ENVIRONMENTAL AND SOCIAL POLICY & PROCEDURES

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POWER AND ELECTRICITY DEPARTMENT

GOVERNMENT OF MIZORAM

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Abbreviations

ACGIH	American Conference on Government and Industrial Hygiene
ADB	Asian Development Bank
ADC	Autonomous District Council
AMI	Automated Metering Infrastructure
APDRP	Accelerated Power Development and Reform Program
ARR	Annual Revenue Requirement
CADC	Chakma Autonomous District Council
CEA	Central Electric Authority
CF	Conservator of Forests
CPCB	Central Pollution Control Board
CPTD	Compensation Plan for Temporary Damages
DC	Deputy Commissioner
DFO	Divisional Forest Officer
DL	Distribution Line
DM	District Magistrate
DoP	Department of Power
DPR	Detailed Project Report
DTs	Distribution Transformers
E&F	Environment & Forest
EA	Electricity Act
EAMP	Environment Assessment Management Plan
EEE	Electrical and Electronic Equipment
EIA	Environmental Impact Assessment
EMF	Electro Magnetic Fields
EPA	Environment Protection Act
ESMC	Environment and Social Management Cell
ESPP	Environment and Social Policy and Procedures
FAC	Forest Advisory Committee
FEAR	Final Environment Assessment Report
GHG	Green House Gas
GoM	Govt. of Mizoram
GRC	Grievance Redressal Committee
GRM	Grievance/ Redressal Mechanism
GSDP	Gross State Domestic Product
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IEAR	Initial Environment Assessment Report
IEE	Initial Environment Examination
JERC	Joint Electricity Regulatory Commission
LAA	Land Acquisition Act
LADC	Lai Autonomous District Council
LSC	Land Settlement Certificate

MADC	Mara Autonomous District Council
MDoNER	Ministry for Development of North East Region
MIS	Management Information System
MoEF	Ministry of Environment and Forests
NCR	National Council on Radiation
NEC	North East Council
NEP	National Environment Policy
NLCPR	Non-lapsable Central Pool of Resources
NLUP	New Land Use Policy
NOC	No Objection Certificate
NPV	Net Present Value
O&M	Operation and Maintenance
ODS	Ozone Depleting Substances
OSMFCP	Online Submission and Monitoring of Forests Clearances Proposals
PAF	Project Affected Persons
PCCF	Principal Chief Conservator of Forests
PEDM	Power & Electricity Department of Mizoram
PHE	Public Health Engineering
R&R	Rehabilitation and Resettlement
RAPDRP	Restructured Accelerated Power Development Reform Programme
RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana
RTI	Right of Information
SAG	State Advisory Group
SEZ	Special Economic Zone
SoI	Survey of India
SMF	Social Management Framework
SPCB	State Pollution Control Board
STLSG	State Transmission Lines Standards and Guidelines
T&D	Transmission & Distribution
TC	Transmission Circle
TL	Transmission Line
TPS	Thermal Power Station
WB	World Bank

EXECUTIVE SUMMARY

1. India's North East Region (NER) stretches across the eastern foothills of the Himalayan mountain range and is comprised of seven states including Assam, Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh and Tripura. Geographically the region is connected to the other parts of the country through a small "chicken neck" corridor in the State of West Bengal. With a total population of 45.6 million (2011 census), the sparsely populated NER accounts for about 3.7 percent of India's total population and covers 7.9 percent of India's total geographical area. The vast majority of the region's population lives in rural areas, accounting for 82 percent of the total population as against compared to the national average of 69 percent (2011). A large part of the NER is hilly and, recognized as one of the globe's biodiversity hotspots. Forests cover over 2/3rd of the area, twice exceeding the policy target of 33%. This sparsely populated region is characterized by extraordinary ethnic, cultural, religious and linguistic diversity, with more than 160 Scheduled Tribes (out of 630 in the country) comprising over 400 distinct sub tribal groups, and a large and diverse non-tribal population as well.

2. **Regional Power Transmission and Distribution**. The North Eastern Region (NER) in India is endowed with rich energy resources but faces significant bottlenecks in electricity access and availability levels. The per capita power consumption in NER is one-third of the national average. The region has a shortfall of about 500 MW installed capacity against peak demand of about 1950 MW. No significant generation capacity has been added in the recent past. Therefore, inadequate power supply continues a critical constraint to sustainable growth and economic development in the NER. Some states are generally not able to draw even their allocated share of power from the Central Generating Stations (CGS) through the grid due to poor/ inadequate intra/ interstate transmission and distribution network and no capacity addition towards transmission/distribution power system not done due to fund constraints. The transmission and distribution (T&D) losses are also drastically high (up to 50%) across most of the States as a large number of remote hilly areas are connected through long low tension lines, resulting in low voltages and poor quality of power at consumer end. While generation capacity addition of about 4000 MW program over present installed capacity is already underway, adequate transmission and distribution infrastructure to transmit and distribute this power to consumers within the North-Eastern States is the need of the day.

Project Context

3. In order to create/ augment proper infrastructure of T&D in NER. Government of India (GoI) has formulated a "Composite scheme for transmission and distribution (T&D) in NER"

capable of delivering adequate power to most consumers with reliability, aiming to improve the inter-state and intra-state transmission and sub-transmission infrastructure and reduce system losses in all the NER states. The Govt. of India (GoI) has approached the World Bank to provide US$ 1500 million of IBRD funding support to portion of the scheme **"NER Power System Improvement Project (NERPSIP)"** in three investment tranches each being US$ 500 million for strengthening, augmentation of the intra-state and interstate transmission and distribution schemes (33kV and above and above) and undertake capacity building initiatives across six NER States of Assam, Manipur, Mizoram, Meghalaya, Tripura and Nagaland for World Bank & GoI funding. Ministry of Power (MoP), GoI has appointed POWERGRID, as the **Central Implementing Agency (IA)** to the six North East States for the Project. However, the ownership of the assets shall be with the respective State Governments/ State Utilities, which upon progressive commissioning shall be handed over to them for taking care of Operation and Maintenance of Assets at their own cost.

4. The project's first investment tranche would be implemented over a seven year period (2014-2021) and has two major components, namely:

a) Priority investments for strengthening of intra-state transmission and distribution systems;
b) Technical Assistance for Institutional Strengthening and Capacity Building of power utilities and departments.

5. Mizoram. In the above background, Mizoram State, one of the states in NER, is contemplating major expansion and augmentation of its transmission & distribution network in near future by implementing projects with the help/grant from GoI and other Multilateral Funding Agencies like the World Bank and ADB. Given the unique socio-economic, cultural and environmental resources, Power & Electricity Department of Mizoram (PEDM) is committed to manage them highly sustainably. Towards this, plans have been made by PEDM to prepare an Environment and Social Policy and Procedures (ESPP) to serve as a guiding instrument. PEDM assimilates environmental and social management procedures into its corporate functioning and also layout management procedures and protocol to address them. It outlines PEDM's commitment to deal with environmental and social issues relating to its transmission & distribution projects with a framework for identification, assessment and management of environmental and social concerns at both organizational as well as project levels. For this, POWERGRID, with proven credentials in management of environmental and social issues of large number of power transmission projects both within and outside the country has been mandated to prepare an ESPP for PEDM. Thus, it enables PEDM;

- To establish clear procedures and methodologies for the environmental and social screening, planning, review, approval and implementation of subprojects to be financed under the Project;
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to sub-projects;
- To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESPP;
- To ensure adequate financial provisions to meet the management measures to be undertaken to mitigate the impacts.

PEDM also believes that the ESPP is dynamic and living document, which shall be further upgraded in light of the experiences gained from field implementation and other relevant factors while mainstreaming the environmental and social concerns in its corporate functioning.

PEDM's Environment & Social Policy Statement

"PEDM commits itself to follow the goal of sustainable development through identification, assessment and management of social and environmental issues at both project planning and implementation stages with total transparency and introducing the state of art technologies by adhering to the basic principles of Avoidance, Minimization and Mitigation".

6. The key principles of PEDM's Environmental and Social Policy are:

- Avoidance of environmentally and socially sensitive areas while planning project activities;
- Minimization of impacts when project activities occur in environmentally and socially sensitive areas;
- Mitigation of any unavoidable negative impacts arising out of its projects.

Methodology & Approach

7. The ESPP has been prepared following a region/ state specific environmental and social assessments which involved generating information through both primary and secondary sources including consultations and library research. The methodology adopted to identify the potential environment and social impacts is based on experience gained from implementation of similar projects and baseline assessments of work activities anticipated in this proposed project. The methodology takes in to account wide range of receptors:

- Physical & chemical environment (e.g. water, soil, etc.);
- Biological environment (forest, animals, birds, etc.); and
- Communities, social groups and individuals (loss of land, loss of agricultural production, tribal, vulnerable groups (women and backward classes), socio-economic condition, health and safety risks).

8. The basic approach broadly involved following:

- Review of environment & social baseline information from secondary sources;
- Review of existing national & state specific legislations and policy and guidelines of multilateral agencies;
- Review of project related documents; and
- Stakeholders' consultations.

Consultation/ Participation

9. Consultations with key stakeholders including local, state, regional, central government entities and key ministries at the state level and central level as well as with World Bank officials were undertaken to know views and concerns about environmental and social issues/ concerns of the project. This activity ensured appropriate participation and gathering views from the environment and social perspective of all the stakeholders' which is integrated in this ESPP to be adopted during different stages of the project implementation.

Mizoram at a Glance

10. ***Geography and Governance***: Mizoram is located in the north-eastern part of the country between 22^{o} 19' to 24^{o} 19' North latitudes and 92^{o} 16' to 93^{o} 26' East longitudes covering a geographical area of 21081 sq. km. It is a landlocked state surrounded by Myanmar in the east, Manipur and Assam in the north, Tripura and Bangladesh in the west and again Myanmar in the south. It has a total of 722 km international boundary with Myanmar (404 km) and Bangladesh (318 km). Geographically, it is 277 km from north to south, and 121 km from east to west with inter State boundary Assam (123 km), Tripura (277 km) and Manipur (95 km). The capital is Aizawl, in the north-central part of the State. The State is a storehouse of exotic flora and fauna and forests. The local flora and fauna bear a very close affinity and resemblance with the floral and faunal components of the Indo-Malayan and Indo-Chinese sub-regions. The State is located in the bio-

geographic zone of 9B-North-East hills and possesses an extremely rich bio-diversity. The hills here could be seen covered with bamboo and banana trees along with a wonderful array of pine trees. The forests here also house some of the rare varieties of orchids that are found only in this region of the country. About 90% of the area is under forest cover. About 94% of the population belongs to Schedule Tribes whose lives are intrinsically woven with that of the forests.

11. Mizoram has witnessed vast constitutional, political and administrative changes during the past years. The traditional chieftainship was abolished and the District and Regional Councils created under **the Sixth Schedule** of the Constitution of India give a substantial measure of local control. The power and functions of the Council is mainly three viz., Legislative, Executive, and Judiciary. The purpose of establishing ***the Autonomous District Council (ADC)*** is to provide for internal autonomy to the tribal people inhabiting these areas, and protect their social, cultural and economic interests, through granting them administrative and legal authority as per constitution of India. Presently the Lais, Maras and Chakmas have separate autonomous District Councils. The Village Councils are the grassroots of democracy in Mizoram. There are three District Councils cover two administrative districts - Lawngthlai and Saiha.

1. Chakma Autonomous District Council (CADC) – Area 1500 Sq km.
2. Mara Autonomous District Council (MADC) – Area 1445 Sq. km
3. Lai Autonomous District Council (LADC) – Area 1,871 Sq.km

12. ***Demography***: As per Census 2011, the state has a population of 1,091,014 comprising 50.63% male and 49.37% female populations. The sex ratio stands at 975 females per thousand male populations. The decadal growth of population was 22.78% during 2001-2011. The population in the age group of 0-6 years constitutes 15.36% of the total population. The Scheduled Caste population comprises 0.11%, whereas tribal population constitutes 94% of the total population. The population density is 52 persons/ sq. km as compared to 382 persons/ sq. km at national level (Census 2011). The literacy rate (91.58%) of Mizoram is one of the highest in the country (against All India figure of 74 %).

13. ***Forests and Protected Areas:*** Forest is an integral part of the culture and tradition of Mizoram as its existence maintains the ecology of the State. Forest covers 19,054 sq. km. that is 90.38% of the State's geographical area. In terms of forest canopy density classes, the State has 138.00 sq. km. very dense forest, 5900 sq.km. moderately dense forest and 13,016 sq. km. open forest. The recorded forest area of the State is 16,717. sq. km. Reserve Forest constitute 7909 sq. km,

Protected Forests constitute 3568 sq. km and un-classed forests constitute 5240 sq. km of the total Forest Area.

14. Mizoram has 10 protected area, out of which 2 are National Park (NP), 1 Tiger Reserve and remaining 7 are Wildlife Sanctuaries (WLS) covering an area of 1240.75 sq. km, which is 5.88% of total geographical area. Lists of protected area including its size, location are presented in **Table 1** below;

Table - 1 : List of Protected Areas

Sl. No.	Name of Protected Areas	Area in sq.km.	District
1	Murlen National Park	100	Champhai
2	Phawngpui National Park	50	Lawngtlai
3	Dampa Tiger Reserve	500	Mamit
4	Ngengpui Wildlife Sanctuary	110	Lawngtlai
5	Khawnglung Wildlife Sanctuary	35.75	Lunglei
6	Lengteng Wildlife Sanctuary	60	Champhai
7	Tawi Wildlife Sanctuary	35	Aizawl
8	Thorangtlang Wildlife Sanctuary	50	Lunglei
9	Pualreng Wildlife Sanctuary	50	Kolasib
10	Tokalo Wildlife Sanctuary	250	Saiha
Total		**1240.75**	

15. The State has predominantly two sources of power; one being its own hydel generation of about 29.35MW (out of its 11 SHP) and another from Central Sector allocation of 64.53 MW. The present peak demand of the State is 178MW. There remains a shortfall of about 84MW. To cater the shortfall, PEDM is executing Tlawva SHP (2x2.5 MW) which will be completed and commissioned by 2014-2015. Another Tuirial HEP (60 MW) is on-going project executed by NEEPCO and the project is scheduled to be completed during the 12th five-year plan. Tuivai HEP (210 MW) is also in the pipeline and the project shall be taken up in the State Sector on PPP Mode under VGF policy of GoI. PEDM is having 729 km length of 132kV, 117 km of 66kV transmission lines and 7 nos. of 132kV Grid substation with transformation capacity of 140.6 MVA. It has over 1170 km of 33kV line, 5045 km of 11kV lines, 2747.59 Km length of LT lines, 45 nos. of 33kV Grid S/S and more than 1630 nos. of various capacities of Distribution Transformers across the entire State with transformation capacity of 146.9 MVA. The Department serves power supply to nearly 2 lakhs consumers and the per capita consumption at the end of 11^{th} Plan is 252 kWh. At the end of 12^{th} Plan, number of consumers is projected at 2, 55,561 nos. and per capita consumption is projected to be 318 Kwh. Efforts are underway not only to bridge the gap but also to ensure that adequate power is made

available to enable boosting of State economy. An abstract of subprojects for the tranche-1 under expansion/augmentation of power system network in the State of Mizoram is presented in **Table 2**.

Table 2: Summary of Subprojects in Tranche- I under NERPSIP

Sl. No.	Name of the subproject	Quantity (Nos.)	Capacity Addition (km/MVA)	Estimated Cost* (in Millions)
1.	132 kV Transmission lines	3	214 km.	2967.20
2.	132/33kV substations (New/Augmentation/Extension)	6	125 MVA	
3.	33 kV Distribution lines (New/Strengthening)	12	5.2 km.	200.40
4.	33/11kV substations (New/Augmentation)	3	6.3 MVA	

The estimated cost includes consultancy fees, contingencies and IDC

Stakeholder analysis

16. Stakeholder's analysis has been undertaken to identify the issues and the concerns of various stakeholders who are supposed to be either directly or indirectly impacted/benefited or assume a position wherein they can have a significant role to influence the project. The Stakeholder's analysis has been carried out to identify existing relationship and also to understand the roles, responsibilities and relations of these stakeholders in context of shaping the environment and social issues with respect to proposed project. The details of the key stakeholders identified at various levels from national level up to national level have been mapped to know their issues & expectations with respect to proposed project. The process of consultation with stakeholders involves formal and informal discussion. A wide range of issues were discussed with various stakeholders that might have environmental / social concern. Some of the key issues are listed below:

17. **Environment Issues.**

- Impact on forest and biodiversity area e.g. national parks, sanctuary, biosphere reserves, etc.
- Impact due to waste (Used Oil or E-waste), oil spills, sanitation;
- Occupational health and safety during implementation , operation and maintenance phase;
- Soil erosion and slope un-stability;
- Leakage of SF6 a potent greenhouse gas; and
- Any other adverse environment issues.

18. **Social and Institutional Issues.**

- Securing/Alienation of land for substation;
- Temporary damages to land, crops, trees or structures during construction;

- Community participation during project cycle i.e. planning, implementation and operation;
- Health and Safety risk including HIV/AIDS;
- Locals, Women and Inter agency participation/coordination.

Impacts – Social

19. This section identifies the potential social impacts of the proposed projects in terms of the nature, magnitude, extent and location, timing and duration of the anticipated impacts. These impacts are both positive or negative relating to the project design stage, construction stage or the project operation and decommissioning stage.

i. Positive Impacts

- Employment creation;
- Improved and reliable power supply;
- Increased economic activity;
- Improved road infrastructure;
- Gender – Access to electricity would improve the quality of life and also reduce the time consumption of women for household activities which will entail availability of more time for other activities;
- Less reliance of fossil fuels like firewood, charcoal etc.;
- Capacity Building.

ii. Negative Impacts

- Loss of land;
- Restriction on land use;
- Temporary loss of access to Common Property Resources; and
- Health and Safety risk including HIV/AIDS.

Impacts - Environment

20. This section identifies the potential environmental impacts of the proposed projects. These impacts are both positive or negative relating to the project design stage, construction stage or the project operation and decommissioning stage.

i. Positive Impacts

- Availability of power lessens the demand of natural resources like firewood, charcoal etc. resulting in conservation/protection of forest/vegetation.

ii. Negative Impacts

- Clearance of tree within RoW;
- Impacts on forest, wildlife habitats and migratory birds;
- Impacts on drainage, soil erosion & water resources;
- Impacts on traffic and road infrastructure;
- Aesthetic appeal of area;
- Impacts from likely oil spillage;
- Effect of electromagnetic fields(EMF);
- Leakage SF6; and
- Health & Safety

The potential E & S issues identified shall be managed within the applicable regulatory framework and international best practices.

Policy, Legal and Regulatory Framework

21. PEDM undertakes its Transmission/ Distribution system (33 kV and above) activities within the purview of Constitutional provisions, Policy, Legal, and Regulatory Framework for environmental and social issues applicable to power transmission & distribution. In addition, the requirements of multilateral funding agencies are also considered in the management procedures for addressing environmental and social issues.

22. The Constitution of India provides for protection of the environment and its improvement as a fundamental duty and the Directive Principles of State Policy under Article 51 A (g) and Article 48 A respectively. The Apex Court has widened the scope of Article 21 (Right to Life) bringing environmental impacts under its ambit. Similarly, the constitutional provisions in regard to social safeguards are enshrined in the Preamble to the Constitution, such as justice, social, economic and political; liberty of thought, expression, belief, faith and worship; equality of status and of opportunity; fraternity assuring the dignity of the individual and the unity and integrity of the Nation. Fundamental Rights and Directive Principles guarantee the right to life and liberty. Health, safety and livelihood been interpreted as part of this larger framework. The provisions on social safeguards are contained in Articles 14, 15, 17, 23, 24, 25, 46, 330, 332, etc.

23. **Sixth Schedule:** In addition to basic fundamental rights, special provisions have been extended to the Tribal Areas of State under the 6th Schedule [Articles 244(2) and 244(A)]. The Sixth Schedule is entirely focused at protection of tribal areas and interests by allowing self-governance

through constitutional institutions at the district or regional level. These institutions are entrusted with the twin task of protecting tribal cultures and customs and undertaking development tasks. The Sixth Schedule provides for administration of tribal areas as autonomous entities. The administration of an autonomous district is vested in a District Council and of an autonomous region, in a Regional Council. These Councils are endowed with legislative, judicial, executive and financial powers. These institutions were expected to integrate these areas with the modern system of administration while preserving the traditional autonomy and local self-governing institutes of the tribal people. The functions of the district council are;

- Allotment, occupation use or setting apart of land other than reserved forest for agriculture;
- Management of forest (which is not a reserved forest);
- Regulation of jhum cultivation or any other forms of shifting agriculture;
- Village or town administration including public health & sanitation.
- Inheritance of property
- Social customs

24. Apart from this, the Constitution of India grants special status to the State under Article - 371G which states "no act of parliament in respect of religious and social practices of the Mizos, Mizo customary laws and procedures, administration of civil and criminal justices involving decisions according to Mizo customary law and ownership and transfer of land shall apply to the state of Mizoram, unless Legislative Assembly of the state, by a resolution, so decides". In view of said constitutional provision the RFCTLARRA, 2013 is not presently applicable in the State of Mizoram for purposes of private land acquisition. However, as per past experience it has been noticed that the process of adoption of central act takes time due to involvement of elaborate consultation for arriving consensus. PEDM taking note of that has taken a conscious decision that private land if required, shall be secured through donations and/ or direct purchases on negotiated rate on willing buyer and willing seller basis till the new act is adopted by their State Assembly. Based on current requirement for tranche-1, land acquisition is not an issue as land for all substaions covered under this tranche is in possession of PEDM (refer **Table-5.4**).

25. **Environment :** Mandatory environmental requirements for PEDM at state level include: sanction of Govt. of Mizoram (GoM) under section 68(1) of the Electricity Act, 2003; Forest clearance under the Forest (Conservation) Act, 1980; During the currency of operations, Regulations on Batteries (Management and handling) Rules, 2001 regarding disposal of used batteries, Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 regarding disposal of used transformer oil, Ozone Depleting Substances (Regulation and Control) Rules, 2000 putting

restrictions on use of ozone depleting substances come into force and required voluntary enforcement and provisions under Biological Diversity Act, 2002, E-waste (Management and Handling) Rules, 2011 regarding maintaining records & handling of electronic wastes, and the Scheduled Tribes & Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.

25. The Forest (Conservation) Act, 1980 is the key legislation through which the environmental impacts of transmission projects are managed since the current regulation does not require an Environmental Impact Assessment for transmission lines. The legislation requires compensatory afforestation for any forest land diverted for non-forest use in twice the area diverted with afforestation undertaken by the respective State Forest Department. A national fund CAMPA has been created for this purpose. In case projects pass through or are located in designated protected areas, clearances from the Wildlife Board are also required. PEDM has decided to undertake assessment of environmental impacts even for cases where not statutorily mandated in order to confirm compliance with its own policy.

26. **Social:** Mandatory Social requirements for PEDM at State level include provisions of section 67 & 68 (5 & 6) of the Electricity Act, 2003 for the calculation of compensation for any temporary damages. Involuntary land acquisitions, if any done, for securing private lands for construction of substations, fall under the realm of The Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013 (RFCTLARRA) (will be applicable only after the resolution passed in Legislative Assembly – **refer para 24**). The provisions of Indian Treasure Trove Act, 1878 as amended in 1949 covers chance finds. The Right to Information Act, 2005 (RTI) ensures citizens to access information under the control of public authorities.

27. **The World Bank** (WB) Operational Policies OP 4.01, 4.04, 4.11 & 4.36/ADB's Safeguard Policy Statement 2009 (SPS 2009) for Environmental and Social Considerations outline funding agencies policy and procedures for Environmental Assessment (EA) of different developmental projects. Depending upon the issues and impacts, the projects are categorized as A, B, and C warranting larger and specialized focus for A and the least for C. This project, as per the WB guidelines, is categorized as A. Likewise, OP 4.10 and 4.12 outlines policy guidelines for managing issues related to tribal people and involuntary resettlement.

28. **RFCTLARRA, 2013** has replaced the old Land Acquisition Act, 1894 and has come into force from 1st January 2014. The new act i.e. RFCTLARRA, 2013 authorizes State Govt. (i.e. GoM) or its authorized Government agency to complete the whole process of acquisition of private land including Social Impact Assessment (SIA), Action Plan for R&R (i.e. Rehabilitation and Resettlement) & its implementation and the PEDM's responsibility is limited to identification and

selection of suitable land based on technical requirement and ensuring budget allocation. Conducting Social Impact Assessments (SIA) has been made mandatory under this new act and results of these assessments are shared with all the stakeholders and public hearing held which makes the process transparent and informed. Subsequently, an entitlement package that includes both compensation (for land/structure and assets to land and structure) and R&R as necessary is prepared. Further to this, individual awards are passed and all documents are disclosed in the public domain through local administration and internet. The flow chart of the land acquisition process with schedule prescribed for various activities is illustrated in **Figure 1** below. The entitlements with regard to compensation and assistances towards land acquisition or loss of any assets or livelihood for all categories of people being affected due to land acquisition is briefly outlined in **Table 3** below:

Table 3: Compensation and R & R Entitlement Framework for Land Acquisition

<table>
<tr><th colspan="2">A Comprehensive Compensation Package</th></tr>
<tr><th>Eligibility for Entitlement</th><th>Provisions</th></tr>
<tr><td>The affected families
• Land Owners: includes any person-
i) whose name is recorded as (he owner of the land or building or part thereof, in the records of the authority concerned;
or
ii) any person who is granted forest rights under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 or under any other law for the time being in force;
or
iii)who is entitled to be granted Patta rights on the land under any law of the State including assigned lands:
or
iv)any person who has been declared as such by an order of the court or Authority;</td><td>Determination of Compensation :
1. Market value of the land
• as specified in the Indian Stamp Act, 1899
or
• the average of the sale price for similar type of land situated in the village or vicinity,
or
• consented amount of compensation as agreed in case of acquisition of lands for private companies or for public private partnership project.
whichever is higher
Market value x Multiplier* between 1 to 2 in rural areas only (No multiplier in urban areas).
2. Value of the assets attached to land:
Building/Trees/Wells/Crop etc. as valued by relevant govt. authority;
Land compensation = 1+2
3. Solatium: 100% of total compensation
Total Compensation : 1+2+3</td></tr>
<tr><td colspan="2">(*) Precise scale shall be determined by the State Govt.
The indicative values of multiplier factor based on distance from urban areas as provided in the act.</td></tr>
<tr><td colspan="2"><table>
<tr><th>Radial Distance from Urban area (Km)</th><th>Multiplier Factor</th></tr>
<tr><td>0-10</td><td>1.00</td></tr>
<tr><td>10-20</td><td>1.20</td></tr>
<tr><td>20-30</td><td>1.40</td></tr>
<tr><td>30-40</td><td>1.80</td></tr>
</table></td></tr>
</table>

40-50	2.00

B. R&R Package

Elements of Rehabilitation and Resettlement Entitlements for all the affected families (both land owners and the families whose livelihood is primarily dependent on land acquired) in addition to compensation provided above

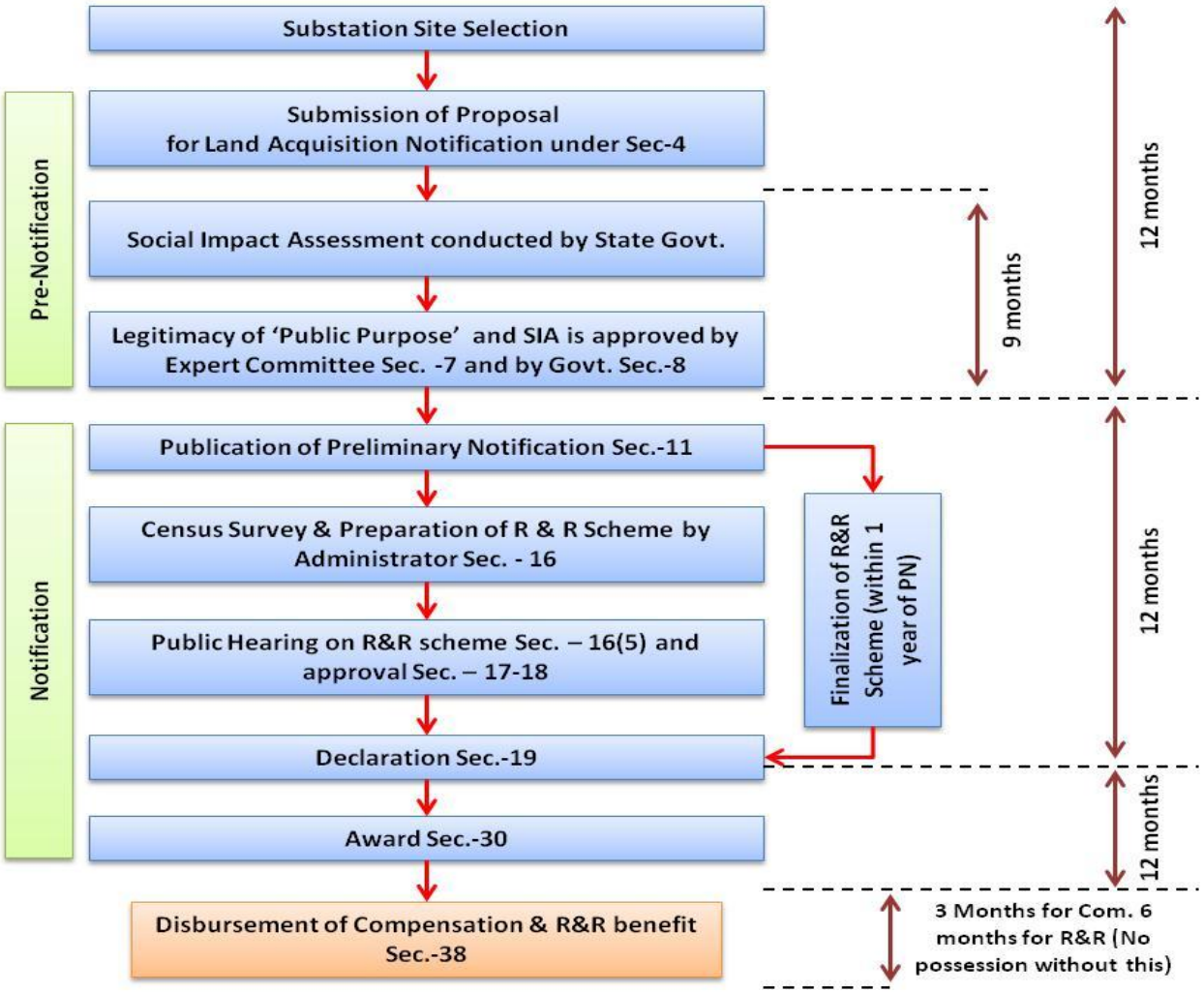
Sl. No.	Elements of R& R Entitlements	Provision
1.	Subsistence grant/allowance for displaced families	Rs. 3000 per month per family for 12 months
2.	The affected families shall be entitled to:	a. Where jobs are created through the project, mandatory employment for one member per affected family; **or** b. Rupees 5 lakhs per family; **or** c. Rupees 2000 per month per family as annuity for 20 years, with appropriate index for inflation; **The option of availing (a) or (b) or (c) shall be that of the affected family**
3.	Housing units for displacement: i) If a house is lost in rural areas: ii)If a house is lost in urban areas	i. A constructed house shall be provided as per the Indira Awas Yojana specifications. ii. A constructed house shall be provided, which will be not less than 50 sq. mts. in plinth area. **In either case the equivalent cost of the house may also be provided in lieu of the house as per the preference of the project affected family.** The stamp duty and other fees payable for registration of the house allotted to the affected families shall be borne by the Requiring Body.
4.	Transportation cost for displaced families	Rs 50,000/- per affected family
5.	Resettlement Allowance (for displaced families)	Onetime Rs 50,000/- per affected family
6.	Cattle shed/ petty shop cost	Onetime financial assistance as appropriate for construction as decided by St. Govt. subject to minimum of Rs.25,000/-
7.	Artisan/small traders/others (in case of displacement)	Onetime financial assistance as appropriate as decided by State Govt. subject to minimum of Rs.25,000/-

Special Provisions for SCs/STs

In addition to the R&R package, *SC/ST families will be entitled to the following additional benefits:*

1. One time financial assistance of Rs. 50,000 per family;
2. Families settled outside the district shall be entitled to an additional 25% R&R benefits;
3. Payment of one third of the compensation amount at very outset;
4. Preference in relocation and resettlement in area in same compact block;
5. Free land for community and social gatherings;
6. In case of displacement, a *Development Plan is to be prepared*
7. *Continuation of reservation and other Schedule V and Schedule VI area benefits from displaced area to resettlement area.*

Figure 1: Activity Chart RFCTLARRA, 2013



Project Cycle – Integrating Environment and Social Issues/ Concerns and Mitigatory Measures

29. Stakeholder analysis and impact assessments had enabled identifying issues. The same are now placed in the project cycle so as to draw management measures for addressing the same. Key milestones in PEDM's transmission/Distribution (33 kV and above) projects are;

i) Project Conceptualization
ii) Project Planning
iii) Approval
iv) Detailed Design and Tendering
v) Project Implementation
vi) Operation & Maintenance
vii) Review and Monitoring and Evaluation.

