



***Environmental and Social Impact Assessment for a 200 MWac /  
260 MWp Solar Power Project in Mhasale Village, Dhule District,  
Maharashtra  
Volume 1: Non-Technical Summary***



# 1.0 INTRODUCTION

This document is the Non-Technical Summary (NTS) for the ESIA. The document presents the details of the 200 MW<sub>AC</sub> (260 MW<sub>p</sub> DC) solar plant, activities carried out during the ESIA study, identified environmental, social and ecological sensitivities and summary of impacts. The NTS summarizes the outcome of the ESIA, which is to identify environmental and social impacts that will occur due to construction and operation of the solar project, suggestion of mitigation measures to reduce these impacts and the understanding of residual impacts after implementation of the mitigation measures. The NTS also summarizes the implementation and supervisory framework for the mitigation measures.

## 1.1 Project Background

AMPYR Renewable Energy Resources Twelve Pvt. Ltd. (hereinafter referred to as 'Client' or AMPYR) commissioned ERM to undertake Environmental and Social (E&S) Risk Screening (Red Flag) and ESIA Scoping Study (hereinafter referred to as 'E&S Scoping Study') and ESIA for the Project, as required under the AMPYR Energy and CFM Environmental and Social Management Systems (ESMS).

The ESIA assesses the environmental and social impacts based on the agreed scope of baseline data collection and impact assessment and the outcome of the ESIA is the preparation of an Environmental and Social Management Plan (ESMP). The ESIA and ESMP will include Bird and bat study, SEP-GRM; and GIAP.

## Terminology used in the ESIA Report

The 200 MW<sub>AC</sub> (260 MW<sub>p</sub> DC) solar power project has been referred to as 'Project' for the remainder of the document.

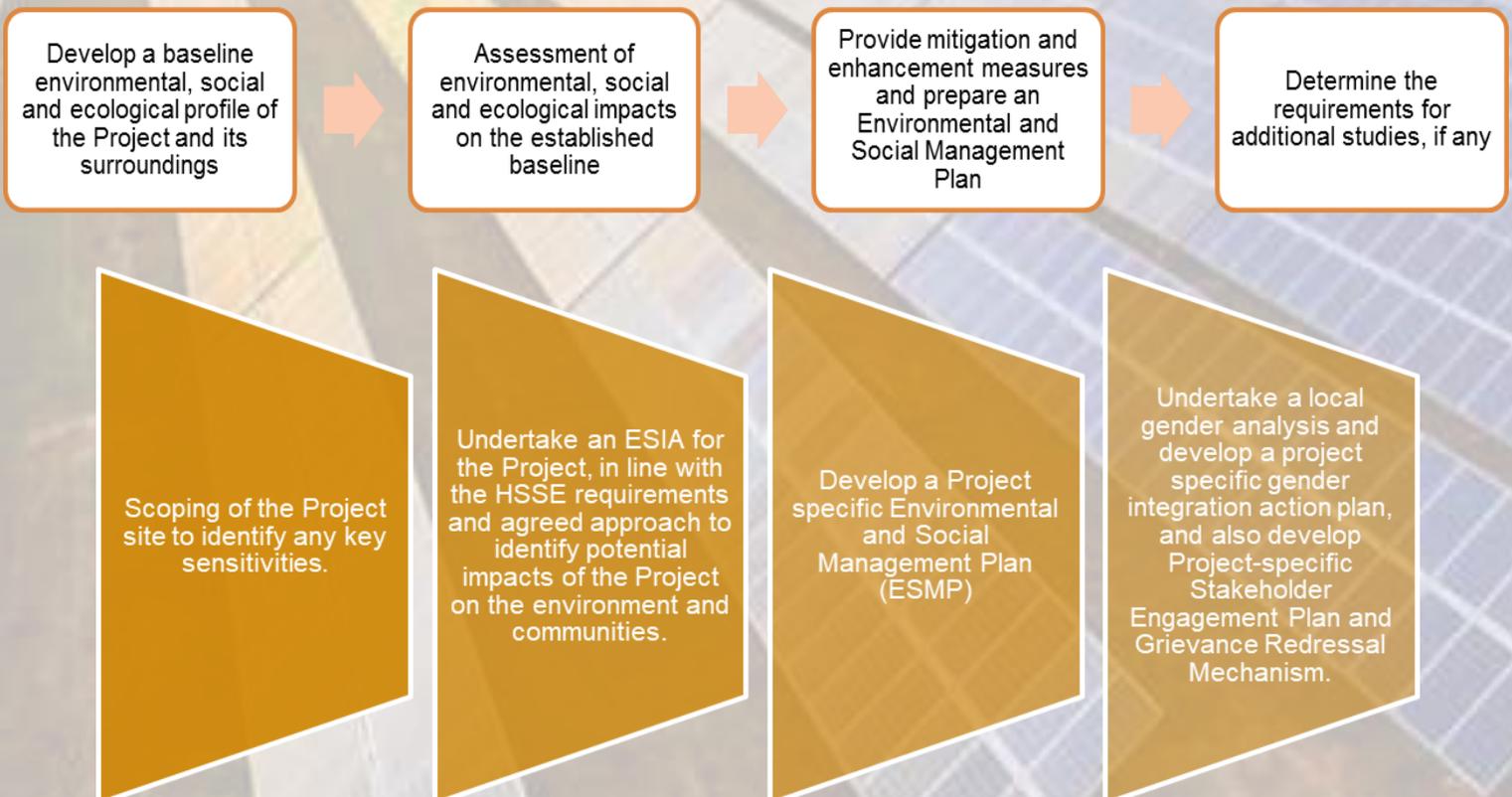
## Justification for the ESIA

Solar power projects do not require an Environmental Clearance (EC) in India in accordance to the Environmental Impact Assessment (EIA) Notification, 2016 and further amendments. AMPYR had commissioned an Environmental & Social (E&S) Scoping Study in June 2023 to determine any risks and impacts due to the construction and establishment of the solar plant. The E&S Scoping Study has identified the requirement for a detailed ESIA study. ERM undertook a review of the E&S Scoping Study and developed a work plan for the ESIA that also identified the necessity for a SEP-GRM and GIAP.

## 1.2. Objectives and Scope of work

The main objective of the ESIA is to assess social, environmental and ecological impacts of the proposed solar plant and provide management strategies to comply with the reference framework. The specific objectives are depicted in **Figure 1**.

**Figure 1: Objectives of ESIA**

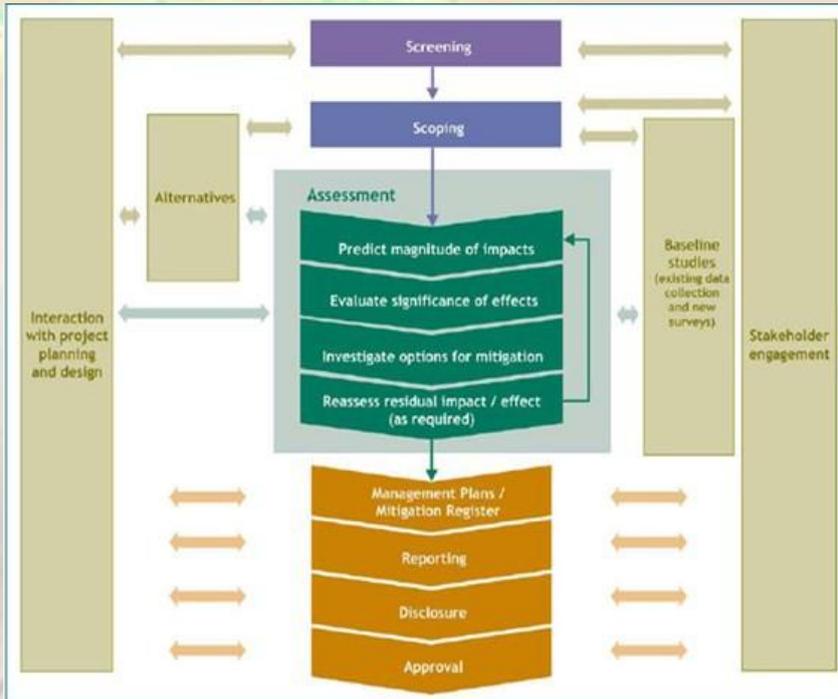


# Approach and Methodology for ESIA and Brief on Technical Management Plans

Approach broken down into two work streams:

Work Stream 1: E&S Red flag assessment & Scoping Study

Work Stream 2: ESIA



- **Desk-based Review** of key environmental, social and ecological sensitivities.
- **Site Visit** was undertaken in **June 2023** to observe prevalent land use and environmental aspects at the Project site. Community consultations, and discussions with representatives were also undertaken as a part of the study.
- **The E&S screening and red flag report** was submitted in **August 2023** and **E&S Scoping report** was submitted on **29 September 2023** which summarized the salient features and preliminary categorization of the Project.

Work Stream 1



- A **Document Review** of maps and satellite imagery was undertaken to understand the key environmental, social and ecological sensitivities.
- **Site Surveys and stakeholder consultations** was undertaken in June 2023, October 2023 and November 2023 for the baseline data collection and identification of risks and impacts for the Project. **The bird and bat monitoring surveys** were conducted in June 2023 (breeding season), November 2023 (early migratory season), and January 2024 (peak migratory season). **The GIAP site visit** was undertaken in November 2023.
- **Environmental Baseline Data collection** was undertaken through site survey from 26th to 28th June 2023 for scoping study
- An **analysis of alternatives** process
- Assessment of **potential impacts** on the various environmental, ecological and social elements.
- An **ESMP** has been developed to summarize the list of mitigation measures recommended to reduce the overall impacts on environmental, social and ecological elements.

Work Stream 2

The **Stakeholder Engagement Plan (SEP) - Grievance Redressal Mechanism (GRM)** is being undertaken to meet AMPYR ESMS to identify modes of continuous engagement with key stakeholders across the Project life cycle

The **Gender Action Plan (GAP)** is being undertaken to meet AMPYR focus on gender-related development as part of its Community Development Framework. The GAP is focused on mainstreaming gender issues and concerns into all aspects of the Project lifecycle and promote participation of women in Project activities.

## Area of Influence for the ESIA

**Project Footprint Area**, area which is reasonably expected to be physically touched by the Project activities, across all phases. The area does not have any demarcation or fencing to indicate the footprint boundary.

