April
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Environmental and Social Management Planning Framework

Assam Distribution System Enhancement and Loss Reduction Project

Proponent: Assam Power Distribution Company Limited

Consultant: Feedback Infra Private Limited, Gurgaon

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LIST OF ABBREVIATIONS

AGM	Assistant General Manager
AIIB	Asian Infrastructure Investment Bank
APDCL	Assam Power Distribution Company Limited
APGCL	Assam Power Generation Company Limited
A/RP	Abbreviate/Resettlement Plan
AT&C	Aggregate Technical and Commercial Losses
ASEB	Assam State Electricity Board
CAR	Central Assam Region
CPCB	Central Pollution Control Board
DFO	Divisional Forest Officer
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMPF	Environmental and Social Management Planning Framework
EPC	Engineering, Procurement and Construction Contractor
ESP	Environmental and Social Policy
ESS	Environmental and Social Standard
ESZ	Ecological Sensitive Zone
GHG	Green House Gas
GSS	Grid Sub-station
GoA	Government of Assam
GoI	Government of India
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HVDS	High Voltage Distribution System
IA	Implementing agency
LAR	Lower Assam Region
MoEF&CC	Ministry of Environment, Forest and Climate Change
NBWL	National Board of Wildlife
NOC	No Objection Certificate
PAPs	Project Affected Persons
PIU	Project Implementing Unit
PMU	Project Management Unit
RP	Resettlement Plan
RCFTLARRA	Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
RGGVY	Rajiv Gandhi Grameen Vidyutikaran Yojana
RoW	Right of Way
RPF	Resettlement Planning Framework
SC	Single Circuit
SF_6	Sulphur Hexafluoride
SIA	Social Impact Assessment
SoA	State of Assam
SPCB	State Pollution Control Board
SS or S/S	Sub Stations
TDP	Temporary Damage Plan

TPDF	Tribal Peoples Development Framework
TPP	Tribal Peoples Plan
UAR	Upper Assam Region

1 EXECUTIVE SUMMARY

1.1 Project Proponent

The project proponent is **Assam Power Distribution Company Limited (APDCL)**, owned by the Government of Assam (GoA). The ultimate responsibility of APDCL is to undertake the electricity distribution, trading and supply in the State of Assam (SoA) or outside in accordance with provisions of applicable law and all activities ancillary or appurtenant thereto.

The main purpose of forming the Company was to takeover, manage and operate the electricity distribution system, assets, liabilities and undertaking of the Assam State Electricity Board (ASEB), as may be transferred to it pursuant to a notified transfer scheme in terms of Part XIII of the Electricity Act, 2003.

1.2 Project Description

The SoA is contemplating major expansion and augmentation of its transmission & distribution network in near future by implementing projects with the help/grant from Government of India (GoI) and other Multilateral Funding Agencies, such as Asian Infrastructure Investment Bank (AIIB). The prime objective of the project/sub-projects is to improve the power sector in the SoA and capacity building to achieve sustainable development in the long term. Given the unique socio-economic, cultural and environmental resources, APDCL is committed to contribute in managing the overall sustainability of SoA.

The demand for the project has emerged primarily from the demand for improving/upgrading the reliability of power supply by strengthening the electricity distribution network which **APDCL**, has sought to comply with an ambitious project "***Assam Distribution System Enhancement and Loss Reduction Project***". The Project will facilitate connection of remote areas, to enhance the capacity and reliability of the system, to improve voltage profile and to reduce losses and ultimately to enhance satisfaction for all categories of consumers which in turn will spur growth and overall development of the State. The scope involves strengthening the electricity distribution system under two phases comprising networks at 33kV level and below by

a) Constructing new 196 nos. of 33/11kV substations at important load centres,

b) Laying of new 33kV and 11kV overhead lines, and

c) Installation of new 1,140 High Voltage Distribution System (HVDS) at select locations to improve reliability and to reduce the distribution losses.

1.3 Environment Legislation

National Legislation: As per the 2006 Environmental Impact Assessment (EIA) notification of the Ministry of Environment, Forest and Climate Change (MoEF&CC) and its subsequent amendments, power transmission projects, including the establishment of a substation, are not listed under the scheduled list of projects that require prior environmental clearance. Hence, as per national regulations, an EIA study is not required to be furnished and no Prior Environmental Clearance is mandated for this project. Forest Clearance shall be applicable where forest land is being diverted for substations and distribution lines. No substations are located within the Protected Areas (National Parks, WL Sanctuaries etc.), however, out of the proposed 135 substations under Priority / Phase I, Chandrapur sub-station is located within notified Ecological Sensitive Zone (ESZ) area of Amchang Wildlife Sanctuary and Pobitora Sanctuary. No Objection Certificate (NOC) from ESZ Monitoring Committee of Amchang Wildlife Sanctuary and Pobitora Sanctuary shall not be required, according to the ESZ notification F.No. 6-60/2020WL Part(I) dated 16th July 2020. No construction will be commenced until all the statutory requirements will be met.

AIIB's Policy: AIIB is an international financial organization that provides multilateral financing and investment platform for infrastructure development and enhanced interconnectivity in Asia. AIIB

recognizes that Environmental and Social (E&S) sustainability is a fundamental aspect of achieving outcomes consistent with its mandate to support infrastructure development and enhance interconnectivity in Asia. The objective of AIIB's Environmental and Social Policy (ESP) is to facilitate achievement of these development outcomes, through a system that integrates sound E&S management into Projects.

The ESP sets forth mandatory E&S requirements for each Project. Environmental and Social Standards (ESSs) include followings,

- **ESS 1:** Environmental and Social Assessment and Management;
- **ESS 2:** Involuntary Resettlement; and
- **ESS 3:** Indigenous Peoples

1.4 Social Legislation

Design and construction of substations and distribution lines will be undertaken to minimize negative social impacts, such as permanent/temporary land acquisition, adverse effect on agriculture and/or livelihoods, associated construction disturbances and risks (including gender-based violence). If permanent or temporary land acquisition is required in certain cases it will be carried out by negotiating with the landowners in presence of district revenue officers as per the guidelines mentioned in the Resettlement Planning Framework (RPF), following national laws: 'Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013', National Resettlement and Rehabilitation Policy, 2007 (NRRP), Provision in the Electricity Act, 2003 read with relevant provisions of Indian Telegraph Act, 1885 and AIIB's ESP.

1.5 Project Categorisation and E&S Instrument

As per AIIB's ESP, the Project is assigned as category B project, as it is likely to have a limited number of potentially adverse E&S impacts; the impacts are not unprecedented; few if any of them are irreversible or cumulative; they are limited to the project area; and can be successfully managed using good practice in an operational setting. However, despite the extent of impacts falling in Category B, the need to address these impacts assumes greater significance given the eco fragile and sensitive nature of the SoA. Hence, the development of an Environmental and Social Management Planning Framework (ESMPF) that will be used as a guidance tool during Project implementation, for APDCL to carry out sub-project specific Environmental and Social Impact Assessment (ESIA) and get AIIB's approval prior to contractors' mobilization, and to implement the Environmental and Social Management Plan (ESMP), Abbreviated/Resettlement Plans (A/RPs) and Tribal People Plans (TPPs, if applicable), which are essential instruments to mitigate impacts and enhance sustainability of the Project.

This ESMPF report comprises baseline data on existing conditions of physical, ecological, economic, and social aspects, together with the identified and anticipated E&S impacts and proposed mitigation measures. The existing substations were audited to provide the remediation measures for E&S risks. The ESMPF study is conducted based on model sub-projects with clear footprints, to provide the model ESIA, generic ESMP and an RPF for implementation, as well as to clearly guide the further E&S assessment by providing specific guidelines. A Tribal People Development Framework (TPDF) is prepared to guide the preparation of TPPs (if applicable) and compliance during Project implementation. AIIB requires APDCL to prepare the E&S assessment for all non-assessed sub-projects during project implementation in conformity with the ESMPF prior to contractors' mobilization. To avoid the potential E&S risks, APDCL will consult with AIIB for careful selection of the site to avoid encroachment of socially, culturally and archaeological sensitive areas (e.g. sacred groves, graveyard, religious worship sites, monuments etc.); and avoid encroachment into such areas by careful site and alignment selection (National Parks, Wildlife Sanctuary, Biosphere Reserves and Biodiversity hotspots). Activities located in the abovementioned areas will be excluded from the project scope through the application of the E&S screening and project categorization guidance.

1.6 Assam Profile

Assam is divided into three geographic zones namely: Lower Assam, Central Assam and Upper Assam. The major subprojects sites are scattered in thirty three districts (19 electrical circle) covering all the three zones. With the 'Tropical Monsoon Rainforest Climate', Assam experiences heavy rainfall and humidity. Assam, one of the biodiversity hotspots occupies a special place in North Eastern India. The floristic richness has prompted many a scholar to describe Assam as the "Biological Gateway" of North East and Cradle of flowering plants.

Based on the interpretation of Indian Remote Sensing (IRS) Resourcesat-2 Linear Imaging Self-Scanner (LISS) III satellite data of the period Nov 2017 to Feb 2018, the forest cover in the state is 28,326.51 sq. km which is 36.11 % of the State's geographical area. In terms of forest canopy density classes, the State has 2,794.86 sq. km under Very Dense Forest (VDF), 10,278.91 sq. km under Moderately Dense Forest (MDF) and 15,252.74 sq. km under Open Forest (OF). Forest Cover in the State has increased by 221.51 sq. km as compared to the previous assessment reported in India State of Forest Report (ISFR) 2017.

In Assam 25 protected area networks consisting of 5 National Parks, and 20 Wildlife Sanctuaries (WLS) (including 2 proposed WLS) have been established for protecting many endangered and endemic species. Assam has five Elephant Reserves (Sonitpur, Dehing-Patkai, Kaziranga-Karbi Anglong, Dhansiri-Lungding and Chirang-Ripu), Eight Elephant Corridors connecting these Elephant Reserves, 2 Biosphere Reserves and 2 World Natural Heritage Sites and they play very important role in in-situ conservation of biodiversity. No Subprojects will be located in any protected area.

Assam is predominantly a rural based state, almost 86% of its population still living in rural areas. The socio-economic levels are lower, compared to urban and national averages. Rural poverty is more than twice that of urban poverty. The population growth in Assam is also a contributing factor to the persistent high poverty rates.

As per census of India 2011, the SoA with an area of 78,438 sq. Km. accounts for about 2.39% of the total geographical area of the country. It has a population of 31.20 million, which accounts for 2.58% of the population of the country. The average land-man ratio is 398 per sq. km. The decadal growth of population for 2001-2011 is 17.07%. According to the 2011 census, the literacy rate in the state is 72.19% in which male literacy is 77.85% and female literacy is 66.27%, creating a gender gap of 11.58%. The Scheduled Caste population comprises 7.15% whereas tribal population constitutes 12.45% of the total population.

1.7 Environment & Social Impacts

The project is not expected to cause significant impacts on the surrounding E&S landscape, whereas the project will contribute to major economic development in the associated areas. The potential adverse E&S impacts and their mitigation measures are described in the generic ESMP, which will be implemented during the project lifecycle. Since many provisions of the ESMP are to be implemented by the contractors, to ensure its proper implementation and monitoring, the ESMP forms a part of the bidding documents. Based on the site visit and information available for the selected proposed sub-projects for the development of ESMPF, a summary of the anticipated issues and potential risks and impacts during different phases is presented as follows.

(a) Impacts on Physical Environment: The proposed subprojects will require excavations for laying foundation, water for construction and operation stage, area for storage of spare parts/ equipment etc. The land type will be changed permanently for substations.

(b) Impacts on Ambient Environment: The subprojects are likely to have minimal short-term adverse impacts due to increased dust and noise levels during the construction phase. After proper mitigations, the impacts on the ambient environment due to the subprojects will be minimized within the limits.

(c) Impacts on Ecological Environment: Most of the subprojects are likely to come up in remote / barren land parcels with minimal tree cover. The protection of existing tree cover is crucial in such areas and should not lead to removal of trees, which may lead to increased dust in these areas. Minimum alteration to existing ground cover in such sites is a chosen strategy. Locations in WLS will be prohibited.

Clearance from the Assam Forest Department is required only in cases where the subprojects are constructed on forestland or requires cutting of forest trees. The forest land will be avoided as much as possible. If not avoidable, APDCL will consult with AIIB for the alignment selection and the clearance shall be obtained prior to awarding the contract.

The proposed subprojects should be completely contained entities with controlled access thereby minimizing the risks of animals getting impacted in any aspects. The ESIA studies for subprojects shall establish the wildlife species movement corridors/ paths/ habitat if any applicable in and around the proposed site. The ESIA studies shall establish the status of wildlife in vicinity of the proposed site and adequate mitigation measures to ensure no human-wildlife conflicts / poaching occurs during the various stage of project development.

(d) Impacts on Socio-economic Environment: Design and construction of substations and distribution lines will be undertaken to minimize negative social impacts, such as permanent/temporary land acquisition, adverse effect on agriculture and/or livelihoods, associated construction disturbances and risks (including gender-based violence). If permanent or temporary land acquisition is required in certain cases it will be carried out by negotiating with the landowners in presence of district revenue officers as per the guidelines mentioned in the RPF, following national laws: 'Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013', National Resettlement and Rehabilitation Policy, 2007 (NRRP), Provision in the Electricity Act, 2003 read with relevant provisions of Indian Telegraph Act, 1885 and AIIB's ESP.

Based on the initial site visit, each substation requires 1,750 m^2 of land. Majority of the required land belongs to GoA., APDCL and APGCL. For about 196 proposed sub-stations, a total of approximately 343,000 m^2 (@ average land requirement for 1 sub-station 1,750 m^2) of land shall be required. APDCL is engaging with the landowners to evaluate how to acquire the land without negatively impacting their livelihoods, preferably through willing buyer-willing seller method. Should land acquisition, involuntary resettlements and/or potential negative impact on livelihoods are identified, A/RPs will be prepared in line with the RPF. Distribution lines have a limited footprint on governmental land, and they will not have any permanent impact on private lands Land proposed in the tea estate is barren land without any tea plantation. Tea estate owners are usually in favour of sharing the land for the proposed sub-stations (s/s) through mutual consent. Substations proposed in the government land are to be located on barren land which is free from encroachments and squatters. However, during the construction phase negative impacts may include loss of crops and trees along the Right of Way (RoW) of the distribution lines from tapping point to proposed new sub-stations. The review identified the following potential negative social impacts, where unavoidable, that will be mitigated or compensated accordingly in the site-specific ESMPs and A/RP:

- Permanent loss of crops, trees, etc.
- Temporary loss of livelihood due to impacts on sources of earning;
- Impact on natural drainage leading to loss of water in downstream areas;
- Probable loss of common property resources such as religious places and cremation ground;
- Impact on host community due to influx of construction workers; and
- Risks related to community transmission of COVID-19.

The proposed projects would be fully fenced entities wherein access would be restricted. The proposed site may include tracks /pathways which are frequently used by the local villagers while performing their day-to-day activities. Such tracks need to be clearly identified during the subprojects' ESIA stage in consultation with the local stakeholders so that the same can be included into the project layout plan or alternative route / tracks may be identified if it is unavoidable.

Labour: At the peak of construction, it is expected that more labourers will be working at the site. However, considering the distributed nature and scale of project, the impact shall be negligible as most

of the work force (except skilled) shall be recruited from local areas. The workforce normally consists of solitary migrant males and that can be potential risk for host population:

- Risk of conflict and social unrest due to cultural differences between the labourers and local community.
- Risk of spread of communicable diseases, such as COVID-19, due to interaction of the labourers and the local community.
- Risk of gender-based violence and sexual exploitation (GBV/SE).
- Health hazard for host community due to lack of sanitation facilities and waste management.

1.8 Consultations and disclosure

Meaningful public participation and community consultations have been taken up as an integral part of E&S assessment process of the project. Focused Group Discussions (FGDs) were conducted with the local community at 23 locations especially in the proposed new 33/11 kV sub-stations sites and its associated lines in different project locations having a total of 153 participants. Individual consultation of Project-Affected People (PAP), in line with COVID-19 preventive measures, will also be carried out during implementation. The outcomes of the consultations are provided in Chapter 9.

1.9 Institutional Arrangement including Monitoring

APDCL (with assistance from Contractor/Concessionaire and Monitoring Consultant) is the responsible entity for ensuring that the mitigation measures are carried out. APDCL has developed E&S management procedures for other multilateral development banks, for instance, World Bank. Same system with elaborated institutional arrangement will be applied to the project. To enable effective implementation of this ESMPF, further E&S assessments on subprojects, and supervision of E&S compliances, APDCL will manage the E&S matters through a well-designed organizational structure of Project Management Unit at corporate level and Project Implementation Units (PIUs) at divisional level, supported by the Project Management Consultant (PMC). Capacity building program will be provided to contractors and APDCL who work on the project on day-to-day basis.

1.10 Grievance Redress Mechanism

A Grievance Redress Mechanism (GRM) will be established immediately to ensure PAPs' and Workers' grievances are addressed in a timely manner. This will include a Grievance Redress Committee (GRC) consisting of representatives from APDCL, local administration, head of Panchayat, and PAP representative under the chairmanship of project director or its representative. PAPs who believe they have been or are likely to be adversely affected by AIIB's failure to implement the ESP in this Project, can submit their submissions to the AIIB in line with Banks' Policy on AIIB Project-affected People's Mechanism (PPM).

Overall, the major E&S impacts associated with the Project are limited to the construction period and can be mitigated to an acceptable level by implementation of ESMPF and by best engineering and E&S practices. Project benefits far outweigh negative impacts.

2 INTRODUCTION

2.1 Project Background

Power Scenario in Assam

Assam has undertaken structural reforms in the electricity sector in 2004. As present, the Assam Power Generation Company Limited (APGCL), Assam Electricity Grid Corporation Limited (AEGCL) and Assam Power Distribution Company Limited (APDCL) are functioning as the State-owned generation, transmission and distribution utilities, respectively.

The Assam Electricity Regulatory Commission (AERC), established in August 2001, has been regulating the electricity sector in the State in accordance with the provisions of the Electricity Act 2003.

