

Environmental & Social Policy & Procedures (ESPP)



Department of Power, Nagaland (DPN)

April 2015

Executive Summary

Lists of Abbreviation

ADB	:	Asian Development Bank
BoD	:	Board of Directors
CA	:	Compensatory Afforestation
CBD	:	Convention on Biological Diversity
CEA	:	Central Electricity Authority
CF	:	Conservator of Forests
CKM	:	Circuit Kilometers
CPCB	:	Central Pollution Control Board
CPTD	:	Compensation Plan for Temporary Damages
CSGS	:	Central Sector Generation Scheme
DFO	:	Divisional Forest Officer
DL	:	Distribution Line
DPN	:	Department of Power, Nagaland
DPR	:	Detail Project Report
EA	:	Environmental Assessment
EAMP	:	Environment Assessment Management Plan
E & F	:	Environment & Forests
E&S	:	Environmental and Social
EMF	:	Electro Magnetic Fields
EPA	:	Environment Protection Act
ESMP	:	Environmental and Social Management Plan
ESMU	:	Environmental and Social Management Unit
ESPP	:	Environmental and Social Policy Procedures
FEAR	:	Final Environmental Assessment Report
GDP	:	Gross Domestic Product
GHG	:	Green House Gas
GoN	:	Government of Nagaland
GRC	:	Grievance Redressal Committee
HT	:	High Tension
IEAR	:	Initial Environmental Assessment Report
kV	:	Kilo-volt

kWh	:	Kilo-watt hour
LT	:	Low Tension
MDONER	:	Ministry of Development of North Eastern Region
MoEF	:	Ministry of Environment & Forests
MU	:	Million Units
MVA	:	Million Volt Amperes
MW	:	Mega Watts
NBWL	:	National Board for Wildlife
NE	:	North East
NEC	:	North Eastern Council
NO	:	Nodal Officer
NOC	:	No Objection Certificate
NPV	:	Net Present Value
NSDP	:	Net State Domestic Product
OP	:	Operational Policy
O & M	:	Operation & Maintenance
PCB	:	Polychlorinated Biphenyl
PGCIL	:	Power Grid Corporation of India Limited
PCCF	:	Principal Chief Conservator of Forests
PMU	:	Project Management Unit
RFCTLARRA	:	The Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013
R & R	:	Rehabilitation & Resettlement
RoW	:	Right of Way
SIA	:	Social Impact Assessment
SF ₆	:	Sulfur Hexafluoride
SIMP	:	Social Impact Assessment and Management Plan
SMF	:	Social Management Framework
SPCB	:	State Pollution Control Board
T&D	:	Transmission and Distribution
TL	:	Transmission Line
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, 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 & 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 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 **Nagaland:** In the above background, Nagaland 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. Given the unique socio-economic, cultural and environmental resources, Department of Power (DPN), Nagaland, is committed to manage them highly sustainably. The main aim and objective of the Department is to supply quality power to all categories of consumers both in Urban and rural areas by constructing Transmission and distribution lines, substations etc. Other function includes maintenance of Transmission and Distribution lines to minimize power supply interruptions and finally the revenue collection. To meet these objectives in a sustainable manner, plans have been made by Department of Power (DPN) to prepare an Environment and Social Policy and Procedures (ESPP) to serve as a guiding instrument. DPN assimilates environmental and social management procedures into its corporate functioning and also layout management procedures and protocol to address them. It outlines DPN’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 DPN. Thus, it enables DPN :

- 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.

6 DPN considers that the ESPP is a 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.

DPN'S ENVIRONMENT & SOCIAL POLICY STATEMENT

*DPN is fully aware of the rich natural resource and religious, social practice and customary laws and procedures of Nagaland and aspires to fulfill its commitments towards sustainable development through early identification, assessment and avoidance of the environmental and social and cultural issues at both planning and implementation and operational phases. It is also committed to comply with all statutes, customary laws, religious and social practice by following a principle of **avoidance, minimization and mitigation** of residual issues with complete transparency and due social responsibility.*

7 The key principles of DPN'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

8 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).

9 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

10 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.

Nagaland at a Glance

11 **Geography and Governance:** The State of Nagaland lies between latitudes of 25⁰6' N and 27⁰4' N and the longitudes of 93⁰20' E and 95⁰15' E and has geographic area of 16,579 sq. km. The altitude ranges from 194 m to 3,048 m above sea level. The state is connected by both rail and road. The broad gauge railway connection to Dimapur links the state to the railway network of India to the rest of the country.