Environmental and Social Concerns

30. **Environmental Concerns.**

- Clearing/lopping of Trees within Right of Way (RoW);
- Clearing of Ground Vegetation for Movement of Machinery;
- Disposal of Used Transformer Oil;
- Disposal of Used Battery;
- Disposal of E-waste; and
- Leakage/use of SF_6 gas.

31. **Social Concerns**

- Loss to Standing Crop;
- Change in Land Prices;
- Temporary Loss of Access to Common Property Resources;
- Restriction on Land Use;
- Loss of livelihood due to acquisition of private agricultural land; and
- Loss of homestead, if any

32. Management measures to address the issues and concerns in respect of social and environment are presented in **Tables 4 and 5** respectively.

Table 4: Social Management Measures

No	Potential Issues	Management Measures
1	Loss of land	For Trenche-1, this is not an issue as land for construction of all proposed transmission and distribution substations are already available with PEDM (for details refer **Table-5.4**). As there is no acquisition of fresh land is involved, physical relocation/displacement is not envisaged.
2	Change in land use and population relocation for substations	Due to inherent flexibility in locating substation and very small size of land, PEDM avoids habituated area completely hence no physical relocation/displacement of population on account of setting up of substation is envisaged.
		However, securing lands may be an issue for subsequent investments under future tranches as well as those supported with other sources of finance. Keeping in this in view, and in case, lands may have to be secured, the same it can be accomplished through following three methods;

No	Potential Issues	Management Measures
		(i) Purchase of land on willing buyer & Willing Seller basis on negotiated rate; (ii) Voluntary Donation; and (iii) Involuntary Acquisition. In case of procurement of land through private purchase, PEDM shall ensure that compensation/rate for land is not less than the rate provided in the new land acquisition act, 2013. In order to comply with this provision PEDM may organize an awareness camp where provisions of new act in respect of basis/modalities of compensation calculation shall be explained to land owners with specific State provision if any. In the case of voluntary donation of land, the following shall be ensured: • The land user(s) will not be subjected to undue pressure for parting of land; • All out efforts shall be made to avoid any physical relocation/displacement due to loss of land; • The PEDM shall facilitate in extending 'gratitude' to the land donor(s) in lieu of the 'contribution' if so agreed. The same shall be documented in the shape of MoU between donor and utility and subsequently title of land transferred in the name of PEDM. • All land donations (as well as purchases) will be subject to a review/ approval from a committee comprising representatives of different sections including those from the IA and GoM. In case of land acquired through involuntary acquisition, provisions of RFCTLARRA, 2013 shall be followed. (for details refer **Part -A** of Social Management Framework placed as **Annexure – 3**). However, the same will be applicable only when the new act is adopted by State Legislative Assembly (**refer para 24**).
3	Change in land use and population relocation due to towers/ poles	As per existing law, land for tower/pole and right of way is not acquired and agricultural activities are allowed to continue after construction activity and PEDM pays compensation for all damages including cost of land below tower to its owner without acquiring it. Hence change in land use and resultant relocation of people is not envisaged in T&D projects.
4	Right of Way	Land for tower and right of way is not acquired as agricultural activities can continue. However, the project shall pay full compensation to all the affected persons/ community for any damages sustained during the execution of work. Accordingly,

No	Potential Issues	Management Measures
		PEDM has formulated appropriate management plan in the form of Compensation Plan for Temporary Damage (CPTD) to minimize the damages and provide compensation plan for temporary damages in consultation with the state government and affected persons and/ or community (for details refer **Part – B** of Social Management Framework placed as **Annexure – 3**)..
5	Impact on Tribal	As it is evident from the Census of India, 2011, that the tribal population constitutes > 94% of the state total population therefore the intended benefits due to this project implementation (providing a basic amenity like power) would enhance the living standard and quality of life in general for the tribal population in the region. It is also pertinent to mention that the tribal population in the state has their own self-governance system through ADC/VDC with administrative, judiciary and customary rights as per provisions of the Sixth Schedule of the Constitution of India. Any physical interventions (related to land acquisition and CPTD) in the scheduled areas, in particular and tribal areas, in general, in such region can only be implemented with the prior consent of the ADC/VDC. Thus, it is further substantiated that the process of implementation as provided in the project cycle indicates this approval process as an integrated activity of the social mitigation plan as necessary. Further, RFCTLARRA 2013 also stipulates additional provisions related to tribals and scheduled areas. All these are detailed in a TPDF (**Anneuxre-3, Part-C)**[1]. Moreover, no fresh land acquisition is involved for tranche-I projects as the land for all proposed substations is already in possession of PEDM.
6	Gender/ women participation	Women involvement will be planned through formal and informal group consultations so that their participation is ensured during preparation and implementation of the project.
7	Induced secondary development during construction	PEDM operations are short-lived and do not induce secondary developments during construction.
8	Health and safety of worker/employee/community	During construction the health and safety aspects of workers and nearby community shall be implemented through contractors with due diligence and compliance of required regulation/guideline through a safety plan PEDM uses best available technology for lines and do not cause any hazards to health and safety.
9	"Chance finds" or discovery of any archaeological	Possibilities of such phenomenon in T&D project are quite remote due to limited and shallow excavations. However, in

[1] All the provisions will become applicable only if tribal land is acquired involuntarily by invoking provisions of this act.

No	Potential Issues	Management Measures
	artifacts, treasure etc. during excavation	case of such findings, PEDM will follow the laid down procedure in the Section-4 of Indian Treasure Trove Act, 1878 as amended in1949.

Table 5: Environment Management Measures

No.	Potential Issues	Management Measures
1	Minimizing adverse impact on forests	PEDM endeavors to circumvent / lessen environmentally sensitive areas such as forest and other ecologically fragile/ sensitive areas through optimization of route including use of modern tools like GIS/GPS and other modern techniques.
2	Clearing/Lopping of trees	Use of extended/special tower to reduce RoW and impact on trees.
3	▪ Vegetation damage ▪ Habited Loss	To minimise damage to vegetation and habitat fragmentation, PEDM utilizes hand clearing and transportation of tower material by head loads into forestland and other land as well, wherever possible.
4	▪ Habitat fragmentation ▪ Edge effect on flora & fauna	PEDM maintains only a 3m wide strip for O&M and allows for regeneration of vegetation in the other one or two strips and beneath the transmission lines to avoid habitat fragmentation and edge effect. In hilly area this can possibly be totally avoided.
5	Chances of accident involving elephant in the specified corridor due to placing of poles	There is no elephant corridor as such in Mizoram. But it is reported elephant sometimes stray over/cross/migrate from Bangladesh in the area. However, in case poles are sited in that area PEDM shall try suitable design modification in the pole of 33kV line, like provision of spike guards, barbed wire fencing or any other arrangement and shall incorporate the same in any location, if required.
6	Chemical contamination from chemical maintenance techniques	PEDM does not use chemicals for forest clearance/ RoW maintenance.
7	Poly-Chloro-Biphenyls (PCBs) in electrical equipment.	PEDM use mineral oil in electrical equipment's. Specification of oil containing PCB less 2 mg/kg (non –detectable level) stated in the tender document.
8	Change in land use and population relocation due to towers/poles	PEDM does not acquire land for its transmission towers. It pays compensation for any crop loss and damage caused during its activities. PEDM allows regeneration and cultivation beneath the towers for Transmission Line (TL) around poles/ structures and lines.
9	Induced secondary development during construction	PEDM operations are short-lived and do not induce secondary developments during construction.

No.	Potential Issues	Management Measures
10	Erosion of soil and drainage along the cut and fill slopes in hilly areas	PEDM would ensure that all cut and fill slopes in TL/ DL are adequately protected using standard engineering practices including bio-engineering techniques wherever feasible. All drainage channels along or inside substations shall be trained and connected to main or existing drainage to avoid any erosion due to uncontrolled flow of water. To further minimise any possible impacts, the already disturbed corridors of Mizoram State Road Project- II under Bank funding are being also utilized wherever possible to route the transmission line alignment.
11	Avian hazards from transmission/distribution lines and towers	Avian hazards mostly encountered in bird sanctuaries area and fly path of migratory bird predominantly related to nesting site. Although the incidence of avian hazards is rare due to the distance between the conductors. PEDM shall take all possible precaution to avoid these areas by careful route selection. However, bird guards are provided to prevent any avian hazards.
12	Air craft hazards from transmission lines and towers	PEDM as per the requirement of IS 5613 of July'94 provides aviation markers, night-lights for easy identification of towers in notified/selected areas.
13	Health and safety of worker/employee/community	During construction the health and safety aspects of workers and nearby community shall be implemented through contractors with due diligence and compliance of required regulation/guideline through a safety. PEDM uses best available technology for lines and do not cause any hazards to health and safety.
14	Fire Hazards	Fire hazards are mostly occurred in forest area. However, PEDM uses state of art automatic tripping mechanism for its transmission/distribution and substations that disconnect the line in fraction of seconds to prevent fire hazards. The Forest Department also take precaution like maintaining fire line in the cleared forest area to avoid spread of fire.
		Firefighting instruments including fire extinguishers are kept in appropriate place for immediate action in case of any fire hazard.
15	Pollution	Although pollution is not an issue with transmission/ distribution projects still PEDM will make efforts to further minimize it. Sites are cleared of all the leftover materials and debris to avoid any chance of pollution.
16	GHG (SF_6 Gas)	Although leakage of SF6 is not a major issue, PEDM will make efforts to reduce the leakage through regular monitoring installing gas pressure monitor/ leak detectors in Circuit Breakers.

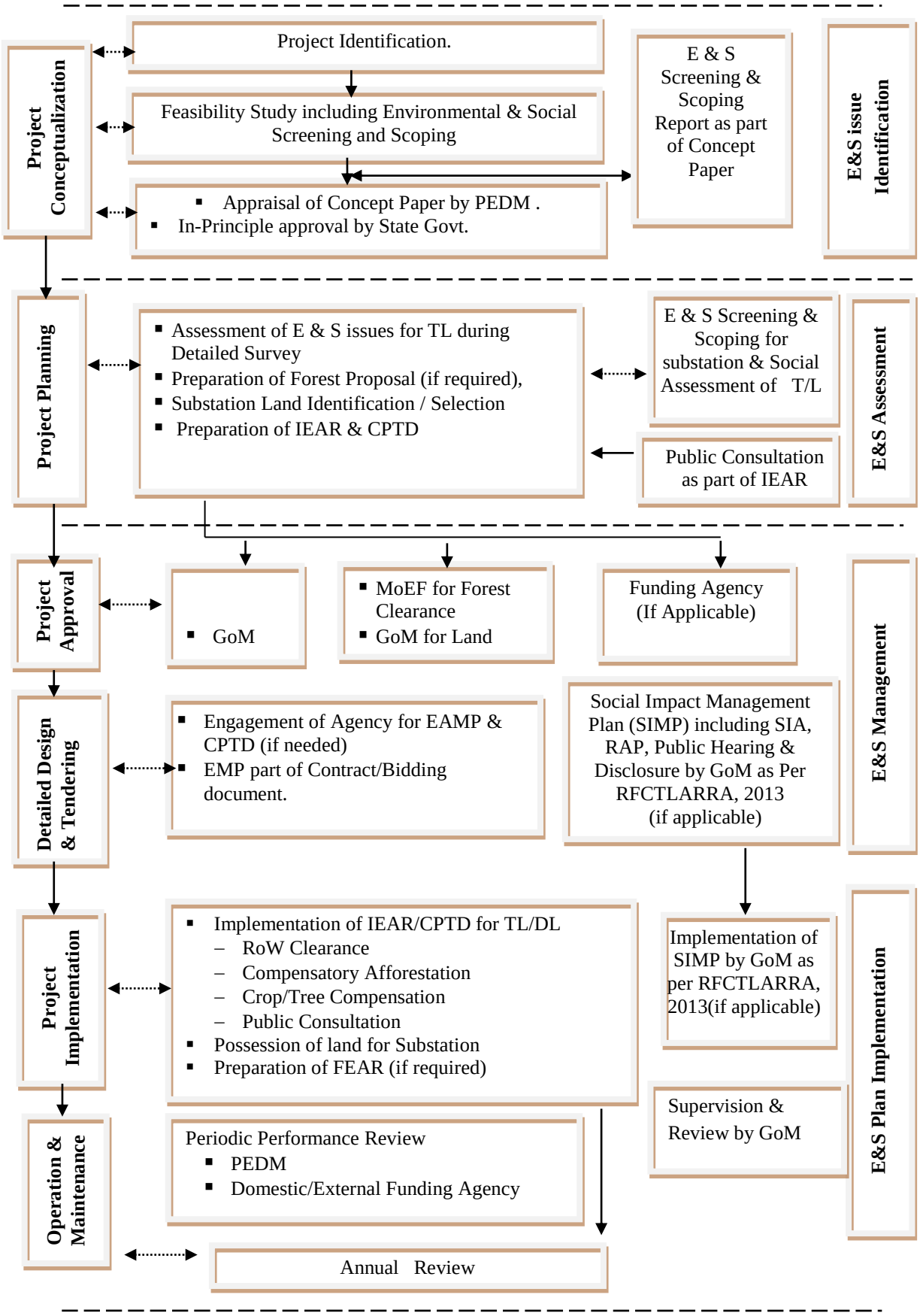
33. Other potential environmental and social issues/ concerns and their management measures are described in an EMP, a sample of which is in the Annex -A to the summary. It will be implemented during the execution of the project. Since many provisions of the EMP are to be implemented by the Contractor, to ensure its proper implementation and monitoring, the EMP forms a part of the contract document.

PEDM's Environment and Social Management Procedures (ESPP)

34. PEDM has developed comprehensive Environment and Social (E&S) management procedures and incorporated them to its project cycle, to ensure that its operation eliminates or minimizes adverse environmental and social impacts. The E&S management procedures identify the relevant issues at early stage of project cycle and follow the basic philosophy of sustainable development along with Principles of Avoidance, Minimization and Mitigation. These three guiding principles are employed in a project right from very beginning i.e. at the time of Project conceptualization & Planning Stage by studying different alternatives line routes for selection of most optimum route to avoid involvement of forests/ biodiversity/Eco-sensitive zone including animal/bird path, protected areas, human habitations etc. to the extent possible. If necessary/required, tall towers are also provided to avoid/minimize the impact. In case it becomes unavoidable due to terrain and line route passes through protected areas additional studies would be conducted by independent agencies to ascertain the impacts and to plan management measures to minimize/mitigate such impacts. A Terms of Reference (ToR), for such assessment, which can be customized for a particular situation/ location/ concern has been prepared and is placed at **Annexure-17** of the main report**.**

35. Likewise for substation land, PEDM identifies number of potential substation sites based on data collected as per the checklist **(Annexure-16** of the main report) and a comprehensive analysis for each alternative site is carried out. The analysis considers various site specific parameters that includes infrastructure facilities such as access roads, railheads, type of land viz. Govt., revenue, private land, agricultural land; social impacts such as number of families getting affected; and cost of compensation and rehabilitation giving due weightage to each. Environmental & Social Management process dovetailed in project cycle for appropriate and timely action is outlined in **Figure 2**.

Figure: 2 Environmental and Social Management Procedures



Environmental and Social Risk Assessment

36. Environmental and Social Risk Assessment is a vital part of PEDM's environmental and social management strategies. The risk assessment process identifies existing risks, and forecast future potential risks in its power transmission/distribution projects. It is a scientific process that includes cost benefit analysis. The environment and social management procedures developed by PEDM evaluate these risks, both qualitatively and quantitatively, and prioritize them. Based on prioritization, environment and social management options are selected. PEDM's Risk Management process involves risk preparedness, risk mitigation and the sharing of liabilities (via internal arrangements and insurance). Responsibilities in the event of occurrence of a risk have been illustrated in **Table 6**.

Table 6: PEDM's Risk Responsibility Framework

Risk	GoM /PEDM	Contractor	Insurers
Non compliance Regulatory[2]	✓	✓	-
Non compliance Contractual[3]	-	✓	-
Major hazards, e.g. tower fall during construction	✓	✓	✓
During O&M	✓	-	-
Impacts on health[4] etc.	✓	-	-
Force Majeure(Insurable)	-	-	✓
Force Majeure(Non-Insurable)	✓	-	-
Inclusion/ Exclusion of concerned Communities	✓	-	-
Public Interest Litigation	✓	-	-

Implementation Arrangements

37. To ensure quality and strengthen organizational systems to enable effective implementation of the ESPP, PEDM shall have to set out procedures and work culture, which will promote total involvement of all its personnel. To attain assigned goal following shall be ensured:

a) A coordinated system of functioning to be adopted by PEDM Planning Dept. who is the spokesperson of Engineer-in-Chief of PEDM/ Sect. (Power).
b) An emphasis on intra-departmental approach, demarcation of departmental responsibilities and the delegation of authority, which will ensure quick response and amendment to change.

[2] Regulatory like working in forest/protected areas without statutory clearances.

[3] Contractual like noncompliance of condition of clearance like fuel supply to labourer to avoid tree felling, no-work during night times, etc.

[4] Impact of health like any case of prolonged exposure to Electro-Magnetic Field (EMF).

c) A commitment to provide at all times the best possible time bound quality service in all areas of its operations.

38. PEDM's commitment to the ESPP shall have to be developed with these principles. To ensure effective implementation of its ESPP, PEDM will focus on:

- Placing dedicated manpower with specialization in the respective field to deal and manage the environment and social issues;
- Reinforcing in-house capabilities by working with specialized external agencies;
- Frequent/regular review by higher management
- Annual review of the ESPP implementation and problem faced to start with internally or through external agencies as necessary.

39. Office of Engg.-in-Chief will have overall responsibility for construction, operation, and maintenance of transmission/distribution systems apart from providing necessary support services.

40. For the NERPSIP, the implementing agency (IA) is POWERGRID with its mandate for design and implementation supervision for the project. In consultations with the states, it has put up a tiered structure as follows:

- **Central Project Implementation Unit (CPIU)** - A body responsible for coordinating the preparation and implementation of the project and shall be housed within the IA's offices at Guwahati. The "Project-In-Charge" of IA & Head of each of the SPCU shall be a member of CPIU.
- **State Project Coordination Unit (SPCU)** – A body formed by the Utility and responsible for coordinating with IA in preparing and implementing the project at the State level. It consist of experts across different areas from the Utility and shall be headed by an officer of the rank not below Chief Engineer, from PEDM.
- **Project Implementation Unit (PIU)** – A body formed by the IA, including members of PEDM on deputation, and responsible for implementing the Project across the State, with its personnel being distributed over work site & working in close association with the SPCU/ CPIU. PIU report to State level "Project Manager" nominated by the Project-in-Charge of IA. The IA will have a Core team stationed at the CPIU on permanent basis and other PMC officers (with required skills) will visit as and when required by this core team.

Grievance Redressal Mechanism (GRM)

41. GRM is an integral and important mechanism for addressing/resolving the concern and grievances in a transparent and swift manner. Many minor concerns of peoples are addressed during public consultation process initiated at the beginning of the project and broadly outlined in **Annexure-23**. For handling grievance, PEDM shall establish Grievance Redress Committee (GRC) at two places, one at the project/scheme level and another at Head Quarter (HQ) level. The GRCs shall include members from PEDM, Local Administration, Village Panchayat Members, Affected Persons representative and reputed persons from the society and representative from the autonomous districts council in case of tribal districts selected/decided on nomination basis under the chairmanship of project head. The composition of GRC shall be disclosed in villages/their councils office and concerned district headquarter for wider coverage.

42. The complainant will also be allowed to submit its complaint to local project official who will pass it to GRC immediately but not more than 5 days of receiving such complaint. The first meeting of GRC will be organized within 15 days of its constitution/disclosure to formulate procedure and frequency of meeting. However, GRC meeting shall be convened within 15 days of receiving a grievance for its solution. GRC endeavor will be to pronounce its decision/ may also refer it to GRC at HQ for solution within 30-45 days of receiving grievances. In case complainant/ appellant is not satisfied with the decision of GRC they can approach PEDM HQ Level Committee /District Collector or Court of law for solution.

43. The HQ level GRC shall function under the chairmanship of Engg.-in-Chief who will nominate other members of GRC including one representative from ESMC at Circle Office who is conversant with the environment & social issues. The meeting of HQ GRC shall be convened within 7-10 days of receiving the reference from project GRC or complainant directly and pronounce its decision within next 15 days.

44. These GRCs shall act as supplement and in no way substitute the legal systems, especially embedded within RFCTLARR Act 2013, The Electricity Act, 2003, and Right to Information Act.

Annex - Environmental Management Plan

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
Pre-construction							
1	Location of overhead line towers/ poles/ underground distribution lines and alignment & design	Exposure to safety related risks	Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites.	Tower location and overhead/ underground alignment selection with respect to nearest dwellings	Setback distances to nearest houses – once	Implementing Agency (IA)	Part of overhead lines tower/poles/ laying of underground cable sitting survey and detailed alignment survey and design
2	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	PCBs not used in substation transformers or other project facilities or equipment.	Transformer design	Exclusion of PCBs in transformers stated in tender specification - once	IA	Part of tender specifications for the equipment
			Processes, equipment and systems not to use chlorofluorocarbons (CFCs), including halon, and their use, if any, in existing processes and systems should be phased out and to be disposed of in a manner consistent with the requirements of the Government	Process, equipment and system design	Exclusion of CFCs stated in tender specification -once	IA	Part of tender specifications for the equipment
					Phase out schedule to be prepared in case still in use – once		Part of equipment and process design
3	Transmission/ Distribution line design	Exposure to electromagnetic interference	Line design to comply with the limits of electromagnetic interference from overhead power lines	Electromagnetic field strength for proposed line design	Line design compliance with relevant standards – once	IA	Part of design parameters
4	Substation location and design	Exposure to noise	Design of plant enclosures to comply with noise regulations.	Expected noise emissions based on substation design	Compliance with regulations - once	IA	Part of detailed siting survey and design

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
		Social inequities	Careful selection of site to avoid encroachment of socially, culturally and archaeological sensitive areas (i.g. sacred groves, graveyard, religious worship place, monuments etc.)	Selection of substation location (distance to sensitive area).	Consultation with local authorities/ autonomous councils -once		Part of detailed siting survey and design
5	Location of overhead line towers/poles/ laying of underground distribution line & alignment and design	Impact on water bodies	Avoidance of such water bodies to the extent possible. Avoidance of placement of tower inside water bodies to the extent of possible	Tower/pole location and overhead/ underground line alignment selection (distance to water bodies)	Consultation with local authorities– once	IA	Part of tower/pole sitting survey and detailed underground /overhead line alignment survey and design
		Social inequities	Careful route selection to avoid existing settlements and sensitive locations	Tower/pole location and overhead/ underground line alignment selection (distance to nearest dwellings or social institutions)	Consultation with local authorities/ autonomous councils and land owners – once	IA	Part of detailed tower/pole sitting and overhead/underground alignment survey and design
			Minimise impact on agricultural land	Tower location and overhead/ underground line alignment selection (distance to agricultural land)	Consultation with local authorities/ autonomous councils and land owners – once		
			Careful selection of site and route alignment to avoid encroachment of socially, culturally and archaeological sensitive areas (i. g. sacred groves, graveyard, religious worship place, monuments etc.)	Tower/pole location and overhead/ underground line alignment selection (distance to sensitive area)	Consultation with local authorities/ autonomous councils -once		

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
6	Securing lands for substations.	Loss of land/ income change in social status etc.	In the case of Involuntary Acquisitions, Compensation and R&R measures are extended as per provision of RFCTLARRA, 2013[5]	Compensation and monetary R&R amounts/ facilities extended before possession of land.	As per provisions laid out in the act	State Govt.	Prior to award/start of substation construction.
7	Encroachment into protected area/ precious ecological area	Loss of precious ecological values/ damage to precious species	Avoid encroachment into such areas by careful site and alignment selection (National Parks, Wildlife Sanctuary, Biosphere Reserves/ Biodiversity Hotspots)	Tower/pole location and overhead/ underground line alignment selection (distance to nearest designated ecological protected/ sensitive areas)	Consultation with local forest authorities - once	IA	Part of detailed siting and alignment survey /design
			Minimize the need by using RoW wherever possible	Tower/pole location and overhead/ underground line alignment selection	Consultation with local authorities and design engineers - once	IA	Part of detailed sitting and alignment survey /design
8	Line through identified Elephant corridor / Migratory bird	Damage to the Wildlife/ Birds and also to line	Study of earmarked elephant corridors to avoid such corridors, Adequate ground clearance, Fault clearing by Circuit Breaker, Barbed wire wrapping on towers, reduced spans etc., if applicable	Tower/pole location and overhead/ underground line alignment selection. Minimum/maximum ground clearance	Consultation with local forest authorities – once. Monitoring – quarterly basis	IA	Part of detailed sitting and alignment survey /design and Operation

[5] *The new land acquisition act i.e RFCTLARRA,2013 is currently not applicable in the State as the State Legislative Assembly has not yet adopted the resolution regarding applicability of new act as per provision under article 371 G of the constitution of India. For acquisition of private land(if required), PEDM shall secure land through donations and/ or direct purchases on negotiated rate on willing buyer and willing seller basis till the applicability of the new act.*

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			Avoidance of established/ identified migration path (Birds & Bats). Provision of flight diverter/ reflectors, bird guard, elevated perches, insulating jumper loops, obstructive perch deterrents, raptor hoods etc.[6], if applicable	Tower/pole location and overhead/ underground line alignment selection	Consultation with local forest authorities - once	IA	Part of detailed sitting and alignment survey /design and Operation
9	Line through forestland	Deforestation and loss of biodiversity edge effect	Avoid encroachment by careful site and alignment selection	Tower/pole location and overhead/ underground line alignment selection (distance to nearest protected or reserved forest)	Consultation with local authorities – once	IA	Part of detailed sitting and alignment survey/design
			Minimise the need by using existing towers, tall towers and RoW, wherever possible		Consultation with local authorities and design engineers – once		
			Measures to avoid invasion of alien species	Intrusion of invasive species	Consultation with local forest authorities - once		
			Obtain statutory clearances from the Government	Statutory approvals from Government	Compliance with regulations – once for each subproject		
			Consultation with autonomous councils wherever required	Permission/ NOC from autonomous councils	Consultation with autonomous councils – once during tower placement		

[6] As per International/National best practices and in consultation with concerned forest/wildlife authority

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
10	Lines through farmland	Loss of agricultural production/ change in cropping pattern	Use existing tower or footings wherever possible	Tower/pole location and overhead/ underground line alignment selection	Consultation with local authorities and design engineers – once	IA	Part of detailed alignment survey and design
			Avoid sitting new towers on farmland wherever feasible	Tower/pole location and overhead/ underground line alignment selection	Consultation with local authorities and design engineers – once		Part of detailed sitting and alignment survey /design
11	Noise related	Nuisance to neighbouring properties	Substations sited and designed to ensure noise will not be a nuisance	Noise levels	Noise levels to be specified in tender documents – once	IA	Part of detailed equipment design
12	Interference with drainage patterns/ irrigation channels	Flooding hazards/ loss of agricultural production	Appropriate sitting of towers to avoid channel interference	Tower/pole location and overhead/ underground line alignment selection (distance to nearest flood zone)	Consultation with local authorities and design engineers – once	IA	Part of detailed alignment survey and design
13	Escape of polluting materials	Environmental pollution	Transformers designed with oil spill containment systems, and purpose-built oil, lubricant and fuel storage system, complete with spill cleanup equipment.	Equipment specifications with respect to potential pollutants	Tender document to mention specifications – once	IA	Part of detailed equipment design /drawings
			Substations to include drainage and sewage disposal systems to avoid offsite land and water pollution.	Substation sewage design	Tender document to mention detailed specifications – once	IA	Part of detailed substation layout and design /drawings
14	Equipments submerged under flood	Contamination of receptors	Substations constructed above the high flood level(HFL) by raising the foundation pad	Substation design to account for HFL (elevation with respect to HFL elevation)	Base height as per flood design- once	IA	Part of detailed substation layout and design /drawings

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
15	Explosions /Fire	Hazards to life	Design of substations to include modern fire fighting equipment Provision of fire fighting equipment to be located close to transformers	Substation design compliance with fire prevention and control codes	Tender document to mention detailed specifications – once	IA	Part of detailed substation layout and design /drawings
Construction							
16	Equipment layout and installation	Noise and vibrations	Construction techniques and machinery selection seeking to minimize ground disturbance.	Construction techniques and machinery	Construction techniques and machinery creating minimal ground disturbance- once at the start of each construction phase	IA (Contractor through contract provisions)	Construction period
17	Physical construction	Disturbed farming activity	Construction activities on cropping land timed to avoid disturbance of field crops (within one month of harvest wherever possible).	Timing of start of construction	Crop disturbance – Post harvest as soon as possible but before next crop – once per site	IA (Contractor through contract provisions)	Construction period
18	Mechanized construction	Noise, vibration and operator safety, efficient operation	Construction equipment to be well maintained.	Construction equipment – estimated noise emissions	Complaints received by local authorities – every 2 weeks	IA (Contractor through contract provisions)	Construction period
		Noise, vibration, equipment wear and tear	Turning off plant not in use.	Construction equipment – estimated noise emissions and operating schedules	Complaints received by local authorities – every 2 weeks	IA (Contractor through contract provisions)	Construction period