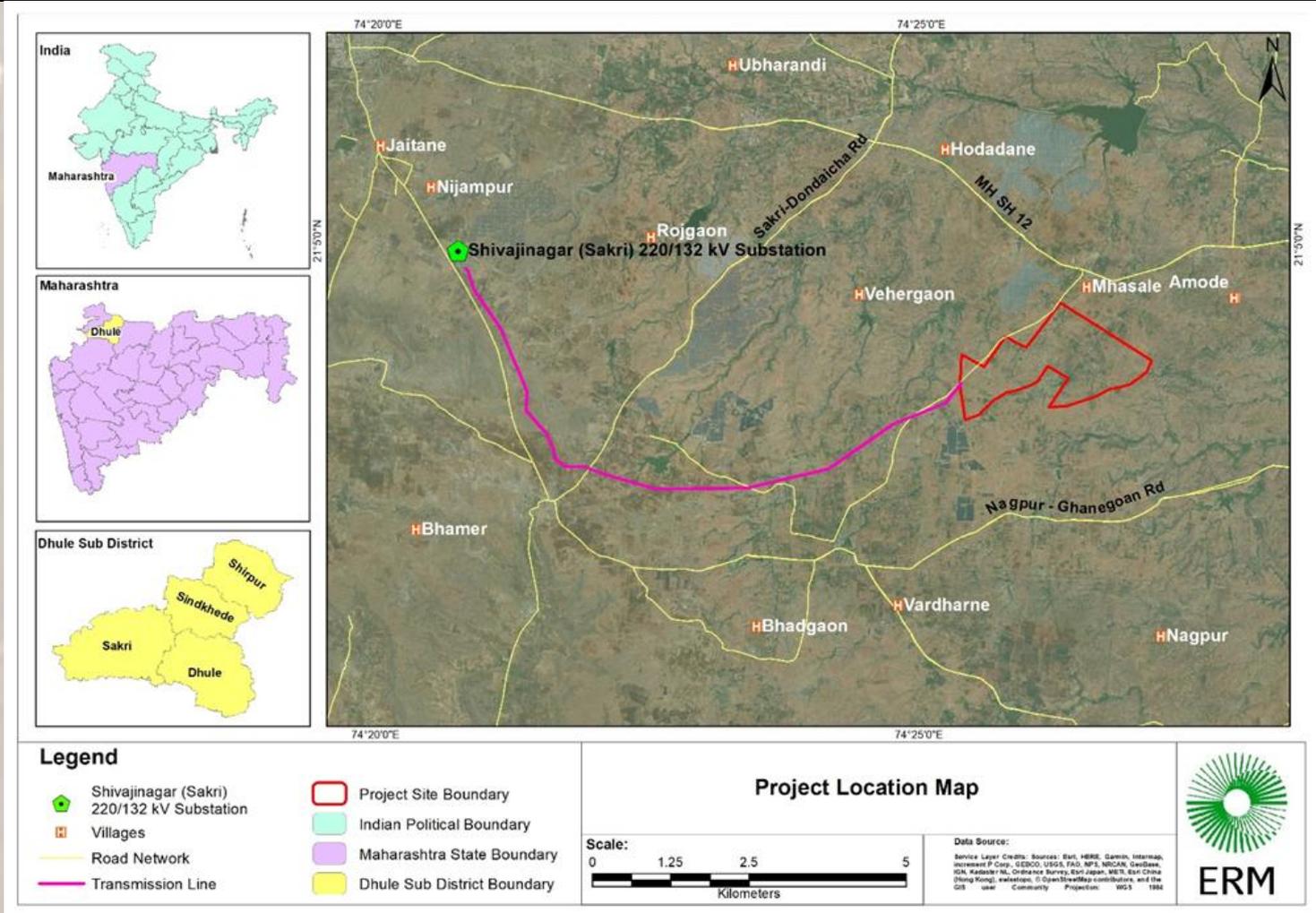
**Project Area of Influence**, area where the Project and Project activities can affect a particular resource or receptor. The AoI has spatial (distance) and temporal (time) dimensions, the scale of which is dependent on a number of factors.

**Study Area**, 100% overlap with the AoI. The study area is broken down into the core zone where majority of impacts are anticipated and buffer zone where induced or indirect impacts are anticipated.

**Core Zone** is 500m for environment and ecology and 2 km for social. **Buffer Zone** is 5 km for all parameters.

# 2.0. Project Description

Particular	Description
Location and Terrain	The Project is located in Mhasale village, Sakri Taluka of Dhule District, Maharashtra. The approximate centre-point coordinates of the proposed site are 21°4'7.57"N and 74°25'44.37"E. The 220 KV Grid Substation where power will be evacuated from the Project is located in Shivajinagar village, Sakri at ~11 km distance from the Project site. The substation is surrounded by agricultural land and the TL route passes predominantly through agricultural lands in the villages of Bhadgaon, Bhamer and Vardharne. The site is partially plain and partially undulated exhibiting a range of undulations interspersed with several small water bodies and streams.
PV Modules	Mono PERC Crystalline - MBB Technology
Power Evacuation	Power will be evacuated to 220 kV Shivajinagar (Sakri) Grid Sub-Station (GSS) located ~11 km through an overhead 220 kV TL.
Land Requirement	The total estimated land required for the Project is 380.8 ha
Current Status	<ul style="list-style-type: none"> <li>• Planning Stage; and</li> <li>• Greenfield Site</li> </ul>
Commissioning Date	<ul style="list-style-type: none"> <li>• AMPYR 12 - 50 MW in Mar 2025;</li> <li>• AMPYR 12A -50 MW in May 2025;</li> <li>• AMPYR 12 A -50 MW in July 2025; and</li> <li>• AMPYR 12 A -50 MW in September 2025</li> </ul>



# Resource Requirements

## Land Footprint

S. No	Aspect	Details
1.	Solar Farm (Total)	380.3 Ha
2.	Type of land	The land identified for the project is private dry agricultural land with low productivity
3.	Village	Mhasale village
4.	External Transmission Line	Power will be evacuated to 220 kV Shivajinagar (Sakri) Grid Sub-Station (GSS) located~11 km through an overhead 220 kV TL

### Land related sensitivities

**Landlessness:** The land sellers consulted during the ESIA visit will have alternate land available after selling their land. Moreover, as confirmed with the land sellers some of the land parcels purchased for the Project are of low productivity and the agriculture is mostly rain fed (in case landowners do not have a well) while the rest of the land parcels are un-cultivated land. The money earned through sale of land to the Project, can be invested in improvements in other land plots owned by the landowners, or in purchasing alternate land elsewhere.

**Schedule V Area and Tribal Land:** The Project area in Sakri Taluka, falls within Schedule V area as defined by the Indian Constitution, involves private land purchased and leased without any ST landowners. Although the Bhils, a major ST group in Mhasale, are present in small numbers and live among non-ST populations, PS 7 is not applicable. No government, tribal, or forest land was procured, and the land purchase process did not impact any critical cultural heritage or displace ST communities

**Forest land:** Two reserve forests are present within 5 km radius of the study area. As per the Survey of India (Sol) toposheet (2011), the proposed solar plant is within one of the reserve forests (unnamed RF). It was stated that this RF has been 'disforested' and does not have the status of a reserve forest anymore. Additionally, there are no standing forests and the actual ground coverage of these areas consists of mostly shrub land.

**Encroachment:** No encroachments on the project land procured till date were reported or were observed during the site visit by ERM team.

**Common Property Resources:** The project land identified is all private land, hence no common property resources will be used for the project. However, there are small drainage channels that pass through the proposed Project boundary and the access to these channels will be restricted once the land is purchased for the Project

**Cultural Heritage:** No temple or site of cultural heritage is located inside the Project boundary

### Resource Requirement

Resource	Construction Phase	Operation Phase
<b>Workforce</b>	Around 300 workers will be required during the peak construction period	2 – 3 permanent employees and 20 O and M staff including housekeeping and security
<b>Water</b>	5730.75 m <sup>3</sup> / year water is required	4,519 m <sup>3</sup> / year water is required
<b>Raw Material</b>	700 MT cement, 300 MT/month steel, 1000 m <sup>3</sup> sand, 14000 cum. Stone, 1000L bitumen	There will not be major requirement of raw materials during operation except for maintenance purpose viz. consumable spares.
<b>Fuel</b>	The on-site fuel requirements during construction will be approx. 1000L litres/ month	NA

## 3.0. Applicable Reference Framework

The applicable reference framework for the ESIA is provided below:

- Applicable policy and legislation with respect to environment, health, safety, labour, land acquisition, stakeholder engagement and indigenous peoples in India;
- Good International Industry Practice (GIIP) as set out in the World Bank Group Environment, Health and Safety (EHS) Guidelines including both the General EHS Guidelines and sector- specific guidance (EHS Guidelines for Transmission and Distribution);
- IFC Performance Standards (2012);
- IFC Workers' Accommodation: Process and Standards;
- Relevant international treaties applicable to the host country including UN Declaration on the Rights of Indigenous Peoples, UN Guidelines Principles on Business and Human Rights, International Covenant on Economic, Cultural and Social Rights and ILO Core Labour Standards ratified by the host country;
- Agreements with other external stakeholders e.g. community groups and non-governmental organizations;
- Agreements with government authorities.
- ERM will also be referring to the following standards during the ESIA process:
- IFC Utility Scale Solar Photovoltaic Power Plants: A Project Developer's Guide (2015); and
- CFM's Responsible Investment Framework.

### Status of Key Permits and Licenses

Permit or License	Status as of December 2022
Environmental Clearance	Not required as per Schedule A of the EIA Notification 2006 for solar projects
Consent to Establish/Operate	Not required in accordance with CPCB 2016 notification for harmonization of industrial categories as solar projects are classified as 'white category'
Hazardous Waste Authorization	Not required in accordance with the Hazardous and Other Wastes Amendment Rules, 2019 for projects that are classified as 'white category'

# 4.0. Analysis Of Alternatives

1.	Project Vs. No Project Scenario
2.	Alternate Source for Power Generation
3.	Alternate Location for project site

### Project vs. No Project Scenario

In the "No Project" scenario for this ESIA report, the solar plant would not be constructed or operated, leading to no environmental or social impact at the site. However, the Project is crucial to India's goal of developing 175 GW of renewable energy by 2022 to meet its Paris Climate Agreement commitments. It also supports Maharashtra's Renewable Energy Policy 2020, which targets 25,000 MW of renewable energy by 2025, including 12,930 MW of solar power. Without the Project, the region would face power shortages, hindering economic growth, despite its high solar potential.

### Alternative Methods of power generation

India's primary energy use is projected to increase four to five times by 2031-32, according to the Planning Commission. While the country's energy mix includes coal, oil, natural gas, nuclear, hydro, and wind power, coal dominates with around 50% of the share. Solar energy, however, offers an eco-friendly, inexhaustible, and low-impact alternative. It is also a cost-effective source of power with minimal pollution. The CO<sub>2</sub> emissions per kWh from coal plants are significantly higher than those from solar plants, whose emissions mainly stem from equipment production and construction but remain much lower overall.

### Alternative locations for the site

Solar power projects are green and renewable energy as sources of energy, which are site specific and dependent on the availability of solar irradiance resources. There are 250-300 days of clear sun with an available average radiation of 4 to 6 kWh/sqm over a day. There is a capacity to generate 1.5 million units/MW/year through solar photovoltaic systems and up to 2.5 million units/MW/year through solar thermal systems .