12 Geographically, the State largely has vast undulating terrain and hilly landscape and some low lying areas giving rise to a very conducive climate with presence of perennial water and moisture

for truly rich variety of flora and fauna and also agriculture. About 70% of the population depends on agriculture. Since the topography is interlocked with mountains in Nagaland, cultivable land is the most valued form of property for its economic, political and symbolic significance.

13 **Demography:** The population of Nagaland as per census 2011 was 19,78,502, with a density of 119 persons per square km. Total ST Population of the state as per the Census 2011 is about 89 %. As of 2012, the state of Nagaland officially recognized 17 Naga tribes. Prominent Naga tribes include Angami, Ao, Chakhesang, Chang, Khamniungan, Konyak, Liangmai, Lotha, Pochury, Rongmei, Zeme. The Naga tribes constitute 98.2% of the population. In addition, some other Naga tribes occupy territory in the contiguous adjoining states and across the border in Burma.

14 **Forests and Protected Areas:** Forest cover constitutes 78.68 % of the total area of this State. The State is endowed with wide range of flora and fauna due to the favorable climate and topography. The recorded forest cover of Nagaland is 13,044 sq. km. Above 90% of the forest of Nagaland is governed by private (individual or communities). These forests are mainly individual forest, village forest, group of village forests, restricted forest, sacred forests etc. Village committee or village council manages and protects these forests. GoN vide Notification No. FOR-58/82 dated 03-07-1986 has limited the application of the Forest Conservation Act to these forest lands. The act, however, does not apply to other forest areas so the compensatory afforestation is not required in private, community or individual forest.

15 Even though the state has 78.68 % of the area under forest cover, there are four protected areas in the State (for details refer Table-1) .There are also nine Important Bird Area (IBA) sites and 421 wetlands in the state. The Doyang reservoir is one of the important wetlands in the state.

Table - 1: Protected Area Network in Nagaland

Sl. No.	National Park/ Wildlife Sanctuary	Area (sq. km.)	District	Important Habitats
1	Intanki National Park	202.02	Peren	White-winged Duck, Rufous-necked Hornbill, Grey Sibia, common pheasant and black star
2	Fakim Wildlife Sanctuary	6.4	Kiphire	Blyth's Tragopan, Hume's Pheasant, Rufous-necked Hornbill, Grey Sibia
3	Puliebadze Wildlife Sanctuary	9.23	Kohima	Blyth's Tragopan, Chevron-breasted Babbler, Dark-rumped Swift, Striped Laughingthrush, Brown-capped Laughingthrush, Streak-throated Barwing, Grey Sibia, White-naped Yuhina
4	Rangapahar Wildlife Sanctuary	4.7	Mon	Sambar Deer, Spotted Deer and Barking Deer.

16 **Power Scenario:** Department of Power (DPN), Nagaland, is responsible for generation, transmission, and distribution of power and maintenance of generation stations, transmission and distribution network in the State. DPN is under the administrative control of Principal Secretary/Commissioner & Secretary/Secretary, Power Department, Civil Secretariat, Govt. of Nagaland and the Chief Engineer is the head of department and is responsible for the efficient administration and direction of the overall establishment. As on March'13, DPN operates approximately 670 Circuit KMs (Ckm) of 132 kV & 66 kV AC transmission lines and 6 Nos. of 132/66 kV, 9 nos of 66/33 kV substations with transformation capacity of about 328.5 MVA. In distribution, it operates over 19,923.63Ckm of 33 kV, 11KV & 440 V distribution lines and 74 nos. of 33/11 KV Transformers and various capacities of other LT transformers (DTs) with transformation capacity of more than 470 MVA. DPN has generation capacity of 26.34 MW primarily from hydro and mini-hydro projects i.e. Likimro Hydro, Duilum Roi stage I & II, Lang and Telangsao. However, it is observed that total availability of power in the state is 26 MW (average). Peak demand of the state is projected about 120 MW. Efforts are underway not only to bridge the gap but also 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 Nagaland 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.	220/132 kV Transmission lines	7	376 km.	5811.20
2.	220/132/33kV substations (New/Augmentation)	10	245 MVA	
3.	33 kV Distribution lines	11	76.5 km.	1483.00
4.	33/11kV substations (New)	10	190 MVA	

**The estimated cost includes consultancy fees, contingencies and IDC*

Stakeholder analysis

17 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. Accordingly, key stakeholders at different levels starting from village/panchayat 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:

A. Environment Issues

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

B. Social and Institutional Issues

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

Impacts – Social

18 Potential social impacts of the proposed projects are identified in terms of the nature, magnitude, extent and location, timing and duration of the anticipated impacts and discussed in this section. These social impacts are both positive or negative relating to the different stages of the project cycle viz. project design stage, construction stage or the project operation and decommissioning stage.

