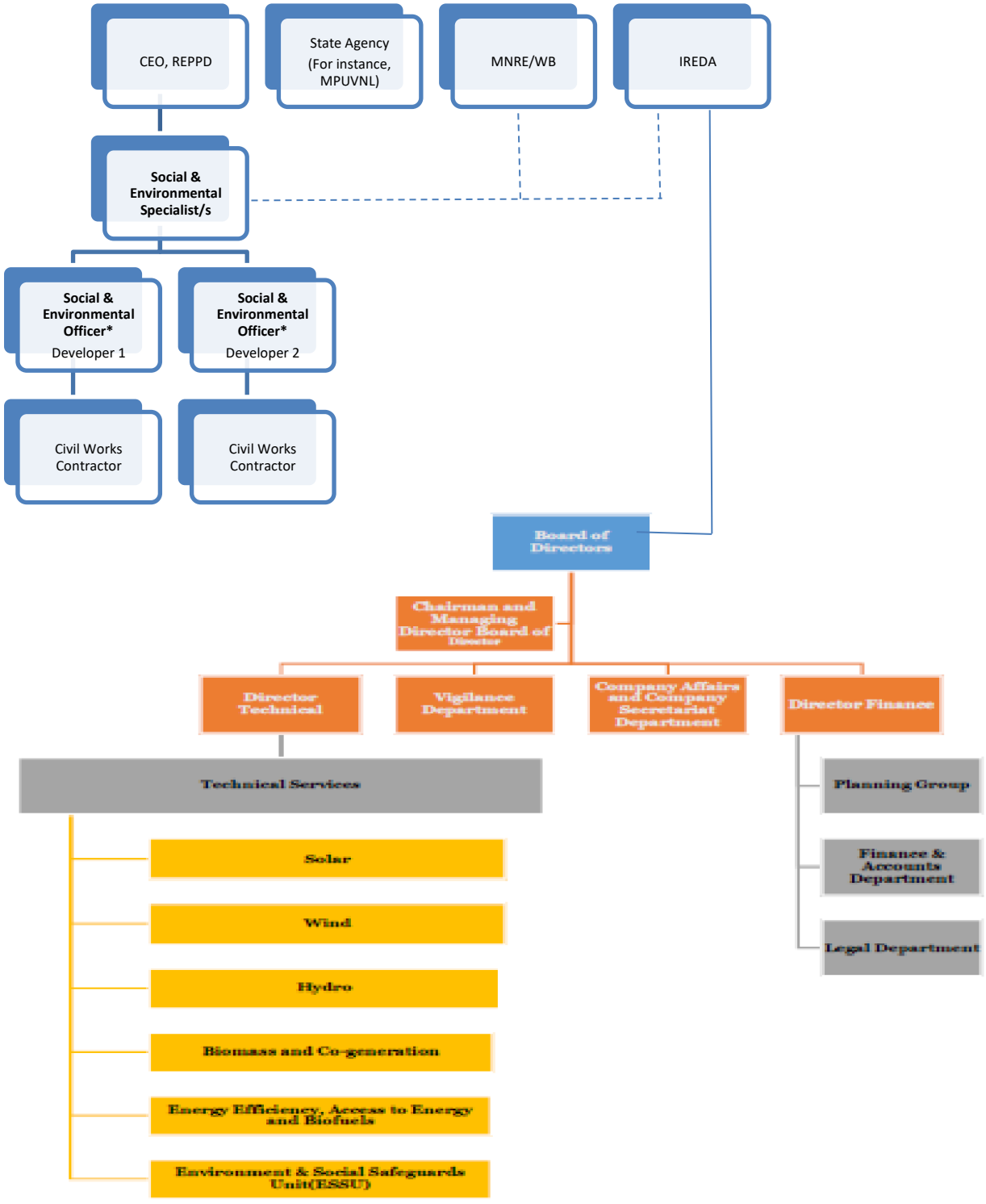


Figure 6-2 : Proposed Organization structure for EMP/RAP Implementation[4]

IREDA has prior experience of implementing World Bank financed project. Responsibility for E&S matters lies with Environment & Social Safeguard Unit (ESSU) of the Technical Services Department of IREDA. The board level responsibility for E&S lies with the

[4] The developer should designate one person from core team as "Environmental and Social Officer" to discharge sub-project responsibilities on ESMP compliance.

Technical Services Director who reports to the Board. The ESSU has been established within the Technical Services Department as a cross-cutting unit supervising E&S affairs from all technical services or sectors. The ESSU is managed by the ESSU Manager, who is responsible for the compliance of IREDA with ESMS requirements. The ESSU Manager is supported by E&S Specialist.

6.3 Utilization of Grant

The expenditure on the development of a solar park will mainly constitute (a) expenditure on account of development of land and its infrastructure facilities and (b) Transmission network and Pooling Sub-station. The grant may be utilized in such a manner that higher proportion of funds are used for internal and external transmission as that is the most essential function. The REPPD, responsible for development of the solar park, shall endeavour to optimize the total expenditure to be made for the development of the solar park, such that the power generated by the prospective solar project develops is low and competitive.

6.4 Grievance Redressal Mechanism

An integrated system will be established with Grievance Redressal Cell (GRCs), with necessary officers, officials and systems, at the state level as well as REPPD. Grievances if any, may be submitted through various mediums, including in person, in written form to a noted address, through a toll free phone line or through direct calls to concerned officials, and online.

At Site Level: The staffing of GRC will include Environmental and Social Nodal officer/Experts of REPPD of respective states and representatives from community / beneficiary / affected persons/EPC contractor/Project Developers. The head of the cell is either government officer or SDM. The Site level GRC will meet at least once a month or may meet more frequently as per the numbers & type of complaints received. Complaint register & Complaint box shall be placed at site. An information board containing contact details of concerned GRC officer should also be put up at project site.
REPPD at Site level may form its own internal team comprising of Site and/or Project Manager/ EHS officers/Member of Gram Panchayat/ Community relation officer (if any) to ensure timely solution to grievances

At REPPD Central Level: The Social and Environmental Expert/s in the REPPD team shall be responsible for coordination of grievance/complaints received. The person in-charge based on nature of complaint, will forward the same to the concerned official at site/ internally. A ticket or a unique number will be generated for all such call and messages. The complainant will be able to follow up based on that unique number. All calls and messages will be responded within two weeks. If response is not received within 15 days, the complaint will be escalated to next level of higher officials.

At IREDA level: IREDA Grievance procedure allows stakeholders to raise questions or concerns or positive feedback telephonically or filling the online grievance to compliant officer. The Environment and social cell is responsible for implementation and execution of this procedure. The following are the grievance committee of IREDA to redress the issues.

- Compliance officer
- E&S Specialist
- Sector head (for which compliant received)
- Project dealing officer

- Representative from legal Department
- Representative from HR Department

A project affected person however is free to approach judiciary system of the country if he or she is not satisfied with the verdict given by GRC.

6.5 Monitoring and Reporting

The REPPD through the respective developers will monitor all the sub projects to ensure conformity to the requirements of the ESMF & also the Sub project Specific ESMP. The monitoring will cover all stages of planning, construction, implementation and execution. The monitoring will be carried out through the environmental and social safeguard compliance reports that will form a part of Monthly Progress Reports (MPR) for all sub projects and regular visits by the environmental and social specialists of the REPPD.

The REPPD will review these evaluation reports and identify technical, managerial, policy or regulatory issues with regards to the compliance of the RAP reports. The identified technical issues will be duly incorporated. Policy and regulatory issues will be debated internally by REPPD and the need for appropriate interventions will be determined. These interventions could include appropriate revision of ESMF document / R&R Policy in consultation with the Bank/IREDA or suitable analytical studies to influence policy or programs of the state, if found necessary / warranted.

An external evaluation of the RAP implementation prepared for sub projects will also be undertaken twice during the implementation of the project – midterm and at the end of the implementation as per the terms of reference. During implementation, meetings will be organized by REPPD inviting all PIUs for providing information on the progress of the project work.

Project monitoring will be the responsibility of the REPPD who will submit Monthly Progress Reports. The reports will compare the progress of the project to targets set up at the commencement of the project

Tables 6.1 below present the Mitigation, Monitoring, Responsibility and Timeline for Environmental and Social Impacts (Monitoring as per respective Project ESIA shall also be implemented by REPPD/ Developers)

Table 6-1: Environmental and Social Monitoring Indicators

S. No	Impact / Issues	Monitoring Measures	Responsible Agency
Environmental Indicators			
1	Disposal of Batteries	Number of batteries disposed / new installed	Developer
2	Handling / disposal of defected PV panels	Number of panels defective / number of panels replaced	Developer
3	Extent of wash water reuse / recycling	Water used on a monthly basis / wash water recycled on a monthly basis	REPPD/Developer
4	Use of PPE on site	PPE available on site	REPPD (Through O&M contractor)/Developer
5	Regulatory Compliance	Quarterly and annual compliance reports submitted to the regulatory authority / REPPD	REPPD/Developer
6	Noise Monitoring (Wind)	Half Yearly for Wind Projects	Developer
7	Soil Quality Oil and grease, Heavy metals (Pb, Cr, Ni, Mn, Fe, etc.)	Half Yearly	Developer
8	Water Quantity Usage & Ground Water Extraction	Monthly (Essential for Solar Park Projects)	Developer
9	Water Quality	Floating Solar Plants / Quarterly	Developer
Social Indicators			

1	Land acquisition	Regular internal monitoring by the REPPD and periodic evaluation	REPPD
2	Acquisition of house/ structure	Regular internal monitoring by the REPPD and periodic evaluation	REPPD
3	Loss of livelihood or source of livelihood	Regular internal monitoring by REPPD; midterm and end term evaluation	REPPD to hire evaluation consultants
4	Loss of access to private and / or common property	Regular internal monitoring by REPPD ; midterm and end term evaluation	REPPD to hire evaluation consultants
5	Displacement of Non-Titleholders	Regular internal monitoring by the REPPD a midterm and end term evaluation	REPPD to hire evaluation consultants
6	IPDP (If applicable)	Regular internal monitoring by the social development professional of REPPD. midterm and end term evaluation	REPPD to hire evaluation consultants
7	Gender Action Plan	Regular internal monitoring by the social development professional of REPPD. midterm and end term evaluation	REPPD to hire evaluation consultants
8	Monitoring of change in services provided (Fish catch, other benefits drawn by locals)	Regular internal monitoring by the social development professional of REPPD. midterm and end term evaluation	REPPD to hire evaluation consultants

The list of above mentioned impact performance indicators will be used to monitor project objectives as depicted in table below along with the milestones. The socio-economic survey conducted will provide the benchmarks for comparison.

Table 6-2: Project objectives as per milestone

Milestones	Objectives	Process	Responsibility	Decision/Target/ Deliverable
1. Sub- Project Screening	To approve categorization of proposed sub-projects	a. Discussions with implementing agencies to ● Assess eligibility of project based on project's priorities ● Identify scope of project report b. Consultants to submit report along with proposed impact categorization	REPPD/IREDA/WB	● Decision to proceed or not ● Identification of impact category
2. Sub- Project Appraisal	To ensure satisfactory compliance with ESMF	Detailed appraisal (including EIA & ESMP, RAP, GAP and IPDP where relevant), including site visits/ investigations if necessary assess suitability of site, adequacy of safeguard measures, risk analysis and regulatory clearances). DPR to be submitted for approval	REPPD/IREDA/WB	Review report and decide to - accept - accept with modifications - reject and instruct to resubmit
3. Approval	Approvals from IREDA	a. Project Implementation Agency to recommend to IREDA	REPPD/ IREDA/WB	Approval of RAP, GAP and IPDP if required

		b. IREDA to review and approve		
4. Implementation of ESMP, RAP, GAP and IPDP Monitoring and Review	Ensure Implementation of agreed ESMP, RAP, GAP and IPDP where applicable)	a. Prepare quarterly progress reports b. Schedule field visits as required c. Midterm and end term evaluation	REPPD/ REPD/Contractor	Quarterly Progress Report

Table below gives the assessment methodology and the expected outputs for the various stages of implementation process.

Table 6-3: Monitoring Project Implementation Process, Input and Output

Progress	**Assessment Methodology**	**Expected Output**
Implementation Process		
Notices under land acquisition process	Structured Schedule, informal and formal discussion	Timely notices to the affected families
Dissemination of information on project and social issues	Check the registers with the REPPD for queries	Adequate knowledge on project and its various components
Consultations conducted under the project with PAPs and others	Check the minutes of meetings registers with the PAPs. Verify copies on agreements made on issues raised and discussed.	Awareness and information on the project and participation in the project.
Consultations on R&R Policy and Distribution of R&R Policy of the project	Check the registers with the PAPs. Verify copies on agreements made on issues raised and discussed.	Awareness on R&R Benefits
Information on modes of valuation of assets, payment schedules and disbursement modes	Check the registers with the PAPs. Structured Schedule, informal and formal discussion	Awareness on methods of valuation, satisfaction with the payment schedules, disbursement modes
Needs assessment and training programs for income generation	Structured Schedule, informal and formal discussion	Awareness and satisfaction with the training programs for income restoration
Services of the NGO	Structured Schedule, informal and formal discussion	Proper knowledge, guidance and assistance in rehabilitation and resettlement
Functioning of the Grievance redressal mechanism	Check the records of the NGO and SPPD for the complaints registered	Appropriate and timely action on the grievances of the affected people
Consultations for the identification of the Community Development Works	Check the minutes of meetings registers with the PAPs. Verify copies on agreements made on issues raised and discussed.	Participation in decision making process and satisfaction with the identified areas of development
Financial progress		
Amount disbursed for acquisition of land, structure, trees, etc.	Structured Schedule, informal and formal discussion	PAPs purchased land equivalent or more than land loss of same quality
Amount disbursed R&R assistance.	Structured Schedule, informal and formal discussion	New house constructed, new land purchased, new productive assets purchased, created some income source to offset the loss of income
Amount disbursed for extension of development programmes, training and capacity building.	Structured Schedule, informal and formal discussion	Alternative income restoration programs initiated and lost income restored.
Fees paid to NGO for implementation of RAP and consultants for M&E activities	Structured Schedule, informal and formal discussion	Timely implementation
Amount disbursed for training of implementation staff of SPPD and PIU	Formal Discussion with concerned officials	Better implementation and coordination
Physical progress		
Total land Acquired	Structured Schedule	Progress of land acquisition
Number of PAFs relocated	Structured Schedule	Progress of resettlement

Number of PAFs R&R Assistance	Structured Schedule	Progress on Economic Rehabilitation
Social well being		
Area and type of house and facility in case of relocation	Core Rapid Appraisal	Resettlement
Health conditions, morbidity and mortality rates, if relocated or pollution due to construction	Structured Schedule	Social well being
Communal harmony if relocated in another revenue village	Rapid Appraisal	Resettlement
Women time disposition and decision making power for women groups trained for alternative livelihood	Participatory Appraisal	Women Empowerment
Increase in literacy level due to project intervention; drinking water, schools, health facilities, and other community infrastructures if relocated and enhanced by the project	Structured Schedule	Social well and improved social status.
Increased annual Household income and expenditure due to project intervention	Structured Schedule	Improved income Economic Status

6.6 Budget

Each sub-project will have its own budget for implementation of EMP, RAP and IPDP. The budget heads for planning and pre-construction stage will include cost towards

i. compensation for immovable properties;
ii. R&R assistances;
iii. cost towards relocation facilities if required;
iv. training and capacity building;
v. implementation arrangement;
vi. monitoring and evaluation and
vii. cost incurred by REPPD for day to day expenses on R&R issues.
viii. Environmental & Social plan preparation

The budget heads for construction and O&M stage will include cost towards

i. Wash Water treatment and reuse
ii. Personal protective equipment
iii. Health & Safety
iv. Hazardous material transportation & disposal

6.7 Capacity Building Requirements / Activities

An assessment of the current institutional structure of the REPPD need to be reviewed to understand the capacity w.r.t to ensuring environmental and social management measures compliance.
The REPPD in coordination with the educational / research institutions in the country who have substantial experience in the environmental and social management sector including a good understanding of the WB/IFC safeguard requirements, shall conduct classroom training sessions for all staff likely to be involved in sub-project planning & implementation. The Social and Environmental Officer Specialists can also be one of the resource persons for conducting such training programs.
The training will focus on the environmental and social issues. The contents will basically focus on the ESMF concept, regulatory requirements, Environment and Social priority issues, project cycle, outline of EA / SA and report formats in respect of the Environmental aspects. In respect of social aspects the course content will focus on the R & R policies and procedures, Land Acquisition process, identification

of PAPs, Social entitlement frameworks, social assessment, RP techniques, and Risk Assessment and management skills.

The typical training modules for formal class room training could cover the following:

i. **Module 1 - ESMF Profile** (Concept, regulatory requirements, ESA, reports and formats)
ii. **Module 2 - Environmental Assessment Process** (Environmental Laws & Regulations, EIA process, Identification of Environmental Impacts, Impact Identification Methods, Identification Mitigation Measures, Formulation of Environmental Management Plan, Implementation and Monitoring, Institutional Mechanism)
iii. **Module 3 - Social Assessment Process** (Description of Solar Park program R&R, tribal and gender frameworks and procedures and National requirements, LA process, Necessity for RAP and its preparation process)

The program should be structured in such a way that it clearly brings out the value addition and enhancement benefits of proper management of environmental and social issues.

Annexures

ANNEXURE 1.1: Environment and Social Baseline - Pavagada

Location Characteristics

The proposed project site is located in the south eastern part of Karnataka State between north latitude 14o13' to 14 o 20' and east longitude 77 o 23' to 77 o30' and falls under five villages (i.e. Thirumani, Balasamudra, Vollur, Kyathaganacherlu and Rayacharlu) of Pavagada Taluk in Tumkur District. The site is covered by SoI toposheet D43L7 & D43L8 Open Series.

The proposed site is located at a distance of approximately 30 km from the taluk headquarters, Pavagada and is connected by a Major District Road (MDR). The proposed site is at an approximate distance of 180 km from state capital Bengaluru. There is no rail connectivity currently available for Pavagada taluk. The nearest railway link is available at a distance of 100 km at Anantpur (Andhra Pradesh) and 140 km at Bellary Junction (Karnataka).

Soil Characteristics & Major Crops

The eastern part of the Tumkur District is characterized by red sandy soil and red loamy soil. These types of soils are generally severe to moderately erosion prone. Red sandy soils are suitable for the growth of Ragi, Jowar, Millets and Oil Seeds under rain fed conditions. The irrigated areas of red loamy soils are favourable for Paddy, Sugarcane and Vegetables.

Major crops grown in the proposed site and it's vicinity includes Ragi, Groundnut, Paddy, Maize, Cotton, Sunflower, Red Gram, Castor, and Horse Gram. Agricultural activities in the area are predominantly rain-fed. The main sources of irrigation are surface water tanks and bore-wells, which are being used only by very few well to do farmers.

Climatic Characteristics

The site elevation ranges from 760m to 900m above MSL. The climate of the area is semi-arid tropical with an average annual rainfall of 620 mm in an approximately 45 day's rainy period (during 2001 till 2010). As per the available statistics, Pavagada taluk received only 333mm rainfall during year 2011 thereby seriously affecting the agriculture activities.

Rains are uncertain and erratic, and cyclic semi dry conditions are very common. Winters are generally mild (12degree C) with summers relatively hot with temperatures touching 38degree C during April & May. The proposed site location is suitable for solar PV installations due to availability of good sunlight for maximum time of the year (annual GHI >1900 KWh/m2), gentle sloping land with minimal tree cover / shadow areas.

The winds are predominantly south westerly during summer monsoon and north easterly during winter monsoon.

Drainage & Slope Characteristics

The drainage pattern in the area can be classified as semi dendritic to dendritic. Overall the area is gently sloping towards north and is well drained. The surface water bodies act as a major source of water for both irrigation and non-portable household requirements. The area is drained by north flowing Pennar river tributary. The river is not perennial in nature.

The ESIA study shall ensure that the existing natural drainage pattern and surface water bodies in the study area are well conserved and any proposed developments do not have any adverse impacts on the surface water resources which are critical for the local residents.

Ground Water Characteristics

The decadal mean pre-monsoon & post monsoon data (2001 –2010) reveals a rise in water level by 0-2 m in most of the study area. The study area (falling under 4C3G6 watershed) has been identified as over exploited with regards to ground water utilization as per CGWB report (March 2009). Sustainability of ground water resource and its judicious use should be given prime importance while planning for Solar UMPP. In critical and over exploited areas artificial recharge and rainwater harvesting measures are recommended to augment the ground water resources. ESIA report should identify, the likely impacts, the likely conflicts in resource allocation among competing uses and mitigation measures to ensure sustainable use of the natural ground water resource.

Ground water in younger granites has more fluoride content than the gneisses. The fluoride content increases with depth in same aquifer. The shallow aquifers are having comparatively low concentration of fluoride. In order to reduce or control the problem, it is recommended to recharge ground water by way of artificial recharge structures like percolation tank, desilting of silted tanks, check dams, nalla bunds, farm ponds etc.

High concentration of nitrates, chloride and fluoride is observed in northern and central parts of Pavagada as per the CGWB findings. The ESIA study shall need to clearly identify the likely impacts and mitigation measures.

Flora & Fauna

The study area does not have any designated forest areas or critical forest areas. As the rainfall is low in Tumkur district, diversity of flora is not much and the species are restricted to Xerophytic type. The vegetation here is shrubby, thorny and stunted. Accacia (Jali) and Taddy trees are commonly found in alkaline soils. Ficus species such as Peepal and Banyan are found in forest as well as in the farms. Same is the case with Tamarind, Neem, Jack, Pongamia trees. The forest type in the 10 km area is dry deciduous forest types with scrub jungle.

Project Site does not pass through eco-sensitive area such as National Parks and Wild life Sanctuaries and there are no notified National Parks and Wild life Sanctuaries in the near vicinity (within 10 km of radius) of the proposed site.

As the area lies in the plains of the Deccan Plateau, bordering Andhra Pradesh, the wildlife found here is related to the drier areas like monkey, wild cat, wolf, squirrel, bats, fox, deer, rabbit, wild pig, wild lizard, variety of snakes, frogs and fishes, peacock, sparrow, crow, eagle, etc.

Socio-Economic Profile of the study area

The proposed project extent spread across the jurisdiction of five revenue villages. As per Census 2011, there were a total of 2417 households and the population of 10,294 with an average household size of 4.26. The average sex ratio in these villages is 941, which ranges between 897 to 1015 across these five villages. The Literacy Rate is quite low at 55.35% and during the consultations in the villages, it has been found that even amongst the literates, the level of literacy is quite low with hardly 1% of the population having a graduation degree. The village-wise details are given in Table below.

Name of Village	Number of Household	Population	Average HH Size	Sex Ratio	Literacy Rate
Thirumani	515	2,193	4.26	897	62.79
Balasamudra	165	914	5.54	928	61.49
Vollur	590	2448	4.15	905	53.27
Kyathaganacherlu	611	2380	3.90	1015	50.67
Rayacharlu	536	2359	4.40	953	52.95
Total	**2,417**	**10,294**	**4.26**	**941**	**55.35**

Over 40% of the population falls under the marginalised section of the society with nearly 22% falling under the category of Scheduled Caste and 18% under the category of Scheduled Tribe as shown in Table below.

Name of Village	SC Population	% of SC	ST Population	% of ST
Thirumani	402	18.33	358	16.32
Balasamudra	284	31.07	156	17.07
Vollur	663	27.08	289	11.81
Kyathaganacherlu	465	19.54	693	29.12
Rayacharlu	446	18.91	415	17.59
Total	**2,260**	**21.95**	**1,911**	**18.56**

During the consultations in the project villages, it has been found that though there is nearly 18% ST population but these are integrated into the mainstream, however, the landholding amongst SC and

ST population is very minimal and fall under the category of marginal and small farmers including the landless. These sections are predominantly dependent on the agriculture labour requirements in the land belonging to large land owners.

The Work Force Participation Rate in these villages is 54.32%, with male and female participation rate of 60.56% of 47.70% respectively, as per Census. It is important to highlight here that the main workers are only about 80% of the total workers, whereas the balance over 20% are marginal workers.

Name of Village	Work Force Participation Rate			Main Workers as % of Total Workers		
	Total	Male	Female	Total	Male	Female
Thirumani	49.66	60.29	37.80	98.99	99.43	98.21
Balasamudra	55.80	56.33	55.23	93.33	95.51	90.95
Vollur	52.08	56.11	47.64	59.45	66.30	50.54
Kyathaganacherlu	56.30	62.32	50.38	79.78	88.86	68.71
Rayacharlu	58.41	65.48	51.00	78.81	83.44	72.57
Total	**54.32**	**60.56**	**47.70**	**79.88**	**85.31**	**72.56**

The distribution of workers given in Table below clearly shows that nearly 86% of the total workers are dependent on agriculture out of which only about 40% are cultivators whereas the remaining 46% are dependent on agriculture labour workers.

Name of Village	Cultivators	Agriculture Labour	HH Industry and Other Services
Thirumani	30.03	51.79	18.18
Balasamudra	73.14	25.10	1.76
Vollur	41.33	49.18	9.49
Kyathaganacherlu	37.54	45.07	17.39
Rayacharlu	38.24	47.68	14.08
Total	**40.36**	**46.14**	**13.50**

During the consultations in these villages, it has been confirmed that a very large percentage of population is working as agriculture labour on the land belonging to the medium and large farmers with male and the female labour getting Rs. 200 and Rs. 150 per day respectively. One of the critical issues would be the impact of the project on the agriculture labour/ landless and especially on the marginalised sections of the society including the SC and ST population.

Land Ownership Profile

The total geographical area of the five villages in the project is about 10,333 Ha. As per the discussions with the local people, about 20% falls under the non-agricultural use including abadi, water bodies, roads, community facilities and amenities etc.; and the balance area is under agriculture use, with only about 5% of the total area is being irrigated by tanks / bore well.

The proposed site area of about 4994 Ha, comprising of about 4811 Ha private land and about 183 Ha of government land has been included in the project as shown in Table below. The land included under the project is nearly 50% of the total land under these villages that measures about 10,333 Ha. The break-up of land-holdings under the five categories as per the Karnataka classification of land holding sizes for farmers clearly shows that the land holding of marginal and small farmers is merely 15%, whereas the number of land owners under these categories account for nearly 45% as shown in subsequent Table giving the break-up of number of owners under the five categories.

Name of Village	Land Holding							
	Marginal (Below 1 Ha)	Small (1 to 2 Ha)	Semi-medium (2 to 4 Ha)	Medium (4 to10 Ha)	Large (Above 10 Ha)	Private Land in Ha	Government Land in Ha	Total Land in Ha
Thirumani	34.68	90.48	155.76	381.19	539.12	1201.24	139.59	1340.83
Vallur	16.63	55.90	187.97	440.12	106.33	806.94	0	806.94
Balasamudra	68.93	169.02	240.52	211.68	32.51	722.65	14.78	737.43
Rayacharlu	57.17	160.44	392.72	629.58	303.96	1543.87	28.45	1572.32
Kyathaganacherlu	23.51	26.18	42.97	86.64	357.38	536.68	0	536.68
Total	**200.93**	**502.01**	**1019.93**	**1749.21**	**1339.30**	**4811.39**	**182.81**	**4994.20**
Percentage	**4.18**	**10.43**	**21.20**	**36.36**	**27.84**	**100.00**		

There are 1422 landowners whose land is getting impacted under the project as per the village-wise details provided in Table below.

Name of Village	Number of Land owners					
	Marginal (Below 1 Ha)	Small (1 to 2 Ha)	Semi-medium (2 to 4 Ha)	Medium (4 to10 Ha)	Large (Above 10 Ha)	Total
Thirumani	53	63	59	63	37	275
Vallur	23	36	63	70	8	200
Balasamudra	122	117	89	39	3	370
Rayacharlu	89	109	143	97	23	461
Kyathaganacherlu	44	18	15	14	25	116
Total	**331**	**343**	**369**	**283**	**96**	**1422**
Percentage	**23.28**	**24.12**	**25.95**	**19.90**	**6.75**	**100.00**

Many of these land owners have already given their consent for a 30-year term lease of their land for setting up of a Solar Park. Land owners in the vicinity of the proposed site have also expressed their interest in giving land on lease for solar power plant, which was confirmed during the consultations. The shape of the site is fairly regular with the total length of approximately 10 km and width varying between 2 to 5 km at different sections.

Although Solar power projects does not involve prior environmental clearance, however such projects involve land poling / acquisition; diversion of water resources meant for domestic uses, resettlement, loss of livelihood for the underprivileged / marginalized communities etc. An Environmental and Social Assessment study shall help avoid adverse impacts; wherein unlikely to be avoided, such impacts shall need to be mitigated or managed. The most critical issue is with regard to the livelihood and economic rehabilitation of agriculture labour who are dependent on the agricultural land in the area.

ANNEXURE 1.2: Environment and Social Baseline - Rewa

Location Characteristics

The proposed site (81° 34' 40.799" E; 24° 28' 33.508" N) for Solar UMPP lies within Gurh tehsil (sub district) of Rewa district in the state of Madhya Pradesh at a distance of approximately 30 kms east of Rewa City. The district falls in the survey of India sheet numbers 63G, H and 63L and is bordered by Uttar Pradesh state in the north, on the east and south east by Sidhi district and Satna district in the west. The district is well connected by NH-7 with the adjacent district headquarters and other major towns.

The MPNRED has identified five villages of Gurh Tehsil namely Badwar, Barseta Desh, Barseta Pahar, Ramnagar Pahar and Etar Pahar for the purpose of delineation of project site for the proposed Solar Ultra Mega Power Project.

Soil Characteristics & Major Crops

The proposed site forms part of the plateau of Rewa and Panna, also known as Vindhyan plateau and lies to the northeast of the Bundelkhand plateau. The maximum height of the plateau is 750 m. The Bhander hills of the Vindhya State group and the Kymore ranges have a number of waterfalls with heights up to 450 m. The area is drained by the Ken, Sonar, Berma and Tons rivers. The covered area has most of its spread in Damoh, Panna, Satna and Rewa districts. Part of Rewa, Shahdol, Umaria and Sidhi districts form the part of Sone valley.

The state of Madhya Pradesh has a variety of soils ranging from rich clayey to gravelly. The north-eastern part of the state including Rewa district has mixed red and black soils. Major crops cultivated in the study area villages include Paddy, Jowar, Tur, Soybean, Wheat, Gram, Lentil and Linseed.

Climatic Characteristics

The tropic of cancer passes 100 kms south of the proposed site. There are three distinctly defined seasons i.e. Rainy Season – Mid June to September end; Winter Season – October to mid-March; Summer Season – Mid-March to mid-June

The area enjoys tropical type climatic conditions. The climate of Rewa is subject to considerable extremes of temperature. The maximum average temperature has been recorded during the month of May & June at 420 C, whereas minimum recorded temperature is 80 C during the month of December and January. The wind direction is mainly from north to west. It is found that the velocity of wind is high compared with the wind velocity flowing other than this direction.

Annual rainfall in the state varies from 600 to 1600 mm. The average rainfall for the state is 1200 mm. The area receives rains mainly from the south-west monsoon, which sources 82% of the average annual rainfall of 1206 mm.

During the last decade, Rewa district has witnessed drought conditions in year 1991-92; 2002–03, 2004 -05, 2006-07 causing damage to crops and shortage of drinking water. However in year 1997-98 the district suffered from excessive rains causing flood like scenarios.

Drainage & Slope Characteristics

The central parts of the Rewa district are drained by Bichhia and Ghoghar rivers which ultimately merge in Tons river. The study area forms part of the 2A7E3 watershed (Tons basin) as per the watershed atlas prepared by the All India Soil and Land Use Survey. The study area being barren outcrop and hard rock surface has a very well defined drainage pattern. The study area being barren outcrop and hard rock surface has a very well defined drainage pattern. The proposed project sites are being drained by “Devdah nala” flowing east to west direction which joins “Bichia Nadi” near Gurh nagar panchayat settlement area, north-west of the proposed sites. The Gurh reserve forest towards the south of the proposed sites is drained by “Devdah nala” only.

The lowest elevation in the district is around 300m above MSL on the tons river bed while the highest elevation is 473m above MSL located east of kailashpur. The slopes for the area falling within the jurisdiction of the five villages identified for the purpose of delineation of the project site generally ranges less than 15% for majority of the land parcels.

Ground Water Characteristics

The demand for water for various uses such as drinking, irrigation, domestic and industrial purposes is increasing with time in general due to the increase in human population. The ground water of this region is affected by Carbonate (CO3), and Bicarbonate (HCO3), also known as temporary hardness. As per the available secondary data, Rewa-Gurh areas are presently facing acute storage of water supply to fulfill the demand of human population.

Flora & Fauna

The table below presents the status of key environmental features in the study area:

Sl. No.	Key Environmental Feature	Aerial Distance (Appox Kms)	Remarks / Observations
1	Forest (Protected / Reserve)	0	The Site is surrounded by Protected / Reserved Forest in the North and Southern Side
2	Natural Habitats (Critical Habitats) / National Wildlife Sanutary / National Park	9 Kms	Sone River stretch south of the proposed site is declared as a gharyial sanctuary
3	Biosphere Reserves	50 Kms	Bandhargarh & Sanjay Gandhi National Parks (more than 50 Kms)
4	Coasts	NA	Land locked area
5	Wetlands	NA	Bansagar Dam at 40 Kms distance
6	Surface Water Resources	9 Kms	Sone River South of the proposed Site
7	Designated Ground Water Recharge Zones	NA	No information is available
8	Nearest Major Highway / Roads		NH- 75 passing through the proposed Site
9	Mining Areas	NA	No information is available
10	Archaeological Sites / Physical or Cultural Heritage	5 Kms	Lord Shiva Temple & an old fort in ruins
11	Flooding & Seismic Risks		• Floods affected 6-8 times in last 26 years • Villages located on BIS Zone II & III Border, having moderate seismic risk
12	Areas devoted to other projects in vicinity	0 kms	• The NH-75 is undergoing upgradation and changes in RoW/ Alignment. • A camp site has been set up by the road civil works contractor.
13	Issues Related to Hazardous Waste Management	NA	No batteries to be used in transfer of power from solar PV modules to Grid.

Socio-Economic Profile of the study area

The Rewa district is predominantly a rural district with nearly 83% of the district population living in rural areas. The sub-district Gurh has 89% rural population and the 11% urban population in the sub-district resides in the only urban area Gurh Nagar Panchayat (Tehsil Headquarter). The sex ratio in the project villages is 962 against district and sub-district average of 931 and 938 respectively, whereas the urban areas have a much lower sex ratio of 910 only.

Name		No. of HHs	Total Population	Avg HH Size	Male Population	Female Population	Sex Ratio
District							
Rewa	Total	526065	2365106	4.50	1225100	1140006	931
	Rural	450297	1969321	4.37	1017839	951482	935

	Urban	75768	395785	5.22	207261	188524	910
Sub-District							
Gurh	Total	30171	127323	4.22	65690	61633	938
	Rural	27338	112715	4.12	58040	54675	942
	Urban	2833	14608	5.16	7650	6958	910
Project Villages							
Badwar	Rural	1543	6168	4.00	3133	3035	969
Barseta	Rural	488	1595	3.27	791	804	1016
Ramnagar Pahar	Rural	9	37	4.11	19	18	947
Itar Pahar	Rural	623	2485	3.99	1300	1185	912
Total Project Villages		**2663**	**10285**	3.86	**5243**	**5042**	**962**

Source: Census of India, 2011

The SC and ST population together accounts for nearly 30% at all the three levels. In case of the project villages, nearly 21% of the total population belongs to Scheduled Tribe.
The district profile information available on the website of Rewa district indicates that nearly 80% of rural Households have low standard of living index.

Unit	Population	SC Population	% SC	ST Population	% ST
District-Rewa	2365106	383508	16.22	311985	13.19
Sub-District-Gurh	127323	18301	14.37	17411	13.67
Project Villages (4)	10285	999	9.71	2146	20.87

Source: Census of India, 2011

Table below presents the literacy rates for Rewa district, Gurh Sub-district and the project villages. It can be clearly observed that the literacy level amongst women in the project villages is very low at only about 54%.