Present Status

As on Nov 2020, Assam's State owned generation utility Assam Power Generation Corporation Limited has a total installed capacity of 345.2 MW. Out of the total installed capacity, thermal power contribution is 231.7 MW and Hydropower contribution is 113.5 MW.

APGCL is in the process to augment generation capacity by implementing hydel power plant and solar projects to meet state's increasing demand.

The State of Assam (SoA) is contemplating major expansion and augmentation of its transmission & distribution network in near future by implementing projects with the help/grant from Government of India (GoI) and other Multilateral Funding Agencies.

APDCL, owned by Government of Assam (GoA). The ultimate responsibility of APDCL is to undertake the electricity distribution, trading and supply in the State of Assam (SoA) or outside in accordance with provisions of applicable law and all activities ancillary or appurtenant thereto.

The main purpose of forming the Company was to take over, manage and operate the electricity distribution system, assets, liabilities and undertaking of the Assam State Electricity Board (ASEB), as may be transferred to it pursuant to a notified transfer scheme in terms of Part XIII of the Electricity Act, 2003. The main object of the company is to develop, maintain and operate power distribution system in the SoA.

APDCL, is currently (as of Oct 2020) catering the electricity needs of more than 58.5 Lakhs consumers across Assam. From Sadiya to Mancachal and from Jonai to Lowairpowa, APDCL is supplying electricity to every corner of the state. From the hilly areas of North Cachar Hills to the plains of Morigaon, APDCL is expanding its distribution network in-spite of many physical hindrances. APDCL is also implementing off-grid solar projects in such areas where the distribution network could not reach such as Amarpur area under Chapalihowa sub-division and the 'Char' areas of Brahmaputra river. APDCL is supplying to the major industrial centers situated in Assam such as Coal India Limited (Ledo, Margherita), Brahmaputra Gas Cracker & Polymer Limited (Lepetkata, Dibrugarh), Cement Corporation of India Limited (Bokajan), Hindustan Paper Corporation Limited (Panchgram & Jagiroad), Assam Petrochemicals Limited (Namrup) etc.

Table 2-1: Status of the Distribution Network of Assam

Particulars	LAR	UAR	CAR
No. of 33/11kV Substations	164	111	128
Total Capacity of the sub-stations	380 MVA	1167.5 MVA	1188.52 MVA
Total Length of 33 kV Lines	3070.92 CKT Km	2397 CKT Km	3332.20 CKT Km
Toal Length of 11 kV Lines	32979 CKT Km	21663 CKT Km	25662.70 CKT Km
Total Length of LT Lines (3-Phase)	48630.7 CKT Km	18984.68 CKT Km	30698.12 CKT Km

Particulars	LAR	UAR	CAR
Total Length of LT Lines (1-Phase)	84723.2 CKT Km	27874.124 CKT Km	51729.23 CKT Km
Total Number of Distribution Transformers	35483 No.	27389 No.	32313 No.
Total Capacity of Distribution Transformers	3408 MVA	1741.656 MVA	1937.397 MVA

Source: O&M data from APDCL (LAR, CAR, UAR) Division, N.B.: CAR data is of March 2020, Rest latest by October 2020

The SoA is contemplating major expansion and augmentation of its transmission & distribution network in near future by implementing projects with the help/grant from Government of India (GoI) and other Multilateral Funding Agencies, such as Asian Infrastructure Investment Bank (AIIB). The prime objective of the project/sub-projects is to improve the power sector in the SoA and capacity building to achieve sustainable development in the long term. Given the unique socio-economic, cultural and environmental resources, APDCL is committed to contribute in managing the overall sustainability of SoA.

The demand for the project has emerged primarily from the demand for improving/upgrading the reliability of power supply by strengthening the electricity distribution network which **APDCL**, has sought to comply with an ambitious project "***Assam Distribution System Enhancement and Loss Reduction Project***". The Project will facilitate connection of remote areas, to enhance the capacity and reliability of the system, to improve voltage profile and to reduce losses and ultimately to enhance satisfaction for all categories of consumers which in turn will spur growth and overall development of the State. The scope involves strengthening the electricity distribution system under two phases comprising networks at 33kV level and below by

a) constructing new 196 nos. of 33/11kV substations at important load centres
b) laying of new 33kV and 11kV overhead lines and
c) installation of new 1,140 High Voltage Distribution System (HVDS) at select locations to improve reliability and to reduce the distribution losses

The Asian Infrastructure Investment Bank (AIIB) will consider supporting the project in compliance to the requirement of the AIIB's Environmental and Social Policy (ESP). Environmental and Social Management Planning Framework (ESMPF), including a Resettlement Planning Framework (RPF) and Tribal People Development Framework (TPDF) for the project substations and distribution lines has been developed.

2.2 Purpose of ESMPF

As per the 2006 EIA notification of the Ministry of Environment, Forests and Climate Change (MoEF&CC) and its subsequent amendments, power transmission projects, including the establishment of a substation, are not listed under the scheduled list of projects that require prior environmental clearance. Hence, as per national regulations, an EIA study is not required to be furnished and no prior environmental clearance is mandated for this project. As per AIIB's ESP, it is tentatively assigned as category B project, as the Project is likely to have a limited number of potentially adverse E&S impacts; the impacts are not unprecedented; few if any of them are irreversible or cumulative; they are limited to the project area; and can be successfully managed using good practice in an operational setting. However, despite the extent of impacts falling in Category B, the need to address these impacts assumes greater significance given the eco fragile and sensitive nature of the state of Assam. Hence, the development of an ESMPF that will be used as a guidance tool to carry out subprojects specific ESIAs once the locations are decided, and to implement the Environmental and Social Management Plan (ESMP), which is one of the essential elements to ensure mitigation of impacts and sustainability of the development work. In case of any land acquisition and/or negative impacts on livelihoods, A/RPs will be prepared in line with the RPF.

Currently, the projects and sub-projects under AIIB funding have not yet been fully decided, and the final project sites and the alignment will be identified after detailed design is prepared and detailed surveys are conducted. Therefore, an ESMPF is being developed to assess the potential positive and negative impacts of the proposed projects and to prepare the generic ESMP. The ESMPF will guide APDCL in determining the appropriate level of environmental and social (E&S) assessment required for the sub-projects and in preparing the necessary environmental and social mitigation measures for the sub-projects during the pre-construction, construction, operations and maintenance phases. The purpose of the ESMPF is to ensure that the activities will be assessed and implemented in conformity with the policies of GoI, SoA and the AIIB's ESP and ESSs.

2.2.1 Objectives and Scope of ESMPF

- Incorporate approaches for management of E&S risks and impacts that are common to Project aspects such as (but not restricted to) Impacts during various phases of project development, Livelihoods improvement/restoration issues, Temporary and permanent land acquisition, Entitlements and compensation framework, Occupational and community health and safety, Grievance Redress mechanism (GRM), and Monitoring and evaluation etc.
- Lay down the procedures for conducting E&S studies to prepare ESIA/ESMP of subprojects without clear footprints at this stage
- Serve as tool for specific action plans, programs, policies, standards and procedures that executing agency, implementing agency, consultants and contractors should adopt and adhere to during the project execution and implementation
- Following tasks to be accomplished:
    - Conducting model ESIA to prepare the generic ESMP
    - Preparation of ESMPF with an RPF to include details such as:
        a. Description of the applicable policies and procedures to be followed;
        b. Analysis of the anticipated E&S risks and impacts;
        c. Screening and assessment of Project-related activities;
        d. Provisions for disclosure of and consultation on the ESMPF with the RPF; and
        e. Implementation and monitoring requirements.
    - Plan for Consultation and Disclosure of Documentation
    - Development of Project Level Grievance Redress Mechanism (GRM)
    - Development of Tribe Peoples Development Framework (TPDF, if applicable)

2.3 Methodology

The methodology for the execution of the work is as stated below:

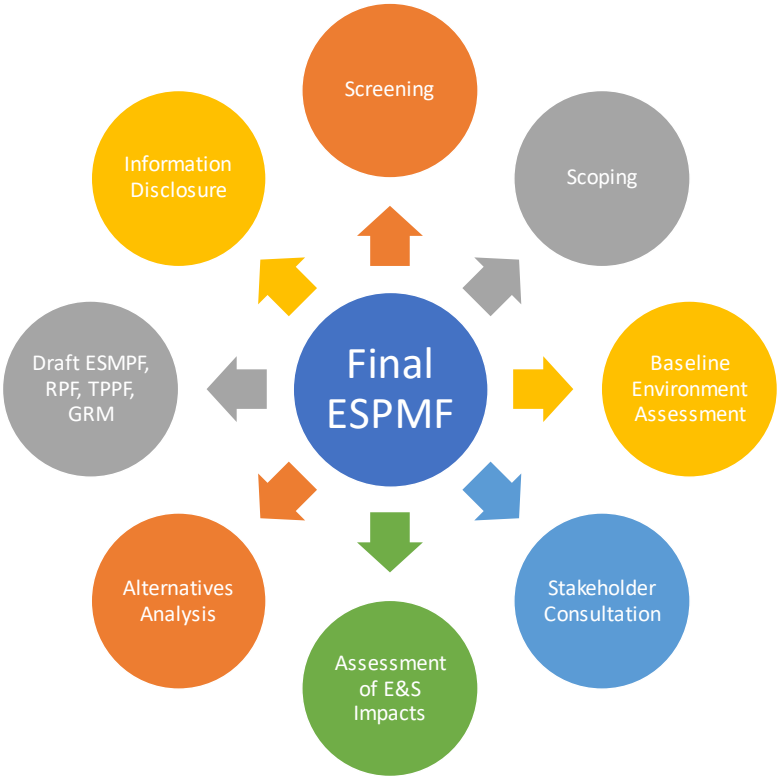
2.3.1 Screening

The Consultant has undertaken a desktop review of Applicable Laws & Regulation at Regional, State and National level, AIIB ESP and ESSs, Labour Laws, Demographic Profile and Socio-economic Status of the affected Villages, District Gazetteer, Forest Working Plan of the Forest department and Ecology and Bio-diversity report of various institutions which would influence the project either directly or indirectly and shall also analyse the gaps in the existing policy framework of APDCL. Strength and capability assessment of existing institutional arrangement of APDCL was also reviewed at this stage. Project activities were screened to identify the activities that potentially interact with environmental and social resources in the project area during various phases of project development. Screening for the project has been undertaken based on Checklist method.

Scoping was conducted to identify potential generic impacts due to project intervention and the key

stakeholders associated with towards further developing strategy for baseline data generation and detailed impact analysis;

Figure 2-1: Flow Diagram of Project Execution Methodology



2.3.2 Baseline

Baseline is primarily based on secondary data followed by primary survey at the selected sub-stations. Methodology for selection of sub-stations for primary site visit is discussed under Section 5.1.2. Baseline assessment has been made for the aspects like ecology & bio-diversity, social profile (caste distribution, gender distribution, literacy rate, work participation rate, etc.), social profile of the indigenous population, livelihood practices (farming / other cultivation, hunting, fishing, grazing, agriculture, etc.) and potential loss of livelihood, migration practices, woman participation in day to day activities, gender violence, inventory of community property resources (religious, education and medical facilities, historical places, etc.), areas of interventions due to proposed development. Specific survey and consultation practice shall be designed for population residing in tribal areas, if applicable.

Inputs from the desk review (Tower Schedule / Route Survey Reports / Sub-station site location) and secondary research (Socio-economic, Physical, Biological profile of project area) has yield the inputs required for marking impact zones on KMZ files. This has been acted as an informative tool for situational analysis, as well as a screening tool for impact assessment for specific subprojects. The KMZ files help in identifying the influenced areas for project as whole and various subprojects.

Various secondary sources were analysed for the analysis of secondary data. The secondary data sources as considered for baseline assessment are tabulated below.

Table 2-2: Secondary Data Sources

Environmental Parameters	Information Sources
Project objectives, Technical information on existing road features	Project Proponent (APDCL)

Environmental Parameters	Information Sources
Inventory of road features like water Bodies, Community structures, environmentally sensitive locations areas, congested locations etc.	Ground Physical surveys
Climatic Condition and Meteorological data	Climatological Normals from India Meteorological Department, State Pollution Control Board (SPCB), ENVIS & District Groundwater Brochure of Central Ground Water Board (CGWB)
Geology, Seismicity, Soil and Topography	State of Environment report published by SPCB, government websites, District Groundwater Brochure of CPCB,
Land Use / Land Cover	ENVIS, Bhuwan, Observation during surveys
Forest Cover, Status of forest areas, Compensatory afforestation norms etc.	State Forest Office, Forest Report 2019
Air quality Noise, Soil and Water	State Pollution Control Board
River geo-morphology, hydrology, drainage, flood patterns	Field observations
Socioeconomic Environment	Official websites maintained by state Govt., Census of India 2011 and Public Consultation during the Field survey

2.3.3 Site Selection & Findings

The primary objective of the assignment is to prepare an ESMPF that comprises of policies, guidelines and procedures, whereby APDCL will realize environmental, social, health and safety management systems and programs that will direct mitigation of environmental and social risks.

To be more specific on the Environment and social management issues, 23 nos. of sub-stations have been identified for model assessment of site conditions and detailed scrutiny according to the SoA Land Acquisition Rules 2015.

The sub-stations have been identified based on preliminary assessment of geography, administrative boundaries, environment & social sensitivity, project capacity, etc. Selection Criteria for the sub-stations are discussed under Chapter 3- Description of the environment.

2.3.4 Stakeholder Consultations and Disclosure

Stakeholder mapping has been undertaken to examine the potential impact of the Project on people and nearby communities. This helps in the identification of each group, nature of their stakes, and group wise specific issues and potential risks. Stakeholder consultations were planned in two stages;

1. Draft project information and findings of the ESMPF will be disclosed to stakeholders (institutional and community including Potential PAPs) to obtain their feedback about the project, perceived impacts and preferred mitigation measures, and to collect information on environmental, ecological, and socioeconomic baseline in the project area
2. Finalized ESMPF will be made publicly available on APDCL and AIIB's websites and physically accessible on sites

Meaningful public participation and community consultations have been taken up as an integral part of E&S assessment process of the project. Focused Group Discussions (FGDs) were conducted with the local community at 23 locations especially in the proposed new 33/11 kV sub-stations sites and its associated lines in different project locations having a total of 153 participants. Individual consultation of Project-Affected People (PAP) will also be carried out during implementation. The outcomes of the consultations are provided in Chapter 9.

Stakeholders consulted during pre-document stage were APDCL, AIIB, District Administration, Forest Department, Archaeological and Historical Department., Market Unions, local residents, landowners and businesspersons. Observations recorded during the consultation was utilised as input for gap analysis and

development of the ESMPF and RPF.

Observations recorded during the consultation shall act as input for gap analysis and development of ESMPF & RPF. Workshop for Collaborative decision making, participatory rural appraisal for community-based consultation, one to one interaction, etc. are the techniques to be utilized for consultation and recording of observations / input. These consultations shall also act as input for the cross verification of data collected during baseline assessment.

2.3.5 Assessment of Environment & Social Impacts

E&S impacts analysis consists of comparing the expected changes in the biophysical and socio-economic environment with and without the project. For each potential E&S impact, the analysis assesses the nature and significance of the expected impacts or explain why no significant impact is anticipated.

Based on the site visit and information available for the selected proposed sub-projects for the development of ESMPF, a summary of the anticipated issues and potential risks and impacts during different phases is presented in this ESMPF report.

2.3.6 Analysis of Alternatives

The primary objective of the "analysis of alternatives" is to identify the location/technology for a particular sub-project that would generate the least adverse impact, and maximize the positive impacts. The analysis of alternatives should be carried out at two different levels: (a) by APDCL along with environmental/social screening; and (b) during carrying out of assessment of a sub-project, if needed (e.g., by the consultant engaged for this purpose).

In general, for any sub-project, the analysis of alternative should focus on: (a) Alternative location (for substation) or route (for power line); (b) Alternative design and technology; (c) Costs of alternatives; and (d) No sub-project scenario.

2.3.7 Reports

ESMPF: The frameworks will be developed to ensure that the mitigation measures and monitoring requirements are implemented and monitored during the project cycle. This activity will also include framework on environmental compliance review to be carried out in subsequent stages of the project. The Consultant will review and propose an institutional arrangement with the APDCL for implementing the ESMPF, conducting screening and ESIA for subprojects, monitoring, stakeholder engagement, disclosure, Grievance redress mechanism (GRM), reporting and capacity building programs.

RPF: RPF will include the guidelines for mitigating the permanent or temporary impacts on PAPs' livelihoods. The compensations and timeline of their allocations will be outlined in the dedicated section Entitlement Matrix in line with ESS2.

TPDF: Tribal People Planning Framework will set the procedures for mitigating adverse impacts, reinforcing, and promoting any available development opportunities in the subproject areas for the Tribal peoples who may be affected. The TPDF consists of Strategy for local participation, Mitigation measures and activities, Institutional capacity, Plan implementation schedule, Monitoring and evaluation, Budget and a Timeline. The TPDF will also include TP Participation, Consultation Strategy and Disclosure plan.

Grievance Redress Mechanism: Accessible and appropriate grievance mechanism must enable for workers, PAPs and local communities at the whole period of project implementation.

3 LEGAL & POLICY FRAMEWORK

3.1 Introduction

This chapter highlights the applicable environmental and social policies and regulations of GoI, GoA, AIIB, International conventions. The regulatory review focuses on:

- Applicable national and state level environmental and social regulations for the project;
- AIIB's Environmental and Social Standards (ESSs)
- International Standards and Conventions and
- Institutional Framework for the implementation of the regulations

3.2 Indian National Laws / Regulations / Policies

There are several existing national/state level laws and policies potentially applicable to the Project. The following sections detail the various regulatory frameworks pertaining to the project.

3.2.1 Environment Protection (Act) 1986 and Environmental Protection Rules 1986 and subsequent amendments

The GoI has framed an 'Umbrella Act' called the Environment (Protection) Act, 1986 which is designed to provide a framework for the coordination of central and state authorities for protection of environment. This Act was passed as an overall comprehensive act "for protection and improvement of environment". Under this Act, rules have been specified for discharge/emission of effluents and different standards for environmental quality. These include Ambient Noise Standard, Emission from Motor Vehicles, Mass Emission Standard for Petrol Driven Vehicles, General Effluent Standards etc.