A. Positive Impacts

- Improved and reliable power supply;
- Improved economic activity;
- Employment generation;

- 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;
- Reduced consumption/ reliance of/ on fossil fuels like firewood, charcoal etc.; and
- Capacity Building.

B. 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.

Impacts - Environment

19 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.

A. Positive Impacts

- Availability of power reduces the demand of natural resources like kerosene, firewood, charcoal etc. resulting in conservation/protection of natural resources.

B. 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;
- Impacts on Aviation and Communication
- 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

20 DPN 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.

21 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.

22 Apart from this, the Constitution of India grants special status to the State under **Article - 371 A** which states “No Act of Parliament in respect of religious or social practices of the Nagas, Naga customary law procedure, administration of civil and criminal justice and ownership of land & its resources shall apply to the state of Nagaland unless approved by the state legislature. Thus laws enacted by the Parliament would only apply once it is approved by the State Legislature. In view of said constitutional provision of The Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013 (RFCTLARRA, 2013) is not presently applicable in the State of Nagaland 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. DPN taking note of that has taken a conscious decision that private land 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.

23 **Environment** : Mandatory environmental requirements for DPN at state level include: sanction of GoN 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, Nagaland Tree Felling Regulation, 2002 regarding felling of trees from non-forest areas including in respect of plantations on non-forest areas, Hazardous Wastes (Management, Handling and Trans-boundary 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 and E-waste (Management and Handling) Rules, 2011 regarding maintaining records & handling of electronic wastes

24 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 CAMPA fund 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. DPN has decided to undertake assessment of environmental impacts even for cases where not statutorily mandated in order to confirm compliance with its own policy highlighted in paragraph 6 above. However, Government of Nagaland (GoN) vide notification no. FOR-58/82 dated 03-07-1986 has extended the application of this Act to forest lands under the control of Forest Department only. Natural forest outside the jurisdiction of the forest department are thus not under the preview of this act.

25 **Social:** Mandatory Social requirements for DPN 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 RFCTLARRA, 2013 (will be applicable in the State only after the resolution passed in Legislative Assembly – **refer para 22 above**). The provisions of Indian Treasure Trove Act, 1878 as amended in 1949 covers chance finds of any treasure, archaeological

artifacts. The Right to Information Act, 2005 (RTI) ensures citizens to access information under the control of public authorities.

26 **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.

27 **Land Tenure:** In Nagaland, the land is owned either by the village community as a whole or by a clan within the village or by individuals. There are no records for conferring upon such ownership rights but the individuals rights are exclusively determined by tradition which is also referred to as customary laws. These Customary Laws are un-codified, and yet very effectively applied and interpreted by the traditional Village Councils in the event of any dispute. Thus, the land holding pattern in the state of Nagaland is unique, most of the land (more than 88%) is owned by the community. To establish individual land holdings in the state is an arduous task. Clan or community lands are allocated to willing individuals for cultivation.

