



Environmental and Social Impact Assessment (ESIA) for 38 MW Balenahalli Wind Farm in Chithradurga, Karnataka. *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 38 MW wind farm, activities carried out during the ESIA study, identified environmental, social and ecological sensitivities and summary of impacts. The outcome of the NTS is the determined impact significance for scoped-in environmental and social parameters, mitigation measures to reduce the impact and residual impact significance after implementation of the mitigation measures. The NTS also summarizes the implementation and supervisory framework for the mitigation measures.

1.1. Project Background

ERM India Pvt. Ltd. was commissioned by Ampyr Renewable Energy Resources One Private Limited (*hereinafter referred to as "Client or "Ampyr"*) to undertake an Environmental and Social Impact Assessment (ESIA) of a 38 MW wind farm in Village Balenahalli, Taluk Challakere and Chitradurga of District Chitradurga in Karnataka, India (*hereinafter referred to as 'Project'*).

Ampyr is an Independent Power Producer (IPP) that is in the process of acquiring the Project from M/s Fiza Group (*hereinafter referred to as 'Fiza'*). Fiza developed a 24 MW wind farm in 2017 consisting of 12 turbines but the construction work was suspended in the same year because the State of Karnataka discontinued the feed-in-tariff (FIT) programme. The turbines were being supplied by Siemens Gamesa Renewable Energy (SGRE) and 11 turbine foundations had been completed with one turbine erected prior to suspension of construction work.

Ampyr intends to increase the capacity of the Project to 38 MW and will sell electricity to nine (09) different off-takers under India's group captive scheme. Ampyr has also sought equity investment from Climate Investors One (CIO), a fund managed by Climate Fund Managers (CFM).

The current phase-wise configuration of the wind farm is as follows:

Phase 1: 11 turbines with an individual capacity of 2MW, totalling 22MW

Phase 2: 8 turbines with an individual capacity of 2MW, totalling 16mw

Justification for the ESIA

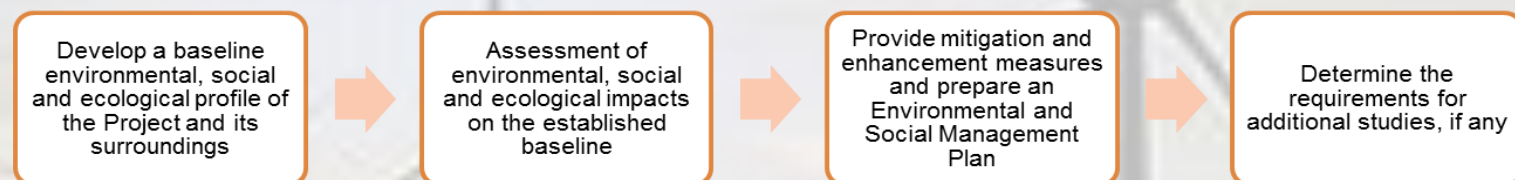
ERM was commissioned by Ampyr to undertake a Red Flags Review (RFR) and Environmental and Social (E&S) screening and scoping study in May 2019. A key outcome of the study was to undertake an ESIA to address impacts related to water resources, ambient noise, occupational health and safety, terrestrial ecology, land-based livelihoods and community health and safety.

1.2. Objectives and Scope of work

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

Figure 1.

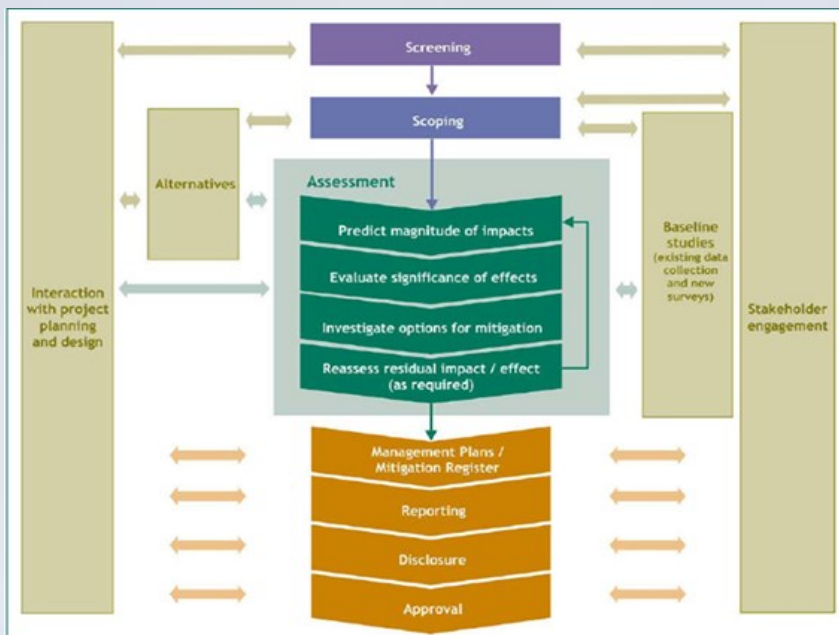
Figure 1: Objectives of ESIA



1.2.2. Scope of Work



Approach and Methodology for ESIA and Brief on Technical Management Plans



- ⇒ Initial discussions on 24 May 2019 for the RFR and E&S Screening and Scoping Study
- ⇒ ESIA update discussion on 25 September 2019 to discuss changes since RFR site visit.



Desk-based review of relevant documents and available topographic maps, satellite imagery and secondary sources of information on the environmental, social and ecological baseline.



Site surveys were undertaken on 25 to 28 September 2019 and 06 to 10 November 2019 for the ESIA and Bird and Bat respectively. The site included a walkthrough the Project, stakeholder consultations and primary environmental, social and ecology surveys.



Analysis of Alternatives (AoA) considers the no Project scenario, alternative modes of power generation, alternate site location and alternative technology



Impact Assessment considers potential environmental, social and ecological elements that will be impacted due to the completed and proposed Project activities.



Environmental and Social Management Plan (ESMP) summarizes the list of mitigation measures recommended to reduce the overall impacts on environmental, social and ecological elements. The ESMP also provides implementation responsibility, supervision mechanisms and means of verification.

The **Stakeholder Engagement Plan (SEP) - Grievance Redressal Mechanism (GRM)** and **Gender Action Plan (GAP)** are being undertaken to meet CFM's Responsible Investment Code (RIC) and identify modes of continuous engagement with key stakeholders and incorporate gender inclusiveness into the Project.

The **Traffic Management Plan (TMP)** has been identified due to the proximity to State Highway 48 and an outcome of the plan is to develop measures to prevent traffic loads, congestion, snag points and community nuisance.

The **Waste Management Plan (WMP)** has been identified as a requirement in the RFR to determine waste streams being generated from the Project and identify storage, transport and disposal requirements based on national laws and international best practice.

The **Bird and Bat (B&B) Study** has been identified in the CFM RIC to determine seasonal risks and impacts on biodiversity and prevent collision/ electrocution risk.

The **Source Water Assessment (SWA)** has been identified in the RFR to address the overexploited groundwater resources in the study area and provide water conservation and recharge measures to mitigate risks associated with groundwater abstraction for the Project.

Area of Influence for the Assessment

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.