3.2.2 EIA Notification, 2006 and subsequent amendments

EIA notification 2006 and its subsequent amendments lists out type of projects that requires EIA and Environmental Clearance from MoEF&CC or State EIA Authority prior to commencement of any developmental work or project expansion. The notification gives stage-wise guidance for processing of Environmental Clearance. The objective of the notification is to formulate a transparent, decentralized and efficient regulatory mechanism to:

- Incorporate necessary environmental safeguards at planning stage
- Involve stakeholders through the public hearing process
- Identify developmental projects based on impact potential
- Securing provision for mitigation efforts

The construction of substation and Transmission line project does not come under purview EIA Notification 2006 and its subsequent amendments. However, project associated activity like creation of borrow area (if any) for the project will require prior Environmental Clearance.

3.2.3 Wildlife Protection Act, 1972 and subsequent amendments

The Wildlife Protection Act, 1972 has allowed the government to establish several National Parks and Sanctuaries over the past 37 years, to protect and conserve the flora and fauna and their habitat.

3.2.4 Forest (Conservation) Act, 1980 and subsequent amendments

The Indian Forest Act (1927) was amended in 1980 to check the rapid deforestation occurring throughout India, and the Forest (Conservation) Act, 1980 came into existence. At the state level, the government was empowered to declare reserves and protected forest and was also given the authority to acquire land for extension and preservation of the forests. Forest (Conservation) Rules, 2003 explains the procedure for procuring clearance for diversion of forests land for non-forest purpose. This Act provides for the

conservation of forests and regulating the diversion of forest lands to non-forestry purpose. Any transmission line project falling under the forest area will require prior clearance from the relevant authorities under Forest (Conservation) Act 1980.

3.2.5 Ancient Monuments, Archaeological Sites & Remains Act 1958 and subsequent amendments

This Act is to ensure preservation of ancient and historical monuments and archaeological sites and remains of national importance and for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects. According to this Act, areas within the radii of 100m and 300m from the "protected property" are designated as "prohibited areas" and "regulated areas" respectively. No development activity is permitted in the "prohibited areas". Development activities are not permitted in the "regulated areas" without prior permission from the Archaeological Survey of India (ASI) if the site/remains/ monuments are protected by ASI or the State Directorate of Archaeology.

3.2.6 Water (Prevention and Control of Pollution) Act, 1974 and subsequent amendments

The Act is enacted to prevent pollution of water sources through the industrial or any other construction activity and for maintaining or restoring of wholesomeness of water. The Act prohibits discharge of pollutants into water bodies beyond a given standard and lays down penalties for non-compliance with its provisions.

The Act resulted in the establishment of the Central and State Level Pollution Control Boards whose responsibilities include managing water quality and effluent standards, as well as monitoring water quality, prosecuting offenders and issuing licenses for construction and operation of any facility. This will include generation of liquid effluent during construction or from domestic activities in workers colony.

3.2.7 The Air (Prevention and Control of Pollution) Act. 1981 and subsequent amendments

The purpose of this Act is to prevent, and control air pollution and preserve air quality. This Act empowers Central and State Pollution Control Boards for managing air quality and emission standards, as well as monitoring air quality, prosecuting offenders and issuing licenses for construction and operation of any facility. Air quality includes noise levels also. This Act has notified National Ambient Air Quality Standard for different land uses.

3.2.8 Noise Pollution (Regulation and Control) Rule,2000 and subsequent amendments

The Noise Pollution (Regulation and Control) rules are promulgated under Environmental (Protection) Act, 1986. The noise pollution rules lay down terms and conditions as are necessary to reduce noise pollution, including during night hours. The rule provides ambient noise level standards for various types of land uses.

3.2.9 Ozone Depleting Substances (Regulation and Control) Rules, 2000

By notification dt. 17th July 2000 under Sections 6, 8 and 25 of the Environment (Protection) Act 1986, the MoEF&CC has notified rules for the regulation/ control of Ozone Depleting Substances (ODS) under the Montreal Protocol. As per the notification, certain control and regulation has been imposed on manufacturing, import, export, and use of these compounds. APDCL is following the provisions of the notification and is phasing out all equipment, which uses these substances, and is aiming at CFC free organization in the near future.

3.2.10 Wetlands (Conservation and Management) Rules, 2017

Wetlands (Conservation and Management) Rules, 2017 are promulgated under Environmental (Protection) Act, 1986 for prohibiting reclamation and degradation through drainage and landfill, pollution (discharge of domestic and industrial effluents, disposal of solid wastes), hydrological alteration (water withdrawal and changes in inflow and outflow), over-exploitation of their natural resources resulting in loss of biodiversity and disruption in ecosystem services provided by wetlands by conservation

of wetlands.

As defined in the rule, 'wetland' means an area of marsh, fen, peatland or water; whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters, but does not include river channels, paddy fields, human-made water bodies/tanks specifically constructed for drinking water purposes and structures specifically constructed for aquaculture, salt production, recreation and irrigation purposes. Whereas, 'wetlands complexes' means two or more ecologically and hydrologically contiguous wetlands and may include their connecting channels/ducts

The rules shall apply to the wetlands or wetlands complexes of following types-

(a) Wetlands categorized as 'wetlands of international importance' under the Ramsar Convention

(b) Wetlands as notified by the Central Government, State Government and Union Territory Administration

Section 4 of the rule elaborates Restrictions of activities in wetlands

3.2.11 The Motor Vehicle Act, 1988 & Motor Vehicles Rules, 1989 and subsequent amendments

The Act regulates all aspects of road transport vehicles. It provides in detail the legislative provisions regarding licensing of drivers/conductors, registration of motor vehicles, control of motor vehicles through permits, traffic regulation, insurance, liability, offences and penalties, etc. This Act will be applicable for all construction equipment/plant and machinery including vehicles deployed during implementation. Motor Vehicles Rules, 1989 mandates Pollution Under Control (PUC) certificate for motor vehicles/construction equipment.

3.2.12 Regulations related to Waste Management

Table 3-1: Applicability of waste management regulations

Nature of Waste	Rules	Relevance
Municipal Solid Waste	Solid Waste Management Rules, 2016	MoEF&CC under the provisions of the Environmental Protection Act, 1986 issued the Solid Waste Management (SWM) Rule, 2016 on 8th April 2016 for management of Solid Waste.
Construction and Demolition Waste	Construction and Demolition Waste Management Rules, 2016	"construction and demolition waste" mean waste comprising of building materials, debris and rubble resulting from construction, re-modelling, repair and demolition of any civil structure. As per rule- Every waste generator shall prima-facie be responsible for collection, segregation of concrete, soil and others and storage of construction and demolition waste generated, as directed or notified by the concerned local authority in consonance with these rules ((Rule 4 sub-rule (1)) there should be no littering or deposition of construction and demolition waste so as to prevent obstruction to the traffic or the public or drains (Rule 4 sub-rule (4))
Plastic Waste	Plastic Waste Management Rules, 2016	MoEF&CC under the provisions of the Environmental Protection Act, 1986 and in in supersession of the Plastic Waste (Management and Handling) Rules, 2011 issued the Plastic Waste Management Rules, 2016 to give thrust on plastic waste minimization, source

Nature of Waste	Rules	Relevance
		segregation, recycling and disposal effectively. These rules shall apply to every waste generator, local body, Gram Panchayat, manufacturer, Importers and producer.
Hazardous Waste	Hazardous and Other Wastes (Management & Trans boundary Movement) Rules, 2016	These rules classify used mineral oil as hazardous waste under the Hazardous Waste, that require proper handling and disposal. The requirements for disposal of used mineral oil as per the rules are: The used oil can be sent / sold for re-refining to registered recyclers, if it meets the specification in Schedule –5. The waste oil which is not suitable for re-refining (i.e. does not meet the specifications listed in Schedule-5), can be used in furnaces if it meets the specifications laid down in Schedule –6 Any waste oil which does not meet the specifications in Schedule–6 shall not be auctioned or sold but shall be disposed of in a hazardous waste disposal facility. Used mineral oil generated at the APDCL substations meets the requirements of Schedule 5 of the above-mentioned Rules. APDCL will seeks authorisation for disposal of hazardous waste from concerned State Pollution Control Boards (SPCB) as and when required (Refer Appendix 4). The oil can be auctioned to authorised/registered re-refiners and information to the respective SPCB.
E-Waste	E-Waste Management Rules, 2016	MoEF&CC under the provisions of the Environmental Protection Act, 1986 and in in supersession of e-waste (Management and Handling) Rules, 2011 issued e-Waste Management Rules, 2016. These rules shall apply to every manufacturer, producer, consumer, bulk consumer, collection centres, dealers, e-retailer, refurbished, dismantler and recycler involved in manufacture, sale, transfer, purchase, collection, storage and processing of e-waste or electrical and electronic equipment listed in Schedule I of the rule, including their components, consumables, parts and spares which make the product operational.
Used Batteries	Batteries (Management and Handling) Rules, 2001	By notification dt. 16th May 2001 under Sections 6, 8 and 25 of the Environment (Protection) Act 1986, the MoEF&CC has put certain restrictions on the disposal and handling of used batteries. Thus, it is the responsibility of the bulk consumer (APDCL) to ensure that the used batteries are deposited with the dealer, manufacturer or registered recycler for handling and disposal.

3.2.13 The Building & Other Construction Workers (Regulation of Employment & Conditions of Service) BOCW Act, 1996

As per the Act, the employer is required to provide safety measures at the building or construction work site along with other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation etc. to the workers.

3.2.14 The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013

The Act that safeguards and mitigates the adverse impacts on the affected persons caused due to land/asset acquisition for a project. It is aimed to regulate land acquisition process and to lay down the process and procedures for granting adequate compensation for the loss of land/asset, rehabilitation and resettlement of project affected persons in a fair and transparent way.

3.2.15 The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006

The Act grants legal recognition to the rights of traditional forest dwelling communities, partially correcting the injustice caused by the forest laws. Makes a beginning towards giving communities and the public a voice in forest and wildlife conservation.

The definitions of forest dwelling Schedule Tribes, forest land, 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, APDCL is committed to abide by the provisions of the act, if any portion of a transmission line passes through any forest land to which the Act applies.

3.2.16 Electricity Act, 2003

Subsection 3,4 and 5 of Section 67 of the Act states that

(3) A licensee shall, in exercise of any of the powers conferred by or under this section and the rules made thereunder, cause as little damage, detriment and inconvenience as may be, and shall make full compensation for any damage, detriment or inconvenience caused by him or by any one employed by him.

(4) Where any difference or dispute [including amount of compensation under sub-section (3)] arises under this section, the matter shall be determined by the Appropriate Commission.

(5) The Appropriate Commission, while determining any difference or dispute arising under this section in addition to any compensation under sub-section (3), may impose a penalty not exceeding the amount of compensation payable under that sub-section.

Subsection 5 and 6 of Section 68 of the Act states that

(5) Where any tree standing or lying near an overhead line or where any structure or other object which has been placed or has fallen near an overhead line subsequent to the placing of such line, interrupts or interferes with, or is likely to interrupt or interfere with, the conveyance or transmission of electricity or the accessibility of any works, an Executive Magistrate or authority specified by the Appropriate Government may, on the application of the licensee, cause the tree, structure or object to be removed or otherwise dealt with as he or it thinks fit.

(6) When disposing of an application under sub-section (5), an Executive Magistrate or authority specified under that sub-section shall, in the case of any tree in existence before the placing of the overhead line, award to the person interested in the tree such compensation as he thinks reasonable, and such person may recover the same from the licensee. Explanation. - For the purposes of this section, the expression "tree" shall be deemed to include any shrub, hedge, jungle growth or other plant.

3.2.17 Indian Treasure Trove Act, 1878, amended in 1949

Section 2 of the Act defines 'treasure' as anything of any value hidden in the soil, or in anything attached thereto. Section 4 states whenever any treasure exceeding in amount or value ten rupees is found, the finder shall, as soon as practicable, give to the Collector notice in writing.

3.2.18 Protection of Civil Rights Act-1955

An Act to prescribe punishment for the [preaching and practice of – "Untouchability"] for the enforcement of any disability arising there from for matters connected therewith.

3.2.19 SC/ST (Prevention of Atrocities) Act 1989

An Act to prevent the commission of offences of atrocities against the members of the Scheduled Castes and the Scheduled Tribes, to provide for Special Courts for the trial of such offences and for the relief and rehabilitation of the victims of such offences and for matters connected therewith or incidental thereto.

3.2.20 Panchayats (Extension to Scheduled Areas) Act, 1996 or PESA

This law was enacted to cover the "Scheduled (under Fifth Schedule) areas" with predominance of tribal population, which are not covered in the 73rd amendment or Panchayati Raj Act of the Indian Constitution. The Act enables Panchayats and Gram Sabhas to implement a system of self-governance with respect to a number of issues such as customary resources, minor forest produce, minor minerals, minor water bodies, selection of beneficiaries, sanction of projects, and control over local institutions.

3.2.21 National Tribal Policy (Draft), 2006

Ministry of Tribal Affairs had prepared a draft National Tribal Policy in 2006, with objective of providing Regulatory Protection and Socio- Economic Empowerment of Scheduled Tribes in the country. A key provision would be the prevention of alienation of land owned by STs and restoring possession of wrongfully alienated lands. However, this policy has not been finalized as invited recommendations are yet to be incorporated.

3.2.22 Relevant Policies

The policy framework is contained in the following:

- National Forest Policy, 1988
- National Conservation Strategy and Policy Statement on Environment and Development, 1992
- Policy Statement for Abatement of Pollution, 1992
- Wildlife Conservation Strategy 2002-15
- National Environment Policy (NEP), 2006
- National Action Plan for Conservation of Migratory Birds and their Habitats along Central Asian Flyway (2018-2023) in 2018

3.3 State Level Laws/Regulations/Policies

3.3.1 Assam Forest Policy, 2004

The principal aim of this policy is to ensure progressive sustainable development of the forests of Assam, to meet the twin objectives of environmental stability and ecological balance together with improved livelihood support system for her people. The Management Paradigm as envisaged in the policy given below.

- The mega-biodiversity existence in Assam will be protected and developed with the active involvement of the communities.
- Without compromising the basic tenets of forest conservation-the forestry sector will be selectively opened to the people of Assam for income and employment generation.

- The Forest cover of Assam will be progressively increased and maintained through scientific sustainable forest management practices giving emphasis on the traditional knowledge and understanding of the ethnic communities of Assam.

3.3.2 Assam Biodiversity Rules, 2010

These rules are established in exercise of the powers conferred by Section 63 of the Biological Diversity Act, 2002 (Central Act 18 of 2003), the Government of Assam.

As per the act Indian entities or non-Section 3(2) (as prescribed under Biological Diversity Act, 2002) entities, prior intimation to the concerned SBB is required and for activities pertaining to commercial utilization, or bio-survey and bio-utilization for commercial utilization.

3.3.3 Wildlife (Protection) (Assam Amendment) Act, 2009

Under this Act hunting outside the boundary of a national park or wildlife sanctuary is also included as offence punishable under section 51 of the Wildlife Protection Act; and penalties have been made more stringent.

3.3.4 Assam (Control of Felling & Removal of trees from Non-forest Land) Rules, 2002

The rule regulates felling permission and transit of timber derived from non-forest areas. The Rule mandates permission for felling of various species of trees from Department of Environment and Forest.

3.3.5 Assam Rhinoceros Preservation Act 1954

This Act aims at protection of the Indian Rhinoceros, Assam's state animal; and enables legal action against killing, injury and capture of the animal.

3.3.6 Assam land and Revenue Regulation (Amendment) Act, 1947

This Act of 1947 was to amend Assam Land and Revenue Regulation 1886, and insert Chapter X, which is aimed at protecting land-ownership rights of indigenous tribal people of Assam.

3.3.7 Assam Land (Requisition and Acquisition) Act. 1964

An Act to amend and consolidate the law for requisition and speedy acquisition of premises and land for certain public purposes such as accommodation, transport, communication, irrigation, flood control and anti-erosion measures.

3.3.8 Indian Rhino Vision (IRV) 2020

This is a collaborative programme, developed and implemented by the Assam Forest Department, Bodoland Territorial Council, WWF, and International Rhino Foundation with support from US Fish and Wildlife Service, for long-term conservation of the one-horned rhinoceros (*Rhinoceros unicornis*) in Assam. IRV 2020 aims at increasing rhino populations in seven protected areas of Assam to 3000 by 2020. This is being achieved through increased protection and translocations of rhinos from source populations in Kaziranga and Pobitora. Between 2008-2012, 18 rhinos were translocated to Manas from Pobitora and Kaziranga and four from the Centre for Wildlife Rehabilitation and Conservation as part of rehabilitation programme of WTI and the Government of Assam. All 22 rhinos survived the translocations.

3.3.9 Project Elephant

Project Elephant (PE) was launched by the Government of India (GoI) in the year 1991-92 as a Centrally Sponsored Scheme with the objectives of protecting elephants, their habitat and corridors, addressing issues of man-elephant conflict, and welfare of domesticated elephants. The implementation of PE is through the C.S.S. Plan Scheme with the grant to State Governments at 90:10 for North East including Assam.

3.4 Indian Legal and Regulatory Framework

The major Indian laws, regulations and policies which are relevant to the Project are listed illustratively in Table below.