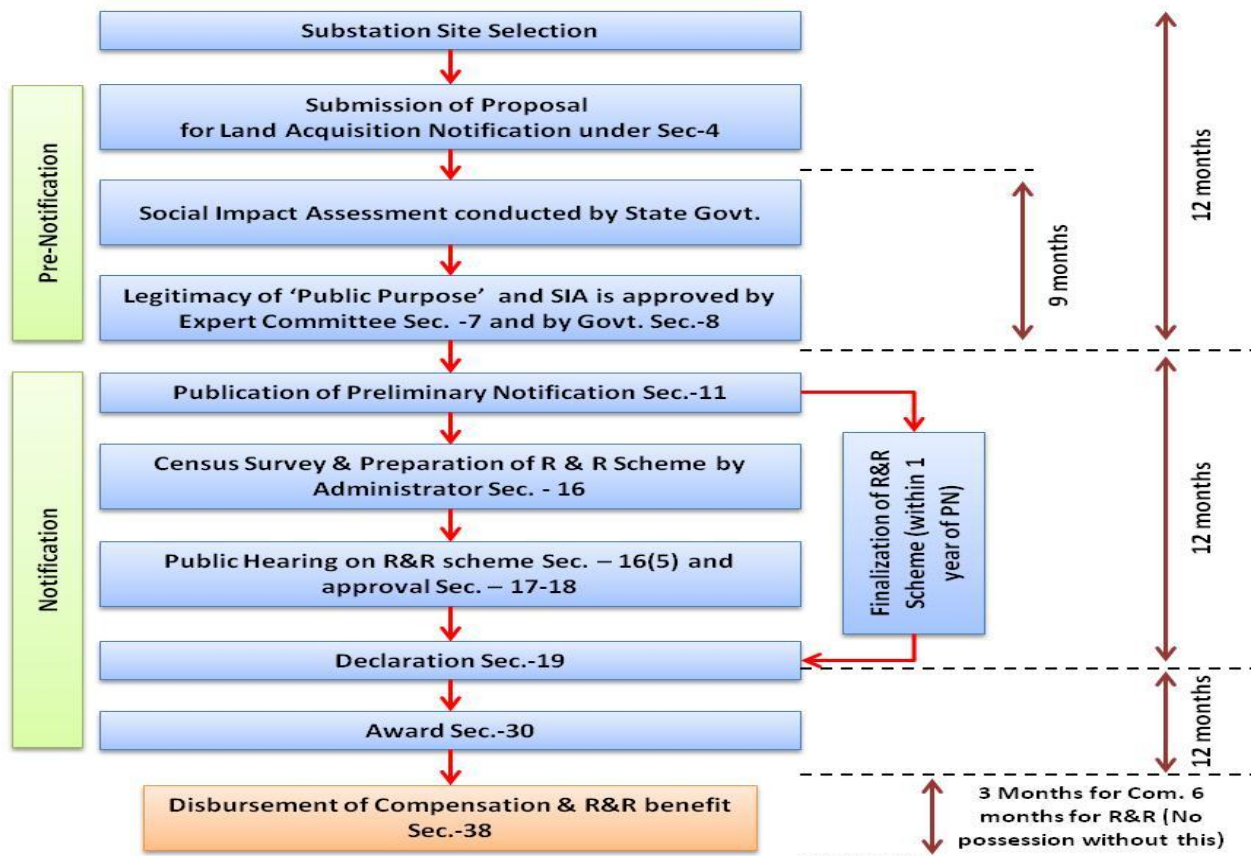
28 **RFCTLARRA, 2013** has replaced the Land Acquisition Act, 1894 and has come into force from 1st January 2014. The new act i.e. RFCTLARRA, 2013 authorizes State Govt. (i.e. GoN) or its authorized Government agency to complete the whole process of acquisition of private land including Social Impact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

A Comprehensive Compensation Package		
Eligibility for Entitlement		Provisions
<p>The affected families</p> <ul style="list-style-type: none"> Land Owners: includes any person- <ul style="list-style-type: none"> 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; 		<p>Determination of Compensation :</p> <p>1. Market value of the land</p> <ul style="list-style-type: none"> 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. <p>whichever is higher</p> <p>Market value x Multiplier* between 1 to 2 in rural areas only (No multiplier in urban areas).</p> <p>2. Value of the assets attached to land:</p> <p>Building/Trees/Wells/Crop etc. as valued by relevant govt. authority;</p> <p>Land compensation = 1+2</p> <p>3. Solatium: 100% of total compensation</p> <p>Total Compensation : 1+2+3</p>
<p>(*) 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.</p>		
Radial Distance from Urban area (Km)		Multiplier Factor
0-10		1.00
10-20		1.20
20-30		1.40
30-40		1.80
40-50		2.00
B. R&R Package		
<p>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</p>		
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:	<p>a. Where jobs are created through the project, mandatory employment for one member per affected family;</p> <p>or</p>