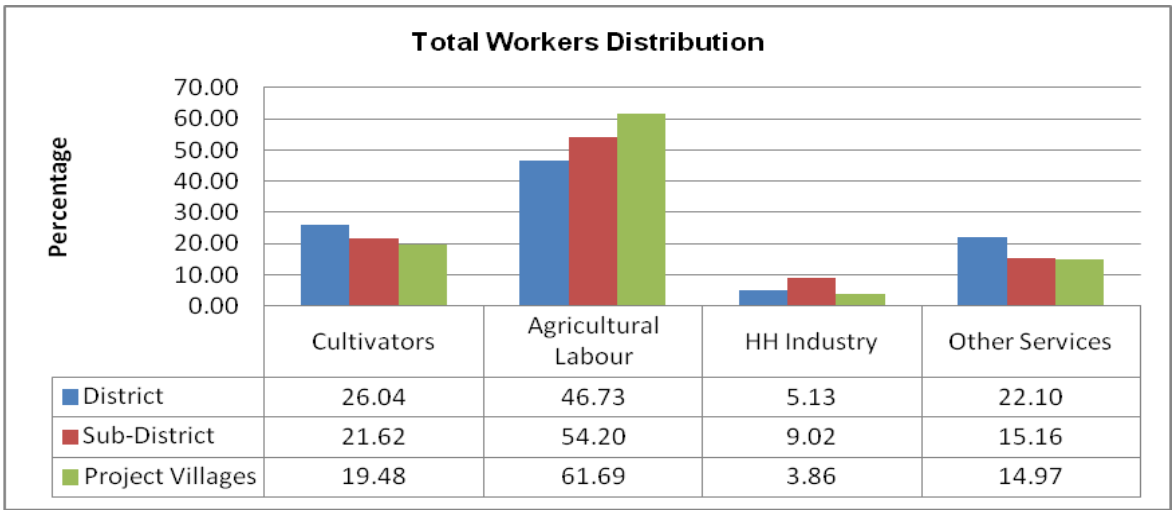
Unit	Literacy Rate		
	Total	**Male**	**Female**
District-Rewa	71.6	81.4	61.2
Sub-District-Gurh	69.5	80.1	58.4
Project Villages (4)	65.2	76.1	54.1

Source: Census of India, 2011

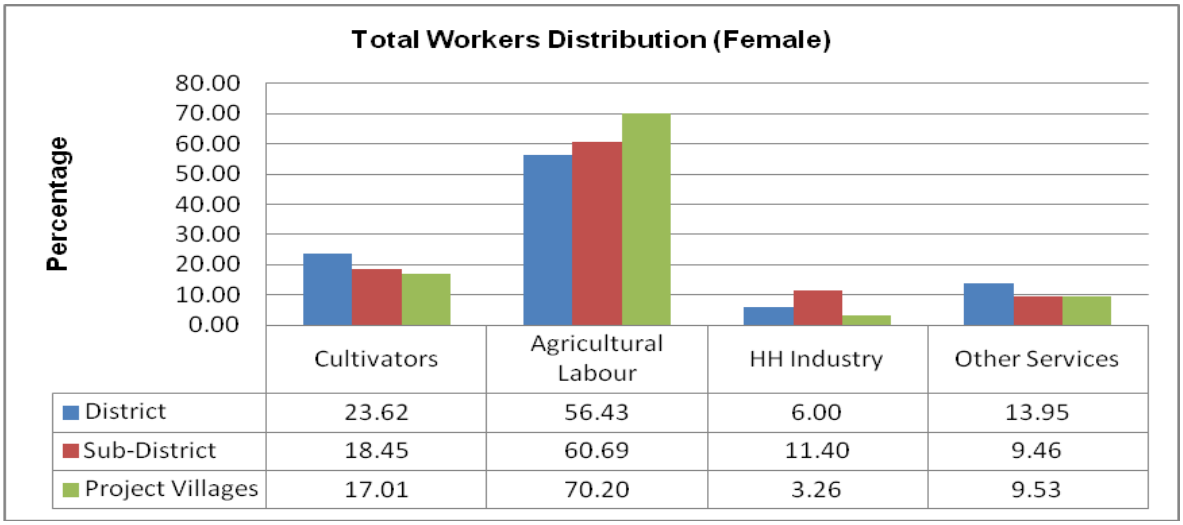
The workforce participation rate is nearly 45% for project villages with regard to the total workers out of which marginal workers account for nearly 16%. It is important to note here that higher WFPR is due to higher participation of women in the economic activity and it is important to highlight here that the workforce participation rate in the project villages and the district are higher compare to state and national rural averages of about 30 and 39 respectively. The residents of villages in vicinity of the study area are generally dependent on agriculture for their livelihood. Their income is supplemented by working as labourers in the nearby urban areas. The people living in vicinity of the forest area supplement their income by collection of non-nationalized forest produce and tendu patta.

Unit	Total Workers	Male Workers	Female Workers	Marginal Workers	Male Marginal Workers	Female Marginal Workers
District-Rewa	41.9	50.4	32.9	15.3	13.8	16.9
Sub-District-Gurh	45.2	51.2	38.9	18.0	15.3	20.9
Project Villages (4)	44.8	50.5	38.9	16.0	13.6	18.6

The Figure below provides the distribution of total workers into the categories of cultivators, agricultural labour, household industries and other services as defined in Census 2011 for total workers as well as by gender. It can be clearly observed that nearly 80% depend on agriculture including 62% of the total workers in the project villages working as agricultural labour against the district average of about 47%. The percentage of agricultural labour amongst women workers is as high as 70%.



	Cultivators	Agricultural Labour	HH Industry	Other Services
District	26.04	46.73	5.13	22.10
Sub-District	21.62	54.20	9.02	15.16
Project Villages	19.48	61.69	3.86	14.97



	Cultivators	Agricultural Labour	HH Industry	Other Services
District	23.62	56.43	6.00	13.95
Sub-District	18.45	60.69	11.40	9.46
Project Villages	17.01	70.20	3.26	9.53

Land Ownership Profile

Nearly 63% of the total land in these villages belongs to the government (including large share under forest). It can be observed that the average size of land per plot ranges between 0.11 Ha in Badwar village to 0.73 Ha in Ramnagar Pahar. Table below depicts the available government land parcels in each of the five villages including those classified under the forest and other categories as per the data available on the Land records department URL.

Aspect Number of Plots	Badwar	Barseta Desh	Barseta Pahar	Itar Pahar	Ramnagar Pahar
Total	9360	2983	135	2199	773
Government Plots	597	196	76	357	145
Private Plots	8763	2787	59	1842	628
Area in Ha					
Total Area in Ha	2730.282	1071.132	477.41	3705	773.902
Area of Govt Land in Ha	1707.743	617.949	457.282	2366.89	317.404
Area of Private Land in Ha	1022.539	453.183	20.128	1338.11	456.498

Average Size of Private Plot in Ha	0.1166	0.1626	0.3411	0.7264	0.7269

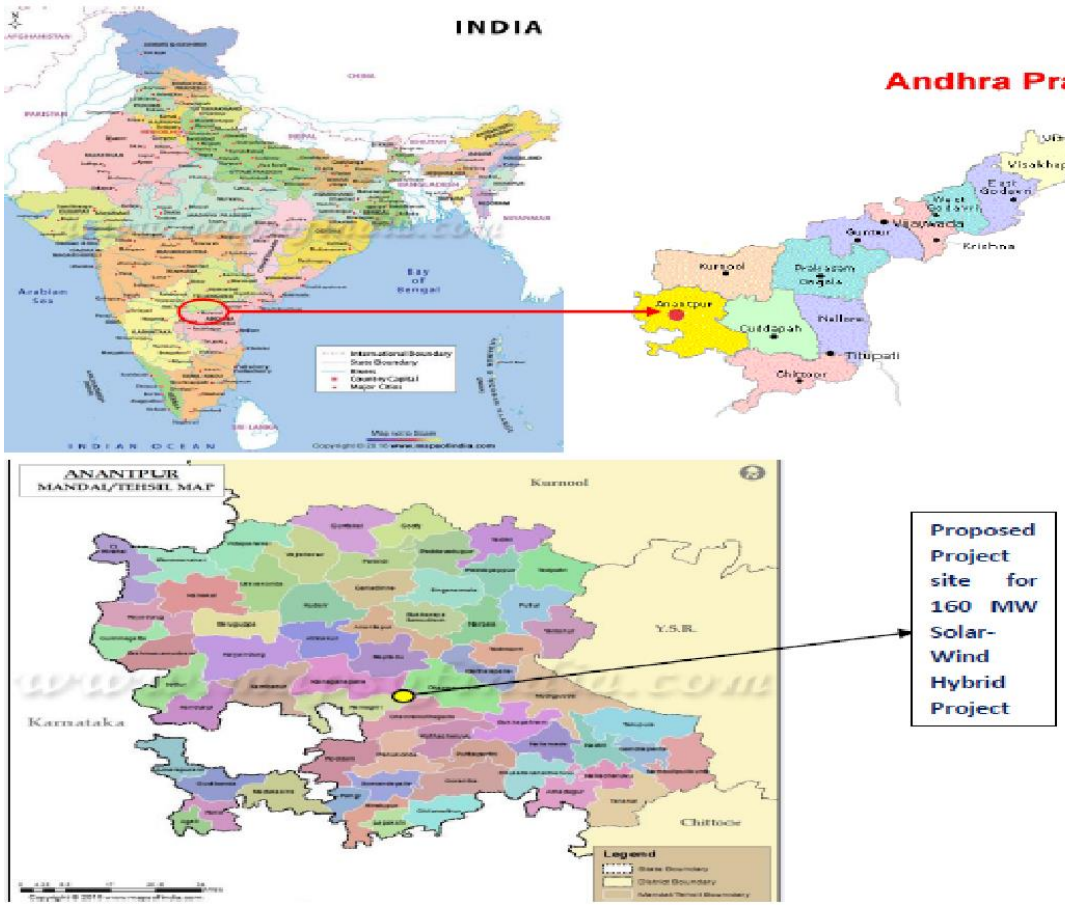
The land-use analysis and the analysis of project villages in the area identified for the project clearly shows that majority of the land south of the road from Gurh is a rocky land with certain small patches of land parcels suitable for agriculture.

The area identified for the proposed solar UMPP is predominantly open scrub wastelands. Agriculture is being practiced in a few selected small parcels which are mainly rain fed (single crop – Kharif crop) as the area identified for agriculture lacks any major irrigation sources. There were also few scattered built-up structures within the proposed site as observed during site visits. The private land parcels are interlocked between the government land parcels. The private land parcels interlocked between the government land parcels has resulted in certain cases the encroachment on the government land in the form of structures at the ground level due to limited availability of cultivable land.

ANNEXURE 1.3: Baseline Environmental and Social Anantapur Solar Wind Hybrid Project (Baseline)

Location Characteristics:

The proposed project area is located in Ramagiri and Muthavakuntla village, Anathapuramu district in the Rayalaseema region of Andhra Pradesh, India. The geographical location of the proposed solar-Wind Hybrid park project site is 14o21'29.7" N latitude and77o31'18.9" E longitude. –The proposed site located in Andhra Pradesh (A.P). Anantapur district It is the largest district of Andhra Pradesh spanning an area of 19,130 square kilometres. It is bounded on the north by Kurnool District, on the east by Kadapa District, on the southeast by Chittoor District, and on the southwest and west by Karnataka state. The project is located 10 km away from National Highway no 44 (AH43).



Physiography and Soil:

Geomorphologically, Anantapur district forms the northern extension of Mysore Plateau. northern and central portions of the Anantapur district are a high plateau, generally undulating, with large granite rocks or low hill ranges rising occasionally above its surface. In the southern portion of the district the surface is more hilly, the plateau there rising to 610 m above the sea. The project area has undulated terrain with elevation varying from 470 m to 517 m amsl. The land is uncultivated land. The project and have thin layer of soil over rocky strata. The soil in the project area is predominantly red gravely soil and black soil. The area lies over zone IV of seismic region, which is considered as stable zone.

Drainage Pattern and Water Bodies:

The Anantapur district is drained by six rivers namely Penna, Chithravathi, Vedavathi, Papagni, Swarnamukhi, and Thadakaleru. The area around the project is mainly drained by project area dendritic drainage pattern is observed at the project area. There are 6-7 local drains/streams spotted

in the project area which carry water only during rains. There is one natural tank in Mutafacient village which is rainfed and stores water throughout the year. In this tank 3 of the drains converge.

Climatic Characteristics:

The area fall under has a semi-arid climatic zone of India with hot and dry conditions for most of the year. Summers start in late February and peak in May with average high temperatures around 37 °C. Monsoon starts in September and lasts until early November with about 250 mm of precipitation. A dry and mild winter starts in late November and lasts until early February; with little humidity and average temperatures in the 22–23 °C. Total annual rainfall is about 535 mm. The average annual rainfall of the district is 535 mm, September and October are the wettest months of the year. The mean seasonal rainfall distribution is 316 mm during southwest monsoon (June-September).

Groundwater characteristics:

The ground water is used for drinking, irrigation and other domestic purpose around the project area. The area falls under semi-critical zone and the water table varied between 60m to 100m below the ground level. The ground water contains high TDS and hardness.

Environmental Quality:

The proposed project area is away from habitation area and there are no significant human activities around the project area. There is no any industrial establishment around the project area. Due to lack of human activities around the project area, the environmental quality in general is fairly good.

Ecological Features:

The topography of the proposed site is undulated plateau with scanty vegetation. Mainly bushy vegetation is observed in the area. Cymbopogon procerus (Boda Grass), a species commonly used for cattle fodder is predominantly spotted in the project area. Beside that dispersed growth of plant species like Acacia catechu, Prosopis juliflora, Acacia nilotica, Cassia auriculata, Agave Americana, Palm tree etc. are also spotted. Spotted deers and black bucks are spotted around the project area which roam around for the fodder. The reptiles and hare are also seen around the land. The project area does not encounter any migratory route for wild animals and birds as confirmed by the Local forest Office. The area does not fall in migratory route of birds.

Two Reserve Forest patches i.e. Ramagiri West RF (at 1.4 Km distance) and Ramagiri East RF (at 3.5 km Distance) is located at south-west and North-East side of proposed project site respectively.

No notified Protected Area (under Wildlife Protection Act, 1972) such as Wildlife Sanctuary, national parks, tiger reserves, Bird Sanctuary etc. is located in and around the project area within 10 Km radius of the proposed project site.

There is no any archaeological site, protected/ historical monument within 10 Km radius of the project area.

Socio-economic Environment:

Although the project area falls in the extent of revenue village Ramagiri (Mandal - Ramagiri) and Mutafacient (Mandal - Kanaganapalle) of Anantapur District of Andhra Pradesh State, there is no settlement in the vicinity of the project area. The nearest settlement is Ramagiri village which is about 200 m away from south west boundary. The other settlements areas are Talimadugula, Balepalyam, Konapuram, Ramagiri, Mutafacient located within 5 Km radius of the project area.

Nearest Railhead from the site location is Dharmavaram (31 Km) and the nearest Airport is Bangalore (187 Km). The district headquarter Anantapur is located about 61 Km away from proposed site.

State Profile: Andhra Pradesh

Andhra Pradesh is one of India's Southern states and is situated on the southeastern coast of the country. Also known as the Rice Bowl of India, because of being one of the highest producers of rice in the state. The population of Andhra Pradesh as per Census 2011, before the formation of Telangana as a separate state was 84,580,777 of which male and female are 42,442,146 and 42,138,631 respectively. In 2001, total population was 76,210,007 in which males were 38,527,413while females were 37,682,594. The total population growth in this decade was 10.98 percent while in previous decade it was 13.86 percent. The population of Andhra Pradesh forms 6.99 percent of India in 2011. In 2001, the figure was 7.41 percent. The state covered an area of 275,045 sq. km before formation of Telangana. But now, the state is spread across 160,205 sq. km and has a population of 49,378,776. Following Table depicts details about the districts of the state:

S No.	District	Population (Census 2011)	Sex Ratio (per 1000)	Average Literacy
1	Anantapur	40,81,148	977	63.57%
2	Chittoor	41,74,064	997	71.53%
3	East Godavari	51,54,296	1006	70.99%
4	Guntur	48,87,813	1003	67.40%
5	Krishna	45,17,398	992	73.74%
6	Kurnool	40,53,463	988	59.97%
7	Prakasam	33,97,448	981	63.08%
8	Sri Potti Sriramulu Nellore	29,63,557	985	68.90%
9	Srikakulam	27,03,114	1015	61.74%
10	Visakhapatnam	42,90,589	1006	66.91%
11	Vizianagaram	23,44,474	1019	58.89%
12	West Godavari	39,36,966	1004	74.63%
13	YSR (Kadapa)	28,82,469	985	67.30%

Source: Census of India, 2011

District Profile: Anantapur

The district has five divisions namely Anantapur, Dharmavaram, Kadiri, Kalyandurga and Penukonda divisions. These revenue divisions are further classified into 63 mandals. Anantapur district stands 1st position in terms of area with 19,130 Sq. Kms. and ranks 7th in terms of population with 40,81,148 persons in the State. Project district stands 7th in terms of urban area with 376.89 Sq. Kms. and ranks 9th in terms of urban population with 11,45,711 persons in the State while it stands 1st in terms of rural area with 18,753.11 Sq. Kms. and ranks 6th in terms of rural population with 29,35,437 persons in the State.

Project Influence Area

The proposed project is covering 20 Census villages of Ramagiri and Kanaganapalle Mandal of District Anantapur (Andhra Pradesh). The study area for this proposed project has been considered both the Mandal of the project area. Further, to achieve an informative result the total area has been segregated into two different mandals namely Ramagiri and Kanaganapalle.

Demographic Profile of the Study Area

The study area for the project has been considered as 5 km radius of the proposed solar-wind hybrid park. The demographic profile around the project area has been consolidated for all the villages falling within 5 Km radius of the project area.

Demographic Profile of the Study Area

S. No.	Name of Villages	HH	Population			Literates			Main Workers			Marginal Workers			Non Workers		
			Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F
Ramagiri Mondal																	
1	Perur	1752	7234	3652	3582	3922	2276	1646	3341	1993	1348	369	131	238	3524	1528	1996
2	Makkinavaripalle	92	371	190	181	207	131	76	196	98	98	6	2	4	169	90	79
3	Kondapuram	338	1543	781	762	836	499	337	721	419	302	153	28	125	669	334	335
4	Motarchintalapalle	1095	4868	2500	2368	2630	1558	1072	2198	1395	803	652	108	544	2018	997	1021
5	Nasanakota	1528	6482	3275	3207	3232	1913	1319	2602	1605	997	606	305	301	3274	1365	1909
6	Ramagiri	865	3778	1933	1845	2093	1246	847	1177	866	311	674	261	413	1927	806	1121
7	Ganthimarri	554	2210	1165	1045	1158	741	417	871	525	346	394	146	248	945	494	451
8	Kuntimaddi	823	3271	1688	1583	1633	977	656	1484	886	598	423	168	255	1364	634	730
9	Seshadribhatra Halli	201	856	458	398	420	277	143	526	281	245	5	0	5	325	177	148
10	Polepalle	815	3388	1722	1666	1960	1122	838	1219	818	401	507	139	368	1662	765	897
Sub-Total		**8063**	**34001**	**17364**	**16637**	**18091**	**10740**	**7351**	**14335**	**8886**	**5449**	**3789**	**1288**	**2501**	**15877**	**7190**	**8687**
Ramagiri Mondal																	
1	Thumucherla	1090	4515	2319	2196	2124	1234	890	2253	1292	961	465	145	320	1797	882	915
2	Thogarakunta	964	4059	2088	1971	2213	1328	885	1777	1055	722	458	167	291	1824	866	958
3	Maddalacheruvu	1497	6426	3280	3146	3326	1938	1388	2647	1479	1168	1022	422	600	2757	1379	1378
4	Konetinayanipalyam	683	2820	1478	1342	1565	932	633	1294	801	493	18	7	11	1508	670	838
5	Narasampalle	370	1562	808	754	863	510	353	575	361	214	290	111	179	697	336	361
6	Elakkuntla	733	3094	1577	1517	1681	997	684	982	613	369	841	330	511	1271	634	637
7	Muthavakuntla	601	2634	1376	1258	1397	826	571	1278	713	565	292	112	180	1064	551	513
8	Kanaganapalle	1702	6965	3647	3318	3755	2288	1467	2948	1738	1210	721	257	464	3296	1652	1644
9	Mukthapuram	985	4093	2136	1957	2369	1440	929	1919	1086	833	394	161	233	1780	889	891
10	Dadalur	856	3505	1820	1685	1837	1112	725	1298	853	445	447	154	293	1760	813	947
Sub-Total		9481	39673	20529	19144	21130	12605	8525	16971	9991	6980	4948	1866	3082	17754	8672	9082
G. Total		**17544**	**73674**	**37893**	**35781**	**39221**	**23345**	**15876**	**31306**	**18877**	**12429**	**8737**	**3154**	**5583**	**33631**	**15862**	**17769**

Source: Census of India, 2011

Baseline Data of the Study Area

In the table below an attempt has been made to provide salient features of socio-economic features of the study area:

Demography, Literacy and Occupational details of people living in Study Area

S.No.	Description	Number	% to total
1	**Total Population - Gender wise**	73,674	100
	Male	37,893	51.43
	Female	35,781	48.57
	Sex ratio (No. of females per 1000 males)	944	
2	**Total Population (0-6 years) - Gender wise**	7,899	100
	Male	4,191	53.06
	Female	3,708	46.94
	Sex ratio (No. of females per 1000 males)	885	
3	**Total Population (Sector Wise)**	73,674	100
	Rural	73,674	100
	Urban	0	0
4	**Total no. of households**	17,544	-
	Average House hold size	4	-
	Lowest Household size	4	-
	Highest Household size	5	-
5	**Total SC & ST Population**	16,597	22.53
	Total Population (SC)	13,861	18.81
	Total Population (ST)	2,736	3.71
6	**Total Literates – Gender wise**	39,221	53.24
	Male Literacy (with respect to the male population)	23,345	61.61
	Female Literacy (with respect to the female population)	15,876	44.37
	Literacy gap between male and female	-	17.24
7	**Total Literates – Sector wise**	47,524	--
	Rural (Number and % to total literates)	47,524	100
	Urban (Number and % to total literates)	0	0
9	**Total Workers & Work Participation Rate**	40,043	54.35
	Male (Number and % with respect to the male population)	22,031	58.14
	Female (Number and % with respect to the female population)	18,012	50.34
	Gender gap in workforce (in percentage)	-	7.8
10	**Total Main Workers & percentage to total worker**	31,306	78.18
	Male (Number and % with respect to the male working population)	18,877	85.68
	Female (Number and % with respect to the female working population)	12,429	69
a)	Main Worker as Cultivator (Number and Percentage)	11,905	38.03
b)	Main Worker as Agricultural Labour (Number and Percentage)	14,306	45.7
c)	Main Worker as Household Industry Worker (Number and Percentage)	628	2.01
d)	Main Worker as Other workers (Number and Percentage)	533	1.7
11	**Total Marginal Workers & percentage to total worker**	8,737	39.66
	Male (Number and % with respect to the male working population)	3,154	17.51
	Female (Number and % with respect to the female working population)	5,583	46.9
a)	Marginal Worker as Cultivator (Number and Percentage)	953	10.91
b)	Marginal Worker as Agricultural Labour (Number and Percentage)	6,908	79.07

c)	Marginal Worker as Household Industry Worker (Number and Percentage)	149	1.71
d)	Marginal Worker as Other workers (Number and Percentage)	727	8.32
12	**Number and Percentage of Marginal Worker (3-6 Months)**	8,180	93.62
13	**Number and Percentage of Marginal Worker (0-3 Months)**	557	6.38

Demographic Composition

Population:

According to Census of India 2011, the total population of the study area is 73,674 in which 51.43% are males and 48.57% are females. An average gender ratio of the study area is approx. 944 females per 1000 males, which is much better than national average of 933 females per 1000 males. Total study area comes under rural settlement. Approx. 10.72% of the total population belongs to 0-6 age group. The sex ratio of this age group is 885 female children per 1000 male children, which is much below than average sex ratio of the study area. The break-up of population data for the study area is given in Table.

Households and Household Size:

The entire population of the study area has been grouped into 17,544 households and the average size of household is approx. 4 persons/ household.

During site visit it was observed and noted that most of the houses of the study area are semi-pucca and approximately 21% are kachcha houses. Nearly every respondent reported that they were living in their own houses. The area of the house structure was varying from 300-600 square metres. Approx. 35% households have toilet facility but 75% people of the study area defecate outside due to lack of water.

Mandal-wise break up of Population in Study Area

S.No.	Study Area	House-holds	House hold Size	Population				Population (06 years)			
				Total	Male	Female	Gender Ratio	Total	Male	Female	Gender Ratio
1	**Ramagiri**	8063	4.22	34001	17364	16637	958	4255	2267	1988	877
2	**Kanaganapalle**	9481	4.18	39673	20529	19144	933	3644	1924	1720	894
Total		**17544**	**4.2**	**73674**	**37893**	**35781**	**1891**	**7899**	**4191**	**3708**	**885**

Source: Census of India, 2011

With reference to the Tables above, approx. 18.81% of the total population of the study area belongs to Schedule Caste and Schedule Tribes. Among the total population, Scheduled Caste constitutes of 15.10% and 3.71% belongs to Schedule Tribe community. Reddy, Rao, Vaishya, Chaudhari, Setty, Rao, Lingabaleja etc. are comes under general category (O.C.); Kurma, Valamiki, Boya, Pinjari, Dudekula, Yadaya, Kurva, Kumbari, Golla, Dukula, Chakali, Mangala, Wadde, Uppare etc. comes under Backward Caste (B.C.); Madiga, Mala, Harizana, Dasari etc. comes under Schedule Caste (SC) and Yerukala, Nayak comes under Scheduled Tribes of social group in the study area. As per primary survey, standard of life of people of the study area is below average. Though the composition of the people of higher caste (approx 10% as per our site visit observation) is very low but they are dominating to the whole society. Approx 70% people come under Backward Caste (B.C.).

The population composition of SC is 15.10% and ST is 3.71% in the villages of study area and they come under vulnerable groups of family. Their livelihood depends on agriculture and agricultural labour. None of the SC/ST family is directly affected due land procurement process. During construction period, they will be given employment opportunity and in PARK DEVELOPER's CSR activity skill

development training will be provided to them on the basis of their hobbies and employment opportunity in the region.

The break up distribution of scheduled caste and scheduled tribe population in the project area is shown in below Table.

Mandal-wise Distribution of SC and ST Population in Study Area (Census of India,2011)

S. No.	Village	Schedule Caste Population				Schedule Tribe Population			
		Total	Male	Female	Percentage	Total	Male	Female	Percentage
Ramagiri Mandal									
1	Perur	1205	621	584	16.66	31	14	17	0.43
2	Makkinavaripalle	156	77	79	42.05	0	0	0	0
3	Kondapuram	468	231	237	30.33	0	0	0	0
4	Motarchintalapalle	1374	692	682	28.23	20	11	9	0.41
5	Nasanakota	2127	1066	1061	32.81	121	54	67	1.87
6	Ramagiri	644	349	295	17.05	255	128	127	6.75
7	Ganthimarri	238	127	111	10.77	0	0	0	0
8	Kuntimaddi	284	148	136	8.68	460	231	229	14.06
9	Seshadribhatra Halli	57	29	28	6.66	17	10	7	1.99
10	Polepalle	392	198	194	11.57	144	71	73	4.25
Sub-Total		6945	3538	3407	20.43	1048	519	529	3.08
Kanaganapalle Mandal									
11	Thumucherla	852	434	418	18.87	6	3	3	0.13
12	Thogarakunta	382	202	180	9.41	362	185	177	8.92
13	Maddalacheruvu	1397	727	670	21.74	557	273	284	8.67
14	Konetinayanipalyam	481	254	227	17.06	29	16	13	1.03
15	Narasampalle	324	167	157	20.74	4	1	3	0.26
16	Elakkuntla	443	212	231	14.32	2	1	1	0.06
17	Muthavakuntla	586	308	278	22.25	165	83	82	6.26
18	Kanaganapalle	976	514	462	14.01	27	14	13	0.39
19	Mukthapuram	988	493	495	24.14	36	18	18	0.88
20	Dadalur	487	236	251	13.89	500	274	226	14.27
Sub-Total		**6916**	**3547**	**3369**	**17.43**	**1688**	**868**	**820**	**4.25**
G. Total		**13861**	**7085**	**6776**	**18.81**	**2736**	**1387**	**1349**	**3.71**

Literacy and Literacy Rate:

The average literacy rate of the study area is 53.21% (18.091) in which male's literacy is 61.85% with respect to the male population as against 44.18% for females with respect to the female population, creating a gender gap of 17.67%. Though the state govt. has facilitated every village with at least Govt. Primary Schools, Upper Primary Schools and Anganwadi Centres but the quality of education in the study area is very poor. As per our observation and consultation with villagers, it was found out that most of the villagers above 50 years of age are literate but they do not have any educational certificates. In core zone, 90% of literate females are educated only up to primary level and only 8- 10% of the females are educated up to secondary levels. Dropout rates especially for girl child are very high in these villages and also in the study area. This is mostly because of poor economic conditions of the study area and less independence of women. Hence, instead of attending schools, these small girls/boys help their parents in household works, or in daily paid labour jobs. Few villagers left their houses with their family members for more than 4 to 6 month every year in search of jobs in nearby villages, towns and cities, therefore schooling education of children are affected. The break up distribution of literate population in the project area is shown in Table below.

Mandal-wise Distribution of Literacy in the Study area

Sl. No.		Number of Literates			Literacy Rate			
	Study Area	Total	Male	Female	Total	Male	Female	Gender Gap
1	Ramagiri	18091	10740	7351	53.21	61.85	44.18	17.67
2	Kanaganapalle	21130	12605	8525	53.26	72.59	47.12	25.47
Total		**39221**	**23345**	**15876**	**53.24**	**61.61**	**44.37**	**17.24**

Source: Census of India, 2011

The literacy rate of the project area has been compared with the literacy rate of district, state and national level which shows that literacy rate of the study area is below than the literacy rate of the district, state and national level. This figure reflects that a little more than the half of the total population of the study area is literate. Literate people can bargain better and put interest of the community during project planning land procurement stage. Literate people can get employment opportunity during project construction and operation phase as per their skill and qualification. They can assess positive and negative impact of the project and give their suggestions during project planning and construction phase better than others.

Workers and Work Participation Rate:

The total number of workers in the study area is 40,043 and the WPR is 54.35% in which male are 58.14% with respect to the male population and females are 50.34% with respect to female population. Among the total workers 85.30% are main workers and the remaining 14.70% are marginal workers. The percentage of male in the main workers is 85.68% with respect to male working population, while it is only 14.32% in the case of marginal workers. On the other hand, the percentage share of female in the main workers is 69.00 % with respect to female working population; it is 17.51% in the case of marginal workers. As per the table below, it appears that most of the people (male & female) are engaged in main workers while in overall male workers dominate to female workers because less opportunity of work, unawareness of women rights, lack of education, lack of skill development opportunity and male dominating tradition to female workers.

Work Participation Rate of the Study area

S. No.	Category	Total	Male	Female
1.	Total Worker	54.35	58.14	50.34
2.	Non-Worker	45.65	41.86	49.66
Total			**100.00**	**100.00**

1.	Main Worker	78.18	85.68	69.00
2.	Marginal Worker	21.82	14.32	31.00
Total			100	100

Source: Census of India, 2011

Categorization of Main Workers on the basis of Occupation:

Following tables reflects that 45.70% of main worker are involved as agricultural labourers followed by cultivators 38.03%, household industry 2.01 % and only 1.70% are involved in other workers.

Categorization of Main Workers on the basis of Occupation

Sl.No.	Zone	Types of Main Workers							
		Cultivators		Agricultural Laborers		Household Industrial Workers		Other Workers	
		Nos.	Percentage	Nos.	Percentage	Nos.	Percentage	Nos.	Percentage
1	Ramagiri	6595	38.86	7741	45.61	308	1.81	2327	13.71
2	Kanaganapalle	5310	37.04	6565	45.8	225	1.57	2235	15.59
	Total	**11905**	**38.03**	**14306**	**45.7**	**533**	**1.7**	**4562**	**14.57**

Source: Census of India, 2011

Categorization of Marginal Workers on the basis of Occupation:

Following tables reflects that 79.07% of marginal worker are involved as agricultural labourers followed by cultivators 10/91, other workers 8.32% and only 1.71% are involved in household industry.

Table: Categorization of Marginal Workers on the basis of Occupation

Sl.No.		Number of Literates			Literacy Rate			
	Study Area	Total	Male	Female	Total	Male	Female	Gender Gap
1	Ramagiri	18091	10740	7351	53.21	61.85	44.18	17.67
2	Kanaganapalle	21130	12605	8525	53.26	72.59	47.12	25.47
Total		**39221**	**23345**	**15876**	**53.24**	**61.61**	**44.37**	**17.24**

Source: Census of India, 2011

Considering the work culture of the study area, it appears that most of the workers in both the category main and marginal are engaged in agricultural labourers. In the study area most of the Workers are either main/marginal agricultural labourers or cultivators or other workers. The daily paid labourers work in the nearby villages, towns or cities as agricultural labours, industry, iron ore mine or earn their livelihood by working as labourers in various construction sites/building etc.

Culture and Religion:

The field survey has revealed that majority of the persons living in the villages are Hindus with approx 10 % of population in the study area are Muslim and Christian. Most part of the study area has been occupied by Hindus and they play a vital role in making cultural and religious activities. Out of total population in the study area, approximately 80% population are general and Backward Caste category, 20% are SC and ST. Men of the study area generally wear Lungi and kamiz/shirt, pant and shirt and women wear saris and suits. Yugadi, Dashahara, Deepawali, Sankranti, Vinayak Festival, Muharram, Eid ul Fiter, Christmassy are the

main festivals celebrated by the people of the study area. They worship Lord Shiva, Anjaney, Rama, Durga and Shiva etc.

House Types:

Houses in the study area are generally semi-pacca. There are pacca and temporary types of structures have also been observed. The houses are generally made by bricks and stones. Although 35% households have facility of toilet and state government is also providing financial donation in making toilets in rural area but approximately 75% of people defecate outside due to lack of water and unawareness. Tap water supplied by village panchayat with government assistance and hand pumps are the main source of drinking water and other domestic use.

Occupation and Economy:

The main occupation of the study area is agriculture and more than 75% people depend on agriculture or as agricultural labourers. Main crops grown in the region are cotton, ground nut, onion, makka, corn etc. which depends on rain water. Few people are engaged in their paternal profession like barber, carpentry etc. There are very few opportunities of livelihood except agriculture and agricultural labours. Average land holding size of the study area is 3 to 30 acres per family. The average income of the family of the study area is INR 5,000 to 10,000 per month while the income of BPL family is < INR 5,000 per month and most part of the income is spent on food. There is requirement of skill development training so that local villagers may get more option to earn their livelihood.

Infrastructures Facilities

Roads

The study area of the proposed solar/wind power project is well connected with state highway and inter village road which are in good in good condition. The internal roads of the villages which link one village to another are also pucca and semi-pucca.

Education:

Considering the educational facilities in the study area, Govt. Primary School, Upper Primary School and Anganwadi is available in every village of core zone. Govt. Senior Secondary School is available in Aspari and Pattikonda villages. Government Degree Colleges are available in Pattikonda and Adoni. In every school and college there is facility of toilets for girls and boys separately but it is observed that it is not in a good condition. Although local panchayat provides water supply through pipeline connection but they are not good for drinking as there is a contamination of fluoride. In spite of government infrastructure facility and support (facility of mid-day meal, free books distribution and two pairs of uniform to every student) for education, the literacy rate is very poor in the study area. Although, there is support for girl child education, but it is only up to junior level. Very few people are able to provide higher education to their girl child.

Health:

As per Rural Health Statistics 2015, there are 576 sub-centres, 83 PHC, 18 CHC, 1 Sub divisional Hospital and 1 District Hospital is running in Anantapur District. In of the study area there are two governments Primary Health Centre working properly, one is in Ramagiri village and another is in Kanganapalle village. Government Community Health centre is available in Penukunda town which is 15 km. from the project site. In this hospital all the facility with advance technology is available. There are so many Private Hospitals are also working with better facility. There is no any epidemic or chronic disease have been reported in the study area during consultation with local villagers except general fever, cough, cold and bone related pains due to contamination of fluoride in ground water.

Drinking Water Facility:

As reported during consultation, there is acute shortage of water in the villages of the study area and ground water level is 400 to 500 feet. Every village, there is water tank constructed. Water is supplied for drinking and other domestic use to each house via pipe line with the assistance of government and village panchayat.

Communication:

The villages in the study area are well connected via mobile, telephone and internet. Government post office is also available in most of the village panchayat of the study area. Means of communications such as internet, telephone and television has made a vital role in changing the conservative thoughts of the people of the study area and brought awareness for development in every dimension of life.