Through solar irradiance mapping, it can be noted that the current site is located in an area where the irradiation is 5.5 - 6.00 kWh/m<sup>2</sup>/day, hence, the current site was selected is most suitable for the solar power generation

### Alternate Project Layout

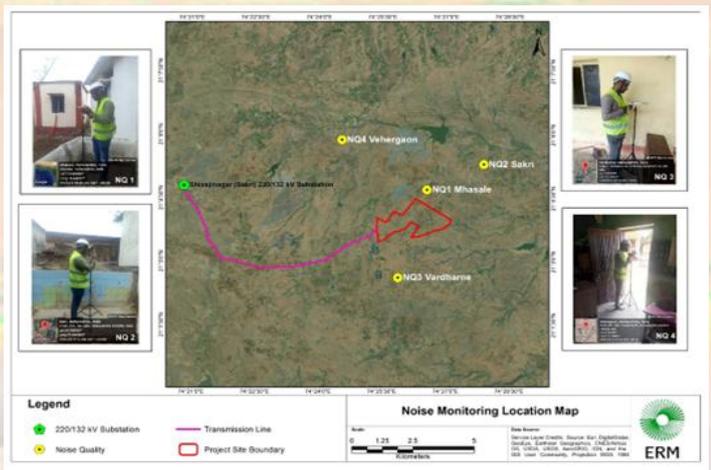
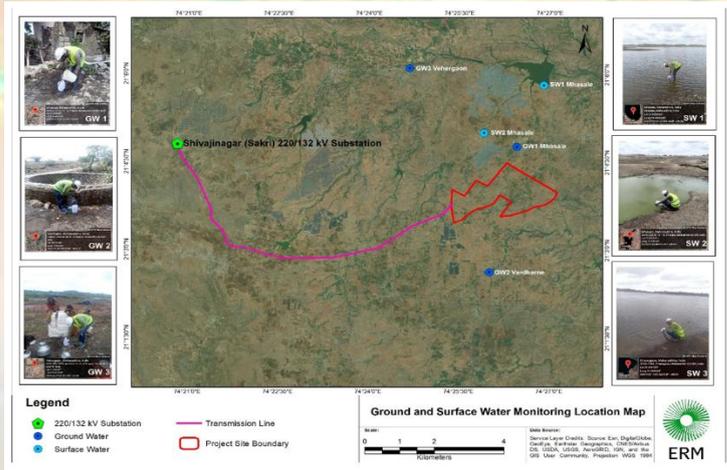
Based on the E&S Scoping findings in September 2023, AMPYR has revised the earlier Project layout for avoidance of possible E&S risks and impacts assessed which are as followed:

- Change in Project boundary: Proximity to the habitation of Village Mhasale was earlier 30 meters from the Project boundary. The Project layout was revised to maintain distance of 300 meters from the habitation.
- Access road: At the time of scoping visit (June 2023), it was reported by AMPYR that a stretch of existing Zila Parishad road falls within the Project boundary. Based on the tentative Project boundary at that time, the procurement of separate land for the existing road was required. As per the current Project boundary, the Project will develop an alternate road in agreement with Zila Parishad and the affected landowners that will be provided access through the periphery of the Project boundary. The development of alternate road will not affect the access for these landowners as they will get access to a developed road instead of the current underdeveloped road. Reportedly no additional land will be procured for the alternate road.
- Avoiding ST Landowners: Based on the review of land due diligence and landowners list shared by AMPYR, it was identified that landowners include members from ST community as well. Based on the observations and further verification, AMPYR decided not to proceed with these land parcels.

Project Site

# 5.0. Environmental Baseline

ERM team has undertaken the primary site survey from 26th to 28th June 2023 and during the same period M/s Mitra S.K, an NABL accredited laboratory was engaged for collection of primary baseline information on ambient noise quality, surface water and ground water quality. The second site visit was conducted by ERM team from 3rd to 9th October 2023 in the post monsoon season to further understand the site settings and environmental sensitivities in the study area.



### Water quality

- As per the district ground water brochure published by CGWB, Dhule district falls under 'Safe' Category.
- As per the results from baseline assessment of groundwater, all parameters of all the groundwater samples collected are within permissible limits of drinking water standards IS 10500:2012.
- As per the CPCB water quality criteria water quality of all surface water samples falls under class 'B' that is the designated best use is outdoor bathing (Organized). brochure published by CGWB, Dhule district falls under 'Safe' Category.
- As per the results from baseline assessment of groundwater, all parameters of all the groundwater samples collected are within permissible limits of drinking water standards IS 10500:2012.
- As per the CPCB water quality criteria water quality of all surface water samples falls under class 'B' that is the designated best use is outdoor bathing (Organized).

### Equivalent Noise Levels Day Time (dB [A])

Location	L <sub>eq</sub> Day	CPCB Limit	WHO/IFC Limit
NQ 1	54.2	55	55
NQ 2	69.6		
NQ 3	74.6		
NQ 4	55.1		

### Equivalent Noise Levels Night Time (dB [A])

Location	L <sub>eq</sub> Night	CPCB Limit	WHO/IFC Limit
NQ 1	47.8	45	45
NQ 2	46.8		
NQ 3	62.7		
NQ 4	43.1		

### Natural Hazards as per BMTPC Vulnerability Atlas (3rd Edition, 2019)

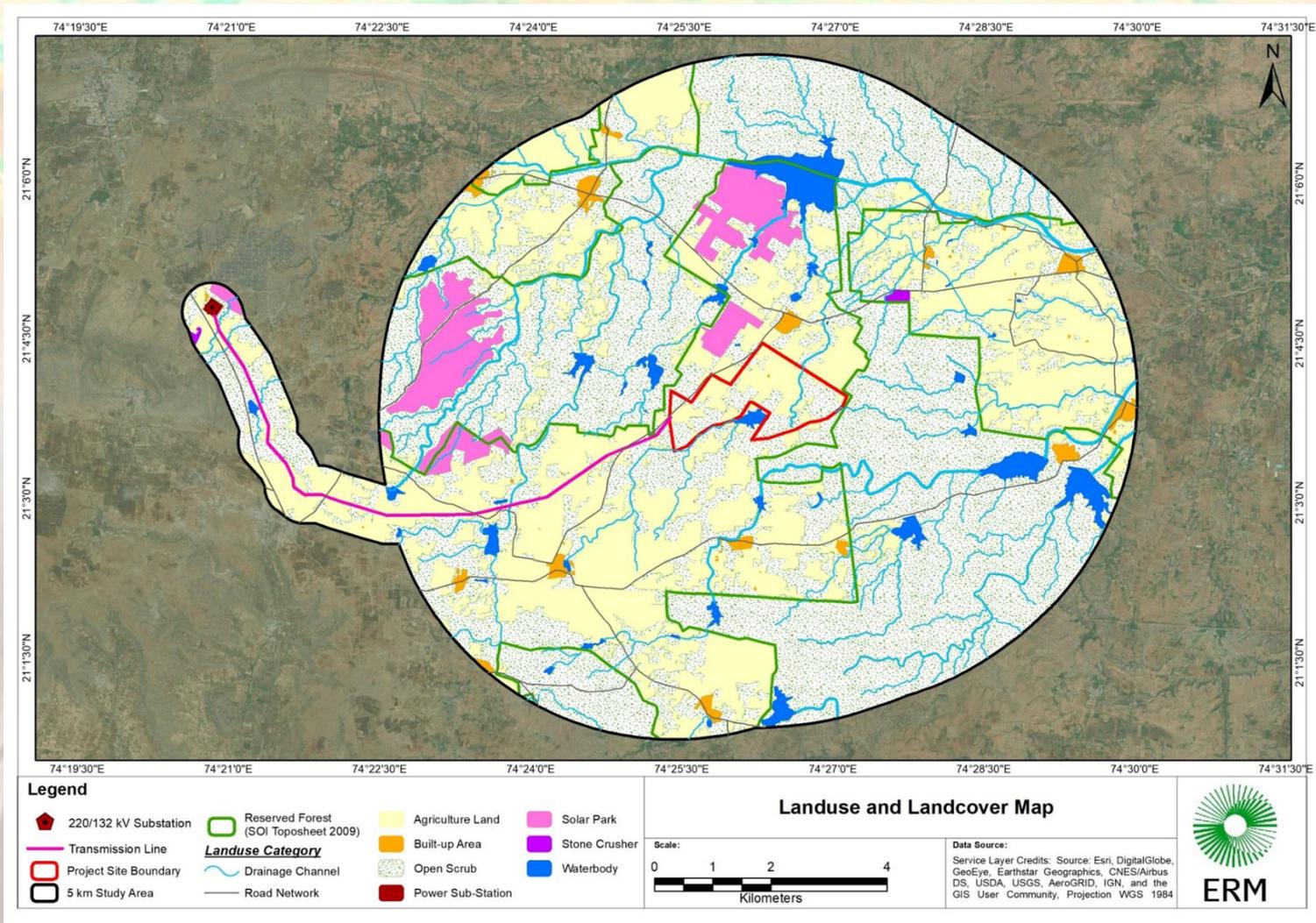
Characteristics	Details
Earthquake	As per Natural Disaster maps published by Building Materials and Technology Promotion Council (BMTPC) of Government of India, the Project site is located in Moderate Damage Risk Zone (MSK VII).
Wind Hazard	As per Natural Disaster maps published by BMTPC of Government of India, the Project site is located in Moderate Damage Risk Zone (basic wind speed of 39 m/sec).
Flood	As per Natural Disaster maps published by BMTPC of Government of India, the Project site is located in proximity to of flood prone area. Recently, in 2019, Dhule experienced rise in the water level of Panzara River which caused flood like situation in the many blocks of Dhule including Sakri.
Land Slide	As per the data released by the BMTPC of Government of India, the Project site is located in an area not prone to landslide incidents.

### Noise Monitoring

- Four different locations within the study area were monitored once for ambient noise levels during the study period.
- As per the results, The Leq values for daytime at N2, N3, and N4 exceed the residential limit of 55 dB(A), and nighttime values at N1, N2, and N3 exceed the residential limit of 45 dB(A).
- This is primarily due to increased vehicular activity near the villages, especially around SH11, added by the ongoing construction of a solar plant and related vehicle movements in Nagpur village.

# Environmental Baseline (continued)

## Land Use of the study area



### Local Topographic Features

The Project site is partially plain and partially undulated, exhibiting a range of undulations interspersed with several small waterbodies and streams. Highest elevation is towards the western and southern parts of the Project site ranging from 348 m amsl to 495m amsl.

### Geomorphology and Hydrology

The district, where the Proposed site located is primarily composed of Basaltic flows known as Deccan Traps, with Tapi Alluvial deposits in the Tapi River valley and a small patch of Bagh Beds in the northwest. It features two aquifer systems: Alluvium and Basalt. The water table elevation ranges from 550 m to 140 m amsl, and the area is mainly drained by the Tapi River and its tributaries.

The soil profile of the district is classified into three zones with approximately 50% of the area is covered by light type soil, 30% of medium black type and remaining 20% is of deep black type.

### Drainage

The district is drained by Tapi River and its tributaries. The Project site has one major drainage channel within the site, while based on the review of google earth imagery and site survey multiple minor seasonal streams are present within the Project site. There are also number of seasonal waterbodies within 5km of the study area.

### Surface Water

There are no surface water bodies within the Project site. There are few seasonal streams and ponds in the study area. The nearest waterbody is a pond located Mhasale at 1.3 km towards North West of the project site.

# 5.1. Ecological Baseline

The ecology site visits and surveys for the Project are undertaken as below:

- June 2023: 20th June to 24th June: Breeding season bird and bat survey
- October 2023: 9th October to 12th October: ESIA site visit
- November 2023: 24th November to 30th November: Early migratory season bird and bat survey
- January 2024: 17th January to 22nd January: Peak migratory season bird and bat survey.