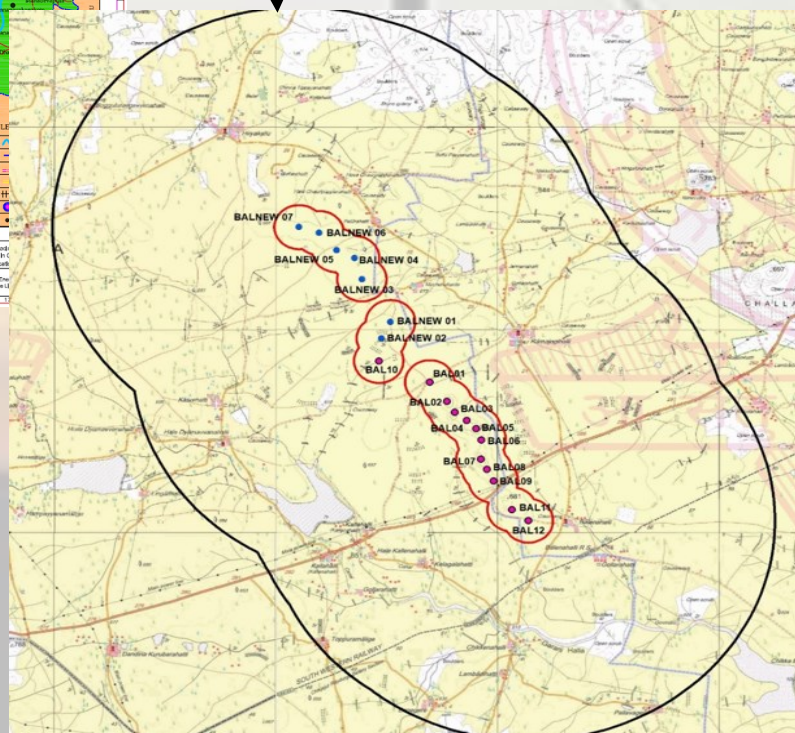
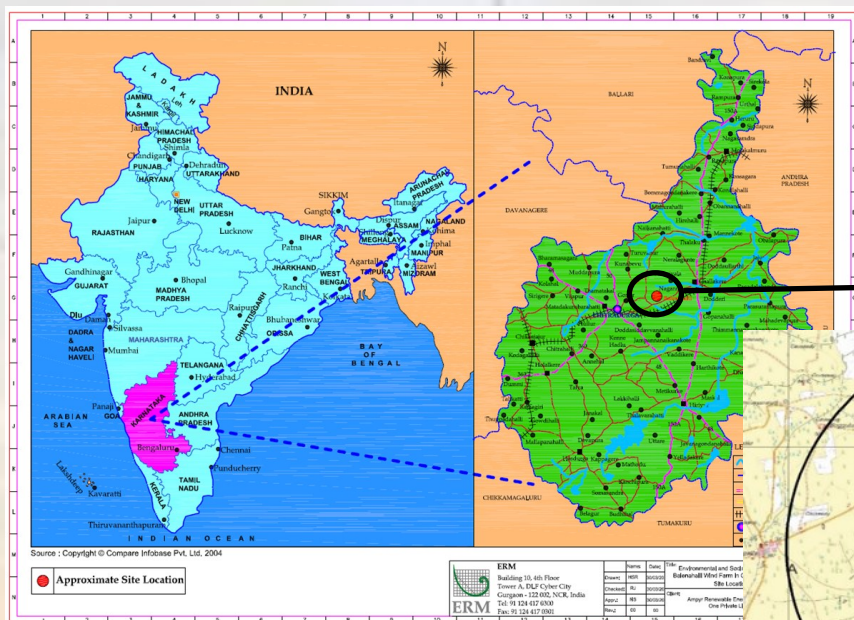
Project Area of Influence, area where the Project and Project activities can affect a particular resource or receptor. The AoI has spatial (distance) and temporal (time) dimensions, the scale of which is dependent on a number of factors.

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 1 km for social. **Buffer Zone** is 5 km for all parameters.

2.0. Project Description

Particular	Description
Location and Terrain	The Project site is located on land parcels belong to 4 villages namely, Dymavvanahalli, Pelorahatti, Ramjogihalli and Balenahalli villages in Chitradurga and Challekere talukas of Chitradurga District. The topography of the site varies from flat to undulating with elevation of the WTGs ranging from 638 - 704 above mean sea level.
Type of WTGs	The wind farm will comprise of 19 WTGs of the Siemens Gamesa Renewable Energy (SGRE) make and model - G 114-2.0 MW. <ul style="list-style-type: none"> Phase I: 11 WTGs of 2.0 MW capacity; and Phase II: 8 WTGs of 2.0 MW capacity.
Power Evacuation	<ul style="list-style-type: none"> Internal transmission line: route of internal transmission line and its length is yet to be finalised. Approximately 15-18 km of internal TL will be developed to evacuate power via a network of 33 kV feeders at the Pooling Substation (PSS); 33/66 kVA Pooling substation at Village Balenahalli; and Approx. 1.6 km of external transmission line is proposed from pooling substation to 66 KVA Grid Substation (GSS) at Balenahalli that is operated by the state government
Project Status at time of study	<ul style="list-style-type: none"> Phase I of the Project had land procured and started construction in 2017 with installation of twelve (12) turbine foundations and erection of one (01) SGRE WTG (BAL 11). The construction was put on hold in the same year. Phase II of the Project was still in the land procurement phase and had identified land parcels but were still in the process of verifying and completing the land procurement process; Storage yard and pooling substation were under construction; and Transmission lines route was being finalized during the site visit.
Commissioning date	Anticipated commissioning date for both phases is October, 2020



Resource Requirements

Land Footprint

S. No	Component	Village	Number of Landowners for the private land	Private Land (acres)	Government Land (acres)	Total Land (in acres)*
1.	WTGs	Dyamavanahalli, Balenahalli, Pelorahatti	11	32	34	66.75
2.	Access road (on lease)	Dyamavanahalli, Balenahalli, Pelorahatti, Ram-joginalli and Muchugunte	20	14.83		14.83
3.	External lines	Balenahalli	10	7.43		7.43
4.	Internal lines	Balenahalli, Dyamavanahalli, Pelorahatti, Ram-joginalli, Muchugunte.	20	7.4		7.4
5.	Storage Yard (on lease)	Dyamvanahalli		4		4
6.	Pooling sub-station	Balenahalli			3	3
Total land requirement				66.41	37	103.41

Land related sensitivities

Landlessness: It was reported by Fiza that land procurement for the Project would not result in landlessness of any land sellers at present and this was confirmed with 5 landowners that were consulted during the site visit, who belonged to the Reddy, Raja (Adi Karnataka) caste group and review of Title Due Diligence reports.

Informal Land Use: No evidence of informal land use (such as squatting and/or encroachments) were observed in any of the land parcels for WTGs and PSS at the time of visit by ERM team in September 2019. No such issues were identified during WTG profiling.

Land Use Change: Most of the private land parcels are reported to be unfit for cultivation, as a majority of them are situated on hillocks. The area largely has rain fed agriculture and the status of rainfall in the area is continuously depreciating, making agriculture a less preferred occupation for the local community. However, under such circumstances, the setting up of the Project will result in permanent land use change of the concerned land parcels from agriculture/ fallow to industrial category.

Mutation: The land is being purchased in the name of the developer Fiza, which will be later transferred to the name of the Project proponent.

Schedule V Area: The Project area does not fall under designated Schedule V area

Forest land: The WTG locations and PSS are being developed on private agricultural and revenue land and no forest land will be used for the Project.

Resource Requirement

Resource	Construction Phase	Operation Phase
Work-force	Employees: 70, Skilled Labour: 35 and Unskilled Labour: 15	Employees: 4, Skilled Labour: 5, Unskilled Labour: 0
Water	1672 KL for civil work, 266 KLD for curing, 135 litres per day per person for domestic use	2-3 KL per day for employees and to maintain earth's resistance.
Raw Material	220 cums of cement mortar will be used for foundation construction of each WTG. 6 construction equipment (crane, man basket, boom placer etc.)	Supplies for the site staff and maintenance needs for the WTGs
Fuel	80-100 litres per WTG	500 litres of oil per WTG
Power	2 mobile Diesel Generator (DG) sets of capacity 15 kVA and 25 kVA as backup. Main power from: HT Connection taken from Karnataka Electricity Department	None; will be done using battery packs

3.0. Applicable Reference Framework

The applicable reference framework for the ESIA study includes the following set of standards and guidelines:

- ⇒ Applicable local and national environmental and social regulations
- ⇒ IFC Performance Standards on Environmental and Social Sustainability (2012);
- ⇒ IFC/World Bank General EHS Guidelines (2007);
- ⇒ IFC/World Bank EHS Guidelines for Wind Energy Projects (2015);
- ⇒ IFC/World Bank EHS Guidelines for Electric Power Transmission and Distribution (2007); and
- ⇒ Any relevant international convention ratified by India related to EHS&S aspects.

ERM will also incorporate key aspects of the national guidelines for onshore wind power projects that has been released by the renewable energy wing of the Government of India i.e. Ministry of New and Renewable Energy (MNRE) vide circular F. No. 66/183/2016-WE, dated 22nd October 2016.