Table 3-2: Relevancy of Key Environmental and Social Legislation

Sl. No.	Law / Regulation / Guidelines	Applicability (Yes/No)	Clearance / Consent to be obtained (Yes/No)	Relevance	Implementing / Responsible Agency
1	The Environmental (Protection) Act. 1986, and the Environmental (Protection) Rules, 1987-2002 (various amendments)	Yes	No	Umbrella Act for Protection and improvement of the environment. Under this act rules have been specified for discharge/emission of effluents and different standards for environmental quality	MoEF&CC, State Department of Environment & Forest, Central Pollution Control Board (CPCB) and State Pollution Control Board (SPCB)
2	The EIA Notification, 2006 & subsequent amendments	To be identified at sub-project level during detailed E&S assessment	No	The construction of Substation and Transmission line project does not come under purview EIA Notification 2006 and its subsequent amendments. However, project associated activity like creation of borrow area (if any) for the project will require prior Environmental Clearance.	State EIA Authority (SEIAA) / MoEF&CC
3	Wildlife Protection Act, 1972	To be identified at sub-project level during detailed E&S assessment	Yes (If identified during detailed E&S assessment)	If subproject site is located within Protected Areas (National Parks, WL Sanctuaries etc.)	National Board for Wildlife (NBWL), State Board for Wildlife (SBWL)
4	Forest (Conservation) Act, 1980 and subsequent amendments	To be identified at sub-project level during detailed E&S assessment	Yes (If identified during detailed E&S assessment)	If diversion of forest land is involved in the subproject	State Environment and Forest Department, MoEF&CC
5	Ancient Monuments and Archaeological sites & Remains Act 1958	To be identified at sub-project level during	Yes (If identified during	If any archaeological site in the vicinity of subproject site	Archaeological Survey of India, State Dept. of Archaeology

Sl. No.	Law / Regulation / Guidelines	Applicability (Yes/No)	Clearance / Consent to be obtained (Yes/No)	Relevance	Implementing / Responsible Agency
		detailed E&S assessment	detailed E&S assessment)		
6	The Water (Prevention and Control of Pollution) Act, 1974	Yes	Yes (Consent to be obtained for utilization of water from ground water board)	Measure to be taken during project cycle especially construction phase towards prevention of water pollution	State Pollution Control Board, CPCB
7	The Air (Prevention and Control of Pollution) Act. 1981	Yes	No (However, Ambient Air quality standards to be followed and record to be maintained)	Measure to be taken during project cycle especially during construction phase towards prevention of air pollution	State Pollution Control Board, CPCB
8	Noise Pollution (Regulation and Control) Act, 1990 and subsequent amendments	Yes	No (However, Ambient Noise level to be followed and record to be maintained)	Construction machineries and vehicles to conform to the standards for construction. Measure to be taken during project cycle especially during construction phase towards prevention of air pollution	State Pollution Control Board, CBCB
9	Wetlands (Conservation and Management) Rules, 2017	To be identified at sub-project level during detailed E&S assessment	Yes (If identified during detailed E&S assessment)	Permission is required if any wetland notified by the Central Government, State Government falls within project site	Wetland Authority; MoEF&CC
10	Assam (Control of Felling & Removal of trees from Non-forest Land) Rules, 2002	To be identified at sub-project level during detailed E&S assessment	Yes (If identified during detailed E&S assessment)	If felling of trees as defined in Assam (Control of Felling & Removal of trees from Non-forest Land) Rules, 2002 is involved	Environment and Forest Department, Assam
11	The Motor Vehicle Act. 1988 and subsequent amendments	Yes	Yes (From State Pollution	All vehicles/equipment used for construction	State Motor Vehicles Department

Sl. No.	Law / Regulation / Guidelines	Applicability (Yes/No)	Clearance / Consent to be obtained (Yes/No)	Relevance	Implementing / Responsible Agency
			Control Board for HMV & LMV)	will need to comply with the provisions of this act.	
12	Solid Waste Management Rules, 2016	Yes	No	Effective management and disposal of various waste during construction and operation stage	MoEF&CC and various concerned departments
13	Construction and Demolition Waste Management Rules, 2016	To be identified at sub-project level during detailed E&S assessment	Yes		
14	Plastic Waste Management Rules, 2016	Yes	No		
15	Hazardous and Other Wastes (Management & Trans boundary Movement) Rules, 2016	Yes	Yes (During operation stage)	Hazardous wastes are likely to be generated during construction and operation stage in forms of used oil, transformer oil and effective management and disposal to be ensured.	State Pollution Control Board
16	E-Waste Management Rules, 2016	Yes	No	Effective management and disposal of e-waste during construction and operation stage	MoEF&CC and various concerned department
17	Batteries (Management and Handling) Rules, 2001	Yes	Yes (During operation stage)	Proper disposal of used batteries	State Pollution Control Board
18	The Building & Other Construction Workers (Regulation of Employment & Conditions of Service) BOCW Act, 1996	Yes	Yes	Key legislations providing guidelines for onsite labour and worker management and welfare during construction	District Labour Commissioner
19	The Right to Fair Compensation and Transparency in Land Acquisition,	To be identified at sub project level during detailed	Yes (In coordination with revenue authorities)	If acquisition of land/asset/loss of livelihood is involved.	GoI and GoA

Sl. No.	Law / Regulation / Guidelines	Applicability (Yes/No)	Clearance / Consent to be obtained (Yes/No)	Relevance	Implementing / Responsible Agency
	Rehabilitation and Resettlement Act, 2013	Environmental and Social assessment			
20	The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006	To be identified at sub project level during detailed Environmental and Social assessment	Yes (If identified during detailed E&S assessment)	Consent of community is required to procure forest clearance for a project if the sub-project requires diversion of forest land where rights of Primitive Tribal Groups or Primitive Agricultural Community may get hampered	Ministry of Tribal Affaires
21	Electricity Act, 2003	Yes	No	The act assures compensation for any damage, detriment or inconvenience caused by the project	State Power and Electricity Department
22	MoP guidelines dated 15th October 2015 for payment of compensation toward damages in regard to RoW	Yes	No	Power and Electricity Dept. of Govt. of Assam defined method for compensation for RoW of Transmission line and Tower Base	GoA
23	The Antiquities and Art Treasures Act, 1972 and Indian Treasure Trove Act, 1878, amended in 1949	Chance find	Yes (If identified during detailed E&S assessment)	In case of sudden encounter with anything valuable at any stage of project cycle.	District Collector / Commissioner

3.5 International Treaties, Conventions and Declarations

There are 20 major global Multilateral Environmental Agreements, to which India is a signatory. These are listed below:

Table 3-3: Nature Conservation treaties

Sl. No.	Nature Conservation	Relevancy to Project
1	Ramsar Convention on Wetlands	Yes, IBA exists in the project area
2	CITES (Convention on International Trade in Endangered Species of Fauna and Flora)	Yes, Endangered Species involved
3	TRAFFIC (The Wildlife Trade Monitoring Network)	No
4	CMS (Convention on the Conservation of Migratory Species)	Yes, flyway involved
5	CAWT (Coalition Against Wildlife Trafficking)	No

Sl. No.	Nature Conservation	Relevancy to Project
6	CBD (Convention on Biological Diversity)	Yes
7	ITTC (International Tropical Timber Organisation)	No
8	UNFF (United Nations Forum on Forests)	No
9	IUCN (International Union for Conservation of Nature and Natural Resources)	Yes
10	GTF (Global Tiger Forum)	No

Table 3-4: Hazardous Material Treaties

Sl. No.	Hazardous material	Relevancy to Project
1	Cartagena Protocol on Biosafety	No
2	SAICM (Strategic Approach to International Chemicals Management)	No
3	Stockholm Convention on Persistent Organic Pollutants (POPs)	No
4	Basel Convention on the Control of Trans-boundary Movement of Hazardous Waste and Their Disposal	Yes, Use of Transformer oil
5	Rotterdam Convention on Prior Informed Consent (PIC) for certain Hazardous Chemicals and Pesticides in International Trade	No

Table 3-5: Atmospheric Emissions

Sl. No.	Atmospheric Emissions	Relevancy to Project
1	UNFCCC (United Nations Framework Convention on Climate Change)	No
2	Kyoto Protocol	No
3	UNCCD (United Nations Convention to Combat Desertification)	No
4	Montreal Protocol (on Ozone Depleting Substances)	Yes, Use of SF6 gas

Table 3-6: Marine Environment

Sl. No.	Marine Environment	Relevancy to Project
1	IWC (International Whaling Commission)	No

The applicability of the various regulations for different project activities are presented in table below.

3.6 Applicability of AIIB ESP

AIIB is an international financial organization that provides a multilateral financing and investment platform for infrastructure development and enhanced interconnectivity in Asia. AIIB recognizes that E&S sustainability is a fundamental aspect of achieving outcomes consistent with its mandate to support infrastructure development and enhance interconnectivity in Asia. The objective of AIIB's ESP is to facilitate achievement of these development outcomes, through a system that integrates sound E&S management into Projects.

1. Environmental and Social Policy sets forth mandatory E&S requirements for each Project.
2. Environmental and Social Standards include following three associated ESSs,
   a) **ESS 1:** Environmental and Social Assessment and Management
   b) **ESS 2:** Involuntary Resettlement and
   c) **ESS 3:** Indigenous Peoples

Table 3-7: Environmental and Social Standards of AIIB

Environmental and Social Standards (AIIB)	Objective & Brief Description
ESS 1: Environmental and Social Assessment and Management	ESS1 aims to ensure the environmental and social soundness and sustainability of Projects and to support the integration of environmental and social considerations into the Project decision-making process and implementation. ESS 1 is applicable

Environmental and Social Standards (AIIB)	Objective & Brief Description
	if the Project is likely to have adverse environmental risks and impacts or social risks and impacts (or both). The scope of the environmental and social assessment and management measures are proportional to the risks and impacts of the Project. ESS 1 provides for both quality environmental and social assessment and management of risks and impacts through effective mitigation and monitoring measures during the course of Project implementation. The ESS 1 defines the detailed requirements of the environmental and social assessment to be carried out for any project to be financed by the Bank.
ESS 2: Involuntary Resettlement	ESS 2 is applicable if the Project's screening process reveals that the Project would involve Involuntary Resettlement (including Involuntary Resettlement of the recent past or foreseeable future that is directly linked to the Project). Involuntary Resettlement covers physical displacement (relocation, loss of residential land or loss of shelter) and economic displacement (loss of land or access to land and natural resources; loss of assets or access to assets, income sources or means of livelihood) as a result of: (a) involuntary acquisition of land; or (b) involuntary restrictions on land use or on access to legally designated parks and protected areas. It covers such displacement whether such losses and involuntary restrictions are full or partial, permanent or temporary. The ESS 2 defined detailed requirements of resettlement planning of the projects involving involuntary resettlement. No involuntary resettlement is proposed for the project. Most of the sub-stations are being installed either on Govt. Land or APDCL / AEGCL Land. Some of the sub-stations are also proposed on donated private or community land. These land parcels are donated by owners or community in accordance to their will. Hence, ESS-2 is not applicable for the proposed development.
ESS 3: Indigenous Peoples	The ESS 3 is applicable if Indigenous Peoples are present in, or have a collective attachment to, the proposed area of the Project, and are likely to be affected by the Project. The term Indigenous Peoples is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees: (a) self-identification as members of a distinct indigenous cultural group and recognition of this identity by others; (b) collective attachment to geographically distinct habitats or ancestral territories in the Project area and to the natural resources in these habitats and territories; (c) customary cultural, economic, social or political institutions that are separate from those of the dominant society and culture; and (d) a distinct language, often different from the official language of the country or region. The ESS 3 defines the detailed requirements of People planning, in case such groups are present in the project area and are likely to be affected by the project.

3. **Environmental and Social Exclusion List:** AIIB decided not to finance Projects that it determines do not comply with the ESP and ESSs. The Bank will not knowingly finance a Project that: (a) either involves or results in forced evictions; or (b) involves activities or items specified in the list set forth in the Environmental and Social Exclusion List of Environmental and Social Framework, February 2016 of AIIB

AIIB determines the Project's category by the category of the Project's component presenting the highest environmental or social risk, including direct, indirect, cumulative and induced impacts, as relevant, in the Project area. It assigns each proposed Project to one out of the 4 designated Categories i.e. Category A, Category B, Category C and Category F1.

The Project has been tentatively assigned to Category B, as APDCL will avoid siting the sub-projects in sensitive areas to minimize E&S impacts to the extent possible. The applicability analysis of AIIB ESSs is defined below.

ESS-1: Environmental and Social Assessment and Management: ESS 1 applies for the present development project as the Project is likely to have some adverse environmental impacts. Project has been tentatively assigned to Category B. Hence, present ESMPF discusses about the Generic Impacts and Proposed mitigation measures for the sub-projects, based on model assessments.

ESS-2: Involuntary Resettlement: No involuntary resettlement is proposed for the project. Most of the sub-stations are being installed either on Govt. Land or APDCL / AEGCL Land. Some of the sub-stations are also proposed on donated private or community land. These land parcels are donated by owners or community in accordance to their will. Hence, ESS-2 is not likely applicable for the proposed development. Though the risk is low, the RPF has been prepared to guide the involuntary resettlement in case it will be required.

ESS-3: Indigenous Peoples: The proposed development project shall create positive impacts by availability of the electricity. Further, no involuntary resettlement is proposed for the project. Therefore, no significant change in Indigenous Peoples rights is foreseen due to proposed project. Hence, the ESS-3 is not likely applicable for the project. Though the risk is low, the TPDF has been prepared to guide the development related to Indigenous People in case it will be required.

3.7 National Regulations in respect to AIIB ESP Standards

As per the 2006 EIA notification of the Ministry of Environment, Forests and Climate Change (MoEF&CC) and its subsequent amendments, power transmission projects, including the establishment of a substation, are not listed under the scheduled list of projects that require prior environmental clearance. Hence, as per national regulations, an EIA study is not required to be furnished and no prior environmental clearance is mandated for this project.

According to AIIB's Environmental and Social Policy (ESP), the Project is tentatively assigned as category B project, as it is likely to have a limited number of potentially adverse E&S impacts; the impacts are not unprecedented; few if any of them are irreversible or cumulative; they are limited to the project area and can be successfully managed using good practice in an operational setting. However, despite the extent of impacts falling in Category B, the need to address these impacts assumes greater significance given the eco fragile and sensitive nature of the SoA. Hence, the development of an ESMPF that will be used as a guidance tool to carry out project specific ESIAs and to implement the ESMP, A/RP, TPPs (if applicable) which are essential instruments to mitigate impacts and enhance sustainability of the Project.

If the Bank determines that the relevant environmental and social requirements of the country in which the Project is located are more stringent than the requirements of the ESP or ESSs, the country's own requirements will apply, provided that they are not in violation of the Bank's Articles of Agreement. Some of the policies comparison between National and AIIP ESPs is presented in Table below.

Table 3-8: National Regulations in respect to AIIB's Policies

Sl. No.	Project Stage	AIIB ESP 2019	National Regulations	Gaps Identified
1	Project Screening and Categorization	Analyse potential impacts of the project for Screening of each proposed project at the concept stage Projects categorized as A, B, C and FI.	As per EIA notification 2006, All projects and activities are broadly categorized in to two categories - Category A and Category B, based on the spatial extent of potential impacts and potential impacts on human health, natural and manmade resources.	Power distribution projects are not listed as environmental sensitive projects under EIA notification 2006. However, according to the ESP, all projects require assessment and mitigation of potential environmental and social impacts. The project is tentatively assigned in Category B, due to the

Sl. No.	Project Stage	AIIB ESP 2019	National Regulations	Gaps Identified
				limited potential E&S impacts.
2	Conduct Environmental and Social Assessment	Client to undertake an Environmental and Social Assessment of potential physical, biological, socioeconomic and cultural risks and impacts.	As per EIA notification 2006; Category A - Require Prior Environmental Clearance (EC) from Central Government in the MoEF&CC through recommendation of Environmental Appraisal Committee (EAC). Category B– require environment clearance from SEIAA	As per National regulations/ standards (EIA notification 2006) the substation and transmission line projects are not listed in EIA notification. Hence, no EIA is requisite as per National Guidelines. The ESP of AIIB lists power transmission projects as projects which may have adverse environmental and social impacts (B) and hence requires ESIA.
3	Assessment of Alternatives	Assessment of alternatives under ESS 1: Environmental and Social Assessment and Management. Examination to avoid or minimize environmental impacts.	As per EIA notification alternatives to the project's location, design, and technology document rationale or selecting the particular project location, design, and technology needs to take under consideration for Category A and Category B1 if the scoping exercise results in need of alternatives.	As per National Laws analysis of alternatives is not mandatory for sub-station and transmission line projects. However, according to the ESP, all projects require assessment and mitigation of potential environmental and social impacts.
4	Prepare Environmental and Social Management Plan (ESMP)	Development and implementation of an ESMP. The ESMP shall include the monitoring plan with budgetary provisions.	A project specific EIA / EMP is required only in case project trigger the EIA notification, 2006 (amended thereof)	As per the GoI and GoA guidelines ESMP development and budget allocation is not required. The same is required as per AIIB's guidelines.
5	Public Consultation and Use of Project-Level Grievance Redress Mechanisms	Client conducts meaningful consultation with Project affected people to facilitate their informed participation in the consultations. Client continues consultation with stakeholders throughout the Project implementation as appropriate. Client to establish a Project-level GRM.	As per EIA notification 2006, all Category A and Category B1 projects or activities are required to undertake Public Consultation with certain narrowly specified exceptions.	As per national regulations, sub-station and transmission line project do not need public consultation. EIA notification does not cover the grievance redress mechanism but AIIB guidelines requires a mechanism to receive and facilitate resolution of grievances or complaints
6	Information Disclosure	Public disclosure of E&S documents, including ESMP, on Client and AIIB	As per the EIA notification, 2006 Information disclosure	As per Indian standards information disclosure is not mandatory for Power

Sl. No.	Project Stage	AIIB ESP 2019	National Regulations	Gaps Identified
		websites as per policy provisions. Local translations of executive summaries of E&S documents should be disclosed as well. Regular disclosure of updated environmental and social information in the Project.	required to be undertaken through public notice prior to the approval by the MoEF&CC only for Category A and B1 projects .	Transmission projects whereas the AIIB guidelines requires information disclosure.
7	Use of Environmental Standards	As a general rule, AIIB bases the project assessment on the regulations that apply in the country in which the project is to be implemented. These regulations must be consistent with international environmental, social, health, safety and labour standards. These include the general and sector Environmental, Health and Safety (EHS) Guidelines of the World Bank Group. For pollution prevention purpose, international standards and CPCB standards whichever stringent will apply.	The Environment (Protection) Rules, 1986 Various legislations addressing aspects such as air and water pollution, hazardous substance management, etc. Occupational health and safety standards included in the Factories Act (India) and various India specific Labour Laws.	There are no specific national guidelines on applicability of minimum environmental standards on power sub-station and transmission line. However, IFC's general EHS Guideline and Guideline for Electric Power Transmission and Distribution clearly sets minimum environmental limits on air, water, noise and soil quality, which should be followed.
8	Monitoring and Reporting	As per AIIB ESP, the recipient of the funds have / has to agree to certain reporting and notification duties and implement appropriate monitoring tools.	For Category A and B1 projects post environmental clearance (EC) monitoring is stipulated by the regulations, with half yearly compliance reports to be made available as public documents. Also, latest report displayed on website of regulatory authority. Which is not required for category B2 projects.	As per Indian Standards the power transmission projects do not require any monitoring and reporting whereas as per AIIB ESP the project requires monitoring and reporting.
9	Compensation, Resettlement and Rehabilitation	As per AIIB's requirement, regardless of the property title status, solutions on both situations of physical and/or economic displacement should be developed in consultation with the affected people. This may include inter alia	Valuation of the land shall be done following the procedure laid down in LARR Act, 2013. Value of the land and compensation amount shall be approved by the negotiation committee.	National Regulations do not cover all displaced persons, such as non-titled on government land. While AIIB requires compensation for all affected people

Sl. No.	Project Stage	AIIB ESP 2019	National Regulations	Gaps Identified
		measures such as e.g. provision of alternative housing, moving assistance, relocation allowances, compensation or other forms of support in order to improve or at least re-establish the livelihood of the affected people.	The compensation of the damage is governed by the Electricity Act, 2003 and the Indian Telegraph Act, 1885. The compensation towards the damage are provided without the acquisition of land which are assessed/reviewed by the Revenue Authorities.	regardless of property title status

3.8 APDCL Environment and Social Management Procedure

APDCL proposed Environment and Social Management procedure is defined in table below.