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
19	Construction of roads for accessibility	Increase in airborne dust particles	Existing roads and tracks used for construction and maintenance access to the line wherever possible.	Access roads, routes (length and width of new access roads to be constructed)	Use of established roads wherever possible – every 2 weeks	IA (Contractor through contract	Construction period
		Increased land requirement for temporary accessibility	New access ways restricted to a single carriageway width within the RoW.	Access width (meters)	Access restricted to single carriage – way width within RoW – every 2 weeks	IA (Contractor through contract provisions)	Construction period
20	Construction activities	Safety of local villagers	Coordination with local communities for construction schedules, Barricading the construction area and spreading awareness among locals	Periodic and regular reporting /supervision of safety arrangement	No. of incidents- once every week	IA (Contractor through contract provisions)	Construction period
		Local traffic obstruction	Coordination with local authority/ requisite permission for smooth flow of traffic	Traffic flow (Interruption of traffic)	Frequency (time span)- on daily basis	IA (Contractor through contract provisions)	Construction period
21	Temporary blockage of utilities	Overflows, reduced discharge	Measure in place to avoid dumping of fill materials in sensitive drainage area	Temporary fill placement (m^3)	Absence of fill in sensitive drainage areas – every 4 weeks	IA (Contractor through contract provisions)	Construction period
22	Site clearance	Vegetation	Marking of vegetation to be removed prior to clearance, and strict control on clearing activities to ensure minimal clearance.	Vegetation marking and clearance control (area in m^2)	Clearance strictly limited to target vegetation – every 2 weeks	IA (Contractor through contract provisions)	Construction period
			No use of herbicides and pesticides				

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
23	Trimming /cutting of trees within RoW	Fire hazards	Trees allowed growing up to a height within the RoW by maintaining adequate clearance between the top of tree and the conductor as per the regulations.	Species-specific tree retention as approved by statutory authorities (average and max. tree height at maturity,in meters)	Presence of target species in RoW following vegetation clearance – once per site	IA (Contractor through contract provisions)	Construction period
		Loss of vegetation and deforestation	Trees that can survive pruning to comply should be pruned instead of cleared.	Species-specific tree retention as approved by statutory authorities	Presence of target species in RoW following vegetation clearance - once per site	IA (Contractor through contract provisions)	Construction period
			Felled trees and other cleared or pruned vegetation to be disposed of as authorized by the statutory bodies.	Disposal of cleared vegetation as approved by the statutory authorities (area cleared in m^2)	Use or intended use of vegetation as approved by the statutory authorities – once per site	IA (Contractor through contract provisions)	Construction period
24	Wood/ vegetation harvesting	Loss of vegetation and deforestation	Construction workers prohibited from harvesting wood in the project area during their employment, (apart from locally employed staff continuing current legal activities)	Illegal wood /vegetation harvesting (area in m^2, number of incidents reported)	Complaints by local people or other evidence of illegal harvesting – every 2 weeks	IA (Contractor through contract provisions)	Construction period
25	Surplus earthwork/soil	Runoff to cause water pollution, solid waste disposal	Soil excavated from tower footings/ substation foundation disposed of by placement along roadsides, or at nearby house blocks if requested by landowners	Soil disposal locations and volume (m^3)	Acceptable soil disposal sites – every 2 weeks	IA (Contractor through contract provisions)	Construction period

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
26	Substation construction	Loss of soil	Loss of soil is not a major issue as excavated soil will be mostly reused for filling. However, in case of requirement of excess soil the same will be met from existing quarry or through deep excavation of existing pond or other nearby barren land with agreement of local communities	Borrow area sitting (area of site in m^2 and estimated volume in m^3)	Acceptable soil borrow areas that provide a benefit - every 2 weeks	IA (Contractor through contract provisions)	Construction period
		Water pollution	Construction activities involving significant ground disturbance (i.e. substation land forming) not undertaken during the monsoon season	Seasonal start and finish of major earthworks(P^H, BOD/ COD, Suspended solids, others)	Timing of major disturbance activities –prior to start of construction activities	IA (Contractor through contract provisions)	Construction period
27	Site clearance	Vegetation	Tree clearances for easement establishment to only involve cutting trees off at ground level or pruning as appropriate, with tree stumps and roots left in place and ground cover left undisturbed	Ground disturbance during vegetation clearance (area, m^2)	Amount of ground disturbance – every 2 weeks	IA (Contractor through contract provisions)	Construction period
				Statutory approvals	Statutory approvals for tree clearances – once for each site		
28	Substation foundation/Tower erection disposal of surplus earthwork/fill	Waste disposal	Excess fill from substation/tower foundation excavation disposed of next to roads or around houses, in agreement with the local community or landowner.	Location and amount (m^3)of fill disposal	Appropriate fill disposal locations – every 2 weeks	IA (Contractor through contract provisions)	Construction period
29	Storage of chemicals and materials	Contamination of receptors (land, water, air)	Fuel and other hazardous materials securely stored above high flood level.	Location of hazardous material storage; spill reports (type of material spilled, amount (kg	Fuel storage in appropriate locations and receptacles – every 2 weeks	IA (Contractor through contract provisions)	Construction period

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
				or m^3) and action taken to control and clean up spill)			
30	Construction schedules	Noise nuisance to neighbouring properties	Construction activities only undertaken during the day and local communities informed of the construction schedule.	Timing of construction (noise emissions, [dB(A)]	Daytime construction only – every 2 weeks	IA (Contractor through contract provisions)	Construction period
31	Provision of facilities for construction workers	Contamination of receptors (land, water, air)	Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities.	Amenities for Workforce facilities	Presence of proper sanitation, water supply and waste disposal facilities – once each new facility	IA (Contractor through contract provisions)	Construction period
32	Influx of migratory workers	Conflict with local population to share local resources	Using local workers for appropriate asks	Avoidance/reduction of conflict through enhancement/ augmentation of resource requirements	Observation & supervision–on weekly basis	IA (Contractor through contract provisions)	Construction period
33	Lines through farmland	Loss of agricultural productivity	Use existing access roads wherever possible	Usage of existing utilities	Complaints received by local people /authorities - every 4 weeks	IA (Contractor through contract provisions)	Construction period
			Ensure existing irrigation facilities are maintained in working condition	Status of existing facilities			
			Protect /preserve topsoil and reinstate after construction completed	Status of facilities (earthwork in m^3)			
			Repair /reinstate damaged bunds etc after construction completed	Status of facilities (earthwork in m^3)			

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
		Social inequities	Land owners/ farmers compensated for any temporary loss of productive land as per existing regulation.	Process of Crop/tree compensation in consultation with forest dept.(for timber yielding tree) and Horticulture deptt.(for fruit bearing tree)	Consultation with affected land owner prior to implementation and during execution.	IA	During construction
34	Uncontrolled erosion/silt runoff	Soil loss, downstream siltation	Need for access tracks minimised, use of existing roads.	Design basis and construction procedures (suspended solids in receiving waters; area re-vegetated in m^2; amount of bunds constructed [length in meter, area in m^2, or volume in m^3])	Incorporating good design and construction management practices – once for each site	IA (Contractor through contract provisions)	Construction period
			Limit site clearing to work areas				
			Regeneration of vegetation to stabilise works areas on completion (where applicable)				
			Avoidance of excavation in wet season				
			Water courses protected from siltation through use of bunds and sediment ponds				
35	Nuisance to nearby properties	Losses to neighbouring land uses/ values	Contract clauses specifying careful construction practices.	Contract clauses	Incorporating good construction	IA (Contractor through contract provisions)	Construction period
			As much as possible existing access ways will be used	Design basis and layout	Incorporating good design engineering		
			Productive land will be reinstated following completion of construction	Reinstatement of land status (area affected, m^2)	Consultation with affected parties – twice- immediately after completion of construction and after the first harvest		

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
		Social inequities	Compensation will be paid for loss of production, if any.	Implementation of Tree/Crop compensation (amount paid)	Consultation with affected parties – once in a quarter	IA	Prior to construction
36	Flooding hazards due to construction impediments of natural drainage	Flooding and loss of soils, contamination of receptors (land, water)	Avoid natural drainage pattern/ facilities being disturbed/blocked/ diverted by ongoing construction activities	Contract clauses (e.g. suspended solids and BOD/COD in receiving water)	Incorporating good construction management practices-once for each site	IA (Contractor through contract provisions)	Construction period
37	Equipment submerged under flood	Contamination of receptors (land, water)	Equipment stored at secure place above the high flood level(HFL)	Store room level to be above HFL (elevation difference in meters)	Store room level as per flood design-once	IA	Construction period
38	Inadequate siting of borrow areas (quarry areas)	Loss of land values	Existing borrow sites will be used to source aggregates, therefore, no need to develop new sources of aggregates	Contract clauses	Incorporating good construction management practices – once for each site	IA (Contractor through contract provisions)	Construction period
39	Health and safety	Injury and sickness of workers and members of the public	Safety equipment's (PPEs) for construction workers Contract provisions specifying minimum requirements for construction camps Contractor to prepare and implement a health and safety plan. Contractor to arrange for health and safety training sessions	Contract clauses (number of incidents and total lost-work days caused by injuries and sickness)	Contract clauses compliance – once every quarter	IA (Contractor through contract provisions)	Construction period
40	Inadequate construction stage monitoring	Likely to maximise damages	Training of environmental monitoring personnel	Training schedules	Number of programs attended by each person – once a year	IA	Routinely throughout construction period

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			Implementation of effective environmental monitoring and reporting system using checklist of all contractual environmental requirements	Respective contract checklists and remedial actions taken thereof.	Submission of duly completed checklists of all contracts for each site - once		
			Appropriate contact clauses to ensure satisfactory implementation of contractual environmental mitigation measures.	Compliance report related to environmental aspects for the contract	Submission of duly completed compliance report for each contract – once		
Operation and Maintenance							
41	Location of line towers/poles and overhead/ under-ground line alignment & design	Exposure to safety related risks	Setback of dwellings to overhead line route designed in accordance with permitted level of power frequency and the regulation of supervision at sites.	Compliance with setback distances ("as-built" diagrams)	Setback distances to nearest houses – once in quarter	PEDM	During operations
42	Line through identified bird flyways, migratory path	Injury/ mortality to birds, bats etc due to collision and electrocution	Avoidance of established/identified migration path (Birds & Bats). Provision of flight diverter/ reflectors, elevated perches, insulating jumper loops, obstructive perch deterrents, raptor hoods etc., if applicable	Regular monitoring for any incident of injury/mortality	No. of incidents- once every month	PEDM	Part of detailed siting and alignment survey /design and Operation
43	Equipment submerged under flood	Contamination of receptors (land, water)	Equipment installed above the high flood level (HFL) by raising the foundation pad.	Substation design to account for HFL ("as-built" diagrams)	Base height as per flood design – once	PEDM	During operations
44	Oil spillage	Contamination of land/nearby water bodies	Substation transformers located within secure and impervious sump areas with a storage capacity of at least 100% of the capacity of oil in transformers and associated reserve	Substation bunding (Oil sump) ("as-built" diagrams)	Bunding (Oil sump) capacity and permeability - once	PEDM	During operations

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			tanks.				
45	SF6 management	Emission of most potent GHG causing climate change	Reduction of SF6 emission through awareness, replacement of old seals, proper handling & storage by controlled inventory and use, enhance recovery and applying new technologies to reduce leakage	Leakage and gas density/level	Continuous monitoring	PEDM	During Operations
46	Inadequate provision of staff/workers health and safety during operations	Injury and sickness of staff /workers	Careful design using appropriate technologies to minimise hazards	Usage of appropriate technologies (lost work days due to illness and injuries)	Preparedness level for using these technologies in crisis – once each year	PEDM	Design and operation
			Safety awareness raising for staff.	Training/awareness programs and mock drills	Number of programs and percent of staff /workers covered – once each year		
			Preparation of fire emergency action plan and training given to staff on implementing emergency action plan				
			Provide adequate sanitation and water supply facilities	Provision of facilities	Complaints received from staff /workers every 2 weeks		
47	Electric Shock Hazards	Injury/ mortality to staff and public	Careful design using appropriate technologies to minimise hazards	Usage of appropriate technologies (number of injury incidents, lost work days)	Preparedness level for using these technology in crisis – once a month	PEDM	Design and Operation
			Security fences around substations	Maintenance of fences	Report on maintenance – every 2 weeks		
			Barriers to prevent climbing on/ dismantling of transmission towers	Maintenance of barriers			

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			Appropriate warning signs on facilities	Maintenance of warning signs			
			Electricity safety awareness raising in project areas	Training /awareness programs and mock drills for all concerned parties	Number of programs and percent of total persons covered – once each year		
48	Operations and maintenance staff skills less than acceptable	Unnecessary environmental losses of various types	Adequate training in O&M to all relevant staff of substations & transmission/ distribution line maintenance crews.	Training/awareness programs and mock drills for all relevant staff	Number of programs and percent of staff covered – once each year	PEDM	Operation
			Preparation and training in the use of O&M manuals and standard operating practices				
49	Inadequate periodic environmental monitoring.	Diminished ecological and social values.	Staff to receive training in environmental monitoring of project operations and maintenance activities.	Training/awareness programs and mock drills for all relevant staff	Number of programs and percent of staff covered – once each year	PEDM	Operation
50	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	Processes, equipment and systems using cholofluorocarbons (CFCs), including halon, should be phased out and to be disposed of in a manner consistent with the requirements of the Govt.	Process, equipment and system design	Phase out schedule to be prepared in case still in use – once in a quarter	PEDM	Operations
51	Transmission/ distribution line maintenance	Exposure to electromagnetic interference	Transmission/ distribution line design to comply with the limits of electromagnetic interference from overhead power lines	Required ground clearance (meters)	Ground clearance - once	PEDM	Operations

Clause No.	Project activity/ stage	Potential impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
52	Uncontrolled growth of vegetation	Fire hazard due to growth of tree/shrub /bamboo along RoW	Periodic pruning of vegetation to maintain requisite electrical clearance. No use of herbicides/ pesticides	Requisite clearance (meters)	Assessment in consultation with forest authorities - once a year(pre-monsoon/post-monsoon	PEDM	Operations
53	Noise related	Nuisance to neighbouring properties	Substations sited and designed to ensure noise will not be a nuisance.	Noise levels {dB(A)}	Noise levels at boundary nearest to properties and consultation with affected parties if any - once	PEDM	Operations

1. Project Context

1. India's North East Region (NER) stretches across the eastern foothills of the Himalayan mountain range and is comprised of seven states including Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura. Geographically the region is connected to the other parts of the country through a small "chicken neck" corridor in the State of West Bengal. With a total population of 45.6 million (2011 census), the sparsely populated NER accounts for about 3.7 percent of India's total population and covers 7.9 percent of India's total geographical area. The vast majority of the region's population lives in rural areas, accounting for 82 percent of the total population as against compared to the national average of 69 percent (2011). A large part of the NER is hilly and, recognized as one of the globe's biodiversity hotspots. Forests cover over 2/3rd of the area, twice exceeding the policy target of 33%. This sparsely populated region is characterized by extraordinary ethnic, cultural, religious and linguistic diversity, with more than 160 Scheduled Tribes (out of 630 in the country) comprising over 400 distinct sub tribal groups, and a large and diverse non-tribal population as well.

2. The North Eastern Region (NER) in India is endowed with rich energy resources but faces significant bottlenecks in electricity access and availability levels. The per capita power consumption in NER is one-third of the national average. The region has a shortfall of about 500MW installed capacity against peak demand of about 1950 MW. No significant generation capacity has been added in the recent past. Therefore, inadequate power supply continues a critical constraint to sustainable growth and economic development in the NER. Some states are generally not able to draw even their allocated share of power from the Central Generating Stations (CGS) through the grid due to poor/inadequate intra/interstate transmission and distribution network and no capacity addition towards transmission/distribution power system not done due to fund constraints. The transmission and distribution (T&D) losses are also quite high (up to 50%) across most of the States as a large number of remote hilly areas are connected through long low tension lines, resulting in low voltages and poor quality of power at consumer end. While generation capacity addition of about 4000 MW program over present installed capacity is already underway, adequate transmission and distribution infrastructure to transmit and distribute this power to consumers within the North-Eastern States is the need of the day.

3. In order to create/ augment proper infrastructure of T&D in NER keeping in mind future requirement, the Government of India (GoI) has drawn a "Composite scheme for transmission and distribution (T&D) in NER" capable of delivering adequate power to most consumers with reliability, aiming to improve the inter-state and intra-state transmission and sub-transmission infrastructure and reduce system losses in all the NER states. This in background, GoI has approached the World Bank to provide US$ 1500 million of IBRD funding support to a portion of the scheme christened: **"NER Power**

System Improvement Project (NERPSIP)". The investments are proposed to be made in three different tranches, each being US$ 500 million. The key objectives include strengthening, augmentation of the intra-state and interstate transmission and distribution schemes (up to 33kV) and undertake capacity building initiatives across six NER States of Assam, Manipur, Mizoram, Meghalaya, Tripura and Nagaland. Ministry of Power (MoP), GoI has appointed POWERGRID, the CTU, as Implementing Agency for the Project in six North Eastern States. However, the ownership of the assets shall be with the respective State Governments/State Utilities, which upon progressive commissioning shall be handed over to them for taking care of Operation and Maintenance of Assets at their own cost.

4. The first tranche under the NERPSIP would be implemented over a seven year period (2014-2021) and has two major components, namely:

(a) Priority investments for strengthening of intra-state transmission and distribution systems;

(b) Technical Assistance for Institutional Strengthening and Capacity Building of power utilities and departments.

1.1 State Specific Details - Mizoram

5. The State of Mizoram is spread over an area of about 21081 sq. km. with a population of more than 1.91 million. The State faces significant bottlenecks in electricity access and availability level. The present per capita energy consumption is of the order of 252 units (kWh) against the regional per capita consumption of about 258 units and national per capita consumption of about 779 units. Presently, the Department serves power supply to nearly 2 lakhs consumers At the end of 12th Plan, number of consumers is projected at 2, 55,561 nos. and per capita consumption is projected to be 318 Kwh The State has predominantly two sources of power; one being its own hydel generation of about 29.35MW (out of its 11 SHP) and another from Central Sector allocation of 64.53 MW The present peak demand of the State is 178MW. There remains a shortfall of about 84MW. The State is endowed with hydropower potentiality for power generation of about 4000 MW without much damage to environment. To cater the shortfall, PEDM is executing Tlawva SHP (2x2.5 MW) which will be completed and commissioned by 2014-2015. Another Tuirial HEP (60 MW) is on-going project executed by NEEPCO and the project is scheduled to be completed during the 12th five-year plan. Tuivai HEP (210 MW) is also in the pipeline and the project shall be taken up in the State Sector on PPP Mode under VGF policy of GoI.

6. Besides this, the present Intra-State transmission system of the State is quite old & weak and is unable to cater to the growing power requirements of the State. Although the present T&D system covers many areas of the State, it is inadequate in its reach and due to non-availability of redundant T&D system, outage of any transmission system element results in long term power shortages

making the system highly unreliable. Besides, some of the network elements have undergone long term outage due to break-down. Therefore, it has become essential to address the above situation through remedial measures in the transmission and distribution (T&D) system. Accordingly, phase-wise strengthening of transmission & distribution system has been proposed. The Power Map of Mizoram indicating the existing and proposed T&D network is placed in **Figure - 1.1**. Summary of subprojects to be implemented in the State in Tranche-1 under NERPSIP along with capacity addition and cost is shown in **Table- 1.1** below.

Table – 1.1 : Summary of subprojects in Tranche- I under NERPSIP

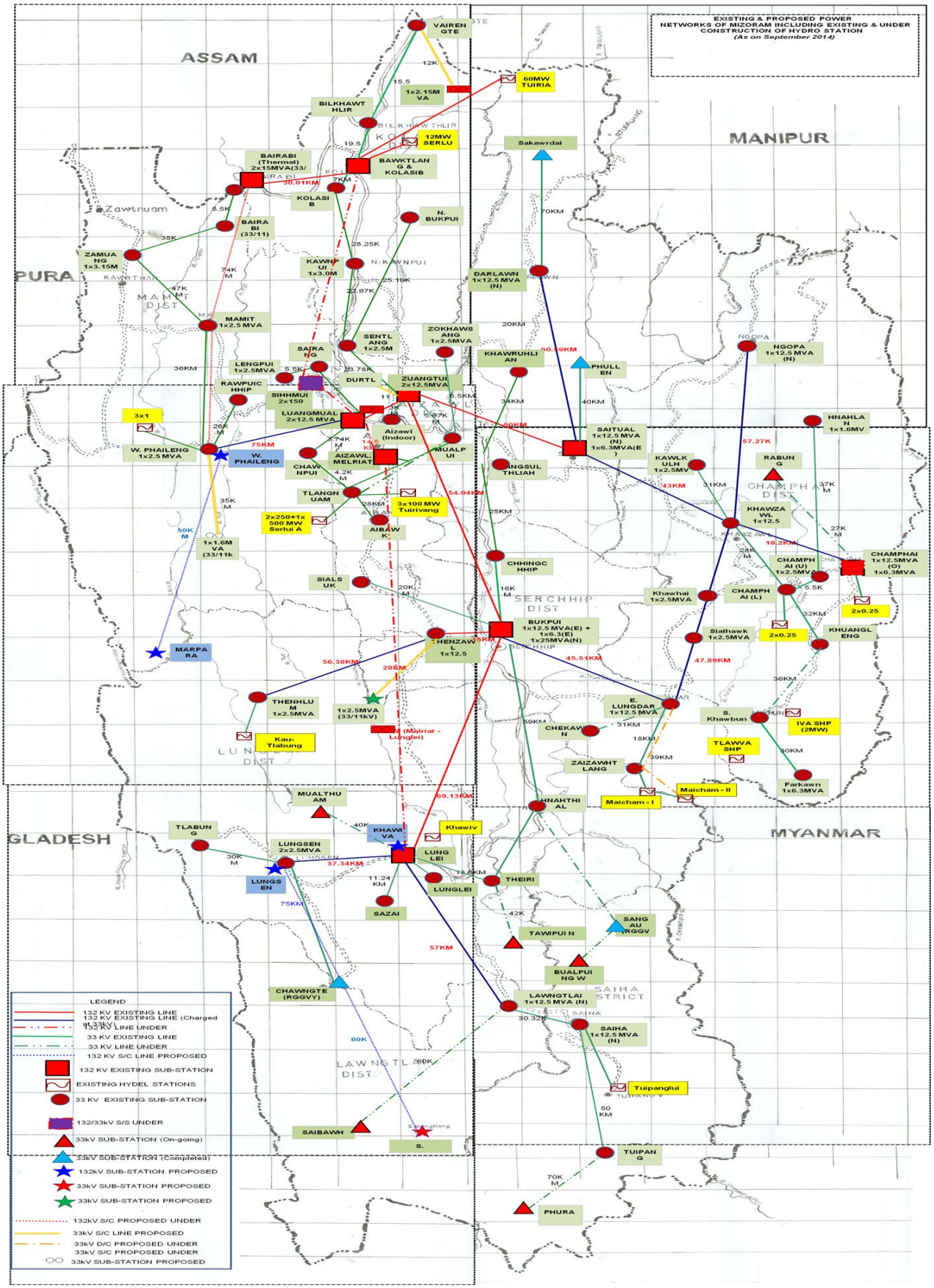
Sl. No.	Name of the subproject	Quantity (Nos.)	Capacity Addition (km./MVA)	Estimated Cost* (in Millions)
1.	132 kV Transmission lines	3	214 Ckt.km.	2967.20
2	132/33kV substations (New/Augmentation/Extension)	6	125 MVA	
3.	33 kV Distribution lines (New/Strengthening)	12	5.2 Ckt.km.	200.40
4.	33/11kV substations[7] (New/Augmentation)	3	6.3 MVA	

The estimated cost includes consultancy fees, contingencies and IDC

7. The prime objective of the project/subproject is to improve the power sector in the State of Mizoram and capacity building to achieve sustainable development in the long term. The Project is expected to facilitate connection to remote/virgin area, to enhance the capacity & reliability of the system, to improve voltage profile & to reduce losses and ultimately to enhance satisfaction for all categories of consumers which in turn will spur growth & overall development in the whole State.

[7] *The substation of 33/11 kV is installed for stepping down the voltage from 33 kV to 11 kV level to facilitate its further transmission to distribution network for its logical use by consumers after further stepping down to 433 V level. The electrical installations in the said substation comprises of transformers, breakers, capacitors etc. and other protection/controlling devices to ensure required power flow".*

Figure – 1.1 Power Map of Mizoram



2. Environment and Social Context – Mizoram

8. Environment and Social Policy and Procedures (ESPP): As the PEDM is contemplating major expansion and augmentation of its transmission & distribution network in near future by implementing projects with the help/grant from GoI and Multilateral Funding Agencies like the World Bank, ADB, it attaches high significance towards managing environment and social issues and the associated concerns. In this context, POWERGRID, with proven credentials in management of environmental and social issues of large number of power transmission projects both within and outside the country has been mandated to develop the Environment and Social Policy and Procedures (ESPP) for PEDM.

9. The PEDM's ESPP is based on POWERGRID's ESPP with updation/ incorporation of state specific requirements/processes including central legislations after extensive review and gap analysis with active participation/support of PEDM officials and field verifications. The ESPP of PEDM assimilates environmental and social management procedures into its corporate functioning and also layout management procedures and protocol to address them. It outlines PEDM's commitment to deal with environmental and social issues relating to its transmission & distribution projects with a framework for identification, assessment and management of environmental and social concerns at both organizational as well as project levels. Thus, it enables PEDM:

- To establish clear procedures and methodologies for the environmental and social screening, planning, review, approval and implementation of subprojects to be financed under the Project;
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to sub-projects;
- To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESPP;
- To ensure adequate financial provisions to meet the management measures to be undertaken to mitigate the impacts.

Environment & Social Policy Statement

"PEDM commits itself to follow the goal of sustainable development through identification, assessment and management of social and environmental issues at both project planning and implementation stages with total transparency and introducing the state of art technologies by adhering to the basic principles of Avoidance, Minimization and Mitigation".

10. PEDM also believes that the ESPP is dynamic and living document, which shall be further upgraded in light of the experiences gained from field implementation and other relevant factors while mainstreaming the environmental and social concerns in its corporate functioning.

2.1 Approach/ Methodology

11. The ESPP has been prepared following a region/ state specific environmental and social assessments which involved generating information through both primary and secondary sources including consultations and library research. The methodology adopted to identify the potential environment and social impacts is based on experience gained from implementation of similar projects and baseline assessments of work activities anticipated in this proposed project. The methodology takes in to account wide range of receptors:

- Physical & chemical environment (e.g. water, soil, etc.);
- Biological environment (forest, animals, birds, etc.); and
- Communities, social groups and individuals (loss of land, loss of agricultural production, tribal, vulnerable groups (women and backward classes), socio-economic condition, health and safety risks).

12. The basic approach broadly involved following:

- Review of environment & social baseline information from secondary sources;
- Review of existing national & state specific legislations and policy and guidelines of multilateral agencies;
- Review of project related documents; and
- Stakeholders' consultations.

2.2 Consultation/ Participation

13. Consultations with key stakeholders including local, state, regional, central government entities and key ministries at the state level and central level as well as with World Bank officials were undertaken to know views and concerns about environmental and social issues /concerns of the project. This activity ensured appropriate participation and gathering views from the environment and social perspective of all the stakeholders' which is integrated in this ESPP to be adopted during different stages of the project implementation. A detailed analysis of stakeholder consultations is presented in **Chapter-4**.

2.3 Structure of the Report

14. **Chapter 1& 2** provides the context from a regional; state and project level with social and environmental scenarios as well as approach and methodology adopted for conducting assessments and preparing ESPP. **Chapter 3** presents an overview of Mizoram State in respect of its social, economic, cultural, environment, infrastructure and administrative fronts. Stakeholder Analysis is presented in **Chapter-4**. While Chapters 1-3 lays foundation to both social and environmental front, subsequently, **Chapters 5 and 6** deal with issues, impacts and measures thereof in respect of social and environmental aspects. Integrating social and environmental management into the overall project cycle is made in the **Chapter-7**. The remaining chapters (**Chapter - 8 to 12**) deal with implementation arrangements, capacity building, grievance redressal mechanism and monitoring and evaluation & budget.

3. Mizoram - An overview

15. Mizoram is located in the north-eastern part of the country between 22^{o} 19' to 24^{o} 19' North latitudes and 92^{o} 16' to 93^{o} 26' East longitudes covering a geographical area of 21081 sq. km. It is a landlocked state surrounded by Myanmar in the east, Manipur and Assam in the north, Tripura and Bangladesh in the west and again Myanmar in the south. It has a total of 722 km international boundary with Myanmar (404 km) and Bangladesh (318 km). Geographically, it is 277 km from north to south, and 121 km from east to west with inter State boundary Assam (123 km), Tripura (277 km) and Manipur (95 km). The capital is Aizawl, in the north-central part of the state. Nearest railhead is Silchar, which is in Assam about 184 km away from the capital Aizwal. Besides Air service, at present through the gateway of N-E i.e. Guhawati, the State is connected to the Indian Road network through Silchar in Assam to the National Highway 54. Another highway, NH-150 connects the state's Seling Mizoram to Imphal Manipur and NH-40A links the State with Tripura.

16. The State is a storehouse of exotic flora and fauna and forests. The local flora and fauna bear a very close affinity and resemblance with the floral and faunal components of the Indo-Malayan and Indo-Chinese sub-regions. The State is located in the bio-geographic zone of 9B-North-East hills and possesses an extremely rich bio-diversity. The hills here could be seen covered with bamboo and banana trees along with a wonderful array of pine trees. The forests here also house some of the rare varieties of orchids that are found only in this region of the country. About 90% of the area is under forest cover. About 94% of the population belongs to Schedule Tribes whose lives are intrinsically woven with that of the forests. The state is now striving to march ahead and utilize the available natural resources as the same holds the key for economic development. Yet, it is a challenging task as the state is characterized by geographical isolation, poor infrastructure facilities, communication bottlenecks and low capital formation. The comprehensive details about Mizoram State are placed at **Annexure-1.**

3.1 History

17. The origin of the Mizos is generally accepted as part of a great Mongoloid wave of migration from China and later moved out to India to their present habitats. The Mizo history in the 18th and 19th Century is marked by many instances of tribal raids and retaliatory expeditions of security. Mizo Hills were formally declared as part of the British-India by a proclamation in 1895. North and south hills were united into Lushai Hills district in 1898 with Aizawl as its headquarters. The name is derived from *Mi* (people), *Zo* (hill) and *Ram* (land), and thus Mizoram implies "land of the hill people" and also was known as the Lushai Hills District of Assam before it

was renamed the Mizo Hills District in 1954. In 1972, it became a centrally administered union territory under the name of Mizoram. As a sequel to the signing of the Historic Memorandum of Settlement between the Government of India and the Mizo National Front in 1986, Mizoram was granted Statehood on February 20, 1987 as per Statehood Act of 1986 and Mizoram became the 23rd State of the Indian Union.

3.2 Governance and Administration

18. Mizoram has witnessed vast constitutional, political and administrative changes during the past years. The traditional chieftainship was abolished and the District and Regional Councils created under **the Sixth Schedule** of the Constitution of India give a substantial measure of local control. The power and functions of the Council is mainly three viz., Legislative, Executive, and Judiciary. The purpose of establishing ***the Autonomous District Council (ADC)*** is to provide for internal autonomy to the tribal people inhabiting these areas, and protect their social, cultural and economic interests, through granting them administrative and legal authority as per constitution of India.

19. Presently, the Lais, Maras and Chakmas have separate autonomous District Councils. The Village Councils are the grassroots of democracy in Mizoram. There are three District Councils cover two administrative districts - Lawngthlai and Saiha.

1. Chakma Autonomous District Council (CADC) – Area 1500 Sq km.
2. Mara Autonomous District Council (MADC) – Area 1445 Sq. km
3. Lai Autonomous District Council (LADC) – Area 1,871 Sq.km.