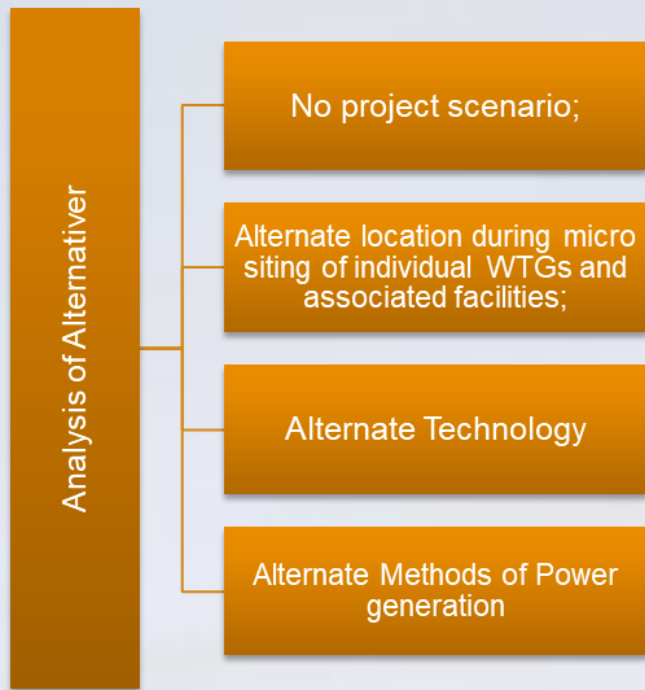
National Regulations

Relevant national, state and local laws that would be applicable to the Project (Pre-construction	Construction	Operation & Maintenance	Decommissioning
Karnataka Land Revenue Code	✓	✓	X	X
Forest Conservation Act 1980	X	X	X	X
Wildlife Protection Act 1972	✓	✓	✓	X
Environmental Protection Act 1986	✓	✓	✓	✓
Water Act, 1974 and Air Act, 1981	X	✓	✓	✓
EIA Notification 2006	X	X	X	X
Hazardous Wastes Rules 2016	X	✓	✓	✓
Noise Rules 2000	✓	✓	✓	✓
Construction and Demolition Waste Management Rules 2016	X	✓	X	✓
Biomedical Waste Management Rules 2016	X	✓	✓	✓
Batteries Rules, 2001	X	X	✓	✓
MSIHC Rules 1989	X	✓	✓	✓
Karnataka Factories Rules 1969	X	✓	✓	X
Labour Laws — BOCW, ISWM, Child Labour, Contract Labour, Bonded Labour, Minimum Wages, Equal Remuneration, Workmen Compensation, Security, POSH and Maternity Benefits.	X	✓	✓	✓

International Standards

Relevant international standards that would be applicable to the Project	Applicability
IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts	✓
IFC Performance Standard 2: Labour and Working Conditions	✓
IFC Performance Standard 3: Resource Efficiency and Pollution Prevention	✓
IFC Performance Standard 4: Community Health and Safety	✓
IFC Performance Standard 5: Land Acquisition and Involuntary Resettlement	X
IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	✓
IFC Performance Standard 7: Indigenous Peoples	X
IFC Performance Standard 8: Cultural Heritage	X
IFC EHS Guidelines for Wind Energy	✓
IFC EHS Guidelines for Electric Power Transmission and Distribution	✓
IFC General EHS Guidelines	✓
Ratified ILO Conventions	✓
Kyoto Protocol	✓
Convention on the Conservation of Migratory Species	✓

4.0. Analysis Of Alternatives



Alternative Methods of power generation/ Alternate Technology

1. **Water:** Several evaluation methods are being employed to assess the footprint of electricity generation through various ways. Wind farms require small amounts of water are used to clean wind turbine rotor blades in arid climates (where rainfall does not keep the blades clean). For current energy investment of 38 MW, Ampyr might consume about 38 gallons MW/h.
2. **Carbon offsetting:** According to National Renewable Energy Laboratory, 1 MW of wind energy results in 2600 tons of CO₂ offsetting. In case of Ampyr, 38 MW can offset approximately 98800 tons CO₂.

Thus, it is clear the harnessing wind energy is an eco-friendly process, inexhaustible and possesses a minimal environmental footprint as there are no significant fuel requirements or large quantities of water for operation of the plant.

No Project Scenario

Under this scenario, there will be no adverse environmental or social impact around the Project site, as there will be no construction and operation of WTGs and its associated facilities. However, this project is important part of India's target to develop 175 GW of non-hydel renewable energy by 2022 to fulfil its commitment towards Paris Climate Change Agreement 2015 and to provide power to meet the increasing energy demands of the country and to contribute towards renewable sources of energy.

The ESIA indicates that majority of the impacts are not significant i.e. categorized as negligible or minor.

Alternative locations for individual WTGs

Wind resource mapping and power potential assessment for the Project was done by NIWE, thus, the option of choosing an alternative area is not available to a project developer. Within the potential area, there is a possibility as well as flexibility of moving the individual WTG locations (micro siting) to avoid any potential environmental and social issue or risks like total landlessness of the owner, environmental impacts, impacts of nearby residents etc. As for associated facilities such as transmission lines, access pathways, pooling substation, yards and stores etc. the land team makes very careful assessments for each and every aspect to choose the best alternative.

The proposed wind power project site has the following location advantages:

- Pre-approved NIWE site for wind energy production;
- No cultural property of archaeological importance within 10 km radius;
- Majority minor or negligible impacts with the exception of impact on water availability that has been specifically mitigated through the commissioning of a Source Water Assessment;
- Single receptor in the 500m radius that has been modelled to have minimal impact due to shadow flicker and is at least 250m away from the proposed turbine locations to reduce noise-related impacts; and
- No habitats that are sensitive including forests, significant clumps of vegetation or surface water bodies and low migratory bird activity that reduce overall ecology risks.



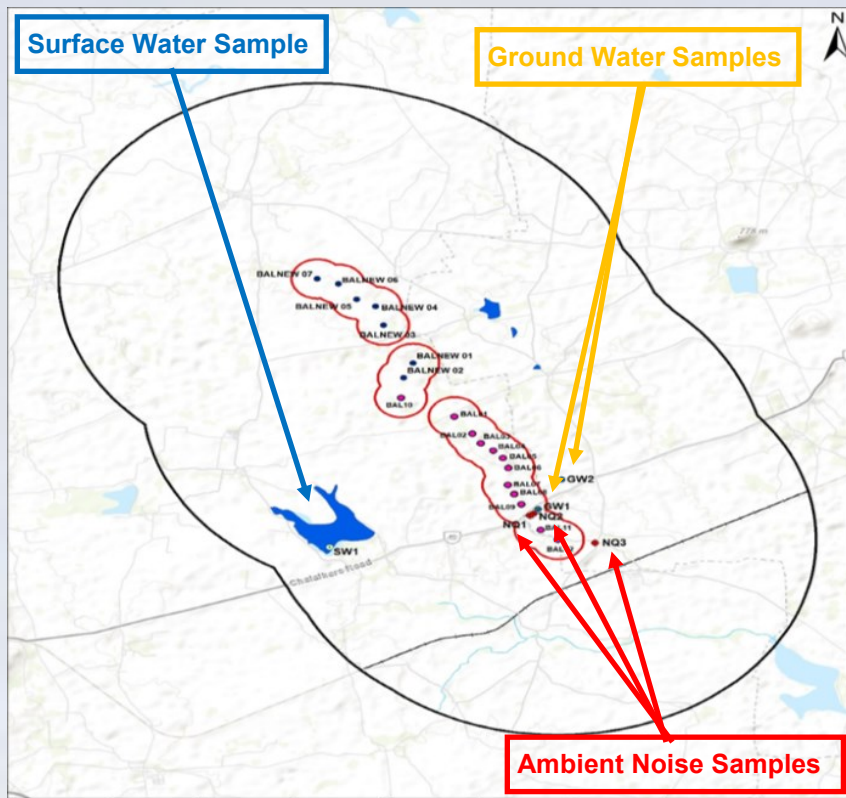
Alternate WTG Location

One of the key outcomes of the RFR and ESIA is the abandoning of BAL 10 (left) from the phase I micro-siting and identification of Alt BAL 10 (right) for the phase II micro-siting. This prevented impacts on the school with respect to noise, construction and dust pollution.



5.0. Environmental Baseline

Primary environmental monitoring of ambient noise levels, groundwater quality and surface water quality was undertaken from 25 to 28 September, 2019.



Equivalent Noise Levels Day Time (dB [A])			
Location	L _{eq} Day	CPCB Limit	WHO/IFC Limit
N1	47.66	50	55
N2	54.72		
N3	46.72	55	
Equivalent Noise Levels Night Time (dB [A])			
Location	L _{eq} Night	CPCB Limit	WHO/IFC Limit
N1	43.27	40	45
N2	48.27		
N3	45.66	45	

In red are those noise samples that exceed the CPCB/WHO/IFC limit (whichever is most stringent)

Ambient Noise Monitoring

The ambient noise levels were determined to be high because of proximity to the State Highway 48 that has continuous movement of heavy vehicles. The 48-hour sampling also identified significant differences between similar time periods on consecutive days and extremely high noise values were identified on day 2 of the sampling. The above discrepancies has resulted in a higher baseline noise value for the Project

Surface Water Quality

The surface water quality assessment was done to understand the baseline surface water quality of the study area. The key exceedances with respect to Drinking Water Standards (IS 1500:2012) are provided below:

- ◆ pH of the surface water sample was found 7.48;
- ◆ Turbidity of the sample was higher than the permissible limits for drinking water but is expected of surface water bodies that would be susceptible to higher dissolved and suspended solid content.
- ◆ Faecal and total coliform was found in the samples.