Electricity Facility:

The study area is good in terms of electricity supply. Generally, 20 to 22 hours' electricity is available in most of the villages of the study area. Proposed 200 MW Wind power project may reduce demand-supply gap of the state. Thus, in future, power cut will be reduced. They utilize power in establishing household industry, irrigation etc. The implementation of the proposed wind power plant project will throw opportunities to local people for both direct and indirect employment. The project will provide impetus to industrialization of the area. Further, the occupational pattern of the people in the area will change making more people engaged in industries and business. With this, occupational shifting of people from tertiary sector to industry, trade and business will get going. Thus, proposed project will improve socio-economic status of the study area.

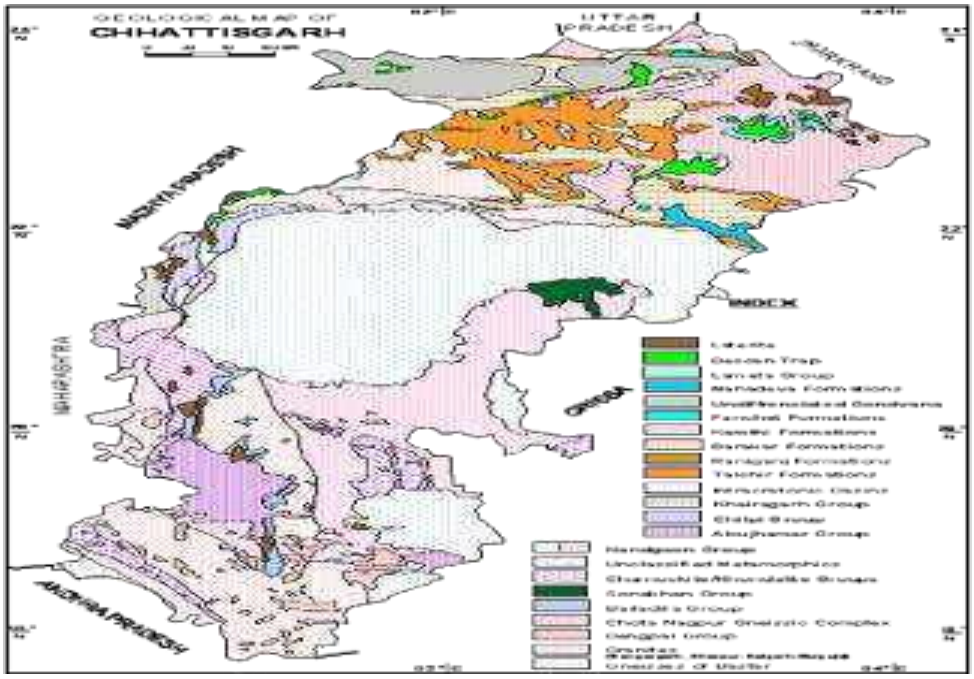
ANNEXURE 1.4: Battery Energy Storage System – Rajnandgaon, Chhattisgarh (* Extracted from Publically available documents on SECI website)

Baseline environmental and study was conducted to understand the present status of the environmental resources in the project area. The environment status of project area was based on field survey and secondary data review. Environmental impact assessment involved prediction of potential impacts by the development of the project on the surrounding area. Based on baseline environmental status and proposed project activities potential impacts have been assessed and predicted and appropriate mitigation measures are suggested to avoid / reduce/ compensate the potential adverse impacts and enhance the positive impacts.

Topography, Physiography and Geology

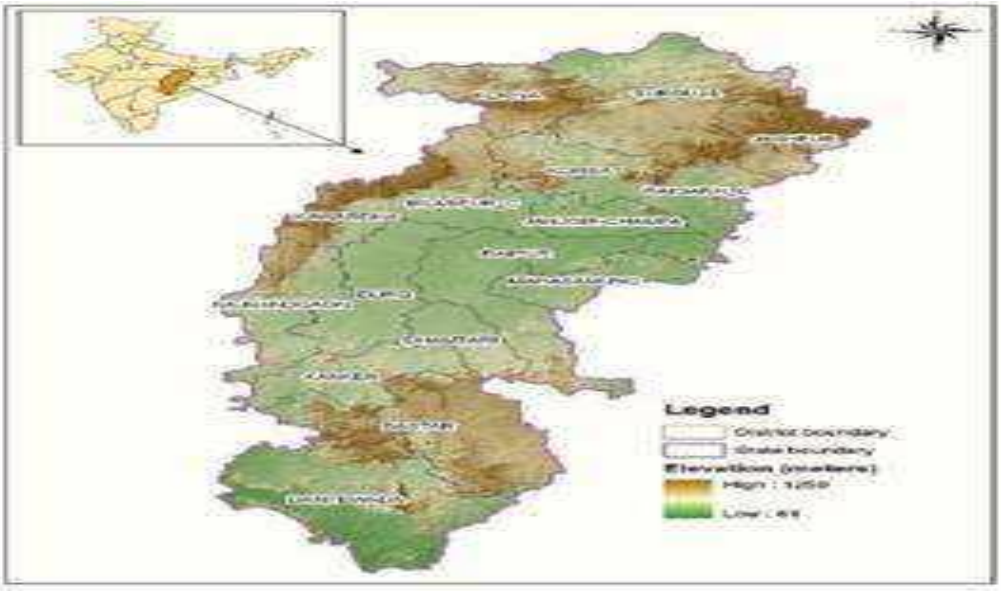
Based on regional topography Chhattisgarh region is divided into three regions, the Northern Hills, the Central Plains and the Bastar Plateau. The central Chhattisgarh basin is characterised by two major landform types, the gently sloping Chhattisgarh Plain and the undulating land. The elevation of the plain ranges from about 250 m on the eastern margin to about 330 m in the west. The gentle gradient of the Chhattisgarh Plain is largely due to its geological structure with flat to gently dipping Cuddapah sedimentary formations. The geological structure of Chhattisgarh state mainly consists of Achaean and Cudappah rocks but Dharwad, Gondwana, Deccan Trap and old Alluvial Laterite rock systems are also found in some pockets of the State. Geological and elevation maps of Chhattisgarh State are given in **Map 1 and Map 2**, respectively.

The Rajanadgaon District can be divided into three district parts, plateau, Hilly terrain and undulating plain. Most of the north western and southern hilly track of the district measuring 3,892 Sq.km is occupied by protected and reserved forests. Nearly 73% of area falls under Mahanadi river basin, 21% under Godavari basin and 6% area in the northern part of the district falls under Narmada basin.



Source: Mines Department, Government of Chhattisgarh

Map 1: Geological Map of Chhattisgarh



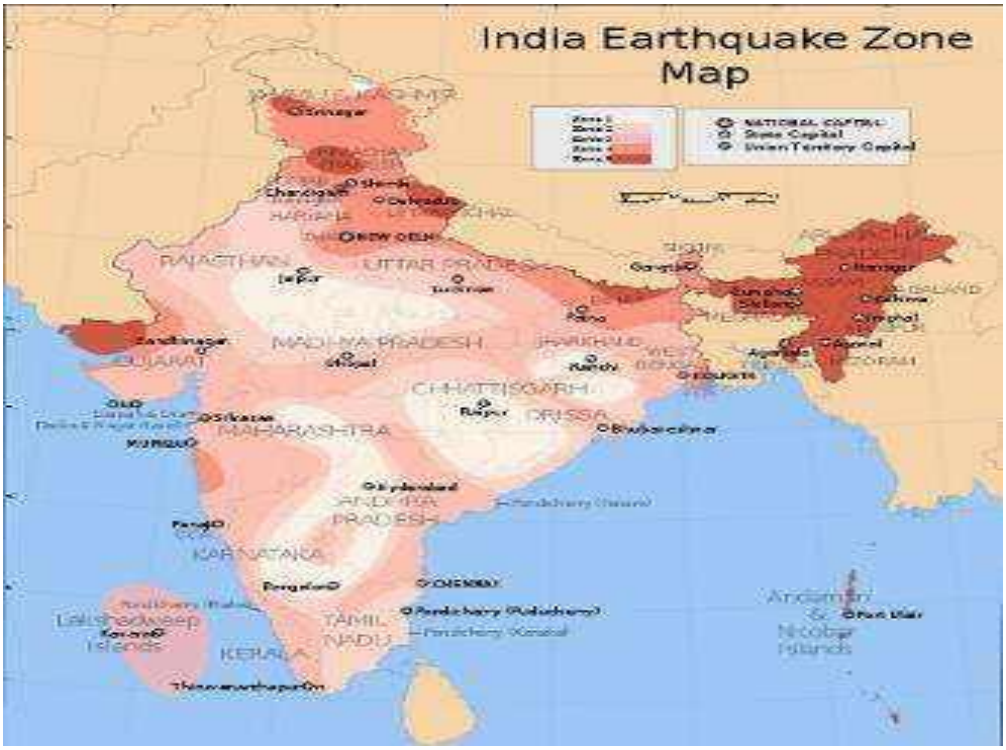
Source: Water Policy for Drought Proofing Chhattisgarh, S. Gupta, Institute for Human Development, 2002

Map 2: Elevation Map of Chhattisgarh

Soil of various types found in the area can be broadly be placed under three groups (i) deep black soil (ii) yellow soil and (iii) red lateritic soil.

Seismicity

Chhattisgarh has very low rates of seismic activity. In recent years, tremors from earthquakes in neighbouring states have been felt, most notably in 1969. The Bureau of Indian Standards (BIS) updated he seismic hazard map of India in 20003. The main change was merging of Zones I & II. As per this updating, the entire Chhattisgarh state falls in Zone II as shown in Map 3. It reveals that the project region falls in Zones II low to moderate risk zone.



Source: IS 1893 (Part 1) 2002

Map 3: Seismic Zone Map

Rainfall

Rainfall data was collected for Raipur IMD station, which is the nearest IMD station in the project area. On an average, 1289 mm of rainfall is received annually mainly from south-east monsoon in the project area

(Table 1-1). The graphical presentation and rainy days in the project road area is presented in Figure 1-1 & Figure 1-2 respectively. The region is classified as heavy rainfall area. Normally rains start in June and continue up to October. Nearly 94.5 % of annual rainfall is received during June to October months. About 2.3% of the normal rainfall is received during the winter season. On an average, there are about 62.3 rainy days in a year.

Rainfall in the Project Area

Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
6.7	12.3	24.6	15.7	18.8	189.8	381.0	344.7	230.2	53.9	7.4	3.7	1288.8
(0.8)	(1.0)	(1.7)	(1.6)	(1.9)	(9.3)	(16.0)	(15.7)	(9.7)	(3.6)	(0.6)	(0.4)	(62.3)

Note: Values given in parentheses are no. of rainy days Source: IMD Station Raipur, (1951 to 1980)

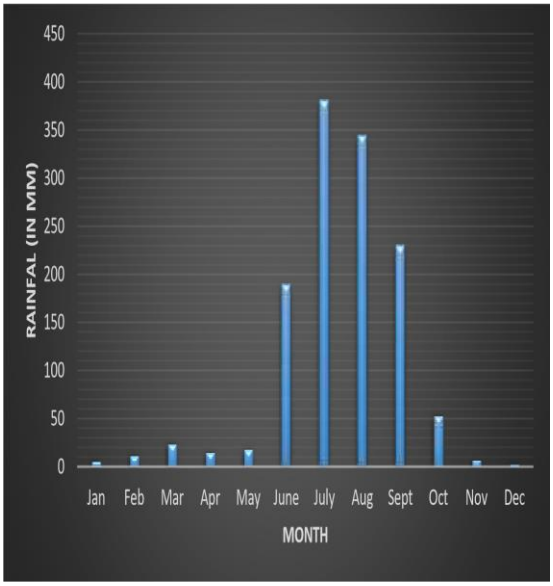


Figure 1-1 Graphical Presentation of Rainfall in Area

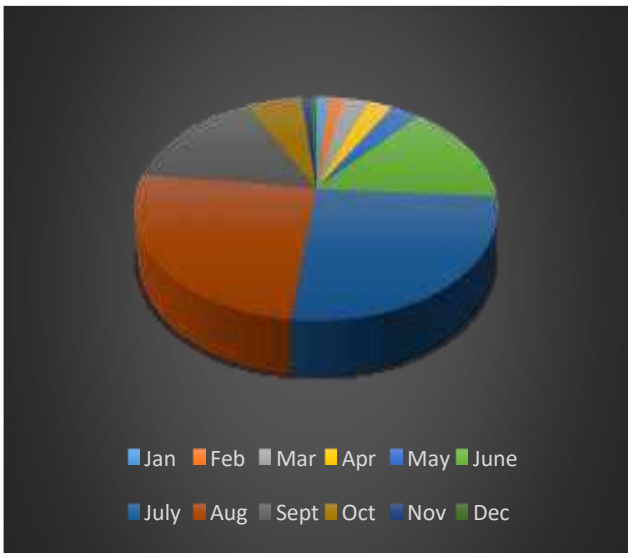


Figure 1-2 Graphical Presentation of Rainy Days in the Project the Project Area

Ground Water Hydrology

Ground water is the dominant water source in the area. The sources of recharging of ground water are mostly from precipitation (rainfall) and partly from flowing water bodies and ponds. Hand pumps are commonly used to draw the water from ground in the villages. Static water levels vary along the stretch of project area. First or upper ground water aquifer lies in the range of 5 to 15 m below ground level (bgl). The ground water level in the area show a decline of 1.2 m to 1.5 m from post monsoon to pre monsoon period.

Climatology

The climate of the project area is characterized by intensely hot dry summer and well distributed rainfall, in south-west monsoon season and winter. Generally, the project area experiences the following four seasons in a year:

- The summer season (also known as pre-monsoon season) starts around Holi festival in March but the mercury rises to the peak in May and first week of June with the mean daily maximum temperature at about 40°C, and the mean daily minimum at about 26°C.
- The rainy season starts around mid-June and continues up to September.
- The winter season starts around the last week of November and continues up to February.
- The intervening period October and November, is the Post-monsoon season or retreating monsoon period.

a) Temperature and Relative Humidity

The mean daily maximum temperature varies from 27.3oC to 42.0oC, while the mean daily minimum temperature varies from 13.2oC to 28.3oC. Data collected from IMD indicates that May is hottest month.

Relative humidity is highest during July to September months (85 to 87% at 8:30 hr and 76 to 78% at 17:30 hr) and lowest during April and May months (39% at 8:30 hr and 23% at 17:30 hr).

b) Wind Pattern

Wind pattern in the area is given in Table 1-2. The prevailing winds are blown from SW – W sector towards NE – E sector during morning and evening hours from March to September. During February to October months, wind blow from NE and E direction to SW and W direction. Calm period is low and observed for 6 to 57% of the time.

Wind Pattern

Sl. No.	Months		N	NE	E	SE	S	SW	W	NW	Calm
1	January	I	21	22	8	4	6	3	2	3	31
		II	22	11	5	2	4	7	6	5	38
2	February	I	20	18	7	5	9	7	3	6	25
		II	20	8	3	2	5	11	14	12	25
3	March	I	16	15	6	5	10	13	10	7	18
		II	16	7	4	2	5	15	19	14	28
4	April	I	7	6	4	4	11	25	21	9	13
		II	9	5	3	3	7	16	26	16	15
5	May	I	9	4	4	3	11	25	24	14	6
		II	13	6	3	4	7	13	22	23	9
6	June	I	3	2	1	2	7	36	34	9	6
		II	9	3	3	4	10	25	27	14	5
7	July	I	1	1	2	1	8	43	33	4	7
		II	3	2	3	2	10	33	34	7	6
8	August	I	2	2	2	2	9	37	35	6	5
		II	2	3	3	2	6	31	36	8	9
9	September	I	8	7	5	3	8	20	23	10	16
		II	11	10	6	4	6	19	19	10	15
10	October	I	17	22	10	5	7	6	4	5	14
		II	13	26	14	6	4	4	3	3	27
11	November	I	26	27	9	3	3	2	2	1	27
		II	17	24	7	3	2	1	1	2	43
12	December	I	20	22	7	5	5	1	0	2	38
		II	17	15	4	2	1	1	1	2	57

All values are percentage of the total time.

Source: IMD Station Raipur (1951 to 1980)

Note: I and II indicate observations at morning (8.30 hrs) and evening hours (17.30 hrs), respectively.

Biological Environment

Biodiversity encompasses the variety of all life on earth. India is one of the 12-mega diverse countries of the world. The diversity of physical features and climatic conditions in India has resulted in diverse ecological habitats like forests, grasslands, wetlands, coastal and marine ecosystems and desert ecosystems which harbors and sustain massive components of biodiversity.

Chhattisgarh is gifted with the most pristine and abundant set of natural resources in the country. Mountain, Plateau, and Plains eco-systems constitute roughly a third each of its physiography. Dense,

green, and untouched, its forests are also the source of major rivers like Mahanadi, Narmada, Indrāvati, and an exotic flora-fauna.

Flora

The floral species found in around the Project area are reported below:

Flora Species

Sl.	Botanical Name	Vernacular Name	Occurrence
I.	**Trees**		
1.	*Acacia nilotica*	Babool	Very Frequent
2.	*Acacia leucophloea*	Reunjha	Frequent
3.	*Acacia catechu*	Khair	Frequent
4.	*Aegle marsupium*	Bel	Occasionally
5.	*Azadirachta indica*	Neem	Very Frequent
6.	*Albizzia procera*	Safed sirish	Very Frequent
7.	*Albizzia lebbeck*	Kala sirish	Very Frequent
8.	*Ailanthus excelsa*	Maharukh	Very Frequent
9.	*Butea monosperma*	Palash	Occasionally
10.	*Cassia fistula*	Amaltas	Frequent
11.	*Careya arborea*	Kumbhi	Occasionally
12.	*Diospyros melanoxylon*	Tendu	Abundant
13.	*Emblica officinalis*	Amla	Occasionally
14.	*Eucalyptus sp*	Nilgiri	Frequent
15.	*Ficus glomerata*	Gular	Frequent
16.	*Lagerstroemia parviflora*	Senha	Frequent
17.	*Leucaena leucocephala*	Subabul	Abundant
14.	*Mangifera indica*	Aam	Frequent
15.	*Madhuca indica*	Mahua	Occasionally
16.	*Shorea robusta*	Sal	Occasionally
17.	*Syzygium cumini*	Jamun	Frequent
18.	*Terminalia arjuna*	Arjun	Abundant
19.	*Terminalia tomentosa*	Saja	Frequent
20.	*Tamarindus indica*	Imli	Occasionally
21.	*Tactona grandis*	Sagun	Occasionally
22.	*Zyziphus jujuba*	Ber	Abundant
II.	**Herbs and Shrubs**		
23.	*Achyranthes aspera*	Apmarga	Very Frequent
24.	*Asparagus racemosus*	Satavari	Occasionally
25.	*Argemone mexicana*	Satyanashi	Abundant

26.	*Abrus precatorius*	Gunja	Abundant
27.	*Careya herbacea*	Chhoti kumbhi	Occasionally
28.	*Calotropis procera*	Ark	Frequent
29.	*Datura metel*	Dhatura	Occasionally
30.	*Ipomoea batata,*	Besharam	Occasionally
31.	*Lantana camara,*	Raimunia	Frequent
32.	*Sida acuta*	Baraira/Bala	Occasionally
33.	*Solanum surattense*	Mokoi	Occasionally
34.	*Urena lobata*	Lotloti	Occasionally

Fauna

The faunal species found in around the Project area are reported below:

Fauna Species

MAMMALS		
Latin name	**Common name**	**WPA Schedule**
Bandicota indica	Large bandicoot Rat	V
Funambulus palmarum	Three striped squirrel	IV
Herpestes edwardsi	Indian grey mongoose	IV
Lepus nigricollis	Indian hare	IV
Mus booduga	Common Indian field mouse	V
Mus musculus	Home Mouse	V
Nosokia indica	Bandicoot rat	V
Rattus rattus	Common Indian rat	V
Suncus murinus	House shrew	V
AMPHIBIANS		
Bufo melanostictus	Common toad	IV
Fejervarya limnocharis	Rice field frog	IV
Hoplobatrachus tigerinus	Indian Bull frog	IV
Rana cyanophlyctis	Skipper frog	IV
Hyla arborea	Tree frog	IV
Polypedates maculatus	Common tree frog	IV
REPTILES		
Bungarus caeruleus	Common Indian Krait	IV
Chameleo zeylanicus	Chameleon	IV
Chrysopelea taprobanica	Tree Snake	IV
Calotes versicolor	Garden lizard	IV
Dryphis nasutus	Whip Snake	IV

Eutropis carinata	Indain grass Skink	IV
Eutropis multifasciata	Common skink	IV
Hemidactylus flaviviridis	Indian wall lizard	IV
Ptyas mucosa	Dhaman / Indian Rat snake	IV
Typhlops diardii	Giant Blind Snake	IV
BIRDS		
Acridotheris tristis	Common myna	IV
Actitis hypoleucos	Common Sandpiper	IV
Aegithinia tiphia	Common lora	IV
Artamus fuscus	Ashy Woodswallow	IV
Bubulcus ibis	Cattle Egret	IV
Caprimulgus affinis	Savanna Nightjar	IV
Chalcophaps indica	Emerald Dove	IV
Charadrius dubius	Little Ringed Plover	IV
Charadrius hiaticula	Common Ringed Plover	IV
Columba livia	Blue rock pigeon	IV
Coracias benghalensis	Indian roller	IV
Latin name	**Common name**	**WPA Schedule**
Corvus splendens	House crow	V
Coturnix coturnix	Common Quail	IV
Cuculus canorus	Common Cuckoo	IV
Cuculus micropterus	Indian Cuckoo	IV
Cypsiurus balasiensis	Asian Palm Swift	IV
Dendrocitta vagabunda	Indian tree pie	IV
Dendrocopus marhatensis	Maratha Woodpecker	IV
Egretta garzetta	Little egret	IV
Elanus caeruleus	Black-winged Kite	IV
Eudynamys scolopaceus	Common Koel	IV
Falco tinnunculus	Common Kestrel	IV
Halcyon pileata	Black-capped Kingfisher	IV
Halcyon smyrnensis	White-Breasted King fisher	IV
Haliastur indus	Brahminy Kite	IV
Hierococcyx varius	Common Hawk Cuckoo	IV
Himantopus himantopus	Black-winged Stilt	IV
Hydrophasianus chirurgus	Pheasant-tailed Jacana	IV
Ictinaetus malaiensis	Black Eagle	IV
Lalage melanoptera	Black-headed Cuckoo	IV

Lanius cristatus	Brown Shrike	IV
Merops orientalis	Little Green Bee Eater	IV
Microcarbo niger	Little Cormorant	IV
Milvus migrans	Common Black kite	IV
Motacilla alba	White wagtail	IV
Passer domesticus	House sparrow	IV
Perdicula asiatica	Bush quail	IV
Pericrocotus cinnamomeus	Small Minivet	IV
Pericrocotus roseus	Rosy Minivet	IV
Psilopogon haemacephalus	Coppersmith Barbet	IV
Psittacula cyanocephala	Blossom headed Parakeet	IV
Pycnonotus cafer	Red-vented bulbul	IV
Rhipidura albicollis	White-throated Fantail	IV
Saxicolodies fulicata	Indian robin	IV
Streptopelia capicola	Ring-necked dove	IV
Streptopelia chinensis	Spotted dove	IV
Streptopelia tranquebarica	Red Collared Dove	IV
Streptopelia tranquebarica	Spotted-necked Dove	IV
Sturnus contra	Pied myna	IV
Butterflies		
Precis lemonias lemonias	Lemon pansy	IV
Precis hierta hierta	Yellow Pansy	IV
Latin name	**Common name**	**WPA Schedule**
Tros aristolochiae	Common rose	IV
Euploea corecor	Common Crow	IV
Dananus aglea	Glassy Blue Tiger	IV
Precis orithya	Blue pansy	IV
Neptis hylas	Common sailor	IV
Papilio demoleus	Lime butterfly	IV
Catopsilia crocale	Common emigrant	IV
Other insects		
Anax imperator	Emperor Dragonfly	Not listed
Tettigonia viridissima	Common Grasshopper	Not listed
Hieroglyphus banian	Rice grasshopper	Not listed
Pecilocerus pictus.	Common painted	Not listed
Nephotettix apicalis	Paddy Jassids	Not listed
Hyblea purea	Skeletonizer or Teak	Not listed

Spodoptera mauritia	DSwefoliaarmitnorg caterpillar	Not listed
Rhopalosiphum maidis	Aphids	Not listed

It is also evident from the lists that there were no endemic or endangered species of flora and fauna around the Project site.

Forest Area and Land Use

Chhattisgarh was carved out of Madhya Pradesh in the year 2000. It covers an area of 1,35,192 sq km, which is 4.11% of the geographical area of the country. The State is bordered by the Madhya Pradesh in the northwest, Uttar Pradesh in the north, Jharkhand in the northeast, Maharashtra in the southwest, Telangana in the south and Odisha in the southeast. The State falls under East Deccan physiographic zone and can be divided into three agro-climatic zones, viz. the Chhattisgarh Plains, the Northern Hills of Chhattisgarh and the Bastar Plateau. The land use pattern of State of Chhattisgarh is presented below:

Land Use Pattern – State of Chhattisgarh

Land Use Type	Area (in 000' ha)	Percentage
Geographical Area	13519	
Reporting area for land utilization	13790	100
Forests	6316	45.8
Not available for land cultivation	1029	7.47
Permanent pastures and other grazing lands	887	6.43
Land under misc. tree crops and groves	1	0.01
Culturable wasteland	351	2.54
Fallow land other than current fallows	258	1.87
Current fallows	267	1.94
Net area sown	4681	33.94

Source: Land Use Statistics, Ministry of Agriculture, GoI, (2014-15)

As per the Champion & Seth Classification of Forest Types (1968), the forests in Chhattisgarh belong to two Type Groups i.e Tropical Moist Deciduous Forests and Tropical Dry Deciduous Forests which are further divided into 12 Forest Types. The State's two main tree species are Sal (Shorea robusta) and Teak (Tectona grandis). Other major species are Bija (Pterocarpus marsupium), Saja (Terminalia tomentosa), Dhavdha (Anogeissus latifolia), Mahua (Madhuca indica), Tendu (Diospyros melanoxylon) and bamboo (Dendrocalamus strictus) etc.
District wise forest cover of Chhattisgarh is presented below.

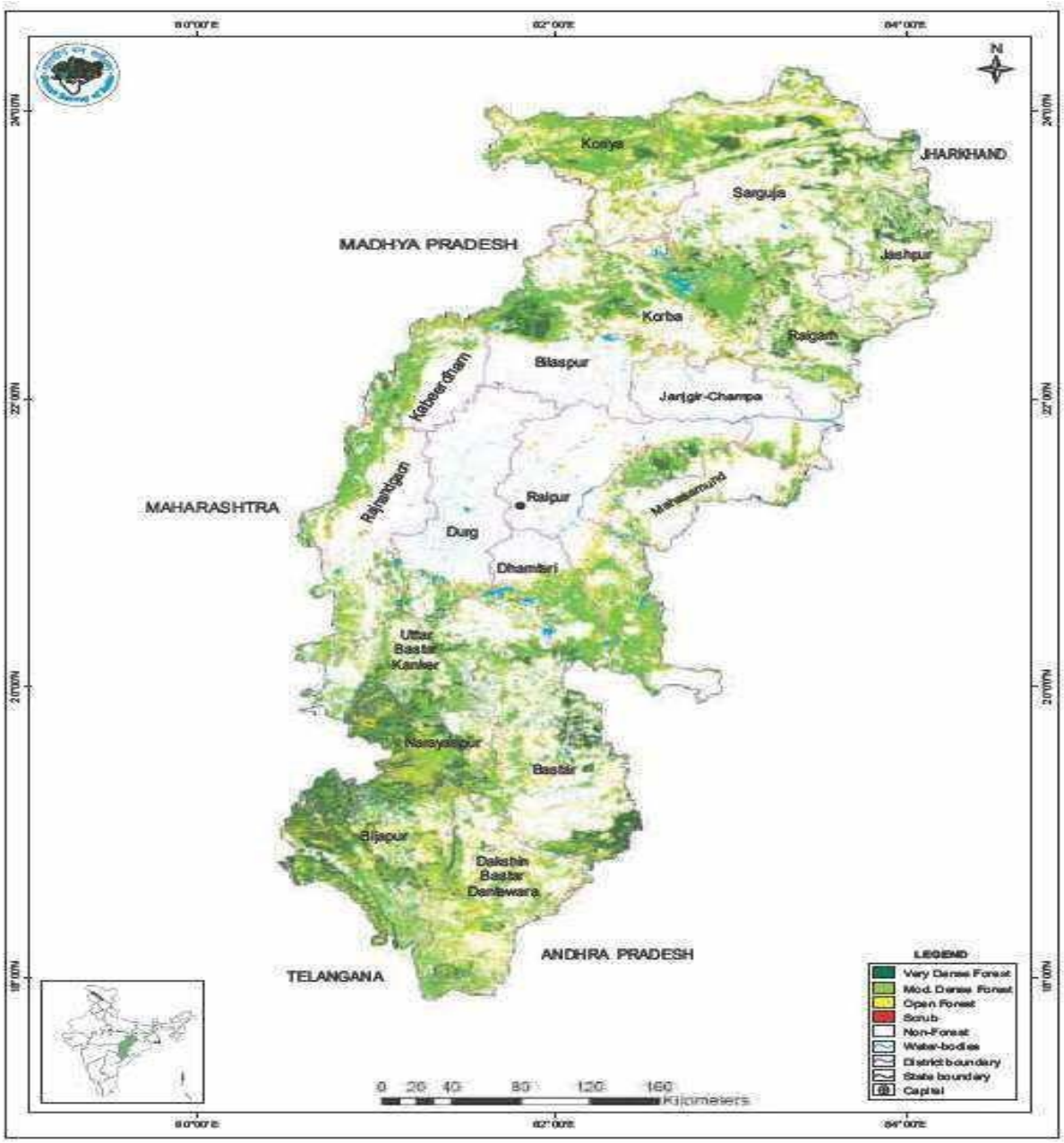
District wise Forest Cover in Chhattisgarh

District	Geographical Area (GA)	Very Dense Forest	Mod. Dense Forest	Open Forest	Total	% of of GA	Scrub
Bastar	10,470	954.84	2,117.50	1,160.52	4,232.86	40.43	34.87
Bijapur	8,530	2,048.29	2,926.49	1,537.37	6,512.15	76.34	1.98
Bilaspur	8,272	395	1,539.19	522.7	2,456.89	29.7	48.3
Dakshin Bastar Dantewada	8,298	250.63	2,305.07	1,907.45	4,463.15	53.79	26.34
Dhamtari	4,084	49	1,385.52	424.6	1,859.12	45.52	8.91
Durg	8,535	44	512.04	220.35	776.39	9.1	20.48
Janjgir-Champa	3,853	2	22.13	125.76	149.89	3.89	13.98
Jashpur	5,838	225.36	1,316.71	573.7	2,115.77	36.24	21
Kabeerdham	4,235	79.09	1,083.84	385.79	1,548.72	36.57	12.75
Korba	6,598	203	2,313.62	877.08	3,393.70	51.44	92.03

Koriya	6,604	78.53	2,579.90	1,438.18	4,096.61	62.03	66.69
Mahasamumd	4,790	4	515.22	425.75	944.97	19.73	27.38
Naraynpur	4,653	1,127.55	1,690.63	978.12	3,796.30	81.59	19.22
RaigarhT	7,086	237.96	1,591.03	791.34	2,620.33	36.98	25.18
Raipur	12,383	141.83	2,413.04	1,075.05	3,629.92	29.31	54.43
Rajnandgaon	8,070	31	1,749.51	754.67	2,535.18	31.41	50.13
Surguja	15,732	706.72	3,930.64	2,445.25	7,082.61	45.02	77.86
Uttar Bastar Kanker	7,161	488.92	2,205.48	701.61	3,396.01	47.42	7.99
Grand Total	**1,35,192**	**7,067.72**	**32,197.56**	**16,345.29**	**55,610.57**	**41.14**	**609.52**

Source: India State of Forest Report, 2019

Forest cover map of Chhattisgarh is placed below.



Source: India State of Forest Report, 2019

Figure 5: Forest Cover Map of Chhattisgarh

Ecological Sensitive Areas

As per Protected Area Gazette Notification Database, there are 03 National Parks and 11 Wildlife Sanctuary located in the State of Chhattisgarh.

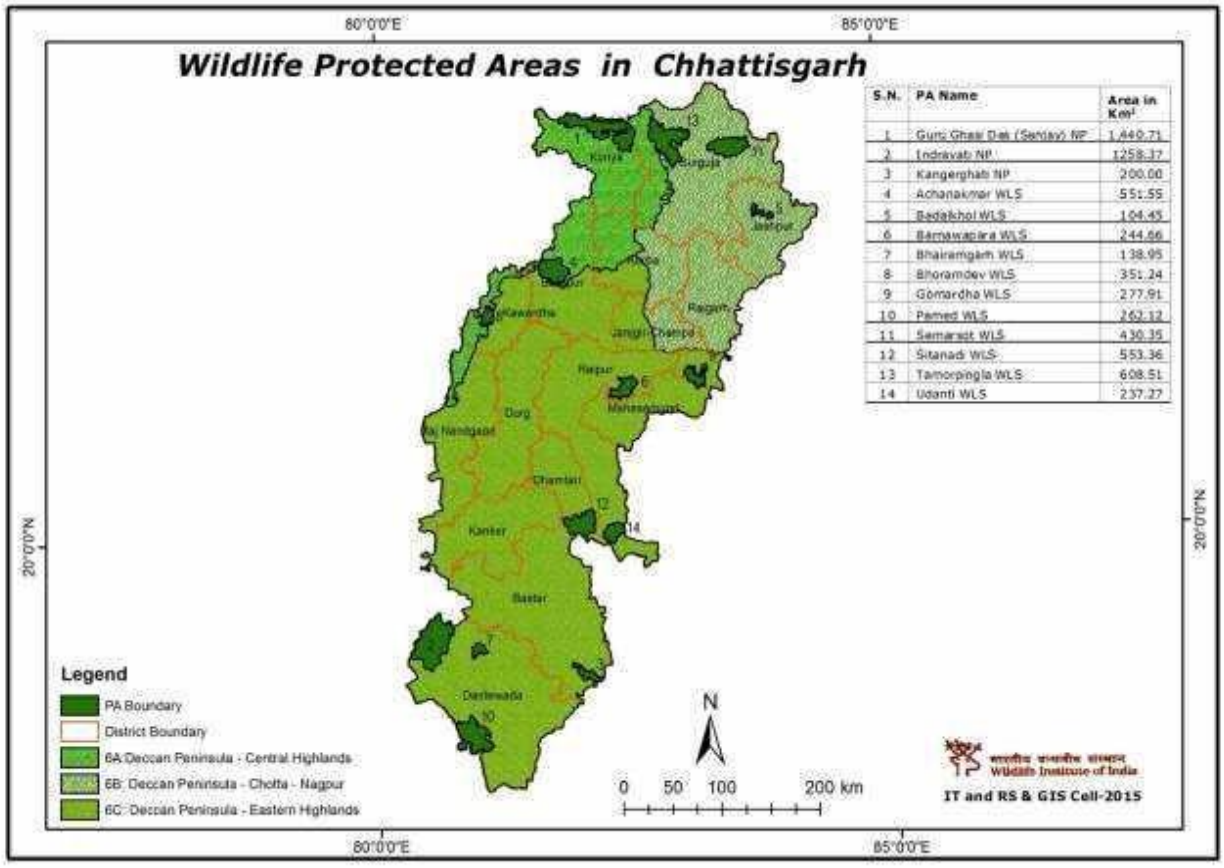


Figure 6: Wildlife Protected Areas in Chhattisgarh

Out of the above 14, no protected area is situated in the Rajnandgaon district. Further, there are 03 tiger reserves, 02 elephant reserve and 04 important bird areas in Chhattisgarh, however, all are located outside the Rajnandgaon district.