20. ADCs receive grant-in-aid annually from the State and the Central Government, and it also earns its own revenue from various sources. It also undertakes various development works through the development departments, such as PWD, PHE, Rural Development (RD), Agriculture Department, Horticulture Department and Planning and Development Dept. It also takes steps for propagation, protection and preservation of the ethnic identity through Arts & Culture Deptt. The majority of the people of Chakma Autonomous District Council in Mizoram are Buddhist (Theraveda) and are mostly farmers. They mainly grow rice, vegetables and fruits. Mara Autonomous District Council looks after many departments in her area including fisheries, schools (up to Middle school) and education, judiciary, land and revenue, forestry, Public Health Engineering (PHE), etc. The main occupation of the people of Lai Autonomous District Council is Agriculture (the backbone of its economy) having Rice as its staple food, other crops like ginger, sesame, banana,

chili, tilt, pine-apple, orange, mango, etc. are also cultivated. The Council also possesses rich natural resources of self-generating bamboo forest as well as thick tropical forest.

21. Unlike other states, Mizoram does not follow the system of Tahluk/Tahsil, etc., thus Rural Development Block areas have been taken as units to demarcate lower formation of geographical and administrative areas in the state. Four new RD Blocks were created after Census 2001 while there was only 22 RD Blocks in 2001 Census. In Census 2011, there are as many as 830 villages and out of which, 704 villages are inhabited and 126 villages are uninhabited. The administrative setup of the State is presented in **Table 3.1** below.

Table 3.1: Administrative Setup in Mizoram

Sl. No.	Administrative Units	Census 2001	Census 2011
1.	Districts	8	8
2.	Rural Development Block	22	26
3.	Village	817	830
3(a)	Inhabited	707	704
3(b)	Un-inhabited	110	126
4.	Town (notified)	22	23
5.	Autonomous District Council (ADC)	3	3

22. Mizo is the official language and the most widely used language for verbal interactions, but English, being important for education, administration, formalities and governance, is widely used.

3.3 Demographic Profile

23. As per Census 2011, the State has a population of 1,091,014 comprising 50.63% male and 49.37% female populations. The sex ratio stands at 975 females per thousand male populations. The decadal growth of population was 22.78% during 2001-2011. The population in the age group of 0-6 years constitutes 15.36% of the total population. The Scheduled Caste population comprises 0.11%, whereas tribal population constitutes 94% of the total population. The population density is 52 persons/ sq. km as compared to 382 persons/ sq. km at national level (Census 2011). The literacy rate (91.58%) of Mizoram is one of the highest in the country (against All India figure of 74 %). In Census 2011, gender wise literacy rates were 47.22% (male) and 44.11% (female), implying a difference of 3.11% only. Workers constitute 44.36% of the total population. Of the total workers, main workers and marginal workers comprise 85.27% and 14.73% respectively. Among main workers, those engaged in agricultural activities comprise 55.18%. Non-workers constitute 55.64%

of the total population indicating high dependency ratio. Urban population of Mizoram is more than 50% and a large majority of urban population is residing in Aizawl. The details of population as per Census 2011 are presented in **Table 3.2.**

Table 3.2: Demographic Profile

Sl. No.	District	Geographical Area (Sq. km.)	Population			Growth Rate (%)	Sex Ratio	Literacy	Density (Persons / Sq.km
			Total	Male	Female				
1.	Aizawl	3576	404054	201072	202982	24.07	1009	98.50	113
2.	Lunglei	4538	154094	79252	74842	12.29	944	89.40	34
3.	Champhai	3185	125370	63299	62071	15.66	981	93.51	39
4.	Lawngtlai	2557	117444	60379	57065	59.53	945	66.41	46
5.	Mamit	3025	85757	44567	41190	36.59	924	85.96	28
6.	Kolasib	1382	83054	42456	40598	25.92	956	94.54	60
7.	Serchhip	1421	64875	32824	32051	20.45	976	98.76	46
8.	Saiha	1399	56366	28490	28490	-7.68	978	88.41	40
Total		**21081**	**1091014**	**552,339**	**538675**	**22.78**	**975**	**91.58**	**52**

Source: Census of India, 2011

24. Mizoram is the cradle of diverse communities like the Lusei, Ralte, Paite, Bete, Powi, Lakher, Hmar, Riang, Tlanglau, Pangs, Bawm, Bru, Chakma and others. They are mostly of Mongoloid race. The entire population is designated as "Scheduled Tribes", as per Schedule VI of the Constitution. The Mizos are a close-knit society with no class distinction and no discrimination on grounds of sex. Ninety percent of them are cultivators and the village exists like a big family. Birth of a child, marriage in the village and death of a person in the village or a community feast arranged by a member of the village are important occasions in which the whole village is involved. Mizo society is a patriarchal society and the male head of the family control the social economic and religious affairs. However, women in social life enjoy freedom and are engaged in various economic activities. Christianity is predominant religion of the state. The inhabitants are mostly Christians followed by Buddhists, Hindus, Muslims and others. The closeness to the numerous international borders has made Mizoram a blend of various tribes that migrated from China, Myanmar (the erstwhile Burma), and the other parts of the Northeast. Some Mizo tribes may have formed a part of the people who lived in the Tao valley in northwest China. They slowly proceeded towards the border of Tibet and Myanmar and around 1700 AD, these tribes shifted to what is known as Mizoram today. The Bnei Menashe tribe claim Jewish descent.

3.4 Land, Agriculture and Forests

25. Mizoram has the most variegated hilly terrain in the eastern part of India. The hills are steep and are separated by rivers which flow either to the north or the south creating deep gorges between the hill ranges. It is also called a land of rolling hills, valleys, rivers and lakes. As many as 21 major hill ranges or peaks of different heights run through the length and breadth of the state, with plains scattered here and there. The average heights of the hills to the west of the state are about 1,000 metres (3,300 ft). These gradually rise up to 1,300 metres (4,300 ft) to the east. Some areas, however, have higher ranges which go up to a height of over 2,000 metres (6,600 ft). Phawngpui Tlang also known as the *Blue Mountain*, situated in the south-eastern part of the state, is the highest peak in Mizoram at 2,210 metres (7,250 ft). About 90% of the state is covered by forests, 8.8% is fallows land and net sown area is 4.67%. Slash-and-burn or *jhum* cultivation, though discouraged, remains in practice in Mizoram and affects its topography.

26. Agriculture is the dominant economic activity of Mizoram, engaging more than two-thirds of the workforce in the early 21st century. Two types of agriculture are practiced: terrace cultivation, in which crops are planted on relatively permanent, graduated terraces on the sides of hills and mountains to conserve water and reduce soil loss; and shifting agriculture, in which tracts called jhum are cleared by burning, cultivated for a limited period of time, and then abandoned for a number of years to allow regeneration of the natural vegetation and nutrients in the soil. An increase in the number of people farming in the 20th century forced a reduction in the traditional eight-year cycle of Jhum regeneration, which in turn resulted in a decrease in farm productivity. Rice, corn (maize), cotton, and vegetables are the main crops.Land use pattern of the State is illustrated in **Table 3.3.**

Table 3.3: Land Use Pattern

Land Use	Area in '000 ha	Percentage
Total geographical area	2,108	
Reporting area for land utilization	2,075	100.00
Forests	1,585	76.39
Not available for cultivation	95	4.58
Permanent pastures and other grazing lands	5	0.24
Land under misc. Tree crops and groves	41	1.98
Culturable wasteland	7	0.34
Fallow lands other than current fallows	183	8.82
Current fallows	61	2.94
Net area sown	97	4.97

Source: Land Use Statistics, Ministry of Agriculture, GOI, 2011-12

27. Forest covers 19,054 sq. km. which is 90.38% of the State's geographical area. In terms of forest canopy density classes, the State has 138.00 sq.km. very dense forest, 5900 sq.km. moderately dense forest and 13,016 sq.km. open forest. The recorded forest area of the State is 16,717. sq.km. Reserve Forest constitute 7909 sq. km, Protected Forests constitute 3568 sq. km and un-classed forests constitute 5240 sq. km of the total Forest Area. This is tabulated in **Table 3.4**.

Table 3.4: District-wise Forest Cover

No.	District	Geographical Area	2013 Assessment(Area in km²)				Percent of GA	Scrub
			Very Dense Forest	Mod. Dense Forest	Open Forest	Total		
1.	Aizawl	3,575	30	1,168	2,051	3,249	90.88	0
2.	Champhai	3,185	60	1,058	1,647	2,765	86.81	0
3.	Kolasib	1,382	0	191	1,038	1,229	88.93	0
4.	Lawngtlai	2,557	0	704	1,646	2,356	91.93	0
5.	Lunglei	4,536	1	1,192	3,003	4,196	92.50	0
6.	Mamit	3,025	41	644	2,091	2,776	91.77	0
7.	Saiha	1,400	0	553	712	1,265	90.36	0
8.	Serchip	1,421	6	390	828	1,224	86.14	0
Total		**21,081**	**138**	**5,900**	**13,016**	**19,054**	**90.38**	**0**

Source: State Forest Report, 2013

3.5 Protected Areas Wetlands and IBA Sites

28. Mizoram has 10 protected area, out of which 2 are National Park (NP), 1 Tiger Reserve and remaining 7 are Wildlife Sanctuaries (WLS) covering an area of 1240.75 sq km, which is 5.88% of total geographical area. Lists of protected area including its size, location are presented in **Table 3.5** below;

Table 3.5: List of Protected Area

Sl. No.	Name of Protected Areas	Area in sq.km.	District
1	Murlen National Park	100	Champhai
2	Phawngpui National Park	50	Lawngtlai
3	Dampa Tiger Reserve	500	Mamit
4	Ngengpui Wildlife Sanctuary	110	Lawngtlai
5	Khawnglung Wildlife Sanctuary	35.75	Lunglei
6	Lengteng Wildlife Sanctuary	60	Champhai
7	Tawi Wildlife Sanctuary	35	Aizawl
8	Thorangtlang Wildlife Sanctuary	50	Lunglei
9	Pualreng Wildlife Sanctuary	50	Kolasib
10	Tokalo Wildlife Sanctuary	250	Saiha
Total		**1240.75**	

29. The Mizoram state has three types of (natural) lakes: valley lakes, tectonic/landslide lakes and artificial reservoirs. Palak lake, Tlawng river and Tamdil lake are the important wetlands of Mizoram. But the only lake of significance is Palak Dil, which is a natural lake in a depression in the hills. The forest around the lake is Tropical Wet Evergreen. Many of the nearby hills are covered by jhum (slash and burn cultivation), bamboo brakes as well as woody vegetation. An interesting feature of the forests surrounding the lake is the presence of low-lying swamps, which transform in to shallow lakes during the monsoon. The lake is surrounded by moderately steep hills. The area has Dipterocarp-dominated Tropical Evergreen Forest. The forests are rich in palms, rattans, dense cane-brakes and reeds along the lake margin. Locally in Mizoram, lakes are called dils. There are many such dils scattered all over the state, but they are tiny pools or marshy depressions such as Rengdil, Tamdil and Mampui Dil etc. The major Wetlands of State is presented in **Table 3.6**.

Table 3.6: Wetlands in Mizoram

No.	Name of the Wetland	District	Area in km^2	Important Flora and Fauna found
1.	Palak Dil. (Natural lake)	Saiha	26.85	A3 (Biome 9: Indo-Chinese Tropical Moist Forest) Recent research in this area has revealed the presence of 42 species of mammals and 136 species of avifauna including rare and threatened primates like the Phayre's leaf monkey (*Trachypithecus obscurus phayrei*) and the Western hoolock gibbon (*Hoolock hoolock hoolock*)
2.	Tamdil (River)	Aizwal	7.92	Surrounded by tropical evergreen and moist deciduous forest with species like Sehenia Wallichii, Chikrassia tabularis, Albizzia sp., Artocarpus sp., Merus sp., bamboos etc. Fish& plenty of prawns in this lake. In surrounding forests bear, deer, wild pig and common avifauna are found.

Source: National wetland Atlas Mizoram 2012 (MoEF)

30. Mizoram is very rich in bird life. About 275 species of birds from 39 families have been recorded so far. Major threatened species found in the State are Blyth's Tragopan, Mrs. Hume's Pheasant, Dark-Rumped or Khasi Hills Swift and Rufousnecked Hornbill. The list of IBA Sites in the State along with IBA Criteria is presented in table below;

S. No	IBA Site name	IBA Criteria
1.	Blue Mountain (Phawngpui) National Park	A1, A2
2.	Dampa Tiger Reserve	A2
3.	Lengteng Wildlife Sanctuary	A1, A2
4.	Murlen National Park	A1, A2
5.	Ngengpui Wildlife Sanctuary	A3
6.	Palak Lake	A3

31. Despite high literacy rate, Mizoram, as a whole, is economically backward. This is largely due to unfavourable natural environment, poor and inadequate communication network. The mountainous terrain has more or less isolated the state from the rest of the country and also inhibited improved communications within the state. The economy is agro-based and items produced in the households are primarily of low value and cater to the local needs. The jhum (shifting) cultivation of the state produces a number of varieties of agricultural products ranging from paddy to pineapples. The principal crop is paddy and others are maize, cucumber, beans, arum, ginger, mustard, sesame, cotton etc. After clearing the burnt jhum, seeds for crops other than paddy are sown. Towards the end of April near the full moon time, paddy is sown. Mainly two types of paddy seeds are sown in the same field - early paddy and principal paddy. Yield of early paddy is rather poor but it ripens early and provides sustenance till the principal paddy is harvested.

32. Mizoram gross state domestic product (GSDP) in 2011-2012 was about ₹6991 crores (US$1.1 billion).The state's gross state domestic product (GSDP) growth rate was nearly 10% annually over 2001-2013 period. With international borders with Bangladesh and Myanmar, it is an important port state for Southeast Asian imports to India, as well as exports from India. The biggest contributors to state's GSDP growth are Agriculture, Public Administration and Construction work. Tertiary sector of service sector continued to have the contribution to the GSDP with its share hovering between 58 per cent and 60 per cent during the past decade. As of 2013, according to the Reserve Bank of India, 20.4% of total state population is below poverty line, about same as the 21.9% average for India. Rural poverty is significantly higher in Mizoram, with 35.4% below the poverty line compared to India's rural poverty average of 25.7; while in urban areas of Mizoram, 6.4% are below the poverty line. The state is developing its Kolodyne River for navigation and international trade. The State is a power deficit state, with plans to develop its hydroelectric potential. After agriculture, the major employers of its people include handloom and horticulture industries. Tourism is a growth industry. In 2008, the State had nearly 7,000 registered companies. The state government has been implementing Special Economic Zones (SEZs) to encourage economic growth.

3.6 Power Scenario

33. The State has predominantly two sources of power; one being its own hydel generation of about 29.35MW (out of its 11 SHP) and another from Central Sector allocation of 64.53 MW The present peak demand of the State is 178MW. There remains a shortfall of about 84MW.

34. PEDM is having 729 km length of 132kV, 117 km of 66kV transmission lines and 7 nos. of 132kV Grid substation with transformation capacity of 140.6 MVA. It has over 1170 km of 33kV

line, 5045 km of 11kV lines, 2747.59 km length of LT lines, 45 nos. of 33kV Grid S/S and more than 1630 nos. of various capacities of Distribution Transformers across the entire State with transformation capacity of 146.9 MVA. The Department serves power supply to nearly 2 lakhs consumers and the per capita consumption at the end of 11th Plan is 252 kWh. At the end of 12th Plan, number of consumers is projected at 2, 55,561 nos. and per capita consumption is projected to be 318 Kwh.

35. In order to provide quality power supply and service at affordable cost together with sustainable development practices PEDM has undertaken many proactive and bold initiatives like covering 100% household electrification, Automated Metering Infrastructure (AMI) for Residential implementation of system strengthening under Restructured Accelerated Power Development Reform Programme(RAPDRP) and Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY).

3.7 Road Ahead

36. The State is endowed with hydropower potentiality for power generation of about 4000 MW without much damage to environment. Present peak demand of the State is 178MW. Own generation is 29.35. PEDM gets about 64.53 MW from Central Power sector allocation out of allocation of 132.3 MW including about 10.5 MW from Tripura. There remains a shortfall of about 84MW. To cater the shortfall, PEDM is executing Tlawva SHP (2x2.5 MW) which will be completed and commissioned by 2014-2015. Another Tuirial HEP (60 MW) is on-going project executed by NEEPCO and the project is scheduled to be completed during the 12th five-year plan. Tuivai HEP (210 MW) is also in the pipeline and the project shall be taken up in the State Sector on PPP Mode under VGF policy of GoI. So efforts are underway not only to bridge the gap but also to ensure that adequate power is made available to enable boosting of State economy.

37. To achieve such ambitious target/ goal, Mizoram has planned for major expansion and augmentation of its transmission and distribution network with sustainability for which ESPP has been designed to identify, address, and mitigate any adverse environmental and social issues during project implementation. Details of proposed expansion/augmentation of power system network in the State of Mizoram with the financial support amounting to Rs. 298 Crores from GoI and World Bank is placed at **Annexure-2**.

4. Stakeholder Analysis

38. The prime objective of the proposed investment is to strengthen the power sector in the State of Mizoram and capacity building to achieve sustainable development in the long term. The implementations of schemes with proposed investments are expected to facilitate power delivery to remote/virgin areas, to enhance the capacity & reliability of the system, to improve voltage profile & to reduce losses and ultimately to enhance satisfaction for all categories of consumers which in turn will spur growth & overall development in the whole State. The scheme is aimed to fulfill the above objectives in the following way:

- To feed the remote or unconnected areas.
- To meet the growing demand, both in domestic & industrial segments.
- To improve reliability and quality of power through bi-furcation/trifurcation of existing 11kV very long overloaded feeders and connection of the different sections of 11 kV feeder/ line so formed to new substations.
- To improve availability of power by augmenting the capacity of existing overloaded power transformers.
- Reduction in technical losses due to improvement in voltage profile/power quality.

39. Stakeholder's analysis has been undertaken to identify the issues and the concerns of various stakeholders who are supposed to be either directly or indirectly impacted/benefited or assume a position wherein they can have a significant role to play on project implementation. The Stakeholder's analysis has been carried out to identify existing relationship and also to understand the roles, responsibilities and relations of these stakeholders in context of shaping the environment and social issues with respect to proposed project. The details of the key stakeholders identified at various levels from national level up to village/panchayat level and their issues & expectations with respect to proposed project has been provided in **Table 4.1.** The process of consultation with stakeholders involves formal and informal discussion. A wide range of issues were discussed with various stakeholders that might have environmental/ social concern. These are listed below.

Table 4.1: Key Stakeholders and their expectations/issues

No.	Levels	Key Stakeholders	Expectations and Issues
A	National Level	Government of India	Improvement of overall power scenario of State and timely implementation of project to achieve the intended objective.
		Ministry of Power	

No.	Levels	Key Stakeholders	Expectations and Issues
		World Bank	Strengthening of T&D networks of State & Capacity development of Utility and ensuring implementation of environment and social safeguards.
		POWERGRID	Would expect active support from state utility and other stakeholders for timely implementation of project with intended benefits like providing electricity supply to remote or unconnected area
B	Regional Level	DONER	Economic development of the North Eastern region
		NEC	
C	State Level	Power & Electricity Department	Availability of land and other clearances for timely implementation projects. Capacity building activities to enable undertaking such projects on their own in future.
		Tribal Welfare Department	Ensuring protection of Mizo customary laws, religious and social practice due to proposed intervention. Proper implementation of welfare measures and policy initiatives as envisaged in the applicable legislation with structured and continuous consultation on project activities.
		State Forest Department	Protection of forest and protected areas, timely processing of approvals for utilization of forest land with minimum loss or implication to State forest
		Utilities like Water supply, PHE, Oil & Gas, etc.	During implementation –coordination for timely shifting of utilities as necessary and secured power supply to enhance efficiency of their activities.
		State Legal Department	Ensuring that all the activities do take place as per the law of the land. Issuance of the proper guidelines and timely interpretations of the legalities, as appropriate
		Local NGOs	Proper information dissemination at the local community level and act as watch dog to oversee implementation as per applicable legal provisions.
		Media	Coordination for information dissemination
D	District Level	District Administration-Revenue Department	Project intervention would ensure requirement of minimum land area and affect minimum people as far as possible. Regular co-ordination/ consultation between implementation agency and projected affected persons for early resolution of grievances & conflict management.
E	Village Level	Village council heads, members, etc.	Implementation of project in their area would create employment and increase business opportunity to local and development of area though better accessibility of quality and reliable supply of power.

No.	Levels	Key Stakeholders	Expectations and Issues
			Protection of right of the affected persons and early resolution of grievances during project implementation. Proper coordination and approvals for utilization/acquisition of land from village council and for carrying out other physical interventions in these areas as necessary.
		Informal groups	Local community leaders, elders, community groups, women groups etc be involved and consulted to address issues related to compensation, employment opportunity due to project activity and coordination as necessary.
		Women	Women groups – be included in all consultation and be made part of decision making process related to project in their domain.
		Others	Ensuring recognition and protection of their institutions, property, social, cultural, religious values and practices

5. Issues, Impacts and Management Measures – Social

40. Key social/institutional issues emanating from stakeholder analysis relate to the following:

- Securing/Alienation of land for substation;
- Temporary damages to land, crops, trees or structures during construction;
- Community participation during project cycle i.e. planning, implementation and operation;
- Health and Safety risk including HIV/AIDS;
- Locals, Women and Inter agency participation/coordination.

5.1 Impacts – Social

41. This section identifies the potential social impacts of the proposed projects in terms of the nature, magnitude, extent and location, timing and duration of the anticipated impacts. These impacts are both positive or negative relating to the project design stage, construction stage or the project operation and decommissioning stage.

i. Positive Impacts

- Employment creation;
- Improved and reliable power supply;
- Increased economic activity;
- Improved road infrastructure;
- Gender – Access to electricity would improve the quality of life and also reduce the time consumption of women for household activities which will entail availability of more time for other activities;
- Less reliance of fossil fuels like firewood, charcoal etc.;
- Capacity Building.

ii. Negative Impacts

- Loss of land;
- Restriction of land use;
- Temporary loss of access to Common Property Resources and
- Health and Safety risk including HIV/AIDS.

5.2 Management Framework – Social

42. Based on the issues to be addressed and impacts likely to occur, appropriate management measures have been drawn for implementation to mitigate the possible impacts due to proposed project interventions. While for positive impacts, enhancement measures are suggested; for negative impacts suitable mitigation measures has been included. Details of potential socials issues and its management framework and measures are outlined in ESPP. Apart from this PEDM has developed a standard Environment Management Plan (Refer Annex.- A attached in ES) for its transmission and distribution projects which shall be made part of contract document for proper implementation by the Contractor. Summary of potential social issues and corresponding management measures is provided below in **Table – 5.1**. Key principles governing the drawing of management measures and some 'definitions' are presented initially for a better reading of the measures.

5.3 Principles

43. The basic principles that guide this Social Management Framework (SMF) are:

- Avoidance socially sensitive areas while planning project activities;
- Minimization of impacts when project activities occur in socially sensitive areas;
- Mitigation of any unavoidable negative impacts arising out of its projects;
- Optimization of land requirement; and
- Greater transparency through involvement of community and other stakeholders through consultation.

5.4 Definitions

44. Following definitions will be applicable unless otherwise stated specifically;

"Administrator" means an officer appointed for the purpose of rehabilitation and resettlement of affected families under sub-section *(l*) of section 43;

"Affected area" means such area as may be notified by the appropriate Government for the purposes of land acquisition;

"Affected family" includes;

i) a family whose land or other immovable property has been acquired;

ii) a family which does not own any land but a member or members of such family may be agricultural labourers, tenants including any form of tenancy or holding of usufruct right, share-croppers or artisans or who may be working in the affected area for three years prior to

the acquisition of the land, whose primary source of livelihood stand affected by the acquisition of land;

iii) the Scheduled Tribes and other traditional forest dwellers who have lost any of their forest rights recognised under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 due to acquisition of land;

iv) family whose primary source of livelihood for three years prior to the acquisition of the land is dependent on forests or water bodies and includes gatherers of forest produce, hunters, fisher folk and boatmen and such livelihood is affected due to acquisition of land;

v) a member of the family who has been assigned land by the State Government or the Central Government under any of its schemes and such land is under acquisition;

vi) a family residing on any land in the urban areas for preceding three years or more prior to the acquisition of the land or whose primary source of livelihood for three years prior to the acquisition of the land is affected by the acquisition of such land;

"Appropriate Government" means,—

i) in relation to acquisition of land situated within the territory of, a State, the State Government;

ii) in relation to acquisition of land situated within a Union territory (except Puducherry), the Central Government;

iii) in relation to acquisition of land situated within the Union territory of Puducherry, the Government of Union territory of Puducherry;

iv) in relation to acquisition of land for public purpose in more than one State, the Central Government, in consultation with the concerned State Governments or Union territories; and

v) in relation to the acquisition of land for the purpose of the Union as may be specified by notification, the Central Government:

Provided that in respect of a public purpose in a District for an area not exceeding such as may be notified by the appropriate Government, the Collector of such District shall be deemed to be the appropriate Government;

"Authority" means the Land Acquisition and Rehabilitation and Resettlement Authority established under section 51;

"Collector" means the Collector of a revenue district, and includes a Deputy Commissioner and any officer specially designated by the appropriate Government to perform the functions of a Collector under this Act;

"Commissioner" means the Commissioner for Rehabilitation and Resettlement appointed under sub-section (/) of section 44;

"Cost of acquisition" includes;

i) amount of compensation which includes solatium, any enhanced compensation ordered by the Land Acquisition and Rehabilitation and Resettlement Authority or the Court and interest payable thereon and any other amount determined as payable to the affected families by such Authority or Court;

ii) demurrage to be paid for damages caused to the land and standing crops in the process of acquisition;

iii) cost of acquisition of land and building for settlement of displaced or adversely affected families;

iv) cost of development of infrastructure and amenities at the resettlement areas;

v) cost of rehabilitation and resettlement as determined in accordance with the provisions of this Act;

vi) administrative cost,—

a) for acquisition of land, including both in the project site and out of project area lands, not exceeding such percentage of the cost of compensation as may be specified by the appropriate Government;

b) for rehabilitation and resettlement of the owners of the land and other affected families whose land has been acquired or proposed to be acquired or other families affected by such acquisition;

c) cost of undertaking 'Social Impact Assessment study':

"Displaced family" means any family, who on account of acquisition of land has to be relocated and resettled from the affected area to the resettlement area;

"Family" includes a person, his or her spouse, minor children, minor brothers and minor sisters dependent on him:

Provided that widows, divorcees and women deserted by families shall be considered separate families;

"Holding of land" means the total land held by a person as an owner, occupant or tenant or otherwise;

"Infrastructure project" shall include any one or more of the items specified in clause *(b)* of sub-section (7) of section 2:

"Land" includes benefits to arise out of land, and things attached to the earth or permanently fastened to anything attached to the earth;

"Landless" means such persons or class of persons who may be,—

i) considered or specified as such under any State law for the time being in force; or

ii) in a case of landless not being specified under sub-clause (0. as may be specified by the appropriate Government;

"Land owner" includes any person,—

i) whose name is recorded as (he owner of the land or building or part thereof, in the records of the authority concerned; or

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

iii) who is entitled to be granted Patta rights on the land under any law of the State including assigned lands: or

iv) any person who has been declared as such by an order of the court or Authority;

"Local authority" includes a town planning authority (by whatever name called) set up under any law for the time being in force, a Panchayat as defined in article 243 and a Municipality as defined in article 243P, of the Constitution;

"Marginal farmer" means a cultivator with an un-irrigated land holding up to one hectare or irrigated land holding up to one-half hectare:

"Market value" means the value of land determined in accordance with section 26;

"Notification" means a notification published in the Gazette of India or, as the case may be, the Gazette of a State and the expression "notify" shall be construed accordingly;

"Patta" shall have the same meaning as assigned to it in the relevant Central or State Acts or rules or regulations made thereunder;

"Person interested" means—

i) all persons claiming an interest in compensation to be made on account of the acquisition of land under this Act;

ii) the Scheduled Tribes and other traditional forest dwellers, who have lost any forest rights recognised under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006;

iii) a person interested in an easement affecting the land;

iv) persons having tenancy rights under the relevant State laws including share-croppers by whatever name they may be called; and

v) any person whose primary source of livelihood is likely to be adversely affected;

"Project" means a project for which land is being acquired, irrespective of the number of persons affected;

"Public purpose" means the activities specified under sub-section (/) of section 2;

"Requiring Body" means a company, a body corporate, an institution, or any other organisation or person for whom land is to be acquired by the appropriate Government, and includes the appropriate Government, if the acquisition of land is for such Government either for its own use or for subsequent transfer of such land is for public purpose to a company, body corporate, an institution, or any other organisation, as the case may be, under lease, licence or through any other mode of transfer of land;

"Resettlement Area" means an area where the affected families who have been displaced as a result of land acquisition are resettled by the appropriate Government;

"Scheduled Areas" means the Scheduled Areas as defined in section 2 of the Provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996;

"Small farmer" means a cultivator with an un-irrigated land holding up to two hectares or with an irrigated land holding up to one hectare, but more than the holding of a marginal farmer.

Table 5.1: Management Measures to address Potential Social Issues

No	Potential Issues	Management Measures
1	Loss of land	For Trenche-1, this is not an issue as land for construction of all proposed transmission and distribution substations are already available with PEDM (for details refer **Table-5.4**). As there is no acquisition of fresh land is involved, physical relocation/displacement is not envisaged.
2	Change in land use and population relocation for substations	Due to inherent flexibility in locating substation and very small size of land, PEDM avoids habituated area completely hence no physical relocation/displacement of population on account of setting up of substation is envisaged.
		However, securing lands may be an issue for subsequent investments under future tranches as well as those supported with other sources of finance. Keeping in this in view, and in case, lands may have to be secured, the same it can be

No	Potential Issues	Management Measures
		accomplished through following three methods; (iv) Purchase of land on willing buyer & Willing Seller basis on negotiated rate; (v) Voluntary Donation; and (vi) Involuntary Acquisition. In case of procurement of land through private purchase, PEDM shall ensure that compensation/rate for land is not less than the rate provided in the new land acquisition act, 2013. In order to comply with this provision PEDM may organize an awareness camp where provisions of new act in respect of basis/modalities of compensation calculation shall be explained to land owners with specific State provision if any. In the case of voluntary donation of land, the following shall be ensured: • The land user(s) will not be subjected to undue pressure for parting of land; • All out efforts shall be made to avoid any physical relocation/displacement due to loss of land; • The PEDM shall facilitate in extending 'gratitude' to the land donor(s) in lieu of the 'contribution' if so agreed. The same shall be documented in the shape of MoU between donor and utility and subsequently title of land transferred in the name of PEDM. • All land donations (as well as purchases) will be subject to a review/ approval from a committee comprising representatives of different sections including those from the IA and GoM. In case of land acquired through involuntary acquisition, provisions of RFCTLARRA, 2013 shall be followed. (for details refer **Part -A** of Social Management Framework placed as **Annexure – 3**). However, the same will be applicable only when the new act is adopted by State Legislative Assembly (**refer para 24**).
3	Change in land use and population relocation due to towers/ poles	As per existing law, land for tower/pole and right of way is not acquired and agricultural activities are allowed to continue after construction activity and PEDM pays compensation for all damages including cost of land below tower to its owner without acquiring it. Hence change in land use and resultant relocation of people is not envisaged in T&D projects.
4	Right of Way	Land for tower and right of way is not acquired as agricultural activities can continue. However, the project shall pay full

No	Potential Issues	Management Measures
		compensation to all the affected persons/ community for any damages sustained during the execution of work. Accordingly, PEDM has formulated appropriate management plan in the form of Compensation Plan for Temporary Damage (CPTD) to minimize the damages and provide compensation plan for temporary damages in consultation with the state government and affected persons and/ or community (for details refer **Part – B** of Social Management Framework placed as **Annexure – 3**)..
5	Impact on Tribal	As it is evident from the Census of India, 2011, that the tribal population constitutes > 94% of the state total population therefore the intended benefits due to this project implementation (providing a basic amenity like power) would enhance the living standard and quality of life in general for the tribal population in the region. It is also pertinent to mention that the tribal population in the state has their own self-governance system through ADC/VDC with administrative, judiciary and customary rights as per provisions of the Sixth Schedule of the Constitution of India. Any physical interventions (related to land acquisition and CPTD) in the scheduled areas, in particular and tribal areas, in general, in such region can only be implemented with the prior consent of the ADC/VDC. Thus, it is further substantiated that the process of implementation as provided in the project cycle indicates this approval process as an integrated activity of the social mitigation plan as necessary. Further, RFCTLARRA 2013 also stipulates additional provisions related to tribals and scheduled areas. All these are detailed in a TPDF (**Anneuxre-3, Part-C)**[8]. Moreover, no fresh land acquisition is involved for tranche-I projects as the land for all proposed substations is already in possession of PEDM.
6	Gender/ women participation	Women involvement will be planned through formal and informal group consultations so that their participation is ensured during preparation and implementation of the project.
7	Induced secondary development during construction	PEDM operations are short-lived and do not induce secondary developments during construction.
8	Health and safety of worker/employee/community	During construction the health and safety aspects of workers and nearby community shall be implemented through contractors with due diligence and compliance of required regulation/guideline through a safety plan PEDM uses best available technology for lines and do not cause any hazards to

[8] All the provisions will become applicable only if tribal land is acquired involuntarily by invoking provisions of this act.