In accordance to CPCB Designated Best Use Water Criteria, the water has been classified as suitable for drinking after applying conventional treatment and disinfection.

Ground Water Quality

Major part of the district is falling under over-exploited category. The results of the groundwater quality surveys and comparison with Indian drinking water standards - IS: 10500:2012 has been provided below:

- ◆ The pH of the groundwater samples for GW1 and GW2 were found in the range of 6.5-8.5.
- ◆ Total dissolved Solid (TDS) of both water sample GW1 and GW-2 were found to be 706 mg/l and 646 mg/l respectively, which is above the acceptable limit of 500 mg/l.
- ◆ Magnesium concentration of GW-2 was found 35.35 mg/l, which is above the acceptable limit of 30 mg/l;
- ◆ Total Alkalinity (as CaCO₃) of GW-1 and GW-2 were found 646.8 mg/l and 440 mg/l respectively, which is more than the acceptable limit of 200 mg/l. GW-1 concentration exceeds even the permissible limit.
- ◆ Total coliform and E-coli were detected in both sample but less than 1 MPN; and

Except above given parameters, all the other parameters were observed well within the acceptable limits of IS 10500:2012. All parameters were within the permissible limits set by IS 10500: 2012.

Environmental Baseline (continued)

Land Use Classification

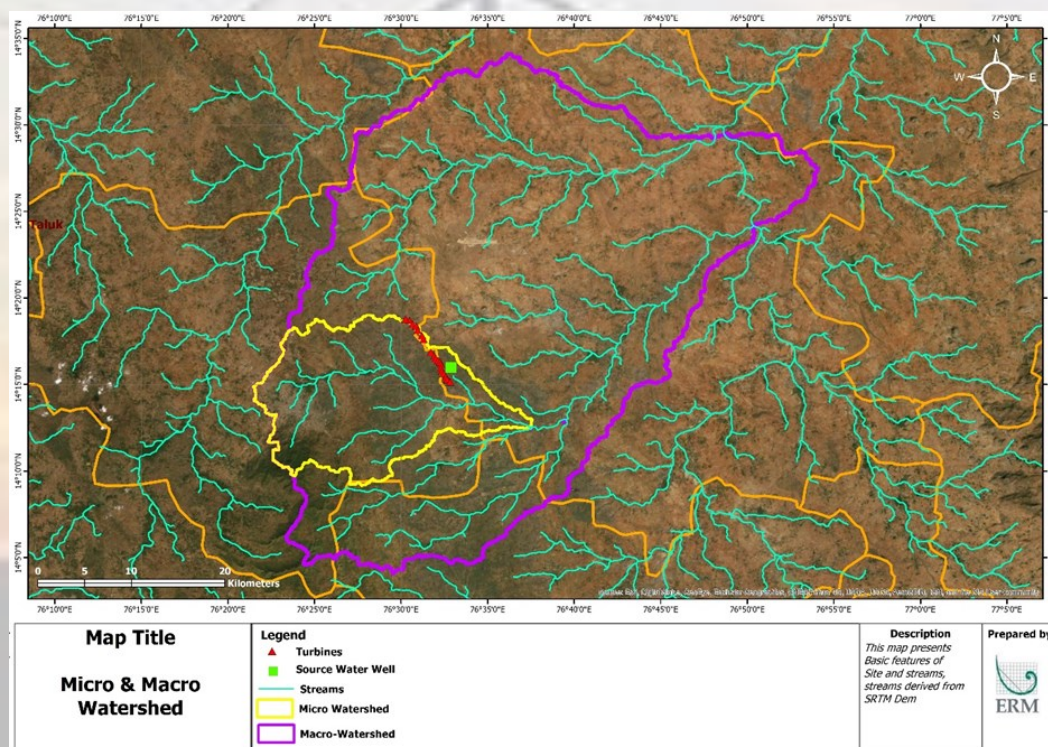
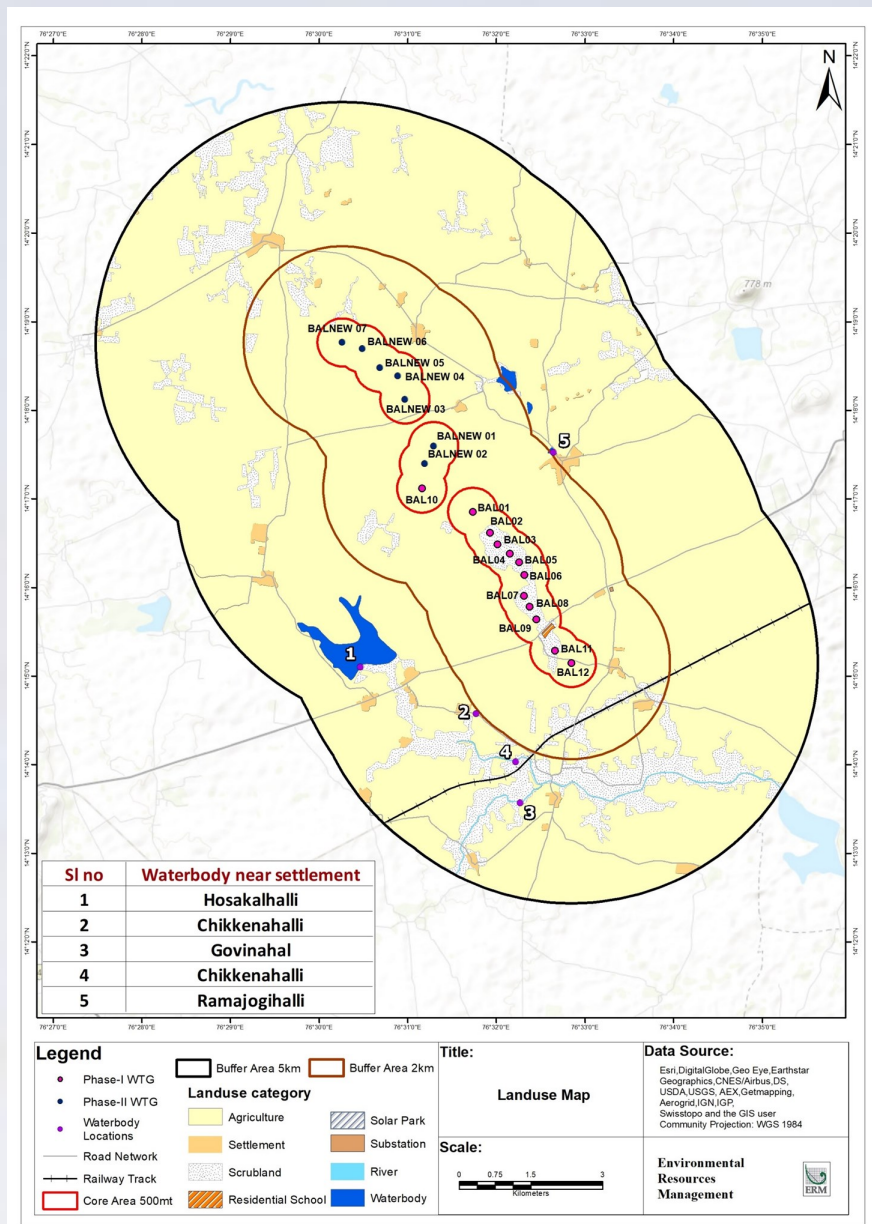
Land use Category	Area in sq. km	Percentage
Agriculture	146.26	87.71%
Scrubland	16.04	9.62%
Settlement	2.01	1.20%
Development	0.95	0.58%
Surface Water Resources	1.49	0.89%
Total Area	166.75	100.00%

Local Topographic Features

The elevation of the study area varies from 638-704m amsl. The phase I turbines are located at the peak of this topographic range at 690-704m amsl. The phase II turbines are located on relatively flat land with a gradual slope in the north direction

Groundwater Status of Study Area

The groundwater status of the Project site and study area is '**overexploited**' as determined through current groundwater status and long-term trends in pre- and post-monsoon levels.



Drainage

The micro and macro watershed falls in Vedavathi River Basin. A couple of streams flow across the watershed, one of which flows south of the Project site (~ 3 km south of BAL 12).