		<p>b. Rupees 5 lakhs per family; or c. Rupees 2000 per month per family as annuity for 20 years, with appropriate index for inflation;</p> <p>The option of availing (a) or (b) or (c) shall be that of the affected family</p>
3.	<p>Housing units for displacement:</p> <p>i) If a house is lost in rural areas:</p> <p>ii) If a house is lost in urban areas</p>	<p>i. A constructed house shall be provided as per the Indira Awas Yojana specifications.</p> <p>ii. A constructed house shall be provided, which will be not less than 50 sq. mts. in plinth area.</p> <p>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.</p> <p>The stamp duty and other fees payable for registration of the house allotted to the affected families shall be borne by the Requiring Body.</p>
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/-
<p>Special Provisions for SCs/STs</p> <p>In addition to the R&R package, <i>SC/ST families will be entitled to the following additional benefits:</i></p> <ol style="list-style-type: none"> 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 <i>Development Plan</i> is to be prepared 7. <i>Continuation of reservation and other Schedule V and Schedule VI area benefits from displaced area to resettlement area.</i> 		

FIGURE 1: ACTIVITY CHART OF RFCTLARRA, 2013



29 The safeguards to be adopted by the DPN where land is acquired either by the voluntary donation or negotiation between the willing buyer and willing seller is described along with other social mitigation measures in Table - 4.

Project Cycle -Integrating Environment & Social Issues/Concerns and Mitigation Measures

30 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 DPN's transmission/distribution (33 kV and above) projects are;

- Project Conceptualization
- Project Planning
- Approval & clearances
- Detailed Design and Tendering
- Project Implementation

- Operation & Maintenance
- Review and Monitoring and Evaluation.

Environmental and Social Concerns

31 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 SF₆ gas.

32 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.

33 Management measures to address the issues and concerns in respect of social and environment are presented in Table 4 and 5 respectively.

TABLE 4: SOCIAL MANAGEMENT MEASURES

S. N.	Potential Issues	Management Measures
1	Loss of land	<p>For Tranche-1, this is an issue as land for only 4 transmission substations (out of 10) and 2 distribution substations (out of 10) is available with the Utility (for details refer Table-5.4 in the main report). For balance 6 transmission and 8 distribution substations, lands will have to be secured a fresh by DPN through adopting any of the following three methods;</p> <ul style="list-style-type: none"> i. Purchase of land on willing buyer & willing seller basis on negotiated rate; ii. Voluntary Donation; and iii. Involuntary Acquisition

S. N.	Potential Issues	Management Measures
		<p>In case of procurement of land through private purchase, DPN 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 DPN 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.</p> <p>In the case of voluntary donation of land, the following shall be ensured:</p> <ul style="list-style-type: none"> • 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; • DPN 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 DPN. • 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 GoN. <p>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 22).</p>
2.	Change in land use and population relocation for substations	<p>Due to inherent flexibility in locating substation and very small size of land, DPN avoids habituated area completely hence no relocation of population on account of setting up of substation is envisaged.</p> <p>Although securing land for construction of substations proposed under tranche-1 is an issue, DPN shall make all out efforts to secure such land wherein possibility of physical relocation/displacement is not envisaged.</p>
3	Change in land use and population relocation due to towers/ poles	<p>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 DPN 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.</p>
4	Right of Way	<p>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, DPN 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).</p>
5	Impact on Tribal	<p>The State of Nagaland is pre-dominantly a tribal state with > 89% population, inhabited by 16 major tribes under the umbrella term of the 'Naga', and along with a number of sub-tribes. Each tribe is distinct and</p>

S. N.	Potential Issues	Management Measures
		unique in character from the others in terms of village administrations, customs, languages and attires. Traditionally, every Naga village had their own form of administrative system which differs from tribe to tribe and from village to village. However, they have a very effective self governance system of Village Council (VC) and a Village Development Board (VDB) - corresponding to a regulating and executive body. These institutions have evolved from indigenous practices of the Naga tribes and later regularized through legislation, facilitating their easy assimilation with existing village system. The council also has full powers to deal with the internal administration of the village, maintenance of law and order, enforce orders passed by competent authority, etc. 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. Any physical interventions (related to land acquisition and CPTD) in such areas can only be implemented with the prior consent of the VC/VDB.. 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 .
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	DPN 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 DPN uses best available technology for lines and do not cause any hazards to 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, DPN will follow the laid down procedure in the Section-4 of Indian Treasure Trove Act, 1878 as amended in 1949.