No	Potential Issues	Management Measures
		health and safety.
9	"Chance finds" or discovery of any archaeological artifacts, treasure etc. during excavation	Possibilities of such phenomenon in T&D project are quite remote due to limited and shallow excavations. However, in case of such findings, PEDM will follow the laid down procedure in the Section-4 of Indian Treasure Trove Act, 1878 as amended in1949.

45. Implementation viz., operationalization of the management measures necessarily needs to be done in the realm of regional/ national/ international legal and regulatory stipulations. The same is discussed below.

5.5 Legal and Regulatory Framework

46. The applicable acts, rules, and relevant policies in the context of the project are presented in **Table- 5.2.** The Project Authority will ensure that project implementation is consistent with provision of such legal framework**.**

Table – 5.2 : Legal and Regulatory Provisions - Social

No.	Acts, Regulations and Policies	Relevance/ Applicability to the project
1. Constitutional Provisions		
1	6th Schedule of the Constitution	Provisions provide Special Power to ADC Area for the support/ development of Tribal. Any activity sited in ADC area needs their consent. The Sixth Schedule provides for administration of tribal areas as autonomous entities. The administration of an autonomous district is vested in a District Council and of an autonomous region, in a Regional Council. These Councils are endowed with legislative, judicial, executive and financial powers. These institutions were expected to integrate these areas with the modern system of administration while preserving the traditional autonomy and local self-governing institutes of the tribal people.
2.	Article 371 A of the Indian Constitution	Provisions provide Special Power to Legislative Assembly to make laws regarding the religious and social practice, ownership and transfer of land and its resource. The laws enacted by Parliament would only apply to the state once it is adopted by State Legislative Assembly.
II. Provisions of Law of the Land		
3.	The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act,	The Act provides for enhanced compensation and assistances measures and adopts a more consultative and participatory approach in dealing with the Project Affected Persons. This act is currently not applicable in the State as the State Legislative Assembly has not yet adopted the resolution regarding applicability of new act as per provision under article 371G of the constitution of India. As per past experience it has been noticed that the

No.	Acts, Regulations and Policies	Relevance/ Applicability to the project
	2013	process of adoption of central act takes time due to involvement of elaborate consultation for arriving consensus. As and when this Act becomes applicable and adopted by the State of Mizoram then PEDM, GoM too shall be bound by and would need to comply with relevant provisions of the Act. The salient features of the provisions of the new RFCTLARRA, 2013 are given in **Annexure- 4.**
4.	Electricity Act, 2003 (EA, 2003)	Transmission line projects are constructed under the ambit of Electricity Act, 2003 following the provisions of Section 67 & 68 of act. Under the provisions of Section 68(1):-Prior approval of the Govt. of Mizoram (GoM) is a mandatory requirement to undertake any new project in the State which authorizes PEDM to plan and coordinate activities to commission a new transmission/distribution project. The electricity act under Section 164 has a provision to grant licensee the power of Telegraph Authority as provided in the Indian Telegraph Act, 1885[9]. Govt. of Mizoram on request of PEDM may by order in writing/through notification authorize them for using powers of telegraph authority after fulfilling the requirement as laid down in the rules thereof. The salient features of the Electricity Act 2003 are given in **Annexure- 5**.
5.	Rights of Way (RoW) and Compensation	In case of agricultural or private land damages, Section-67 and or Section-68 (5 & 6) of the Electricity Act, 2003 and Section-10 of the Indian Telegraph Act, 1885 if vested with power under section 164 of the Electricity Act are followed for assessment and payment of compensation towards such damage.
6.	The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	The act recognizes and vests the forest rights and occupation in forest land to forest dwelling. Scheduled Tribes and other traditional forest dwellers who have been residing in such forests for generations but whose rights could not be recorded, and provides for a framework for recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land. The definitions of forest dwelling Schedule Tribes, forestland, forest rights, forest villages, etc. have been included in Section 2 of the Act. The Union Ministry of Tribal Affairs is the nodal agency for implementation of the Act while field implementation is the responsibility of the government agencies. The applicability of this act has also been linked with forest clearance process under Forest (Conservation) Act, 1980 w.e.f. August 2009 by MoEF shall be complied by PEDM.
7.	The Mizoram (Land Revenue) Act, 2013	The act provides for procedure to be followed in case of allotment of land, its tax collection etc. It also specifically mention about the land not to be processed for allotment within the areas of 800 metres measuring from the

[9] POWERGRID, the designated Implementing Agency has already been vested with powers of telegraph authority by GoI vide Gazette Notification dated Dec.24, 2003.

No.	Acts, Regulations and Policies	Relevance/ Applicability to the project
		centre on either side of the following rivers, which may alter the transmission alignment in some cases. (a) Tlawng; (b) Tut; (c) Teirei; (d) Langkaih;(e) Chemlui; (f) Serlui; (g) Tuivawl; (h) Tuirini; (i) Tuirial; (j) Kau;(k) De; (l) Phairuang; (m) Tuiruang ; (n) Khawthlangtuipui;(o) Mat; (p) Tuichang (Lunglei District); (q) Tuichang ; (r) Tuipui;(s) Tiau.
8.	Mizoram (Prevention of Government Land Encroachment) Act, 2001	This Act is applicable to the whole of Mizoram excepting the areas of the Autonomous District Councils under the Sixth Schedule to the Constitution of India. This act is not directly applicable to transmission projects because it deals with the prevention and penalty for encroachment on government land.
9.	The Right to Information Act, 2005	The Act provides for setting out the practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, the constitution of a Central Information Commission and State Information Commissions and for matters connected therewith or incidental thereto.
10.	Indian Treasure Trove Act, 1878 as amended in 1949	The act provides for procedures to be followed in case of finding of any treasure, archaeological artifacts' etc. during excavation. Possibilities of such discoveries are quite remote due to limited and shallow excavations. However, in case of such findings, PEDM will follow the laid down procedure in the Section-4 of act.
11..	Workman's Compensation Act, 1923	The act specifies the employer's liability for compensation to the employee in several situations.
III. World Bank OP (Operational Policy)		
11.	OP 4.12 – Involuntary Resettlement	This policy covers direct economic and social impacts that both result from Bank-assisted investment projects, and are caused by the involuntary taking of land. To avoid or minimize involuntary resettlement and, where this is not feasible, assist displaced persons in improving or at least restoring their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. Comparison between World Bank Policy (OP 4.12) Requirements and RFCTLARR Act, 2013 is placed in **Table 5.3**
9.	OP 4.10 – Indigenous Peoples	This policy contributes to the Bank's mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of Indigenous Peoples. The Bank provides project financing only where free, prior, and informed consultation results in broad community support to the project by the affected Indigenous Peoples. Such Bank-financed projects include measures to (a) avoid potentially adverse effects on the Indigenous Peoples' communities; or (b) when avoidance is not feasible, minimize, mitigate, or

No.	Acts, Regulations and Policies	Relevance/ Applicability to the project
		compensate for such effects Bank-financed projects are also designed to ensure that the Indigenous Peoples receive social and economic benefits that are culturally appropriate and gender and inter generationally inclusive. The project shall ascertain broad community support for the project based on social assessment and free prior and informed consultation with the affected Tribal community, if any.

Table – 5.3: Analysis of Requirements under WB Policy (OP 4.12) and RFCTLARR Act, 2013

S. N	World Bank Involuntary Resettlement Requirement	RFCTLARRA, 2013	Remarks and provisions in RFCTLARRA, 2013
Policy objectives			
1	Avoid involuntary resettlement (IR) wherever feasible	√	Social Impact assessment (SIA) should include: (i) whether the extent of land proposed for acquisition is the absolute bare minimum extent needed for the project; (ii) whether land acquisition at an alternate place has been considered and found not feasible. **[Section 4 sub-section 4(d) and 4(e)]**
2	Where resettlement cannot be avoided, resettlement activities should be conceived and executed as a development programme by providing sufficient resources to enable Affected Persons (APs) to share in project benefits.	√	The cumulative outcome of compulsory acquisition should be that affected persons become partners in development leading **[Preamble of the RFCTLARR Act]**
3	APs should be meaningfully consulted and provided opportunities to participate in planning and implementing resettlement programs.	√	Whenever a SIA is required, the appropriate Government shall ensure that a public hearing is held at the affected area, after giving adequate publicity about the date, time and venue for the public hearing, to ascertain the views of the affected families to be recorded and included in the SIA Report. **[Section 4 (1), 5, 45 (2)]**
4	APs should be assisted in their efforts to improve their livelihoods and standards of living, or at least restore them, to pre-displacement levels or to pre-project levels.	√	The cumulative outcome of compulsory acquisition should be that affected persons become partners in development leading to an improvement in their post acquisition social and economic status and for matters connected therewith or incidental thereto. **[Preamble of the RFCTLARR Act]**
Coverage of Impacts			
5	Involuntary taking of land resulting in loss of income sources or means of livelihood, whether or not the	√	Preamble of the said Act envisages restoration of livelihood as one of the guiding principle. In the definition of affected family in includes 'a family which does not own any land but a

	affected persons must move to another place		member or members of such family may be agricultural labourers, tenants including any form of tenancy or holding of usufruct right, sharecroppers or artisans or who may be working in the affected area for three years prior to the acquisition of the land, whose primary source of livelihood stand affected by the acquisition of land; and further, a distinction is made between affected family and displaced family in the definition (i.e) a displaced family means any family, who on account of acquisition of land has to be relocated and resettled from the affected area to the resettlement area. **[Section 3 sub-section c (ii) and k]**
	Involuntary taking of land resulting in loss of assets or access to assets		In the definition of affected family, it includes 'a family whose land or other immovable property has been acquired' **[Section 3 sub-section c (i)]**
6	Involuntary restriction of access to of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons.	√	In the definition of affected family in includes 'family whose primary source of livelihood for three years prior to the acquisition of the land is dependent on forests or water bodies and includes gatherers of forest produce, hunters, fisher folk and boatmen and such livelihood is affected due to acquisition of land' **[Section 3 sub-section c (vi)]**
Eligibility Criteria			
7	Those who have formal legal rights to land (including customary and traditional rights recognized under the laws of the country)	√	In the definition of affected family, it includes 'a family whose land or other immovable property has been acquired' **[Section 3 sub-section c (i)]**
8	Those who do not have formal legal rights to land **at the time the census begins but have a claim to such land or assets--provided that such claims are recognized under the laws of the country or become recognized through a process identified in the resettlement plan**	√	In the definition of affected family, it includes 'the Scheduled Tribes and other traditional forest dwellers who have lost any of their forest rights recognized under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 due to acquisition of land'; and also includes 'a member of the family who has been assigned land by the State Government or the Central Government under any of its schemes and such land is under acquisition'; a family which does not own any land but a member or members of such family may be agricultural laborers, tenants including any form of tenancy or holding of usufruct right, share-croppers or artisans or who may be working in the **affected area for three years prior to the acquisition of the land**; a family residing on any land in the urban areas for preceding three years or more prior to the

			acquisition of the land or whose primary source of livelihood **for three years prior to the acquisition** of the land is affected by the acquisition of such land **[Section 3 sub-section c (ii),(iii) and(v)]**
Measures/Entitlements			
9	Ensure APs are informed about their options and rights pertaining to resettlement	√	Whenever a SIA is required, the appropriate Government shall ensure that a public hearing is held at the affected area, after giving adequate publicity about the date, time and venue for the public hearing, to ascertain the views of the affected families to be recorded and included in the SIA report. **[Section 5]**
10	Ensure APs are provided prompt and effective compensation at full replacement cost for losses of assets attributable directly to the project.	√	Though explicitly not stated, the compensations are expected to be much more than replacement costs. Total compensation and monetary benefits under R & R have to paid to PAPs before possession of land is granted. **{Section -38 (1)}**
11	If there is physical relocation, provide APs with (i) assistance(such as moving allowances) during relocation; and (ii) residential housing, or housing sites, or, as required, agricultural sites for which a combination of productive potential, locational advantages and other factors is at least equivalent to the advantages of the old site.	√	The Rehabilitation and Resettlement Award shall include all of the following..... (c) particulars of house site and house to be allotted, in case of displaced families; (d) particulars of land allotted to the displaced families; (e) particulars of one time subsistence allowance and transportation allowance in case of displaced families. **[Section 31 sub-section 2(c), (d) and (e)] and schedule-3**
12	Provide relocation assistance to displaced persons	√	Each affected family is to be given one time Resettlement Allowance of Rs. 50,000/-
13	Particular attention to be paid to the needs of vulnerable groups among those displaced, especially those below the poverty line, the landless, the elderly, women and children, indigenous peoples, ethnic minorities, or other displaced persons who may not be protected through national land compensation legislation	√	The act provides for special provisions and assistance for scheduled caste and scheduled tribe in scheduled area. **[Section 41]** Further the act recognizes widows, divorcees and women deserted by families as separate families **[Section sub-section (m)]**
14	Provision of compensation and of other assistance required for relocation, prior to displacement, and	√	Total compensation and monetary benefits under R & R have to paid to PAPs before possession of land is granted. **{Section -38 (1)}.**

	preparation and provision of resettlement sites with adequate facilities, where required. In particular, taking of land and related assets may take place only after compensation has been paid and, where applicable resettlement sites and moving allowances have been provided to the displaced persons.		
15	Preference should be given to land- based resettlement strategies for displaced persons whose livelihoods are land-based.	√	Land for land is recommended in irrigation projects and in projects where SC/ST is involved equivalent land. [**Section 41 &Second Schedule S.No.2]**
16	Cash compensation levels should be sufficient to replace the lost land and other assets at full replacement cost in local markets.	√	Method of valuation of land and considering the higher value as base with multiplying factor of 1-2 and the 100 solatium with 12% interest comes out to be more than replacement cost for land. For structure, tree and crops, valuation by appropriate authority will be equivalent to replacement value with provision of expert assistance. **[Section 26 sub-section 1 and 2, Section 29 and Section 30]**
17	Appropriate and accessible grievance mechanisms are established for these groups.	√	For the purpose of providing speedy disposal of disputes relating to land acquisition, compensation, rehabilitation and resettlement, establish by notification. one or more Authorities to be known as "the Land Acquisition, Rehabilitation and Resettlement Authority" **[Section 51 sub-section 1]**
18	In new resettlement sites or host communities, infrastructure and public services are provided as necessary to improve, restore, or maintain accessibility and levels of service for the displaced persons and host communities.	√	In every resettlement area as defined under this Act, the Collector shall ensure the provision of all infrastructural facilities and basic minimum amenities specified in the Schedule-3 of the Act. **[Section 32]**
19	Disclose the resettlement plan, including documenta-tion of the consultation in an accessible place and a form and language(s) understand-able to affected persons and other stakeholders.	√	Discloser of R&R Scheme along with records of public hearing to be put in public domain by uploading on specified website as well as placement in Panchayat/ Municipality in **vernacular language**. **{ Sec. 19 (4)}**
20	Monitor and assess resettlement outcomes, their	√	Provision of post implementation social audit by R&R Commissioner Rehabilitation &

	impacts on the standards of living of displaced persons.		Resettlement Committee to carry out post implementation social audit in consultation with Gram Sabha/ Municipality. **{ Sec. 44 (3) & 45}**

5.6 Mitigation Measures

47. The likely/associated social impact of transmission & distribution line projects are not far reaching and are mostly localized to near vicinity/ ROW. Many such impacts can be minimized through careful route selection and siting of substations. Sound design/ engineering variations also play a major role in planning effective mitigative measures depending upon the site situation/location. The major social issues that need attention and proper care under this project are as follows;

a) Substation: Land for all substations are already in the possession of PEDM and no fresh land is needed for any of the subprojects under Tranche 1. Hence issue related to acquisition of land including possible Rehabilitation and Resettlement (R&R) are not envisaged. Details of land availability status of substations are provided in **Table - 5.4**.

Table - 5.4: Land Availability for Substation

Sl. No.	Name of the Substation	Scope of work	Land Status
A. Transmission Substation			
1	132/33 kV Lungsen	New	Land is already available with PEDM and no new lands are to be acquired.
2	132/33 kV W.Phaileng	New	
3	132/33 kV Marpara	New	
4	132/33 kV Lunglei	Augmentation	
B. Distribution Substation			
1	33/11 kV S.Bungtlang	New	Land is in possession with PEDM, thus no new lands are to be acquired.
2	33/11 kV W.Phaileng	Augmentation	

Thus, 'lands' is not an issue in Tranche-1. However, securing lands may be an issue for subsequent investments under future tranches as well as those supported with other sources of finance. Keeping in this in view, and in case, lands may have to be secured, the same can be accomplished through following three methods;

i) Purchase of land on willing buyer & Willing Seller basis on negotiated rate;

ii) Voluntary Donation; and

iii) Involuntary Acquisition.

In case of procurement of land through private purchase, PEDM shall ensure that compensation/rate for land is not less than the rate provided in the new land acquisition act, 2013. In order to comply with this provision PEDM may organize an awareness camp where provisions of new act in respect of basis/modalities of compensation calculation shall be explained to land owners with specific State provision if any.

In case of voluntary donation of land the following shall be ensured:

- The land user(s) will not be subjected to undue pressure for parting of land;
- All out efforts shall be made to avoid any physical relocation/displacement due to loss of land;
- The PEDM shall facilitate in extending 'gratitude' to the land donor(s) in lieu of the 'contribution' if so agreed. The same shall be documented in the shape of MoU between donor and utility and subsequently title of land transferred in the name of PEDM.
- All land donations (as well as purchases) will be subject to a review/ approval from a committee comprising representatives of different sections including those from the IA and GoM.

In case of land acquired through involuntary acquisition, provisions of RFCTLARRA, 2013 is applicable as and when the new act is passed by State Legislative Assembly (**refer para 24**). However, the new act i.e. RFCTLARRA, 2013 authorizes State Govt. (i.e. GoM) or its authorized Government agency to complete the whole process of acquisition of private land including Social Impact Assessment (SIA), Action Plan for R&R (i.e. Rehabilitation and Resettlement) & its implementation and the PEDM's responsibility is limited to identification and selection of suitable land based on technical requirement and ensuring budget allocation.

Safeguards against land acquisition:

Conducting Social Impact Assessments (SIA) has been made mandatory under this new act and results of these assessments are shared with all the stakeholders and public hearing held which makes the process transparent and informed. Subsequently, an entitlement package that includes both compensation (for land/structure and assets to land and structure) and R&R as necessary is prepared. Further to this, individual awards are passed and all documents are disclosed in the public domain through local administration and internet. The flow chart of the land acquisition process with schedule prescribed for various activities is illustrated in **Figure – 5.1** below. The entitlements with regard to compensation and assistances towards land acquisition or loss of any

assets or livelihood for all categories of people being affected due to land acquisition is briefly outlined in **Table –5.5** below.

Table - 5.5 : Compensation and R & R Entitlement Framework for Land Acquisition

<table>
<tr><th colspan="2">A Comprehensive Compensation Package</th></tr>
<tr><th>Eligibility for Entitlement</th><th>Provisions</th></tr>
<tr><td>The affected families
• Land Owners: includes any person-
i) whose name is recorded as the owner of the land or building or part thereof, in the records of the authority concerned;
or
ii) any person who is granted forest rights under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 or under any other law for the time being in force;
or
iii) who is entitled to be granted Patta rights on the land under any law of the State including assigned lands:
or
iv) any person who has been declared as such by an order of the court or Authority;</td><td>Determination of Compensation :
1. Market value of the land
• as specified in the Indian Stamp Act, 1899
or
• the average of the sale price for similar type of land situated in the village or vicinity,
or
• consented amount of compensation as agreed in case of acquisition of lands for private companies or for public private partnership project.
whichever is higher
Market value x Multiplier* between 1 to 2 in rural areas only (No multiplier in urban areas).
2. Value of the assets attached to land:
Building/Trees/Wells/Crop etc. as valued by relevant govt. authority;
Land compensation = 1+2
3. Solatium: 100% of total compensation
Total Compensation : 1+2+3</td></tr>
<tr><td colspan="2">(*) Precise scale shall be determined by the State Govt.
The indicative values of multiplier factor based on distance from urban areas as provided in the act.</td></tr>
<tr><td colspan="2"><table>
<tr><th>Radial Distance from Urban area (Km)</th><th>Multiplier Factor</th></tr>
<tr><td>0-10</td><td>1.00</td></tr>
<tr><td>10-20</td><td>1.20</td></tr>
<tr><td>20-30</td><td>1.40</td></tr>
<tr><td>30-40</td><td>1.80</td></tr>
<tr><td>40-50</td><td>2.00</td></tr>
</table></td></tr>
<tr><td colspan="2">B. R&R Package
Elements of Rehabilitation and Resettlement Entitlements for all the affected families (both land owners and the families whose livelihood is primarily dependent on land acquired) in addition to compensation provided above</td></tr>
<tr><td colspan="2"><table>
<tr><th>Sl. No.</th><th>Elements of R& R Entitlements</th><th>Provision</th></tr>
</table></td></tr>
</table>

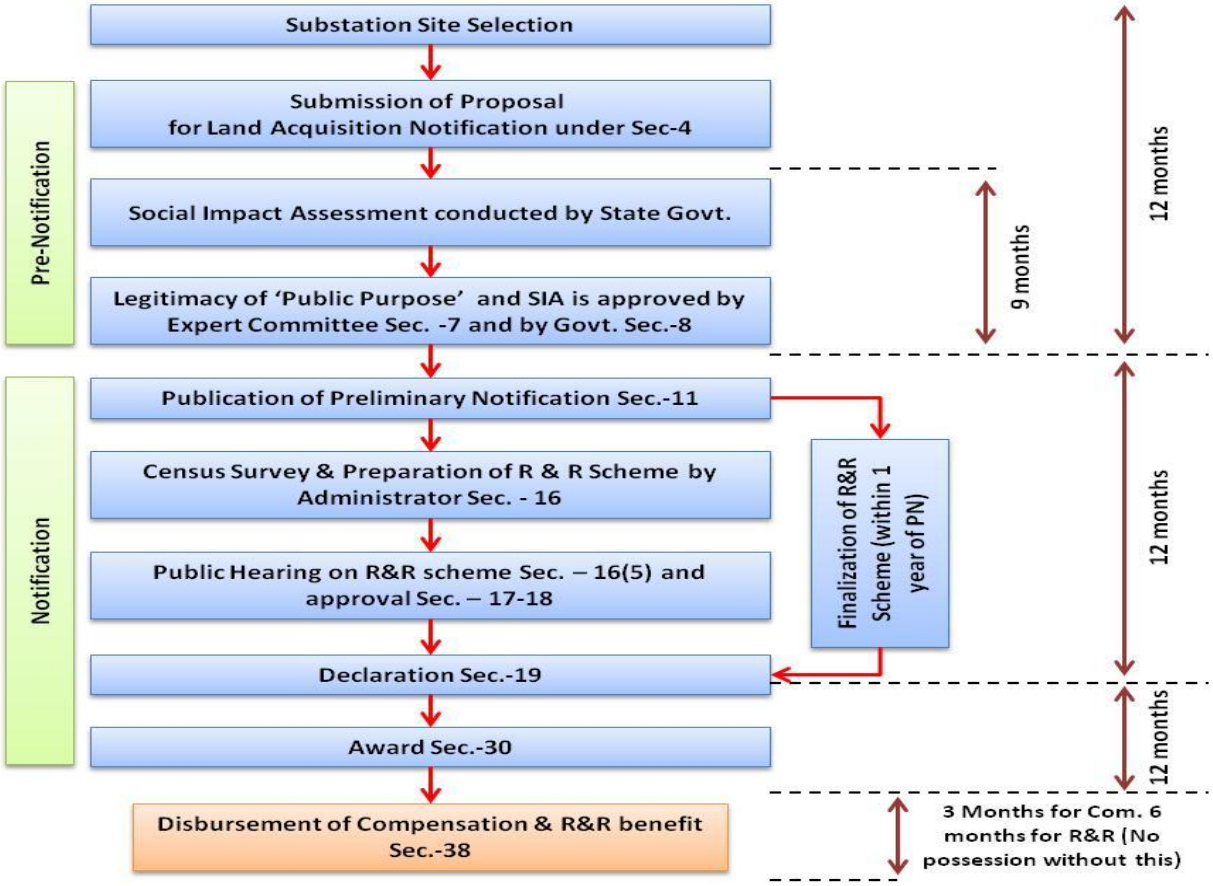
1.	Subsistence grant/allowance for displaced families	Rs. 3000 per month per family for 12 months
2.	The affected families shall be entitled to:	a) Where jobs are created through the project, mandatory employment for one member per affected family; **or** b) Rupees 5 lakhs per family; **or** c) Rupees 2000 per month per family as annuity for 20 years, with appropriate index for inflation; **The option of availing (a) or (b) or (c) shall be that of the affected family**
3.	Housing units for displacement: i. If a house is lost in rural areas: ii. If a house is lost in urban areas	i. A constructed house shall be provided as per the Indira Awas Yojana specifications. ii. A constructed house shall be provided, which will be not less than 50 sq. mts. in plinth area. **In either case the equivalent cost of the house may also be provided in lieu of the house as per the preference of the project affected family.** The stamp duty and other fees payable for registration of the house allotted to the affected families shall be borne by the Requiring Body.
4.	Transportation cost for displaced families	Rs 50,000/- per affected family
5.	Resettlement Allowance (for displaced families)	Onetime Rs 50,000/- per affected family
6.	Cattle shed/ petty shop cost	Onetime financial assistance as appropriate for construction as decided by St. Govt. subject to minimum of Rs.25,000/-
7.	Artisan/small traders/others (in case of displacement)	Onetime financial assistance as appropriate as decided by State Govt. subject to minimum of Rs.25,000/-

Special Provisions for SCs/STs

In addition to the R&R package, *SC/ST families will be entitled to the following additional benefits:*

1. One time financial assistance of Rs. 50,000 per family;
2. Families settled outside the district shall be entitled to an additional 25% R&R benefits;
3. Payment of one third of the compensation amount at very outset;
4. Preference in relocation and resettlement in area in same compact block;
5. Free land for community and social gatherings;
6. In case of displacement, a Development Plan is to be prepared
7. Continuation of reservation and other Schedule V and Schedule VI area benefits from displaced area to resettlement area.

Figure -5.1: Activity Chart of RFCTLARRA, 2013



b) Right of Way: Land for tower and right of way is not acquired as agricultural activities can continue. However, the project shall pay full compensation to all the affected persons/ community for any damages sustained during the execution of work. Accordingly, PEDM has formulated appropriate management plan in the form of Compensation Plan for Temporary Damage (CPTD) to minimize the damages and provide compensation plan for temporary damages in consultation with revenue department and affected person based on assessment (refer **Part - B** of Social Management Framework placed as **Annexure- 3**). The detailed process for crop/tree compensation is placed at **Annexure - 6.** The entitlement matrix for planning compensation for possible impact is provided in **Table – 5.6**.

Table - 5.6 : Entitlement Matrix for CPTD

S. N.	Issue/Impact	Beneficiary	Entitlement Options
1.	Land area below tower base.	Owner	100% land cost at market value as ascertained by revenue authorities or based on negotiated settlement without actual acquisition/title transfer.

S. N.	Issue/Impact	Beneficiary	Entitlement Options
2.	Loss/damage to crops and trees in line corridor	Owner/ Tenant/ sharecropper / leaseholder	Compensation to actual cultivator at market rate for crops and 8 years income for fruit bearing trees*. APs will be given advance notice to harvest their crops. All timber* will be allowed to retain by the owner.
3.	Other damages (if applicable)	All APs	Actual cost as assessed by the concerned authority.
4.	Loss of structure		
(i)	House	Titleholders	Cash compensation at replacement cost (without deduction for salvaged material) plus Rs. 25,000/- assistance (based on prevailing GOI norms for weaker section housing) for construction of house plus transition benefits as per category-5 below.
(ii)	Shop/ Institutions/ Cattle shed	Individual/ Titleholders	Cash compensation plus Rs. 10000/- for construction of working shed/shop plus transition benefits as per category-5 below
5.	Losses during transition under (i) & (ii) above for Shifting / Transport	Family/unit	Provision of transport or equivalent cash for shifting of material/ cattle from existing place to alternate place
6	Tribal/ Vulnerable APs	Vulnerable APs[10]	One time additional lump sum assistance not exceeding 25% of total compensation on recommendation of State Authority/ADC/VC.

c) Tribal People: As per Census 2011, the State has a population of 1,091,014 The tribal population consists nearly 94% of total population of the State. The project is being implemented in the tribal areas (under Sixth Schedule provision of the Indian Constitution) of Mizoram and bulks of the beneficiaries are expected to be tribal. Thus, the need for a separate Tribal Peoples' Development Framework/ Plan as per O.P.4.10 is not required under this project. Further, no negative impact on Tribal is envisaged due to implementation of this project. However, positive impact like improvement/availability of electricity shall play a definite role in enhancement of living standard & quality of life.

d) Gender: Women will be involved through formal and informal consultations so that their participation is ensured during preparation and implementation of the project. To enable this, efforts will be made to deploy as many women community volunteers as possible and conduct gender sensitization capacity building programs for all the project staff.

[10] Vulnerable APs include scheduled tribes residing in scheduled areas/ physically handicapped/ disabled families etc.

5.7 Health and Safety Requirements

48. PEDM maintains safety as a top priority, apart from various labour laws dealing with workers' health and safety, such as the Workmen's Compensation Act. PEDM ensures the implementation of health and safety as per the norms the said act, which is an integral part of the contractors' activities. EHS guidelines of PEDM (**Annexure-7** for detailed checklist) are developed on the basis of World Bank EHS guidelines to be adopted by PEDM.

5.8 Exposure to Electro Magnetic Fields (EMF)

49. There have been some concerns about the possibility of an increased risk of cancer from exposure to electromagnetic radiation from overhead transmission lines. However, a review by the World Health Organization (WHO) held as part of the International EMF Project (1996), concluded that:

"From the current scientific literature there is no convincing evidence that exposure to radiation field shortens the life span of humans or induces or promotes cancer".