Natural Hazard Risks

Disaster	Risk Level
Earthquakes	Low
Cyclones	Low
Land Slides	None
Flood	None

5.1. Ecological Baseline

The ecology baseline was compiled across two site visits in September (25-28) and November (06-10) for the ESIA and Bird and Bat respectively

Habitat Classification

Classification Scheme	Classification
Biogeographical Province of India	6E: Deccan Peninsula – Deccan South
Agro Ecological Sub Region (ICAR)	Eastern Ghats, TN uplands and Deccan (Karnataka) Plateau
Agro-Climatic Region	Southern Plateau and Hills Region (X)
Champion and Seth forest classification	Tropical Dry Deciduous Scrub (5/DS1)



Agricultural Land



Scrub Land

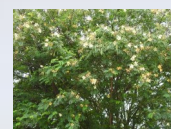


Water Reservoir

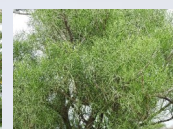
The habitat in the study area was largely agricultural land (~ 87%) and scrubland (~ 10%). Five water bodies were identified in the study area and all the water bodies were at least 1 km from the Project site. No forest land found in the study area. No area of ecological significance or protected area found within the study area.

Floral Assessment

A total of fifty-three (53) floral species belonging to twenty-six (26) families were observed from the 5 km radius of the wind farm. Fabaceae was the most dominating family in the area with 15 species. none of the species identified in the region is threatened (i.e. critically endangered, endangered or vulnerable) in accordance to IUCN Red List (Version 2019-2)



Delonix elata



Euphorbia tirucalli



Ipomoea carnea



Passiflora foetida

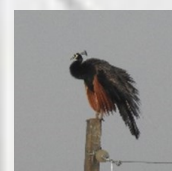
Faunal Assessment

Herpetofauna: 9 species were observed or reported from the 5 km study area, of which, the Bengal Monitor Lizard (*Varanus benghalensis*) and the Indian Python (*Python molurus*) are the 2 protected species and no threatened species reported in the area.

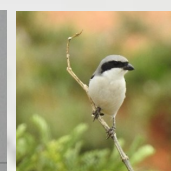


Indian Bull Frog

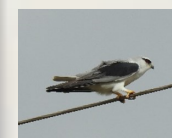
Avifauna: A total of 61 bird species were observed/reported in and around the study area of the wind farm. Of which, 46 species were directly observed during the site visit. Besides one Vulnerable (Southern Grey Shrike) and four Near Threatened (Black-headed Ibis, Pallid Harrier, River Tern and Laggard Falcon) species, all the species have been classified as 'Least Concern' as per the prevalent IUCN Red List. **No Critically Endangered or Endangered species have been identified during either site visit.** Total 4 species reported or observed from the study area i.e. Black Kite (*Milvus migrans*), Pallid Harrier (*Circus macrourus*), Black-winged Kite (*Elanus caeruleus*) and Indian Peafowl (*Pavo cristatus*) are protected under Schedule I of the Wildlife Protection Act, 1972. One species House Crow (*Corvus splendens*) is listed under Schedule V as per the Wildlife Protection Act, 1972.



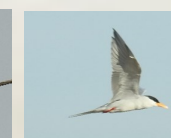
Indian Peafowl



Southern Grey

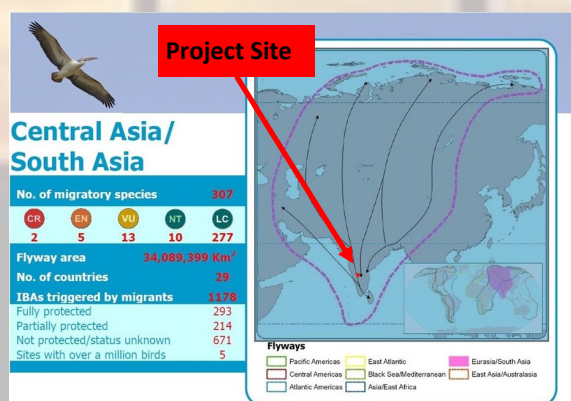


Black-winged Kite



River Tern

Mammals: 7 mammals were observed or reported from the 5 km study area of the proposed wind farm out of which none were protected (Wildlife Protection Act, 1972) or threatened (IUCN Red List Version 2019-2)



Migratory Routes

As a portion of the Central Asian Flyway passes in the west of the Chitradurga, all the IBAs of the area supports the congregations of migratory bird species. 6 migratory species namely, Common Stonechat (*Saxicola torquatus*), Green Sandpiper (*Tringa ochropus*), Grey Wagtail (*Motacilla cinerea*), Lesser Whitethroat (*Sylvia curruca*), White-Winged Tern (*Chlidonias leucopterus*) and Pallid Harrier were also reported or observed from the 5 km buffer of the wind farm.

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.

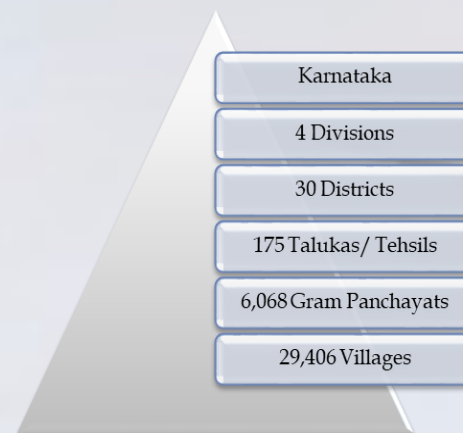
Profile of the Study Area

The study area comprises of area lying within 5 km radius of the project boundary, and is further divided into core zone and buffer zone. The core zone comprises of 2 villages (without considering villages for Transmission Line route), while the buffer zone comprises of 10 villages.

State: Karnataka's geographical area is 1,91,791 square kilometres accounting for 5.83% of the total geographical area of India. It is the eighth largest state in the Country. The capital of the state is Bengaluru. The state of Karnataka is divided into 30 districts, 4 administrative divisions, 175 talukas/tehsils, 6,068 gram panchayats, 270 towns and 29,406 villages. According to the 2011 census of India, the state comprises of a population of 61,095,297 individuals, which is predominantly rural, forming 61.32 % of the state's total population.

District: Chitradurga is located at a distance of 202 kilometers northwest of the Bengaluru District. The district is divided into six taluks, namely Chitradurga, Hiriya, Hosadurga, Holalkere, Challakere and Molakalmuru. The district is bounded by Tumkur District to the southeast and south, Chikmagalur District to the southwest, Davanagere District to the west, Bellary District to the north, and Anantapur District of Andhra Pradesh state to the east.

Study Area for Social Baseline: As per the 2011 Census, the study area, covering 12 villages in the 5 km radius, has a total of 5,585 households and a population of 26,164. Bale-nahalli Village is the closest from the Project and has the maximum population.



Administrative structure of Karnataka

Study region	No of Households	Total population	Sex ratio	SC%	ST%
Challakere Tehsil	64,311	3,10,590	964	23.70	30.20
Chitradurga Tehsil	59,546	2,83,673	962	27.57	27.57

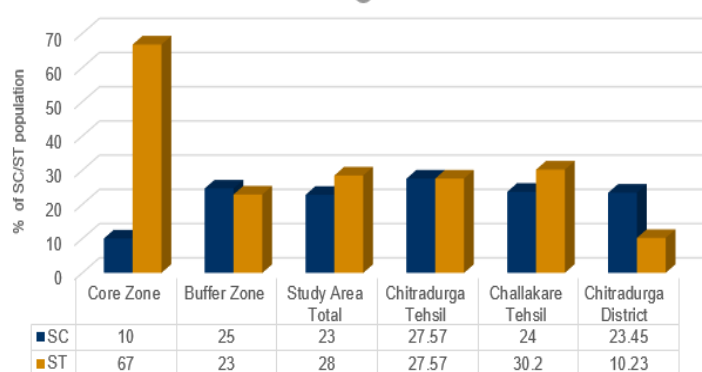
Demographic Profile of Tehsil

Social Stratification

The study area is inhabited by various caste groups from the Hindu community such as Brahmin and Reddys and Scheduled Castes (SC) such as Holer, Madar, Rajput, Chouhan, Rathore and Poddar, Scheduled Tribes (ST) such as Chamars, Balais, Malis, etc. and Muslims (mostly Sunni) are also reported to inhabit the study area.

There is moderate presence of ST population in both Challakere and Chitradurga district (30.20% and 27.57 % respectively). For the overall study area, the population of STs varies from core zone to Buffer zone. There are approximately 67 % of ST population and 10 % SC population in the core zone. Pelorahatti village is having maximum percentage of ST population (94.7%) among the entire core zone of the study area of the projects. Whereas, there is 23 % and 25 % of ST and SC population respectively. Haikal village in the buffer zone.

Figure 5.14 - Social stratification



Social Baseline (continued)

Education

The average literacy rate in core zone and buffer zone is nearly same (i.e. 72.96 %) and is lower than Chitradurga tehsil and higher than Challakere tehsil figures. Literacy rate in women is consistently low at all levels. It is also evident that there is significant gap in literacy rate of women and men in Project study area. However, it was reported during the site visit that this trend is now changing and women are encouraged to complete their education. There are a total of 26 schools in the study area.