Table 3-9: APDCL's E&S Management Procedures

Milestones	Process	Output / Indicators	Internal Responsibility			External Responsibility
			Preparation /Execution	Review	Approval	
Project Conceptualisation						
Environmental & Social Screening and Scoping for Transmission/Distribution Lines	Screen and scope: Distribution Lines from an environmental & social perspective	E & S screening and scoping documents as part of Concept Paper	Circle (Site) office	Engg. Dept., ESMC	APDCL Management Appraisal	Pre-appraisal by Planning Dept., GoA
Environmental & Social approval	Submit Concept paper (with E&S details) for Management Approval	APDCL Management Appraisal	ESMC Corp. Plg.	ESMC Engg. Dept. Corp. Plg.	APDCL Management Appraisal	In-principle approval by GoA
Project Planning						
Environmental & Social Screening and Scoping for substations	Screen and scope substations sites from an environmental & social perspective Consultation with Revenue Authorities	E & S Screening and Scoping reports for substation sites Scope for land acquisition	Circle office ESMC	ESMC Engg. Dept. Corp. Plg	APDCL Management Approval	Ext. agency like revenue, forest dept etc. for Social Screening & Scoping
Environmental & Social Impact Assessment and Management Planning	To prepare ESMP • Distribution line • Substations • Public Consultation	E & S Impact Assessment and E & S Management Plan	ESMC Circle office	ESMC	APDCL Management Approval	State Forest Dept
Social Assessment for Temporary Damages	To prepare RP • Assessment of temporary damages • Compensation plan • Public consultation	RP	ESMC Circle office	ESMC	APDCL Management Approval	Revenue Dept
Project Approvals						
Forest Clearance	• Submit forest proposal to State Govt • Forest Proposal to MoEF&CC for 1st stage approval • Compliance to MoEF&CC for Final Forest Clearance	Final Forest Clearance by MoEF&CC	ESMC Circle office	ESMC Finance Dept.	APDCL Management Approval	MoEF&CC
State Govt.	Submit DPR (with E & S details) to State Govt.	Project approval by State Govt.	Circle Office, Corp. Plg.	ESMC Corp. Plg.	APDCL Management Approval	Budget/fund allocation
FA Acceptance	Submit ESIA and RP to Funding Agencies for appraisal	ESIA and RP concurrence by FA	ESMC Corp. Plg.	ESMC Corp. Plg. Dept.	Internal Management Approval	Detailed appraisal and concurrence
Detailed Design & Award						
ESIA/RP Implementation	Engage authorised agencies for E & S management plan work	Authorised agencies engaged to execute management works	ESMC Circle office, Engg. Dept.	Corp. Plg. ESMC /Circle office Engg. Dept.	Management Approval	Monitoring /Supervision
ESMP part of bidding documents	Project specific ESMP to be included in bidding document	ESMP part of contract document	Circle office	ESMC	Management Approval	Monitoring /Supervision
Project Implementation						
Execution of Environmental Management Works	Execute environmental management works (ESMP)	Environmental management measures executed	Circle office, Authorised agency	ESMC Circle office	Management Approval	Environment Management works executed
Execution of RP	Execute RP	RP (by APDCL)	Circle office, /GoA	ESMC Circle office Corp. Plg.	Management Approval /GoA	Social management works executed, Possession of Land
Operation & Maintenance						
Environmental & Social Monitoring	Monitor ESMP & RP (TL) Measures	Periodic monitoring reports	ESMC Circle Office, / GoA	ESMC Circle office, O&M Circle office	Management Approval, /GoA	Periodic monitoring report
Project Review						
Periodic Environmental & Social Review	Review and report on E & S performance of project during construction, O &M	Annual environmental and social review report	ESM/Circle office	Corp. Plg. Engg. Dept Fin. dept	Management Approval	FA appraisal GoA

4 PROJECT DESCRIPTION

4.1 Project Overview

The objective of the Assam Distribution System Enhancement and Loss Reduction Project is to improve the reliability and the security of power supply by strengthening the electricity distribution network in the State of Assam. The scope involves strengthening the electricity distribution system comprising networks at 33kV level and below by a) constructing new 33/11kV substations at important load centres, b) laying of new 33kV and 11kV overhead lines, and c) installation of new 1,140 High Voltage Distribution System (HVDS) at select locations to improve reliability and to reduce the distribution losses.

4.1.1 Phased Development

The overall project components have been distributed in three priorities, comprising of erection of 196 sub-stations of 33/11 kV, 1,140 HVDS, 33 kV sub-transmission line and 11 kV distribution line over a period of 6 years. The project shall be developed in 2 phases, however, the present report shall remain valid for all the development phases. As some of the project locations haven't been decided, the project will have a priority of development stated in table below.

Table 4-1: Substations and Distribution Line in Different Phases

Priority Phase	Nos. of sub-stations	High Voltage Distribution System	Length of 33 kV sub-transmission line	Length of 11 kV distribution line
Priority / Phase I	135	240 No. (tentative)	1,822 km (tentative)	2,188.5 km (tentative)
Priority / Phase II	61	900 No. (tentative)	1,213.7 km (tentative)	2,614 km (tentative)

4.1.2 Sub-Projects under Priority / Phase I

Tentative list of projects to be undertaken in Phase-1 are as follows.

Table 4-2: List of Project Units Proposed Under Phase I

Sl. No.	Electrical Circle	33/11 KV Sub-Station	Transformer Capacity (MVA)	Proposed feeding GSS/33 KV SS	Proposed Length (Km)	
					33 KV Line	11 KV Line
1.	Bongaigaon	Nayapara	2x5	Bhalukdubi 33/11 KV SS	8	10
2.	Bongaigaon	Matiabazar	2x5	Matia 132/33 kV GSS	5	12
3.	Bongaigaon	Koshdhowa	2x5	Damra 33/11 KV SS	18	10
4.	Bongaigaon	Tiplai	2x5	Rongjuli 33/11 KV SS	15	11
5.	Bongaigaon	Murulijhar	2x2.5	Nidanpur 33/11 KV SS	25	11
6.	Bongaigaon	Sadullabari	2x2.5	Sonapur 33/11 KV SS	15	8
7.	Bongaigaon	Bhalukandi	2x2.5	Sonapur 33/11 KV SS	5	8
8.	Bongaigaon	Koila Moila	2x5	Dhaligaon 132/33 KV GSS	31	20
9.	Bongaigaon	Jelkajhar	2x5	Dalaigaon 33/11 KV SS	15	10

Sl. No.	Electrical Circle	33/11 KV Sub-Station	Transformer Capacity (MVA)	Proposed feeding GSS/33 KV SS	Proposed Length (Km)	
					33 KV Line	11 KV Line
10.	Bongaigaon	Madhyam Runikhata	2x5	Shyamthaibari 33/11 KV SS	17	12
11.	Bongaigaon	Rowmari (Potabari)	2x2.5	Chapaguri 33/11 KV SS	15	8
12.	Bongaigaon	Borigaon	2x5	Abhayapuri 33/11 KV SS	10	20
13.	Bongaigaon	Lengtisiga (Borkhata)	2x2.5	Abhayapuri 33/11 KV SS	17	12
14.	Bongaigaon	Ulubari	2x2.5	Barnagar 132/33 KV GSS/ New Serfanguri 132/33 kV GSS	30	26
15.	Mangaldoi	Dhula	2x5	Chopai 33/11 KV SS	9	20
16.	Mangaldoi	Kulsigate	2x5	Punia 132/33 KV GSS	8	22
17.	Mangaldoi	Bahbari	2x2.5	Burigaon 33/11 KV SS	8	20
18.	Mangaldoi	Arimari	2x2.5	Burigaon 33/11 KV SS	12	20
19.	Mangaldoi	Bahgora (Ganesh Kuwari)	2x5	Bezera 33/11 KV SS	20	22
20.	Mangaldoi	Borbari	2x2.5	Dipila 33/11 KV SS	6	21
21.	Mangaldoi	Balipara	2x2.5	Tongla GSS (Proposed)	15	20
22.	Mangaldoi	Sasthapara (Dalanghat SS)	2x2.5	Khoirabari 33/11 KV SS	15	22
23.	Mangaldoi	Sonaigoan	2x5	Rowta 33/11 KV SS	21	19
24.	Mangaldoi	Bamunjuli	2x5	Rowta 33/11 KV SS	25	20
25.	Mangaldoi	Khagrabari	2x2.5	Khoirabari 33/11 KV SS	20	22
26.	Mangaldoi	Lamabari	2x5	Mazbat 33/11 KV SS	15	20
27.	Mangaldoi	Ekrabari (Kajiamati SS)	2x5	Rowta 33/11 KV SS	21	20
28.	Mangaldoi	Shikari Bangla (Nagasuba SS)	2x2.5	Tongla 132/33 KV GSS (Proposed)	16	22
29.	Mangaldoi	Bherbheri	2x5	Kalaigaon 33/11 KV SS	20	21
30.	Mangaldoi	Borjhar	2x5	Rowta 33/11 KV SS	16	20
31.	Mangaldoi	Lakhimpur	2x2.5	Kalaigaon 33/11 KV SS	16	20
32.	Mangaldoi	Dhansiri ghat	2x2.5	Rowta 33/11 KV SS	12	20
33.	Barpeta	Uttar Barpeta Road	2x5	Barpeta Road 33/11 KV SS	7	15

Sl. No.	Electrical Circle	33/11 KV Sub-Station	Transformer Capacity (MVA)	Proposed feeding GSS/33 KV SS	Proposed Length (Km)	
					33 KV Line	11 KV Line
34.	Barpeta	Howly new	2x5	Howly 33/11 KV SS	1	10
35.	Barpeta	Pathsala Town	2x5	Pathsala 33/11 KV SS	7	10
36.	Barpeta	Balajan	2x5	Kharisala 33/11 KV SS	24	10
37.	Barpeta	Patbaushi	2X5	Tapping will be done from 33 KV Chenga feeder or 33 KV Sarthebari feeder through LILO arragement which are originated from 33/11 KV Bhakatpara SS in addition to 132 KV Barpeta GSS to Patbaushi SS	4	12
38.	Barpeta	Gahiya	2X5	Tapping will be done from 33 KV Sarthebari feeder which is originated from 33/11 KV Bhakatpara SS	17	15
39.	Barpeta	Kamargaon	2x5	two source - 1) Kamargaon 132/33 GSS - 8 KM 33 KV line 2) LILO option from ULUBARI 33/11 KV SS (which will constructed under AIIB scheme)	2.5	15
40.	Kokrajhar	Srirampur	2x5	Gossaigaon (Joyma) 132/33 KV GSS	19	12
41.	Kokrajhar	Bodofa Nagar	2x5	Kokrajhar (Adabari) 132/33 KV GSS	5	10
42.	Kokrajhar	Salakati	2x5	Salakati 132/33 KV GSS	5	12
43.	Kokrajhar	Bidyapur	2x5	Salakati 132/33 KV GSS	25	8
44.	Kokrajhar	Tamarhat	2x2.5	Hatidhora 33/11 KV SS	25	8
45.	Kokrajhar	Tipkai	2x2.5	Udmari 132/33 KV GSS	30	20

Sl. No.	Electrical Circle	33/11 KV Sub-Station	Transformer Capacity (MVA)	Proposed feeding GSS/33 KV SS	Proposed Length (Km)	
					33 KV Line	11 KV Line
46.	Kokrajhar	Dolgram	2x5	Panbari 33/11 KV SS	15	30
47.	Kokrajhar	Biskhowa	2x2.5	Agamoni 33/11 KV SS	10	20
48.	Kokrajhar	Raniganj	2x2.5	Udmari 132/33 KV GSS	20	5
49.	Rangia	Suagpur	2x5	Goreswar 33/11 KV SS	20	21
50.	Rangia	Dwarkuchi	2x5	Rangia 132/33 KV GSS	12	26
51.	Rangia	Majdia	2x5	Tamulpur 33/11 KV SS	10	28
52.	Rangia	Daranga	2x5	Kumarikata 33/11 KV SS	12	22
53.	Rangia	Cowli	2x5	Kumarikata 33/11 KV SS	12	34
54.	Rangia	Baganpara	2x2.5	Dhomdhoma 33/11 KV SS	12	30
55.	Rangia	Rampur (Rangia)	2x5	Mukalmua 33/11 KV SS	14	30
56.	Rangia	Titkuri (Dorakahora)	2x5	Kamalpur 132/33 KV SS	12	24
57.	Rangia	Kalmoni (Kendukona)	2x5	Kamalpur 132/33 kV GSS	10	16
58.	GEC-I	Chandrapur	1x5	CTPS 132/33 KV GSS	0.5	20
59.	GEC-II	Bongara	2x5	Kukurmara 400 KV GSS	0.8	12
60.	GEC-II	Goroimari	2x5	Bamunigaon 33/11 KV SS	20	21
61.	GEC-II	Satpur	2x5	Kukurmara 400 KV GSS	8	12
62.	GEC-II	Jharobari	2x5	Kukurmara 400 KV GSS	18	15
63.	GEC-II	Rampur	2x5	Bijoynagar 33/11 KV SS	7	12
64.	GEC-II	Kukurmara	2x5	existing 33 kV Bamunigaon Feeder	1	4
65.	GEC-II	Dhupguri	2x5	Boko 33/11 KV SS	27	29
66.	GEC-II	Changchari	2x10	Kamalpur 33/11/kV SS	0.5	10
67.	GEC-II	Singimari-Dadara	2x10	Kulhati 132/33 kV GSS	14	10
68.	GEC-II	Dekabari	2x5	Joyguru 220/132 kV GSS	14	20
69.	GEC-II	Barkuchi	2x5		1	4
70.	Tezpur	Panbari Dhekiajuli	2x5	Dhekiajuli 33/11 KV SS	1.5	22

Sl. No.	Electrical Circle	33/11 KV Sub-Station	Transformer Capacity (MVA)	Proposed feeding GSS/33 KV SS	Proposed Length (Km)	
					33 KV Line	11 KV Line
71.	Tezpur	Gingia	2x2.5	Pavoi 132/33 KV GSS	20	10
72.	Tezpur	Tupia	2x2.5	Jamuguri 33/11 KV SS	12	15
73.	Tezpur	Tezpur University	2x2.5	Depota 132/33 KV SS/Tezpur-II 132/33 KV GSS	4	14
74.	Tezpur	Haleswar	2x2.5	Depota 132/33 KV GSS	4	8
75.	Tezpur	Phulbari (Ghoramari AIDC)	2x2.5	Ghoramari 132/33 KV GSS	4	10
76.	Tezpur	Burigang	2x5	Monabari 33/11 KV SS	38	10
77.	N. Lakhimpur	Bongalmora	2x2.5	New Bihpuria 220/33 KV GSS	32	18
78.	N. Lakhimpur	Simluguri	2x2.5	New Bihpuria 220/33 KV GSS	18	12
79.	N. Lakhimpur	Sonarichapori	1x5	Dhakuakhana 33/11 KV SS	20	10
80.	N. Lakhimpur	Mechaki	2x5	Gelua 33/11 KV SS	15	30
81.	N. Lakhimpur	Joyrampur	1x5	Bordoloni 33/11 KV SS	20	10
82.	N. Lakhimpur	Gali	2x2.5	Telam 33/11 KV SS	25	20
83.	N. Lakhimpur	Mornoi	1x5	Ghilamara 33/11 KV SS	25	10
84.	N. Lakhimpur	Goroimari (Dhemaji)	1x5	Gogamukh 33/11 KV SS	30	10
85.	N. Lakhimpur	Butikur	2x2.5	Tapping/LILO from Hatigarh GSS- Machkhowa Line	5	15
86.	N. Lakhimpur	Harmutty	2x5		15	20
87.	Cachar	Rajpur	2x5	Kalain 33/11 KV SS	11	16
88.	Cachar	Haticherra	2x5	Udarband 33/11 KV SS	15	8
89.	Cachar	Pailapool	2x10	Pailapool 132/33 KV GSS	0.1	5
90.	Cachar	Binnakandi	2x5	Phulertol 33/11 KV SS	8	12
91.	Cachar	Kothalroad	2x5	Srikona Mehepur Line (Tapping)	8	4
92.	Cachar	Sonairoad	2x5	Meherpur 33/11 KV SS	5	5
93.	Cachar	Silbori	2x5	Meherpur-Kabuganj Line (Tapping)	5	5