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

TABLE 5: ENVIRONMENT MANAGEMENT MEASURES

S.N.	Potential Issues	Management Measures
1.	Minimising adverse impact on forests	DPN 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. However, in case of felling of trees in non- designated forest areas (which are not covered under the Forest Conservation Act vide Notification No. FOR-58/82 dated 03-07-1986). DPN/IA shall provide fund for compensatory afforestation for planting 3 trees for every tree to be felled subject to availability of land. However, in legally designated forest areas, provisions of the Forest (Conservation) Act, 1980 shall prevail.
2.	Clearing/Lopping of trees	Use of extended/special tower to reduce RoW and impact on trees.
3.	<ul style="list-style-type: none"> •Vegetation damage •Habitat Loss 	To minimise damage to vegetation and habitat fragmentation, DPN utilizes hand clearing and transportation of tower material by head loads into forestland and other land as well, wherever possible.
4.	<ul style="list-style-type: none"> •Habitat fragmentation •Edge effect on flora & fauna 	DPN 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	DPN shall try to avoid such area to the extent possible. However, in case avoidance is not possible, suitable design modification in the pole like provision of spike guards, barbed wire fencing or any other arrangement shall be incorporated in such location, if required
6.	Chemical contamination from chemical maintenance techniques	DPN does not use chemicals for forest clearance/ RoW maintenance.
7.	Poly-Chloro-Biphenyls (PCBs) in electrical equipment.	DPN use mineral oil in electrical equipments. 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	DPN does not acquire land for its transmission towers. It pays compensation for any crop loss and damage caused during its activities. DPN allows regeneration and cultivation beneath the towers for Transmission Line (TL), around poles/ structures and lines.
9.	Induced secondary development during construction	DPN operations are short-lived and do not induce secondary developments during construction.

S.N.	Potential Issues	Management Measures
10.	Erosion of soil and drainage along the cut and fill slopes in hilly areas	DPN would ensure that all cut and fill slopes in TL/ Distribution Line (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.
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. DPN 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	DPN 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. DPN uses best available technology for lines and do not cause any hazards to health and safety.
14.	Fire Hazards	<p>Fire hazards are mostly occurred in forest area. However, DPN 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 takes precaution like maintaining fire line in the cleared forest area to avoid spread of fire.</p> <p>Firefighting instruments including fire extinguishers are kept in appropriate place for immediate action in case of any fire hazard.</p>
15.	Pollution	Although pollution is not an issue with transmission/ distribution projects still DPN will make efforts to further minimise 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 SF ₆ is not a major issue, DPN will make efforts to reduce the leakage through regular monitoring installing gas pressure monitor/ leak detectors in Circuit Breakers.