Currently no EMF exposure guidelines have been framed in the country. However, international guidelines in this regard are detailed below:

- State Transmission Lines Standards and Guidelines in the USA;
- International Commission on Non-Ionizing Radiation Protection (ICNIRP);
- US National Council on Radiation; and
- American Conference on Government and Industrial Hygiene (ACGIH)

The ICNIRP guideline for the general public (up to 24 hours a day) is a maximum exposure level of 1,000 mG or 100 μT. PEDM shall follow the best international practices while designing its system to maintain acceptable prescribed EMF level.

5.9 General Safety Standards

50. PEDM will follow all applicable standards concerned with safety for transmission, distribution and erection of Substation. These include IS: 5613 – recommendation on safety procedures and practices in electrical work as per CEA (Measures relating to Safety and Electric Supply) Regulation, 2010 notified in the Gazette on 20th Sept. 2010 **(Annexure-8)**.

6. Issues, Impacts and Management Measures - Environment

51. Environmental issues of T&D projects are manageable given the inherently small 'foot print' of towers and flexibility in siting facilities within a relatively large host area and are mostly localized to ROW. However, transmission line project may have some adverse effects on natural resources. These impacts can be minimized by careful route selection and siting of substations. In order to get latest information and further optimization of route, modern survey techniques/tools like GIS, GPS aerial photography are also applied. Introduction of GIS and GPS/Google earth/IBAT in route selection result in access to updated / latest information, through satellite images and further optimization of route having minimal environmental impact. Moreover, availability of various details, constraints like topographical and geotechnical details, forest and environmental details help in planning the effective mitigation measures including engineering variations depending upon the site situation / location. In the instant project also these techniques are to be used for minimizing/mitigating such issues.

6.1 Environmental issues

A) <u>Transmission/Distribution lines</u>

52. The key environmental issues associated with installation of transmission/distribution lines are:

1) Clearing of Trees within Right of Way

53. Right of Way (RoW) width for the transmission/distribution line depends on the line voltage. The maximum permissible width of RoW on forestland and minimum clearance between Trees and conductors as specified in IS: 5613 and by MoEF guidelines are given in **Table 6.1**.

54. At present, a width clearance of 3 m is allowed below each conductor for the movement of tension stringing equipment (**Annexure-9)**. Trees on such strips are felled/lopped to facilitate stringing and maintenance of RoW. After completion of stringing, natural regeneration or dwarf tree/medicinal tree plantation is allowed to a certain height. Trimming or pruning is done with the permission from the local forest officer to maintain required electric clearance as necessary during operation and maintenance. In hilly areas where adequate clearance is already available, tree will not be cut/felled in 3 meter strip beneath for RoW except working clearance as stringing is done manually only. As compared to transmission line, distribution line requires only small right of way and therefore felling of trees is much less than that requires for lying of transmission lines. Generally stringing of distribution line is carried out manually and therefore trimming/pruning of tree branches

are only required instead of large nos. tree cutting Felling, lopping of tree can open up forest canopy allowing more sunlight into under storey where it can lead to edge effect and allow for proliferation of socio-phytic weeds. This can have added repercussions within a semi evergreen or evergreen biotope.

Table 6.1: RoW Clearance between Conductors and Trees

Transmission Voltage (In kV)	Max. ROW (In Meters)	Min^{m}. Clearance (in meters) between conductor & Trees *
11	7	2.6
33	15	2.8
66	18	3.4
110	22	3.7
132	27	4.0
220	35	4.6
400 D/C & S/C	46	5.5

**** As per IS: 5613 and MoEF guidelines finalized in consultation with CEA***

2) Clearing of Ground Vegetation for Movement of Machinery

55. Machinery and equipment is used for installation of transmission and distribution lines, towers/poles and construction of substations and may require clearing of ground vegetation for its movement. This activity causes temporary disturbance to the forest, orchards, plantation and agriculture etc. PEDM, wherever possible uses the existing path / access roads for the movement of man and machinery. The existing roads which cannot support heavy machinery load are upgraded and thus the village infrastructure is improved. In areas where lines traverse agricultural land, compensation is paid to owners for any crop damage incurred as a result of construction activities. Agricultural activities are allowed to continue following the construction period. If bunds or other on-farm works are disturbed during construction or maintenance, they are restored to the owner's satisfaction following cessation of construction or maintenance activities. In the event that private trees are felled during construction or maintenance operations, compensation is paid to the owner as determined by the forest / horticulture departments. In case of requirement of new access road through forestland to reach any location in the forest, inclusion of such areas in the forest proposal shall be done in consultation with the Forest Department.

3) Aesthetic appeal of an area

56. Erection of transmission/distribution towers and lines some time affects the aesthetics of the area. However, measures like planting trees along roads running parallel to transmission/distribution

lines in consultation with Forest Department, if feasible would be undertaken by PEDM to buffer visual effect.

B) Substations

57. The key environmental issues associated with construction of substation are:

1) **Clearing of Ground Vegetation:** The land requirement for substations varies from 0.3 acres to 10 acres depending upon voltage level and no. of bays. The ground vegetation needs to be cleared to enable construction activity.
2) **Used Transformer Oil:** As a part of routine maintenance, transformer oil is changed every 10-15 years. The used transformer oil is categorised as hazardous wastes as per Hazardous waste (Management, Handling and Trans-boundary Movement) Rules, 2008 and its unscientific disposal in environment may lead to soil and water contamination.
3) **Used Battery:** Used lead acid battery is a pollutant and therefore its improper handing & disposal may lead to contamination of soil and water.
4) **E-waste:** The electrical and electronic equipment (EEE) have hazardous / toxics substances in their components, which may cause harm/pose risk to health and environment during handling after its expiry & full usage.
5) **SF_6 gas** is a highly potential Green House Gas (GHG) being used in Circuit Breaker. Mishandling and leakage etc can lead to its escape into the atmosphere causing global warming.

6.2 Principles

58. The basic principles that guide EMF are:

- Avoidance environmentally sensitive areas while planning project activities;
- Minimization of impacts when project activities occur in environmentally sensitive areas; and
- Mitigation of any unavoidable negative impacts arising out of its projects;
- Greater transparency through involvement of community and other stakeholders through consultation.

6.3 Definitions

Adverse environmental effect" means any irreversible harmful affect on natural environment;

"Battery" means lead acid battery which is a source of electrical energy and contains lead metal;

"Central Pollution Control Board" means the Central Pollution Control Board constituted under sub-section (1) of section 3 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974);

"Forest" The word "forest" must be understood according to its dictionary meaning. This description covers all statutorily recognised forests, whether designated as reserved, protected or otherwise for the purpose of Section 2(i) of the Forest Conservation Act. The term "forest land", occurring in Section 2, will not only include "forest" as understood in the dictionary sense, but also any area recorded as forest in the Government record irrespective of the ownership;

"E-waste" means waste electrical and electronic Equipments, whole or in part or rejects from their manufacturing and repair process, which are intended to be discarded;

"Hazardous waste" means any waste which by reason of any of its physical, chemical, reactive, toxic, flammable, explosive or corrosive characteristics causes danger or is likely to cause danger to health or environment, whether alone or when in contact with other wastes or substances, and shall include- (i) waste specified under column (3) of Schedule-I, (ii) wastes having constituents specified in Schedule-II if their concentration is equal to or more than the limit indicated in the said Schedule, and (iii) wastes specified in Part A or Part B of the Schedule-III in respect of import or export of such wastes in accordance with rules 12, 13 and 14 or the wastes other than those specified in Part A or Part B if they possess any of the hazardous characteristics specified in Part C of that Schedule;

"**Environment"** means land, water, air, living organisms and interacting natural systems;

"Environmental assessment" means the process of assessing the environmental effects of a project in order to evaluate their significance, and may include identifying measures to prevent, minimize, mitigate or compensate for adverse environmental and social effects. Environmental and social assessment is the responsibility of the project sponsor;

"**Mitigation measures**" means methods to reduce, eliminate or compensate for adverse environmental and social effects;

"State Pollution Control Board" means the State Pollution Control Board or the Pollution Control Committee constituted under sub-section (1) of section 4 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974);

6.4 Legal and Regulatory Framework

59. The applicable acts, rules, and relevant policies in the context of the project are presented in **Table- 6.2.** The Project Authority will ensure that project activities implemented is consistent with provisions of such legal framework

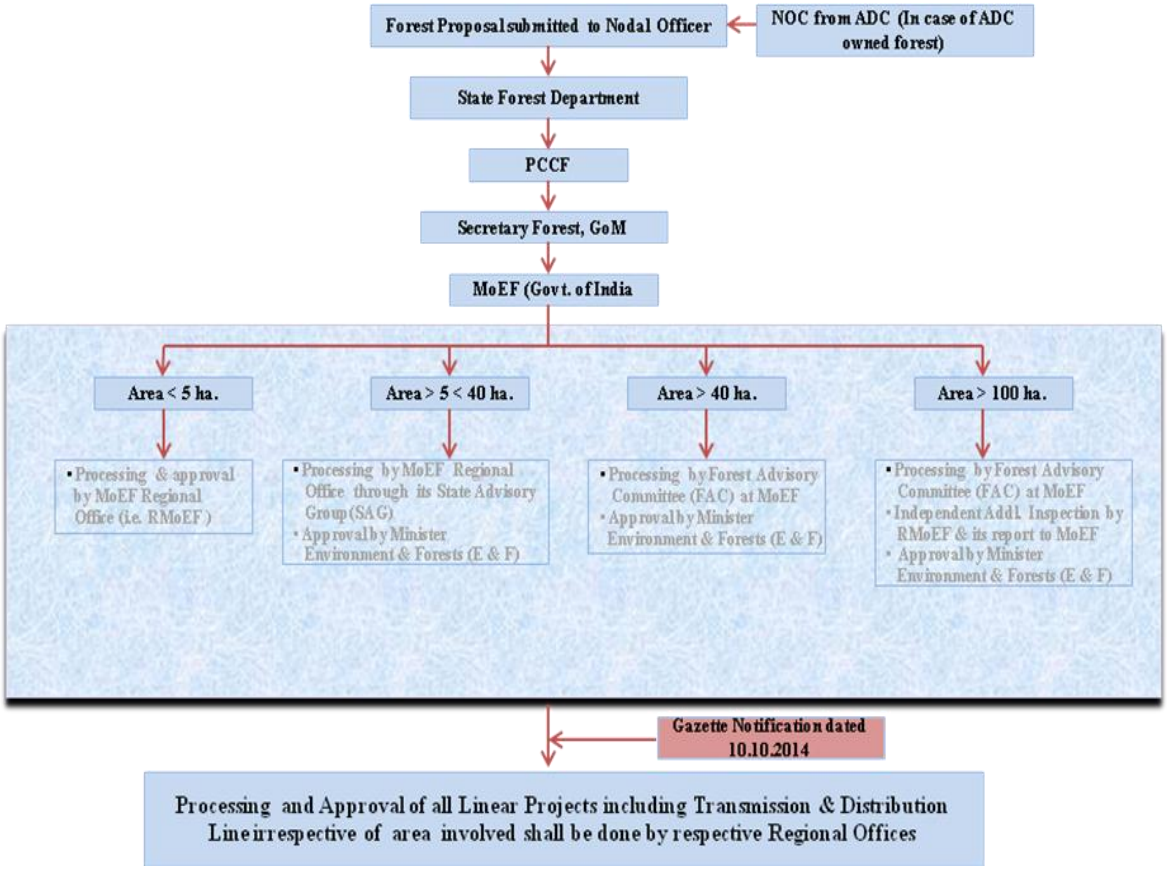
Table – 6.2 : Legal and Regulatory Provisions – Environment

Sl. No.	Acts, notifications and policies	Relevance/ Applicability to the project
I. Constitutional Provisions (India)		
a	Article 48 A	The State shall endeavor to protect and improve the environment and to safeguard the forests and wildlife of the country.
b	Article 51 A (g)	It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures.
II. Provisions Law of the Land/Rules		
1.	Electricity Act, 2003 (EA, 2003)	Transmission line projects are constructed under the ambit of Electricity Act, 2003 following the provisions of Section 67 & 68 of act. Under the provisions of Section 68(1):-Prior approval of the Govt. of Mizoram (GoM) is a mandatory requirement to undertake any new project in the State which authorizes PEDM to plan and coordinate activities to commission a new transmission/distribution project. The electricity act under Section 164 has a provision to grant licensee the power of Telegraph Authority as provided in the Indian Telegraph Act, 1885. Govt. of Mizoram on request of PEDM may by order in writing/through notification authorize them for using powers of telegraph authority after fulfilling the requirement as laid down in the rules thereof. The salient features of the Electricity Act 2003 are given in **Annexure- 5**.
2	Forest (Conservation) Act, 1980	This Act provides for the conservation of forests and regulates the diversion of forest land to non-forestry purpose. When any transmission/distribution line traverses forest land, prior clearance is mandatorily required from Ministry of Environment and Forests (MoEF), GoI under the Forest (Conservation) Act, 1980. The approval process of forest clearance in brief, as per set procedure in the guideline under the act and rules is shown in **Figure 6.1** below. Flow charts for forest clearance process and procedure of online submission of application are provided in **Annexure- 10 & 10a** respectively**.**
3.	The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	The act recognizes and vests the forest rights and occupation in forest land to forest dwelling. Scheduled Tribes and other traditional forest dwellers who have been residing in such forests for generations but whose rights could not be recorded, and provides for a framework for recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land. The definitions of forest dwelling Schedule Tribes, forestland, forest rights, forest villages, etc. have been included in Section 2 of the Act.

Sl. No.	Acts, notifications and policies	Relevance/ Applicability to the project
		The Union Ministry of Tribal Affairs is the nodal agency for implementation of the Act while field implementation is the responsibility of the government agencies. The applicability of this act has also been linked with forest clearance process under Forest (Conservation) Act, 1980 w.e.f. August 2009 by MoEF which shall be complied by PEDM.
4.	Environment (Protection) Act, 1986	It is umbrella legislation for the protection and improvement of environment. This Act as such is not applicable to transmission/ distribution projects of PEDM. Project categories specified under the schedule of the EIA notification is provided in **Annexure-11**. Even then some limited compliance measures notified under this EPA, 1986 are to be adhered to relevant rules and regulations under the EPA, 1986 applicable to the operations of PEDM.
i)	Ozone Depleting Substances (Regulation and Control) Rules, 2000	As per the notification, certain control and regulation has been imposed on manufacturing, import, export, and use of these compounds.
ii)	Batteries (Management and Handling) Rules, 2001	As per notification, Being a bulk consumer PEDM to ensure that the used batteries are disposed to dealers, manufacturer, registered recycler, re-conditioners or at the designated collection centers only. A half-yearly return is to be filed as per Form-8 **Annexure-12** to the Mizoram State Pollution Control Board.
iii)	Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008	As per notification, used oil is categorized as hazardous waste and require proper handling, storage and disposed only to authorized disposal facility (registered recyclers/ reprosessors) Being a bulk user, PEDM shall comply with provision of said rules. PEDM, as bulk user of transformer oil which is categorized as Hazardous Waste, shall comply with the provisions of the said rules (refer **Annexure- 13** for MoEF notification dated 24th September 2008) if the practice of storing of used oil is maintained. In case it is decided to outsource the process of recycle of used oil to registered recycler as per the provisions of notification then PEDM shall submit the desired return in prescribed form to concerned State Pollution Control Board at the time of disposal of used oil.
iv)	E-waste (Management and Handling) Rules, 2011	As per notification, bulk consumers like PEDM is to dispose e-waste generated by them in environmentally sound manner by channelizing to authorized collection centers/ registered dismantler/ recyclers/return to producers. PEDM, being a bulk consumer of electrical and electronics equipment's shall maintain record as per Form-2 (**Annexure-14**) for scrutiny by State Pollution Control Board.

Sl. No.	Acts, notifications and policies	Relevance/ Applicability to the project
5	Biological Diversity Act, 2002	This act is not directly applicable to transmission projects because it deals with the conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith. PEDM abides by the provision of the act wherever applicable, and avoids Biosphere Reserves during route alignment.
6	Indian Treasure Trove Act, 1878 as amended in 1949	The act provides for procedure to be followed in case of finding of any treasure, archaeological artifacts etc. during excavation.
7.	The Right to Information Act, 2005	The Act provides for setting out the practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, the constitution of a Central Information Commission and State Information Commissions and for matters connected therewith or incidental thereto.
III	**World Bank OP (Operational Policy)**	
8.	OP- 4.01: Environmental Assessment	To ensure the environmental and social soundness and sustainability of investment projects. Support integration of environmental and social aspects of projects in the decision-making process.
9.	OP- 4.04: Natural Habitats	To promote sustainable development by supporting the protection, conservation, maintenance, and rehabilitation of natural habitats and their functions.
10.	OP-4.11: Physical Cultural Resources (PCR)	To preserve PCR and in avoiding their destruction or damage. PCR includes resources of archeological, paleontological, historical, architectural, and religious (including graveyards and burial sites), aesthetic, or other cultural significance.
11.	OP-4.36: Forests	To realize the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests

Figure- 6.1 Approval Process of Forest Clearance



Note: MoEF has made online submission of application mandatory w.e.f. 15th August 2014 (refer Annexure- 10a).

6.5 Assessment of Environment Impact

60. This section identifies the potential environment impacts due to intervention of project in terms of the nature, magnitude, extent and location, timing and duration of the anticipated impacts. These impacts are both positive or negative relating to the project design stage, construction stage or the project operation and decommissioning stage;

i. Positive Impacts

- Availability of power lessen the demand of natural resources like firewood, charcoal etc. resulting in conservation/protection of forest/vegetation.

ii. Negative Impacts

- Clearance of tree within RoW;
- Impacts on forest, wildlife habitats and migratory birds;

- Impacts on drainage, soil erosion & water resources;
- Impacts on traffic and road infrastructure;
- Aesthetic appeal of area;
- Impacts from likely oil spillage;
- Effect of electromagnetic fields(EMF);
- Leakage of SF6, a potent green house gas; and
- Health & Safety

6.6 Management Framework

61. Based on the outcome of impact assessment appropriate management measures has been suggested in ESPP for implementation to mitigate the possible impacts due to proposed project interventions. While for positive impacts enhancement measures are suggested; for negative impacts suitable mitigation measures has been included. Detailed of potential environment issues and its management measures are outlined in ESPP. Apart from this, PEDM has developed a generic Environment Management Plan (EMP) (Annex to executive summary) which includes details of anticipated impacts along with mitigation measures, monitoring and implementation schedule for its transmission and distribution projects. The EMP provisions shall be made part of bidding/contract document for proper implementation by the Contractor. Summary of key potential environmental issues and its management measures is presented below in **Table 6.3**.

Table 6.3: Potential Environment and Social (E&S) issues and its Management Measures

No.	Potential Issues	Management Measures
1	Minimizing adverse impact on forests	PEDM endeavors to circumvent / lessen environmentally sensitive areas such as forest and other ecologically fragile/ sensitive areas through optimization of route including use of modern tools like GIS/GPS and other modern techniques.
2	Clearing/Lopping of trees	Use of extended/special tower to reduce RoW and impact on trees.
3	▪ Vegetation damage ▪ Habited Loss	To minimise damage to vegetation and habitat fragmentation, PEDM utilizes hand clearing and transportation of tower material by head loads into forestland and other land as well, wherever possible.
4	▪ Habitat fragmentation ▪ Edge effect on flora & fauna	PEDM maintains only a 3m wide strip for O&M and allows for regeneration of vegetation in the other one or two strips and beneath the transmission lines to avoid habitat fragmentation and edge effect. In hilly area this can possibly be totally avoided.

No.	Potential Issues	Management Measures
5	Chances of accident involving elephant in the specified corridor due to placing of poles	There is no elephant corridor as such in Mizoram. But it is reported elephant sometimes stray over/cross/migrate from Bangladesh in the area. However, in case poles are sited in that area PEDM shall try suitable design modification in the pole of 33kV line, like provision of spike guards, barbed wire fencing or any other arrangement and shall incorporate the same in any location, if required.
6	Chemical contamination from chemical maintenance techniques	PEDM does not use chemicals for forest clearance/ RoW maintenance.
7	Poly-Chloro-Biphenyls (PCBs) in electrical equipment.	PEDM use mineral oil in electrical equipment's. Specification of oil containing PCB less 2 mg/kg (non –detectable level) stated in the tender document.
8	Change in land use and population relocation due to towers/poles	PEDM does not acquire land for its transmission towers. It pays compensation for any crop loss and damage caused during its activities. PEDM allows regeneration and cultivation beneath the towers for Transmission Line (TL) around poles/ structures and lines.
9	Induced secondary development during construction	PEDM operations are short-lived and do not induce secondary developments during construction.
10	Erosion of soil and drainage along the cut and fill slopes in hilly areas	PEDM would ensure that all cut and fill slopes in TL/ DL are adequately protected using standard engineering practices including bio-engineering techniques wherever feasible. All drainage channels along or inside substations shall be trained and connected to main or existing drainage to avoid any erosion due to uncontrolled flow of water. To further minimise any possible impacts, the already disturbed corridors of Mizoram State Road Project- II under Bank funding are being also utilized wherever possible to route the transmission line alignment.
11	Avian hazards from transmission/distribution lines and towers	Avian hazards mostly encountered in bird sanctuaries area and fly path of migratory bird predominantly related to nesting site. Although the incidence of avian hazards is rare due to the distance between the conductors. PEDM shall take all possible precaution to avoid these areas by careful route selection. However, bird guards are provided to prevent any avian hazards.
12	Air craft hazards from transmission lines and towers	PEDM as per the requirement of IS 5613 of July'94 provides aviation markers, night-lights for easy identification of towers in notified/selected areas.
13	Health and safety of worker/employee/community	During construction the health and safety aspects of workers and nearby community shall be implemented through

No.	Potential Issues	Management Measures
		contractors with due diligence and compliance of required regulation/guideline through a safety. PEDM uses best available technology for lines and do not cause any hazards to health and safety.
14	Fire Hazards	Fire hazards are mostly occurred in forest area. However, PEDM uses state of art automatic tripping mechanism for its transmission/distribution and substations that disconnect the line in fraction of seconds to prevent fire hazards. The Forest Department also take precaution like maintaining fire line in the cleared forest area to avoid spread of fire.
		Firefighting instruments including fire extinguishers are kept in appropriate place for immediate action in case of any fire hazard.
15	Pollution	Although pollution is not an issue with transmission/ distribution projects still PEDM will make efforts to further minimize it. Sites are cleared of all the leftover materials and debris to avoid any chance of pollution.
16	GHG (SF_6 Gas)	Although leakage of SF6 is not a major issue, PEDM will make efforts to reduce the leakage through regular monitoring installing gas pressure monitor/ leak detectors in Circuit Breakers.

7. Integration of environment and social management measures into overall project cycle

62. In the previous section, ESPP outlines various management measures to address the potential environment and social impacts based on the outcome of identification and impact assessment process during different stages of project activities. In order to address identified environment and social issues due to proposed project interventions, the suggested management measures has been dovetailed in to the project cycle so that it can be taken care off at appropriate level and at appropriate time (refer ESPP for detail management procedures). **Figure - 7.1 and 7.2** below illustrates link between different stages of project cycle and management measures to be undertaken to address the environment and social issues.

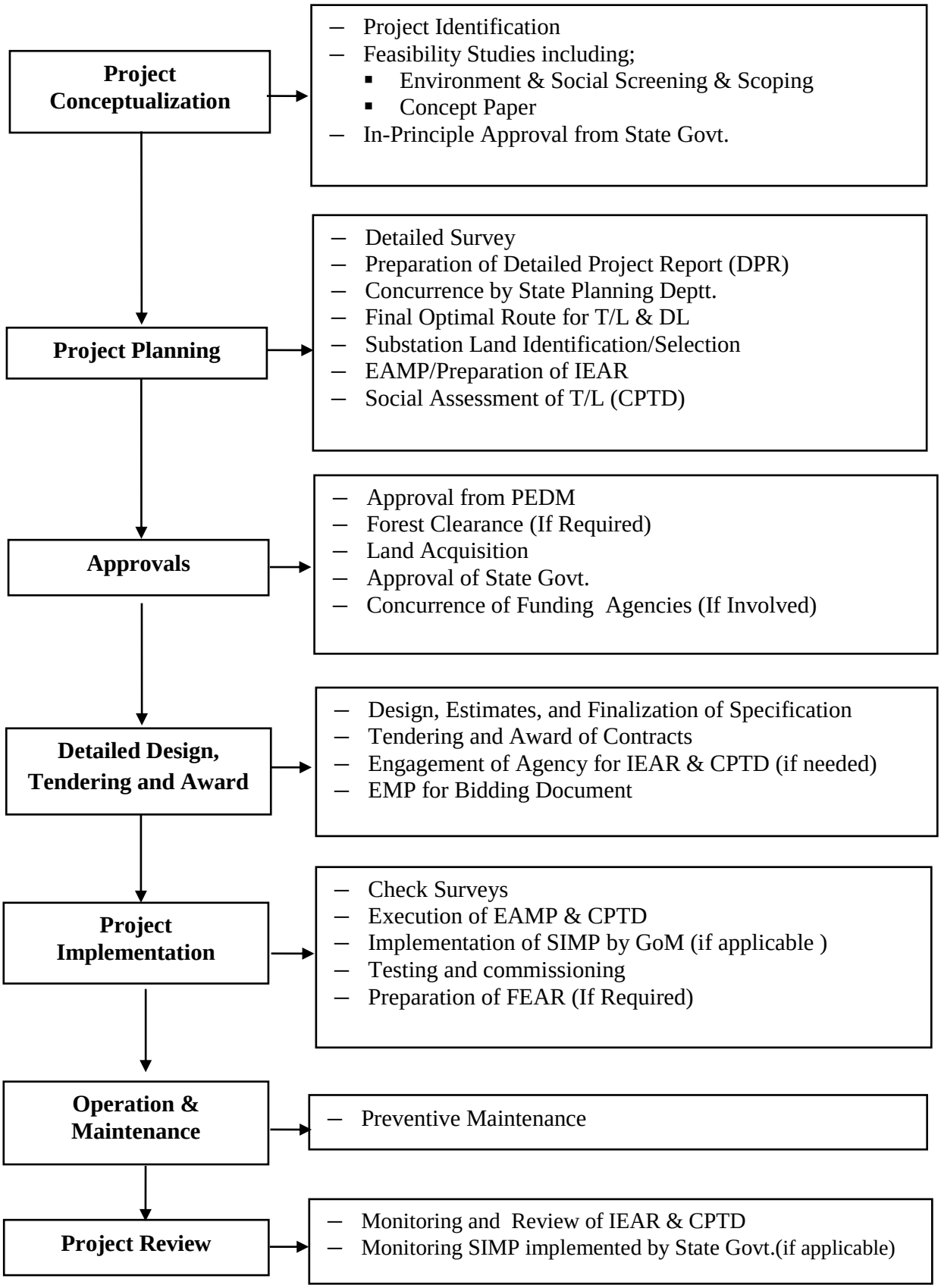
7.1 Project Cycle

63. In order to address environmental and social issues arising out of construction, operation and maintenance of transmission and distribution projects in the State of Mizoram, it become pertinent to review typical PEDM's project cycle so as such issues are attended at appropriate time. The key milestones of such projects cycle are:

1. Project Conceptualization
2. Project Planning
3. Approval
4. Detailed Design and Tendering
5. Project Implementation
6. Operation & Maintenance
7. Review

Figure- 7.1 outlines the detailed process of typical transmission/distribution project and same is described in subsequent sections.

Figure- 7.1: Project Cycle of a Typical Transmission/Distribution Project



7.1.1 Project Conceptualisation

64. The need of addition/augmentation of Transmission & Distribution (T &D) network is primarily determined on the basis of demand and future plans in the State. Subsequent to identification based on the above requirements, initial feasibility studies are carried out that includes technicality, environmental, social, economic, and financial assessments. The planning for execution schedule is formulated on prioritizing the project for implementation. During the feasibility study, PEDM develops various options for the location/siting of T & D lines and construction of substations considering avoidance of environmentally and socially sensitive area. During desk study various options of line routes are plotted on a Forest Atlas map or SOI (Survey of India) map or Google Earth map using a "BEE Line" (the shortest distance between origin of proposed TL and the sub-stations sites) avoiding environmentally and socially sensitive area. At least 3 (three) alternative are marked subject to site verification. With this reference, Reconnaissance survey is taken-up either in-house (walk-over survey with hand-held GPS i.e. Geo-positioning System) or through external agency to find out tentative co-ordinates (spot) and route alignment avoiding any kind of negative impact or minimising the same, out of at least 3 (three) alternatives to have fair assessment of the proposed project and its components. During this process, PEDM field staffs also consult the people/villagers to explore surroundings and other possibilities. On the basis of assessment and findings, a "Concept Paper" is prepared indicating all components i.e. environmental, social, techno-economic, and financial assessments/cost estimate. In case of transmission project this "Concept Paper" after the appraisal/ recommendation of PEDM management, is forwarded to Planning Deptt., GoM for the in-principle approval of Ministry for Development of North East Region (MDoNER) (e.g. North East Council(NEC)/Non-lapsable Central Pool of Resources(NLCPR)/ State Plan (SPA), etc) for budget provision. For distribution project the 'Concept Paper' after the appraisal/ recommendation of PEDM management, is forwarded to Planning Department, GoM for in-principle approval under State plan other than RGGVY- Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY)/ Accelerated Power Development and Reform Program (APDRP)/ Restructured-Accelerated power development and Reform Program(RAPDRP) scheme under GoI.

7.1.2 Project Planning

65. Planning stage is started with preparation of Detailed Project Report (DPR). During detailed survey, all critical information/data such as rivers, hills, railway crossings, telephone line, villages, power transmission/distribution lines and other major offset on both the side of alignment with parameters for ground profile etc are recorded. Additionally, environmental and social details are also noted in the prescribed pro-forma (**Annexure-15).** People are also consulted time and again during the survey.

66. During detail survey further attempt is made to minimise involvement of forestland and areas of significant natural resources, human habitation and areas of cultural importance by realigning the route for optimization, if possible. If forestland is unavoidable after completion of survey on the finalised route, environmental assessment limited to forest area is undertaken by PEDM with the help of authorised agencies (Forest Department/GoM) and formulate forest proposal including its assessment and management plan. Local forest authorities certify that the final route so selected involves the barest minimum of forestland. The complete forest proposal is processed and recommended/forwarded by GoM to MoEF for obtaining forest clearance with an undertaking from PEDM to bear the cost of compensatory afforestation, NPV etc. as per guidelines.

67. PEDM shall also identify probable substation sites suiting technical requirement based on data collected as per the checklist (**Annexure-16**) and a comprehensive analysis for each alternative site is carried out. The analysis will consider various site specific parameters that include infrastructure facilities such as access roads, railheads, type of land, namely, Government., revenue, private land, agricultural land; social impacts such as number of families getting affected; including its cost aspect also. This helps in selecting particular land for substation with minimal impact after doing comparison assessment. Thereafter, PEDM proposes for land acquisition other than government land to the GoM, which in turn process the request as per the existing procedures or secure land through donations and/ or direct purchases on negotiated rate on willing buyer and willing seller basis.