Sl. No.	Electrical Circle	33/11 KV Sub-Station	Transformer Capacity (MVA)	Proposed feeding GSS/33 KV SS	Proposed Length (Km)	
					33 KV Line	11 KV Line
94.	Cachar	Pallanghat	2x5	Kabuganj 33/11 KV SS	12	6
95.	Cachar	Dwarbond	2x5	Dargakona 33/11 KV SS	12	5
96.	Cachar	Chirakundi	2x5	Srikona Mehepur line (tapping)	0.1	4
97.	Badarpur	Sonakhira	2x5	Pathakandi 33/11 KV SS	10	25
98.	Badarpur	Bazarghat	1x5	Dulabchera 33/11 KV SS	18	15
99.	Badarpur	Gamaria	1x5	Serispur 132/33 KV GSS	0.5	10
100.	Badarpur	Aeynakhal	2x5	Tapping/LILO in R.K Nagar 33/11 KV SS to Lala Line	2	13.5
101.	Badarput	Sutarkandi (Akbarpur)	2x5	Karimganj 33/11 kV SS	23	15
102.	Badarput	Serispur	2x5	Serispur 132/33 kV GSS	1	13.5
103.	Nagaon	Jengani	2x5	Bordowa 33/11 KV SS	14	25
104.	Nagaon	Dharamtul	2x2.5	Nelli 33/11 KV SS	15	20
105.	Nagaon	Magurgaon	2x2.5	Raha 33/11 KV SS	10	19
106.	Nagaon	Kaliabor Tinali	2x2.5	Hatimura 33/11 KV SS	25	20
107.	Nagaon	Kuthori	2x2.5	Kohora 33/11 KV SS	20s	25
108.	Nagaon	Kachuwa	2x5	Kampur 33/11 KV SS	18	17
109.	Nagaon	Sankardev Nagar	2x5	Teliati SS	2	25
110.	Nagaon	Ambari	2x2.5	Nilbagan 33/11 kV SS	12	35
111.	Morigaon	Nelli (Spun Mill, Jagirod)	2x5	Tapping/LILO at 33 KV Jagirod-Sonapur Line	6	20
112.	Morigaon	Charaibahi	2x5	Khaloigaon 132/33 kV GSS	12	29
113.	Dibrugarh	Japisajia	2x5	Dibrugarh G SS-ICMR line (LILO/Tapping)	0.5	25
114.	Dibrugarh	Belbari Tinali	1x5	Romai 33/11 KV SS (UC)	10	15
115.	Dibrugarh	Khermia	1x5	Tipling 33/11 KV SS	7	21
116.	Dibrugarh	Mahmora	2x2.5	Sonari 132/33 KV GSS	25	15
117.	Dibrugarh	Garchariali	2x5	Mahmora 33/11 KV SS (Proposed)	18	18
118.	Jorhat	Kuralguri	2x5	Rangoliting33/11 KV SS	13	10

Sl. No.	Electrical Circle	33/11 KV Sub-Station	Transformer Capacity (MVA)	Proposed feeding GSS/33 KV SS	Proposed Length (Km)	
					33 KV Line	11 KV Line
119.	Jorhat	Nayabazar	2X5	Fulani 33/11 SS Termial Bay reed Construction reqd indoor 33 Panel	20	9
120.	Jorhat	Umabari	2X5	Kakojan SS (LILO)	12	12
121.	Jorhat	Madhopur (Pokamura)		TITABOR 33/11 KV (LILO)	27	20
122.	Jorhat	UPPER GORUMORA	2X5	The 33 KV source tapped from PANICHOKUA GSS to 33/11KV AJANTA SS	10	24.5
123.	Jorhat	AIIDC Kundar Gaon	2X5	LILO from Letekujaan 33/11 KV SS	17	9
124.	Golaghat	Billgaon Ratanpur	1X5	Barpathar SS	20	10
125.	Golaghat	Borbali	1X5	Ekorani GSS (UC)	9	10
126.	Golaghat	Melamora	1X5	Golaghat -II SS	11	11
127.	Golaghat	Rongajan	1X5	Pholongoni SS	1	9
128.	Golaghat	Bokial	2X5	Pholongoni SS	11	10
129.	Golaghat	Dolamara	1X5	Bokakhat SS	2	8
130.	Sivasagar	Namtola	2x5	Sonari 132/33 kv GSS Space available for bay and control pannel.	6.5	8
131.	Sivasagar	Baruanagar	2x5	feed from Salkathoni SS to Baruasali SS 33 kV line (LILO)	7.5	10
132.	Sivasagar	AIIDC, Industrial Estate, Sivsagar	2X10	132/33 kv Betbari GSS Space available for bay and control pannel.	3	10
133.	Kanch	Tumpreng	2x2.5	LILO at Tumpreng from Existing 33 KV feeder from Sahnkardev Nagar GSS	1	25
134.	Kanch	Dillai	2x2.5	Kuthori 33/11 KV SS (Upcoming in AIIB)	23	24
135.	Kanch	Langting	2x2.5	Maibong 33/11 KV SS	38	10

Figure 4-1: Location / Distribution of the Proposed Sub-stations under Phase-I

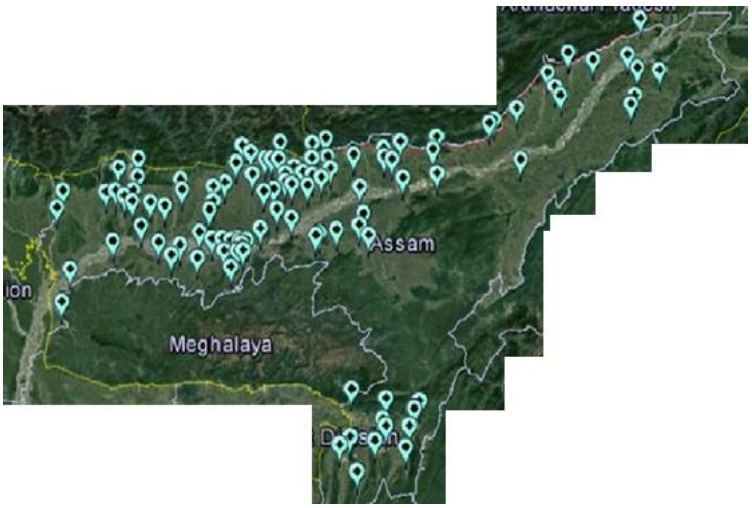


Figure 4-2: Typical G/SS (existing operational at Chandrapur division)

Figure 4-3: Typical 33/11 KV SS (existing operational at Chandrapur division)

4.2 Sub-Station Size

The approximate land size for most of the proposed sub-stations will be 1 Bigha which is equivalent to 1,750 sq. meter. However, it may slightly reduce or in increase for one or two specific cases.

Figure 4-4: Typical Layout for 33/11 KV SS

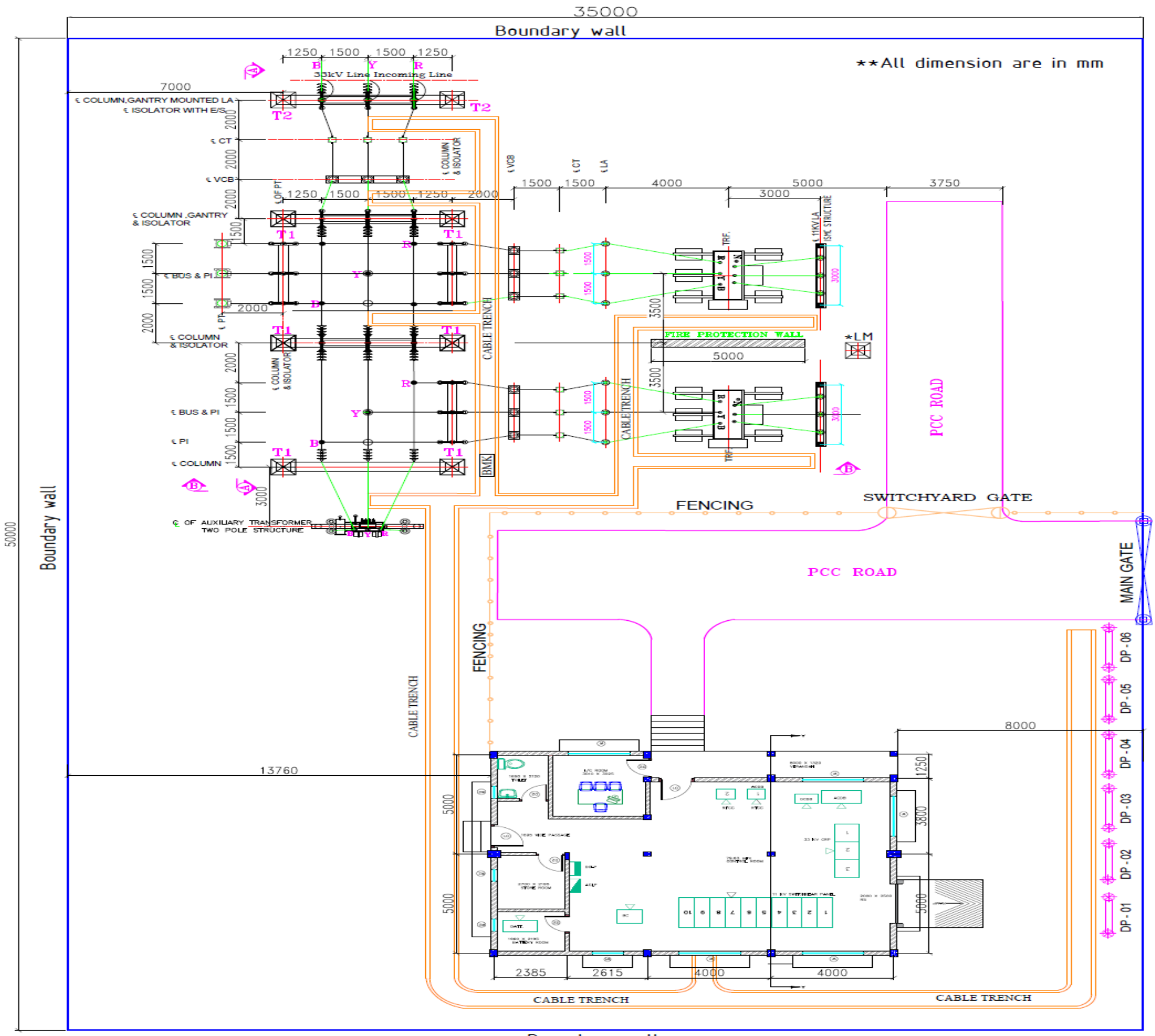


Figure 4-5: Typical HVDS & Distribution lines

4.3 Bays and Transformers

A) At New Sub-station end (Receiving End):

- For each 33/11 KV (2x2.5) MVA, (2x5) MVA and (2x10) MVA Sub-stations with one Incomer
  - 33 KV Line Bay- 1 No.
  - 33 KV Transformer Bay- 2 Nos.
- For each 33/11 KV (2x2.5) MVA, (2x5) MVA and (2x10) MVA Sub-stations with LILO provision
  - 33 KV Line Bay- 2 No.
  - 33 KV Transformer Bay- 2 Nos.
- For each 33/11 KV (1x5) MVA Sub-stations
  - 33 KV Line Bay- 1 No.
  - 33 KV Transformer Bay- 1 Nos.

B) At existing Grid/Distribution Sub-stations (Sending end):

One no. of 33 KV Terminal Bay for each new 33 KV Line at the respective existing GSS or 33/11 KV Distribution sub-stations.

Table 4-3: Total Scope of Terminal Bays for 1st Phase

Particulars	Numbers (Tentative)
33 KV Terminal Bay at Sending End (For Outgoing Line)	130
33 KV Terminal Bay at Receiving End (For incoming Line)	142
33/11 KV Transformer Bay	256

4.4 Project Construction Methods and Implementation Plan

Before proceeding with the construction work of the new substation, the contractor shall fully familiarize himself with the site conditions and general arrangements and scheme etc. Though the owner shall endeavour to provide the information, it shall not be binding for the owner to provide the same. The contractors are advised to visit the substation site and acquaint themselves with the topography, infrastructure and also the design philosophy. The contractor shall be fully responsible for providing all

equipment, materials, system and services specified or otherwise which are required to complete the construction and successful commissioning, operation and maintenance of the substation in all respects. The Major Construction activities related to Civil works are as follows:

- Soil Investigation of Sub-station area.
- Foundation for 33/11 kV transformers, Fire wall between power transformers.
- Foundation for steel lattice/Gantry structures, equipment etc.
- Foundation for lighting poles, marshalling box, Panels, Control Cubicles of equipment, Fire protection System etc. wherever required
- Cable trenches along with covers and sump pits, trench crossings with roads, culverts etc.
- Stone filling and anti-weed treatment of substation area
- Drainage system in the substation
- Permanent water supply for control room
- Substation fencing, Gates etc.
- Buildings for substation control room with Sanitary System Soak Pits, Septic tanks etc.
- Foundation/Grouting works associated with installation of Station service transformer, 11 KV Outgoing Feeder arrangement etc.
- Construction for Approach Road to Sub-stations including Culverts (if required) and Roads within the substations.

Figure 4-6: Flow Chart of Construction of Substations

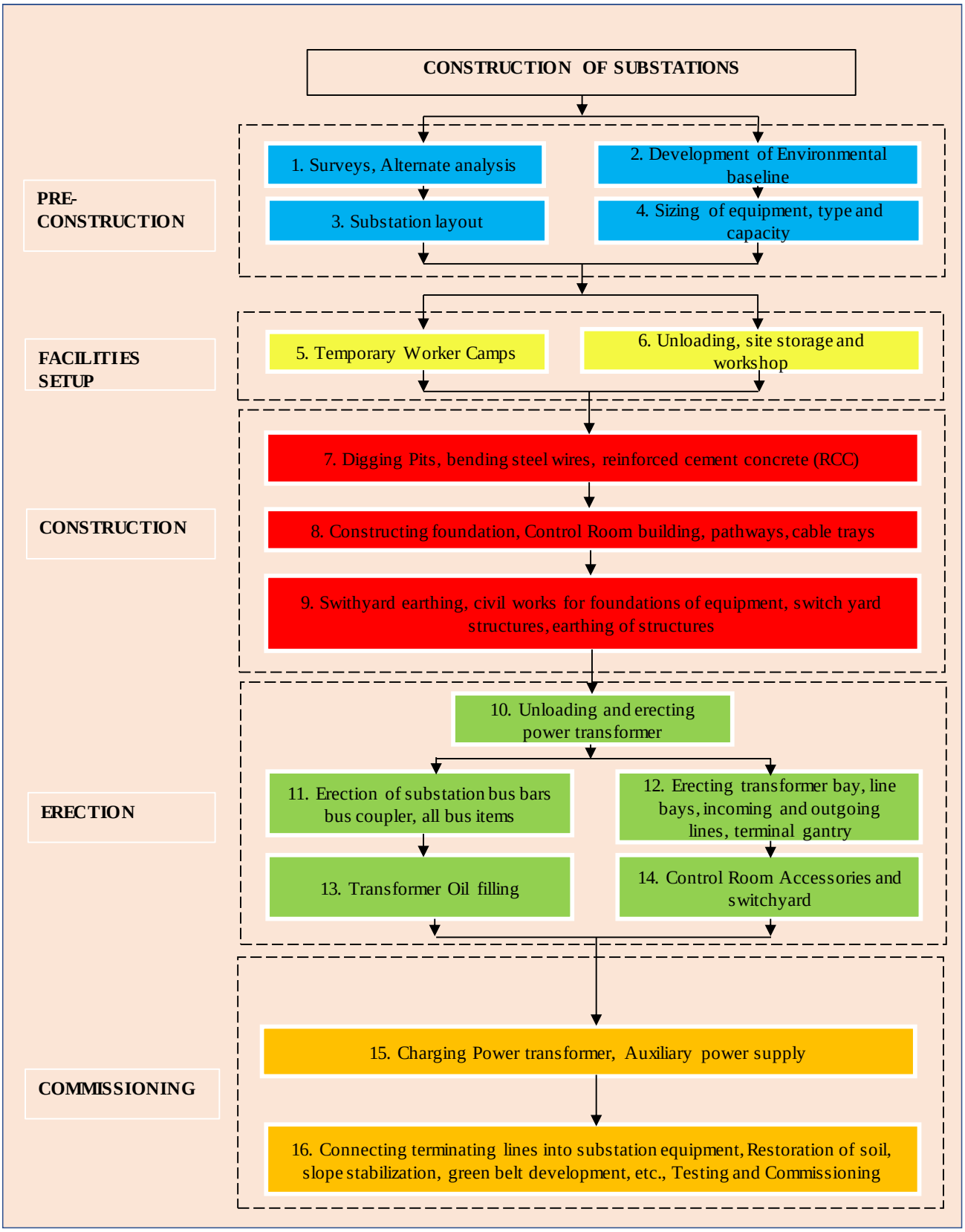


Figure 4-7: Sample Photographs of Construction of Substations

4.5 Climate Change Resilient Design

The main objective of adaptation as defined by the Intergovernmental Panel on Climate Change is "to moderate harm or exploit beneficial opportunities". In the case of the power distribution system, the primary objective of adaptation could be interpreted as guaranteeing the distribution of electricity throughout time. A moderate range of control measures are available:

- Update design, siting and operational planning for extreme events (flooding, drought, storms, cyclones etc.), and including the identification of alternative routes for distribution lines to avoid flooding and riverbank erosion.
- Improved design standards for specific components with protective measures for lightning, wind, flooding, and other extreme events.

Climate Resilient Design shall be adopted wherever required as per the baseline data collection and site inspection. A few climate change risks recorded in Assam and the adaptation designs are listed in the table below.