Occupation

Agriculture is the mainstay of the local economy of the study area. Cultivators constitute a significant portion among the different occupations followed by agriculture labour in study area. The WPR of the study area is 67.09 % and 60.71% in core and buffer zone respectively. This figure suggests the study area villages have moderate employment rate and as less than 40 % of the people are unemployed in both the zones in the study area.

Majority of people reported working on their own farms as farmers as well as working as agriculture labourers on irrigated agriculture land owned by others (specifically during lean monsoon season) . According to the community consultation in Balenahalli, Pelorahatti and Ramajogihalli villages, some people have also started working in the button and leather factories in Chitradurga tehsil. However, it was informed during the consultation with the community that there is a progressive shift from agriculture based economy to non-agriculture based economy due to lack of irrigation facilities and decline in crop yield.

The setting up of wind power plants in the area is expected to provide short term employment opportunities, with special consideration to competent members of the households whose land will be bought/ leased for WTGs and other project components.

Land

The study area has a predominantly agrarian economy for which dependence on land resources is considerably high. Land holding pattern of the study area shows that majority farmers in these areas are under small and medium categories of farmers.

An average family has about 2-3 acres of land. It was noticed that the vulnerable sections of the villages like people from the ST community are mostly under marginal category. Consultations in Balenahalli, Pelorahatti and Ramajogihalli villages indicated that there are landless families as well. Most of the landless families belong to vulnerable households (ST/SC, Muslims etc.).

Census 2011 data suggests that a negligible proportion of the agricultural land for project area villages was classified as culturable waste land.

Drinking Water and Sanitation

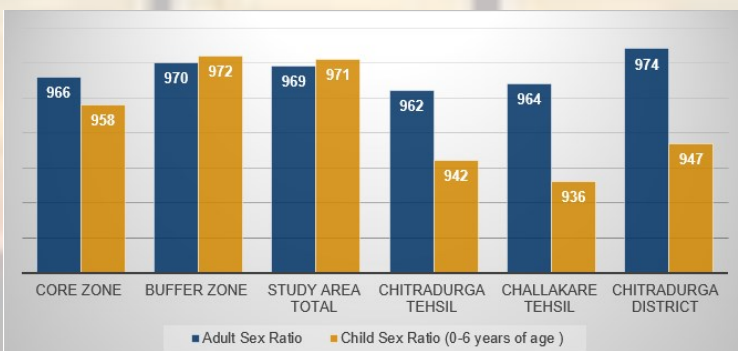
It was indicated during consultations that less than a quarter of the villages in the core and buffer zones do not have access to tap water and covered wells and water scarcity over the past few years has deteriorated further. Increasingly long spells of summer and a corresponding decline in rainfall are reported to have severely affected the water table in the region. Most of the water ATMs installed by Gram panchayat funded by Government of Karnataka (GoK) were reported to be not functioning because of lack of maintenance.

In addition, villages in core and buffer zone are not covered under Total Sanitation Campaign (TSC). In community consultation it was reported that most of the people mainly economically weaker section and ST households resort to open defecation and face issues regarding lack of or underdeveloped drainage system.

Irrigation and Electricity

In the core zone, 91.95% of the total area under cultivation is unirrigated. Canal/ tanks/lakes do not serve as sources for irrigation water in any of the core villages due to water scarcity issues. Whereas, in the buffer zone, 89.44% of the total area under cultivation is unirrigated.

All the villages in the study area have access to household electricity supply under 'Deendayal Upadhyaya Gram Jyoti Yojana'. However, it was reported during consultations that there is power outages of 2-4 hours daily, with increased power cuts in the summer months.



Sex Ratio in the study area

6.0. Stakeholder Engagement

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. Stakeholder mapping 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 categorisation

Stakeholder Groups	Primary Stakeholders	Secondary Stakeholders
Community	Land sellers from Dyamavanahalli, Balenahalli and Pelloarhatti Villages. Developers and Contractors Local Labourers	Local Community Vulnerable Social Groups
Institutional Stakeholders	Ramajohilhalli and Dyamavvanahalli Gram Panchayats	Civil Society/ Local NGOs
Government Bodies	Regulatory Authorities District Administration School	

Summary of overall stakeholder influence

Stakeholder Category	Relevant Stakeholders	Magnitude of Influence/Impact	Urgency/ Likelihood of Influence	Overall Rating of Stakeholder Influence
Primary stakeholder	Land Sellers	High	High	High
	Developers and EPC Contractors	Medium	Medium	Medium
	Local Labourers	Negligible	Medium	Medium
	Gram Panchayats	Medium	Negligible	Medium
	Regulatory Authorities	Negligible	Negligible	Low
	District/Tehsil Administration	Negligible	Negligible	Low
	Employees	High	High	High
Secondary Stakeholders	Local Community	Negligible	Negligible	Low
	School constructed near an erstwhile WTG location	Medium	Medium	Medium
	Vulnerable Communities	Negligible	Negligible	Low
	Civil Society/Local NGOs	Negligible	Negligible	Low

Key Feedback received during Stakeholder Consultations

Key feedback received from local community of Balenahalli, Pelorahatti and Ramajogihalli: It was informed during the consultation with the community that there is a progressive shift from agriculture based economy to non-agriculture based economy due to lack of irrigation facilities and decline in crop yield. There was a positive outlook towards upcoming projects in the area. They expect to receive benefits from the Project in terms of employment and vendor-ship opportunities and development of infrastructure. .

Key feedback received from 5 land sellers who were consulted during the ERM site visit: It was informed that the sellers are willing to sell their land due to the low productivity of the agricultural land, dependency on monsoons and lack of irrigation facilities. The land price received after selling their land was reinvested into purchase of fertile land in other nearby villages at a lower price and payment of loans. Selling land is therefore also considered as an option of liquidating their assets.. The major concern of the stakeholder group till now is related to availability of employment opportunities that the Project will generate.

7.0. 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.

Construction Phase

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	With Mitigation
Change in land use	Negative	Minor	<ul style="list-style-type: none"> Construction activity should to be restricted to designated area On completion of the construction activities, land used for temporary facilities will be restored to the extent possible and handed over to the owners The land use in and around permanent project facilities should not be disturbed. 	Negligible
Soil Erosion & Compaction	Negative	Minor	<ul style="list-style-type: none"> Vehicles should utilize existing roads to access the site to the extent possible. Routes should be selected based on the traffic management analysis and minimal congestion provided in the Traffic Management Plan (TMP). Existing roads should be widened based on requirement as identified in route survey to have the width and turning radius to accommodate the necessary vehicles for the Project. Soil should be ploughed in compacted areas after completion of construction work. Stripping soil should be conducted only when required and top soil should be retained for landscaping. Stripping of top soil, excavation and access road construction should not be carried out during the monsoon season or during heavy winds to minimize erosion and run-offs The stock piles of top soil should be kept moist to avoid wind erosion of the soil Revegetation of the construction boundaries using fast growing local vegetation 	Negligible
Waste Generation	Negative	Minor	<ul style="list-style-type: none"> Waste Management Plan (WMP) developed for the Project should be communicated to all employees, contractors and labourers through a periodic training mode. Municipal domestic waste generated at site should be segregated at site during storage Sub-contractors should ensure daily collection and weekly disposal of construction waste, generated debris, concrete, metal cuttings and waste/used oil. Municipal waste collection should be routed through local municipal bodies for further disposal. Hazardous waste will be properly labelled, stored onsite at a location provided with impervious surface, shed and secondary containment system as per in accordance to Hazardous Wastes Rules, 2016 Hazardous waste records should be maintained at site. 	Negligible
Soil contamination	Negative	Minor	<ul style="list-style-type: none"> Use of spill control kits to contain and clean minor spills and leaks. The guidelines and procedures shall be prepared and followed for immediate clean-up actions following any spillages. The sewage generated onsite will be treated and disposed through septic tanks and soak pits as per specifications given in IS 2470: 1995 (Part I and II); Transport vehicles and equipment should undergo regular maintenance to avoid any oil leakages; and Unloading and loading protocols should be prepared for diesel, oil and used oil respectively and workers trained to prevent/contain spills and leaks. Ensure oil/ lubricants are stored on impervious floor in the storage area having secondary containment. 	Negligible