Classification Scheme	Classification
Champion and Seth Classification	Southern tropical dry deciduous forest
Biogeographical Provinces of India	6D: Deccan Peninsula Central Peninsula
Agro Ecological Sub Region (ICAR)	Deccan plateau, hot semi-arid eco region (6.2)
Agro-Climatic Zone (Planning Commission)	Western plateau and hills region (IX)
Agro-Climatic Zone (NARP)	Scarcity Zone (MH-6)

## Habitat Survey

The various habitats within the study area were identified using GoogleEarth Pro to determine the types and extent of habitats in the 5 km radius of the TL route. These habitats were marked and visited during the site reconnaissance to identify the quality and level of disturbance at these habitat locations.

## Floral Assessment

The floral diversity of the study area was recorded by visual observations during the site visit, discussions with local communities/stakeholders and a review of scientific publications available in the public domain

## Faunal Assessment

Faunal species were recorded based on direct sightings, indirect evidence (dung, droppings, scat, pugmarks, scratch signs, burrow, nests, etc.) and consultations with local communities. The species occurring within the study area were surveyed using the following methodologies:

**Amphibians:** Amphibians are often restricted to natural and constructed ponds during the hottest parts of the day. All such waterbodies were visited during the hottest parts of the day to determine the presence of amphibians along the shaded ledges of the Waterbody.

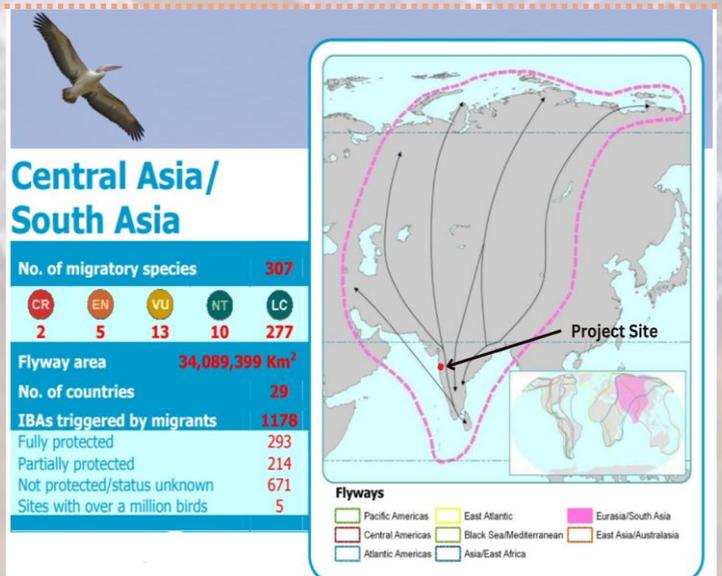
**Reptiles:** Reptile presences were determined through the use of Intensive Time Constrained Search Methods. The method is adapted for the terrain by targeting rocks and logs located around waterbodies or recently dried streams, hedges and along the trunks of higher vegetation.

**Avifauna:** Any avifaunal species that was identified by visually sighting or hearing bird calls were recorded. Birds were identified along motor able roads, around waterbodies, and in clumps of higher vegetation during the hottest parts of the day. Binoculars and standard field guides were used for avifaunal identification. Among all faunal groups, special emphasis was given to avian fauna, as transmission line infrastructure may threaten avian fauna due to electrocution or collision.

**Mammals:** Mammal surveys were conducted along motor able roads, near waterbodies and in grassy terrain. Individuals were identified through indirect methods such as pellets, tracks, paw marks and scat. Species were then identified using standard literature.

### Migratory Routes

The Project site falls within the Central Asian Flyway. Twenty three (23) migratory species namely, Booted Eagle (*Hieraaetus pennatus*) -LC, Booted Warbler (*Iduna caligata*) -LC, Common Chiffchaff (*Phylloscopus collybita*) -LC, Desert Wheatear (*Oenanthe deserti*) -LC, Eurasian Kestrel (*Falco tinnunculus*) -LC, Eurasian Spoonbill (*Platalea leucorodia*) -LC, Montagu's Harrier (*Circus pygargus*) -LC, Grey-necked Bunting (*Emberiza buchanani*) -LC, Common Sandpiper (*Actitis hypoleucos*) -LC, Green Sandpiper (*Tringa ochropus*) -LC, Indian Paradise-Flycatcher (*Terpsiphone paradisi*), Indian Pitta (*Pitta brachyura*) -LC, Little Ringed Plover (*Charadrius dubius*) -LC, Mallard (*Anas platyrhynchos*) -LC, Montagu's Harrier (*Circus pygargus*) -LC, Peregrine Falcon (*Falco peregrinus*) -NT, Pallid Harrier (*Circus macrourus*) -LC, Eurasian Sparrowhawk (*Accipiter nisus*) -LC, Eurasian Kestrel (*Falco tinnunculus*) -LC, Eurasian Marsh-Harrier (*Circus aeruginosus*) -LC, Western Yellow Wagtail (*Motacilla flava*) -LC, White Wagtail (*Motacilla alba*) -LC, & Wood Sandpiper (*Tringa glareola*) -LC were also reported or observed from 5 km buffer of the Project site.



## 5.1. Ecological Baseline (Contd.)

### Delineation of Habitats

Habitat Type	Discussion	Conclusion
Open Scrub land (Study area comprising the Project site and 5 km radius)	Scrublands in the study area are found in patches near agricultural land, with observed livestock grazing. These areas are vegetated with herbs, shrubs, and few scattered trees. Common shrub species include <i>Vachellia nilotica</i> , <i>Vachellia leucophloea</i> , <i>Achyranthes aspera</i> , <i>Calotropis procera</i> , <i>Euphorbia hirta</i> , <i>Opuntia elatior</i> , and <i>Prosopis juliflora</i> , among others. Open scrub areas are dominated by <i>Prosopis</i> , <i>Vachellia</i> , <i>Calotropis</i> , and <i>Cassia</i> species, with scattered trees like <i>Vachellia nilotica</i> and <i>Azadirachta indica</i> .	The habitat can thus be considered as <b>Natural and Modified Habitat</b> (based on IFC PS6 Habitat Classification)
Agricultural Land (Study area comprising the Project site and 5 km radius)	The Project area mainly consists of private agricultural land used for cereal cultivation and open scrubland. Agriculture here depends on rain and groundwater from private borewells. Crops grown include cotton, sorghum, pearl millet, green gram, maize, soybean, and red gram, primarily during the Kharif season (June–October). Horticultural crops like onions and chilies are also grown.	The habitat can be considered as <b>Modified habitat</b>
Reserve Forest (Study area comprising the Project site and 5 km radius)	Two Reserved Forests are located within 5 km of the study area. As per the Survey of India toposheet (2011), the proposed solar plant is adjacent to the Reserved Forest (designated) comprising of scrubland. It was reported that this RF has been 'disforested' and no longer holds reserve forest status. Additionally, there are no standing forests and the actual ground coverage of these areas consists of mostly shrub land. The land has been distributed to farmers as private agricultural land. Consultation with the Forest Department confirmed this, though they indicated that specific survey number details would be provided by the Revenue Department. A brief telephonic conversation with the Talati (Village level Revenue Officer) reiterated that the land is disforested, but no specific survey number information was shared.	The habitat can be considered as <b>Natural habitat</b>
Waterbodies (Study area comprising the Project site and 5 km radius)	A total of 23 waterbodies were surveyed within a 10 km radius, with a special focus on eight larger ones. These areas provide habitat for water birds and are vegetated with species such as <i>Vachellia nilotica</i> , <i>Calotropis procera</i> , <i>Cyperus difformis</i> , <i>Ipomoea aquatica</i> , <i>Prosopis juliflora</i> , and <i>Senna auriculata</i>	This habitat can thus be considered as <b>Natural habitat.</b>

### Critical Habitat Applicability

Protected Areas like National Parks or Wildlife Sanctuaries are not located within 5 km of the Project site (i.e. the study area). The nearest protected area, Aner Dam Wildlife Sanctuary is present about 62 km away from the Project site (i.e. the solar plant) in north-east direction. No internationally recognized biodiversity areas like KBAs are located within 50 km of the Project site. The nearest KBA and IBA, Taloda Reserved Forest, is about 68 km away from the Project site in the north-west direction.

No EN/CR species or range-restricted species were reported or observed in the Project area. Congregations of migratory species, such as the Common Pochard (VU), Northern Pintail (LC), and Eurasian Wigeon (LC), were observed at several waterbodies within the study area. However, the population of each species did not exceed the 1% threshold required to trigger critical habitat designation. Hence, a Critical Habitat Assessment is not required for the Project.

## 5.2. Socio-Economic Baseline

This baseline provides an understanding of the administrative set up of the district, the demographic profile of the villages in the Project AoI, the social groups present, the land use patterns in the area, the livelihood profile of the community and the social and physical infrastructure available. The social and physical infrastructure includes education and health infrastructure, the water supply for irrigation and drinking purposes, sanitation facilities and connectivity..

### Profile of the Study Area

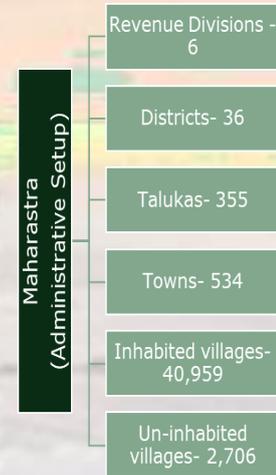
The area up to 2 km from the Project boundary has been considered as the Project direct influence area (core zone) and the area between 2 km and 5 km is considered the buffer Zone.

**State:** Maharashtra has a total population of 11.24 crore (Census, 2011) and has a geographical area of 3.08 lakh sq. km. The population density of the state is 365 persons per sq. km. in 2011 (as compared to 315 persons per sq. km in 2001). The state has a total of 6 revenue divisions, 36 districts, 355 talukas, 40,959 inhabited villages, 534 towns and 2,706 uninhabited villages. About 45% of the population of Maharashtra is urban. The state has a lower sex ratio as compared to India; 929 females per 1,000 males as compared to India's sex ratio. Maharashtra State has a literacy rate of 82.3%, which is higher than India's overall literacy rate of 73%.

**District:** Dhule is located at the North-West part of Maharashtra and is surrounded by State of Gujarat on the West and the North-East side, District of Nandurbar to the North-West, Jalgaon on the East, and Nashik to the South. Dhule is divided into 4 talukas – Dhule, Sakri, Shindkheda and Shirpur.

**Study Area for Social Baseline:** As per the Census of India, 2011, Mhasale has a total population of 1,468 living in 296 households, with an average household size of five people. As per consultation with the Sarpanch, the current population is estimated to be ~2,500 living in ~450 households. Therefore, there are changes in the data from the 2011 census. These demographic changes is a result of natural population growth.