Socio-Cultural Environment

Rajnandgaon district is situated in the western part of newly created Chhattisgarh state, the district lies between latitude 20°70‟- 22°29‟ North latitude and 80°23‟ to 81°29‟ East longitude covering an area of 8172.33 sq.kms. Its greatest length in the north-south is about 185 kms, while its width in the east-west extends about 80 kms. It is surrounded by Kawardha district in north, Durg district in the east; Bastar district is the in south and Garchiroli, Bhandara (Maharashtra) and Balaghat (Madhya Pradesh) districts in the west. The District headquarter Rajnandgaon is on the Mumbai - Howrah line of south-eastern railways. The National Highway no. 6 (Great Eastern Road) (AH 46) also passes through the town of Rajnandgaon. The nearest airport to the District is at Mana (Raipur), about 80 kms away. All-important places within the district are well connected by a network of the state highways and all-weather roads. The district is divided into 8 tehsils and 9 blocks for its administrative functioning and revenue collections. It is further divided in Nagar Palik Nigam, 2 Nagar Palika , 5 Nagar Panchayat , Janpad Panchayat , 692 Gram Panchayat. Rajnandgaon town (N 21°5’ E 81°2’) is the district Headquarters. Profile of the District Rajnandgaon as per Census – 2011 is present below:

District Profile - Rajnandgaon		
Number of Villages	Total	1,653
	Inhabited	1,600
	Uninhabited	53
Number of Towns	Statutory	8
	Census	-

	Total		8
Number of Households	Normal		3,17,515
	Institutional		587
	Houseless		386
Population	Total	Persons	15,37,133
		Males	7,62,855
		Females	7,74,278
	Rural	Persons	12,64,621
		Males	6,26,212
		Females	6,38,409
	Urban	Persons	2,72,512
		Males	1,36,643
		Females	1,35,869
Sex Ratio		Total	1,015
(Number of females per 1000 males)		Rural	1,019
		Urban	994
Literates	Persons		75.96
(in percentage)	Males		85.4
	Females		66.7
Scheduled Castes	Persons		1,56,623
	Males		76,979
	Females		79,644
Scheduled Tribes	Persons		4,05,194
	Males		1,98,032
	Females		2,07,162
Workers and Non-Workers			
Total Workers (Main and Marginal)	Persons		8,00,092
	Males		4,36,611
	Females		3,63,481
(i) Main Workers	Persons		5,95,959
	Males		3,58,946
	Females		2,37,013
(ii) Marginal Workers	Persons		2,04,133
	Males		77,665
	Females		1,26,468
Non-Workers	Persons		7,37,041
	Males		3,26,244
	Females		4,10,797
Category of Workers (Main & marginal)			
(i) Cultivators	Persons		3,42,116
	Males		1,82,739
	Females		1,59,405
(ii)Agricultural Labourers	Persons		2,90,108
	Males		1,25,229
	Females		1,64,879
	Persons		10,847

(iii)Workers in household industry		Males		6,403
		Females		4,444
(iv) Other Workers		Persons		1,57,021
		Males		1,22,240
		Females		34,781
Source of household lighting (% of household)		Electricity		87.31
		Kerosene		11.89
		Solar		0.35
		Other Oil		0.16
		Any Other		0.07
		No Lighthing		0.21
Main Source of Drinking Water (in %)		Tapwater from treated source		14.3
		Tapwater from un-treated source		8.76
		Covered well		0.78
		Un-covered well		8.35
		Handpump		62.99
		Tubewell/Borehole		4.35
		Spring		0.08
		River/ Canal		0.13
		Tank/ Pond/Lake		0.03
		Other sources		0.23
Percentage Distribution of Household living in Pemanent, Semi-Permanent and Temporary Houses		Total	Permanent	26.23
			Semi-Permanent	67.65
			Temporary	5.93
		Rural	Permanent	17.54
			Semi-Permanent	76.24
			Temporary	6.1
		Urban	Permanent	64.28
			Semi-Permanent	30
			Temporary	5.18
Type of Latrine Facility (% of Household)	Total	Flush / Pour latrine	Piped Sewer System	0.96
			Septic Tank	14.43
			Other System	3.25
		Pit Latrin	With slab/Ventilated improved pit	3.21
			Without slab/open pit	3.01
		Night soil disposed into open drain		0.06
		Service Latrine	Night soil removed by human	0
			Night soil removed by animal	0.06
		No Latrin within premises	Public Latrine	1.63
			Open	73.39
	Rural	Flush / Pour latrine	Piped Sewer System	0.57
			Septic Tank	6.87
			Other System	3.73
		Pit Latrin	With slab/Ventilated improved pit	3.68
			Without slab/open pit	3.6
		Night soil disposed into open drain		0.02
		Service Latrine	Night soil removed by human	0
			Night soil removed by animal	0.06

		No Latrin within premises	Public Latrine	0.18
			Open	81.28
	Urban	Flush / Pour latrine	Piped Sewer System	2.69
			Septic Tank	47.56
			Other System	1.18
		Pit Latrin	With slab/Ventilated improved pit	1.13
			Without slab/open pit	0.4
		Night soil disposed into open drain		0.19
		Service Latrine	Night soil removed by human	0
			Night soil removed by animal	0.04
		No Latrin within premises	Public Latrine	7.99
			Open	38.82
Type of drainage connectivity for waste water outlet (% of household)	Total	Closed Drainage		3.56
		Open Drainage		19.21
		No Drainage		77.23
	Rural	Closed Drainage		2.36
		Open Drainage		9.48
		No Drainage		88.17
	Urban	Closed Drainage		8.81
		Open Drainage		61.88
		No Drainage		29.31
Avilabilty of Kitchen Facility (% of household)	Total	Cooking inside house	Has Kitchen	64.26
			Does not have kitchen	31.68
		Cooking outside house	Has Kitchen	1.53
			Does not have kitchen	2.35
		No cooking		0.19
	Rural	Cooking inside house	Has Kitchen	61.85
			Does not have kitchen	33.94
		Cooking outside house	Has Kitchen	1.61
			Does not have kitchen	2.47
		No cooking		0.14
	Urban	Cooking inside house	Has Kitchen	74.82
			Does not have kitchen	21.77
		Cooking outside house	Has Kitchen	1.19
			Does not have kitchen	1.85
		No cooking		0.39
Avilabilty of Fuel Used for Cooking (% of household)	Total	Firewood		88.4
		Crop Residue		0.51
		Cowdung Cake		0.86
		Coal/lignite/charcoal		0.92
		Kerosene		0.6
		LPG/PNG		8.39
		Electricity		0.05
		Bio-gas		0.05
		Any other		0.04
		No Cooking		0.19
	Rural	Firewood		96.68
		Crop Residue		0.49
		Cowdung Cake		0.95
		Coal/lignite/charcoal		0.19
		Kerosene		0.18
		LPG/PNG		1.23
		Electricity		0.05
		Bio-gas		0.05
		Any other		0.03

		No Cooking	0.14
	Urban	Firewood	52.14
		Crop Residue	0.57
		Cowdung Cake	0.44
		Coal/lignite/charcoal	4.13
		Kerosene	2.44
		LPG/PNG	39.78
		Electricity	0.03
		Bio-gas	0.04
		Any other	0.05
		No Cooking	0.39

Land requirement for the project

The project is proposed to be developed on Revenue Waste Land allocated by State Government for the development of Solar Park. The overall land initially identified for the proposed project is around 405 hectares, based on the contour maps developed from Digital Elevation Map of the site suitable areas for the project has been identified marked and has been mentioned in the below table. Topography survey for the said land parcels has also been carried out. The location of different plots are identified and same was marked in Google Maps and shown in Figure 7-1(a) and (b).

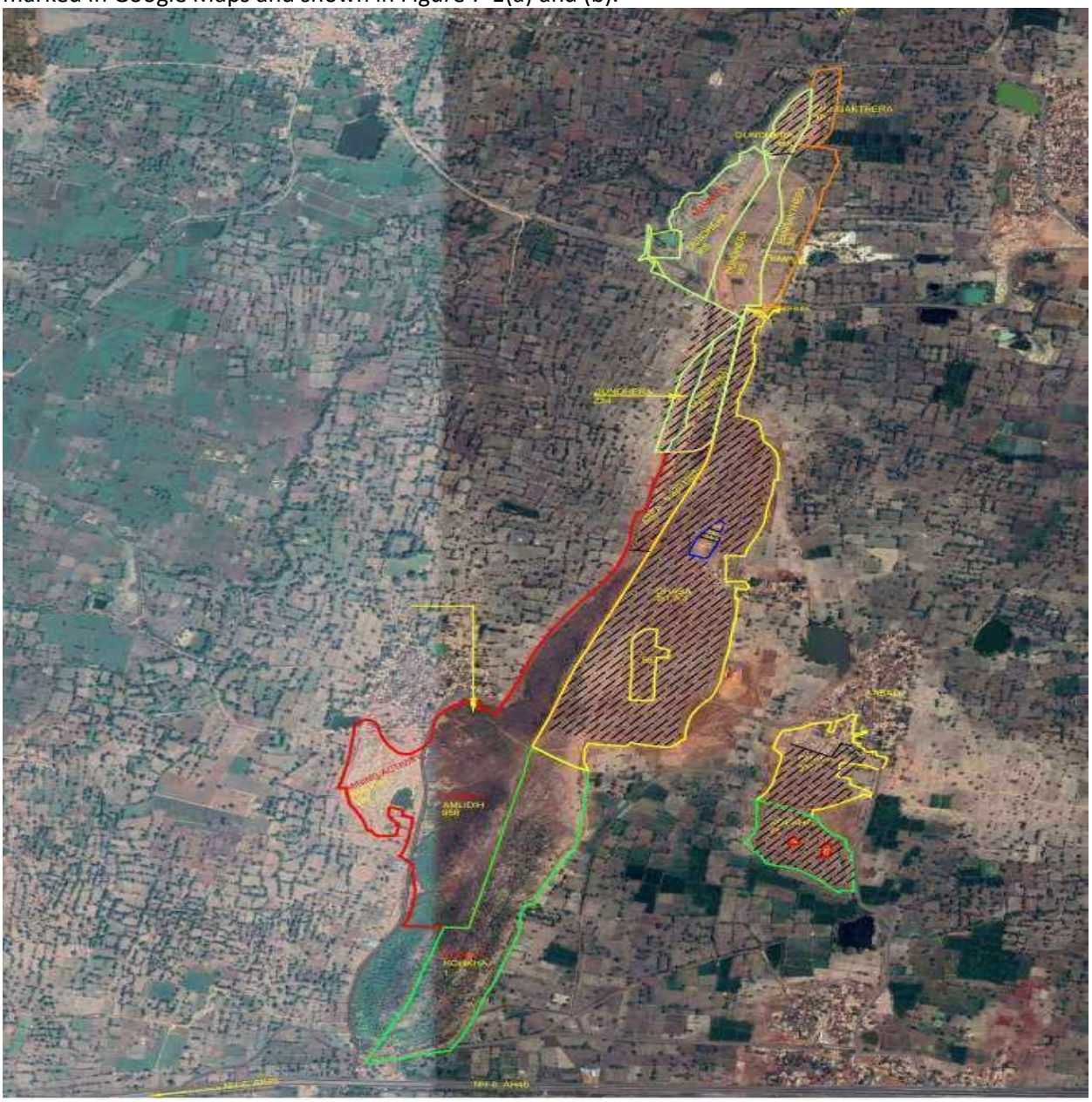


Figure 7-1(A): Indicative Layout of the site superimposed on Village Map

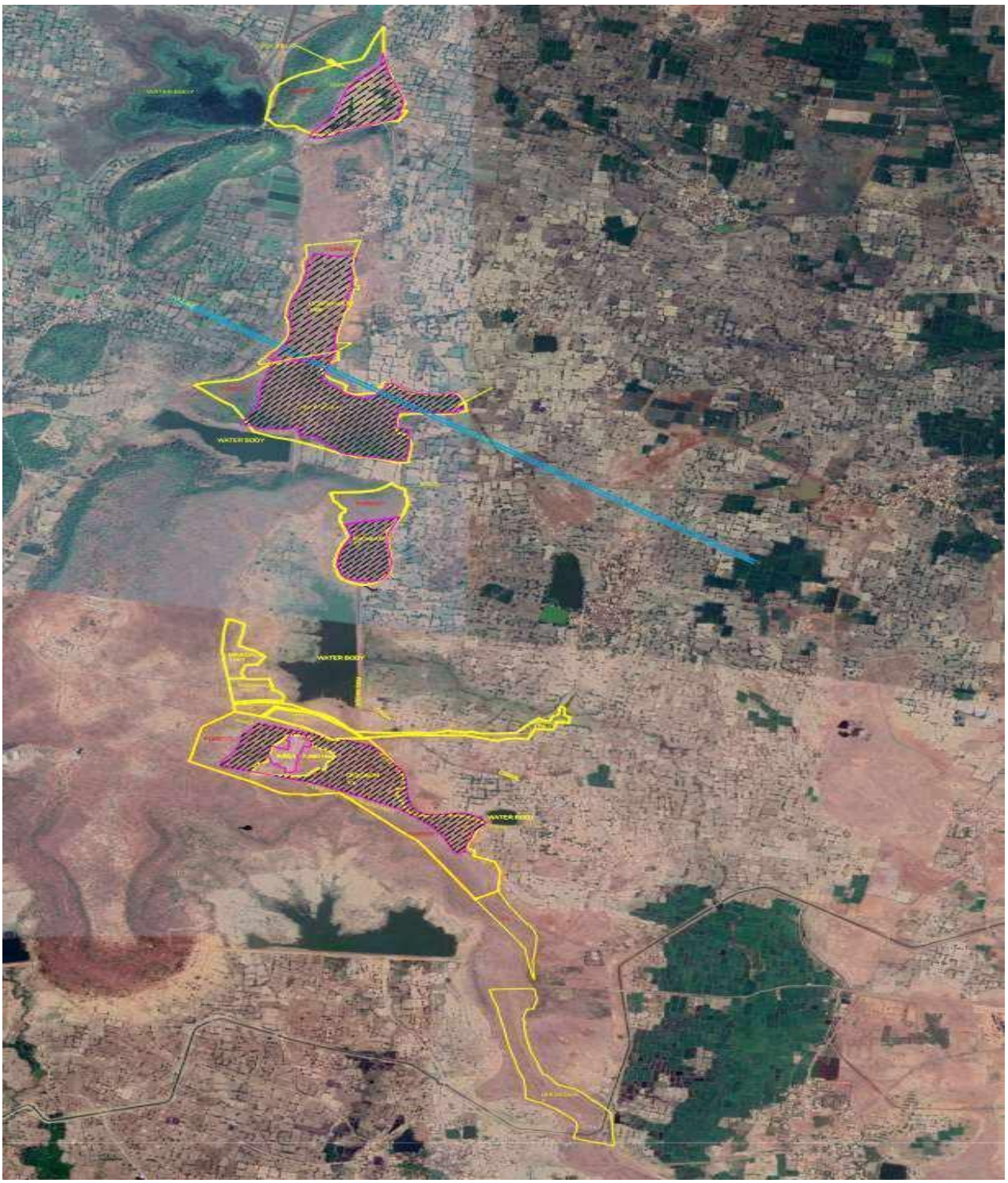


Figure 7-1(B): Indicative Layout of the site superimposed on Village Map

The entire 378 ha of land that has been transferred to the project is government land as shown in the maps above. The project however will require 200 ha. Process of conducting the topography survey is on. After the conclusion of the topographic survey. During finalization of the tentative project boundary, due care shall be taken to avoid tree cutting, acquisition of private land, gothan area, any damage to property of cultural importance, community building, schools etc.

The proposed project falls under the villages listed in below table. It is also proposed to construct a transmission line of length 33 km approx. the exact route shall be determined at later stage by conducting a detailed route survey analysis.

List of Project Affected Villages

S.NO	VILLAGE NAME	TEHSIL	AREA AS PER RECORD (P-II) (Ha)
I	RENGAKATHERA	Dongargarh	3.22
		Dongargarh	6.13
SUB- TOTAL (I)			**9.35**
II	DUNDHERA	Dongargarh	9.22
		Dongargarh	10.78
		Dongargarh	2.25
		Dongargarh	2.55
		Dongargarh	5.99
SUB- TOTAL (II)			**30.79**
III			40.56
AMLIDEEH			
Dongargarh			
SUB- TOTAL (III)			**40.56**
IV	DHABA	Dongargaon	0.24
		Dongargaon	39.7
		Dongargaon	10.93
		Dongargaon	2.58
		Dongargaon	9.59
SUB- TOTAL (IV)			**63.04**
V	KOHKHA	Dongargaon	36.3
		Dongargaon	7.8
		Dongargaon	0.41
SUB- TOTAL (V)			**44.5**
VI	ODARBANDH	Dongargaon	30.44
		Dongargaon	22.89
SUB- TOTAL (VI)			**53.34**
VII	TOLAGAON	Dongargaon	51.09
		Dongargaon	
SUB- TOTAL (VII)			**51.09**
VIII	MARGAON	Dongargaon	19.67
		Dongargaon	6.62
		Dongargaon	4.05
		Dongargaon	2.33
		Dongargaon	4.87
		Dongargaon	2.7
SUB- TOTAL (VIII)			**40.23**
IX	GIRGAON	Dongargaon	52.88
SUB- TOTAL (IX)			**52.88**
X	GUGHWA	Dongargaon	19.24
		Dongargaon	
SUB- TOTAL (X)			**19.24**
Grand Total (I+II+III+IV+V+VI+VII+VIII+IX+X)			**405.022**

Demographic Profile of Affected Villages

The details of the 10 Project Affected Villages, as per Census – 2011 data is presented below:

Tehsil	Dongargarh	Dongargaon

Village		Renga kathera	Dundera	Amlidih	Dhaba	Kohkha	Odarbandh	Tolagaon	Margaon	Girgaon	Gughwa
Number of Households		356	370	212	276	283	83	113	332	167	97
Population	Total	1772	1917	1081	1,284	1,334	409	585	1,769	841	480
	Males	899	951	546	648	639	202	286	848	433	232
	Females	873	966	535	636	695	207	299	921	408	248
Literates	Total	1098	1162	690	879	926	277	434	1,112	616	309
	Males	649	661	396	500	492	155	227	614	342	163
	Females	449	501	294	379	434	122	207	498	274	146
Scheduled Castes	Total	88	100	90	88	212	5	145	338	11	83
	Males	50	54	45	36	102	3	78	165	6	36
	Females	38	46	45	52	110	2	67	173	5	47
Scheduled Tribes	Total	490	578	305	527	363	202	83	506	322	78
	Males	249	277	157	273	175	92	39	250	165	37
	Females	241	301	148	254	188	110	44	256	157	41
Workers and Non-Workers											
Total Workers	Total	1093	1129	623	681	747	277	392	848	460	277
(Main and	Males	569	565	319	364	372	134	192	484	244	137
Marginal)	Females	524	564	304	317	375	143	200	364	216	140
(i) Main Workers	Total	915	1042	579	277	318	229	330	802	278	89
	Males	476	537	296	184	173	113	166	464	240	70
	Females	439	505	283	93	145	116	164	338	38	19
Category of Workers (Main)											
(a) Cultivators	Total	219	753	401	60	294	46	160	483	208	54
	Males	164	373	201	55	157	18	78	276	192	44
	Females	55	380	200	5	137	28	82	207	16	10
(b) Agricultural Labourers	Total	508	240	155	7	14	162	152	264	36	24
	Males	147	132	79	2	7	82	76	136	18	20
	Females	361	108	76	5	7	80	76	128	18	4
(c) Workers in household industry	Total	-	3	-	7	-	4	-	-	1	2
	Males	-	1	-	4	-	2	-	-	1	2
	Females	-	2	-	3	-	2	-	-	-	-
(d) Other	Total	188	46	23	203	10	17	18	55	33	9
Workers	Males	165	31	16	123	9	11	12	52	29	4
	Females	23	15	7	80	1	6	6	3	4	5
(ii) Marginal	Total	178	87	44	404	429	48	62	46	182	188
Workers	Males	93	28	23	180	199	21	26	20	4	67
	Females	85	59	21	224	230	27	36	26	178	121
Category of Workers (Marginal)											
(a) Cultivators	Total	2	43	1	2	96	22	37	27	172	13
	Males	1	6	1	1	49	10	15	9	4	7
	Females	1	37	-	1	47	12	22	18	168	6
(b)	Total	171	40	42	312	333	25	24	17	7	162

Agricultural	Males	89	20	21	135	150	10	11	9	-	49
Labourers	Females	82	20	21	177	183	15	13	8	7	113
(c) Workers in household industry	Total	-	3	-	-	-	1	-	-	-	8
	Males	-	1	-	-	-	1	-	-	-	7
	Females	-	2	-	-	-	-	-	-	-	1
(d) Other	Total	5	1	1	90	-	-	1	2	3	5
Workers	Males	3	1	1	44	-	-	-	2	-	4
	Females	2	-	-	46	-	-	1	-	3	1
Non-Workers	Total	679	788	458	603	587	132	193	921	381	203
	Males	330	386	227	284	267	68	94	364	189	95
	Females	349	402	231	319	320	64	99	557	192	108

Annexure 2: Applicability of IFC Performance Standard & WB Operational Policies /Bank Procedures

Title of Performance Standard	Performance Standard (PS) requirements in brief	Applicability to project (Compliance)	Requirements
Performance Standard (PS) 1: Assessment and Management of Environmental and Social Risks and Impacts	Identify and evaluate Environmental and Social risks and conduct an environmental and social impact assessment (ESIA) of the sub-projects.	The PS 1 is applicable to projects with environment and/or social risks and/or impacts. The Sub-project will have environmental and social impacts resulting generation of noise, construction activities etc. PS 1 is therefore applicable for the project	IREDA has developed an Environmental and Social Management System (ESMS). Borrower/Project Developer is required to fulfil the following requirements as per the system procedure mentioned in ESMS: • Compliance of Legal and Other Requirements; • Grievance Redressal Mechanism; • Livelihood restoration plan; • Indigenous People Plan; • Labour Management Plan; • Stakeholder engagement plan
	Establish Environmental and Social Management Plans in reference to findings of the ESIA and consultation with affected communities		
	Adopt a mitigation hierarchy to anticipate and avoid the risks through applicable laws, regulations and the requirements of these Performance Standards		
	Provide organizational capacity and contractor / employee training to enable project to achieve continuous environmental and social performance		
	Establish and maintain a timely process of affected community engagement throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated		
	Establish procedures to monitor and measure the effectiveness of the environmental and social management program, including internal and external reporting of the program's effectiveness to the project's senior management, commensurate with the concerns of the affected communities and disclosure of such plans		
PS 2: Labour and Working Conditions	Provide alternative analysis of retrenchment on workers before implementing any collective dismissals	Prior to implementing the project	Undertake retrenchment plan to avoid impact on workers
	Adopt and implement Human Resources Policy consistent with the requirements of this Standard that informs employees of their rights under national labour and employment laws	Applicable during construction and operation phase	The contractors should have well framed HR policies. The workers/labours engaged by the contractors should be informed about their rights under national labour and employment laws.
	Provide workers with documented information that is clear and understandable regarding their rights under national labour and employment law	Applicable during construction and operation phase	Engagement of labours should be supervised so that the engagement of workers is in accordance to applicable rules and regulations. Equal opportunity should be given to both

			men and women depending on their skills and capacity wages, work hours and other benefits should be as per the national labour and employment Laws.
	Provide a mechanism for workers to raise workplace concerns	Applicable during construction and operation phase	Grievance Redressal Mechanism (GRM) should be in place, the same will be implemented at project level and also form a separate committee to deal with grievances of contractor. This is applicable both during construction and operation phase and should be supervised by Borrower
	Provide workers with a safe and healthy work environment, considering risks inherent to the project sector	Applicable during construction and operation phase	Borrower or their contractor should follow its EHS policy while operating onsite. In absence of EHS policy of contractor, ESMS policies of IREDA will be applicable or their contractor should appoint an EHS manager onsite, who has well defined roles and responsibilities at all the RE power site
PS 3: Resource Efficiency & Pollution Prevention		In case the solar panel contain any hazardous material, chances of ground water and soil contamination cannot be ruled out. Waste oil and other hazardous chemicals released from construction activities may result in contamination of ground and nearby surface water. There is risk of contamination of groundwater due to leaching of contaminants during construction activity. During construction phase water may be sourced through tanker water supply and operation phase water may be sourced through the same means to avoid extraction of ground water, if feasible.	In the event, project proponent planned for installation of borewell for ground water extraction in the operational phase, permission from regulatory authority shall be obtained prior to construction of borewell. The project is expected to contribute to significant GHG avoidance. Temporary impacts on ambient air quality and noise levels may be expected during construction phase. Developer should implement measures during construction: management of excavated earth and construction rubble; and minimization of fugitive dust emissions. Further, Borrower should ensure through its contractors that other wastes (packing material, metal, debris, cement bags, drums/cardboards etc.) are collected, stored and disposed of to re-users or in appropriate authorized debris disposal areas.

			During the construction phase developer should ensure no material impact on groundwater quality. The sub-contractors should ensure that the water made available to workers and employees' meets national potable water quality norms. Appropriate facilities for collection, treatment and disposal of sewage (septic tank and soak pit) should be provided both during construction and operation phases.
	The project proponent should ensure that adequate control techniques are provided to minimize emissions or achieve a pre- established performance level and minimize pollution from project activities. The client will avoid the release of pollutants or, when avoidance is not feasible, minimize and/or control the intensity and mass flow of their release.	During the construction phase, the vehicles involved for hauling of equipment's and materials to the project site may increase the pollution level and dust in the air.	Project developer should ensure water sprinkling on the unpaved roads to reduce dust emission. All the project vehicles should have valid PUC.
	The client will implement technically and financially feasible and cost-effective measures for improving efficiency in its consumption of energy, water, as well as other resources and material inputs, with a focus on areas that are considered core business activities.	During construction and operation phase.	Contractor should plan and implement pollution control measures. Practices like minimal release of waste, safe disposal of waste, wastewater management etc. should be considered in all phases of project life cycle.
PS 4: Community Health, Safety and Security		This Performance Standard is applicable to projects Project activities, equipment, and infrastructure can increase community exposure to risks and impacts. The project wil involve transportation of components such as mounting structures, electrical equipment's, solar modules, which may pose safety risks to the local communities. Considering scale of project substantial movement of heavy vehicles are envisaged.	The Applicability will be limited to construction period with movement of heavy machinery /vehicles. Unskilled labour and security staff should be engaged from local community. Developer through its contractors will try to engage maximum workers from the neighbouring villages. It should be ensured by Developer that the subcontractors use vehicles having valid PUC certificate. Proper signage's should be provided along the access road and project site indicating – Construction in process and other safety alarm signs.
	Evaluation of risks and impacts of the project on health & safety of the affected community during the project lifecycle and establish preventive/mitigation measures to reduce/ minimize the impacts. Disclosure of action plans to	During Construction Phase	The potential occupational hazards arising from the project activities and the impacts on health & safety of the affected community should be identified.

	affected community and the government agency.		
	Design, construct, operate and decommission of Structural elements or components in accordance with good industrial practice to reduce impact on community health & safety.	During Construction Phase	An occupation health safety plan to be formulated. All steps to reduce the impact on the health and safety of the community to minimal to be ensured.
	Avoid and minimize of impacts on the health and safety of the community caused by natural hazards that could arise from the land use changes due to project activities.	During Construction Phase and Operational phase	CSR plan to be implemented by REPPD/REPD/Contractor
	Prevent or minimize the potentials for community exposure to communicable diseases during project activities	During Construction Phase	A management plan to be formulated to address the issue.
PS 5: Land Acquisition and Involuntary Resettlement	Avoidance or at least minimization of involuntary resettlement by exploring alternative project designs balancing environmental, social and economic costs and benefits; and by acquiring land through negotiated Settlements. Compensation and benefits for displaced person as per Performance Standard.	PS 5 is applicable when there is physical and/or economic displacement due to acquisition of land for the project.	
	Disclosure of all relevant information and consultation with affected persons and communities in decision making process related to resettlement. Establish a grievance mechanism to record and resolve communities' concerns and grievances about the relocation (if any) and compensation		
	Avoidance or at least minimization of involuntary resettlement by exploring alternative project designs balancing environmental, social and economic costs and benefits; and by acquiring land through negotiated Settlements.		Depending on the sub-project
	Compensation and benefits for displaced person as per Performance Standard	Applicable in the sub-projects	Depend upon the land procured for the sub-projects
	Disclosure of all relevant information and consultation with affected persons and communities in decision making process related to resettlement.	Applicable to all the sub projects where resettlement taken place	Depend on the sub project that resettlement has taken place due to the project activity or not

	Establish a grievance mechanism to record and resolve communities' concerns and grievances about the relocation (if any) and compensation	During the construction and operation phase	REPPD/REPD has to develope grievance redress mechanism (GRM) which will be implemented in this project.
PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	As a matter of priority, the client should seek to avoid impacts on biodiversity and ecosystem services. When avoidance of impacts is not possible, measures to minimize impacts and restore biodiversity and ecosystem services should be implemented. Given the complexity in predicting project impacts on biodiversity and ecosystem services over the long term, the client should adopt a practice of adaptive management in which the implementation of mitigation and management measures are responsive to changing conditions and the results of monitoring throughout the project's lifecycle.	Avoid ecological sensitive area like National Park and Wildlife sanctuary within the study area (10 km project site).	Significance of wildlife sanctuary or trees depend on the proposed projects.
PS 7: Indigenous Peoples	Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded. Their languages, cultures, religions, spiritual beliefs, and institutions may also come under threat. Therefore, Indigenous Peoples may be more vulnerable to the adverse impacts associated with project development than non-indigenous communities	PS 7 is applicable in Solar, Wind, Hybrid, & floating power projects	As per Census, 2011, Presence of tribal population (Schedule Tribe) depend upon the location of the project.
	Anticipate and avoid adverse impacts of projects on communities of Indigenous peoples	Prior to Implementation of the project	Developer, together with the Affected communities of Indigenous Peoples, will design appropriate mitigation and compensation mechanism to address project impacts
PS 8: Cultural Heritage	Performance Standard 8 recognizes the importance of cultural heritage for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this Performance Standard aims to ensure that clients protect cultural heritage during their project activities.	Depend on the proposed project locations	However, the possibility of chance find cannot be ruled out in future. Chance find Procedure could be formulated under PS 8 in case of discovery of any artefacts and/ or settlement in the future at proximity of the project area. In that case Performance Standard 8 would be applicable

World Bank Operation / Bank Policy			
OP/BP 4.01: Environmental Assessment	The objective of this policy is to ensure that the Bank financed project is environmentally sound and sustainable		Reports required under the Categories- Category A- ESIA & EMP Category B- EMP
OP/BP 4.04: Natural Habitats	The policy prioritises conservation of Natural Habitats for long term project sustainability	Applicable to potential significant loss or degradation	Avoid , minimise or mitigate loss or degradation
OP 4.09: Pest Management	This policy seeks to minimise and manage the environmental and health risks associated with pesticide use and promote and support safe, effective, and environmentally sound pest management	Applicable to project where risky pesticides are being used without following any norms	During implementation, Borrower requests Bank's No-Objection to each substance Avoid pesticides in WHO Classes IA, IB, and II; POP and PIC lists Provide Technical assistance and training in Integrated pest/vector management and Safe pesticide handling
OP 4.10: Indigenous Peoples	The policy aims at restoring the rights and cultural dignity of the indigenous people while ensuring receipt of proper social and economic benefits	Policy applicable where Indigenous people already exist before pre construction or start of any civil works	Developer/Borrower shall prepare report on Indigenous People Plan(IPP), Resettlement action plan (RAP) and Indigenous Peoples Planning Framework (IPPF)
OP/BP 4.11: Physical Cultural Resources	The policy emphasises preservation of cultural property in the project area, restoration of archaeological monuments and unique environmental features	Applicable to the project falls within the area notified by GOI	Seeks to avoid or mitigate adverse impacts on physical cultural resources
OP/BP 4.12: Involuntary Resettlement	The policy objective is to avoid involuntary displacement and resettlement as far as practicable by exploring viable alternatives. It also emphasises approach to improve the living standards of the displaced people, encourages community participation in implementation of resettlement activities and help the affected people regardless of their legal status on title of the land	Involuntary taking of land and other assets (for civil works, commercial agriculture, etc.) and restriction access to natural resources	Physical relocation (when needed), Compensation and assistance for land taken or other assets lost Livelihood restoration; support for alternative livelihoods
OP/BP 4.36 Forests	Realize the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests	Forests policy applies to all types of natural forests, as well as plantation forests Natural Habitats policy applies to all types of natural habitats, including natural forests Both apply to all types of	Avoid any damage to Critical Natural Habitats and Prevent and mitigate damage to natural habitats and biodiversity Meaningful participation of forest dependent communities in natural forest harvesting

		projects that would affect forests and natural habitats, but OP 4.36 has additional requirements for forestry projects	
OP/BP 4.37: Safety of Dams	Ensure adequate safety of dams in projects that involve construction of new dams, or projects that depend upon existing dams for their safe and effective operation and includes water reservoirs as well as mine tailings dams	Project involves construction of new dam(s) or dependent on existing dam	
OP/BP 7.50: Projects on International Waterways	This policy applies to any river, canal, lake, or similar body of water that forms a boundary between, or any river or body of surface water that flows through, two or more states	Applicable to irrigation, flood control, navigation, drainage, water and sewerage, industrial and similar projects that involve the use or potential pollution of international waterways	Detailed design and engineering studies of such projects even when WBG is not financing works
OP/BP 7.60: Projects in Disputed Areas	This policy is concerned with any project in the disputed area/s concerning two countries	Any proposed projects falls within the notified boundary	Required full details of the dispute areas

Annexure 3: Environmental and Social Due Diligence Report

SFG2561

ENVIRONMENTAL & SOCIAL DUE DILIGENCE - 250 MW SOLAR PV PARK (MANDSAUR)









DRAFT REPORT

October 2016

Knight Frank

1505 – 1508, 15th Floor, Tower – B,
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Gurgaon - 122001, Haryana, India

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CHAPTER I.INTRODUCTION

Section 1.01 Program Background

India's power system needs to grow rapidly to fuel the country's economic growth and provide electricity to its growing population. Over the last decade, India's economy expanded at an average annual rate of 7.6 percent, placing it among the top five fastest growing nations in the world. The demand for power is expected to rise to support the growing economy. With about 275,000 megawatts (MW) of installed capacity (as of November 2015), the Indian power system is among the largest in the world, but per capita consumption of electricity is less than one-fourth of the world average. The Government of India (GoI) wants a growing share of the country's electricity generation to come from renewable energy.

World Bank has maintained a close engagement with the GoI on renewable energy generation particularly in solar power sector. The World Bank is providing support in development of utility scale solar investments by financing the shared infrastructure and transmission investments that are necessary to attract investment in utility scale solar parks. The current (under-construction) Mandsaur 250MW project is one such investment wherein shared infrastructure / transmission network is partially financed by World Bank.

While, solar projects in India does not require a regulatory environmental clearance, it is also understood that such utility scale projects will have adverse environmental and social impacts and these impacts need to be avoided/mitigated as far as possible. Potential environmental and social impacts for investments to be financed under the Mandsaur 250MW Solar PV project are expected to be modest in intensity, of limited duration and extent, mostly reversible, and readily mitigated to acceptable levels.

The Mandsaur 250MW Solar PV project is planned for 25 years duration and is currently under construction phase.

Section 1.02 Purpose of the Report

The Environmental and Social due diligence report being prepared by M/s Knight Frank (India) Private Limited is in discussions with the RUMS[1] (Rewa Ultra Mega Solar Limited) officials at Bhopal and Mandsaur; appointed developer (NTPC) & EPC contractors; informal consultations with villagers/ panchayat representatives, to assess the adequacy of the project with the applicable national / state and World Bank's environmental and social safeguard compliance gaps.

The report has been prepared as per the documents/information received from the developer and on the basis of site visit observations.

Section 1.03 Project Location & Brief Description

The proposed 250MW solar PV project of 553 Hectares is located to the East at 125 kms approximately from Mandsaur town along the MP-Rajasthan state border. The proposed site can be approached through an existing single lane village road. The nearest airport is at Indore about 200 kms from Mandsaur town.

The Project is already under implementation phase with NTPC as the Project developer. NTPC has further awarded the work of execution of the project by dividing it into 5 modules of 50 MW each including the responsibility of O&M for five years. There are four EPC contractors involved in the execution as per the information provided in table below:

[1] RUMS: A (50:50) joint venture between Solar Energy Corporation of India and Madhya Pradesh Urja Vikas Nigam Limited (MPUVNL). The stated objectives of RUMS are to develop and facilitate the development of large scale solar power projects in the state of Madhya Pradesh.

Block	Block P1	Block P2	Block P3	Block P4	Block P5
Total Area of the Block as per GIS database	60.9 Ha	144.97 Ha	102.74 Ha	114.35 Ha	112.36 Ha
EPC Contractors Firm	LANCO	LANCO	Vikram Solar	BHEL	Tata Power

The total area as per the GIS Map prepared for the study is 535.398 Ha. The reduction is on account of exclusion of some of the water bodies / natural drains during the construction phase. The location of project and accessibility map is depicted in Figure-1 below.