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	With Mitigation
Water Availability	Negative	Moderate	<ul style="list-style-type: none"> Regular inspection for identification of water leakage and preventing water wastage Optimum use of water during sprinkling on roads for dust settlement, washing of vehicles, concrete mixing, etc. Construction Labour deputed onsite to be sensitized about water conservation and encouraged for optimal use of water Groundwater recharge measures as recommended in the Source Water Assessment should be undertaken. For construction uses, the low quality water if available, will be blended with fresh water Recycle and reuse of water to the extent possible Spraying technique can be used for curing of foundation 	Moderate
Water Quality	Negative	Negligible	<p>Mitigation measures not required for negligible impacts but due to the Project site being in a water-stressed area, the following enhancement measures are recommended:</p> <ul style="list-style-type: none"> The provisions of septic tank and soak pits will be provided (as per specifications given in IS 2470 1995 Part I and Part II) onsite for treatment and disposal of sewage, thereby minimizing the impacts of wastewater discharge Planning of toilets, soak pits and septic tanks, waste collection areas should be away from natural drainage channels Spill, leakage and clearance plan to be adopted for immediate cleaning of spills and leaks Ensure proper cover and stacking of loose construction material at WTG's site to prevent surface runoff and contamination of receiving water body Use of licensed contractors for management and disposal of waste and sludge Labourers will be given training towards proactive use of designated areas/bins for waste disposal and encouraged for use of toilets. Open defecation and random disposal of sewage will be strictly restricted 	Negligible
Air Quality	Negative	Minor	<ul style="list-style-type: none"> 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 If it is decided for BAL 10 foundation to be demolished, during the demolition of BAL 10 foundation, surrounding area should be cordoned off by GI sheet Emissions from the emergency DG set and other stationary machines will be controlled by ensuring that the engines are always properly tuned and maintained Minimize stockpiling by coordinating excavations, spreading, re-grading and compaction activities Speed of vehicles on site will be limited to 10-15 km/hr which will help in minimizing fugitive dust emissions due to vehicular movement; Cease or phase down work if excess fugitive dust is observed. Investigate the source of dust and ensure proper suppression measures before recommencing work. Proper maintenance of engines and use of vehicles with Pollution Under Control (PUC) Certificate Idling of vehicles and equipment will be prevented as part of periodical monitoring and auditing program, seek and review data pertaining to accidents and incidents involving vehicle fleets of the project 	Negligible
Noise Quality	Negative	Moderate	<ul style="list-style-type: none"> Two meter height boundary wall along the periphery of the residential school should be constructed to reduce background noise levels. Normal working hours of construction to be defined (preferable 8 am to 6pm). If work needs to be undertaken outside these hours, it should be limited to activities which do not generate noise Only well maintained equipment to be operated on site. 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 should be carried out to bring down the noise and placing all the noise generating equipment such as DG sets, batching plant etc. away from village settlement as possible Machinery and construction equipment that may be used intermittently, should be shut down or throttled down during non-working hours. BAL 10 foundation should be decommissioned and BAL 09 should be erected at a time when the residential school is not operational or has low occupancy (e.g. vacations). Minimal use of vehicle horns and heavy engine breaks should be encouraged. 	Negligible

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	With Mitigation
Occupational Health & Safety	Negative	Minor	<ul style="list-style-type: none"> All the construction activities should be carried out during day time hours and vigilance should be maintained for any potential accidents. Night-time activity being carried out post 7 pm and before 7 am should be undertaken after developing specific job-wise permit to work systems that determine all possible risks and impacts that can occur. Personal Protective Equipment (PPEs) including safety shoes, helmets, goggles, ear muffs and face mask should be provided as necessary Structural integrity should be checked before undertaking any work Electrical and maintenance work should not be carried out during poor weather and during lightning strikes All workers should be provided with training with Health & safety policies in place with appropriate refresher courses throughout the life cycle of the project Permitting should be implemented to ensure that cranes and other lifting equipment is operated by trained and authorised person only Appropriate safety harness and lowering/raising tools should be provided for the workers Safe drinking water should be provided for the workers Excavated areas to be temporarily fenced to avoid access to outsiders and wildlife Security should be deputed at potential accident sites to restrict entry and prevent near misses, injuries and fatalities First aid box to be provided at all the construction sites and trained person should be appointed to manage it. Working with electrical equipment for transmission line laying and maintenance should be staggered to ensure that no individual is being exposed to EMF radiation for extended periods of time. An emergency response plan should be in place to account for natural disasters, accidents and any emergency. The nearest hospital, ambulance, fire station should be identified in the emergency response plan. 	Negligible
Visual Impact	Negative	Minor	<ul style="list-style-type: none"> Ancillary structure presence and area should be minimized to the extent necessary Construction area to be restored to the original form Signage related to wind farm to be discrete and confined to entrance gates No other corporate or advertising signage should be displayed on site The footprint of the operation and maintenance facilities as well as parking and vehicular circulation should be clearly defined and not allowed to spill over into other areas of the site 	Negligible
Loss of land and land-based livelihood	Negative	Negligible	<ul style="list-style-type: none"> Provide assistance and encourage the sellers of land to purchase alternate land using the money earned through the sale so as to ensure that the total landholding of such families does not decline; Provide training and agricultural inputs in the form of subsidized HYV seeds, equipment etc. to help in improving the farm yield in the Project area as part of Developmental activities planned in the area. Provide employment (to the extent practicable) to the members of land selling households in the construction phase; Ensure inclusion of members of these households in other community development initiatives like skill training, entrepreneurship support, etc. to the extent possible; Provide potable drinking water to households that lack access to supply of piped water or even tube wells. The provision of water will promote the use of traditional agricultural income that may have been reduced due to the lack of cultivable land and water shortage in the area in the households that have sold land for the Project; and Grievance redress mechanisms of the Project should be disclosed to the landowners. Documentation of engagement activities and record of grievances received and action taken there upon should be maintained. 	Negligible
Vulnerable Communities	Positive	-	None	-

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	With Mitigation
Local employment	Positive	-	Enhancement Measures <ul style="list-style-type: none"> • Provide skills-based training interventions, especially for self-employment to the young and unemployed in the families who will be selling land to project. This will enhance their employability and create potential for income generation through self-employment; • Sourcing local labour wherever possible should be made obligatory for the sub-contractors and in all major procurement activities. The Project proponent should establish a mechanism to audit subcontractors and suppliers with respect to compliance of utilizing local labour and resources; • It should be clearly communicated to the workers working during the construction period that this will be short term employment and the duration should be informed; • Information on local employment should be communicated to the gram panchayat (GP) and information on availability of employment opportunities should be displayed at GP office premises (preferably in the local language) in consultation with the sarpanch; • Skills training programmes for promoting agri-allied activities so as to create self-employment opportunities should be promoted; and • Specific measures for engagement of female workers and enhancement of employment opportunities are provided in Gender Action Plan and Community development initiatives. 	-
Community Health & Safety	Negative	Minor	<ul style="list-style-type: none"> • Carry out periodic blade inspection and repair any defects that could affect blade integrity; • Consultation should be undertaken with the relevant aviation authorities to determine prevention and control measures; • Use anti-collision lighting and marking system on tower and /or blades and consult with the relevant aviation authorities to determine appropriate lighting and marking requirements in line with national standards. • Use gates on access roads; • Where public access is not promoted to the site and/ or there are no current rights of way across the site, consider fencing of an appropriate standard around the substation with anti-climb paint and warning signs; • Prevent access to turbine tower ladders; and • Motor Vehicle (amendment) Act, 2019 should be strictly followed at site; • Review records of Grievances received from community due to H&S risks identified. 	Negligible
Vegetation clearance and Construction Works	Negative	Minor	<ul style="list-style-type: none"> • Construction and transportation activities should be avoided at night (6:00 pm to 6:00 am) and should particularly avoid high faunal activity areas like locations near forest or water bodies during dawn (6:00 am to 7:30 am) and dusk (5:00 pm to 6:30 pm); • Areas with pre-existing burrows or ground roosting sites of birds should be avoided when possible; • Temporary barriers should be installed on excavated areas; • Hazardous materials should not be stored near natural drainage channels; • Simultaneous revegetation on outskirts of Project activity area should be practiced for areas that have loose or unstable soil to avoid erosion and sedimentation; • Efforts should be made to minimize construction noise and the use of noise barriers should be considered for high noise levels; • Waste materials should be cleared in a timely manner and the use of artificial lights should be minimized so as to not attract wildlife; • Good housekeeping should be followed for construction activities, waste packaging material should be properly disposed; • Proper sanitation facilities should be provided at the labour camps; • Labour movement should be restricted between construction camps and construction sites; and • General awareness regarding fauna should be enhanced through trainings, posters, etc. among the staff and labourers. 	Negligible