34 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

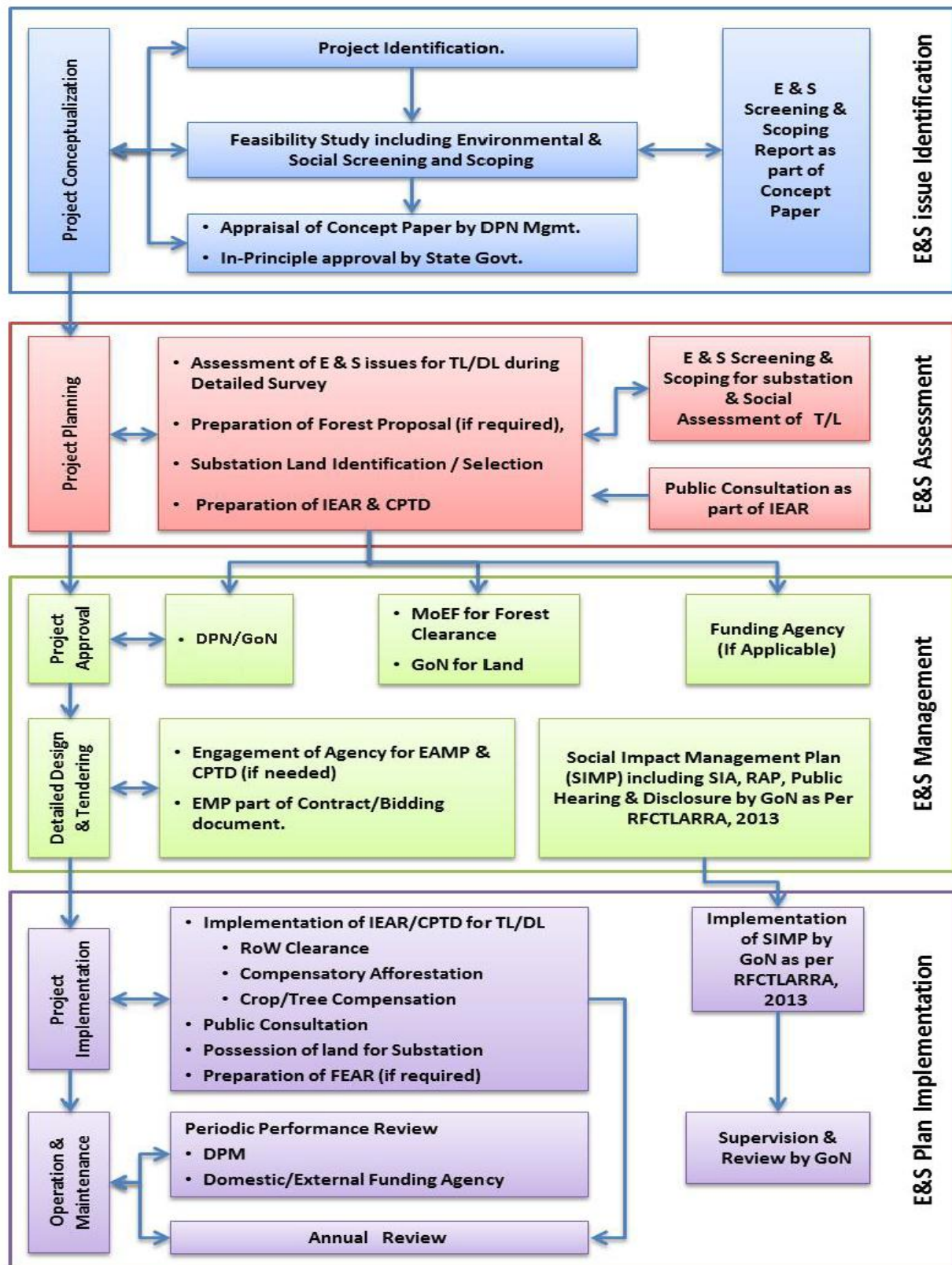
implemented by the Contractor, to ensure its proper implementation and monitoring, the EMP forms a part of the contract document.

DPN's Environment and Social Management Procedures (ESPP)

35 DPN 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.

36 Likewise for substation land, DPN 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: ENVIRONMENT AND SOCIAL MANAGEMENT PROCEDURES



Environmental and Social Risk assessment

37 Environmental and Social Risk Assessment is a vital part of DPN 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 DPN evaluate these risks, both qualitatively and quantitatively, and prioritise them. Based on prioritisation, environment and social management options are selected. DPN'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: DPN'S RISK RESPONSIBILITY FRAMEWORK

Risk	GoN	DPN	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

38 To ensure quality and enabling organizational support structure for effective implementation of the ESPP, DPN shall set out procedures and work culture which will promote total involvement of all its personnel. To attain assigned goal following shall be ensured:

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).

- A synchronized system of functioning adopted by Planning and Implementation group, which monitors all activities in the organization
- An emphasis on intradepartmental approach to all projects, delineation of departmental responsibilities and the delegation and decentralization of authority resulting in a fast response and quick adjustment to change
- A commitment to provide at all times the best possible time bound quality service in all areas of its operations.

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

- Strengthening the implementation of the ESPP by deployment of appropriately trained personnel at key levels;
- Reinforcing in-house capabilities by working with specialized external agencies;
- Placing dedicated manpower with specialization in the respective field to deal with and manage the environment and social issues;
- Reviewing progress of the ESPP internally or through external agencies.

40 Head office will have overall responsibility for construction, operation, and maintenance of transmission/distribution systems apart from providing necessary support services.

41 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 DPN.
- **Project Implementation Unit (PPIU)** – A body formed by the IA, including members of DPN 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 IA officers (with required skills) will visit as and when required by this core team.

Grievance Redressal Mechanism (GRM)

42 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, DPN 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 DPN, 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.

43 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 DPN HQ Level Committee /District Collector or Court of law for solution.

45 The HQ level GRC shall function under the chairmanship of Chief Engineer who will nominate other members of GRC including one representative from corporate ESMU 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.