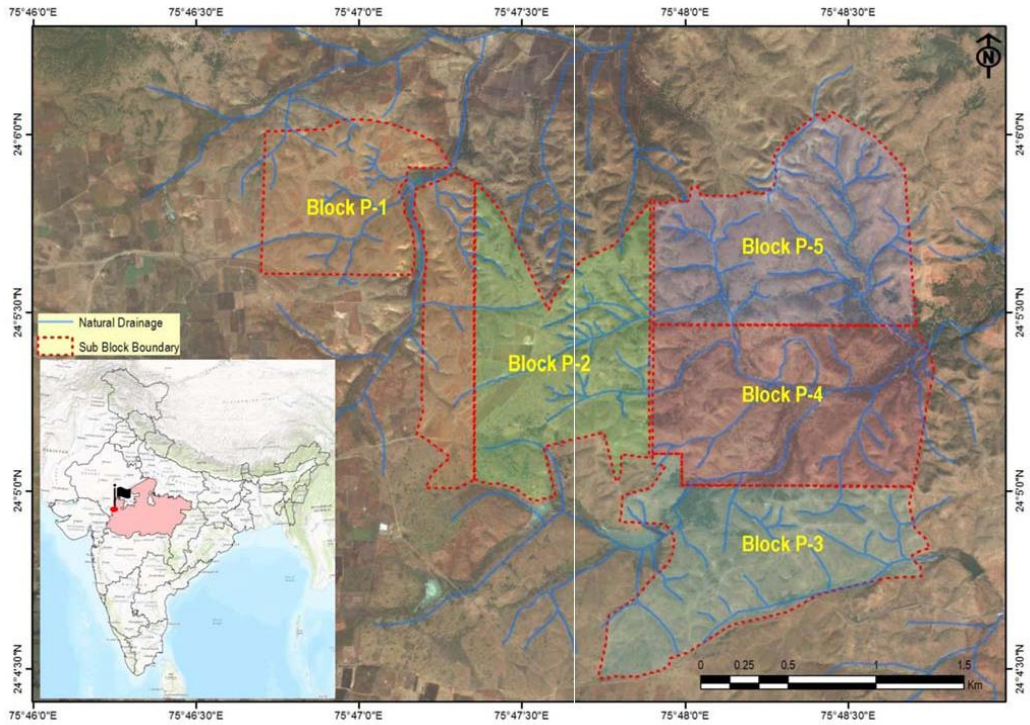


Figure 1: Layout of the Mandsaur 250MW Solar PV project

Table -1 below provides a brief description of the project

Brief Description - Mandsaur 250MW Solar PV Project		
Site Coordinates	Between Latitude 24^0-4'-30" N to 24^0-6'-10" N and Longitude 78^0-45'-50" E To 75^0-46'-30" E	
Solar Park Developer	RUMS (Rewa Ultra Mega Solar Limited)	
Project Capacity & Project Cost	250 MW	₹205.48 Crore as per Pre-Feasibility Report
Technology	Gird connected Solar Photovoltaic system (Fixed Axis)	
Annual Capacity Utilization factor / CUF	17-18%	

Annual Energy Generation	0.39 billion units
Project Life	25 Years
EPC Contracts	NTPC (project developer cum operator) has awarded 4 EPC contracts
Commercial Operations Date	March 2017
Power Evacuation	400 kV Mandsaur- Sitamau substation; alignment currently being finalized.
Project Site villages	Gujarkhedi (uninhabited) and Runija Villages; Sitamau Block; Suwasra Tehsil, Mandsaur
Total Land area of proposed project	553.6 Ha approximately *Land transfer to the MPNRED, GoMP via notification no .32/A 20(1)/2015-16, dated 27/01/2016 (Refer Annexure – 1)*
Geomorphology	Plain area; upland and undulating topography
Soil Characteristics	Sandy and black cotton soils
Water Availability for proposed project	Developer intends to dig additional bore wells i.e. 10 (2 per block) in total to meet construction / operation stage requirements based on the interactions with the developer.
Ground water control and regulations in place	The proposed site falls under over exploited / notified block – Sitamau[2] (District Ground water information booklet 2013; CGWB)
Land Ownership Details	Government Owned Land except for few small parcels given on "patta".
Employment Generation potential	The project is expected to generate approximately 3000 persons during construction stage and around 100 persons during operation stage.
Ecologically Sensitive Areas	Reserved / Protected Forest in vicinity; major water bodies
Cultural Sites	Local religious site within project area, but at present hardly ever visited by locals. No idols / structure present on site.
Tree Cutting permissions	Required under the project

Table 1: Mandsaur 250MW project details

Section 1.04 Power Evacuation Arrangement

As per the Pre-Feasibility Report (PFR), the evacuation of 250 MW power will initially be done by tapping into existing 220 kV double circuit Balod- Nepania line (phase I). Later, the 33/220 kV pooling substation of the solar park will be connected to 400 kV Mandsaur- Sitamau substation, anticipated to come under the green corridor by March/April 2018 (phase II). Figure-2 below depicts the proposed alignment for evacuation transmission line. The total length is estimated at 43.62 kms approximately.

[2] The Central Ground Water Authority has declared Mandsaur and Sitamau blocks of Mandsaur district notified blocks of regulation and ground water management act in the year 2006. The stage of ground water development of Mandsaur district as a whole is 96 % and special attention is needed to tackle problem of over-exploitation of ground water resources and to prevent falling water level of Sitamau, Mandsaur, and Malhargarh blocks area.

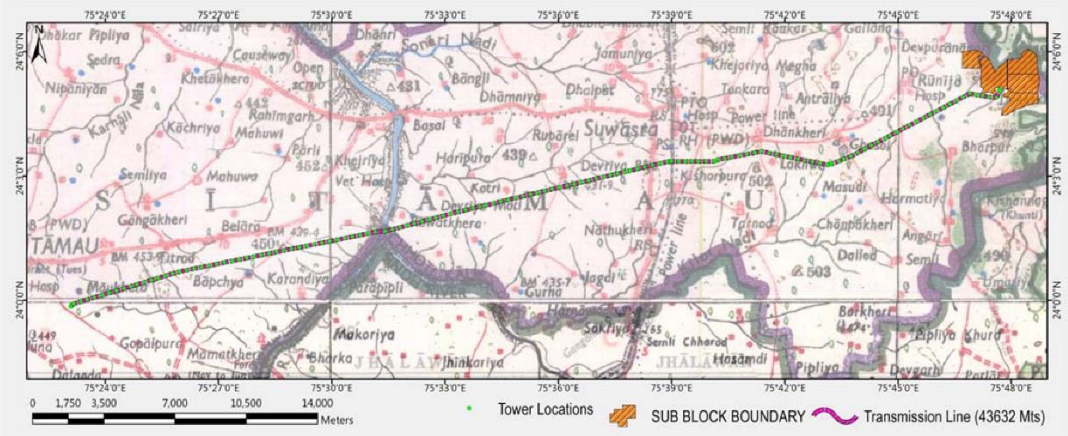


Figure 2: Proposed Alignment for dedicated evacuation Line (tentative)

The proposed corridor (tentative) as depicted in Figure-2 above does not cross any designated forest areas / national parks / wildlife sanctuary areas. Prima facie it appears the alignment shall not cross any major critical environmental features except river Chambal near state border. It is assumed that an EIA study will be undertaken separately for the transmission line. The proposed alignment crosses railway line near Suwasra town, will require necessary clearances / permissions.

Section 1.05 Status of Project Implementation

The project is currently under the construction phase, wherein the four EPC contractors have prepared the solar panel array layout drawings as per their own site assessment and subsequent approvals of NTPC (developer) and initiated the civil works as depicted in the site snaps below:

Figure 3: snaps of on-going Construction stage activities

CHAPTER II. ENVIRONMENTAL & SOCIAL BASELINE

Section 2.01 Socio Economic Profile of the Area

Mandsaur District in the state of Madhya Pradesh is part of the Malwa region, bounded by Neemuch District to the north, Rajasthan state to the east and west, and Ratlam District to the south. The district is divided into eight tehsils i.e. Mandsaur, Malhargah, Garoth, Shamgarh, Dalauda, Bhanpura, Suwasra and Sitamau. The project site is located in Suwasra Tehsil. The location map is shown in figure - 3 below:

Figure 4: Location of Selected villages within Madhya Pradesh State

According to census 2011, the population of the Mandsaur district was 1,340,411 persons comprising of 682,851 males and 657,560 females. The brief demographic profile of the Mandsaur district is presented in Table -2 below:

Table 2: Demographic Profile of Mandsaur District

Sl. No.	Particulars	Mandsaur Dist.
1	Total Population	1,340,411 persons
2	Density	242 persons per sqkm
3	Male Population	682,851
4	Female Population	657,560
5	Sex Ratio	963 females per 1000 male
6	Literacy rate	71.78%
7	Male Literate	85.14%
8	Female literate	57.98%

The district occupies 29th rank in the state in terms of area (5,535 sqkm) which accounts for 1.8 percent of the total area of Madhya Pradesh state. The district has the population density of 242 persons per sqkm. Literacy rate of Mandsaur district is 71.78 % and it occupies 17th position in the state. The district holds 15th rank in the state with the sex ratio of 963 females per 1000 males. Economy of the district is mainly dependent on agriculture and the district is famous for Pashupati Nath Mandir.

(a) Socio-Economic Profile of Selected Villages

As per 2011 census, Gujarkhedi village is un-inhabited and Runija village has total of 1,063 households and the population of 4,943 persons comprising of 52% males and 48 % females with an average household size of 4.6. Around 15% of the village population falls under the age group of 0-6 years.

According to census 2011, around 80% of the households do not have toilet facility. There are few community toilets however the use is very limited.

The sex ratio in Runija village is 940 and the overall literacy rate is low at 59 % comprising of 71% of male literates and only 46% of females literates. The demographic profile of the project villages are as follows (Table 3):

Table 3: Demographic Profile

Name of Village	Number of Household	Population	Average HH Size	Sex Ratio	Literacy Rate
Runija	**1,063**	**4,943**	**4.65**	**940**	**59.05%**
Gujarkhedi	----------Un-inhabited----------				

(i) Vulnerability Profile

Over 25% of the population falls under the marginalised section of the society with majority falling under Scheduled Caste and only one household falls under Scheduled Tribe category as shown in Table 4 below.

Table 4: **SC/ST Population in Project Villages**

Name of Village	SC Population	% of SC	ST Population	% of ST
Runija	**1,275**	**25.80%**	**1**	**0.02%**
Gujarkhedi	----------Un-inhabited----------			

(ii) Household Assets

As stated in census 2011, 44% of the households (HH) have Television set; around 11% of HH owns radio and only 1% of the HH have computers/laptops. More than 51% of HH have a mobile / telephone. It is seen that only 8% of the households use LPG/PNG for cooking rest 92% of the HH are dependent on fire-wood for cooking. The HH with either two or four Wheeler are only 18% and around 38% of the HH have cycles as their mode of transport. The asset holding pattern in the project village is given in Table 5 below.

Table 5: Household Assets

Household Assets - Household wise	Percentage
TV	44.2%
Radio / Tape Recorder	11.4%
Computer/Laptop	0.8%
Cycle	37.6%
Telephone / Mobile	51.1%
Two Wheeler	16.5%
Four Wheeler	1.7%
Cooking Gas – LPG/PNG	8.6%

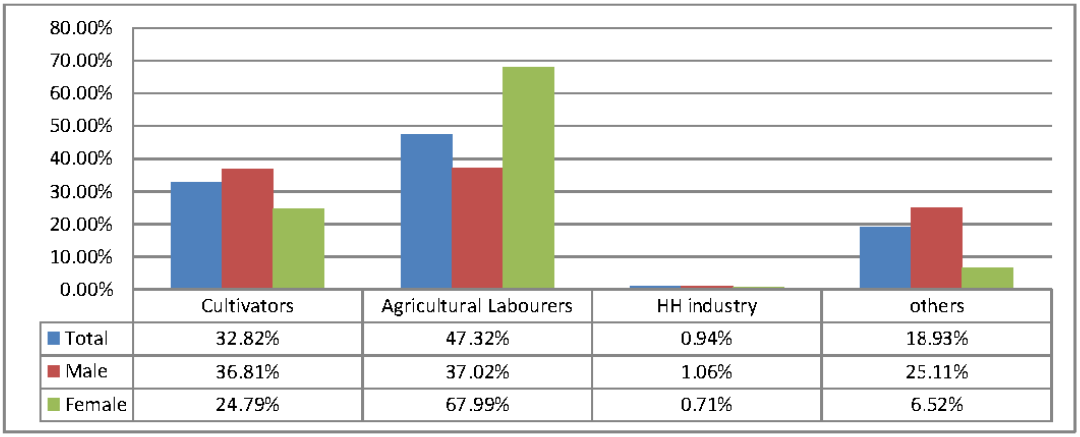
(iii) Economic Profile

The Work Force Participation rate in Runija village is 42.96%, with male and female participation of 55.67% and 29.46% respectively as per Census India 2011. It is important to highlight here that the main workers are only about 80% of the total workers, whereas the balance 20% are marginal workers. Refer Table 6 below.

Table 6: **Work Force Profile**

Name of Village	Work Force Participation Rate			Main Workers as % of Total Workers		
	Total	Male	Female	Total	Male	Female
Runija	**42.96%**	**55.67%**	**29.46%**	**80.9%**	**93.08%**	**56.15%**
Gujarkhedi	----------Un-inhabited----------					

As Census India 2011 data shows, nearly 80% of the total workers are dependent on agriculture out of which 32.82% are cultivator and 47.32% are agricultural labourers. The distribution of workers analysed on the basis of gender segregation of data is presented in Figure 5.



	Cultivators	Agricultural Labourers	HH industry	others
Total	32.82%	47.32%	0.94%	18.93%
Male	36.81%	37.02%	1.06%	25.11%
Female	24.79%	67.99%	0.71%	6.52%

Figure 5: Distribution of Workers

It is observed that the project affected village has 697 cultivators (522 male and 175 female) and 1005 agriculture labours (525 male and 480 female) or in other words, 1702 workers are engaged in agricultural activities in these villages.

Also, around 422 workers are engaged in the others allied activities. During consultation with villagers it was found that the workers from the village are also involved in marble carving, other unskilled construction works in nearby areas.

Section 2.02 Land Aspects

The total land under the project admeasuring about 553 Ha fall under the jurisdiction of two revenue villages, namely, Runija (134.19 Ha out of total village area of 2290 Ha) and un-inhabited Village Gujarkhedi (419.44 Ha out of total village area of 626 Ha). Out of the total land under the project, land admeasuring an area of about 545 Ha was under the ownership and possession of government, which was transferred in favour of the implementing agency RUMSL. About 8 Ha of this land (2 Ha in Runija and 6 Ha in Gujarkhedi village) has been allotted to SC families (3 families in Runija and 6 families in Gujarkhedi).

Khasra number 106 (Gujarkhedi village) referred to as Abadi Land in the revenue records fall within the project boundary and is not allotted as per the list of Khasras transferred for the project. The site for the same was verified on ground and no habitation exists on site. The issue was confirmed during the consultation process also and it was informed by the elderly people in the village that there were few huts in the pre-independence era but no one is aware about who those people were. It is proposed that the land may be transferred in favour of RUMS after following the necessary administrative process for de-notification of Abadi land.

The boundary envisaged under the DPR and the actual demarcation of the sites for the five blocks under implementation has undergone certain changes. This is on account of exclusion of forest area (Block P3) and the demand for exclusion of water bodies falling within the project boundaries by the local villagers as depicted in Figure - . On verification of forest and project

boundaries through ground truth verification and inspection of revenue record, it is found that there is no forest land falling within the project boundary.

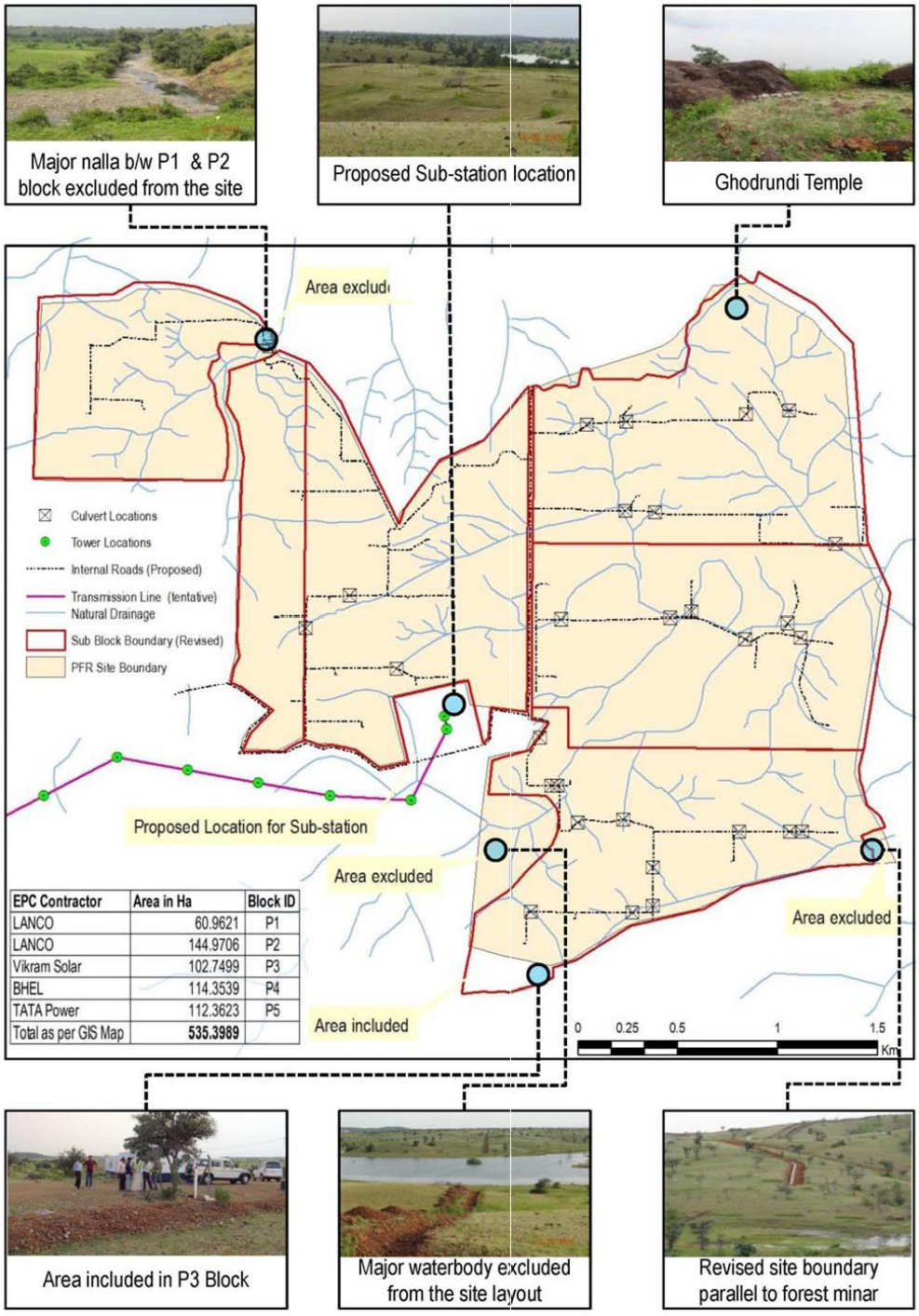


Figure 6: Modification of Project Site Boundaries

Section 2.03 Ground Water (Availability) Characteristics

The average annual rainfall of Mandsaur district is 657.3mm. Mandsaur district receive maximum rainfall during southwest monsoon period i.e. June to November. About 90.5% of annual rainfall is received during monsoon season. Only 9.5% of annual rainfall takes place between Octobers to May period. The surplus water for groundwater recharge is available only during the southwest monsoon period.

Geologically major parts of the Mandsaur district is occupied by Deccan Trap basalts except narrow patch of alluvium and sedimentary rocks of Vindhyans super group in isolated patches, which are forming different type of aquifer in the area. Occurrence and movement of groundwater in hard rock is mainly controlled by secondary porosity through joints and fractures.

As per Ground Water Resources estimation of Mandsaur district for the year 2011, the available ground water resources and gross annual groundwater drafts are 57,221 ham and 55,201 ham respectively, reaching 97 percent stage of groundwater development for the district. Mandsaur & Sitamau blocks fall under the **Over-Exploited** category. The Central Ground Water Authority has declared Mandsaur and Sitamau blocks of Mandsaur district notified blocks for regulation under the ground water management act in the year 2006. (Source: District Ground Water Information Booklet – Mandsaur District, CGWB-Bhopal; 2013)

The surface water availability is inadequate to meet the total requirement and the irrigation is mainly based on the groundwater resources. The depletion of this resource is manifested by continuous decline of water level and upcoming of saline fresh water interface. To revive the situation it is necessary to implement artificial recharge projects in the area on large-scale basis.

Different water conservation and artificial recharge structures right from gully plug to contour bund, gabion structures, nala bunds, check dams, cement plugs, percolation tanks and sub-surface dykes should be constructed at suitable hydrogeological locations, in large scale after detailed site specific studies to prevent depleting water levels, drying of wells in the areas. Watershed concept should be followed for construction of these structures at suitable sites. Below table-7 provides the overall scenario for ground water development in the Tehsil.

Table 7: Ground water Availability Status at Tehsil Level

Groundwater availability and stage of development (31.3.2009)

District/ Assessment Unit	Sub-unit Command/ Non-Command/	Net Annual Ground water Availability (ham)	Existing Gross Ground water Draft for Irrigation (ham)	Existing Gross Ground water Draft for Domestic & Industrial water Supply (ham)	Existing Gross Ground water Draft for All uses (11+12) (ham)	Provision for domestic, and industrial requirement supply to next 25 year (2033) (ham)	Net Ground water Availability for future irrigation d development (ham)	Stage of Ground water Development {(13/10)*100} (%)	Category
Sitamau	Command								
	Non-Command	14756	14364	624	14988	624	-232	102	
	Block Total	**14756**	**14364**	**624**	**14988**	**624**	**-232**	**102**	Over exploited
	District Total	**55624**	**51057**	**3093**	**54150**	**3093**	**1474**	**97**	**Over exploited**

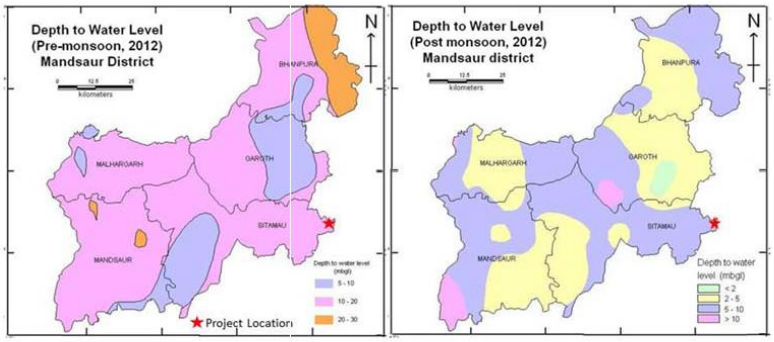
The subsequent section depicts the pre monsoon and post monsoon scenarios based on the 2012 data for Mandsaur district.

(a) Pre Monsoon

In pre-monsoon period, May 2012, depth to water level ranges between 4.40 m bgl at Sitamau to 25.40 m bgl at Sandhara. The most part of the district have water level in the range of 10-20 m bgl during the pre-monsoon. Water level more than 20 m bgl has been recorded at isolated locations in Mandsaur & north eastern part of Bhanpura block.

(b) Post Monsoon

During post-monsoon period, November 2012, depth to water level ranges from 1.20 m bgl at Shamgarh to 11.25 m bgl at Dhamara. It is observed that in 53% area of the district the water level lies between 5 & 10 and 43% area has water level between 2 & 5 m bgl.



Analyses of Groundwater level data of pre-monsoon period indicate that there is rising as well as declining trend in water level in the district. Declining trend in water level is in the range of 0.005 to 0.69 m/year whereas rising trend is in the range of 0.08 to 0.79m/year. About 48% wells shows declining trend.

Section 2.04 Topography & Block Layout

The site has a fairly undulating topography as depicted in Figure –7. Certain areas of the proposed site are not suitable for laying of PV panels due to slopes more than 15% and all such areas have been excluded by the EPC contractors while planning the internal layouts.

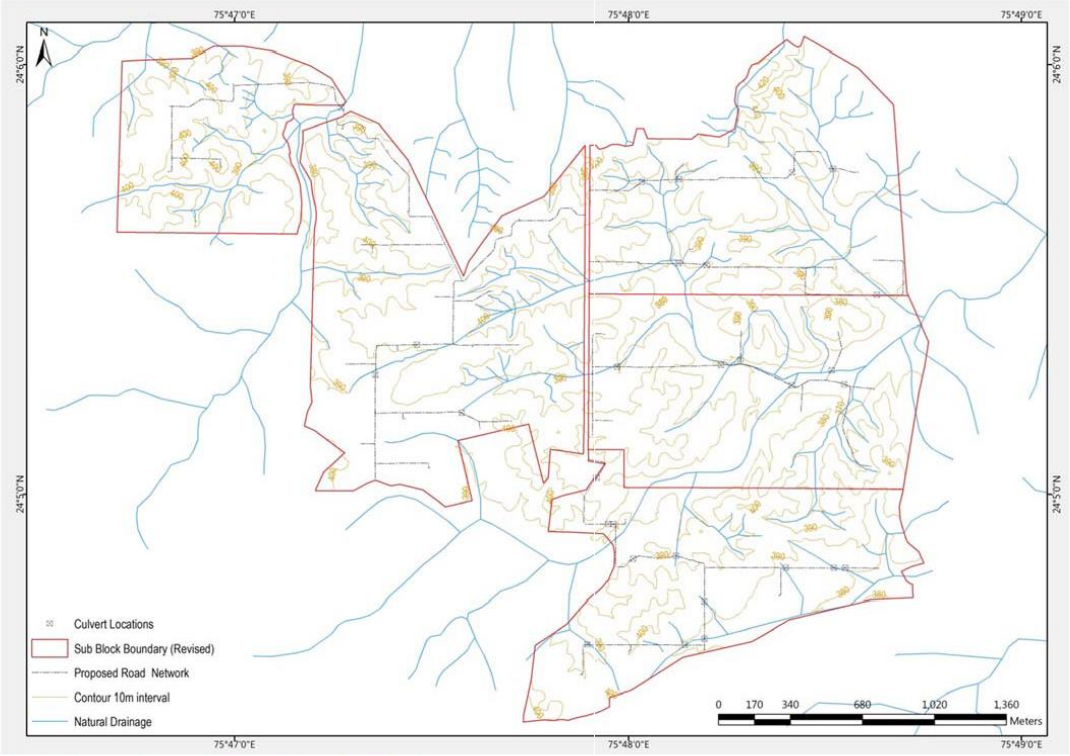


Figure 7: Topography map depicting 10m contour interval

The EPC contractors have planned the internal layout of PV panels considering the orientation, the existing slope and other aspects. The overall layout of panels in all five blocks is presented in Figure - 8. The shaded grey areas in map represent the area occupied by the solar PV panels. The preliminary examination of the panel layout reveals that in a few of the locations, the existing drainage (first order & second order) might be adversely impacted due to the placement of PV panels. The panel location proposed in the drainage channel network would lead to unwarranted erosion and obstructing the free flow of rain water from the catchment to the downstream water bodies.

Adequate mitigation measures would be required in order to ensure that the natural drainage pattern of the site is not adversely impacted leading to reduction in downstream flow. Certain areas in sub blocks would require realignment to ensure that the existing drainage is not altered. The RUMSL / developer should inspect the layouts for corrective actions.

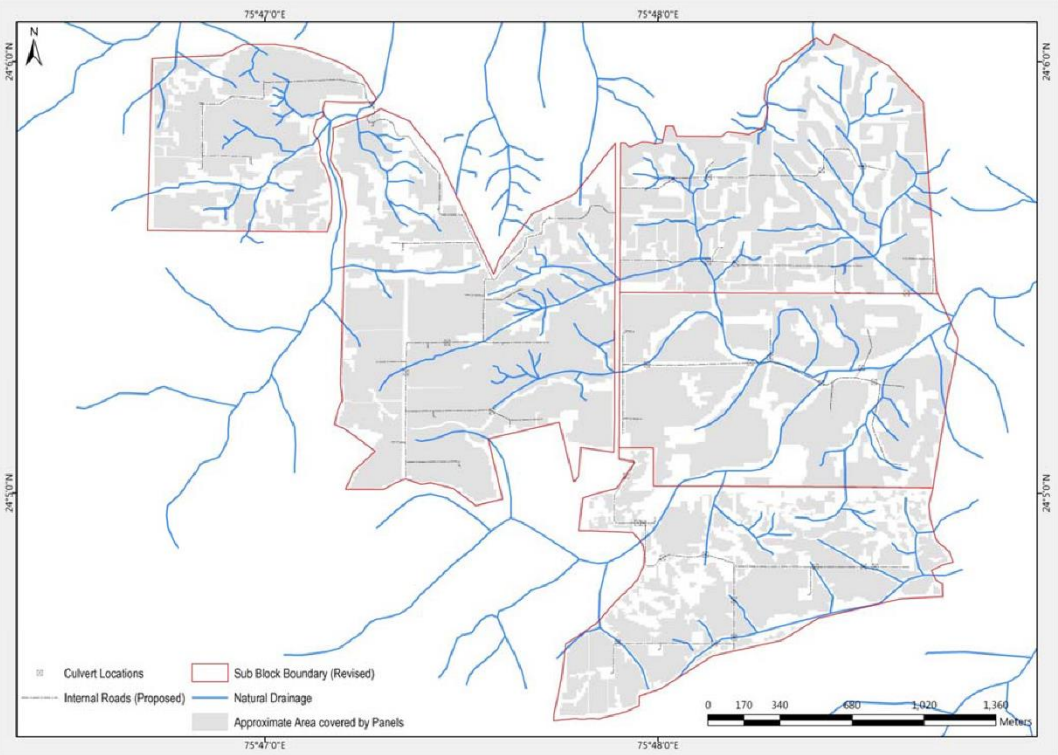
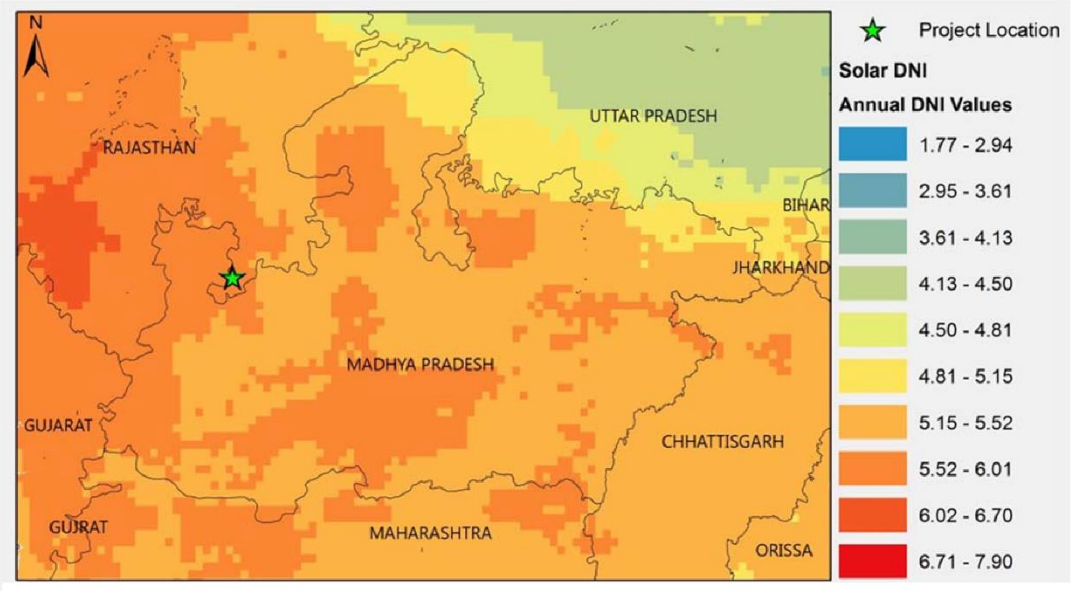


Figure 8: PV Panel Layout depicted in grey shade

Section 2.05 DNI Potential for Proposed Site (Annual)

Direct Normal Irradiance (DNI) depicts the solar radiation energy received on a given surface during a given time, typically in kWh/m2/day or kWh/m2/year. The solar radiation map as per the NREL database depicting the average annual DNI values for the proposed solar park location are presented in Figure – 9. Only the parallel sun rays normal to the receiving surface can be concentrated, and this is the portion known as DNI, which has the SI unit of W/m^2. In the solar power industry, irradiation with time duration (typically in the form of Wh/day or kWh/year per unit area) is often used interchangeably with irradiance.

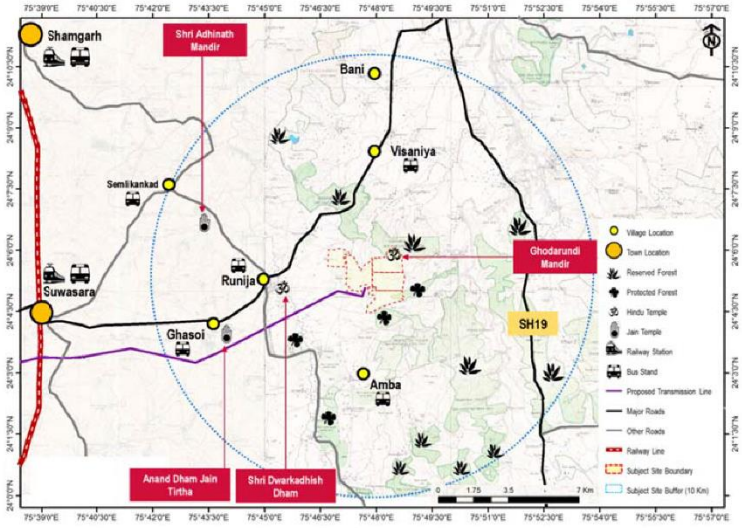
The state of Madhya Pradesh is endowed with high solar radiation with around 300 days of clear sun and offers good sites with potential of more than 5.5 kWh/ sq.m./day for installation of Solar based projects. In most of the state clear sunny weather is experienced with moderate temperatures as depicted in figure above.



Section 2.06 Physical Cultural Resources

The Mandsaur town's main attraction is Lord Pashupati Nath Temple, situated on banks of Shivna River. The idol draws parallel to the temple of Lord Pashupati Nath in Nepal. Every year in month of October and November a fair is organized for a period of 15 days which attracts to approximately 150,000 to 175,000 people.

Four cultural properties have been identified within 10 Km of the project site including 2 Jain terths located outside the village boundaries, one Dwarkadheesh temple in Runija Village which is also outside the project boundary. The fourth cultural property is on hill top within the project boundary where few stones with saffron colour painted over them were found. The issue was discussed with the local community and as it has been reported that the place is known as Devnarayan where in the old times a Gandharvsen from the surrounding area used to come by horse for worshipping and that's how people call it Ghodarundi. However, very few people go there as there is no temple or any idol of god at that location as verified during the field visit. Figure – 10 below depicts the location of identified cultural properties important along with other important environmental and social features within 10kms of the proposed project site.



CHAPTER III. ENVIRONMENTAL & SOCIAL SAFEGUARDS COMPLIANCE

The project is required to comply with applicable national / state regulations relating to environment; social issues, occupational health and safety aspects. The project is required to have all the necessary clearances as well as permits / approvals for project execution.

Solar PV projects are not covered under the ambit of EIA Notification, 2006 of Government of India and no prior environmental clearance is required for such projects. No Environmental Assessment study has been conducted for the proposed project.

The environmental due diligence report is based on the review of available documents and assess the compliance of project with respect to environmental safeguards, regulatory clearances, environmental impacts and management measures, health, safety and environment (HSE) measures, public consultations and information disclosure. The following documents were referred in preparation of the due diligence report:

1. Draft pre-feasibility report
2. Proposed layout design of the blocks
3. Documents shared by RUMSL / NRED Mandsaur Office while obtaining NOC / addressing grievances / land transfer details etc.

Key documents pertaining to Labour licence, EPC contract clauses related to environmental and social aspects and the HSE policy adopted EPC contractors were not made available to the consultant's team.