68. After identification and assessment of possible impacts, project specific Environment Assessment Management Plan (EAMP) is prepared including the Initial Environment Assessment Report (IEAR) to mitigate adverse impact arising due to project activity. In case of lines, passing through protected areas additional studies would be conducted to ascertain the impacts on the bio-diversity. The terms of reference for Bio-Diversity studies in provided in **Annexure-17**. Similarly Social Assessment of transmission line is also undertaken to develop a project specific Management Plan in the form of Compensation Plan for Temporary Damages (CPTD). The CPTD is a document prepared after social assessment of likely impacts on land by installing towers or poles during construction of transmission/distribution lines. The CPTD also contains the compensation procedure for tree/crop/land damages as per the prevailing regulation/guidelines.

7.1.3 Project Approvals

69. The DPR so finalised and recommended by PEDM management is forwarded to State Govt. and funding agency (if applicable) for concurrence and fund/budget allocation**.**

7.1.4 Detailed Design and Tendering

70. PEDM after detailed design, finalization of specifications for line and substation starts the tendering process and contracts are awarded to competent contractors through bidding process. Similarly engagement of agency (if required) for IEAR and CPTD implementation is also undertaken. During bidding process, project specific EMP is included in the contract document for implementation by the contractors/subcontractors.

7.1.5 Project Implementation

71. Before the start of implementation, PEDM informs the general public about the project and invites their suggestion, if any. When construction starts, PEDM's field staff and contractors conduct check survey to authenticate tower spotting done in the profile based on detailed survey. If there is any changes necessary, site modification is done/noted in the profile/ datasheets, wherever required for final documentation and resubmission for reference/record. Civil Construction work is then initiated for transmission /distribution line followed by tower/pole erection & stringing. Simultaneously works of substation are also initiated. During the construction stage due care is taken to minimise / mitigate environmental impacts. PEDM also give utmost importance health & safety of workers, employees and nearby communities. During construction the health and safety of workers and nearby communities shall be taken care by contractors by compliance of required regulation/guideline through a "Safety Plan" (refer **Annexure-7** for checklist for health & safety and **Annexure-18** for Safety Plan). Before test charges both transmission/distribution lines and substations, pre-commissioning check and testing are rigorously done by PEDM to ensure safety of commissioning of the project/subproject. Implementation of IEAR and CPTD are also to be taken up in parallel to above work.

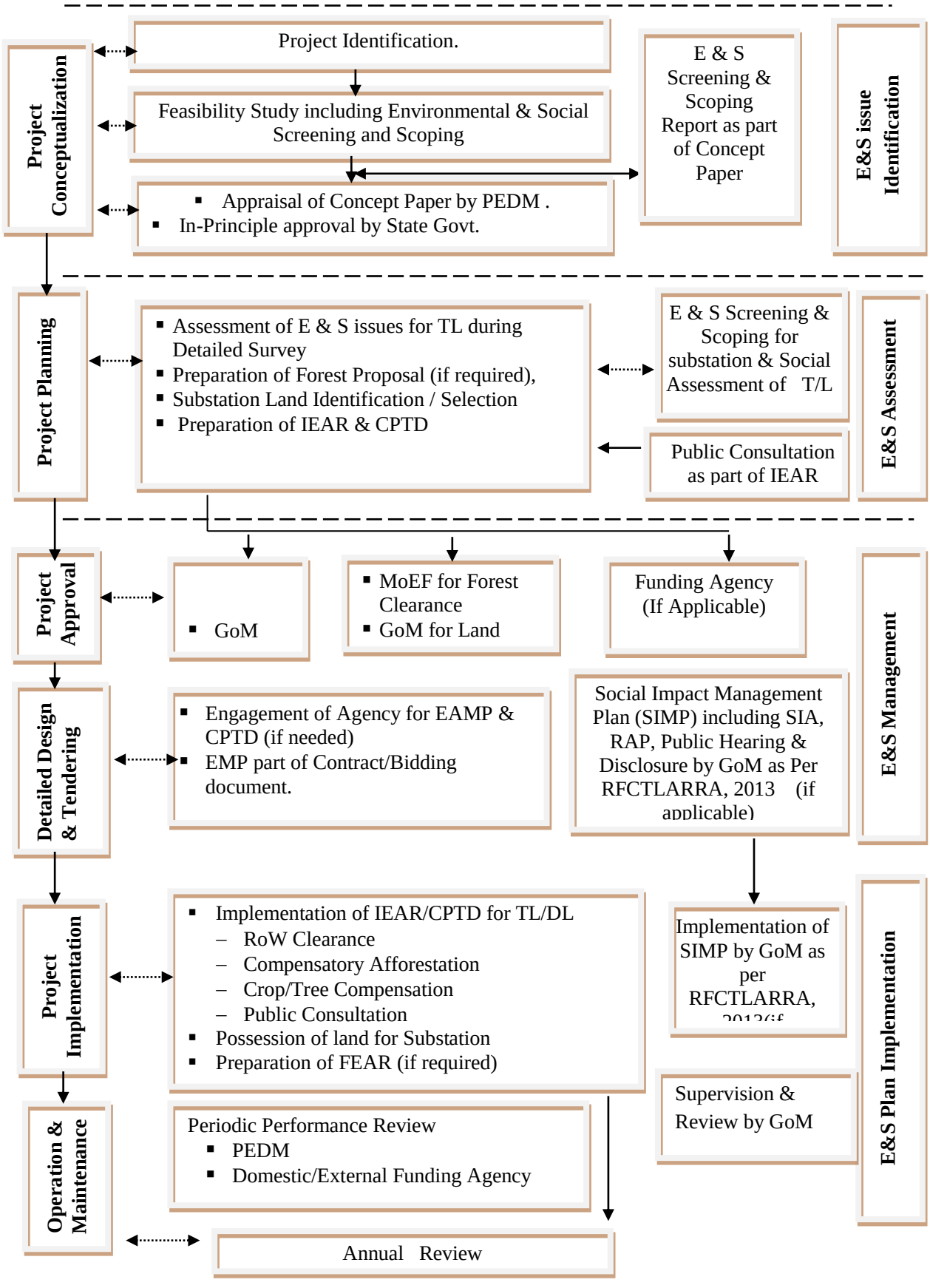
7.1.6 Operation and Maintenance

72. PEDM continuously monitors the transmission/distribution lines and substations for smooth operation. These lines and substations are patrolled regularly to identify faults and its rectification. The site offices carry out monitoring of line in accordance with the checklists provided for inspection of transmission/distribution lines and substations (**Annexure-19).**

7.1.7 Project Review

73. Apart from reviewing the lines and substations on daily basis, PEDM's field staffs review any unfinished/ pending issues related to environment & social components like the implementation of IEAR/ CPTD/ SIMP while the same are reviewed at the level of Chief Engineer on monthly basis.

Figure: 7.2 Environmental and Social Management Procedures



7.2 Project Conceptualization

74. Conceptualisation of a projects/subprojects necessarility entails identification of potential E & S issues that may require evaluation in relation to its nature, magnitude and measures to address them. Screening and scoping process enable this evaluation. Infact, the environmental screening and scoping report forms an integral part of project feasibility study i.e. 'Concept Paper', which is put up to State Govt. for in-principle approval of the project after appraisal/recommendation of PEDM management. The E & S issues identification process for any PEDM project will include the following:

- E & S screening and scoping for transmission/distribution lines;
- Appraisal/approval of Concept paper by Internal Management & State Govt.

75. The objectives, process and output of each of these steps are discussed below;

7.2.1 Environment & Social Screening and Scoping for Transmission/Distribution Lines

A. Objective

1) To identify environmentally & social sensitive areas & issues;
2) To suggest alternative transmission line routes, if necessary ;
3) To outline scope of environmental and social assessment.

B. Process

1) PEDM through its "Bee" line survey (i.e. a desk review) on Survey of India (SOI) map (topo-sheets) preferably on 1:50,000 Scale, the Forest Atlas and or Google Earth map examine various route options at least 3 (Three) alternatives referring 'Bee' line as a guiding one between two or multiple origins of proposed transmission/distribution line avoiding/minimizing environmentally and socially sensitive areas based on base line data/information;

2) Taking reference to this desk review, a reconnaissance survey in-house or through other agency/ or walkover survey is undertaken with hand-held GPS for on-site verifications to confirm findings of desk review survey or otherwise. During Recce or W/O survey it may also be possible to identify other better option of route following the criteria of avoidance & minimization, if so the same, after having collected/updated information/data may be considered as another alternative. In addition, environmental and social details are also noted. (**Annexure-15** for Pro-forma to gather relevant environment and social information for transmission lines and substations);.

3) During the process, public views and necessary inputs about surroundings/ villages/crops etc. are also necessary and noted for screening/scoping. After comparison and analysis of all E & S parameters so gathered for all alternatives and considering other significant economic benefit associated with the project/subproject, the most optimum route having minimum environment & social impact is selected for further investigation;

4) Site office will consults with state forest departments if the line is passing through forest areas. Revenue authorities will be consulted for their views on revenue/other lands.

C. Output

1) Environment & Social screening and scoping as part of Concept Paper, which provides details of environmentally sensitive areas, E & S issues etc. apart from technicality, economics and financial assessment of the project.

7.2.2 Approval

76. The Concept Paper after appraisal and recommendation of internal management forwarded to State Govt. for In-principle approval of the proposed project.

7.3 Project Planning

77. During planning stage, detailed survey of entire line is undertaken and route alignment of transmission/distribution line is finalised. Similarly, tentative locations for substation are identified and environment & social screening is conducted. After screening & scoping process of proposed project are completed, specific management plan are prepared by assessing potential impacts of identified E & S issues associated with transmission/distribution line and substation. Following activities are conducted in this stage.

- Environment and Social Screening & Scoping for substation;
- Environmental Assessment and Management Planning (IEAR);
- Social Assessment of Temporary Damages for TL (CPTD).

7.3.1 Environment and Social Screening for substation

A. Objective

1) to identify environmentally & social sensitive areas, E & S issues;
2) to outline scope for land acquisition.

B. Process

1) PEDM identify tentative locations for substation for E & S screening and scoping based on specific parameters information collected from secondary sources including technical requirements as per the checklist **(Annexure-16**);

2) A broad analysis for each alternative site is also carried out after spot verification by site office to checks that environmentally and socially sensitive areas are not encountered;

3) Site office will consult revenue authorities for their views on selected sites and shortlist the optimum site;

4) In case of land controlled by ADC, district/village council is consulted for obtaining their consent.

C. Output

1) Environment & Social screening and scoping document with details of as part of environmentally and socially sensitive areas, E & S issues etc and views of revenue deptt. & scope of land acquisition.

7.3.2 Environmental Assessment and Management Planning

A. Objective

1) To prepare EAMP(IEAR)

B. Process

1) While finalizing the route alignment during detailed survey, the involvement of forest area is ascertained. If protected areas (Wildlife Sanctuaries, National Parks, Biosphere Reserves, etc.) or any notified/recognized migratory path/fly path is encountered in spite of utmost care/optimization, a separate biodiversity assessment study through an independent expert/agency shall be carried out as part of the Environment Assessment (EA) process. The Terms of Reference of the biodiversity assessment study is provided in **Annexure-17.** In case of forest involvement, forest proposal is prepared for transmission/distribution line with the help of Forest Department which includes details of species and girth wise classification of trees to be felled, cost benefit analysis, identified degraded forest land, details of Compensatory Afforestation (CA) enumerated on a map and preparation of CA scheme. Various digitalized map of diverted and CA area, NOC/certificate from DC under FRA, 2006 etc. are submitted

along with the forest proposal. In case of forest area controlled by ADC, PEDM shall obtain NOC from village/district council before the formal process of forest clearance is initiated;

2) Prepare IEAR detailing assessment and review of potential environment and social issues identified during screening & scoping and formulate a project specific Environment Management Plan (EMP) highlighting management measures to mitigate the same (**Annexure - 20 for contents of IEAR**);

3) Public Consultations are held en-route of line to ascertain public views/suggestion, if any on proposed project.

C. Output

1) IEAR detailing assessment and review of potential environment & social issues and associated management measures;
2) Biodiversity Assessment Report (if applicable).

7.3.3 Social Assessment for Temporary Damages for TL (CPTD)

A. Objective

1) To prepare CPTD

B. Process

1) PEDM shall undertake assessment of land area likely to be affected by putting up tower and line and extent of damages during foundation, erection & stringing works;

2) Formulate appropriate management plan to minimize the damages and prepare compensation plan for temporary damages in consultation with revenue deptt. .and affected person based on above assessment. The CPTD prepared at this stage will be periodically updated based on check survey and finalisation of tower location and its owner during project implementation.

C. Output

1) CPTD detailing assessment of temporary damages and associated management measures including compensation plan (refer **Annexure-21** for contents of CPTD).

7.4 Approval

78. Environment and social management steps are initiated during approvals stage of project cycle. The Detail Project Report including the EAMP after recommendation of internal management

is forwarded to State Govt. and funding agency (if applicable) for concurrence and budget allocation/funding. Procedure of forest clearance (If needed) is initiated by submitting forest proposal to concerned authority. If acquisition of private land is involved till the new act is made applicable to State of Mizoram, PEDM shall initiate the process of procurement of land through direct purchases on negotiated rate on willing buyer and willing seller basis and/or through donations. During this stage, following activities are undertaken:

7.4.1 Forest Clearance

A. Objective

1) To obtain forest clearance from MoEF

B. Process

1) PEDM submits a forest proposal request through online on MoEF forest clearance web portal (http://forestsclearance.nic.in)[11]. On receiving the request, Nodal Officer (NO) after scrutiny forward the same to concerned Divisional Forest Officer (DFO) for assessment of the land proposed to be diverted for the transmission/distribution line and for formulation of proposal;

2) After formulation, DFO recommend the proposal to CF (Conservator of Forests) and again send to CCF to NO and PCCF (Principal Chief Conservator of Forests) who will forward it to State Secretary of Forests and finally to MoEF;

3) Forest clearance is issued in two stages Stage-I & Stage-II. Stage-I approval is conditional on PEDM on depositing the cost of compensatory afforestation and Net Present Value to forest Deptt. and fulfilling any other stipulated conditions. Work in forest area can be undertaken after realizing the fund by MoEF deposited towards CA & NPV by PEDM. State Govt. informs MoEF about compliance of conditions and MoEF grant final approval.

C. Output

1) Forest Clearance from MoEF allowing PEDM activities in given forest area

7.4.2 State Government Approval

A. Objective

1) To obtain approvals from GoM for DPR for budget allocation/fund

[11] For details refer **Annexure – 9a**

B. Process

1) PEDM submit DPR including the environment and social component of the project to State Govt. through its State Planning Deptt.

C. Output

1) Approval of State Govt. for the project

7.4.3 Social Impact Management Plan (SIMP) for substation *(if applicable)*

A. Objective

1) To prepare SIMP by State Government

B. Process

79. On confirmation of the scheme, PEDM would submit a proposal for land acquisition detailing the extent of land and the affected area to be notified and acquired for the project by the State government. In accordance with the RFCTLARRA, 2013 the responsibility of preparation of the SIMP rests with GoM. The preparation of the SIMP including the SIA, RAP and the Public Disclosure would be carried out by the Rehabilitation and Resettlement Commissioner of the State Government. Procedures expected to be adopted by GoM is described below.

i) Establishment of Institutions

As per RFCTLARRA, 2013 the following bodies are to be established permanently in the state (to cater to all projects proposed in future):

- The State Social Impact Assessment Unit;
- The office of the Commissioner Rehabilitation & Resettlement;
- The State Level Monitoring Committee

For a particular project, the following bodies will be established:

- The Expert Group to appraise the SIA;
- The office of the Administrator Rehabilitation & Resettlement;
- Project Level Committees

ii) Social Impact Assessments[12]

- State SIA Unit, after the receipt of a request from GoM, will prepare a detailed project specific Terms of Reference (ToR) for each proposed case of land acquisition;
- Based on the nature and extent of the work involved, costs involved are decided and require depositing the same with the Unit;
- SIA Unit deploys an external professional agency (or individuals) for the conduction of SIA.
- The first step in the SIA will involve building up a detailed understanding of the proposed project and reviewing its stated public purpose. The project should be screened to ensure that it meets the cause of "public purpose";
- The SIA shall conduct a detailed land assessment, list out accurately the number of PAPs, socio-economic as well as cultural profile of the PAPs as well as that of their environ, and asses the nature and extent of impacts likely to occur as a result of the project intervention;
- Impacts are to be identified at different phases of the project cycle- planning, construction and O&M. Same time efforts are to be made on assessing: (i) direct/ indirect impacts; and (ii) differential impacts – on women, children, elderly and disabled. The latter can be done through gender impact assessments and/ or vulnerability and resilience mapping;
- Following the above assessment, a SIMP is prepared encompassing a comprehensive compensation as well as R&R entitlements in respect of each PAP;
- Formal public hearing/s will be held in the affected areas with the specific purpose of presenting the main findings of the SIA, seeking feedback on its contents, and making sure that any omissions or additional information and views are incorporated into the final documents. These hearings will be held in all the GPs and/ or Village Council whose lands are proposed to be acquired;
- Explicit consent will be required in the case of lands in respect of tribal areas from ADC and the Village Councils;
- Every Social Impact Assessment (SIA) conducted will be formally appraised by an Expert Group, which will then make a written recommendation to the Government on whether or not the proposed land acquisition should proceed. Final decision to accept or not, and go ahead or not, rests with GoM;

iii) Disclosure

The final SIA Report and SIMP will be published in the local language and made available:

[12] The responsibility to carry out SIA and preparation of R & R Plan , its disclosure, approval etc. is in the domain of State Govt. and not under Utility(PEDM)

- The Panchayat, Municipality or Municipal Corporation and the offices of the District Collector, Sub-Divisional Magistrate and the Tehsil;
- Published in the affected areas; and
- Uploaded on the websites of the government.

iv) Compensation and Rehabilitation and Resettlement (R&R)

- Based on the SIMP, the Collector shall discuss the Package in a meeting with the Rehabilitation and Resettlement committee at project level, and submit the Package to Commissioner Rehabilitation and Resettlement along with his/ her remarks;
- The Commissioner Rehabilitation and Resettlement shall, after due vetting, accords approval to the scheme and make it available in public domain;
- After approval of R & R plan by Commissioner R & R , the Collector shall issue two awards one for land compensation based on procedures described in act & State's rules and second for R & R as per approved SIMP

v) Compensation and Rehabilitation and Resettlement (R&R)

As far as possible, no acquisition of land shall be made in the Scheduled Areas and where such acquisition take place it shall be done only as a demonstrable last resort. In addition to the R&R package, SC/ST families will be entitled to the following additional benefits;

- One time financial assistance of Rs. 50,000 per family;
- Families settled outside the district shall be entitled to an additional 25% R&R benefits;
- Payment of one third of the compensation amount at very outset;
- Preference in relocation and resettlement in area in same compact block;
- Free land for community and social gatherings;
- In case of displacement, a *Development Plan is to be prepared*
- Continuation of reservation and other benefits of Schedule V and Schedule VI area from displaced area to resettlement area

C. Output

1) Social Impact Management Plan (SIMP) including SIA, RAP and Public Disclosure by GoM.

7.1.4 Funding Agency Concurrence/Acceptance (if applicable)

A . Objective

1) To obtain concurrence of funding agencies related to E & S components of the projects

B. Proess

1) PEDM submits DPR and various reports on environment and social like IEAR, CPTD to funding agencies for appraisal and concurrence.

C. Output

1) Acceptance/concurrence of funding agencies.

7.5 Detailed Design & Tendering

80. During this stage, following environment & social management activities are undertaken;

1) Design measures that can avoid environmental and social impacts like taller/specialized towers and changes of substation configuration for example protect sensitive receptors nearby would be made a part of the bidding documents;

2) PEDM shall either implement IEAR/CPTD in-house or engage outside agencies that are capable of executing such task;

3) Project specific EMP to be made part of contract/bidding document for implementation by contractors/subcontractors

7.5.1 Project Implementation

81. During this phase, various environment and social management plan prepared for the project are implemented and monitored. This includes;

- Execution of EMP & EAMP
- Execution of CPTD

7.5.2 Execution of EMP & EAMP

A. Objective

1) To carryout environment management works as prescribed in IEAR

B. Process

1) EAMP (IEAR) is executed taking into account appropriate working clearance & ROW (by cutting/ felling/pruning trees etc and other measures identified in clearance. Forest dept. undertakes CA Scheme;

2) Other mitigation measures enlisted in EMP are executed by PEDM and Contractor;

3) PEDM shall initiate the process (for WB funded projects) and prepare a Final Environmental Assessment Report (**FEAR)** (refer **Annexure-22** for contents of FEAR).

C. Output

1) Tangible proof of EMP/EAMP execution;

2) FEAR containing compliance of mitigation measures as listed in IEAR, EMP implementation and details of forest clearance etc.

7.5.3 Execution of CPTD

A. Objectives

1) To carryout social management works as prescribed in CPTD.

B. Process

1) PEDM shall pay the compensation in consultation with revenue authority and affected persons and execute any other measures as agreed and documentation in the CPTD for transmission/distribution lines.

C. Output

1) Tangible proof of execution of social management measures;

2) RoW.

7.5.4 Execution of SIMP *(if applicable)*

A. Objectives

1) SIMP to be executed by GoM as per RFCTLARRA, 2013.

B. Process

82. The execution of the SIMP is the responsibility of the GoM. However, the following process is to be facilitated by PEDM:

1) PEDM deposits cost for land and R & R measures as per award issued under RFCTLARRA, 2013 to concerned authority/State Government;

2) Transfer of compensation and monetary R & R benefits to affected persons account by GoM;

3) Possession of land by PEDM.

C. Output

1) Possession of land

7.6 Operation and Maintenance (O&M)

83. The environment & social works undertaken in earlier phase of project cycle are monitored in this period.

7.6.1 Environmental Monitoring

A. Objectives

1) To monitor work undertaken as part of EAMP

B. Process

1) Regular patrolling of RoW and CA;
2) Substation to be monitored on daily basis;
3) Others mitigation measures outlined in EMP are monitored as per schedules

C. Output

1) Periodic monitoring reports containing updates of execution of EAMP execution.

7.6.2 Social Monitoring:

A. Objectives

1) To monitor work undertaken as part of CPTD, SIMP (if applicable).

B. Process

1) CPTD implementation;
2) If land acquisition is involved, PEDM (as member of State R & R committee) monitored SIMP implemented by GoM as per the provisions of RFCTLARRA,2013.

C. Output

1) Periodic monitoring reports containing updates of execution of CPTD and SIMP execution.

7.7 Review

i) Circle office of PEDM at Engg.-in-Charge office shall monitor and review of E&S activities of the Transmission and Distribution project on monthly basis along with site office;

ii) The implementation/performance of environmental and social management measures along with other project works shall be reviewed by PEDM management initially every quarter for a period of at least 1 (one) year as this ESPP will be inducted in its corporate functioning first time in implementation of PEDM's Transmission/ Distribution Project;

iii) PEDM Management shall undertake annual review of ESPP implementation to obtain feedback on problems/limitations/stakeholders expectations for deliberations and incorporating changes/improvement in the document for its smooth implementation.

Table 7.1: Environmental and Social Assessment & Management Process of a Typical T & D Project

Milestones	Objectives	Process	Responsibility	Product/Decision
I. Project Conceptualisation				
1. Environmental and Social Screening & Scoping for Transmission /Distribution Lines	▪ To identify environmentally and socially sensitive areas, issues and possible management measures ▪ To suggest alternate transmission line routes, if necessary ▪ To outline the scope of Environmental Assessment (EA) and Social Assessment (SA) studies	▪ Screen and scope Transmission Lines from an environmental and social perspective ➢ Desk Review ➢ Spot Verification ➢ Informal Public Consultation ➢ Consultation with Forest Dept.& Revenue Authorities	▪ Circle office ▪ Engg. Dept. ▪ Site office	▪ Environmental & Social screening and scoping documents as part of Concept Paper.
2. Environmental & Social approval	▪ To obtain environmental & social approvals from the PEDM management and In-principle approval by State Govt.	▪ Submit 'Concept Paper' (with E&S screening & scoping details) to PEDM Management	▪ Engg. Dept ▪ Site office ▪ Circle office	▪ PEDM Management Appraisal.
		▪ Submit 'Concept Paper' (with E &S screening and scoping details) for In-principle approval by State Govt	▪ Engg. Dept ▪ Circle office	▪ In-Principle approval by State Govt.
II. Project Planning				
▪ Environmental and Social Screening and Scoping for substations	▪ To identify substation lands avoiding/ minimising environmentally and socially sensitive areas, ▪ Selection of proper site which has minimal impact ▪ To suggest alternate substation sites , if necessary ▪ To outline scope of land acquisition	▪ Screen and scope substation sites from an environmental and social perspective ➢ Desk Review ➢ Spot Verification ➢ Consultation with Revenue Authorities ➢ Informal Public view	▪ Engg. Dept. ▪ Circle office ▪ Site office	▪ Environmental & social screening and scoping documents for substations
▪ Environmental Assessment & Management Planning	▪ To prepare IEAR for the project/sub-projects.	a. Forest Areas ➢ Tree Enumeration ➢ Cost-benefit Analysis ➢ Compensatory Afforestation b. Other Areas ➢ Undertake environmental review and formulate appropriate management measures	▪ Circle office ▪ Site Office ▪ Auth. Agencies	▪ IEAR ➢ Environmental review ➢ Forest Proposal ➢ Environmental Management Measures ➢ Views of Public

Milestones	Objectives	Process	Responsibility	Product/Decision
		c. Public Consultation ➢ To inform/record public views for refinement / review if needed		
▪ Social Assessment for Temporary Damages for TL	▪ To prepare Compensation Plan for Temporary Damages(CPTD)	▪ Undertake assessment of land area likely to be affected by putting up tower and line and extent of damages during foundation, erection & stringing works. ▪ Formulate appropriate management plan to minimize impact and prepare compensation plan	▪ Circle office ▪ Site office ▪ Authorised Agencies	▪ CPTD ➢ Social review ➢ Management measures ➢ Compensation plan
III. Project Approvals				
1. State Govt.	▪ To obtain project approval from GoM	▪ Submit DPR (with EAMP and Social Screening and Scoping details) to Planning Dept./GoM for their review	▪ Circle office ▪ Engg. Dept.	▪ Project approved by State Govt.
2. Financial Agency's Acceptance	▪ To obtain acceptance from FA for environmental & social components of Concept Paper or IEAR & CPTD	▪ Submit DPR along with IEAR and CPTD to Financial Agency for acceptance	▪ Circle office	▪ Acceptance/concurrence by FA
3. Forest Clearance	▪ To obtain Forest Clearance	▪ Submit forest proposal to concerned authority. ▪ Forest Proposal to MoEF for conditional approval after recommendation by GoM ▪ Forward Compliance report by GoM to MoEF for Final Forest Clearance	▪ Site office ▪ Circle office	▪ Final Forest Clearance by MoEF
IV. Detailed Design & Award				
1. Environment Assessment and Social Management Measures	▪ To appoint a suitable agency to implement IEAR/CPTD , if required	▪ Select and appoint suitable agency for IEAR/CPTD implementation, if required	▪ Circle office ▪ Site office	▪ Agency appointed for IEAR/CPTD
	▪ To include EMP part of bidding/contract document for implementation by contractor	▪ EMP included in bidding /contract document	▪ Circle office ▪ Site office	▪ EMP part of contract document
V. Project Implementation				
1. Execution of Environmental Management Works	▪ To undertake environmental management work as prescribed in environmental assessment management plan	▪ Execute environmental management works ➢ Appropriate clearance for transmission line ROW, etc. ➢ Compensatory Afforestation ➢ EMP by contractor	▪ Circle office ▪ Authorised Agency ▪ Site office ▪ Contractors	▪ Environmental management measures executed

Milestones	Objectives	Process	Responsibility	Product/Decision
	▪ Preparation of Final Environment Assessment Report(FEAR), If required (for WB funded project)	▪ Compliance to mitigation measures listed in ➢ IEAR ➢ EMP ➢ Forest clearance	▪ Circle office ▪ Authorised Agency ▪ Site office ▪ Contractors	▪ FEAR for FA
2. Execution of CPTD for TL & SIMP for Substation (if applicable)	▪ To undertake social management work as prescribed in CPTD	▪ Transmission lines ➢ Pay compensation in consultation with Revenue Authority and affected persons as agreed & documented in CPTD and execute other measures ▪ Sub-stations ➢ Deposit cost for land and R & R measures as per award ➢ Transfer of compensation money to affected person's a/c ➢ Possession of land	▪ Circle office ▪ External Agency ▪ Site ▪ PEDM	▪ Social management measures executed ▪ Possession of land
VI. Operation & Maintenance				
1. Environmental & Social Monitoring	▪ To monitor work being undertaken as part of EAMP, CPTD & SIMP(if applicable)	▪ Monitor EAMP measures ➢ Maintenance of ROWs ➢ Progress on compensatory afforestation ➢ Compliance to EMP as per schedule	▪ Circle office ▪ Site office	▪ Periodic monitoring reports
		▪ Monitor CPTD measures ➢ Appropriate compensation and other measures during maintenance of towers and lines ▪ Monitor SIMP measures undertaken by State Government as per RFCTLARRA, 2013(If land acquisition involved)	▪ Circle office ▪ Site office ▪ Circle office ▪ Site	
VII. Project Review				
1. Annual Environmental & Social Review	▪ To review annually the EAMP and the CPTD of its projects	▪ Review and report on environmental and social performance of project during construction operation and maintenance	▪ Circle office ▪ Corporate office	▪ Annual environmental and social review report

7.8 Risk Management Framework

84. Environmental and Social Risk Assessment is a vital part of PEDM's environmental and social management strategies. The risk assessment process identifies existing risks, and forecast future potential risks in its power transmission/distribution projects. It is a scientific process that includes cost benefit analysis. The environment and social management procedures developed by PEDM evaluate these risks, both qualitatively and quantitatively, and prioritise them. Based on prioritisation, environment and social management options are selected.

85. PEDM's risk assessment process involves several, successive, interactive stages, which have been included in the environmental and social assessment and management procedures and are, listed below:

- Risk Identification
- Risk Assessment
- Risk Characterisation
- Risk Management
- Risk Mitigation
- Risk Preparedness

85 PEDM, based on its environmental and social risk assessment process, decides on management options to purge environmental and social impacts. The risk management process includes risk preparedness, risk mitigation and the sharing of liabilities (via Internal Arrangements and Insurance). Responsibilities in the event of occurrence of a risk have been illustrated in **Table 7.2**.

Internal Arrangement

86 To absorb the risk in the event of its occurrence PEDM will strengthen internal capacities. This would include creating funds or supplementing present funds to prepare for contingencies such as major ecological disasters adverse or health impact resulting in environmental human disease.

Insurance

87 To share risk, PEDM will maintain insurance schemes and supplement them to give it fuller coverage as regards environmental and social risks. The only legislation relevant to environmental insurance is the Public Liability Insurance Act, 1991. This Act makes it mandatory for any owner dealing with and handling hazardous substance to take out an insurance policy. In case of an industrial accident, payment to the victims will be made from the relief funds and insurance cover.

Table 7.2: PEDM's Risk Responsibility Framework

Risk	GoM /PEDM	Contractor	Insurers
Non compliance Regulatory[13]	✓	✓	-
Non compliance Contractual[14]	-	✓	-
Major hazards, e.g. tower fall during construction	✓	✓	✓
During O&M	✓	-	-
Impacts on health[15] etc.	✓	-	-
Force Majeure Insurable	-	-	✓
Force Majeure Non-Insurable	✓	-	-
Inclusion/ Exclusion of concerned Communities	✓	-	-
Public Interest Litigation	✓	-	-

[13] Regulatory like working in forest/protected areas without statutory clearances.