Table 4-4: List of Climate Risks and Resilient Designs

Climate Risks	Design Measures
Flooding and Heavy Rain	• Drainage network based on flood analysis, Water Logging free drainage network • Strengthening of towers of distribution lines • Land filling and compaction of substation land • Drainage network based on highest rainfall intensity of last five years
High speed Wind	• Condition based refurbishment programme in place

Climate Risks	Design Measures
	• Strengthening of towers of distribution lines
Lightning	• Lightning protection on network • Install fire-fighting equipment • Define procedures and routine practices to follow (appoint fire patrol guard, have a fire plan, fire mitigation and control tools, water supply carried on vehicles, have a permanent fire coordinator who is the liaison to fire services) • Protection policies subject to regular review
Gradual Warming	• Annual review of network loadings ensures adequate vacant room on network. • Programme of condition monitoring of assets
Drought	• Programme of condition monitoring of assets

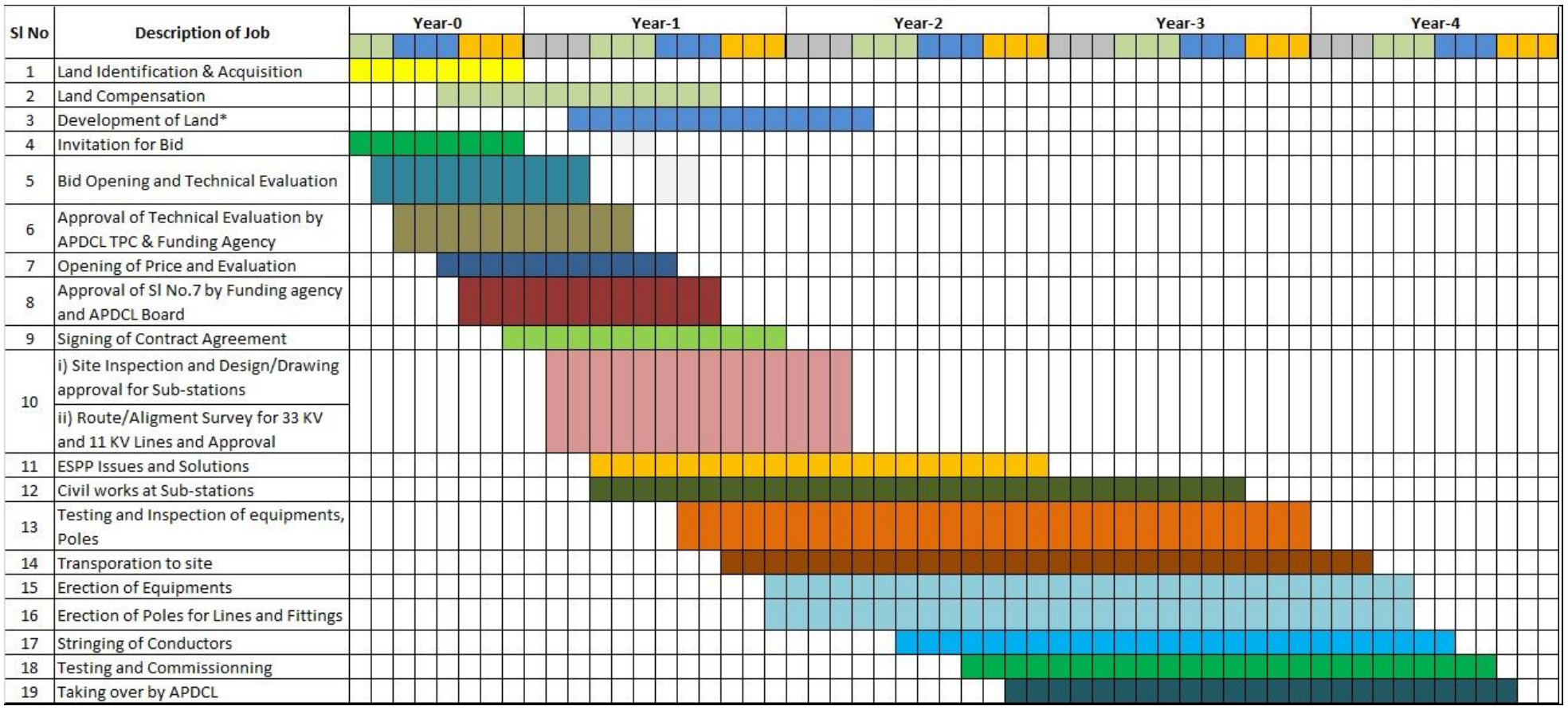
4.6 Associated Facilities

The project aims to improving / upgrade the reliability of power supply by strengthening the electricity distribution network. There are no associated facilities for the project as project will only provide system strengthening for power distribution in Assam.

4.7 Project Implementation Plan

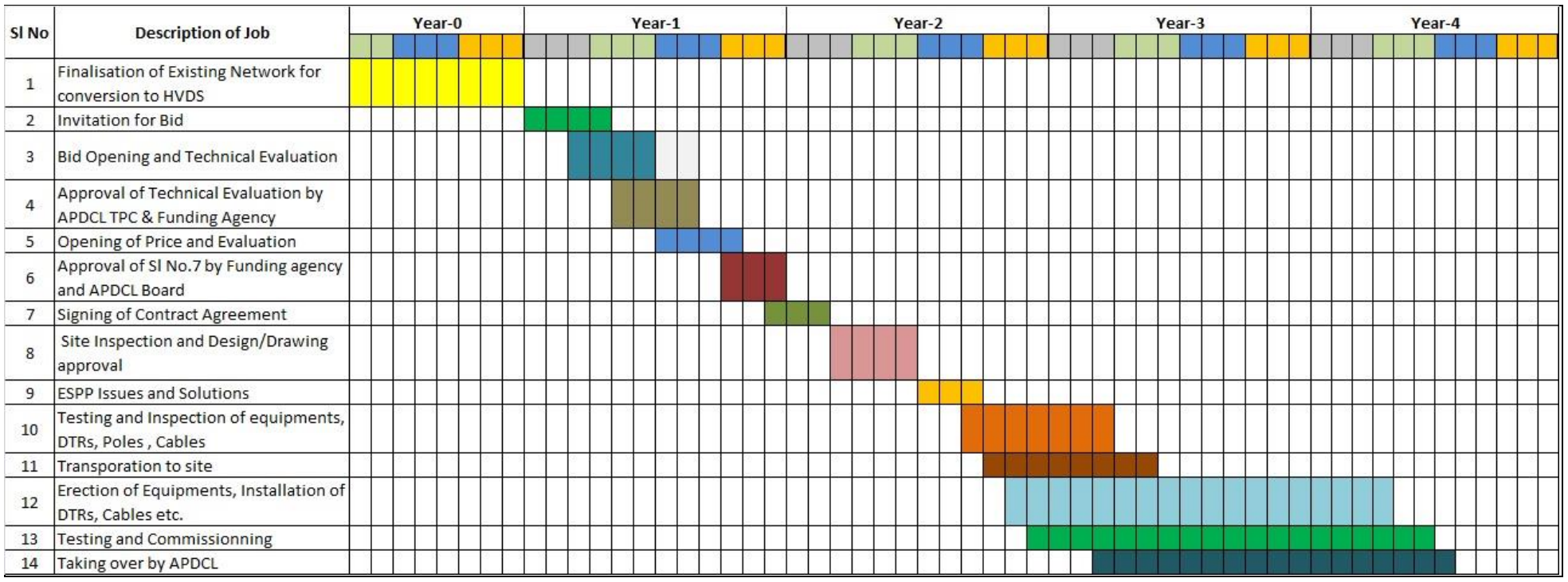
The Project implementation plan has been drawn up by APDCL and includes all the activities and the sub-activities including procurement plan, pre-construction, construction & monitoring plans. This plan shall be uploaded & shared as a separate annexure by APDCL. Timeline for the project implementation is distributed from March 2020 to end of December 2024. The graphical presentation (Bar Chart) of the completion schedule is presented in figures below.

Figure 4-8: Bar Chart for Construction of New 33/11 KV Sub-station including associated 33 KV & 11 KV lines, terminal Bays (1st Phase)



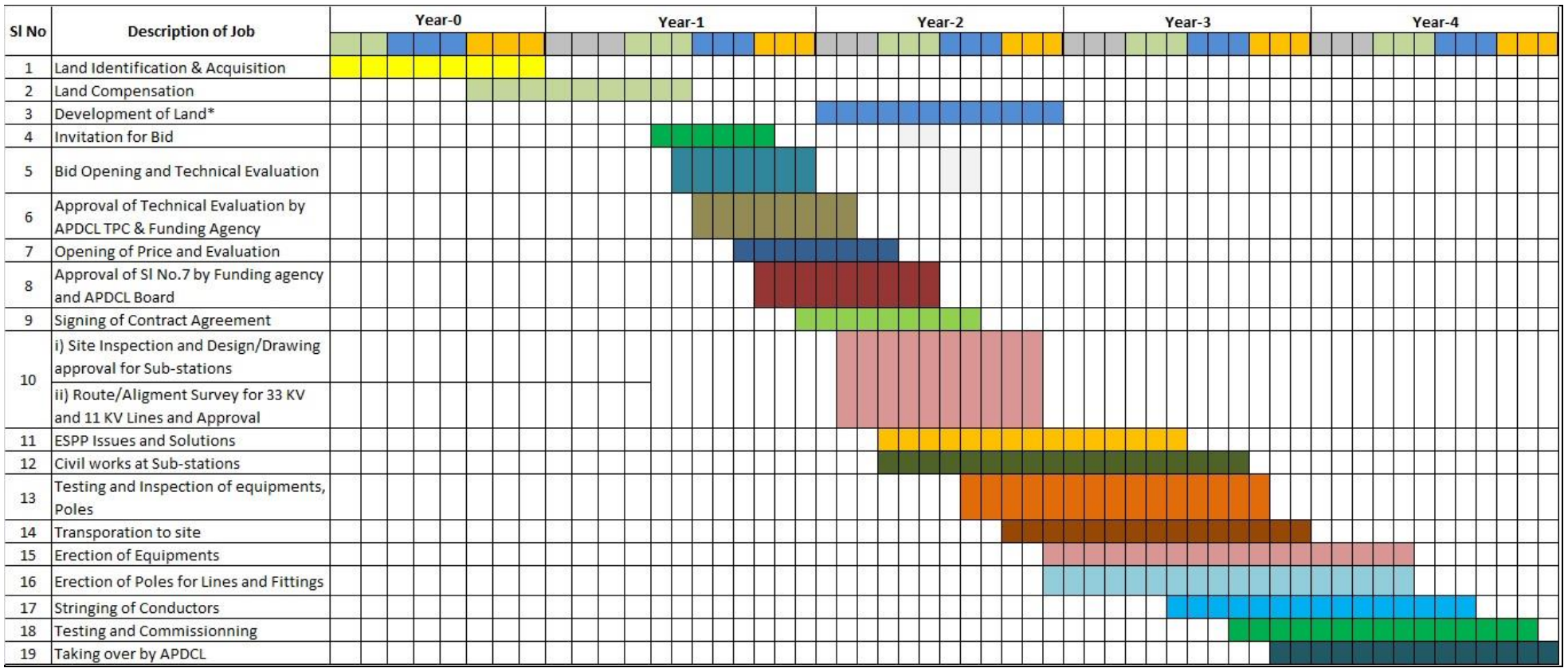
*- Land development will be under scope of the turnkey contractor as a part of the contract.

Figure 4-9: Bar Chart for Construction of HVDS System (1st Phase)



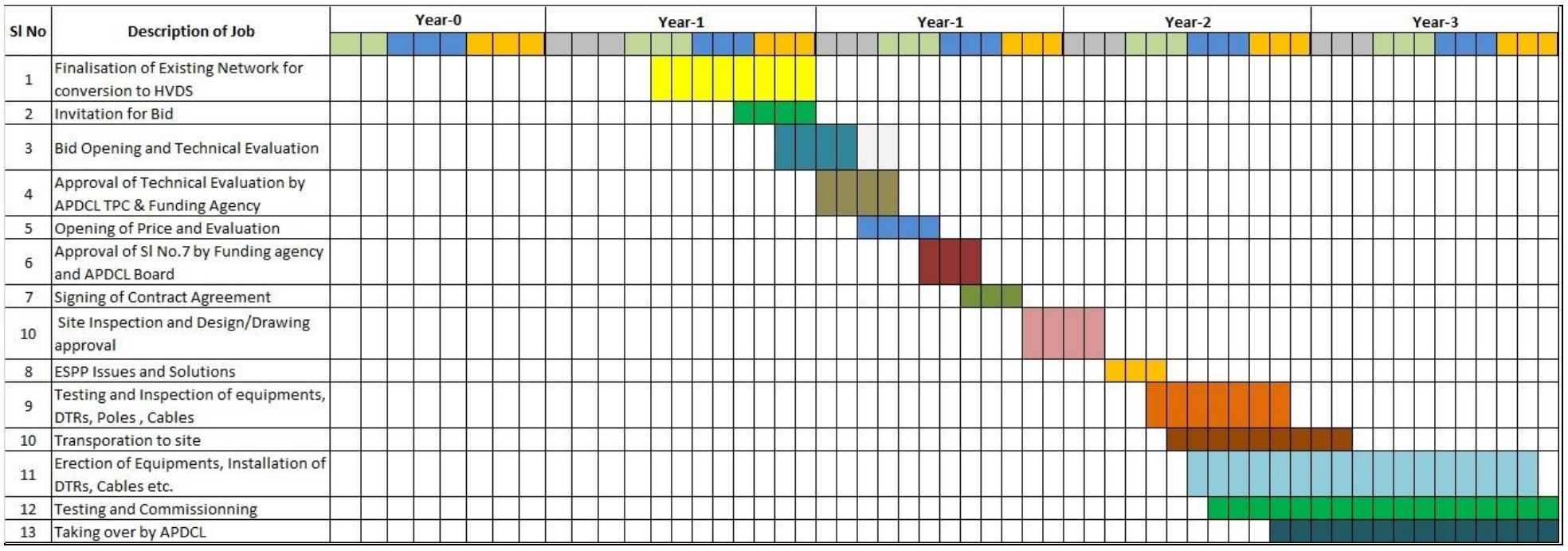
1. Existing Network will be converted to HVDS, hence, the issue of site acquisition, clearance does not arise.
2. Erection, testing, commissioning will run parallelly because, the restoration powers to existing consumers have to be done with minimum possible outage

Figure 4-10: Bar Chart for Construction of New 33/11 KV Sub-station including associated 33 KV & 11 KV lines, terminal Bays (2nd Phase)



*- Land development will be under scope of the turnkey contractor as a part of the contract.

Figure 4-11: Bar Chart for Construction of HVDS System (2nd Phase)



1. Existing Network will be converted to HVDS, hence, the issue of site acquisition, clearance does not arise.
2. Erection, testing, commissioning will run parallelly because, the restoration powers to existing consumers have to be done with minimum possible outage

5 BASELINE

5.1 Description of Environmental and Social Baseline Condition

The project is spread across different geographical parts of Assam and thus this chapter establishes a broader level baseline environmental and social conditions towards the development of the ESMPF. The baseline Environmental and Social conditions of the model substation sites visited and analysed also have been included here. The baseline information helps in project decision making, environmental management planning and strategizing to minimize any potential impact due to the project activities on the surrounding environment. The baseline information is furnished for:

- Physical environment
- Biological environment &
- Socio-economic and cultural environment

5.1.1 Location

Assam situated in the North-East of India covers an area of 78,438 km^2 and is administratively divided into 33 districts with 80 sub-division, 219 Development Blocks and 2202 Gaon Panchayats, out of which 3 districts with 4 sub-divisions & 16 Development Blocks are under three hill districts of Karbi-Anglong, East Karbi-Anglong and Dima Hasao. Further, four districts with eight sub-divisions are under Bodoland Territorial Council (BTC) area viz Kokrajhar, Chirang, Baksa and Udalguri.

Figure 5-1: Project Location

https://bhuvan.nrsc.gov.in/bhuvan_links.php

Physical Environmental Profile of the project district is described in Annexure 6.

5.2 Physical Environment

5.2.1 Climate, Rainfall and Temperature

With the 'Tropical Monsoon Rainforest Climate', Assam is a temperate region and experiences heavy rainfall and humidity. The climate of Assam is humid, with a sub-tropical nature, having warm humid summers and cool dry winters. Due to its unique geographical location, along with the presence of varied physiography, Assam has an array of climatic conditions. Assam is situated in the high rainfall zone with annual average rainfall of 2297.4 mm during. The state normally receives 2% of rainfall in Winter Season

(January-February), 25% in Summer Season (March-May), 65% in Monsoon Season (June-September) and 7% in Post-Monsoon Season (October-December). However, Assam is prone to floods and sometimes there is also the presence of drought like situations with the lack of rains. Thus, though the State has enough natural potentialities for growing food grains in abundance, it at times faces losses impacting on its contribution and share to the national granary, due to the presence of erratic and unpredictable weather conditions, as experienced specially during the last few years. The State had experienced 2042.20 mm rainfall in 2016 against normal rainfall of 2295.80 mm and the departure was 7% during the year from normal rainfall. In the plains, the maximum temperature during the rainy season is around 38^0C while in the cool season, the minimum temperature is 8^0C. With the tropical monsoon climate, Assam is temperate (summer max. at 35–38 °C and winter min. at 6–8 °C) and experiences heavy rainfall and high humidity. Spring (March–April) and autumn (September–October) are usually pleasant with moderate rainfall and temperature.

5.2.2 Physiography & Topography

The State can be broadly divided into 3 physiographic domains: Brahmaputra valley, Central Assam Hills (Mikir Hills in Karbi Anglong and North Cachar Hill districts) and Barak valley. Majority of the areas in Assam State are floodplains of the Brahmaputra and Barak Rivers and the altitude of the plain areas vary from as low as 25 m to as high as 600 m. The eastern plains have an altitude of about 600 m. Cachar plains in the southern part of the state have an altitude of about 25 m. Central and south-central part of the state, comprising North Cachar Hills and Rengma Hills, have an altitude ranging from 300 m to 150 m. The western part of the state, comprising North and South Brahmaputra Hills, have similar altitude range. Satellite images shows that the surface morphology is dominated by major river systems with numerous tributary rivers and streams, oxbow lakes, relict oxbow lakes and stream channels.