### Administrative structure of Maharashtra



### Social Stratification

As per the Census 2011, the SC population is 11% and the ST population is 39% of the total population of Mhasale village. However, it is noted that the census data referenced is from 2011, making it 13 years old. Based on consultations with the Panchayat Sachiv, there are 50 households (11% of the village population) belonging to the Bhil community, which is the largest Scheduled Tribe (ST) group in the village and is officially recognized as such in Maharashtra. While there are also smaller populations of other ST groups in the village, their numbers are not significant. The discrepancy between the census figures and the Panchayat's current figures is due to the time gap.

The Project area falls under Sakri Taluka which is a Schedule V area as defined in the Indian Constitution. The major social groups in the village include Patil and Brahmins which are classified as General Category, while Mali, Koli, Patil, Rajput, Vani, Vanjari, and Thakur are the major Other Backward Classes (OBCs). The major SC sub-caste includes Mahar, Chamar and Vadar and major ST groups include Bhil and Pardhi. Based on the consultations with the local community, it was reported that Muslim communities in the village falls under OBC category (based on consultations conducted, there are 10-15 Muslim households in the village).

### LITERACY PROFILE

During site visit, teachers reported that children from all communities in the villages study up to 8th grade (ages 13-14). However, about 20% drop out, mostly girls, due to financial constraints and the inability to travel to secondary school in Nizampur, 13 km away. This is influenced by a patriarchal mindset prioritizing girls' safety. The nearest colleges are in Nizampur and Sakri (22 km away), with students using local buses or personal vehicles. Early marriage is common, with girls marrying by 18 and boys by 21-25, driven by low education and employment opportunities. There is a growing awareness of the importance of education, with more parents now wanting their children, especially girls, to complete secondary school before marriage.

## Social Baseline (continued)

### Land Use Pattern

The data shows that Open scrub land (notified reserve forest and other land (58.7%)), followed by agricultural land (30.1%), Waterbodies including drainage channel (6.2%), Industries (4.13%), and built-up area (~1%). In addition to the environmental understanding of the land use, this section presents the socio-economic aspects of land use in the study area villages. Although the land in the study area is predominantly agricultural land, consultations suggested that the agriculture practiced is rainfed to a large extent such that 88% of the net sown area is unirrigated (rainfed) in the Project footprint and agriculture is carried out only for six months of the year in two cycles - between July-September and February-April.

### Occupation and Livelihood

The livelihood in the study area is predominantly based on agriculture and livestock rearing, with a significant reliance on farm-based activities as indicated by the 2011 Census data. About 29% of workers are cultivators, and 60% are agricultural laborers. Despite this, only 52% of the land is under cultivation, with the rest comprising forest areas (34%), barren and uncultivable land (6%), culturable wasteland (4%), and land under non-agricultural uses (3%).

Over the past 13 years, there has been a noticeable shift from farm-based livelihoods to daily wage labor, small businesses, teaching, government services, and migration to urban areas for jobs. This change is largely driven by increased access to education, leading younger generations to prefer non-farm-based occupations. Consultations with the local community and land sellers confirm that the younger population is less inclined towards farming, reflecting a broader trend towards diversification of livelihoods.

### Gender

The adult sex ratio of Mhasale is 899 females per 1,000 males and the child sex ratio fares significantly worse at 800 females per 1,000 males as compared to taluka, district, and state level. The adult sex ratio in the Study Area is 888 females per 1,000 males which is significantly lower than taluka (970 females per 1,000 males) and district level (946 females per 1,000 males).

As per the Census of India, 2011, the average female literacy in Mhasale village is 55% which is higher than the taluka level significantly lower than district (66%) and state level (67%). Mhasale has significantly lower female literacy as compared to taluka, district and the state level. However, these figures are based on 2011 and reportedly, much has improved in the last decade.

### Social and Physical Infrastructure

**Water and Sanitation:** Stakeholder consultations indicate that all villages in the study area have access to potable drinking water through panchayat wells, with pipeline connections to households under construction via the Jal Jeevan Mission (JJM). Currently, Mhasale village has three open wells for drinking water. About 60% of households have toilets built under the Swachh Bharat Mission, but open defecation remains a significant issue due to lack of awareness and ingrained habits, particularly among older men. Mhasale has two public toilets used by women, though their condition is reported as poor.

**Healthcare and health seeking behaviour:** Stakeholder consultations revealed that the community in the study area relies on the Community Health Centre in Sakri for emergency healthcare. There is only one Primary Health Centre in Dusane, 13 km from Mhasale, and both private and government hospitals are available in Dhule, 55 km away. Mhasale has a primary health sub-centre for emergencies like deliveries and oxygen needs. Common transport includes personal vehicles, auto rickshaws, and ambulances. Monthly Non-Communicable Disease (NCD) camps are organized by the government for general check-ups. Prevalent health issues include anemia among pregnant women and children, with minor cases of tuberculosis and malnutrition. Alcoholism is a major concern, with reported deaths due to alcohol consumption, including spurious alcohol.

**Electricity:** All the Project village households have an electricity connection, though not all the households have a formal connection of electricity supplied by the government. The households with an informal connection get electricity from neighbors with a formal connection. It was reported that power

## 6.0. Impact Assessment

The impact assessment section below presents a summary of the IA carried out for the Project. For each of the scoped-in impacts in the ESIA, the table identifies the impact nature (positive/negative), impact significance, mitigation measures and residual impact significance after implementation of the mitigation measures.

Pre-Construction Phase				
Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	With Mitigation
Land Sellers (Titleholders)	Negative	<b>Minor to Moderate</b>	<ul style="list-style-type: none"> <li>The aggregators should assess the extent of land that will be left with the landowners after the land take for the Project footprint, and whether it will be adequate to pursue their current land-based livelihood. Land purchase from marginal farmers (households owning less than one hectare) and small farmers (households owning less than two hectares) should be avoided;</li> <li>Avoid all irrigated and cultivated land parcels and households with small and/or marginal land holdings;</li> <li>If such households (those who are small and marginal farmers) cannot be avoided, the Project should provide assistance in adopting non-farm livelihoods such as owning and running small businesses etc. through focused intervention activities. In order to ease the process of transition from farm based to non-farm livelihood, opportunities should be identified, and linkage should be created for such households to adopt non-farm occupations;</li> <li>Fixed assets like wells, structures present on the land parcels that are being purchased needs to be compensated at full replacement cost.; and</li> <li>Ensure the inclusion of members of land selling households in community development initiatives such as skill building, entrepreneurship support etc.</li> <li>AMPYR to offer financial literacy training to all persons in receipt of payments for land purchase as per the findings and recommendation from LRP study.</li> <li>In the event that there are any households that sell all of their land to the Project, it should be reviewed if these households should be included in the LRP to assess the extent of impacts and support required for them;</li> </ul>	<b>Negligible</b>
Land Lessors (Titleholders)	Negative	<b>Minor to Moderate</b>	<ul style="list-style-type: none"> <li>The Project should assess the extent of land that will be left with the landowners after the land take for the Project footprint and whether it will be adequate to pursue their current land-based livelihood. Land lease from marginal farmers (households owning less than one hectare) and small farmers (households owning less than two hectares) shall be avoided;</li> <li>Where possible all irrigated and cultivated land parcels and households with small and/or marginal land holdings should be avoided;</li> <li>Fixed assets like wells, structures present on the land parcels that are being leased to be compensated at full replacement cost;</li> <li>Prioritize the inclusion of members of land leasing households in community development initiatives such as skill building, entrepreneurship support etc.;</li> <li>AMPYR to offer financial literacy training to all persons in receipt of payments for land lease as per the findings and recommendation from LRP study; and</li> <li>In the event that there are any households that sell all of their land to the Project, it should be reviewed if these households should be included in the LRP to assess the extent of impacts and support required for them;</li> </ul>	<b>Negligible</b>

Transmission Line Landowners (Titleholders)	Negative	<b>Moderate</b>	<ul style="list-style-type: none"> <li>• There are no residential structures within the transmission line RoW. Non-residential structures that are within the RoW area should be avoided and transmission line routes should be altered in such cases.</li> <li>• Compensation for land within the tower footprint as per the Ministry of Power Guidelines.</li> <li>• No land to be permanently acquired for the casting of tower foundations and erection of towers.</li> <li>• Prior intimation should be given to the landowners. Necessary witness should be obtained from the Revenue Officials along with owners' signature for acceptance of number and descriptions of the trees to be cut within RoW and tower base area.</li> </ul>	<b>Negligible</b>
Land Users (Non-titleholders)	Negative	<b>Moderate</b>	<ul style="list-style-type: none"> <li>• Prepare a Livelihood Restoration Plan (LRP) targeting all non-title holders. The LRP should assess the number of affected people (men and women) the extent of the impacts, availability of alternatives and the extent of interim support required to help restore incomes and livelihoods.</li> <li>• Provide financial literacy training as part of the LRP;</li> <li>• The GRM of the Project should be disclosed and made accessible to not just the landowners but also to the non-title holders and the larger community. Engagement activities, grievances received, and actions taken must be documented</li> </ul>	<b>Minor</b>
Gender Differentiated Impacts	Negative	<b>Major</b>	<ul style="list-style-type: none"> <li>• For ongoing land acquisition process beyond the initial 65 MWp, verification needs to be undertaken towards the end of the land purchase process to assess whether the process has been undertaken transparently and fairly especially focusing on women title holders who are joint and sole owners to obtain assurance that safeguards have been implemented as per Ampyr's land processes</li> <li>• The entire negotiation process and compensation amount should be specifically explained to the women members in the family, be they owners or non-owners with the involvement of the consultant.</li> <li>• Household level financial literacy training and joint consultations between male and female members in the family can be undertaken at the time of sale deed signing with the help of a local NGO to develop a plan on utilization of the amount received.</li> </ul>	<b>Minor</b>
Scheduled Tribes	Negative	<b>Minor to Moderate</b>	<ul style="list-style-type: none"> <li>• Provision of preference for employment during the construction phase of the Project to the agricultural laborers particularly belonging to vulnerable groups like ST along with landowning households;</li> <li>• The LRP prepared for the non-title holders should include any laborers from the ST community in Mhasale; and</li> <li>• Provide financial literacy training as part of the LRP</li> </ul>	<b>Minor</b>