[14] Contractual like noncompliance of condition of clearance like fuel supply to labourer to avoid tree felling, no-work during night times, etc.

[15] Impact of health like any case of prolonged exposure to Electro-Magnetic Field (EMF).

8. Implementation Arrangements

88 Ministry of Power (MoP), GoI has appointed POWERGRID as Design cum Implementation Supervision Consultant (i.e Project Management Consultant-PMC) now changed to Implementing Agency (IA). However, the ownership of the assets shall be with respective State Govt's /State Utilities, which upon progressive commissioning shall be handed over to them for taking care of Operation and Maintenance of assets.

89 The arrangement for monitoring and reviewing of project from the perspective of environment and social management will form part of overall arrangements for project management and implementation environment. Following implementation arrangement has been proposed at different levels for smooth implementation of this project;

8.1 Administrative Arrangement for Project Implementation

- **Central Project Implementation Unit (CPIU) -** A body responsible for coordinating the preparation and implementation of the project and shall be housed within the IA's offices at Guwahati. The "Project-In-Charge" of IA & Head of each of the SPCU shall be a member of CPIU.
- **State Project Coordination Unit (SPCU)** – A body formed by the Utility and responsible for coordinating with IA in preparing and implementing the project at the State level. It consist of experts across different areas from the Utility and shall be headed by an officer of the rank not below Chief Engineer, from PEDM.
- **Project Implementation Unit (PIU)** – A body formed by the IA, including members of PEDM on deputation, and responsible for implementing the Project across the State, with its personnel being distributed over work site & working in close association with the SPCU/ CPIU. PIU report to State level "Project Manager" nominated by the Project-in-Charge of IA. The IA will have a Core team stationed at the CPIU on permanent basis and other PMC officers (with required skills) will visit as and when required by this core team.

8.2 Review of Project Implementation Progress:

90 To enable timely implementation of the project/subprojects, following committee has been setup to review the progress;

- **Joint Co-ordination Committee (JCC):** IA and SPCU nominate their representatives in a body called JCC to review the project. PMC shall specify quarterly milestones or targets, which shall

be reviewed by JCC through a formal monthly review meeting. This meeting forum shall be called as Joint Co-ordination Committee Meeting (JCCM).The PMC shall convene & keep a record of every meeting. MoP, GoI and The Bank may join as and when needed. Minutes of the meeting will be shared with all concerned and if required, with GoI and The Bank.

- **High Power Committee (HPC):** The Utility in consultation with its State Government shall arrange to constitute a High Power Committee (HPC) consisting of high level officials from the Utility, State/ District Administration, Law enforcement agencies, Forest Department. etc. so that various permission/ approvals/ consents/ clearances etc. are processed expeditiously so as to reach the benefits of the Project to the end consumers. HPC shall meet on bimonthly basis or earlier, as per requirement. This forum shall be called as High Power Committee Meeting (HPCM) and the SPCU shall keep a record of every meeting. Minutes of the meeting will be shared with all concerned and if required, with GoI and The Bank.

- **Contractor's Review Meeting (CRM):** Periodic Review Meeting will be held by officials of PIU with Contractors at field offices, State Head Quarters (PIU location) and if required with core team of PMC at Guwahati. These shall be called "Contractor's Review Meeting" (CRM). PIU shall keep a record of all CRMs, which shall be shared with all concerned and if required, with GoI and The Bank.

91 A review will be held among MoP, GoI, The Bank, State Government., Utility and IA, at four (4) months interval or earlier if needed, primarily to maintain oversight at the top level and also to debottleneck issues that require intervention at GoI/ State Government level. Minutes of the meeting shall be prepared by PMC and shared with all concerned.

8.3 Implementation Arrangement for Environment & Social Management by PEDM

92 ESPP implementation requires a robust and efficient institutional framework. This section captures these institutional arrangements for ESPP implementation by its employees who collectively have experience of laying and maintaining substations, transmission and sub-transmission lines. Moreover, services of leading environment/social institutes/individual experts specializing in the relevant discipline may be utilized in the initial stage, if needed. Independent specialist may also be engaged to deal with complex and technical issues like wildlife management. POWERGRID who has also been designated as Implementing Agency (IA) has vast experience of implementation of thousands of kilometers transmission lines in the country and abroad. POWERGRID is also leader in development and subsequent implementation of ESPP in the country. The service of POWERGRID's trained and experience personnel shall be utilised for training and establishment of institutional

framework of PEDM. Moreover, successful implementation of provision of ESPP requires involvement and support of higher officials of PEDM who shall regularly monitor/review E & S aspects of transmission and distribution project.

8.3.1 Organizational Requirements

93 To ensure quality and strengthen organizational systems to enable effective implementation of the ESPP, PEDM shall have to set out procedures and work culture, which will promote total involvement of all its personnel. To attain assigned goal following shall be ensured:

- A coordinated system of functioning to be adopted by PEDM Planning Dept. who is the spokesperson of Engineer-in-Chief of PEDM/ Sect. (Power).
- An emphasis on intra-departmental approach, demarcation of departmental responsibilities and the delegation of authority, which will upshot quick response and amendment to change.
- A commitment to provide at all times the best possible time bound quality service in all areas of its operations.

94 PEDM's commitment to the ESPP shall have to be developed with these principles. To ensure effective implementation of its ESPP, PEDM will focus on:

- Strengthening the implementation of the ESPP by deploying specialist or redeployment of appropriately trained personnel at key levels;
- Placing dedicated manpower with specialization in the respective field to deal and manage the environment and social issues;
- Reinforcing in-house capabilities by working with specialized external agencies;
- Frequent/regular review by higher management
- Annual review of the ESPP implementation and problem faced to start with internally or through external agencies as necessary.

95 Office of Engg.-in-Chief will have overall responsibility for construction, operation, and maintenance of transmission/distribution systems apart from providing necessary support services (Refer **Figure -8.1:** PEDM Departmental profile for the basic structure of the Head office/Circle office and Site office).

8.3.2 Organizational Structure and Responsibilities

96 An appropriate organizational structure shall have to be developed at the head, circle and site level to help effective implementation of the ESPP document. The organizational flowchart of PEDM for the proposed ESPP is given in **Figure 8.1.**

97 At the Circle office level, an Environment and Social Management Cell (ESMC) will be formed under SPIU headed by Chief Engineer (Transmission Circle). However, Planning Dept. in tandem with Transmission Circle shall extend all help for the successful implementation of ESPP in PEDM functioning. The key responsibilities of ESMC will include:

- Coordinating environmental and social commitments and initiatives with various multilateral agencies, GoM and MoEF.
- Coordination of all environmental activities related to a project from conceptualisation to operation and maintenance stage.
- Advising and coordinating site offices to carry out environmental and social surveys and route alignment for new projects.
- Advising site offices to follow-up with the state forest offices and other state departments for expediting forest clearances and other E & S issues of various projects.
- Providing a focal point for interaction with the MoEF for expediting forest clearances
- Training of Circle and Site officials on E & S issues arising out of Transmission/ Distribution projects and their management plan.
- Training of other departments to familiarize them with the ESPP document.

98 A responsibility allocation matrix has been developed as per **Table 8.1**. This matrix captures the project activities, environmental and social management processes, key indicators to monitor progress, roles, and responsibilities of various stakeholders at different levels and involvement of external agencies.

Figure-8.1 : PEDM Organization Chart and for the Proposed ESPP

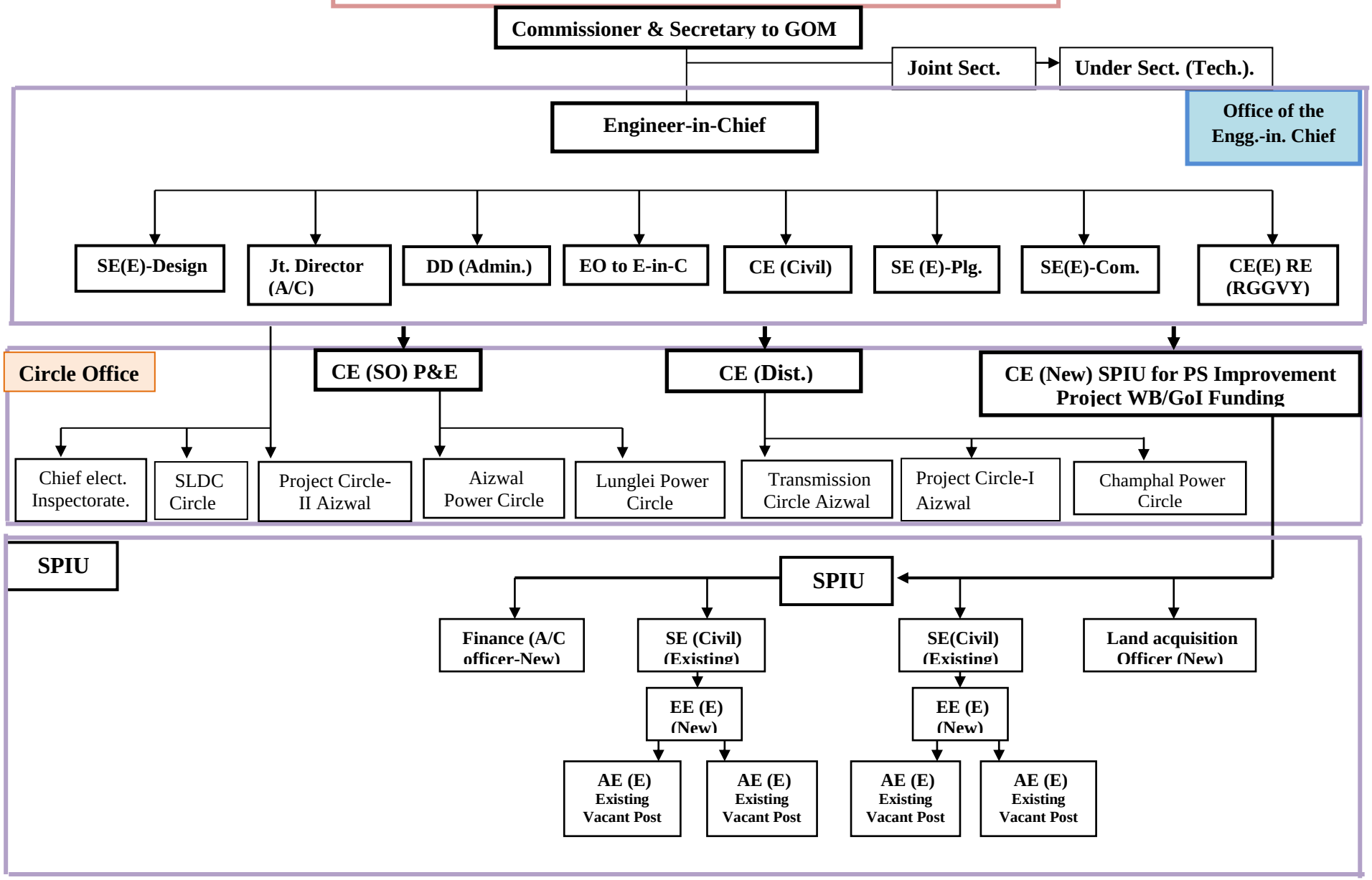


Table 8.1: Responsibility Allocation Framework for the E & S Assessment & Management Process

Milestones	Process	Output / Indicators	Responsibility			
			Internal			External
			Preparation / Execution	Review	Approval	Preparation
I. Project Conceptualisation						
1. Environmental & Social Screening and Scoping for T & D Lines	▪ Screen and scope Transmission/Distribution Lines from an environmental & social perspective	▪ E & S screening and scoping documents as part of Concept Paper	▪ Site office	▪ Engg. Dept. ▪ SPIU	▪ PEDM Management Appraisal	▪ Pre-apprisal by Planning Deptt., GoM
2. Environmental & Social approval	▪ Submit Concept paper (with E&S details) for Management Approval	▪ PEDM/ GoM Appraisal	▪ SPIU ▪ Plg.Dpt./PEDM	▪ SPIU ▪ Engg. Dept. ▪ Plg.Dpt./ PEDM	▪ PEDM Management Appraisal	▪ In-principle approval by GoM
II. Project Planning						
1. Environmental & Social Screening and Scoping for substations	▪ Screen and scope sub-stations sites from an environmental & social perspective ▪ Consultation with Revenue Authorities	▪ E & S Screening and Scoping reports for substation sites ▪ Scope for land acquisition	▪ Site office ▪ SPIU	▪ SPIU ▪ Engg. Dept. ▪ Plg. Dept. /PEDM	▪ PEDM Management Approval	▪ Ext. agency like revenue, forest dept etc. for Social Screening & Scoping
2. Environmental Assessment and Management Planning	▪ To prepare EAMP ➢ Transmission/Distribution line ➢ Substations ➢ Public Consultation (line)	▪ Environmental/ Assessment Management Plan	▪ SPIU ▪ Site office	▪ SPIU	▪ PEDM Management Approval	▪ State Forest Dept
3. Social Assessment for Temporary Damages for TL	▪ To prepare CPTD ➢ Assessment of temporary damages ➢ Compensation plan ➢ Public consultation	▪ Compensation Plan for Temporary Damages (CPTD)	▪ SPIU ▪ Site office	▪ SPIU	▪ PEDM Management Approval	▪ Revenue Dept

Milestones	Process	Output / Indicators	Responsibility			
			Internal			External
			Preparation / Execution	Review	Approval	Preparation
III. Project Approvals						
1. Forest Clearance	▪ Submit forest proposal to State Govt ▪ Forest Proposal to MoEF for 1st stage approval ▪ Compliance to MoEF for Final Forest Clearance	▪ Final Forest Clearance by MOEF	▪ SPIU ▪ Site office	▪ SPIU ▪ Finance Deptt.	▪ PEDM Management Approval	▪ RMoEF/MoEF
2. State Govt.	▪ Submit DPR (with E & S details) to State Govt.	▪ Project approval by State Govt.	▪ Circle Office ▪ Plg.Dept./ ▪ PEDM.	▪ SPIU ▪ Plg.Dept/ ▪ PEDM	▪ PEDM Management Approval	▪ Budget/fund allocation
3. FA Acceptance	▪ Submit IEAR and CPTD to Funding Agencies for appraisal	▪ IEAR and CPTD concurrence by FA	▪ SPIU ▪ Plg.Dept. ▪ PEDM	▪ SPIU ▪ Plg.Dept. ▪ PEDM.	▪ Management Approval	▪ Detailed appraisal and concurrence
IV. Detailed Design & Award						
1 IEAR/CPTD Implementation	▪ Engage authorised agencies for E & S management plan work	▪ Authorised agencies engaged to execute management works	▪ Site ▪ SPIU .	▪ Plg.Dept. ▪ SPIU	▪ Management Approval	▪ Monitoring /Supervision
2.EMP part of bidding documents	▪ Project specific EMP to be included in bidding document	▪ EMP part of contract document	▪ Circle office	SPIU	▪ Management Approval	▪ Monitoring /Supervision
V. Project Implementation						
1. Execution of Environmental Management Works	▪ Execute environmental management works(IEAR)	▪ Environmental management measures executed	▪ Site office ▪ Authorised agency	▪ SPIU / Circle office	▪ Management Approval	▪ Environment management works executed
2. Execution of CPTD & SIMP (if applicable)	▪ Execute CPTD for TL ▪ SIMP for Substations (SIA/GoM)	▪ CPTD – by PEDM) ▪ SIA/GoM (for substations)	▪ Site office ▪ SIA/GoM	▪ SPIU/Circle office ▪ Plg./PEDM ▪ SIA	▪ Management Approval ▪ SIA/GoM	▪ Social management works executed ▪ Possession of Land

Milestones	Process	Output / Indicators	Responsibility			
			Internal			External
			Preparation / Execution	Review	Approval	Preparation
VI. Operation & Maintenance						
1. Environmental & Social Monitoring	▪ Monitor EAMP &CPTD (TL) measures ▪ Monitor SIMP (if applicable) Measures by SIA/GoM	▪ Periodic monitoring reports ▪ Periodic monitoring reports (SIA)	▪ SPIU Site Office ▪ Site office SIA/GoM	▪ SPIU Circle office ▪ O&M circle office	▪ Management Approval ▪ SIA/GoM	▪ Periodic monitoring report ▪ Periodic monitoring reports
VII. Project Review						
1. Periodic Environmental & Social Review	▪ Review and report on E & S performance of project during construction, O &M	▪ Annual environmental and social review report	▪ Site office ▪ SPIU /Circle office	▪ Plg./PEDM Engg. Dept ▪ Fin. dept	▪ Management Approval	▪ FA appraisal ▪ GoM

9. Training & Capacity Building

99 Training and development of employees shall be an essential part for implementation of ESPP. Identification/assessment of Training requirement is to be carried out Circle office and Site level, based on which focused training modules will be developed for:

- Strengthening in house capacity to implement the provisions of ESPP
- Creating awareness providing the tools for implementation of ESPP and related management procedures to all departments
- Developing competence within key employees by providing training in their respective field

100 Based on training needs identification ESMC/Circle office/Site office are key organisational support groups, which need to have required competence to integrate the ESPP document within all departments. The skill requirement for these groups is depicted in **Table 9.1.** Based on skill requirement/improvement at all levels for proper implementation of ESPP, training program focusing personnel from Head Office, ESMC/Circle office, Divn./Sub-divn./Site office is prepared in **Table 9.2** to implement for staff development program. These training programs may be conducted with the help of local experts and or national training institution and experts in various aspect of environmental and social management.

Table 9.1 : PEDM's Skill Requirement

Milestones	Environment and Social Management Cell (ESMC) at Circle office	Engineering Department	Planning Department	Field office
1. Environmental & Social Screening and Scoping for Transmission Lines	▪ ESPP & Project Cycle ▪ Dom./Ext. FA Requirement ▪ EA & SA process ▪ Env. & Soc. issues identification & management technique ▪ Negotiation skills ▪ Mitigation techniques	▪ E & S issues identification skills ▪ EA & SA process		▪ EA & SA process ▪ Env. & Soc. issues identification & management technique ▪ Negotiation skills ▪ Mitigation techniques
2. Environmental & Social approval			▪ EA & SA process ▪ ESPP & project cycle ▪ FA requirement ▪ E&S mgmt. Techniques	
3. Environmental & Social Screening and Scoping for sub-station sites	▪ Env. & Soc. issues identification skills ▪ EA & SA process	▪ E & S issues identification skills ▪ EA & SA process		▪ E & S issues identification skills ▪ EA & SA process
4. Environmental Assessment and Management Planning	▪ EA process ▪ EM techniques ▪ Risk assessment ▪ Forest proposal process ▪ Comp. afforestation process	▪ EA process ▪ EM techniques		▪ EA process ▪ EM techniques ▪ Risk assessment ▪ Forest proposal process ▪ Comp. afforestation process
5. Forest Clearance	▪ Forest proposal process ▪ Compensatory afforestation process	▪ Forest clearance process		▪ Forest proposal process ▪ Compensatory afforestation process
6. GoM Approvals	▪ FA requirements ▪ Awareness of Central/State laws, policies on environment and social aspects		▪ Central and Ext. FA requirements ▪ Awareness of Central/State laws, policies on	

Milestones	Environment and Social Management Cell (ESMC) at Circle office	Engineering Department	Planning Department	Field office
			environment and social aspects	
7.FA acceptance	▪ FA requirements ▪ Awareness of Central/State laws, policies on environment and social aspects		▪ Central & Ext. FA requirements ▪ Awareness of Central laws, policies on E&S aspects	
8.Social Assessment for Temporary Damages	▪ SA process, ▪ Public consult skills ▪ SM process	▪ SA process ▪ SM techniques		▪ SA process, ▪ Public consult skills ▪ SM process
9.Consultation for IEAR/CPTD works	▪ Skill to assess Consultation capabilities to meet IEAR/ CPTD			
10. Execution of EAMP works	▪ EM techniques ▪ Compensatory Afforestation process	▪ EM process		▪ EM techniques ▪ Compensatory Afforestation process
11. Execution of CPTD	▪ SM process ▪ SM techniques	▪ SM process		▪ SM process ▪ SM techniques
12. Monitoring	▪ Monitoring Techniques			▪ Monitoring techniques
13. Annual E & S Review	▪ Review process			

Table 9.2 : Staff Development Programme

Course	Training Schedule	Duration Of Programme	For Awareness/ Orientation and for Training of Staff	Department
▪ ESPP ▪ Policy ▪ Contents of ESPP ▪ How PEDM will implement the ESPP	Workshop	1/2 day or 1 day	All Senior staff (CE and proposed ESPP Team at Circle office	▪ All
▪ ESPP ▪ Policy ▪ Project cycle ▪ E&S assessment and Management process	Workshop	2 days	Proposed ESPP Team and relevant staff	▪ ESMC ▪ SPIU ▪ Engg. Dept. ▪ Corp. Plg. ▪ Legal Dept. ▪ Fin. Dept.
▪ RFCTLARRA, 2013 (If applicable) ➢ SIA ➢ R & R Planning ➢ Public consultation	Workshop	2 days	Interface with State Govt. Agencies like SIA, R & R Commissioner and External Expert	
▪ ESPP ▪ Project cycle ▪ EA&SA process ▪ Env. & Soc. issue identification ▪ Public consultation ▪ Risk Assessment & Management ▪ EAMP & CPTD	Training Programme	3 days	Proposed ESPP Team and relevant staff	▪ ESMC/ ▪ SPIU ▪ Site/Field Officials

10. Grievance Redressal Mechanism (GRM)

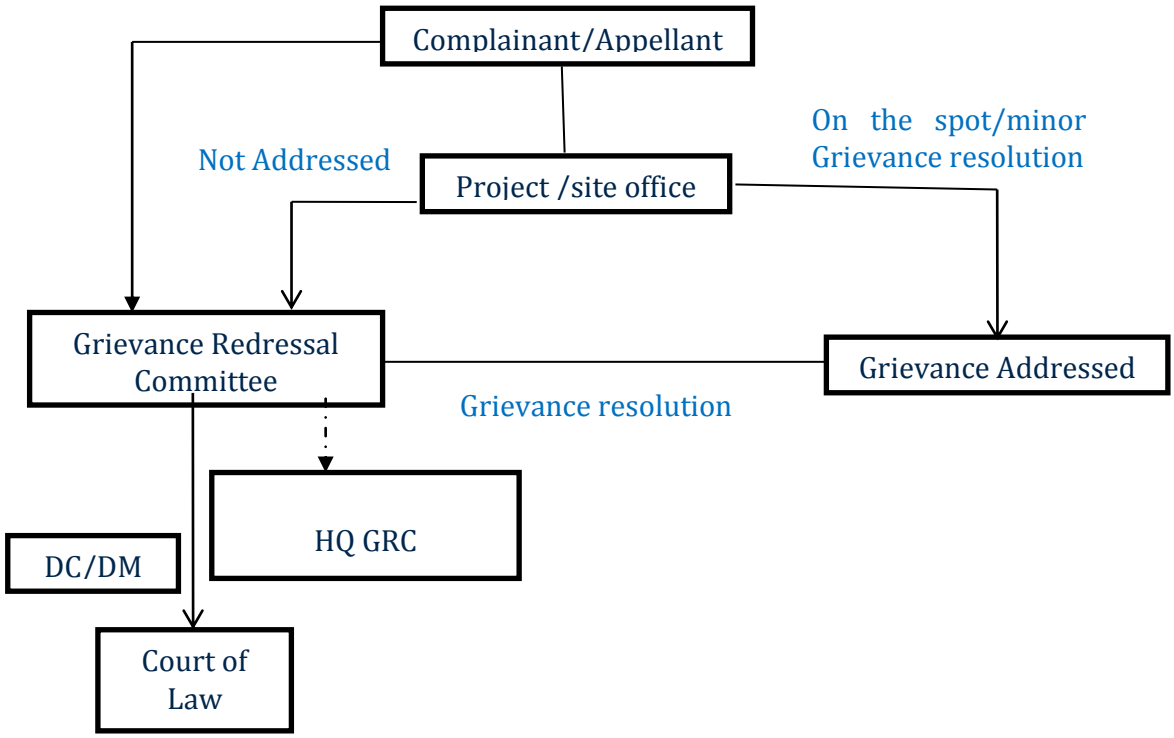
101 GRM is an integral and important mechanism for addressing/resolving the concern and grievances in a transparent and swift manner. Many minor concerns of peoples are addressed during public consultation process initiated at the beginning of the project and broadly outlined in **Annexure-23**. For handling grievance, PEDM shall establish Grievance Redress Committee (GRC) at two places, one at the project/scheme level and another at Head Quarter (HQ) level. The GRCs shall include members from PEDM, Local Administration, Village Panchayat Members, Affected Persons representative and reputed persons from the society and representative from the autonomous districts council in case of tribal districts selected/decided on nomination basis under the chairmanship of project head. The GRC is aimed to provide a trusted way to voice and resolve environment & social concerns of the project, and to address affected person/community concerns in a time bound manner without impacting project implementation. The composition of GRC shall be disclosed in villages/their councils office and concerned district headquarter for wider coverage.

102 The complainant will also be allowed to submit its complaint to local project official who will pass it to GRC immediately but not more than 5 days of receiving such complaint. The first meeting of GRC will be organized within 15 days of its constitution/disclosure to formulate procedure and frequency of meeting. However, GRC meeting shall be convened within 15 days of receiving a grievance for its solution. GRC endeavor will be to pronounce its decision/ may also refer it to GRC at HQ for solution within 30-45 days of receiving grievances. In case complainant/ appellant is not satisfied with the decision of GRC they can approach PEDM HQ Level Committee /District Collector or Court of law for solution.

103 The Field /Site Office shall keep records of all grievances received including: contact details of complainant, date that the complaint was received, nature of grievance, agreed corrective actions and the date these were effected, and final outcome.

104 The HQ level GRC shall function under the chairmanship of Engineer-In- Chief who will nominate other members of GRC including one representative from ESMC at Circle Office who is conversant with the environment & social issues. The composition of HQ level GRC shall be communicated to all project head who is also the chairman of project level GRC. The meeting of HQ GRC shall be convened within 7-10 days of receiving the reference from project GRC or complainant directly and pronounce its decision within next 15 days. The flow chart showing Grievance Redressal Mechanism is presented in **Figure 10.1**.

Figure 10.1: Flow Chart Showing Grievance Redressal Mechanism



Complainant/Appellant can approach only the Court of Law directly during ongoing Grievance Redressal process.

105 The above referred GRCs are meant to act as supplement/ complement and in no way substitute the legal systems, especially embedded within RFCTLARR Act 2013, The Electricity Act, 2003, and Right to Information Act.

11. Monitoring & Evaluation

106 Continuous monitoring of all its activities including environment and social aspects and its mitigation measures would be the key to the success of PEDM project completion. ESMC shall regularly monitor E & S issues with project activities and report to the Chief Engineer (Transmission). Regular monitoring of activities shall also be carried out by site office and shall be reviewed by Circle Office on monthly basis. Engg.-in-Charge shall review ongoing project activities on quarterly basis, which will include environment, and social issues and suggest corrective measures if required for implementation at site.

107 For environmental and social components of a project, environmental and social monitoring plan is developed, based on baseline data and impacts predicted during the environmental and social assessment process. The concerned forest department staffs, as part of their duties monitor impacts on ecological resources through which the transmission line traverses. PEDM in association with forest/revenue official shall monitor timely implementation of various activities such as compensatory afforestation, RoW maintenance, prevention of fire hazards, natural regeneration of vegetation etc. The environmental and social monitoring plan for each project will be integrated with project cycle for monitoring by the ESMC on monthly basis. The higher management shall be appraised through MIS on monthly/quarterly basis.

108 Since regular and effective monitoring of implementation of EAMP/CPTD for Transmission/Distribution Line and SIMP for substations are crucial for desired result, PEDM shall designate one Officer each for Environment and Social related aspects who will be made responsible for all the activities related to implementation/monitoring of the EAMP and CPTD. Further, for effective monitoring/implementation of mitigation measures, help of District Magistrate (DM) / Deputy Commissioner (DC) and other officials of local administration is solicited wherever required. Participation of PAPs in the monitoring of EAMP/CPTD/SIMP is also ensured through regular consultation and their active participation. Major monitoring indicator identified along with frequency of measurement and responsibility at different stage of project for effective monitoring is presented below in **Table -11.1.**

Table 11.1: Monitoring Framework

Sl. No.	Project Activity/ Stage	Monitoring Indicator	Frequency	Responsibility
1	Pre-Construction	Tower Location and Line alignment w.r.t. Distances from; • Set back from nearest dwellings or social institutions • Water bodies • Agricultural land • Ecological protected area • Reserved forests • Flood Zone	Once - at time of detailed siting and alignment survey and design	PEDM
		Exclusion of PCB in transformer	Once – As part of tender specification	PEDM
		Exclusion of CFC in electrical or other equipment	Once – As part of tender specification	PEDM
		EMF strength	Once – part of detailed alignment survey	PEDM
		Noise level from Substation	Once – built in design criteria and specified in tender	PEDM
		Sewage disposal system	Once – in tender specification	PEDM
		Oil spill containment provision & spill cleanup	Once – Built in product specification	PEDM
2.	Planning/ Approval /Construction	Government Clearances	Once for each subproject	PEDM
		Fire prevention and fire protection equipment monitoring	Once – in tender specification	PEDM
		Crop/tree disturbance during construction	Periodically when required	PEDM
		Noise during construction	Once – during construction machinery specification or SOS	PEDM assigned contractor
		Availability of land for Substation (New) ✓ Method of acquisition ✓ SIA start/ disclosure date ✓ Expert group recommendation ✓ No. of PAPs ✓ Date of Award	Periodic monitoring as per provisions RFCTLARRA, 2013	GoM and PEDM

Sl. No.	Project Activity/ Stage	Monitoring Indicator	Frequency	Responsibility
		➢ Compensation ➢ R & R ✓ Payment of Compensation ✓ Implementation of R&R plan (SIMP)		
		Compensation for temporary loss of, trees/ crops. Monitoring of CPTD ➢ Number of APs ➢ Date of issuance of Notice ➢ Determination of compensation ➢ Compensation Amount ➢ Compensation paid	Once a month/quarter – Based on consultation with PAP	PEDM
		Air borne dust emissions during construction	Every two weeks	PEDM assigned contractor
		Vegetation marking and clearance	Every two weeks – strictly limited to target vegetation	PEDM assigned contractor
		Trimming and cutting of trees in ROW	Once per site – Identification of presence of target species with height following vegetation clearance plan	PEDM assigned contractor
		Disposal of cleared vegetation	Once per site – as approved by statutory authorities	PEDM assigned contractor
		Health & safety of workers	Once in quarter	PEDM assigned contractor
		Disposal of excavated soil	Every 2 weeks	PEDM assigned contractor
3	Operation and Maintenance	Effectiveness of Training programs and plan	Once a year	PEDM
		Implementation of SIMP (other development works, infrastructure facilities etc.) within 15-18 months of possession of land.	Periodic monitoring as per provisions RFCTLARRA, 2013	PEDM (being a member of State R & R committee)
		Implementation of CPTD	Periodically when required	PEDM

Sl. No.	Project Activity/ Stage	Monitoring Indicator	Frequency	Responsibility
		Compliance with transmission tower setback conditions	Once in quarter	PEDM
		Maintenance of ground clearance to comply with limits of EMF	Once	PEDM
		Noise levels at boundary nearest to substations	Once a year	PEDM

12. Budget

109 Adequate financial provision is required to meet the management measures to be undertaken to mitigate the impacts as underlined in ESPP. Based on past experience of implementation of similar projects, PEDM estimates about 5-10 % overall project towards such measures for which necessary budget provisions shall be made during planning stage itself.