Operation and Maintenance Phase

Impact Description	Impact Nature	Impact Significance		
		Without Mitigation	Mitigation Measure	With Mitigation
Waste Disposal /Generation	Negative	Negligible	Not applicable for negligible impacts	Negligible
Soil Contamination	Negative	Minor	Same as construction phase	Negligible
Water Availability	Negative	Negligible	Not applicable for negligible impacts	Negligible
Water Quality	Negative	Negligible	Not applicable for negligible impacts	Negligible
Air Quality	Negative	Negligible	Not applicable for negligible impacts	Negligible
Noise Quality	Negative	Negligible	Not applicable for negligible impacts	Negligible
Visual Impact	Negative	Minor	Same as construction phase	Negligible
Occupational Health and Safety	Negative	Minor	Same as construction phase	Negligible
Shadow Flicker	Negative	Negligible	Not applicable for negligible impacts	Negligible
Vulnerable Communities	Positive	-	None	-
Local Employment	Positive	-	None	-
Community Health and Safety	Negative	Minor	Same as construction phase	Negligible
Bird and Bat Collision Risk	Negative	Minor	<ul style="list-style-type: none"> Food waste materials should not be left lying around and if any waste is found then it should be cleared immediately so as to not attract birds near the WTG blades. Avoid the use areas of high bird concentrations. Wind turbine generators should be properly maintained to ensure that turbine blade speeds are regulated and blade throws are avoided Restore herb layers in the vicinity of the site to provide adequate shelter to prey species. Restrictions should be imposed so that dead carcasses are not disposed near the WTG areas so that the vultures are not attracted. A carcass register should be maintained as part of the O&M phase to record any bird carcasses or suspected bird carcasses. 	Minor
Electrocution Risk	Negative	Minor	<ul style="list-style-type: none"> Regular checking of transmission lines and towers to identify nesting of any birds Mark overhead cables using diffractors/diverters at all transmission lines and towers located at an elevation (690m+ amsl) and along the 66 kV line (680-690 amsl). Diffractors/diverters should be placed at a distance of 20m apart or less along the overhead cables. Installation of perch rejectors on the insulator caps of the 33 kV line Installation of spike guards on horizontal cross arms of the 66 kV line 	Minor

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
Waste Disposal/Generation	Negative	Minor	Same as construction phase	Negligible
Soil Contamination	Negative	Minor	Same as construction phase	Negligible
Water Quality	Negative	Negligible	Not applicable for negligible impacts	Negligible
Air Quality	Negative	Minor	Same as construction phase	Negligible
Occupational Health and Safety	Negative	Minor	Same as construction phase	Negligible
Local Employment	Positive	-		-

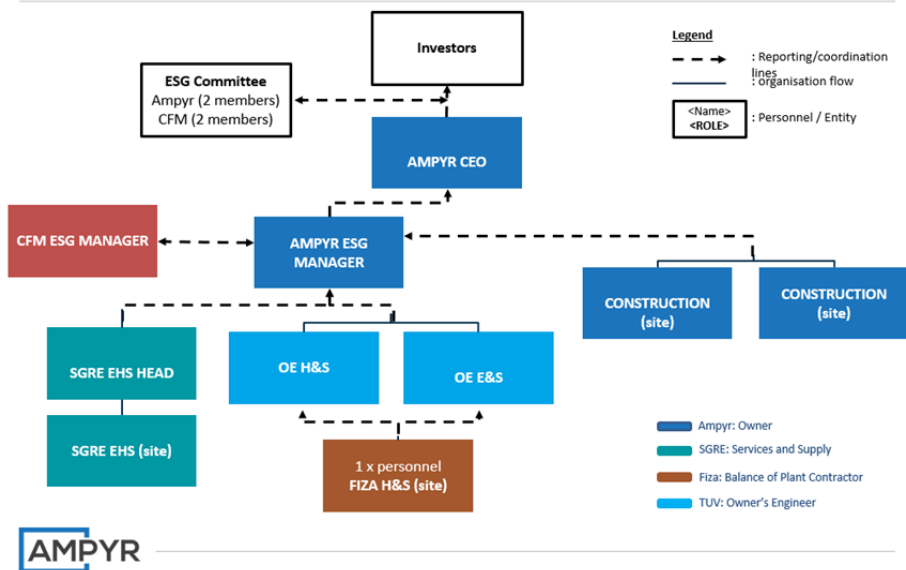
8.0 Environmental and Social Management Plan

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.

The recommended mitigation measures has been provided in Section 7.0 Impact Assessment of this NTS in accordance to key negative effects on the physical, natural and social environment. This section therefore identifies the implementation mechanism, supervisory responsibilities and key outcomes of the recommended mitigation measures.

Implementation Responsibilities and Supervisory Structures

Balenahalli Wind Project Phase 1: EHSS Management



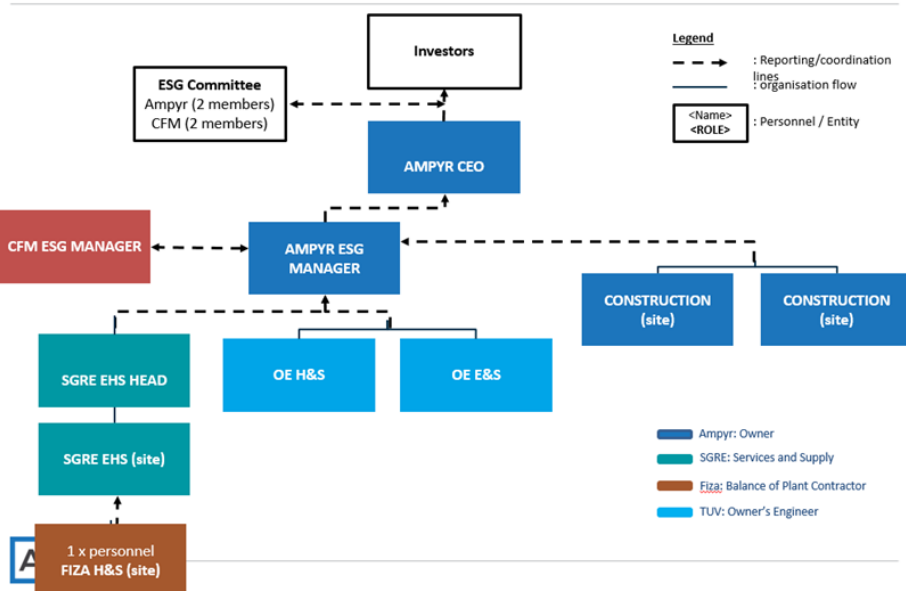
Implementation

- ⇒ Implementation of construction phase mitigation measures — Fiza H&S
- ⇒ Implementation of operation phase mitigation measures — O&M Team
- ⇒ Implementation of decommissioning phase mitigation measures — Identified decommissioning contractor.

Supervision

- ⇒ Supervisory responsibility to ensure mitigation measures are implemented — TUV
- ⇒ Ultimate responsibility of ensuring mitigation measures are implemented — Ampyr ESG Team

Balenahalli Wind Project Phase 2: EHSS Management



Implementation

- ⇒ Implementation of construction phase mitigation measures — Fiza H&S
- ⇒ Implementation of operation phase mitigation measures — O&M Team
- ⇒ Implementation of decommissioning phase mitigation measures — Identified decommissioning contractor.

Supervision

- ⇒ Supervisory responsibility to ensure mitigation measures are implemented — SGRE
- ⇒ Ultimate responsibility of ensuring mitigation measures are implemented — Ampyr ESG Team

Note: Certain key items such as ensuring 2m boundary wall around residential school, community development initiatives, gender inclusiveness actions, site restoration post-construction, implementation of traffic management plan and all training requirements have been assigned to Ampyr ESG Team and TUV team. The above applied to Phase I and II

Means of Verification that mitigation has been met: site inspections, record keeping, training photos and records and surprise visits, The Project itself can maintain records of the progress on the aforementioned mitigation measures by incorporating it into weekly, monthly, and quarterly progress reports that are submitted to Ampyr Corporate Office.

LAYOUT OF THE ESIA-ESMP

Volume	Volume Name	Details
1	Non-Technical Summary (NTS)	<i>(this report)</i> Summary report of the ESIA-ESMP (Volume 2)
2	Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP)	Main ESIA-ESMP report that incorporates the key outcomes across all studies undertaken for the Project site.
3	Technical Management Plans	<p>Individual technical management plans undertaken simultaneous to the ESIA study:</p> <ul style="list-style-type: none">• SEP-GRM• GAP• SWA• B&B• TMP• WMP <p>The volume also includes a copy of the Environmental and Social Screening and Scoping Report undertaken prior to the ESIA.</p>
4	Community Needs Assessment (CNA)	CNA report linked to the ESIA-ESMP but provided as a standalone document.