## Construction Phase

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	With Mitigation
Change in land use	Negative	<b>Moderate</b>	<ul style="list-style-type: none"> <li>Construction activity to be restricted to designated area</li> <li>On completion of the construction activities, land used for temporary facilities to be restored to the extent possible and handed over to the owners</li> <li>The land use around the permanent Project facilities is not to be disturbed</li> </ul>	<b>Minor</b>
Topography and Drainage	Negative	<b>Minor</b>	<ul style="list-style-type: none"> <li>Project shall ensure to avoid changes in the topography by unnecessary clearing of land and levelling, especially during the preconstruction and construction phase</li> <li>The Project shall develop a storm water drainage system, to ensure that water collected in the site flows out the site through said drainage system constructed within the plant boundary</li> <li>Existing wells should be used as rainwater harvesting structure</li> </ul>	<b>Negligible</b>
Soil erosion, compaction	Negative	<b>Minor</b>	<ul style="list-style-type: none"> <li>The topsoil present shall be removed and stock piled in separate area</li> <li>The stock pile should be protected from natural elements to prevent from erosion and also degradation</li> <li>Topsoil to be reused on site for landscaping purpose</li> <li>Defined routes for transportation and construction vehicles, workers etc. to minimize soil compaction</li> <li>Maintenance of natural drainage and good cross drainage as per the natural slope condition should be provided to reduce surface runoff and associated erosion</li> <li>Back filling and revegetation of the area disturbed will be undertaken phase wise immediately after the completion</li> <li>Site clearance, piling, excavation and access road development will not be carried out during the monsoon season to minimize erosion and run-off</li> </ul>	<b>Negligible</b>
Soil Contamination	Negative	<b>Moderate</b>	<ul style="list-style-type: none"> <li>Designated areas should be provided for Municipal Solid Waste (MSW) and daily collection and periodic disposal should be ensured</li> <li>Construction and Demolition Waste should be stored separately and be periodically collected by an authorized treatment and storage facility</li> <li>All waste should be stored in a shed that is protected from the elements (wind, rain, storms, etc.) and away from natural drainage channels</li> <li>EPC/decommissioning contractor should ensure that no unauthorized dumping of used oil and other hazardous waste is undertaken at the site</li> <li>A log book should be maintained for quantity and type of hazardous waste generated</li> <li>In case of accidental/unintended spillage, the contaminated soil should be immediately collected and stored as hazardous waste</li> <li>Ensure hazardous waste containers are properly labelled and stored onsite provided with impervious surface, shed and secondary containment system awaiting handling and disposal by an authorised vendor (authorised by the MPCB and as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, as amended)</li> <li>E waste, used discarded batteries shall be disposed of in accordance to e-waste management rules and batteries management and handling rules</li> <li>Use of spill control kits to contain and clean minor spills and leaks</li> <li>The guidelines and procedures shall be prepared and followed for immediate clean-up actions following any spillages</li> <li>Unloading and loading protocols should be prepared for diesel, oil and used oil respectively and workers trained to prevent/contain spills and leaks</li> </ul>	<b>Minor</b>

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	With Mitigation	
Water Resources	Negative	Minor	<ul style="list-style-type: none"> <li>• Construction labour deputed onsite to be sensitised about water conservation and encouraged for optimal use of water</li> <li>• Wells present within the site should be protected through barricading;</li> <li>• Wells also should be used as recharging structure;</li> <li>• Dumping waste or construction material within wells should be avoided;</li> <li>• Alternate sources of water supply to be evaluated and ground water abstraction to be minimized to the extent possible</li> <li>• Regular inspection for identification of water leakages and preventing wastage of water from water supply tankers is necessary for efficient utilization of water;</li> <li>• Blending of low-quality water with fresh water for construction uses to ensure efficient use of natural resource (if any treated water available from nearest city or town);</li> <li>• Groundwater recharge measures to be undertaken in the form rainwater harvesting through recharge pits; and</li> <li>• Recycling/reusing to the extent possible.</li> </ul>	Minor
Water Quality	Negative	Minor	<ul style="list-style-type: none"> <li>• Ensure proper cover and stacking of loose construction material at site to prevent surface runoff and contamination of receiving water body</li> <li>• Provision of number of toilets across easily accessible locations at the Project site</li> <li>• Avoid disturbing soil layers at the edges of the hillock</li> <li>• Open defecation and random disposal of sewage will be strictly restricted</li> <li>• Planning of toilets, soak pits and septic tanks, waste collection areas away from natural drainage channels</li> <li>• Use of licensed contractors for management and disposal of waste and sludge</li> <li>• Labourers will be given training towards proactive use of designated areas/bins for waste disposal and encouraged for use of toilets</li> <li>• Provision for impervious storage area, especially for fuel &amp; lubricant, hazardous waste, etc. will be made onsite</li> <li>• Spill/ leakage clearance plan to be adopted for immediate cleaning of spills and leakages</li> </ul>	Negligible
Ambient Air quality	Negative	Minor	<ul style="list-style-type: none"> <li>• Preventive measures such as storage of construction material in sheds, covering of construction materials during transportation will be undertaken, for reducing dust as part of the embedded controls;</li> <li>• The construction site to be barricaded;</li> <li>• Keeping areas of open excavation to a minimum;</li> <li>• Minimize stockpiling by coordinating excavations, spreading, re-grading and compaction activities;</li> <li>• Speed of vehicles on site to be limited to 10-15 kmph which will help in minimizing fugitive dust emissions due to vehicular movement;</li> <li>• Emissions from the D.G. set and other stationary machines to be controlled by ensuring that the engines are always properly tuned and maintained;</li> <li>• D.G. sets to be provided with adequate stack height;</li> <li>• Cease or phase down work if excess fugitive dust is observed. Investigate the source of dust and ensure proper suppression measures;</li> <li>• Proper maintenance of engines and use of vehicles with Pollution Under Control (PUC) Certificate; and</li> <li>• Idling of vehicles and equipment will be prevented</li> <li>• Sprinkling of water at regular intervals during high fugitive dust emission;</li> <li>• Ensuring regular engagement with communities near to the Project site to address their concerns.</li> </ul>	Negligible

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	With Mitigation
Noise Quality	Negative	<b>Minor</b>	<ul style="list-style-type: none"> <li>• Only well-maintained equipment to be operated on-site</li> <li>• If it is noticed that any particular equipment is generating too much noise then lubricating moving parts, tightening loose parts and replacing worn out components to be carried out to bring down the noise</li> <li>• Machinery and construction equipment that may be in intermittent use to be shut down or throttled down during non-work periods</li> <li>• Low noise equipment shall be used as far as practicable</li> <li>• The number of equipment operating simultaneously shall be reduced as far as practicable</li> <li>• DG set with acoustic enclosures shall be used</li> <li>• Vehicular movement through village roads should be planned to avoid traffic jam and inconvenience to local residents</li> <li>• Equipment noise should be 85 dB (A) at 1 m from the source in line with WB/ IFC EHS guidelines</li> <li>• Minimal use of vehicle horns needs to be encouraged</li> <li>• Limit construction related activities to day time in order to restrict the noise related issues at night, where permissible noise threshold is lesser</li> <li>• Noise monitoring should be undertaken periodically during the construction phase at any receptors or in the direction of receptors</li> <li>• Vehicles and equipment used for the Project should be well maintained and oiled to prevent excess noise during construction</li> </ul>	<b>Negligible to minor</b>
Occupational Health and Safety	Negative	<b>Moderate</b>	<ul style="list-style-type: none"> <li>• Manual lifting by adult men to be less than 55 kg and for women it is to be less than 30 kg</li> <li>• Erection of steel structures to be carried out by experienced workers and they are to use safety harness, lifelines, catchment etc.</li> <li>• Obtain and check contractor's safety method statements</li> <li>• Monitor health and safety performance and have an operating audit system</li> <li>• Permitting system to be implemented to ensure that cranes and lifting equipment is operated by trained and authorized persons only</li> <li>• Appropriate safety harnesses and lowering/raising tools to be used for working at heights</li> <li>• All equipment to be turned off and checked when not in use</li> <li>• Emergency contact numbers and route to the nearest hospital to be displayed at the construction site</li> <li>• Site specific safety or emergency response plan should be in place to account for natural disasters, accidents and any emergency situations</li> <li>• Site specific/ activity specific Hazards Identification and Risk Assessment (HIRA) to be developed prior to start of the activities at site</li> <li>• Provide H&amp;S achievement information to employees</li> <li>• Safe drinking water supply to be provided for the workers</li> <li>• Excavated areas to be temporarily fenced to avoid access to outsiders and wildlife</li> <li>• Security to be deputed at potential accident sites to restrict entry and prevent near miss or fatal incidents</li> <li>• An up to date first aid box as per checklist (inventory &amp; expiry date) to be provided at construction and a trained person to be appointed to manage it</li> <li>• All equipment to be turned off and checked when not in use</li> <li>• The local/ host community to be kept at safe distance from construction site</li> <li>• At a minimum, implement all COVID-19 related safety and emergency response measures, as relevant and as prescribed by the government</li> </ul>	<b>Minor</b>

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	
			With Mitigation	
Community Health and Safety	Negative	<b>Minor to Moderate</b>	<ul style="list-style-type: none"> <li>There is no typical set back distance for solar Projects. However, the distance from the Project boundary to the settlements is above 100 m which is an adequate buffer distance for fire safety. Further, the internal access roads within the Project boundary will also add to the setback distance from the solar plant area. Initial barrier is the Project boundary wall and in addition the area between the plant boundary and the settlement has vegetation patches which also acts as barrier.</li> <li>Motor Vehicle (amendment) Act, 2019 should be strictly followed at site.</li> <li>Only the designated access road will be used for transporting panels and other components for the solar plant;</li> <li>No hazardous waste or any waste be stored within the site for long periods of time and be in contact with the soil in order to prevent against ground water contamination.</li> <li>The truck drivers carrying construction machinery and materials will be instructed to drive within speed limits with careful consideration for village traffic;</li> <li>Movement of heavy equipment and construction materials will be regulated during the daytime and hours of peak road usage (09:00 AM to 06:00 PM)</li> <li>Mitigation Measures along Transmission Line during Construction Phase</li> <li>Risks to general public during operation will be reduced by public awareness and education and physical measures by attaching an appropriate warning sign on all faces of the tower;</li> <li>Once the stringing work is complete, notices and permanent anti climbing devices to be installed on the tower. The operational start date for electricity transmission and safety implications to be publicized locally in advance.</li> <li>The SOP for preventive maintenance and repairing of fault to be defined and followed;</li> <li>Fire-fighting measures to be maintained at substation;</li> <li>Provide the local community an understanding of the Project activities and the potential H&amp;S risks and the grievance redressal mechanism as part of the stakeholder engagement process;</li> </ul>	<b>Minor</b>
Influx of Labour	Negative	<b>Minor to Moderate</b>	<ul style="list-style-type: none"> <li>The recommended mitigation/ management measures to address the impacts related to migrant labors should include:</li> <li>Measures to ensure that the worker accommodation during the construction phase is not located in close proximity to settlements and if they are, then controls for hygiene will have to be put in place;</li> <li>Ensure that most of the labor requirements are sourced from the neighboring villages for unskilled work;</li> <li>Extending provisions for hygiene at Work Site, in terms of adequate lighting, sanitation facilities, proper drinking water facilities and monitoring of drinking water quality, proper disposal of waste, etc.; and</li> <li>Access to healthcare services and emergency medical care.</li> <li>The following approach should be adopted to handle the issues of worker's accommodation that might arise and dealt step-by-step in following manner:</li> <li>Assessment of the type and number of workers who will be requiring accommodation facility;</li> <li>Identify applicable regulatory requirements on establishment of workers' accommodation; and</li> <li>Determining the standards to apply to the location of facilities, the construction of housing and provision of facilities.</li> </ul>	<b>Minor</b>
Economy and Employment	Positive		<ul style="list-style-type: none"> <li>It is understood that employment opportunities will be greater during the construction phase than the operations phase. The opportunities during the operations phase could be limited to housekeeping or security personnel. As the impacts of the Project on the local economy and employment is positive, the following measures have been recommended to further enhance the positive impact:</li> <li>Sub-contractors should be required to source local labor and AMPYR should audit compliance. Preference will be given to young adults/children of Mhasale landowners. Workers should be informed upfront that employment is short-term. Local employment information should be communicated to Gram Panchayats and displayed at their offices in consultation with the Sarpanch. The Project's Grievance Redressal Mechanism should apply to all contractual workers throughout the Project lifecycle</li> </ul>	