The environmental safeguard due-diligence study was carried out for the project on the basis of site visit observations and understanding project scope based on information and documents provided by MPNRED & developer. A detailed discussion on the Environmental and Social safeguards related issues was also carried out with the team from project developer / EPC contractor at site. Interactions with following officials from various agencies were carried out during the field visits:

Table 8: List of officials met during site visits

Name	Department / Organization	Remarks
Shri Mridul Khare	Deputy Commissioner; Office of the Commissioner (New & Renewable Energy), Bhopal	Discussions on the overall project status, consultants study ToR requirements / data requirements
Shri Som Deo Singh	Addl Commissioner; Office of the Commissioner (New & Renewable Energy), Bhopal	Information pertaining to the project, its current status
Shri Sanjay Kumar Verma	New & Renewable Energy Department, Bhopal	Information related to land aspects
Shri Sohan Lal Bajaj	MPNRED, Mandsaur	Information on project, land aspects, grievances addressed etc
Shri B R Rathore	MPNRED, Mandsaur	Facilitated site visits, collection of project specific information on grievance addressed, interactions with villagers, panchayat representatives etc.
Shri S K Datta	Project Incharge; NTPC, Mandsaur	Site visits and data collection, understanding site specific issues during construction stage.
Shri Srinivas	LANCO Solar Enegry Pvt Ltd – EPC Contractor	Site visits to respective blocks

Name	Department / Organization	Remarks
Shri Iqbal Ahmed	Vikram Solar Pvt Ltd – EPC Contractor	Site visits to respective blocks
Shri Arif	BHEL – EPC Contractor	Site visits to respective blocks
Shri Amitabh	TATA Power Solar Systems Ltd – EPC Contractor	Site visits to respective blocks
Informal Group Discussions	Villagers, Gram panchayat elected members and Sarpanch – Runija village	Understanding the local villager's perception on the project and their anticipations.

Section 3.01 Regulatory Requirements

Solar Photovoltaic Power Projects are not covered under the ambit of EIA Notification, 2006 and no prior environment clearance is required for such projects under the provisions thereof. State Pollution Control Board has exempted the Solar Photovoltaic Plants irrespective of their capacity, from obtaining consent to establish (NOC)/consent to operate of the Pollution Control Board. As per the latest notification, Solar PV parks are classified as "White Industries" and intimation to SPCB will be adequate.

The developer shall be required to comply with the applicable guidelines relating to the environment, occupational health and safety in addition to complying with labour laws and other local regulations. The statutory clearances related to environmental aspects obtained/to be obtained from regulatory authorities as part of the project development were assessed and current status (September 2016) of availability of such clearances are given in table - 9 below:

Table 9: Regulatory Compliance Status

Sr No	Clearance Requirements	Current Status
1	Forest Clearance	No designated Forest areas getting impacted. *NOC granted by Forest Department (Refer Annexure –2)*
2	Tree Cutting Clearance	Number of trees/shrubs to be uprooted in each block has been estimated at 2,231 covering all five blocks. *Application has been submitted to Collector Office. (refer Annexure-3)*
3	The Contract Labour (Regulation and Abolition) Rules, 1970	Labour license for the project under the said Act was not available on-site as per the information shared during field visits.
4	Approvals for Transmission Line	The alignment for the proposed evacuation line is currently being finalized. A generic EMP is adopted for planning / implementing substation component. *The process of undertaking necessary approvals shall be undertaken in due course as informed during site visits. As the site does not cross any designated forest areas, no clearance would be required from forest department. The proposed alignment crosses a major railway track requiring necessary approvals from Railways.*
5	Land Use Permissions	Advance land use permissions have been undertaken. (Refer Annexure - 4). All necessary formalities have to be completed later.
6	Permissions for ground water extraction	Application for digging additional bore wells submitted to the Collector Office. (refer Annexure - 5) *Before digging of bore well, permissions from competent authority is to be obtained.*
7	Use of Surface water sources for construction/operation stage	It is informed that the Developer/EPC contractor do not have any plan to withdraw water from any surface water sources.
8	Labour Camps	The EPC Contractors were initiating tasks related to setting up of labour camps. Currently manpower working at the sites stay in rented

Sr No	Clearance Requirements	Current Status
		accommodation in nearby villages. *To setup Labour camps & related faciiities, permission would be required.*
9	State Policy for Land Procurement / Land acquisition	The land has been transferred to MPNRED for project execution. *Initiated the process of compensation and R&R assistance as per the provisions of the State Policy for land procurement for the PAPs of Gujarkhedi & Runija villages. The land for which compensation and R&R assistance process has been initiated is not being used by the PAPs for agricultural use and is lying vacant.*

Section 3.02 Applicable World Bank Safeguard Policies

Based on the field visits, informal consultations with locals and documents shared by the developer, following World Bank Operational Policies are likely to be triggered. The implementation of the World Bank Operational Policies seek to avoid, minimize or mitigate the adverse environmental and social impacts, including protecting the rights of those likely to be affected or marginalized by the proposed project. Adequate mitigation measures to address the safeguard concerns; minimize / reduce adverse impacts have been proposed under the action plan.

Table 10: Applicable WB Policies

Safeguard Policy	Triggered (Yes / No)
Environmental Assessment (OP 4.01)	● Yes ○ No
Natural Habitats; (OP 4.04)	○ Yes ● No
Indigenous Peoples (OP 4.10)	○ Yes ● No
Physical Cultural Resources; OP 4.11	● Yes ○ No
Involuntary Resettlement (OP 4. 12)	● Yes ○ No
Forest (OP 4.36)	○ Yes ● No

The project can be classified as Category-B project as per the World Bank Safeguard policy guidelines. This classification is based on the review of the available documents and site visit with respect to the environmental sensitivity due to project activities. The following labour laws will be applicable, and the EPC contractor shall undertake the requisite licence from Labour commissioner. Some of the acts directly relevant for the Mandsaur 250MW project include:

Table 11: Applicable Labour Laws for the project

Applicable Acts	Coverage Provisions
Minimum Wages Act 1948	The act ensures minimum wages for each category of workers
Child Labour (Prohibition and Regulation) Act, 1986	Prohibits employment of children bellow 14 years of age
The Labours Act 1988	Ensure health and safety of construction workers
The Factories Act, 1948	Ensures Health and safety considerations of workers
Workmen's Compensation Act, 1923	Ensure fair compensation in case of injury by accidents during the course of employment
Contract Labour (Regulation and Abolition) Act, 1970	Ensure basic welfare measures to be made available to the contract workers by the employer
The Building and other Construction Workers Act, 1996	Ensure safety measures at construction work site and other welfare measures such as canteens, first-aid facilities, ambulance, housing accommodation for Workers near the Workplace etc

The applicability and compliance status of the above labour laws could not be established as the necessary documents were not available with the camp offices of developer / EPC contractors.

Section 3.03 Environmental Sensitivity Analysis

The environmental sensitivity assessment based on review of documents and field visits is presented below:

I. No prior EIA/SIA studies were conducted for the proposed project. Potential impacts due to the proposed project are expected to be modest in intensity, of limited duration and extent, mostly reversible in nature and can be readily mitigated to acceptable levels. The successive chapter on Proposed Action Plan shall outline the mitigation measures that need to be adopted to ensure compliance to the WB Safeguard policies.

II. The land available for the sub project is mainly government land and the same has been transferred to the implementing agency for the purpose of setting up the solar PV project.

III. The sub-project sites are not located in any protected area like wildlife sanctuary /national parks. However the proposed site is adjoining designated forest areas. There are no impacts anticipated due to the proposed project. An NOC from forest department has already been obtained.

IV. During site visit and as per discussions with the sub-project staff, it was informed that no wild animals are sighted in and around the sub-project area.

V. Tree cutting shall be required within the proposed site, an application by the EPC contractors have been submitted to the Collector office. It is estimated that a total of 2,231 trees / shrubs need to be uprooted under the project requiring clearance from the competent authority. The block wise details as per the application submitted to the collector office is:

Block P1	Block P2	Block P3	Block P4	Block P5
450 trees / Shrubs	450 trees / Shrubs	402 trees / Shrubs	478 trees / Shrubs	451 trees / Shrubs

VI. The EPC contractors i.e. LANCO, BHEL, Vikram Solar and TATA Power have their own Environment, Health and Safety Policy which is being implemented at the site.

VII. The Labour camps and related infrastructure facilities are yet to be developed by the EPC contractors. An Environmental Management Plan as part of the action plan shall be prepared to address any adverse impacts due to the construction stage activities.

Section 3.04 Social Sensitivity Analysis

I. RUMS had already initiated the process of compensation and R&R assistance as per the provisions of the State Policy for land procurement for the PAPs of Gujarkhedi village. Based on the verification of revenue records and discussions with the official of RUMS it is found that RUMS has also initiated the process of compensation and R&R assistance for the PAPs of Runija Village. The land for which compensation and R&R assistance process has been initiated is not being used by the PAPs for agricultural use and is lying vacant.

II. Based on the Census Data and also from the consultation with the local people, it is found that there is no tribal population in these villages. Hence Indigenous People Development Plan Policy of the World Bank does not trigger. However, SC population in the Runija Village account for nearly 25% of the total population. These have been allotted land in and around villages. In addition to agriculture, the people from this community are also working as construction labour, where they also commute to the construction projects with families.

III. During the consultation process in one of the 20 wards (SC habitation) located right at the entry of the road leading to the site it was found that very few households have toilet facilities at home and majority of the households still go for open defecation. In addition, the school and the habitation are located on the opposite sides of this road. With increase in traffic due to project implementation, it poses threat to the local residents especially the children, so community were looking for providing safety measures as well as toilet facilities.

IV. The employment for the local villagers emerged as one of the key issues during informal consultation with the people and the elected representatives. However, it is important to highlight here that RUMSL and NTPC had conducted consultations with the local public representatives and have already requested the elected representatives to prepare the ward-wise list

of the employable people along with their qualification and the skills possessed in order to provide employment opportunities to the locals.

V. Additional Grievances received from the various stakeholders were addressed by RUMSL.

VI. The project will have positive social impacts with enhanced employment opportunities for the local population during the construction as well as operational phase of the project.

Section 3.05 Conclusions / Findings of the Study

The following screening checklist provides a preliminary assessment of the likely adverse impacts that would require adequate mitigation measures:

S. No.	Environmental & Social Features	Status / Availability in & around site (10-kms)	Significance (based on likely impact)
Physical Environment			
1	Drainage pattern / Conditions	Within Site	Moderate adverse impacts
2	Surface Water Resources	In vicinity, major water bodies for which the proposed site acts as a catchment	Moderate adverse impacts
3	Erosion Prone stretches	Within site along drainage channels, steep slopes	Moderate adverse impacts during construction stage
4	Slope percentage	More than 15% is many areas. Steep slope areas have been excluded by the developer while planning the solar panel layout.	No impacts envisaged
5	Topography	Undulating topography with well-defined channels	Moderate adverse impact on drainage is envisaged
Biological Environment			
1	National Park / Wildlife Sanctuary	Not present	No impacts envisaged
2	Non-NP/WLS areas	Not present	No impacts envisaged
3	Migratory routes	Not present	No impacts envisaged
4	Reserved Forests	In vicinity	No impacts envisaged
5	Large Trees / Woodland	In vicinity	No impacts envisaged. Provision for cooking fuel/LPG in labour camps to be made by EPC contractor as per Action Plan.
6	Protected Forests	In Vicinity	No impacts envisaged
7	Presence of endangered species / habitat areas	Not present	Not Applicable
8	Ecologically sensitive areas	Not present	Not Applicable
9	Settlements / Built-up Environment	Not present in immediate vicinity	No impacts envisaged
10	Sensitive Receptors	School / Settlement on way to Site	Mitigation measures proposed to

Environmental & Social Due diligence – 250 MW Solar PV Park Mandsaur

S. No.	Environmental & Social Features	Status / Availability in & around site (10-kms)	Significance (based on likely impact)
			reduce adverse impacts
11	Drinking Water sources	None within the proposed site	No impacts envisaged
12	Physical cultural Resources – Religious	No impacts on identified physical cultural resources.	No impacts envisaged
13	Physical cultural resources – community	Water bodies in vicinity used by the locals.	No impacts envisaged
14	Underground utility lines like electricity lines, pipelines for gas, etc	Not present	Not Applicable
15	Agricultural land parcels / land fertility levels	Not present	Not Applicable
16	Defence Installations / Airports	Not present	Not Applicable
17	Damage to existing infrastructure, public utilities, amenities etc.	Not present	Not Applicable
18	Presence of Indigenous / vulnerable communities	Not present	Not Applicable
Social Environment			
1	Land acquisition of private land leading to loss of shelter and livelihood	Not present	No impacts envisaged
2	Any loss / reduction of access to traditional dependent communities (to areas where they earn for their primary or substantial livelihood).	Not present	No impacts envisaged
3	Adverse impacts to women, including economic and safety concerns	Not present	No impacts envisaged
4	Involuntary land taking resulting in loss of income; livelihood; sources of livelihood; loss of access to common property resources and / or private residential and/or property resources.	Not present	No impacts envisaged
5	Any specific gender issues	Not present	No impacts envisaged
6	Possible conflicts with and/or disruption to local community	Not present	No impacts envisaged
7	Significant issues raised by the stakeholders during consultation	Employment opportunities for locals in proposed solar PV project as skilled and un skilled labour.	Positive impacts

ANNEXURES

Annexure 1

Land Possession Letter (Page 1 of 5)

कार्यालय, जिला अक्षय ऊर्जा अधिकारी
म.प्र. ऊर्जा विकास निगम लिमिटेड़
एल.आई.जी. ए–22, जनता कालोनी, मंदसौर म.प्र. 458001 फोन नं. 07422 222274

(53)

क्रमांक / ऊ.वि.नि. / मंदसौर / सोलर / 2016-17 / 10

मंदसौर दिनांक - 06.04.2016

प्रति,
उपायुक्त
कार्यालय-आयुक्त
नवीन एवं नवकरणीय ऊर्जा
"ऊर्जा भवन" मुख्य मार्ग क्रमांक-2
शिवाजी नगर भोपाल (म.प्र.)

विषय:- ग्राम रुनिजा, गुर्जरखेड़ी तहसील सुवासरा, जिला मंदसौर में प्रस्तावित 250 मेगावाट क्षमता की सौर ऊर्जा परियोजना हेतु आवंटित राजस्व भूमि का आधिपत्य प्राप्त करने बाबत ।

संदर्भ:- 1. आपका पत्र क्रमांक / आयु./ एन आर ई/ सोलर /2015/1287 भोपाल दिनांक 01.03.2016 ।
2. कलेक्टर महोदय, जिला मंदसौर का आदेश पृष्ठ क्रमांक 216 / आरटीसी / 2016 मंदसौर, दिनांक 28.01.2016 ।
3. तहसीलदार सुवासरा जिला मंदसौर का पत्र क्र. 272 / री-1/16 दिनांक 05-04-2016 ।

महोदय,

उपरोक्त विषयनातर्गत एवं संदर्भानुसार लेख है कि माननीय न्यायालय कलेक्टर, जिला मंदसौर के संदर्भित आदेशानुसार, म.प्र. शासन के नवीन एवं नवकरणीय ऊर्जा विभाग को ग्राम रुनिजा में 134.19 हेक्टर तथा ग्राम गुर्जरखेड़ी में 419.448 हेक्टर कुल रकबा 553.638 हैक्टर राजस्व भूमि आवंटित की गयी है । उपरोक्त आदेश एवं निर्देश के परिपालन में निम्नानुसार आवंटित राजस्व भूमियों का तहसीलदार, तहसील सुवासरा जिला मंदसौर से आधिपत्य (कब्जा) प्राप्त करके आवश्यक मूल दस्तावेज़ (आधिपत्य प्रपत्र इत्यादि)आपकी और प्रेषित है । राजस्व भूमि का विवरण निम्नानुसार है ।

क्रमांक	ग्राम का नाम / प.ह. न.	खसरा नं.	कुल रकबा हेक्टर	मद	आवंटित किया गया रकबा हेक्टर
1.	रुनिजा	1014	13.050	चरनोई	13.050
		1015	17.650	चरनोई	17.650
		1016/ मीन-1	14.040	नाकाका	14.040
		1016/ मीन-2	1.550	चरनोई	1.550
		1017/1	15.050	नाकाका	15.050
		1028/ मीन-1	18.730	बर्डी	18.730
		1029	18.390	बर्डी	18.390
		1030	19.880	बर्डी	19.880
		1031	15.850	बर्डी	15.850
	कुल किता	09	134.190		134.190
2.	गुर्जरखेड़ी	1	2.805	बर्डी	2.805
		2	7.682	बर्डी	7.682
		3	1.829	बर्डी	1.829
		5	42.600	बर्डी	42.600
		7	8.152	गैरमुम.	8.152

EE(S) 4 7/4 Shivanand

निरंतर ---- 2

Land Possession Letter (Page 2 of 5)

	8/ मीन 1 से 7	25.085	बडीं	19.085
	9/1	18.814	बडीं	18.814
	9/2	7.421	बडीं	7.421
	11	35.589	बडीं	35.589
	12	3.114	गैरमुम.	3.114
	13 / मिन-2	3.480	बडीं	3.480
	14	31.982	गैरमुम.	31.982
	15	5.769	गैरमुम.	5.769
	17	1.097	बीड गैरमुम.	1.097
	18	21.406	बीड गैरमुम.	21.406
	19	21.137	बीड गैरमुम.	21.137
	20	19.755	गैरमुम.	19.755
	21	3.031	गैरमुम.	3.031
	87	8.351	गैरमुम.	8.351
	88	8.152	गैरमुम.	8.152
	102	0.418	गैरमुम.	0.418
	103	3.972	गैरमुम.	3.972
	105	1.505	गैरमुम.	1.505
	107	17.360	गैरमुम.	17.360
	110	4.923	मगरा बीड गैरमुम.	4.923
	111	4.923	मगरा बीड गैरमुम.	4.923
	112	25.817	मगरा बीड गैरमुम.	25.817
	113	15.259	बीड	15.259
	114	30.102	गैरमुम.	30.102
	115	13.556	चरनोई गैरमुम.	13.556
	116	14.057	गैरमुम.	14.057
	118	16.305	मगरा	16.305
कुल किता	**31**	**431.448**		**419.448**
महा योग	**40**	**565.638**		**553.638**

सूचनार्थ प्रेषित ।

संलग्न :- कम्प्युटर खसरा, नक्शा एवं आधिपत्य प्रपत्र ।

भवदीय

जिला अक्षय ऊर्जा अधिकारी
मंदसौर / नीमच / झाबुआ
एस.एल.कॉज
जिला अक्षय ऊर्जा अधिकारी
म.प्र.ऊर्जा विकास निगम लि.
मंदसौर (म.प्र.)

Land Possession Letter (Page 3 of 5)

(50)

आधिपत्य प्रपत्र

अवर सचिव म.प्र. शासन, नवीन एवं नवकरणीय ऊर्जा विभाग, भोपाल के पृष्ठ क्रमांक F6-02/2015/ साठ भोपाल दिनांक 24.02.2016 द्वारा ग्राम रुनिजा, तहसील सुवासरा, जिला मंदसौर की राजस्व भूमि 134.190 हेक्टर में सौर ऊर्जा परियोजना स्थापित करने हेतु म.प्र. शासन, राजस्व विभाग मंत्रालय, भोपाल के परिपत्र F16-14/2013/ सात / 2ए दिनांक 04.03.2014 से जारी नीति निर्देशों एवं आदेश में उल्लेखित शर्तों के तहत, न्यायालय कलेक्टर, जिला मंदसौर, म.प्र. के प्रकरण क्रमांक 32/ अ -20(1)/ 2015-16 में पारित आदेश दिनांक 27.01.2016 के परिपालन में कुल किता 09 कुल रकबा **134.19** हेक्टर राजस्व भूमि (विवरण निम्नानुसार) का आधिपत्य (कब्जा) नवीन एवं नवकरणीय ऊर्जा विभाग मंत्रालय, भोपाल के निर्देशानुसार जिला अक्षय ऊर्जा अधिकारी, म.प्र. ऊर्जा विकास निगम लि., मंदसौर को प्रदान किया जाता है । राजस्व भूमि का विवरण निम्नानुसार है :-

क्रमांक	ग्राम का नाम / प.ह. न.	खसरा नं.	कुल रकबा हेक्टर	मद	आवंटित किया गया रकबा हेक्टर
1.	रुनिजा	1014	13.050	चरनोई	13.050
		1015	17.650	चरनोई	17.650
		1016/ मीन-1	14.040	नाकाका	14.040
		1016/ मीन-2	1.550	चरनोई	1.550
		1017/1	15.050	नाकाका	15.050
		1028/ मीन-1	18.730	बर्डी	18.730
		1029	18.390	बर्डी	18.390
		1030	19.880	बर्डी	19.880
		1031	15.850	बर्डी	15.850
	कुल किता	**09**	**134.190**		**134.190**

भूमि का आधिपत्य प्राप्तकर्ता
नवीन एवं नवकरणीय ऊर्जा विभाग
म.प्र. शासन, भोपाल द्वारा अधिकृत
म.प्र. ऊर्जा विकास निगम लि. मंदसौर
जिला अक्षय ऊर्जा अधिकारी के हस्ताक्षर

एस.एल.वर्मा
जिला अक्षय ऊर्जा अधिकारी
म.प्र.ऊर्जा विकास निगम लि.
मंदसौर (म.प्र.)

भूमि का आधिपत्य सौंपने वाले
पटवारी के हस्ताक्षर .....
नाम D. S. Chundawat
PATWARI
H. No. 22
Teh. Suwashra

तहसीलदार
के हस्ताक्षर .....
नाम .....

Land Possession Letter (Page 4 of 5)

आधिपत्य प्रपत्र

अवर सचिव म.प्र. शासन, नवीन एवं नवकरणीय ऊर्जा विभाग, भोपाल के पृष्ठ क्रमांक F6-02/2015/ साठ भोपाल दिनांक 24.02.2016 द्वारा ग्राम गुर्जरखेड़ी, तहसील सुवासरा, जिला मंदसौर की राजस्व भूमि 419.448 हेक्टर में सौर ऊर्जा परियोजना स्थापित करने हेतु म.प्र. शासन, राजस्व विभाग मंत्रालय, भोपाल के परिपत्र F16-14/2013/ सात / 2ए दिनांक 04.03.2014 से जारी नीति निर्देशों एवं आदेश में उल्लेखित शर्तों के तहत, न्यायालय कलेक्टर, जिला मंदसौर, म.प्र. के प्रकरण क्रमांक 32/ अ -20(1)/ 2015-16 में पारित आदेश दिनांक 27.01.2016 के परिपालन में कुल किता 31 कुल रकबा 419.448 हेक्टर राजस्व भूमि (विवरण निम्नानुसार) का आधिपत्य (कब्जा) नवीन एवं नवकरणीय ऊर्जा विभाग मंत्रालय, भोपाल के निर्देशानुसार जिला अधिकारी ऊर्जा अधिकारी, म.प्र. ऊर्जा विकास निगम लि., मंदसौर को प्रदान किया जाता है । राजस्व भूमि का विवरण निम्नानुसार है :-

क्रमांक	ग्राम का नाम / प.ह. न.	खसरा नं.	कुल रकबा हेक्टर	मद	आवंटित किया गया रकबा हेक्टर
1.	गुर्जरखेड़ी	1	2.805	बडी	2.805
		2	7.682	बडी	7.682
		3	1.829	बडी	1.829
		5	42.600	बडी	42.600
		7	8.152	गैरमुम.	8.152
		8/ मीन 1 से 7	25.085	बडी	19.085
		9/ मीन - व 2	26.235	बडी	26.235
		11	35.589	बडी	35.589
		12	3.114	गैरमुम.	3.114
		13	9.480	बीड गैरमुम.	3.480
		14	31.982	गैरमुम.	31.982
		15	5.769	गैरमुम.	5.769
		17	1.097	बीड गैरमुम.	1.097
		18	21.406	बीड गैरमुम.	21.406
		19	21.137	बीड गैरमुम.	21.137
		20	19.755	गैरमुम.	19.755
		21	3.031	गैरमुम.	3.031
		87	8.351	गैरमुम.	8.351
		88	8.152	गैरमुम.	8.152
		102	0.418	गैरमुम.	0.418
		103	3.972	गैरमुम.	3.972
		105	1.505	गैरमुम.	1.505
		107	17.360	गैरमुम.	17.360
		110	4.923	मगरा बीड गैरमुम.	4.923
		111	4.923	मगरा बीड गैरमुम.	4.923
		112	25.817	मगरा बीड गैरमुम.	25.817

Land Possession Letter (Page 5 of 5)

	113	15.259	बीड.	15.259
	114	30.102	गैरमुम.	30.102
	115	13.556	चरनोई गैरमुम.	13.556
	116	14.057	गैरमुम.	14.057
	118	16.305	मगरा	16.305
कुल किता	31	431.448		419.448

भूमि का आधिपत्य प्राप्तकर्ता
नवीनएवं नवकरणीय ऊर्जा विभाग
म.प्र. शासन, भोपाल द्वारा अधिकृत

म.प्र. ऊर्जा विकास निगम लि., मंदसौर

जिला अक्षय ऊर्जा अधिकारी के हस्ताक्षर
एस.एल.बजाज
जिला अक्षय ऊर्जा अधिकारी
म.प्र.ऊर्जा विकास निगम लि.
मंदसौर (म.प्र.)

भूमि का आधिपत्य सौंपने वाले
पटवारी के हस्ताक्षर
नाम

तहसीलदार
के हस्ताक्षर
नाम

Annexure 2

NOC – Town & Country Planning Department, Neemach (M.P.)

कार्यालय उप संचालक
नगर तथा ग्राम निवेश,नीमच (म.प्र.)

क्रमांक/1579/नजूल/न.ग्रा.नि./2015 नीमच दिनांक 24/4/2015

प्रति,

तहसीलदार,
तहसील कार्यालय सुवासरा,
जिला मन्दसौर (म.प्र.)

विषयः– सौलर पार्क हेतु भूमि आवंटन के संबंध में अभिमत ।

सन्दर्भः– आपका पत्र कमांक 646/री–1/2015 सुवासरा दिनांक 03.11.20135

–00–

उपरोक्त विषयान्तर्गत एवं सन्दर्भित पत्र व्दारा तहसील सुवासरा के कमशः ग्राम रूनिजा के सर्वे कमांक 1014,1015,1016,/1,2,3, एंव सर्वे कमांक 1017, 1027,1028/1,2,3 से 1031 कुल रकबा 137.400 हेक्टर ग्राम गुर्जर खेडी सर्वे कमांक 1 से 7,8/1,9,11 से 21, 87,88,101 से 108/1,2,109 से 118 रकबा 430.967 हेक्टर ग्राम आम्बा के सर्वे कमांक 131, 132, 135, 173, 218, 353,/1 मिन–1,1087/1,1182 रकबा 84.947 हेक्टर कुल रकबा 653.314 हेक्टर भूमि सोलर उर्जा पार्क विकसित करने हेतु भूमि आवंटन के संबंध में इस कार्यालय का अभिमत चाहा गया है।

प्रश्नाधीन भूमि एंव ग्राम मध्यप्रदेश नगर तथा ग्राम निवेश अधिनियम 1973 की धारा 13 (1) के तहत गठित निवेश क्षेत्र की सीमा में नहीं होने से प्रस्तावित सोलर उर्जा पार्क के विकास हेतु भूमि निम्नलिखित शर्तो के साथ आवंटित कि जाती है,तो इस कार्यालय को कोई आपत्ति नहीं है।

1 प्रश्नाधीन भूमि के सम्मुख 12.00 मीटर चौड़ा पहुंच मार्ग का विकास संबंधित संस्था को करना आवश्यक होगा।

2. भूमि आवंटन के पूर्व यह सुनिश्चित कर लिया जावे कि प्रस्तावित भूमियां किसी सार्वजनिक उपयोग की भूमि का भाग न हो, अथवा किसी शासकीय उपयोग हेतु वांछित या आरक्षित न हो। तथा पट्टे आदि पर आवंटित नही की गई हो।

3. प्रस्तावित भूमियों से संबंधित ग्राम की भूमियों से संबंधित पंचायतों से अनापत्ति प्राप्त करना आवश्यक होगा।

4. भूमि आवंटन के पश्चात स्थल पर विकास/निर्माण के पूर्व सालेर उर्जा परियोजना संबंधि नियोजित अभिन्यास का अनुमोदन इस कार्यालय से प्राप्त करना आवश्यक होगा।

5 अन्य सभी संबंधित विभागों से उनके नियमों/अधिनियमों के अन्तर्गत यदि कोई अनुमति/अनापत्ति/अभिमत/अनुज्ञा/अनुज्ञप्ति प्राप्त करना हो तो उसे भूमि आवंटन के पूर्व लेना आवश्यक होगा।

प्र.उप संचालक
नगर तथा ग्राम निवेश
नीमच (म.प्र.)

NOC – Public Works Department , Mandsaur

कार्यालय कार्यपालन यंत्री लोक निर्माण विभाग संभाग मंदसौर

क्रमांक 5229/तक/अनापत्ति/2015–16/ मंदसौर, दिनांक 26-12-15

प्रति,

तहसीलदार,
तहसील कार्यालय सुवासरा,
जिला मंदसौर

विषय :– सोलार पार्क हेतु भूमि आवंटन में अभिमत बाबत्।

संदर्भ :–1. आपका कार्यालयीन पत्र क्र. 644/ए–1/15 सुवासरा दि. 03.11.15.

2. कार्यालय जिला अक्षय ऊर्जा अधिकारी मध्यप्रदेश ऊर्जा विकास निगम लिमिटेड, मंदसौर के पत्र क्र. ऊविनि/भूमि आवंटन/सौर ऊर्जा/2015–16/171 मंदसौर दिनांक 16.12.2015.

उपरोक्त विषयान्तर्गत् संदर्भित पत्र में नवीन एवं नवकरणीय ऊर्जा विभाग, भोपाल के द्वारा ग्राम रूनिजा में 13 स्थानों के विभिन्न खसरा क्र. 1014 से 1031 के अन्तर्गत् कुल 37.400 हेक्टर भूमि ग्राम गुर्जरखेडी ग्राम में कुल 41 स्थानों के विभिन्न खसरा क्र. 1 से 118 के अन्तर्गत् 430.967 हेक्टर भूमि तथा ग्राम आम्बा में कुल 08 स्थानों के विभिन्न खसरा क्र. 131 से 1182 के अन्तर्गत् कुल 84.947 हेक्टर भूमि (पत्र के संलग्न सूची अनुसार) सोलार पार्क हेतु आंवटन किए जाने हेतु अभिमत चाहा गया है।

प्रकरण में प्रस्तावित स्थल ग्राम रूनिजा, गुर्जरखेडी एवं आम्बा ग्राम विभाग के मार्ग सुवासरा गुराडियाकलां मार्ग के मध्य से 52 फीट छोडकर एवं निम्न शर्त पर आवंटित की जाना उचित होगा :–

1. सोर ऊर्जा प्लांट के स्थापना हेतु परिवहन (सोलर प्लेटों एवं अन्य सामग्री) के दौरान यदि मार्ग क्षतिग्रस्त होने की स्थिति में सम्बन्धित निवेशक या विकासक द्वारा मार्ग को विभाग के अनुविभागीय अधिकारी या उपयंत्री की देखरेख में दुरूस्त कराए जाने की जवाबदारी सम्बन्धित कम्पनी की होगी।

कार्यपालन यंत्री
लोक निर्माण विभाग संभाग मन्दसौर

पृ. क्रमांक /तक/अनापत्ति/2015–16/ मंदसौर, दिनांक

प्रतिलिपि :–

1. कलेक्टर, जिला मंदसौर की ओर सादर सूचनार्थ प्रेषित।
2. अनुविभागीय अधिकारी, लोक निर्माण विभाग, उपसंभाग मंदसौर की ओर उनके पत्र क्र. 2208/तशा/15–16 मंदसौर दिनांक 05.11.2015 के संदर्भ सूचनार्थ प्रेषित एवं उपरोक्त ग्रामों में सोर ऊर्जा प्लांट के स्थापना हेतु परिवहन यदि मार्ग क्षतिग्रस्त होता है तो मार्ग सम्बन्धित कम्पनी से दुरूस्त कराया जाना सुनिश्चित करें।

कार्यपालन यंत्री
लोक निर्माण विभाग संभाग मन्दसौर

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NOC – M.P.P.K.V.V.C. , Sitamau (Page 1 of 2)

कार्यालय म.प्र.प.क्षे.वि.वि.कं.लि. संभाग,सीतामऊ

दूरभाष नं. 07426-222057 फेक्स नं. 07426-222502 ई-मेल eesitm46@gmail.com

कमांक/ 4114/का.यं./सामा./2015-16 सीतामऊ, दिनांक 30.11.15

प्रति,

तहसीलदार महोदय,
तहसील सुवासरा
जिला मंदसौर म.प्र.

विषयः- सोलर पार्क हेतु भुमि आबंटन में अभिमत बाबत।
संदर्भः- आपका पत्र कमांक 646 दिनांक 3-11-2015

उपरोक्त विषयान्तर्गत संदर्भित पत्र के माध्यम से नवीन एवं नवकरणीय उर्जा विभाग भोपाल द्वारा ग्राम गुर्जर खेड़ी / आम्बा रूनीजा में सूची अनुसार सोलार पार्क हेतु भुमि आंबटन में विभाग का अभिमत चाहा गया था, जो कि निम्नानुसार हैः-

आपके संदर्भित पत्र के माध्यम से ग्राम रूनिजा गुर्जरखेड़ी व आम्बा में भुमि आबंटन हेतु जो निम्नांकित सर्वे कमांक दर्शाये गये है, वह भुमि सोलर पार्क हेतु आंबटित की जाने में यदि प्रस्तावित भूमि में इस विभाग की कोई एल.टी. या एच.टी. लाईन शिफ्ट की जाना आवश्क हो तब सुपरविजन चार्ज इस विभाग में जमा करवाया जाकर आवश्यक अनुमती प्राप्त कर संबंधित द्वारा शिफ्ट करवायी जावे । उपरोक्तानुसार इस विभाग को भुमि आंबटन में कोई आपत्ति नहीं है।

Details of Land at Mandsaur Distt Proposed for Solar Park

Runija Village

S.No.	Khasra Number	Total Area (Hec.)
1	1014	13.050
2	1015	17.650
3	1016/min 1	14.040
4	1016/min 2	1.550
5	1016/min 3	0.500
6	1017	15.050
7	1027	1.210
8	1028/min 1	18.730
9	1028/min 2	0.500
10	1028/min 3	1.000
11	1029	18.390
12	1030	19.880
13	1031	15.850
	Total	137.400

Gujarkhedi Village

S.No.	Khasra Number	Total Area (Hec.)
1	1	2.805
2	2	7.682
3	3	1.829
4	4	0.439
5	5	42.600

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NOC – M.P.P.K.V.V.C. , Sitamau (Page 2 of 2)

6	6	0.784
7	7	8.152
8	8 min 1 to 7	25.085
9	9	26.235
10	11	35.589
11	12	3.114
12	13	3.48
13	14	31.982
14	15	5.769
15	16	2.017
16	17	1.097
17	18	21.406
18	19	21.137
19	20	19.755
20	21	3.031
21	87	8.351
22	88	8.152
23	101	0.167
24	102	0.418
25	103	3.972
26	104	0.314
27	105	1.505
28	106	0.167
29	107	17.36
30	108/1	0.533
31	108/2	0.021
32	109	0.157
33	110	4.923
34	111	4.923
35	112	25.817
36	113	15.259
37	114	30.102
38	115	13.556
39	116	14.057
40	117	0.92
41	118	16.305
	Total	430.967

Amba Village

S.No.	Serve Number	Total Area (Hec.)
1	131	6.445
2	132	8.807
3	135	15.709
4	173	5.193
5	218	6.553
6	353/1Min-1	7.296
7	1087/Min-1	13.024
8	1182	21.920
	Total	84.947

कार्यपालन यंत्री (सं/सी)
म.प्र.प.क्षे.वि.वि.कं.लि.सीतामऊ

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NOC Department of Mining , Mandsaur (Page 1 of 3)

कार्यालय कलेक्टर (खनिज) जिला मन्दसौर (म.प्र.)

कमांक 1916/खनिज/2015 मन्दसौर, दिनांक 17/12/2015

प्रति,

तहसीलदार
तहसील सुवासरा
जिला–मंदसौर (म.प्र.)