46 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 A– Sample Environmental Management Plan

Claus e 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	Implementin g 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 -	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
		Social inequities	Careful selection of site to avoid encroachment of socially, culturally and archaeological	Selection of substation location (distance to	Consultation with local authorities/ autonomous		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
			sensitive areas (i.e. sacred groves, graveyard, religious worship place, monuments etc.)	sensitive area).	councils -once		
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	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	Line through protected area/ precious ecological area	Loss of precious ecological values/ damage to precious species	Avoid siting of lines through 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 A of the constitution of India. For acquisition of private land, DPN shall secure land either 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 locating lines in forest land 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		
10	Lines through farmland	Loss of agricultural production/ change in	Use existing tower or footings wherever possible	Tower/pole location and overhead/ underground line	Consultation with local authorities and design engineers – once	IA	Part of detailed alignment survey and design

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
		cropping pattern	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 clean up 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
15	Explosions /Fire	Hazards to life	Design of substations to include modern fire fighting equipment	Substation design compliance with	Tender document to mention	IA	Part of detailed substation layout

Clause No.	Project activity/ stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			Provision of fire fighting equipment to be located close to transformers	fire prevention and control codes	detailed specifications – once		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
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	Use of established roads wherever possible – every 2 weeks	IA (Contractor through contract	Construction period

Clause No.	Project activity/ stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
		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				
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	Presence of target species in RoW following vegetation clearance – once per site	IA (Contractor through contract provisions)	Construction period

Claus e No.	Project activity/ stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
		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	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
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	Seasonal start and finish of major earthworks(P ^H ,	Timing of major disturbance activities –prior to	IA (Contractor through	Construction period

Clause No.	Project activity/ stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			undertaken during the monsoon season	BOD/ COD, Suspended solids, others)	start of construction activities	contract provisions)	
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) Statutory approvals	Amount of ground disturbance – every 2 weeks Statutory approvals for tree clearances – once for each site	IA (Contractor through contract provisions)	Construction period
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 or m ³) and action taken to control and clean up spill)	Fuel storage in appropriate locations and receptacles – every 2 weeks	IA (Contractor through contract provisions)	Construction period
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	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
					– once each new facility	provisions)	
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)			
		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	Incorporating good design and construction management	IA (Contractor through contract	Construction period
			Limit site clearing to work areas				

Clause No.	Project activity/ stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
			Regeneration of vegetation to stabilise works areas on completion (where applicable)	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])	practices – once for each site	provisions)	
			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		
			Productive land will be reinstated following completion of construction	Reinstatement of land status (area affected, m ²)	Consultation with affected parties – twice –		
		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	IA (Contractor through contract	Construction period

Clause No.	Project activity/ stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
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 Implementation of effective environmental monitoring and reporting system using checklist of all contractual environmental requirements Appropriate contract clauses to ensure satisfactory implementation of contractual environmental mitigation measures.	Training schedules Respective contract checklists and remedial actions taken thereof. Compliance report related to environmental aspects for the contract	Number of programs attended by each person – once a year Submission of duly completed checklists of all contracts for each site - once Submission of duly completed compliance report for each contract – once	IA	Routinely throughout construction period
Operation and Maintenance							
41	Location of line towers/poles and overhead/ underground 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	DPN	During operations
42	Line through identified bird	Injury/ mortality to	Avoidance of established/ identified migration path (Birds &	Regular monitoring for any incident of	No. of incidents- once every month	DPN	Part of detailed siting and

Claue No.	Project activity/ stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
	flyways, migratory path	birds, bats etc due to collision and electrocution	Bats). Provision of flight diverter/reflectors, elevated perches, insulating jumper loops, obstructive perch deterrents, raptor hoods etc., if applicable	injury/mortality			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	DPN	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 tanks.	Substation bunding (Oil sump) (“as-built” diagrams)	Bunding (Oil sump) capacity and permeability - once	DPN	During operations
45	SF ₆ management	Emission of most potent GHG causing climate change	Reduction of SF ₆ 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	DPN	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	DPN	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				

Claus e No.	Project activity/ stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation sche dule
			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	DPN	Design and Operation
			Security fences around substations	Maintenance of fences	Report on maintenance – every 2 weeks		
			Barriers to prevent climbing on/ dismantling of transmission	Maintenance of barriers			
			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	DPN	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	DPN	Operation

Clause No.	Project activity/ stage	Potential Impact	Proposed mitigation measures	Parameter to be monitored	Measurement & frequency	Institutional responsibility	Implementation schedule
					each year		
50	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	Processes, equipment and systems using chlorofluorocarbons (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	DPN	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	DPN	Operations
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)	DPN	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	DPN	Operations