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	With Mitigation
Gender differentiated impacts	Negative	<b>Moderate</b>	<ul style="list-style-type: none"> <li>• Mandatory and repeated training and awareness raising for the workforce about refraining from unacceptable conduct toward local community members, specifically women;</li> <li>• Informing workers about national laws that make sexual harassment and gender-based violence a punishable offence which is prosecuted;</li> <li>• Introducing a Worker Code of Conduct as part of the employment contract, and including sanctions for non-compliance (e.g., termination, and adequate monitoring of contractors, with agreed punitive measures for repeat offences and non-compliance)</li> <li>• Contractors adopting a policy to cooperate with law enforcement agencies in investigating complaints about gender-based violence.</li> <li>• Further, complementary actions by AMPYR can include the following which are focused on public administration and law enforcement:</li> <li>• Reinforcing local police in a remote setting, where services may not be sufficiently staffed or equipped to maintain public order after the influx,</li> <li>• 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 preventive training with workers to demonstrate the presence of government authority in the Project area</li> <li>• In addition, following measures need to also be undertaken</li> <li>• Communication to local community, shops and vendors prior to the start of the construction;</li> <li>• Local community to be made aware of the grievance mechanism and provide access to the local community and laborers to the grievance redress mechanism for the Project;</li> <li>• Labour Camp is planned to be located away from nearby settlement, with entry control, if located near an existing settlement/residential area</li> <li>• Restricted access of local persons in the labor camp</li> <li>• Movement of migrant laborers within the residential areas in the proximity of camps should be restricted.</li> </ul>	<b>Minor</b>

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	
Habitat Modification and Loss	Negative	Minor	<ul style="list-style-type: none"> <li>Vegetation disturbance and clearance should be restricted to the Project activity area only;</li> <li>Larger mature trees with significant height and girth, along the edge of solar plant (provided they are not predicted to impact power production, by shading) should be avoided to the extent possible when constructing the solar compound and access road.</li> <li>Unnecessary disturbance of neighbouring vegetation due to off-road vehicular movement, fuel wood procurement, needless expansion of labour camp and destruction of floral resources should be prohibited;</li> <li>Project construction related facilities such as site office, store yard, camp, should be sited within the land parcel planned to be developed as the solar project site to reduce physical footprint of the project and avoid additional loss/modification of terrestrial habitat site, that area should be temporarily avoided for construction activity.</li> <li>Labour Camp/ Mess Facility should be provided with cooking gas, to reduce additional modification of habitat from fuel weed collection.</li> <li>Camp and site office should be provided with Toiled and sewage generated onsite should be treated and disposed through septic tanks and soak pits as per specifications given in IS 2470: 1995 (Part I and II)</li> <li>Ensure proper cover and stacking of loose construction material at site to prevent surface runoff and contamination of receiving water body.</li> <li>Unloading and loading protocols should be prepared for diesel, oil and used oil respectively and workers trained to prevent/contain spills and leaks;</li> <li>Provision for impervious storage area, especially for fuel &amp; lubricant, hazardous waste, etc. should be made onsite.</li> <li>Spill/ leakage clearance plan to be adopted for immediate cleaning of spills and leakages</li> <li>Vehicles and equipment should undergo regular maintenance to avoid any oil leakages.</li> <li>Broken or damaged solar panels are required to be immediately shifted to a designated area in scrap yard to avoid any type of land contamination;</li> </ul>	With Mitigation Negligible
Impact due to other construction activities	Negative	Minor	<ul style="list-style-type: none"> <li>No hunting, trapping or injuring of local fauna shall be communicated to laborers through a workshop or formal training exercise. The training should also communicate presence of species protected under Wildlife Protection Act, 1972 Schedule I and the penalties associated with contravention on the identified law;</li> <li>Strict anti-poaching policies to be adopted by AMPYR, and the policy along with penalties associated with poaching must be communicated to all Project personnel, subcontractors and labors.</li> <li>Adequate toilets, gas/firewood and space to be provided in any anticipated labor accommodation and the laborers to be informed not to enter or utilize any resources from surrounding forest land over the course of the construction period.</li> <li>Excavated areas to be adequately fenced and security to be deployed to prevent wildlife intrusion into these areas.</li> <li>Construction activities and transportation to 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 to be kept to a minimum.</li> <li>Areas with pre-existing nests, ground-roosting sites and burrows to be avoided for construction related work to reduce the impact on local fauna.</li> <li>In case any camp is considered for the accommodation of labors and professionals associated with the Project or in case of pantry or mess facility, all generated kitchen waste (uneaten food, discarded vegetable material) to be disposed off through authorized vendors. In case there any requirement of temporary storage (overnight) kitchen waste to be stored in closed containers or bean bags, to prevent release of smell. Considering remote location of the TL route, in case waste disposal through authorized vendor is not possible, kitchen waste to be disposed off in pits dug in ground. Pits to be covered by soil every night to prevent release of smell. As smell of cooked/ uncooked/ raw/ decomposing food material or kitchen waste can attract wildlife like scavengers.</li> </ul>	Negligible

## Operation and Maintenance Phase

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	With Mitigation
Waste Disposal / Generation	Negative	<b>Minor</b>	<ul style="list-style-type: none"> <li>Municipal domestic waste generated at site to be segregated onsite</li> <li>Daily collection and disposal of waste to be ensured</li> <li>The municipal waste will be routed through proper collection and handover to local municipal body for further disposal</li> <li>Ensure oil/ lubricants are stored on impervious floor in the storage area having secondary containment</li> <li>Use of spill control kits to contain and clean small spills and leaks during O&amp;M activities</li> <li>The guidelines and procedures shall be prepared and followed for immediate clean-up actions following any spillages</li> <li>Ensure hazardous waste is properly labelled, stored onsite at a location provided with impervious surface, shed and secondary containment system as per in accordance to Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016</li> </ul>	<b>Negligible</b>
Water Availability	Negative	<b>Moderate</b>	<ul style="list-style-type: none"> <li>Adopt less water consuming module cleaning methods</li> <li>As a good industry practise and in line with MNRE's advisory for effective usage of water in Solar Power Plants, management to check feasibility of using dry cleaning of modules</li> <li>Provisions for rain water harvesting structures</li> <li>Optimising water usage by application of water conservation measures such as sensor based taps, low flush urinals etc.</li> <li>Maintain logbook for water consumption</li> <li>Team should be sensitized about water conservation and encouraged for optimal use of water</li> <li>Regular inspections of pipelines and water storage infrastructure within the control monitoring office should be undertaken to ensure that there is no wastage of water resources</li> <li>Recycling/reusing to the extent possible</li> </ul>	<b>Minor</b>
Economy and Employment	<b>Positive</b>		<ul style="list-style-type: none"> <li>Sourcing local labour wherever possible should be made obligatory for the sub-contractors and in all major O&amp;M activities. AMPYR should establish a mechanism to audit subcontractors with respect to compliance of utilizing local labour and resources;</li> <li>The contractor shall inform the workers and local community about the duration of work;</li> </ul>	<b>Positive</b>
Impact on nearby Terrestrial Habitat and Ecosystem Services	Negative	<b>Minor</b>	<ul style="list-style-type: none"> <li>Unloading and loading protocols should be prepared for diesel, oil and used oil respectively and workers trained to prevent/contain spills and leaks;</li> <li>Provision for impervious storage area, especially for fuel &amp; lubricant, hazardous waste, etc. should be made onsite.</li> <li>Spill/ leakage clearance plan to be adopted for immediate cleaning of spills and leakages</li> <li>Vehicles and equipment should undergo regular maintenance to avoid any oil leakages.</li> <li>Broken or damaged solar panels are required to be immediately shifted to a designated area in scrap yard to avoid any type of land contamination;</li> <li>The sewage generated onsite (from site office) should be treated and disposed through septic tanks and soak pits as per specifications given in IS 2470: 1995 (Part I and II)</li> </ul>	<b>Negligible</b>

## Operation and Maintenance Phase

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	
Electrocution and collision with transmission line components	Negative	<b>Minor</b>	<ul style="list-style-type: none"> <li>Line design modifications for mitigating bird casualties should include sufficient spacing between different conductors and between conductors and grounded wires or hardware. Spacing between conductors should be not less than 140 cm and 70cm between perching sites and live components. In areas where large birds are present like vultures (e.g., the wingspan of White-rumped Vulture is 2.1 m) or large raptors, distances greater than 2.7m between power lines and more than 1.8m between perch and energized parts are recommended.</li> <li>Line markers like spheres, swinging plates, spiral vibration dampers, strips, swan flight diverters, bird flappers, aerial marker spheres, ribbons to be installed on conductors to increase visibility of the conductor, it is recommended to install barker balls on the topmost earth wire at an interval of 25m.</li> <li>Line markers should be as large as possible and increase the visible thickness of the line by at least 20 cm, for a length of at least 10-20 cm. Spacing of each device should not be more than 5-10 m apart. It is crucial that the line markers should incorporate as much contrast with relevant backgrounds as possible<sup>19</sup>. The technical specifications for bird flight diverter<sup>20</sup>, in consultation with Central Electricity Authority, India should be followed.</li> <li>Where poles or pylons or substation hardware pose a risk of electrocution to birds by virtue of the insufficient clearances between critical hardware, it is possible to rectify the situation with add-on mitigation like using insulation.</li> <li>Perch management: Cross-arms, insulators and other parts of the power lines can be constructed so that there is no space for birds to perch where they can be close to energized wires. This is often done by using exclusion devices, or perch deterrents.</li> <li>Nesting trees to be avoided to the extent possible when it falls within the Solar Park site.</li> <li>Larger mature trees<sup>21</sup> with significant height and girth to be avoided to the extent possible when constructing the solar Project. Larger trees can be set aside within the Project site and avoided as part of the micro-siting of the solar modules.</li> <li>Seeding of native plant species outside of the Project site especially in areas where the soil layers have been impacted can offset the loss of floral resources and dependent ecosystem services.</li> </ul>	<b>Negligible</b>
O&M work of TL: Impact on Threatened (IUCN v2.2020) and Schedule I (WPA, 1972) Birds of Prey and Migratory Birds, due to electrocution and collision.	Negative	<b>Minor</b>	<p>Prior to operation a detailed Collision Risk Modelling/Assessment is required to be done for each species based on their specific morphometrics, for the transmission line, complemented with bird flight movement data collected through "Vantage Point survey" spread across different seasons. This will estimate predicted annual mortality for each species and allow estimation of residual impacts.</p> <p>Post operation, AMPYR should regularly monitor the transmission line and the ground below the line for signs of bird hit and maintain a carcass register as part of the Operation and Maintenance (O&amp;M) phase to record any bird carcasses or suspected bird carcasses. The register should include a date, type of specie (to the extent identifiable), geographic location and nearest transmission line infrastructure for each carcass entry. If possible, the register should be backed-up with photo-documentation of any identified carcasses or remains. If the number of carcasses are significant, then AMPYR should commission an ecologist to suggest more stringent mitigation measures at the sensitive Project components.</p>	<b>Negligible</b>