विषय :– सोलार पार्क हेतु भुमि आवंटन में अभिमत बाबत्।

संदर्भ :– आपका पत्र कमांक 646/री–1/15 सुवासरा दि. 03.11.2015।

–0–

उपरोक्त विषयांतर्गत संदर्भित पत्र के तारतम्य में लेख है कि आपके द्वारा पत्र के साथ सलंग्न सूची अनुसार निम्न ग्रामों के सर्वे कमांकें में इस कार्यालय का अभिमत चाहा गया है:–

ग्राम रूनिजा		
कं.	खसरा कं.	रकबा (हे.में)
1	1014	13.050
2	1015	17.650
3	1016/मिन–1	14.040
4	1016/मिन–2	1.550
5	1016/मिन–3	0.500
6	1017	15.050
7	1027	1.210
8	1028मिन–1	18.730
9	1028मिन–2	0.500
10	1028मिन–3	1.000
11	1029	18.390
12	1030	19.880
13	1031	15.850
योग		137.400
ग्राम गुजरखेड़ी		
1	1	2.805
2	2	7.682
3	3	1.829
4	4	0.439
5	5	42.600
6	6	0.784
7	7	8.152
8	8मिन 1 से 7	25.085

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NOC Department of Mining , Mandsaur (Page 2 of 3)

9	9	26.235
10	11	35.589
11	12	3.114
12	13	3.48
13	14	31.982
14	15	5.769
15	16	2.017
16	17	1.097
17	18	21.406
18	19	21.137
19	20	19.755
20	21	3.031
21	87	8.351
22	88	8.152
23	101	0.167
24	102	0.418
25	103	3.972
26	104	0.314
27	105	1.505
28	106	0.167
29	107	17.36
30	108/1	0.533
31	108/2	0.021
32	109	0.157
33	110	4.923
34	111	4.923
35	112	25.817
36	113	15.259
37	114	30.102
38	115	13.556
39	116	14.057
40	117	0.92
41	118	16.305
योग		**430.967**
ग्राम आम्बा		
1	131	6.445
2	132	8.807
3	135	15.709
4	173	5.193
5	218	6.553

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NOC Department of Mining , Mandsaur (Page 3 of 3)

6	353/1मिन–1	7.296
7	1087/मिन–1	13.024
8	1182	21.920
योग		84.947

उपरोक्त सूची में वर्णित ग्रामों के सर्वे कमांकों के सम्मूख दर्शाये गये रकबों की भूमि आवंटित की जाती है तो इस विभाग को कोई आपत्ति नहीं है।

15.12.15

प्रभारी अधिकारी
(खनिज शाखा)
जिला मन्दसौर (म. प्र.)

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NOC- Forest Department , Mandsaur (Page 1 of 2)

Phone No. – 07422-255519 (O)
09424794935 (M)
E-mail – dfotmsour@mp.gov.in

कार्यालय वनमण्डलाधिकारी
सामान्य वनमण्डल मन्दसौर, मध्यप्रदेश

क्रमांक / मा0चि0 / 2015 / 6185 मन्दसौर, दिनांक :– 15/12/15

प्रति,

कलेक्टर
जिला मन्दसौर

विषय :– सोलर पार्क हेतु भूमि आवंटन में अभिमत बाबत्।
संदर्भ :– तहसीलदार सुवासरा का पत्र क्रमांक / री–1 / 2015 / 646 दिनांक 03.11.2015.

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विषयांतर्गत संदर्भित पत्र से तहसीलदार सुवासरा जिला मंदसौर द्वारा रीवा अल्ट्रा मेगा सोलर लि0 द्वारा नीमच–आगर सोजर पार्क परियोजना स्थापित करने हेतु मन्दसौर जिले के ग्राम रूनिजा, गुजरखेड़ी एवं अम्बा में स्थित कुल रकबा 653.314 हे0 शासकीय भूमि चिन्हित कराई जाकर उक्त कार्य के क्रियान्वयन हेतु आरक्षित / आबंटन बाबद वन हानि नही होने के संबंध में अभिमत / अनापत्ति प्रमाण–पत्र चाहा गया था। जो निम्नानुसार हैं।

क्र.	ग्राम का नाम	तहसील	खसरा नम्बर	रकबा (हेक्टर मे)	रिमार्क
01	आम्बा	सुवासरा	131	6.445	उक्त भूमि समस्त भूमि शासकीय राजस्व भूमि हैं।
			132	8.807	
			135	15.709	
			173	5.193	
			218	6.553	
			353/1 Min-1	7.296	
			1087/Min-1	13.024	
			1182	21.920	
			Total	**84.947**	
02	गुर्जरखेड़ी	सुवासरा	01	2.805	उक्त भूमि समस्त भूमि शासकीय राजस्व एवं निजी भूमि हैं।
			02	7.682	
			03	1.829	
			04	0.439	
			05	42.600	
			06	0.784	
			07	8.152	
			08 Min 01 to 07	25.085	
			09	26.235	
			11	35.589	
			12	3.114	
			13	3.48	
			14	31.982	
			15	5.769	
			16	2.017	
			17	1.097	
			18	21.406	
			19	21.137	
			20	19.755	
			21	3.031	
			87	8.351	
			88	8.152	
			101	0.167	
			102	0.418	
			103	3.972	
			104	0.314	
			105	1.505	
			106	0.167	
			107	17.36	

वृक्ष है तो जल है, जल है तो कल है।

NOC- Forest Department , Mandsaur (Page 2 of 2)

02	गुर्जरखेड़ी	सुवासरा	108/1	0.533	उक्त भूमि समस्त भूमि शासकीय राजस्व एवं निजी भूमि हैं।
			108/2	0.021	
			109	0.157	
			110	4.923	
			111	4.923	
			112	25.817	
			113	15.259	
			114	30.102	
			115	13.556	
			116	14.057	
			117	0.92	
			118	16.305	
			Total	**430.967**	
03	रूनिजा	सुवासरा	1014	13.050	उक्त भूमि समस्त भूमि शासकीय राजस्व एवं निजी भूमि हैं।
			1015	17.650	
			1016/Min 1	14.040	
			1016/Min 2	1.550	
			1016/Min 3	0.500	
			1017	15.050	
			1027	1.210	
			1028 Min 1	18.730	
			1028 Min 2	0.500	
			1028 Min 3	1.000	
			1029	18.390	
			1030	19.880	
			1031	15.850	
			Total	**137.400**	

प्रकरण में वन परिक्षेत्र अधिकारी मन्दसौर द्वारा उनके पत्र क्रमांक/1952 दिनांक 30.11.2015 के अनुसार उक्त प्रस्तावित स्थल का मौका निरीक्षण/जॉच कर निकटतम वनक्षैत्र के कक्ष क्रमांक पी–11 की सीमा से पश्चिम एवं दक्षिण की ओर स्थित होने तथा वनक्षेत्र एवं वन संरक्षण अधिनियम 1980 के प्रावधानों पर कोई विपरित प्रभाव नहीं पड़ने का उल्लेख करते हुऐ अभिमत उप वनमण्डलाधिकारी गरोठ के द्वारा उनके पत्र क्रमांक/क्यु–1 दिनांक 04.12.2015 से की गई अनुशंसा के आधार पर इस कार्यालय से अनापत्ति जारी की जाती है। यदि प्रस्तावित भूमि पर किसी भी प्रकार का खनि–उत्खनन कार्य किया जाता है, तो अनापत्ति निरस्त मानी जावेगी।

वनमण्डलाधिकारी
सामान्य वनमंडल मन्दसौर

पृ. क्रमांक/मा0चि0/2015/6186 मन्दसौर, दिनांक :– 15-12-15

प्रतिलिपि :–

1. कलेक्टर भू–अभिलेख जिला मंदसौर की ओर सूचनार्थ प्रेषित्।
2. उप वनमण्डलाधिकारी गरोठ की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित्।
3. वनपरिक्षेत्राधिकारी मन्दसौर की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित्।
4. तहसीलदार तहसील सुवासरा की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित्।

वनमण्डलाधिकारी
सामान्य वनमंडल मन्दसौर

Annexure 3

Tree Cutting Application (P1 – LANCO)

Always Inspi

Ref: LSEPL/NTPC2X50MW/MP/Site/003

Dt: - 15-07-201

To,

The collector, Mandsaur,

Madhya Pradesh.

Ref: RE –CS-5714-004-9(R)-SC-COA-0012 Dtd.11-04-2016

Sub: Permission for tree & bush cutting at P1 Block, 50 MW, SPV Project, Mandsaur

Dear Sir,

LSEPL bagged a Solar project contract from NTPC Ltd for development of 50 MW(Block P1) SPV Project at village Runija, Tehsil Suwasra, P.O: Runija , Dist Mandsaur, Madhya Pradesh.

With reference to letter no. NRE/SOLAR/2016-17/127 Dated 16/05/2016, NTPC has acquired 553 hectare of land & necessary permission for execution of SPV Project. We have been allotted 100 hectare of land for development of P1 blocks. As a part of Project activities, we have to cut the trees & bushes from P1 Block. There are 450 numbers of trees & bushes need to be cut.

We request you to grant your approval and issue an NOC for the start of cutting works on P1 Block.

Regards,

For LANCO SOLAR ENERGY PRIVATE LIMITED

Authorized Signatory

Received copy

Lanco Solar Energy Private Limited

Corporate Office: Lanco House, Plot # 397, Udyog Vihar, Phase-3, Gurgaon-122 016, New Delhi Region, India.
T: +91 124 4741000 F: +91 124124 4741088 E: info@lancogroup.com
Registered Office: Lanco House, Plot # 4, Software Units Layout, HITEC City, Madhapur, Hyderabad-500 081, Telangana, India.
T: +91 40 40090400 F: +91 40 23116127 E: info@lancogroup.com
www.lancogroup.com

Tree Cutting Application (P2 – LANCO)

Always Insp

Ref: LSEPL/NTPC2X50MW/MP/Site/004

Dt: - 15-07-2016

To,

The collector, Mandsaur,

Madhya Pradesh.

Ref: RE –CS-5714-004-9(R)-SC-COA-0012 Dtd.11-04-2016

Sub: Permission for tree & bush cutting at P2 Block, 50 MW, SPV Project, Mandsaur

Dear Sir,

LSEPL bagged a Solar project contract from NTPC Ltd for development of 50 MW(Block P2) SPV Project at village Runija, Tehsil Suwasra, P.O: Runija , Dist Mandsaur, Madhya Pradesh.

With reference to letter no. NRE/SOLAR/2016-17/127 Dated 16/05/2016, NTPC has acquired 553 hectare of land & necessary permission for execution of SPV Project. We have been allotted 100 hectare of land for development of P2 blocks. As a part of Project activities, we have to cut the trees & bushes from P2 Block. There are 450 numbers of trees & bushes need to be cut.

We request you to grant your approval and issue an NOC for the start of cutting works on P2 Block.

Regards,

For LANCO SOLAR ENERGY PRIVATE LIMITED

Authorized Signatory

Received copy.

Lanco Solar Energy Private Limited
Corporate Office: Lanco House, Plot # 397, Udyog Vihar, Phase-3, Gurgaon-122 016, New Delhi Region, India.
T: +91 124 4741000 F: +91 124124 4741088 E: info@lancogroup.com
Registered Office: Lanco House, Plot # 4, Software Units Layout, HITEC City, Madhapur, Hyderabad-500 081, Telangana, India.
T: +91 40 40090400 F: +91 40 23116127 E: info@lancogroup.com
www.lancogroup.com

Tree Cutting Application (P3 – Vikram Solar)

vikram

Ref : VSPL-NTPC-50 MW-P19-Ltr-006 16th July 2016

To

The Collector, Mandsaur

Madhya Pradesh-458888

Contract Ref : Ref. No. RE-CS-5714-004-9(R)-FC-COA-0013 dated 20th Apr 2016

Ref. No. RE-CS-5714-004-9(R)-SC-COA-0014 dated 20th Apr 2016

Subject : Permission for tree and bush cutting at P-3 Block, Mandsaur Solar Power Project

Dear Sir,

We would like to inform you that NTPC Ltd who is developing Mandsaur Solar Power Project in your Tehsil, has awarded work to M/S Vikram Solar Pvt Ltd for development of 1X50 MW (Block P-3) Solar photo voltaic Project at village-Gujarkhedi, Tehsil-Suwasra, PO- Runija , Dist- Mandsaur, MP on EPC basis.

We would like to also inform you that NTPC has acquired 553 hectare of land & necessary land use permission have also been obtained on 16th May 2016 from concerned department (Letter attached). We have allotted 100 hectare of land for development of P-3 Block. As part of project activity, we have to cut the trees and bushes from P-3 Block. There are 402 numbers of trees and bushes need to be cut.

We request you to grant your approval and issue an NOC for the start of cutting works on P-3 Block.

Regards

FOR SPV

Site-In-Charge (SATYANARAYAN)

For Vikram Solar Pvt Ltd.

Encl: As above

Received 28/07/2016

Tree Cutting Application (P4 – BHEL)

Bharat Heavy Electricals Limited
Ramachandrapuram:: Hyderabad – 502032
Project Engineering & Systems Division: PE&SD

Ref: HY/PE&SD/SPV/NTPC/Mandsaur/Ltr-TC/07-16 Dt: 15.07.2016

To,

The collector,Mandsaur,

Madhya Pradesh

Ref:RE-CS-5714-004-9(R)-SC-NOA-0016 Dtd.31-03-2016

Sub: Permission for tree & bush cutting at P4 Block,1x50 MW,SPV Project,Mandsaur

Dear Sir,

BHEL bagged a solar project contract from NTPC Ltd for development of 1x50 MW(Block P4) SPV Project at village gujarkhedi, Tehsil Suwasra P.O: Runija Dist Mandsaur, Madhya Pradesh

With reference to letter no. NRE/SOLAR/2016-17/127 Dated 16/05/2016, NTPC has acquired 553 hectare of land & necessary permission for execution of SPV Project.We have been allotted 100 hectare of land for development of P4 block. As a part of project activities, we have to cut the trees & bushes from P4 Block. There are 478 numbers of trees & bushes needs to be cut.

We request you to grant your approval and issue an NOC for the start of cutting works on P4 Block.

Regards,

For BHARAT HEAVY ELECTRICALS LIMITED
Hyderabad

Tree Cutting Application (P5 – TATA Power)

TATA

To,

The Collector
Dist – Mandasur (M.P)

Date – 16th July-2016

SUB – Permission for Bush Cleaning work at our 50 MWp Project (P5 Block), part of 250 MWp NTPC Solar PV Project, Vill-Runija, Dist-Mandasur (M.P)

Respected Sir,

This is to inform you that NTPC Limited developing 250 MWp Solar Plant at Vill-Runija, Tehsil-Suwasra, Dist-Mandasur (M.P). As per respective NOA **(Ref: RE-CS-5714-004-9(R)-FC-NOA-0017)** We Tata Power Solar Systems Limited executing 1X50 MWp PV as EPC contract in the same Project.

With reference to letter no. NRE/SOLAR/2016-17/127 dated 16th May2016, NTPC has acquired 553 hectares of land and necessary permission for execution of SPV Project. We have been allotted 123 Hectare of land for development of P5 block. As a part of Project initial activity we have to remove the bushes and small trees from P5 block. There are 451 numbers of Trees and bushes needs to be cut.

We request you to grant your approval and issue an NOC for starting of cutting works in P5 Block.

Yours Sincerely,

FOR. TATA POWER SOLAR SYSTEMS LIMITED

AMITAVA SAMANTA

Project Manager

TATA POWER SOLAR

Tata Power Solar Systems Limited

Annexure 4

Land Use Permission

Office Of The Commissioner

New and Renewable Energy
Urja Bhawan, Near - 5 no. bus stop, Shivaji Nagar, Bhopal – 462016
Phone: 0755- 2551438,2579876, Fax: 0755-2551439

No.: NRE/SOLAR/2016-17/ 127 Date: 12/05/2016
16/5/2016

To,

Mr. S.K. Datta
General Manager & Head of the Project
NTPC Mandsaur.

Sub:-Advance land use permission.

Ref:- Your proposal for 250 MW SPV Power Project in Village Gujarkhedi, Runiza, Tehsil Sitamau Dist Mandsaur.

Dear Sir,

Please take the above reference. As requested by you, looking to urgency and time lines of the SPV project, advance land use permission for (134.19 Ha in Runiza & 419.448 Ha in Gujarkhedi Total Area) 553.638 Ha is hereby issued. All the necessary formalities have to be done later.

Please acknowledge.

Enclosed:- Land Details

(S.D. Singh)
Additional Commissioner

Cc To:- 1. Mr. S.L. Bajaj, DREO Mandsaur to follow up.
2. Mr. Sandesh Jaiswal, NTPC Limited , Regional Inspection office, 1st Floor, Press Shop Annexe Block 10, BHEL, Bhopal-462022 (MP)

Additional Commissioner

Annexure 5

Bore well Application (P1 – LANCO)

LANC
Always Inspirin

Ref: LSEPL/NTPC2X50MW/MP/Site/013

Dt: - 04-08-2016
22-08-2016

To,

The collector, Mandsaur,

Madhya Pradesh.

22/8/16
अधिवक्ता लिपिक

Ref: RE –CS-5714-004-9(R)-SC-COA-0012 Dtd.11-04-2016

Sub: Permission for Borewell at P1 Block, 50 MW, SPV Project, Mandsaur

Dear Sir,

LSEPL bagged a Solar project contract from NTPC Ltd for development of 50 MW(Block P1) SPV Project at village Runija, Tehsil Suwasra, P.O: Runija , Dist Mandsaur, Madhya Pradesh.

With reference to letter no. NRE/SOLAR/2016-17/127 Dated 16/05/2016, NTPC has acquired 553 hectare of land & necessary permission for execution of SPV Project. We have been allotted 100 hectare of land for development of P1 blocks. As a part of Project activities, we have to do bore well from P1 Block. There are 2 numbers of bore wells to be done.

We request you to grant your approval and issue an NOC for the start of bore well works on P1 Block.

Regards,

For LANCO SOLAR ENERGY PRIVATE LIMITED

P.S. Chalo

Authorized Signatory

P.S. Chalo

Lanco Solar Energy Private Limited
Corporate Office: Lanco House, Plot # 397, Udyog Vihar, Phase-3, Gurgaon-122 016, New Delhi Region, India.
T: +91 124 4741000 **F:** +91 124124 4741088 **E:** info@lancogroup.com
Registered Office: Lanco House, Plot # 4, Software Units Layout, HITEC City, Madhapur, Hyderabad-500 081, Telangana, India.
T: +91 40 40090400 **F:** +91 40 23116127 **E:** info@lancogroup.com
www.lancogroup.com

Bore well Application (P2 – LANCO)

LANC
Always Inspirir

Ref: LSEPL/NTPC2X50MW/MP/Site/014

Dt: - 04-08-2016
22-08-2

To,

The collector, Mandsaur,

Madhya Pradesh.

22/8/16

आवक लिपिक
कलेक्टोरेट, मन्दसौर

Ref: RE –CS-5714-004-9(R)-SC-COA-0012 Dtd.11-04-2016

Sub: Permission for Borewell at P2 Block, 50 MW, SPV Project, Mandsaur

Dear Sir,

LSEPL bagged a Solar project contract from NTPC Ltd for development of 50 MW(Block P2) SPV Project at village Runija, Tehsil Suwasra, P.O: Runija , Dist Mandsaur, Madhya Pradesh.

With reference to letter no. NRE/SOLAR/2016-17/127 Dated 16/05/2016, NTPC has acquired 553 hectare of land & necessary permission for execution of SPV Project. We have been allotted 100 hectare of land for development of P2 blocks. As a part of Project activities, we have to do bore well from P2 Block. There are 2 numbers of bore wells to be done.

We request you to grant your approval and issue an NOC for the start of bore well works on P2 Block.

Regards,

For LANCO SOLAR ENERGY PRIVATE LIMITED

A.S. Chako

Authorized Signatory

A.S. Chak

Lanco Solar Energy Private Limited

Corporate Office: Lanco House, Plot # 397, Udyog Vihar, Phase-3, Gurgaon-122016, New Delhi Region, India.
T: +91 124 4741000 **F:** +91 124124 4741088 **E:** info@lancogroup.com
Registered Office: Lanco House, Plot # 4, Software Units Layout, HITEC City, Madhapur, Hyderabad-500 081, Telangana, India.
T: +91 40 40090400 **F:** +91 40 23116127 **E:** info@lancogroup.com
www.lancogroup.com

Bore well Application (P3 – Vikram Solar)

vikramsolar

Ref: VSPL-NTPC-50 MW- P19- Ltr-010

4th Aug 2016
22nd

The Collector
Tehsil Suwasra, District Mandsaur
Madhya Pradesh - 458888

22/8/16
आवक लिपिक
कलेक्टोरेट, मन्दसौर

Contract Ref: Ref. No. RE-CS-5714-004-9(R)-FC-COA-0013 dated 20th Apr 2016
Ref. No. RE-CS-5714-004-9(R)-SC-COA-0014 dated 20th Apr 2016

Subject: Permission for Bore hole at P-3 Block, Mandsaur Solar Power Project

Dear Sir

We would like to inform you that NTPC Ltd who is developing Mandsaur Solar Power Project in your tehsil, has awarded work to **M/s Vikram Solar Private Limited** for development of 1x50 MW (Block P3) Solar Photo Voltaic Project at Village Gujarkhedi, Tehsil Suwasra, PO Runija, District Mandsaur, MP on EPC basis.

We would like to also inform you that for development of site & operation and maintenance of plant, we would be requiring water. To meet the water requirement, We would be required to dig 2 boreholes per 50 MW at site. Therefore, we request you grant us permission to dig 2 nos. of bore holes at site.

We solicit your support & cooperation on above to complete this prestigious Solar Plant (250 MW) at Mandsaur district, MP on time. We look forward for expeditious approval & we assure you that we will complete this activity within law.

Regards

VIKRAM SOLAR PVT. LTD.

Site In-charge
For Vikram Solar Private Limited

Received
23/09/16

VIKRAM SOLAR PRIVATE LIMITED

CORPORATE OFFICE
THE CHAMBERS, 8th Floor
1865, Rajdanga Main Road

TOLL FREE 1800 212 8200
EMAIL sales@vikramsolar.com
WEB www.vikramsolar.com

REGISTERED OFFICE
"TOBACCO HOUSE", 4th Floor
1, Old Court House Corner

FACTORY
Special Economic Zone, Sect
Falta, 24 Parganas (South),

Bore well Application (P4 – BHEL)

Bharat Heavy Electricals Limited
Ramachandrapuram:: Hyderabad – 502032
Project Engineering & Systems Division: PE&SD

Ref: HY/PE&SD/SPV/NTPC/Mandsaur/Borewell/08-16 Dt: 04.08.2016
22.08.2016

To,
The collector, Mandsaur
Madhya Pradesh.

22/8/16
अतिरिक्त लिपि:
कलेक्टोरेट, मन्दसौर

Contract Ref:CS-5714-004-9(R)-SC-NOA-0016 Dtd.31.03.16

Sub: Permission for digging Borewell at P4 Block, 1x50MW, SPV Project,Mandsaur

Dear Sir,

BHEL bagged a solar project contract from NTPC Ltd for development of 1x50 MW(P4 Block) SPV Project at Gujarkhedi,Tahsil:Suwasra,P.O:Runija,Dist:Mandsaur,M.P

This is with reference to the letter vide no.NRE/SOLAR/2016-17/127 Dated 16/05/2016, NTPC has obtained permission for use of 553 hectare of land for execution of 5x50 MW SPV Project. We have been allotted 100 hectare of land out of 553 hectare for development of P4 Block of 1x50MW.As part of project activities. We have to dig two numbers of borewell to meet the project requirement.

We request you to grant your approval and issue a NOC for digging borewell on P4 Block.

Regards

06.08.2016
For BHARAT HEAVY ELECTRICALS LTD.
Hyderabad

Bore well Application (P5 – TATA Power)

TATA POWER SOLAR
ENABLING SOLAR EVERYWHERE

Ref: TPS/NTPC/Mandasur/Site/003

To,

The Collector
Dist – Mandasur (M.P)

Date – 07th August-2016

SUB – Permission for Bore Well work at our 50 MWp Project (P5 Block), part of 250 MWp NTPC Solar PV Project, Vill-Runija, Dist-Mandasur (M.P)

Respected Sir,

This is to inform you that NTPC Limited developing 250 MWp Solar Plant at Vill-Runija, Tehsil-Suwasra, Dist-Mandasur (M.P). As per respective NOA **(Ref: RE-CS-5714-004-9(R)-FC-NOA-0017)** We Tata Power Solar Systems Limited executing 1X50 MWp PV as EPC contract in the same Project.

With reference to letter no. NRE/SOLAR/2016-17/127 dated 16th May2016, NTPC has taken necessary permission for execution of SPV Project. We have been allotted P5 Block for development that consists of 02 Bore well. As a part of Project initial activity we have to construct the Bore Well for respective Block.

We request you to grant your approval and issue an NOC for the same Bore well work as per Approved Specification.

Yours Sincerely,

FOR TATA POWER SOLAR SYSTEMS LIMITED

AMITAVA SAMANTA

Project Manager

Tata Power Solar Systems Limited
(formerly known as Tata BP Solar India Limited)
Unit 1 78 Electronics City Phase I Hosur Road Bengaluru 560 100
CIN: U40106KA1989PLC034989 Tel: +91 80 6777 2000/3000 Fax: +91 80 6777 2252
email: info.solar@tatapower.com website: www.tatapowersolar.com
Registered Office 78 Electronics City Phase I Hosur Road Bangalore 560100

Annexure 4: Environment and Social Screening Checklist (Solar Park/ Wind/ Hybrid/ Solar With Battery / Floating Solar)

A. Borrower Information

Application Registration Number (ARN):

Project Title:

Location:

Borrower:

Contact Details of Responsible Person from Borrower for Environmental & Social Issues:

Name:	
Designation:	
Address:	
Phone:	
Email:	

B. Project Design Data

Sr. No.	Parameter	Description
1.	Type of project:	☐ Solar Wind Hybrid ☐ Wind ☐ Ground Mounted Solar/ Solar Park ☐ Solar with Battery Storage ☐ Floating Solar
2.	Total Power Capacity of Project (MW):	
3.	Grid connection:	☐ Grid Connected ☐ Off-Grid
4.	Technology:	☐ Thin Film ☐ Monocrystalline ☐ Polycrystalline ☐ Any Other (Please Specify_____)
5.	Solar panel capacity (if hybrid):	
6.	Rated Power of each Turbine (MW):	
7.	Number of turbines:	
8.	Total Area covered (Acres/ Hectares):	

9.	Type of Battery:	☐ Lead Acid ☐ Lithium Ion ☐ Others, Specify. _____
10.	Number of batteries installed:	
11.	Previous (Before installation of the project) land categorization, as per Government records:	☐ Agricultural. If Yes, has it been converted to Non-agricultural land? Provide the documentation for the same.☐ Non-Agricultural☐ Government☐ Residential ☐ Commercial ☐ Industrial ☐ Forest ☐ Others. Please specify. _____
12.	Previous Land Use of Project Area: (*The purpose for which the project land was being used*)	☐ Agriculture ☐ Human Habitation ☐ Commercial/Business operations ☐ Industrial ☐ Forest ☐ Unused ☐ Other
13.	Land Conversion: Has land conversion been executed?	☐ Yes. Provide documentation. ☐ No. State the reason. _____
14.	Geographical Coordinates (Lat, Long):	Latitude- _____ °(N/S) Longitude- _____ °(E/W)
15.	Project Status:	☐ Implementation yet to begin (Planning phase) ☐ Under-Construction ☐ Commissioned (Provide date of Commissioning) ☐ Others. Please specify. _____
16.	Associated Infrastructure in and outside project area (like transmission line, labour camp, etc.):	

C. Environment and Social Information

Sr. No.	QUESTION	RESPONSE
1.	Has there been any Environment and Social Impact Assessment (ESIA) /Environment and Social Management Plan (ESMP) of the project?	☐ Yes, provide report. ☐ No, are there plans to carry out the same? _____
2.	Land procurement	☐ Government Land: Allotment. Mention lease period _____ years ☐ Private: Self-Owned ☐ Private: Willing seller ☐ Private: Leased. Mention the lease tenure - _____years.
3.	If the land was being used for agriculture, were there any standing trees or crops?	
4.	Does the project require felling of trees for transmission lines, access roads and other facilities? If yes, what is the compensation paid/to be paid for the trees? Please provide relevant documents.	
5.	Will facilities associated with the project like transmission line be established outside the project areas? If yes, is the Right of Way (RoW) in place? Have additional trees/vegetation been cleared within the Right of Way?	
6.	Is the transmission line RoW passing over / in vicinity of	☐ Natural Habitats ☐ Water Bodies ☐ Settlements ☐ Standing Crops ☐ Pre-existing nests, ground-roosting sites and burrows
7.	Are there any community facilities in/around (within 500 m radius) the project site? If yes, please name of the facility and specify the distance from project boundary?	☐ Any place of worship _____ m ☐ Community center _____ m ☐ Pond _____ m ☐ School _____ m ☐ Hospital _____ m ☐ Archeological/ Protected Monuments & Cultural properties in the form of memorial stone in different shape and sizes, graves, sacred tree, etc. _____ m ☐ Others, Please specify _____

8.	Is the access to any one of the above-mentioned facilities affected, due to the project?	☐ Yes. Please mention the facility and how? _____ ☐ No
9.	Is there any of these within 10 km radius of the project boundary? If yes, please provide details and the distance from site.	☐ Physical Cultural/Religious Heritage Site _____m ☐ Primary forest ☐ Wildlife Sanctuary _____m ☐ National Park _____m ☐ Wetland/Water Body _____m ☐ Mangrove/ Estuary (In case of coastal projects) _____m ☐ Special Biodiversity Rich Area _____m
10.	Does the project require involuntary displacement of people?	☐ Yes. How many individuals/ families were displaced? ☐ No
11.	What is the distance of the nearest human settlement from the project boundary? (km)	_____ km
12.	Are there any female workers in the project?	☐ Yes. Specify the number and kind of activities they are involved in. ☐ No
13.	Is there any Indigenous/Tribal population around the project site?	☐ Yes. Provide details. _____ ☐ No
14.	What are the measures being adopted to ensure the Occupational Health and Safety during the project construction and operations?	☐ Personnel Protective Equipment (PPEs). Mention details. _____ ☐ Health and Safety Trainings. Provide details. _____ ☐ Certifications such as OHSAS, etc. Provide details. _____ ☐ Company's Environment Health and Safety Policy/Manual. Provide details or copy of EHS Policy. ☐ Others. Please specify. _____
15.	What is the approximate number and source of labour hired by the owner or contractor? (Local or Migrant)	☐ Local_____ ☐ Migrant. Details of the arrangement for their lodging and other facilities. _____ ☐ Both_____
16.	Basic facilities for the labour	☐ Drinking Water. Mention details. _____ ☐ Sanitation. Mention details. _____ ☐ Others. Mention details. _____

17.	Does the project require any blasting? If yes, please provide details of the permission obtained	☐ Yes. Provide details. _____ ☐ No
18.	Will the project use, store, transport, handle or produce substances or materials which could be harmful to human health or environment or raise concerns about actual or perceived risks to human health?	
19.	Will there be any risks & vulnerabilities to community health & safety during construction or operation of the project?	
20.	What are the arrangements to prevent environmental pollution (air/ water/ land/ wastes- both solid & hazardous/ spills from batteries/ oils spillage) in the construction & operation phases of the project	
Wind Power		
21.	Does the project area fall under any bird migratory route?	☐ Yes. Provide details and what are the measures being taken to prevent bird or bat strikes against rotor blades. _____ ☐ No
22.	What is the distance of the nearest airport from the project site?	
23.	Is the aviation clearance required? If yes, provide documents	☐ Yes. Provide details. _____ ☐ No
24.	What is the distance of the closest national highway or state highway from the turbines?	_____ km
Solar Power		
25.	What is the arrangement for management of construction waste and packaging material?	
26.	What is the arrangement for management of hazardous waste generated during operations such as broken panels, transformer oil, etc.?	

	Provide a Waste Management Plan (WMP) for construction phase.	
27.	What is the source of water to be used for cleaning?	☐ Groundwater ☐ Surface Water Body. Specify. _____ ☐ Private Water Tankers. Provide source of water for tankers. _____ ☐ Others. Provide details. _____
28.	What is the arrangement for disposal of broken panels?	☐ Panel Repair/replacement options from supplier. Provide details. _____ ☐ Training to operator. Please provide details. _____ ☐ Others. Provide details. _____
29.	What is the method for cleaning solar panels?	☐ Water hose ☐ Water Sprinkler ☐ Robotic Cleaning ☐ Dry Mopping ☐ Others. Mention the details. _____
30.	What is the frequency of cleaning and estimated water consumption (kilo liter /year) for this purpose?	Frequency: _____ cleaning cycles in a month Water Usage: _____ kl (kilo liter) per cleaning cycle
31.	What is the source of water to be used for cleaning? (Procurement method as well as Ultimate source from where water is coming)	☐ Groundwater. Please provide copy/status of permission for Groundwater extraction. _____

		☐ Private Water Tankers. Provide source of water for tankers _____ ☐ Nearby Surface Water body. Provide details _____ ☐ Others. Provide details _____
32.	Is there a provision/ plan for Rainwater Harvesting (RWH)? If yes, what is the status thereof?	☐ Yes. What is the status thereof? _____ ☐ No
Floating Solar PV		
33.	Area for FSPV in sq. m (also in % of total area of water body)	
34.	Water body identified for floating solar is reservoir / backwater/ any other (specify)?	
35.	Is the identified water body used for Water Supply/ Fishing Activities/ Tourism & Recreation/ any other human activity? Kindly specify	
36.	Will project activity restrict access to the water body?	
37.	Any order/policy specific to the FSPV site?	
38.	Who is the owner of the FSPV waterbody & has their consent/ permission been obtained for usage?	
39.	Whether any endangered aquatic Flora/ fauna is present at FSPV site?	
40.	Whether the project (including Linked Activities/ Associated Facilities) viz. Transmission Lines involves approval/clearance under a) Forest (Conservation) Act,1980? b) Wildlife Protection Act, 1972? c) CRZ notification, 2019	

1. **Mention the contact details of the Local Revenue Official/ Block Development Official- Name, Designation, Phone Number, Email ID and Address**

2. **Mention the contact details of the Local Forest Official- Name, Designation, Phone Number, Email ID and Address**

Undertaking: I hereby declare and affirm that the information furnished above is true and correct to best of my knowledge and belief and nothing material has been concealed therein.

Name: Email: Contact No.:

Date

Note:

1. In case the project gets financing from IREDA, following documents need to be provided before first disbursement under the loan agreement
    a. Environment Management Plan (Land, Water, Waste, etc.)
    b. Occupational Health & Safety Plan
    c. Social Management and Community Health, Safety & Security Plan
    d. Grievance Redressal Plan

Annexure 5: Screening Criteria for Floating Solar PV Sub-projects

The currently proposed Shared Infrastructure for Solar Park Project plans to invest in Floating Solar PV sub-projects. Practice suggests that on average approximately 1.7-2 hectares of reservoir area is required for each 1 MWp installed. Currently, the various implementing agencies/ REPPD are looking at various suitable sites in the country to implement FSPV project, they shall be guided by this screening criteria & submit their proposals to IREDA, the borrower of the SISPP, in accordance with the same.

Benefits

There are many benefits associated with Floating Solar PV:

1. Critically, suitable land for meeting India's RE targets will become scarce – sites with the 'best' RE resources and with easy access to land are being taken up. Yet, land acquisition requirements for stand-alone solar (ground mounted about 2 hectares / MWp) suggest vast land needs to meet RE targets. Preliminary studies suggest that utilization of just 10 percent of India's water bodies would allow for the development of about 300 GW of FSPV generation capacity.[5]

2. Additional advantages of the technology include optimizing utilization of existing power evacuation infrastructure, improved efficiencies of PV panels due to a surface water cooling effect, lowering PV panel cleaning requirements, potentially reducing evaporation, and improving the habitat for aquatic life, i.e. by reducing water temperatures.

3. For example, Floating Solar PV Projects (FSPV) were observed to reduce water evaporation up to 1000 liters per m2 per year saved in Spain (M. R. Santafé, P. S. Ferrer Gisbert, F. J. Sánchez Romero, J. B. Torregrosa Soler, J. J. Ferrán Gozálvez, and C. M. Ferrer Gisbert, "Implementation of a photovoltaic floating cover for irrigation reservoirs," Journal of Cleaner Production, vol. 66, pp. 568-570, 2014.) and also there is increase in the quality of water with reduction in Algae growth (www.waterworld.com/articles/2011/09/floating-solar-systems-provide-power-environmental-benefits.html) formation which will help to protect the environment.

Potential Environmental Impacts

The area of potential impact of a FSPV sub-project will be its footprint and the associated areas of electrical evacuation infrastructure. Environmental impacts associated with the construction and operation of solar PV plants and their mitigation measures are well known. When the sub-project is expected to complement generation output with an existing hydropower plant there may be potential environmental impacts associated with any changes to the hydropower plant's operation, i.e. water levels and associated water flows. These associated impacts and mitigation measures are also well understood in the practice. There may also be well understood risks associated with the upstream construction and operation of evacuation infrastructure.

[5] According to a preliminary assessment of Renewable Energy College, Kolkata.