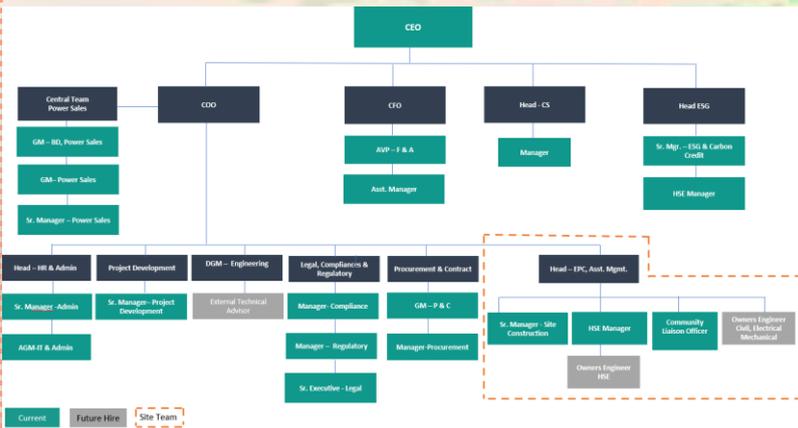
## Decommissioning Phase

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	With Mitigation
Soil Erosion and Compaction	Negative	Minor	Same as construction phase	Negligible
Water Availability	Negative	Minor	Same as construction phase	Negligible
Waste Disposal /Generation	Negative	Moderate	Same as construction phase	Negligible
Soil Contamination	Negative	Minor	Same as construction phase	Negligible
Air Quality	Negative	Minor	Same as construction phase	Negligible
Noise Quality	Negative	Moderate	Same as construction phase	Negligible
Impact on Economy and Employment	Negative	Minor	<ul style="list-style-type: none"> <li>• The Client shall ensure that retrenchment packages are provided for all staff who stand to lose their jobs when the plant is decommissioned;</li> <li>• The contractor shall inform the workers and local community about the duration of work;</li> <li>• Reduction of worker will be done phase wise and corresponding to completion of each activity; and</li> <li>• All waste generated from demobilisation shall be collected and disposed of at the nearest municipal disposal site.</li> <li>• The Grievance Redressal Mechanism of the project shall be applicable to the contractual workforce engaged throughout the project lifecycle.</li> <li>• The Project shall provide the local community an understanding of the decommissioning activities and the potential H&amp;S risks and the grievance redressal mechanism as part of the stakeholder engagement process</li> </ul>	Negligible

# 7.0 Environmental and Social Management Plan (ESMP)

The purpose of this ESMP is to specify the standards and controls required to manage and monitor environmental and social impacts during different phase of project life cycle, i.e. construction, operation and decommissioning phases. To achieve this, the ESMP identifies potential adverse impacts from the planned activities and outlines mitigation measures required to reduce the likely negative effects on the physical, natural and social environment. This is in accordance to IFC Performance Standards 1 that emphasizes the importance of managing social and environmental performance through the lifecycle of the Project. This section therefore identifies the implementation mechanism, supervisory responsibilities and key outcomes of the recommended mitigation measures.

## Organizational Structure (Construction and Operation Phase)

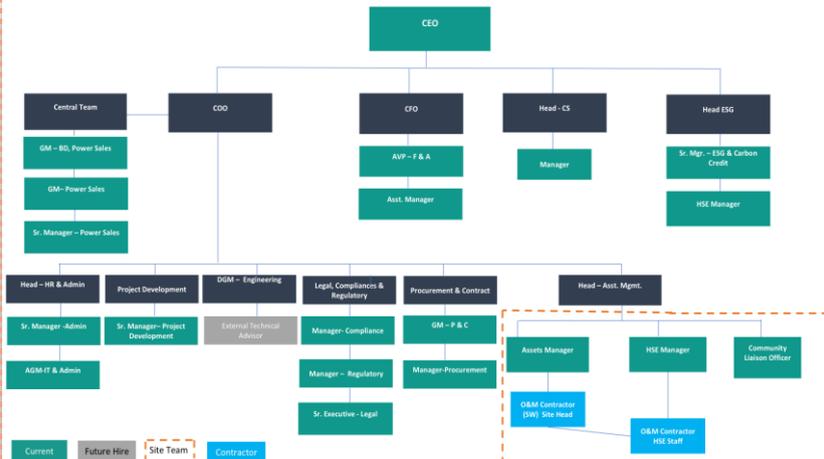


## Implementation

The SPV will have ultimate responsibility for implementing the provisions of the ESMP. This role will include the on-going management of environmental and social impacts, monitoring of contractor performance as well as development of mechanisms for dealing with environmental and social problems. SPV will also ensure that the activities of its contractors (both during construction and operation phase) are conducted in accordance with good practice measures, implementation of which will be required through contractual documentation.

The overall management and coordination of the Project will be the responsibility of Project Manager of SPV. SPV will engage EPC contractor to undertake construction activities including installation of solar modules, site office, etc. At project level, implementation of management plans and corrective actions are the responsibilities of HSE Engineer of EPC Contractor. In construction and operational phase, HSE Manager of AMPYR/ Project Manager will supervise the Contractor HSE Engineer's performance to implement the management action plans.

## Project Level O&M Organization Chart



### EHS Department

Environment, health and safety department shall be responsible for monitoring of the implementation executed by the agencies specified in the ESMP

### Stakeholder Engagement and Grievance Management

AMPYR needs to establish a community disclosure and grievance redressal system that will be a part of the stakeholder engagement plan

### The Gender Action Plan (GAP)

GAP Will aim to assess the implications of livelihoods and other Socio-economic parameters on gender in the study area. In particular women and effects on them

### Inspection, Audit and Monitoring

Through the process of inspection and auditing, the SPV will ensure that the conditions stipulated in various permits are complied with the entire process

### Reporting and documentation

The SPV will develop and implement a programme of regular reporting through the stages of the Project lifecycle

### ESMP Review and Amendments

The ESMP acts as an environment and social management tool which needs to be periodically reviewed to address changes in the organization, process or regulatory requirements.

## 8.0. Stakeholder Engagement and Grievance Redressal

Stakeholder mapping refers to the process of identifying individuals or groups having influence over a project and assessing the effects of their actions on the project. It helps in identifying the different stakeholders as primary or secondary based on the degree of influence on a project and by analysing the stakes or interest each of them has in the project and the manner in which both the stakeholder group as well as the project can benefit from each other.

### Stakeholder Group categorization

Stakeholder Groups	Primary Stakeholders	Secondary Stakeholders
Community	<ul style="list-style-type: none"> <li>Land lessers from Mhasale</li> <li>Land Aggregator, Local Land Agents, Developers, Contractors</li> <li>Local Labourers, female workers and labourers</li> </ul>	<ul style="list-style-type: none"> <li>Local Community,</li> <li>Vulnerable Communities</li> </ul>
Institutional Stakeholders	Gram Panchayat— Mhasale I, Government School Teachers, and ASHA and Anganwadi Workers	Civil Society/ Local NGOs
Government Bodies	Regulatory Authorities, District Administration, Maharashtra Transmission Communication Infrastructure Limited (MTCIL); Village Talati (Local Revenue Officer	Solar panels and equipment suppliers
Other Groups	Employees, EPC and O&M Contractors, Contractual labourers (non-local)	-

### Summary of overall stakeholder influence

Stakeholder Category	Stakeholder group	Impact/ influence of the Project on this stakeholder group	Impact/ influence of the stakeholder group on the Project	Overall rating of Stakeholder influence
Primary	Land lessers	Medium	High	High
	Land Users	Large	Low	Moderate
	Land Aggregator	Medium	High	High
	Developers and EPC Contractors	Medium	High	High
	Female Workers and Labourers	Small	Low	Negligible
	Local Gram Panchayat	Medium	Medium	Moderate
	Migrant workforce	Small	Medium	Minor
	Regulatory Authorities	Small	High	Minor
	Maharashtra Transmission Communication Infrastructure Limited	Small	High	Moderate
	AMPYR	High	High	High
	Local laborers engaged by contractors	Small	Medium	Minor
	District/Taluk Administration	Negligible	Low	Negligible
	Local Community in Project footprint	Small	Medium	Minor
	Vulnerable Groups such as women headed households, SC, ST and Landless households	Small	Low	Negligible
Secondary	Neighboring villagers	Small	Low	Negligible
	Equipment Suppliers	Medium	Medium	Moderate

## 9.0 SEP-GRM (Contd.)

The types of grievances that would be taken into consideration by the project under the ambit of this GRM are as follows:



### Stages of GRM



In order to manage its engagements with the project stakeholders and meet the objectives of SEP-GRM processes, AMPYR is required to ensure that this engagement process is given as much importance as the other project activities as well as guarantee the availability of certain resources. For the management of the E&S aspects of the Project, three entities will be responsible for various activities linked with the Construction and Operations phases of the project, viz., AMPYR, will appoint EPC contractor and O&M team. However, the overall responsibility of implementation of the GRM lies with AMPYR, in close coordination with appointed EPC contractor and O&M team, during the construction and operations phases. Additionally, the project team at site shall be trained on aspects of engagement with various key stakeholders and the staff deputed/ identified for SEP and GRM implementation shall be assigned the responsibility of documenting and maintaining records of all stakeholder engagement activities undertaken during the project lifecycle and providing updates to the corporate on the same.

# LAYOUT OF THE ESIA-ESMP

Volume	Volume Name	Details
1	Volume 1: Non-technical Summary (NTS)	A concise summary of the ESIA process and key findings that can be easily read and understood by the general public.
2	Volume 2: ESIA Introduction, Project Context and Summary of Scoping Report ( <i>this report</i> )	<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Project Description</li> <li>• Policy, Legal and Administrative Framework</li> <li>• Summary of ESIA Scoping Process</li> <li>• Analysis of Alternatives</li> </ul>
3	Volume 3: Environmental and Social Baseline and Impact Assessment	<ul style="list-style-type: none"> <li>• Environmental, Social and Ecological Baseline</li> <li>• Stakeholder Engagement</li> </ul>
4	Volume 4: Impact assessment	<ul style="list-style-type: none"> <li>• Impact Assessment (Environmental, Social and Ecology)</li> </ul>
5	Volume 5: Environmental and social management plan	<ul style="list-style-type: none"> <li>• Summary of impacts identified during pre-construction, construction, operations and decommissioning stages; and</li> <li>• Complete ESMP summarizing recommendations across the ESIA</li> </ul>
6	Volume 6: Technical Annexures	<ul style="list-style-type: none"> <li>• Stakeholder Engagement Plan (SEP) and Grievance Redressal Mechanism (GRM);</li> <li>• Stakeholder records (summary of discussions, commitments, dates and locations);</li> <li>• Landownership details with due regards for confidentiality in view of potential disclosure;</li> <li>• Summary of consultations with land sellers and aggregators; and</li> <li>• Summary of Focused Group Discussions</li> </ul>