Potential environmental impacts that are somewhat novel to FSPV are their impacts to water quality and aquatic-supported biodiversity. These include but are not limited to:

- Impacts on temperature stratification and on dissolved oxygen levels due to shading of water
- Impacts on aquatic habitat resulting from shading
- Impacts on water quality and aquatic fauna/flora due to leaching from materials
- Impacts on water quality and aquatic fauna/flora from accidental release of oils and or lubricants of boats used during maintenance activities or detergents in panel washing
- Impacts on aquatic habitat as a results of installations in shallower (littoral zone) and benthic zone (bottom of reservoir) due to mooring systems or disturbances from placement/movement of underwater electrical cables (i.e. increased turbidity)
- Impacts that could occur from exposure to EMF associated with underwater electrical cables
- Impacts on water feeding and surface diving birds while hunting at the water surface or pursuing fish or foraging underwater.
- Impacts from the creation of waste (replacement parts)

The probability and scale of any of these impacts are site specific. For example, reservoir characteristics vary widely, including from where there is practically no aquatic-supported biodiversity (i.e. coal mine/quarry reservoirs), reservoirs that are used for drinking water supply, and natural ponds/lakes.

Shared Infrastructure for Solar Parks Project Screening Criteria and Procedures

a) Implementation Agency/ REPPD shall make a determination of the suitability of the proposed sub-project site on a case by case basis.

b) While there is over 1 GW of FSPV installations world wide, studies on environmental impacts of these sites are currently limited. Therefore, a site-specific ESIA will be required for each sub-project site and shall be consistent with applicable World Bank safeguards policies for the SISPP (as defined in the SISPP ESMF). The findings of the ESIA and the robustness of recommended mitigation measures will be used as the basis for the suitability of the site.

c) Implementation Agency/ REPPD shall be guided by the following principles in screening potential sites:

- Identify and prioritize sites that minimize potential negative environmental and social impacts
- Avoid all legally protected areas whether on land or water. These include various degrees of protection such as National parks, Sanctuaries, Conservation Reserves, Community Reserves that are specified in the Indian Laws governing Wildlife Protection.
- Avoid areas that are being proposed for such legal designation, where finalization is not yet done

- Avoid areas identified as important areas for conservation using IBAT, a tool that the World Bank Group has internalized for screening of projects for their impact on biodiversity.
- In a case where an existing hydropower plant with evacuation infrastructure exists in a protected area as defined above, Implementation Agency/ REPPD shall assess the likelihood and scope of potential incremental environmental impacts and consult with relevant authorities to determine whether the site is suitable and consistent with these screening principles.
- For locations that meet all the criteria above, Implementation Agency/ REPPD would ascertain presence of important fish species – either ask local experts or fishermen whether any species listed in Tables 1, 2 or 3 of the Publication "Threatened Freshwater Fishes of India" (available at http://www.nbfgr.res.in/pdf/ThreatenedFreshwaterFishes.pdf).
- Follow the 'do no harm' principle in assessing site suitability – because experience with FSPV is relatively limited, mitigate potential impacts by aiming to limit the footprint of the sub-project on a specific reservoir where aquatic flora and fauna exist.
    - Based on this principle, favorable go/no go decisions are more likely if the subproject's footprint is limited to ten percent of the average surface area of such a proposed reservoir over the last decade.
    - Subprojects larger than ten percent can be considered on such a reservoir provided that Implementation Agency/ REPPD can have reasonable assurance that the ESIA consultant would be able to collect sufficient data of satisfactory quality to assess the environmental and social impacts of a larger subproject on such a reservoir.
    - For reservoirs where no significant aquatic flora or fauna exist, the size of the footprint of the sub-project can be made on a case by case basis, following the above-mentioned principles.

Implementation Agency/ REPPD shall prepare a recommendation with a **FSPV Site Suitability Report** based on its initial screening, including references to supporting documentation, as appropriate, and a proposed Terms of Reference for the scope of the site-specific ESIA (informed by Implementation Agency/ REPPD's inquiries above). Implementation Agency/ REPPD shall submit it to the IREDA for its review and no objection. IREDA will forward the report to World Bank with comments, World Bank no objection on Implementation Agency/ REPPD's recommendation is required prior to taking a go/no go decision on support and subsequent ESIA preparation.

ESIA Preparation and Sub-Project Appraisal

i. The scope of work in the ESIA in addition to assessing impacts on such selected sites, would also analyze the potential measures to minimize, mitigate, compensate identified unavoidable adverse impacts – on water quality, ecology and any other environmental features deemed to be important in the particular context of that waterbody.
ii. Implementation Agency/ REPPD shall be responsible for the hiring of high quality consultants to conduct the ESIA (and associated preparation of the EMP or other instruments as may be needed), for quality control and eventually ensuring the

EMP is appropriately implemented following obligations spelled out in the SISPP legal agreements.

iii. Implementation Agency/ REPPD's sub-project appraisal will assess the likelihood and scale of environmental and social impacts and whether the proposed mitigation measures are likely to be effective, there is sufficient capacity to implement them and that they are appropriately resourced.

iv. Following the SISPP's ESMF, WB/CTF resources supporting the SISPP shall be used only if the Dam Safety Report confirms there are no major issues associated with the relevant Dam (that resulted in the formation of the waterbody) as defined by the Dam Safety Policy of the Bank. Implementation Agency/ REPPD shall follow the ESMF wherever relevant to ensure the Dam Safety Report is prepared by a qualified dam safety expert following terms of reference agreed with the Bank.

v. IREDA appraisal findings and recommendations will be submitted to the World Bank for its no objection, which would include IREDA's recommendation for a go/no go decision on investing in the project with partial WB/CTF financing.

Implementation and Monitoring

Following the SISPP's ESMF,

- Implementation Agency/ REPPD shall also monitor safeguards compliance accordingly during implementation.
- Implementation Agency/ REPPD shall task its environmental and social safeguards staff to monitor emerging literature and studies on FSPV. New studies may inform future sub-project preparation and development of appropriate ecosystems required to help sustainably scale up FSPV in India.
- Implementation Agency/ REPPD shall also explore opportunities to have its sub-projects participate in long-term studies that aim to fill knowledge gaps on environmental and social impacts, such as partnering with universities, scientific research institutes, etc.

Annexure 6 (A): Template for Environmental and Social Impact Assessment ToR – for Solar PV parks, Floating Solar and Hybrid Solar parks

This assignment is designed to assess the impact of the proposed solar PV park / Hybrid Solar wind park / Floating Solar park / wind parks project as well as associated evacuation facility (transmission lines) up to the proposed substation and recommend a set of measures and criteria for managing impacts in the project area and its surrounding; as per the requirements of the Government of India and the World Bank safeguard requirements.

Background:

The Government of India (GoI) has identified the power sector as key to achieving its goals of high and sustainable economic growth and accelerated poverty alleviation Ministry of New and Renewable Energy (MNRE) has identified certain states to be a potential state for engagement wherein a comprehensive solar development initiative is being thought about. Under National Solar Mission, GoI sets a target of 1,00,000 megawatts of grid-connected solar power by 2022. Solar Power Projects (SPP) & Wind Power Projects (WPP) have increased manifold in the past decade & are expected to be the mainstay in the RE sector power mix. 'National Wind-Solar Hybrid Policy' has been issued to provide a framework for promotion of large grid connected wind-solar PV hybrid system for optimal and efficient utilization of transmission infrastructure and land, reducing the variability in renewable power generation and achieving better grid stability. Many such benefits are also realised by setting up of new types of projects viz. Floating Solar Sub Projects / Battery Energy Storage Sub Projects.

Rationale and Objective:

While, solar & wind projects in India do not require a regulatory environmental clearance, it is also understood that large-scale projects will have environmental impacts and these impacts need to be avoided as far as possible.

For large-scale programs or projects (even if environmental clearance is not required), it is unlikely that projects could be undertaken without any adverse impacts on natural resources, forests, habitats (such as coasts and wetlands); or where resettlement, acquisition of productive land, diversion of water meant for other competing uses is required domestic is not required.

However, regulatory clearances processes and procedures are to be followed and complied even in case of solar & wind projects. These regulatory clearances include:

i. Consent to establish under the Water and Air Acts; as regulatory clearance for all solar and wind projects
ii. Commitment for water availability for construction and operations phase:
iii. Consent to withdraw groundwater, if any, or use of surface water resources after applicable clearance and allocation of resource.
iv. If located on the designated groundwater recharge zones, regulatory clearances from State Water Resources Department (WRD) or Central Ground Water Board (CGWB) will be required.
v. If located in the close vicinity of rivers, wetlands, state level clearances will be required.
vi. If located in forest areas, regulatory clearances under the Forest Conservation Act and the Forest Dwellers' Rights Act (additionally wildlife clearance will be required depending on if the forest in the vicinity is a national park or a wildlife sanctuary).

vii. Establishing clearance requirements related to alignment of the transmission lines for transfer of generated solar power to National and State grid.
viii. Usual clearances will be required if land acquisition is involved.

The requirements of the above-mentioned regulatory clearances including any other clearance requirements applicable for the proposed Project shall be evaluated by the appointed consultant.
The key objective of this study is to conduct Environmental and Social Impact Assessment (ESIA) with a view to identify the critical environmental and social concerns in the proposed renewable power projects and address them as an integral part of project design. The specific objective includes:

i. To assess the existing status of environment and social in the study area and its vicinity (10 km radius) and to identify threats and issues which have potential to adversely impact important environmental and social features of the project influence area.
ii. Carry out environmental and social analysis of project area and potential activities envisaged under the project.
iii. Analyse various options available in the site layout and arrangements for ancillary facilities like water supply, drainage, access, etc. to minimize adverse impacts and enhance positive impacts, where feasible
iv. Identification of the project affected families; assessment of loss of livelihood / property resources for people living within the proposed site and in its immediate vicinity through primary census surveys covering all project affected families/ consultations.
v. Assess impacts on the indigenous/marginalized communities within the site and its influence area.
vi. Prepare a site specific environmental and social assessment report by documenting environmental features of the project area, socio-economic and cultural status of community in and around the probable project site.
vii. To identify the environmental and social issues associated with implementation of proposed renewable power generation project and develop environmental codes of practices for common activities like site preparation, installation of panels, management of waste, occupational health, and safety, etc. and social exclusion list that need to be followed during various stages such as planning, construction, and operation & maintenance.
viii. This assessment should also include considerations of safety – both for the workers in the site and related facilities, as well as of nearby residents, especially those that live close to ancillary facilities ,
ix. To undertake consultations with potentially affected people and to take these into account during the preparation of the management plans that would be executed before the developers start working on the site.
x. To assist the client in establishing the site boundary on-site by integrating the total station outputs (available with client department) with the baseline study outputs.
xi. To identify portions of the codes of practice/management framework that need to be integrated with the bidding documents to ensure that the prospective bidders

are aware of what all will be required during project implementation and operation from an environmental, health and safety, as well as social perspective.

Contents of the Environmental and Social Impact Assessment Study

The Environmental and Social Impact Assessment (ESIA) study (and the report) will cover the following:

1. **Defining the Project/Project Description**; Providing a Project description with focus on understanding the environmental and social setting and sensitivities for the proposed project, including an overview of the land lease process and resettlement requirements and its impacts on indigenous peoples and other marginalized families, if any. This would also include any related facilities that may be required (e.g., access roads, transmission lines and substations, water supply arrangements, housing, raw material etc.).
2. **Laying down Policy, legal, and administrative framework:** Discussing the policy, legal and administrative framework within which the assessment is carried out, national and state specific regulations (including permits and licenses), and The World Bank's Operational Policies and Best Practices and IFC Performance Standards. Reviewing the Social & Environmental compliance requirement with respect to the above; present an overview of *Government of India's and State Government's social policies, legislations, regulatory and administrative frameworks* in conjunction with the World Bank's safeguard policies and IFC Performance Standards. Where gaps exist between these policies, make recommendations to bridge the gaps in the context of the proposed project.
3. **Generating Data for Environmental and Social Assessment:** Collection and generation of relevant social and environmental (physical, biological) data (primary & secondary) within the study area. This data should be relevant to decisions about project location, design, construction, operation, or mitigation measures. The data generation should specifically focus on issues related to
    a. Water- its quality, availability and adequacy vis-à-vis the requirements during different phases of the project life cycle
    b. Land and physical environment
    c. Physiographic characteristics
    d. Prepare **Socio-economic profile** in terms of demographic characteristics, land use pattern, economic profile, occupational pattern and other socio-economic parameters.
    e. Identify and **analyse the issues of vulnerable communities and gender**
    f. Land, access requirements, land use, and involuntary resettlement, if any
    g. Assess the likely impacts of the sub-project, in terms of land lease (loss of lands, houses, livelihood, etc.), and resultant involuntary resettlement, if any and undertake the census of potential project affected people;
    h. Based on the assessment of potential social and economic impacts, the SIA should establish criteria that will assist in the formulation of strategies; to the extent possible maximize project benefits to the local population and minimize adverse impacts of the project interventions on the affected communities;

i. The consultants would study the living patterns of vulnerable population (including tribal, scheduled castes, women, landless, households below poverty line, etc.) in the project area and assess whether they are involved in community decision making process. If the findings reveal that certain groups are excluded in the development process, then the consultants should develop a strategy for their inclusion in project development and operation as well as in preparing social risk management plan.
j. Identify likely loss of community assets including the religious structures and common property resources (e.g. forest, grazing land, drinking water source, etc.); the impacts of their loss on the local population, and prepare mitigation plans
k. Ecology or biodiversity
l. Project design interventions including power evacuation
m. Physical or cultural heritage (if any)
n. Flooding and seismic risk
o. Hazardous and domestic waste management, etc.
p. Review of the land take/lease process to assess any legacy or current/existing issues (like informal settlers, livelihood dependence, other usage etc.) on the allotted land. It will also look at current and proposed development activities within the project's area of influence, including those not directly connected to the project

4. **Information Disclosure, Consultation and Participation**: Describe the consultation and participation mechanisms adopted, including the activities undertaken to disseminate project and resettlement information during project design and engaging stakeholders. The results of consultations with affected persons, the host communities, civil society organizations and other stakeholders, and REPPD response to address the concerns raised will be summarized.
5. **Conduct *stakeholders' consultation*** that ensures that all key stakeholders are aware of the objectives and potential environmental and social impacts of the proposed project, and that their views are incorporated into the projects' design as appropriate. Stakeholders' will include all those who are directly or indirectly dependent on the project site(s). **Therefore, identify the key stakeholders** (Government, NGOs, CSOs, Academicians, etc.) in the project area; analyse their perspectives of the project. The analysis shall be carried out for both primary and secondary stakeholders at project level through structured discussions on the (a) importance of addressing social issues (b) impressions of past efforts, if any (c) suggestions for what to do differently in future (d) key issues (goals and safeguards) to be addressed; and (e) issues of co-ordination and / or conflict among various stake holders. The analysis shall be summarized in a structured manner and shall clearly bring out the implications for project design.
6. **Review of land lease / purchase process,:** The consultant, based on documentation provided by project developer, site visits and consultations with the land owner, will review the following (i) processes followed for land procurement including an assessment of the adequacy of information disclosed to the landowners and the bargaining power of landowners to negotiate for fair compensation, (ii) policies and laws (if any) that are applicable for negotiated settlements in the area, (iii) confirmation of third party validation of the

negotiations carried out, (iv) mechanisms adopted for calculating the lease rate of land and other assets impacted, and (v) record keeping requirements of the negotiation process.

7. **Assessing Social and Environmental Impacts and Mitigation Measures:** Assessing the Social and Environmental impacts (both positive and negative) of solar energy project, with potential assessment of cumulative impacts (linked to development or other projects and the overall park), if relevant and as appropriate. Identify mitigation measures and any residual negative impacts that cannot be mitigated. Also evaluate impacts and risks from associated facilities and other third party activities. The mitigation measures shall be presented in the form of Environmental Management Plan (EMP), which shall include but not limited to:
    a. Rainwater harvesting where feasible.
    b. Occupational health and safety
    c. Labour working conditions
    d. Construction labour management
    e. Environmental action and monitoring plan
    f. Waste Management including for Hazardous waste
    g. Disaster management plan
    h. Develop an R&R entitlement framework in consultation with the affected people and other stakeholders and prepare a resettlement action plan (RAP) or social management plan (SMP) which is acceptable to the project affected people;
    i. Description of the entitlements for various categories of impacts, mitigation measures to address livelihood impacts, etc.
    j. Interventions needed for skill development and overall social upliftment of the communities in the project influence area
    k. To develop a consultation framework for participatory planning and implementation of proposed mitigation plan;
    l. Assess the capacity of institutions and mechanisms for implementing social development aspects of the project implementation including the social safeguard plans and recommend capacity building measures; and,
    m. Develop monitoring and evaluation mechanism to assess social development outcomes
    n. Preparation of Gender Action Plan and Indigenous Peoples Development Plan (if required)
    o. Assessment and mitigation measures for health and safety issues of the workforce and community, as well as compliance with national labour laws, IFC Performance Standard 2 on Labour and Working Conditions and World Bank Group EHS Guidelines
8. **Analysing the Alternatives:** Comparing reasonable alternatives to the proposed project site, technology, design, and operation in terms of their potential social environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. It would also state the basis for selecting the particular site and project design justifying recommended approaches to pollution prevention and abatement.

9. **Grievance Redress Mechanism:** Description of the community grievance redress framework/mechanism (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental and social performance.
10. **Draft inputs for inclusion in the Bidding Documents**: These would include contractual requirements, specific indicators that would be monitored during implementation and operation by the successful bidder, and (dis)incentives for compliance with requirements as well as how any disputes relating to performance on these aspects would be managed.
11. **Conclusion and Recommendation** - Providing conclusions drawn from the assessment and providing recommendations.

An Executive Summary of the entire study will be prepared and once finalized will be translated into local language for disclosure purposes both in the project area and in the websites of project developer.

Outputs and Payments

The following outputs are expected during the course of the assignment

Deliverable / Report Title	Printed Copies	Soft Copies (in pen drive/ CD)	Time Frame from submission of acceptance of Work Order & Performance Security	Payment as % of total cost of the assignment
Inception Report	3	6	2 weeks	20
Draft ESIA and Consultations Report	3	6	8 weeks	40
Final ESIA and Consultations Report	3	6	Within 2 weeks of receiving comments from Client/REPPD and WB and disclosure of the document	20
Inputs to the Bidding documents for developers	6	12	2 weeks from ESIA report	20

Expertise needed

The following indicative expertise is suggested for the assignment. The consultant is expected, however, to undertake their own assessment and propose their best team to successfully deliver the above scope of work.

Sl. No.	Expertise	Qualification	Input required
1.	Team Leader	● A post-graduate / doctoral degree holder in Environmental or Social Sciences or a related field with at least 15 years of experience in delivering ESIAs for development projects ● S/he should have demonstrated experience of working with and leading multi-sectoral teams ● S/he should be conversant with relevant regulations in India and its various states & multilateral funding agencies like the World Bank ● S/he should be fluent in English and similar level of competency in Local language would be an advantage	14weeks

		• at least 5 Environment and Social Impact Assessment (ESIA) in the Renewable Energy field	
2	Social Expert	• A post-graduate/doctoral degree holder in Social Sciences, or a related field with at least 15 years of undertaking (E)SIA studies, preferably for development projects, with funding support from multilateral agencies like World Bank • S/he should have experience of organizing consultations with potentially affected persons • Familiarity with the relevant regulations of selected states would be an advantage • Fluency in Local Language would be required and that in English would be desirable • at least 3 Environment and Social Impact Assessment (ESIA) or Social Impact Assessment (SIA) in the Renewable Energy field	14weeks
3	Resettlement Expert	• A post-graduate/doctoral degree holder in Social Sciences, or a related field with at least 8 years of undertaking resettlement studies, meeting international standards like the World Bank and IFC Performance Standards • Should have led the development of at least 3 RAPs or Livelihood restoration Plans in the last 5 years, with at least one in the power sector • Familiarity with the relevant regulations of selected states would be an advantage • Fluency in Hindi or Local Language would be required and that in English would be desirable	As per the project requirement
4	Environmental Expert	• A post-graduate/doctoral degree holder in Environmental science/engineering or related field with at least 15 years of experience in undertaking E(S)IA studies, preferably for development projects, with funding support from multilateral agencies like World Bank • S/he should have experience of organizing and analyzing environmental survey results and incorporating the findings into the report • Familiarity with Contracting procedures, especially in the PPP mode would be an advantage • Prior experience of developing codes of practice and other tools for management of generic issues would be an asset. • at least 3 Environment and Social Impact Assessment (ESIA) OR Environment Impact Assessment (EIA) in the Renewable Energy field	As per the project requirement
5	Aquatic Ecology Expert (For Floating Solar parks)	• A post-graduate/doctoral degree holder in Environmental science/engineering, eco-system services management or related field • S/He should have experience in ESIA of floating solar PV projects • S/he is having experience in Water Quality/Aquatic Ecological Modelling would be preferred	As per the project requirement
6	Geo - hydrologist	• A post-graduate degree holder in relevant discipline with at least 8 years of experience of geo-hydrological investigations • Prior experience of working in multi-disciplinary teams will be an advantage	As per the project requirement
7	Health and Safety Expert	• An engineering graduate with industrial safety courses, like NEBOSH, diploma in safety, etc.	As per the project requirement

		• Experience of working in the energy sector of at least 8 years	
8	Hazardous Waste Specialist	• A scientist/engineer with relevant experience in handling hazardous substances/waste issues in line with GoI requirements with about 8 years of experience • Experience of working in power plants would be desirable	As per the project requirement
9	Ecological expert	• A post-graduate/doctoral degree holder in Biodiversity/Ecology or a related field with at least 5 years of undertaking (E)SIA studies, preferably for development projects, with funding support from multilateral agencies like World Bank	As per the project requirement
10	Transmission and Sub-station Expert	• A transmission and substation expert with graduate qualification in Electrical and experience of 15 years in transmission sector and substation development	As per the project requirement
11	Support Staff	• As per need	As per the project requirement

Facilities to be provided by the Client/ REPPD

The client will provide letters of introduction to various State and Central Government departments/entities upon specific request by the consultant. It is expected that the consultant will identify these early in the study, preferably by the Inception Report stage. No other facilities will be provided by the Client.

Scope of assignment for Floating Solar PV Park Facility

In general, the consultant shall cover the following for floating solar power park facility.

i. Site visits to be carried out by the consultant team for assessment of the actual site conditions and other related information.
ii. Location suitability analysis from an environmental and social perspective shall be carried out.
iii. Analyse the change in water surface area based on GIS-study of satellite collected data and also evaluate the patches of reservoir identified for installation of FSPV project at the reservoir.
iv. Baseline analysis of the physical, chemical, biological data pertaining to the reservoir.
v. Analysis of metrological data covering wind speed, wind direction, humidity, ambient temperature and rainfall.
vi. Details of Statutory and Legal framework required for developing the FSPV based projects at the identified reservoir, relevant state policies, statutory clearances, licences and permissions required.
vii. Floating solar park location and land ownership status, location, approach, land allocation process to project developer.
viii. Environmental settings in and around 10 km radius of proposed facility covering location, and site-setting, accessibility, approach road, details of nearest electric sub-station, alternatives for transmission connectivity, surrounding areas, heritage sites, ecological sensitive areas, reserve or protected forest, any property of archaeological importance etc. illustrated with a location map and site plan at a suitable scale.

ix. Environmental impacts on the flora and fauna, nesting habitats in vicinity, reservoir ecosystem, water quality, flooding, and seismic risks, Endangered/threatened species, and critical habitats,
x. Stakeholders mapping with influence matrix and consultation with the stakeholders
xi. Stakeholder Analysis (Key Expectations, Impacts, Issues as related to each stakeholder) and public consultations.
xii. Use of water for other purposes, to identify all direct and indirect use of water (drinking, agricultural, economic (like fishing), socio-cultural and other purposes in the study stretch through consultation with local communities, and relevant stakeholders/government agencies
xiii. Socio-economic and cultural profile of the population in study area, identification of key social issues – social diversity and gender, opportunities and participation of key stakeholders, vulnerable social groups.
xiv. Assessment of land use, services and infrastructure, anticipated impacts on land use and changes.
xv. Impacts on the livelihoods and displacement of people due to proposed project interventions,
xvi. Assessments of positive and negative environmental and social impacts/risks likely to occur for different sub-groups or beneficiaries as a result of project interventions; and suggest measures to avoid/minimize/mitigate negative impacts and derive the maximum from positive impacts;
xvii. Analysis of citizen engagement and beneficiary feedback for incorporating at the design stage.
xviii. Estimated reduction in CO2 emissions
xix. The study shall cover the project design, implementation, and operation phases.
xx. A plan for evacuation of power from the proposed project along with mitigation measures for any anticipated adverse impacts;
xxi. A timetable, approximate cost, and the methods and timing of construction of the project, including underwater details of temporary construction facilities, labour and material requirements and waste management etc.
xxii. Description of the potential significant environmental and social impacts of the project as well as description of the forecasting methods used in evaluation.
xxiii. Description of the measures envisaged for avoiding, minimizing, mitigating, restoration of the adverse environmental and social aspects.
xxiv. Impacts due to storage, handling, operations and disposal of the battery energy storage systems and auxiliary facilities.

Scope of assignment for wind power projects

In general, the consultant shall cover the following for wind parks and hybrid solar - wind parks

i. Overview of the state of environment on the site and its surrounding - natural heritage, archaeological, cultural heritage, noise (current state and during

operations), wildlife habitats, safety aspects, proximity to roads and railroad, powerlines, interference with communication systems, aircraft safety aspects, shadow flicker, existing land use and land cover in the study area,

ii. Proximity of the proposed site to built-up structures/populated areas, schools & hospitals, industrial and commercial activity, agricultural land, and its anticipated impacts.
iii. Review of the relevant regulations, clearance procedures required for planning and construction of wind energy parks.
iv. Characteristics of the development – size, possible cumulative impacts of the development of multiple wind turbines, use of natural resources and energy, risk of accidents, visual impacts due to the project.
v. Impact on site topography, drainage patterns, due to the implementation, operations, and decommissioning of the park.
vi. Impacts due to the increased shadow flicker, noise levels and vibration, lighting at the site.
vii. Evaluating the requirement of new road /rail links during construction stage, closing or diverting existing routes during construction stage.
viii. Impact on the existing land use due to the proposed project.
ix. Are there any areas, on the site or in its proximity, designated by international or domestic regulations due to their ecological, landscape, cultural or other values that can be affected by the impact of the project.
x. Impact on the drainage and surface water bodies on site and its immediate vicinity.
xi. project site status w.r.t to risk of earthquakes, ground settling, landslides, erosion, floods or recurring climate conditions (e.g. difference in temperature, fog, strong winds) that can lead to the project causing adverse environmental and social impacts.
xii. The study shall cover the project design, implementation, and operation phases.
xiii. A plan for evacuation of power from the proposed project along with mitigation measures for any anticipated adverse impacts;
xiv. A timetable, approximate cost, and the methods and timing of construction of the project, including underwater details of temporary construction facilities, labour and material requirements and waste management etc.
xv. Description of the potential significant environmental and social impacts of the project as well as description of the forecasting methods used in evaluation.
xvi. Description of the measures envisaged for avoiding, minimizing, mitigating, restoration of the adverse environmental and social aspects.
xvii. Impacts due to storage, handling, operations and disposal of the battery energy storage systems and auxiliary facilities.

Scope of assignment for hybrid solar & wind power projects

In general, the consultant shall cover the following for wind parks and hybrid solar - wind parks

i. Overview of the state of environment on the site and its surrounding - natural heritage, archaeological, cultural heritage, noise (current state and during

operations), wildlife habitats, safety aspects, proximity to roads and railroad, powerlines, interference with communication systems, aircraft safety aspects, shadow flicker, existing land use and land cover in the study area,

ii. Risk of earthquake, landslides, flooding, storms on the proposed site.
iii. Possible cumulative impacts with other developments,
iv. Impact on site topography, drainage patterns, due to the implementation, operations, and decommissioning of the park.
v. Risks of accidents endangering human health and environment during the implementation, operations, and decommissioning stage.
vi. Anticipated social changes in the study area i.e. demographic, employment, lifestyle due to the project
vii. Assessment of the adverse impacts and Direct habitat loss (eg. on site, cable route) and associated biological impacts (e.g. reduced biodiversity, loss of feeding/breeding habitats), bird collision.
viii. Proximity to environmentally sensitive locations including flora and fauna habitats, migratory bird paths, nesting grounds, habitat fragmentation, protected areas designated by state or national regulations like protected forest, reserved forest, national parks and wildlife sanctuary etc.
ix. Impacts due to generation of waste during the construction, operations, and decommissioning stage of the power project
x. The study shall cover the project design, implementation, and operation phases.
xi. A plan for evacuation of power from the proposed project along with mitigation measures for any anticipated adverse impacts;
xii. A timetable, approximate cost, and the methods and timing of construction of the project, including underwater details of temporary construction facilities, labour and material requirements and waste management etc.
xiii. Description of the potential significant environmental and social impacts of the project as well as description of the forecasting methods used in evaluation.
xiv. Description of the measures envisaged for avoiding, minimizing, mitigating, restoration of the adverse environmental and social aspects.
xv. Impacts due to storage, handling, operations and disposal of the battery energy storage systems and auxiliary facilities.

Annexure 6 (B): Monitoring & Evaluation TOR

SCOPE OF WORK

The objective to carry out a monthly review of social and environmental safeguard activities being implemented in the project and provide specific recommendations to mitigate the issues identified during the review period.

Resettlement Action Plan and Land Acquisition

i. Verify the process followed in determining the compensation/lease rent;
ii. Verify timely payment of compensation/lease rent to the landowners once the compensation/lease rent awards are made. Participate in some of the compensation/lease rent distribution meetings to ascertain the process followed for distribution of compensation/lease rent;
iii. Verify the process followed in the dissemination and administration of reimbursement of stamp duty or taxes in case those who buy alternative lands and houses out of compensation money;
iv. Verify the process followed for dealing with those cases where severance of lands are involved ;
v. Ascertain how the various provisions including payment of additional compensation in case of delay in completing the land acquisition process are administered;
vi. Follow up on the status for dealing with grievances related to compensation rates/lease rent;
vii. Report on any additional land acquisition/procurement requirements due to expansion plans;
viii. Identify gap and critical areas in implementation process and develop appropriate corrective actions in consultation with social & environmental officer
ix. Carry out random sample check at field level to assess whether land acquisition/procurement and/or resettlement and/or social program objectives have generally been met. The sampling size will be prepared in consultation with SPPD;
x. Monitor effectiveness of the grievance system;
xi. Liaison with SPPD, Developer, NGO (engaged for implementation of RAP), and project affected communities to review and report progress against RAP;
xii. Verify and ascertain that the Entitlements as available in the Entitlement Matrix are administered to the various category of PAPs;
xiii. Ascertain that the various proposals made in RAP to mitigate the impacts are implemented in the manner it was described in the RAP;
xiv. Ascertain how various suggestion and concerns raised by the local people during consultations are incorporated or addressed during the project implementation;
xv. Report on the Status of completion of reconstruction of affected community assets prior to handing over of the land to the developer;
xvi. Report on the functioning of grievance redress mechanism to deal with the complainants grievances related to RAP implementation;

xvii. Review the functioning of Data Base Management to track the implementation progress;
xviii. Review the periodical internal monitoring reports and identify any gaps in reporting or delay in implementation progress;
xix. Verify the coordination between Developer and RAP implementation;
xx. Monitor the role of consultants and NGOs in RAP implementation and identify any improvements required and suggestion for their services;
xxi. Monitor the progress in providing unskilled jobs to the PAPs and local people;
xxii. Participate in the meetings and consultations carried out by the implementing agency or carry out independent consultations to get first hand feedback from the affected and local people on the project implementation in general and RAP Implementation in particular;
xxiii. Any others tasks that are appropriate to deal with resettlement impacts and PAPs/local villagers concerns;
xxiv. Report other social safeguard issues such as incidence of child labor, unequal wages, unhealthy work camps posing health or security hazards to the workers, etc.
xxv. Preparation of Monthly progress report on all social issues

Environmental Management

i. Review the EMP and recommend the implementation plan for ensuring its implementation
ii. Formulate necessary reporting formats for the SPPD/Developer contractors to monitor the implementation of environmental management activities
iii. Plan and impart regular orientation / training programs for the SPPD/Developer staff on the effective implementation of Environmental Management measures in the project
iv. Review if Labour camp is set up as per EMP and monitor its satisfactory operation
v. Verify proper Health & Safety measures are in place for labours, employees working at site
vi. Check trees are removed following all procedures and with clearance from Forest Dept. Verify compensation paid to the owners of trees which are felled to clear the site as per the provisions
vii. Review if Developer avoid soil pollution
viii. Monitor pollutants not making its way to water bodies and advise Social & Environmental Officer
ix. Check construction work is not carried during the night and during rainy season, without necessary safety and precautionary measures.
x. Ensure that the Developer carries out regular environmental monitoring as per the EMP and recommend necessary mitigation measures, where the parameters exceed the permissible standards
xi. Verify adequate dust suppression measures are undertaken and these follow CPCB emission norms; periodical AAQ monitoring data to be checked w.r.t. standards
xii. Monitor that the construction activities are carried without causing any unwanted land subsidence
xiii. Check solid waste and other types of wastes including hazardous waste are managed as per EMP and regulatory provision

xiv. Verify whether permission from the authority is obtained for withdrawal of water from ground water & / or natural water body

xv. Participate in the meetings and consultations held by the implementing agencies/developer

xvi. Report any lapse by Developer on environmental aspects to the SPPD with specific recommendations for remedial actions.

xvii. Preparation of Monthly progress report on all environmental issues

Annexure- 7 Environment, Health & Safety Considerations for Projects using Battery Storage Energy System (BESS)

i. Adequate ventilation of battery area to be ensured to remove potentially explosive gases that are generated from charging cycles
ii. BESS system/ battery bank to be protected by fire/smoke detection and suppression systems
iii. First responder action plans, including signage for access routes, assembly points, and emergency lighting should be available.
iv. Rules, procedures, and PPE provisioning for site access to be ensured.
v. Emergency power-off interlock strategies for connected utilities or systems and fault condition annunciation and signalling should be in place
vi. Technician certification requirements to be imposed on those working in BESS
vii. Rigging instructions and access routes for equipment unloading or servicing (including load bearing limits of site surfaces) is required
viii. Development of an operations manual including all aspects of security and operations is required
ix. Ensure redundancy of systems and implementation of fail-safe designs
x. Ongoing monitoring of the BESS, including clear warning systems and alarms is required
xi. Hiring required technical experts for operation is required
xii. Ensuring security of the BESS, both physically and as cyber-security is required
xiii. Clear communication and training of staff and first responders, including regular emergency response drills is required
xiv. Regular on-site inspections to look for abnormal issues related to:

- Restricted access or drainage
- Rust and deterioration
- Mechanical or Electrical deterioration
- Examining battery cells for defects to avoid cell failures

xv. An Emergency Response Plan, which describes how any incidents will be responded to in order to safely shut down and address immediate safety issues such as fire, chemical, or electrical issues, must be created.
xvi. Careful consideration of the ESS environment with respect to moisture and/or temperature control.
xvii. Batteries should be properly stored prior to installation, and careful installation will avoid incorrect connections and wire shorts.
xviii. Proper care while integrating different BESS components that may originate from different manufacturers is crucial.
xix. Proper care during installation is required. Careful installation will avoid incorrect connections, loose materials and wire shorts
xx. Take necessary measures to ensure safe storage of the used batteries following the norms stipulated in the batteries (Management and Handling) Rules, 2001. As a best practise, Used batteries are to be stored in covered enclosure on impervious surface to avoid exposure to the elements & to avoid any spill/leaching of heavy metals into ground/ ground water

xxi. Put in place buy-back arrangements with the battery manufacturers and ensure safe transportation of any replacement batteries (under warranty)/ used batteries to the manufacturer. Lead acid batteries may also be sent to authorised recyclers. It is preferred that batteries are recycled to potentially reuse some of its components, where economically and technically feasible.

xxii. Comply with the government regulations, viz. Batteries (Management & Handling) Rules, 2001 as amended regarding disposal of batteries/ any of the components used in the battery units. Some components of BESS may also attract provisions of E-waste rules 2016 & are to handled/ disposed accordingly

xxiii. Compensation and assistance for private landowners should be completed (As per RAP) before final possession of land.

xxiv. Livelihood Restoration Plan should be in place, which provides employment to affected persons based on their skills.

xxv. Area having aesthetic/ cultural/ religious importance to the local community, to be avoided to extent possible

xxvi. Ensure the plant and equipment will be installed away from settlements so as to avoid any Health & Safety implications

xxvii. Proper health check and trainings may be provided to the nearby communities under CSR support