5.2.3 Geology & Soil

The soils of state are mostly alluvial. The northern areas, which are nearer to the Brahmaputra River have new alluvium, while the southern areas or areas near the foothills have old alluvium. The areas with older alluvium are the best sites for the cultivation of tea. Accordingly, the areas with older alluvium are dotted with many tea gardens. The entire area is under humid sub-tropical climate and it receives well-distributed rainfall from May to October. The process of leaching of soils in the undulating piedmont and hilly areas and stagnation and flooding in the areas with gentle slope are very prominent. As per taxonomical classification considering the aspects like soil depth, soil drainage, soil texture, areas of occurrence, slope condition, nature of the exposed surface, vulnerability to erosion and flooding - a taxonomical classification of the soils of Assam has been suggested by the National Bureau of Soil Survey and Land Use Planning (NBSS&LUP). As per this classification, the soils of Assam belong to 4 orders, 9 sub-orders, 15 great groups, 26 sub-groups and 83 family associations. In the context of Assam, it is observed that the Inceptisols are the dominant soils followed by Entisols, Aflisols and Utisols and these occupy respectively 41.4%, 33.6%, 11.3% and 5.6% of the total geographical area of the state (NBSS&LUP, 1993).

5.2.4 Land Use Pattern

Table 5-1: Land Utilization in Assam

Land Use	Area (in '000 ha)	Percentage (%)
Total geographical area	7844	
Reporting area for land utilization	7844	100.00
Forests	1853	23.62
Area under non-agricultural uses	1270	16.19
Barren & unculturable land	1190	15.17
Other uncultivated land excluding fallow land	529	6.74
Fallow Land	175	2.23
Net Sown Area	2827	36.04

***Source**: Directorate of Economics and Statistics, GoA 2014-15*

5.2.5 Seismology

The great Assam earthquake of 1897 (8<M<8.1) is the largest known Indian intraplate earthquake. It raised the northern edge of the Shillong Plateau by more than 10 m, resulting in the destruction of structures over much of the Plateau and surrounding areas and causing widespread liquefaction and flooding in the Brahmaputra and Sylhet floodplains. Shaking intensity data for the earthquake are crucial for estimating future earthquake hazards in NE India and Bangladesh since similar earthquakes will no doubt recur.

The entire Assam state has been placed under seismic Zone V and therefore all districts in which the subprojects are located fall in Zone V that has highest potential for occurrence of severe earthquake. Therefore, all the project sites fall under seismic Zone V and covers areas liable to seismic intensity MM-IX[1] and above. This is the most severe seismic zone and is referred to as Very High Damage Risk Zone.

The project areas lie in Zone V, where the maximum intensity could reach (MSK)[2] IX. It must be noted that Bureau of Indian Standards (BIS) estimates the hazard on previously known earthquakes. Since the earthquake database in India is still incomplete, especially with regards to earthquakes prior to the historical period (before 1800 A.D.), these zones offer a rough guide of the earthquake hazard in any region and need to be regularly updated.

5.2.6 Ambient Air Environment

The Pollution Control Board of Assam (PCBA) is carrying out ambient air monitoring under NAMP since 1991. The programme in Assam was started with one station at Bamuni maidan (HO, Guwahati) in 1991. The no. of monitoring stations has been increased to 22 in Assam, all these stations are in residential areas only.

Table 5-2: List of Air Quality Monitoring Station & Location in Assam

District	No. of Monitoring Station	District	No. of Monitoring Station
Kamrup Metro	6	Baksa	1
Bongaigaon	2	Cachar	2
Sonitpur	1	Tinsukia	2
Sivasagar	2	Lakhimpur	1
Dibrugarh	1	Nagaon	1
Golaghat	1	Nalbari	1

The ambient air quality monitoring data and Noise level monitoring data was collected from Assam Pollution Control Board, the provided data includes the concentration of Sulphur Oxide, Nitrogen Dioxide and Particulate Matter at eleven locations in five districts.

Table 5-3: Air Quality Monitoring Data (SPCB)

Station Code	Sampling Date	Name of Monitoring Station	City	SO_2	NO_2	PM_{10}	Remarks
607	22/02/2019	Janiganj	Silchar	8	13	59	Clear
567	23/02/2019	Office building of RLO, near Ithkola Market, Ghaniwala road	Silchar	6	12	49	Cloudy
606	05/02/2019	Shivdham	Tinsukia	9	18	87	Clear
538	28/02/2019	Dibrugarh Office Building	Dibrugarh	5	10	34	Rainy
595	28/02/2019	Water Resources Division Office Campus, Christian Patty, near Nagaon College	Nagaon	8	16	138	Clear

[1] Modified Mercalli Intensity Scale

[2] Medvedev-Sponheuer-Karnik scale

Station Code	Sampling Date	Name of Monitoring Station	City	SO_2	NO_2	PM_{10}	Remarks
603	27/02/2019	Boargaon	Guwahati	5	16	94	Clear / Partly rainy
602	25/02/2019	Guwahati University Campus	Guwahati	6	19	106	Clear
193	29/03/2019	Head Office, Bamuni maidan	Guwahati	20	40	227	Clear
519	29/03/2019	ITI Building, Gopinath Nagar	Guwahati	9	26	273	Clear
541	29/03/2019	Near Pragjyotish College, Santipur	Guwahati	10	19	211	Clear
596	13/03/2019	Khanapara, Central Dairy	Guwahati	6	16	151	Clear

Source: *Assam Pollution Control Board*

Various anthropogenic activities along with the industrial activities has an irreversible impact on the air quality. It is dynamics in character and a change in air quality in certain place have impacts on places far away falling in the direction of prevailing air passage. Air pollution adversely affects the biological species in affected areas including human beings causing many diseases. The problem of pollution and its adverse ecological impacts get adverse due to increasing industrial and anthropogenic activities. Monitoring of air quality on specific points relating to the sources of air pollution is an essential exercise of the Board. In order to have better understanding on air environment, baseline information on the status w.r.t to air environment is important.

Table 5-4: National Ambient Air Quality Standards (CPCB notification, 2009)

Sl. No.	Pollutants	Time-weighted average	Concentration in Ambient Air	
			Industrial, Residential, Rural & other Areas	Ecologically Sensitive Areas (notified by Central Government)
1	Sulphur Dioxide (SO_2) µg/m³	Annual*	50	20
		24 hours**	80	80
2	Nitrogen Dioxide (NO_2) µg/m³	Annual*	40	30
		24 hours**	80	80
3	Particulate Matter (size less than 10 µm) or PM_{10} µg/m³	Annual*	60	60
		24 hours**	100	100
4	Particulate Matter (size less than 2.5 µm) or $PM_{2.5}$ µg/m³	Annual*	40	40
		24 hours**	60	60

* *Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.*

** *24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.*

Table 5-5: GoI vs WHO Ambient Air Quality Guidelines

Air Quality Parameters 24-hour max content	SO_2 (ug/m³)	NO_2 (ug/m³)	PM_{10} (ug/m³)	$PM_{2.5}$ (ug/m³)	CO (ug/m³)
GoI regulations -24 hour	80	80	100	60	2
WHO Ambient Air Quality (WB EHS 2007) Guidelines-24 hour	20	40 (Annual)	50	25	-

The more stringent of the two – the GoI regulations and IFC EHS guidelines will be followed for monitoring purposes. Data suggest that several locations would be Degraded Airshed for PM. Careful attention will be paid to dust management in vicinity of receptors for construction phase.

During the site visits it has been observed that most of the site are away from any pollution emitting source and are having good green cover. The overall air quality is within the permissible limits.

5.2.7 Acoustic Environment

Subject to the provisions of the Rule 3 of the Noise Pollution (Regulation and Control) Rules, 2000, the State Government shall categorize the area into industrial, commercial residential or silence areas/zones for the purpose of implementation of noise, standards for different area. The State Government shall take measures for abatement of noise including the noise emanating from vehicular movements and ensure that the existing noise levels do not exceed the ambient air quality standards specified under these rules. All development authorities, local bodies and other concerned authorities while planning development activity or carrying out functions relating to town and country planning shall take into consideration all aspects of noise pollution as a parameter of quality of life to avoid noise menace and to achieve the objective of maintaining the ambient air quality standards in respect of noise.

An area comprising not less than 100 meters around hospital, educational institutions and courts may be declared as silence area/zone for the purpose of these rules. The noise levels in any area/zones shall not exceed the ambient air quality standards in respect of noise as specified in the Schedule. The authority shall be responsible for the enforcement of noise pollution control measures and the due compliance of the ambient noise level standards.

Table 5-6: Noise Level Monitoring Data

Date	Location	L_{min}	L_{max}	Leq dB(A)	Area Type
28th March 2019	At GMCH Campus, Bhangagarh	55.7	73.8	61.1	Commercial
	Assam Sachivalaya, Dispur (Near Main Gate)	67.1	78.7	70.5	Commercial
	Khanapara, Infront of Veterinary college	62.0	90.3	71.0	Silence
	Basistha Chariali, N.H-37	70.2	83.2	75.6	Industrial / commercial
	Lokhra Chariali, N.H-.37	74.4	82.0	77.9	Industrial / commercial
	Pachim Boragaon Chowk, N.H-37	65.1	89.9	78.3	Industrial / commercial
	Guwahati University Campus, (Near Environmental Building)	49.9	69.1	56.8	Silence

Source: *Assam Pollution Control Board*

Table 5-7: Ambient Quality Standards in respect of Noise

Area Code	Category of Area/Zone	CPCB Limits in dB(A) Leq *		WHO	
		Day Time	Night-time	Day Time	Night-time
(A)	Industrial area	75	70	70	70
(B)	Commercial area	65	55	70	70
(C)	Residential area	55	45	55	45
(D)	Silence Zone	50	40	55	45

Source: *Central Pollution Control Board, India and www.ifc.org/ehsguidelines*

For compliance with the legal permissions obtained for the project, the AQS as laid by the Statutory Authority shall prevail. All the above secondary data has been collected from the stations established by state PCB, which is quite far from the proposed SS / GSS locations. Most of these locations are within the city limits and hence the noise levels are on the higher side than the prescribed limits due to the traffic noise. Meanwhile, visual observation and site visit by on the professional found absence of noise generating sources and it may be deduced that the baseline noise quality is within the permissible limits under Silence zone to Residential area at the site locations. However, the EPC contractors shall establish the baseline data before start of work.

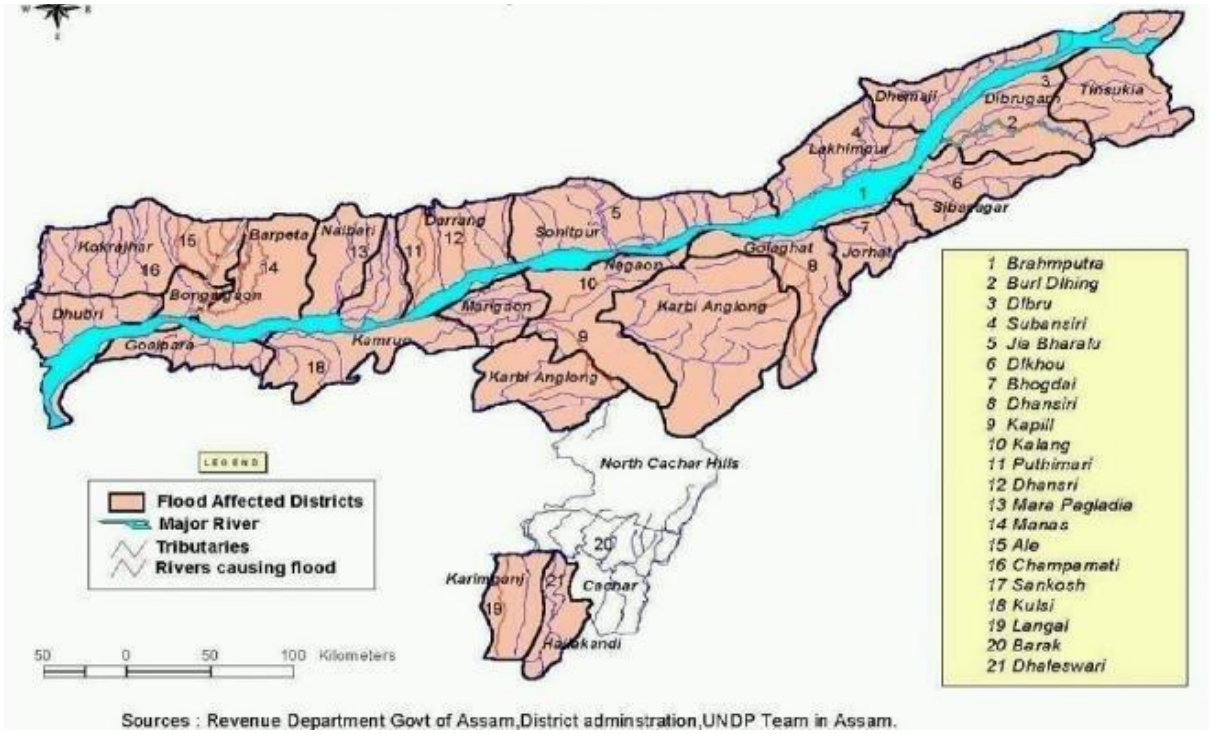
5.2.8 Water Resource and Water Quality

Assam is endowed with enormous water resources. The large perennial rivers and other water bodies with the rich aquifer speak about vastness of its water resource. Surface water is available in the forms of river, stream, lake, swamps, pond etc. The ground water is available at low to moderate depth almost in entire state. Although there is seasonal and regional variation in the availability of water resources, the annual availability of water resource remains almost same. In the last few decades, the use of water has been growing at a fast rate, which is more than twice the rate of the increase of human population. The consumption of water has increased due to the increase of human population as well as the diversification of human activities. With the increase of per capita consumption of water in domestic, agricultural and industrial sectors, cause the reduction of potential per capita availability of water. Moreover, it may cause the deterioration of water quality to a great extent.

Surface Water:

Apart from the rainwater received, the state is endowed with number of perennial rivers and lake locally known as beel. The state is drained by the dance networks of two river system, viz the Brahmaputra and the Barak. These rivers have large number of tributaries joining them from both the banks. There are about 73 important tributaries of the Brahmaputra river and 11 tributaries of Barak river. The vast potential surface water resource of the state is not yet properly utilized in the state. In the last few decades, the rate of consumption of water in the agricultural sector, industrial sector and in the urban centres has been increased significantly. The discharges of untreated domestic wastewater, industrial wastewater, run of from the agricultural fields and the urban sewage water posing threat to the water bodies of the state.

Figure 5-2: River Map of Assam



Source: *Relief Web*

The description of the Brahmaputra and Barak River Systems is provided in table below:

Table 5-8: River System in Assam

River System	A Glimpse
Brahmaputra River System[3]	The Brahmaputra is one of the biggest rivers of the world. The Brahmaputra basin covers an area of 5,80,000 sq.km of which 1,94,413 sq.km falls in India. Brahmaputra is a perennial river, fed by snow as well as by rain. The Brahmaputra rolls down the plain of Assam from east to west for a distance of 640 km up to Bangladesh border. It is the fourth largest river in the world in term of average water discharge at the mouth with a flow of 19,830m3s-1. The river carries 82 per cent of its annual flow during the rainy season (May through October). Through its course, the river receives innumerable tributaries (about 73) coming out of the northern, north-eastern and the southern hill ranges. The mighty river with a well-knit network of tributaries drains an area of 56,480 sq. km of the state accounting for 72 per cent of its total geographical area. Most of the right bank tributaries of Brahmaputra are snow as well as rain feed and are perennial. Although the left bank tributaries are mainly rain feed but perennial in nature.
The Barak River System	Barak is the second largest river system in the North East India as well as in Assam. The river with a total length of 900 km from source to mouth drains an area of 52,000 sq. km. In India and traverses a distance of 532 km up to the Indo-Bangla border. Like Brahmaputra, the Barak is also a perennial river of the state. The important north bank tributaries of Barak river are Jiri, Siri, Madhura, Jatinga and Larang, while the important south bank tributaries include Sonai, Ghagra, Katakhal, Dhaleswari, Singla and Longai. The flows of the rivers in Assam decrease considerably during the dry season. They maintained pick flow in summer rainy months.

Ground Water Resource

Assam is one of the rich states of the country in term of the ground water development potentiality. The entire Brahmaputra valley, covering more than 70 per cent of the total geographical area of the state, contain prolific aquifer system with water table lying within 5 m of land surface. The Barak valley also has a good potentiality for the development of ground water. The present stage ground water development even in the Brahmaputra valley, the most populous part of the state, is nothing but in a nascent stage.

Based on the recommendation of the Ground Water Estimation Committee, Ministry of Irrigation, March 1984, the recoverable recharge of ground water in Assam as worked out by the Central Ground Water Board, to about 2-million-hectare metre per year. With the present ground water resource available to be utilized, it is estimated that an additional area of about 14 lakh hectares of net area sown can be brought under irrigation. Besides the irrigational use, ground water forms the most common form source of domestic use water in the state. The lifting of ground water through dug wells, tube wells, shallow tube wells and deep tube wells for irrigation, domestic and industrial use is very common in the state. As identified by CGWB, all the blocks spread over 26 districts across the state of Assam of Assam are of Safe category. None of the blocks have been reported as 'Semi-Critical, 'Critical, 'Over-exploited' category under district wise categorization of groundwater blocks of the state.

Reservoirs

Reservoirs are artificial impoundments of water for irrigation, flood control, municipal water supplies, hydro-electric power generation and so forth. There are as many as 10 number of reservoirs covering an area of 2662.5 ha which constitutes 0.03 percent of the total geographical area of the state and 2.63 percent of the total area under wetlands. The smallest of them covers 17.50 ha while the largest one has 930.00 ha of areal coverage. Majority of this type of wetlands contains water with low turbidity. An analysis of aquatic vegetation in these reservoirs indicates that most of them are either free from vegetation or partially vegetated. Highest number of reservoirs is observed in N.C. Hills district (4 nos.) followed by Golaghat and Nalbari districts (2 nos. each). But area wise, the highest area under this category is observed

[3] Assam ENVIS

in N.C. Hills district (2365.00 ha) followed by Kamrup (220.00 ha) and Golaghat (37.50 ha) districts. Some of the important wetlands under this category are Garampani and Umrangsu in N.C. Hills district.

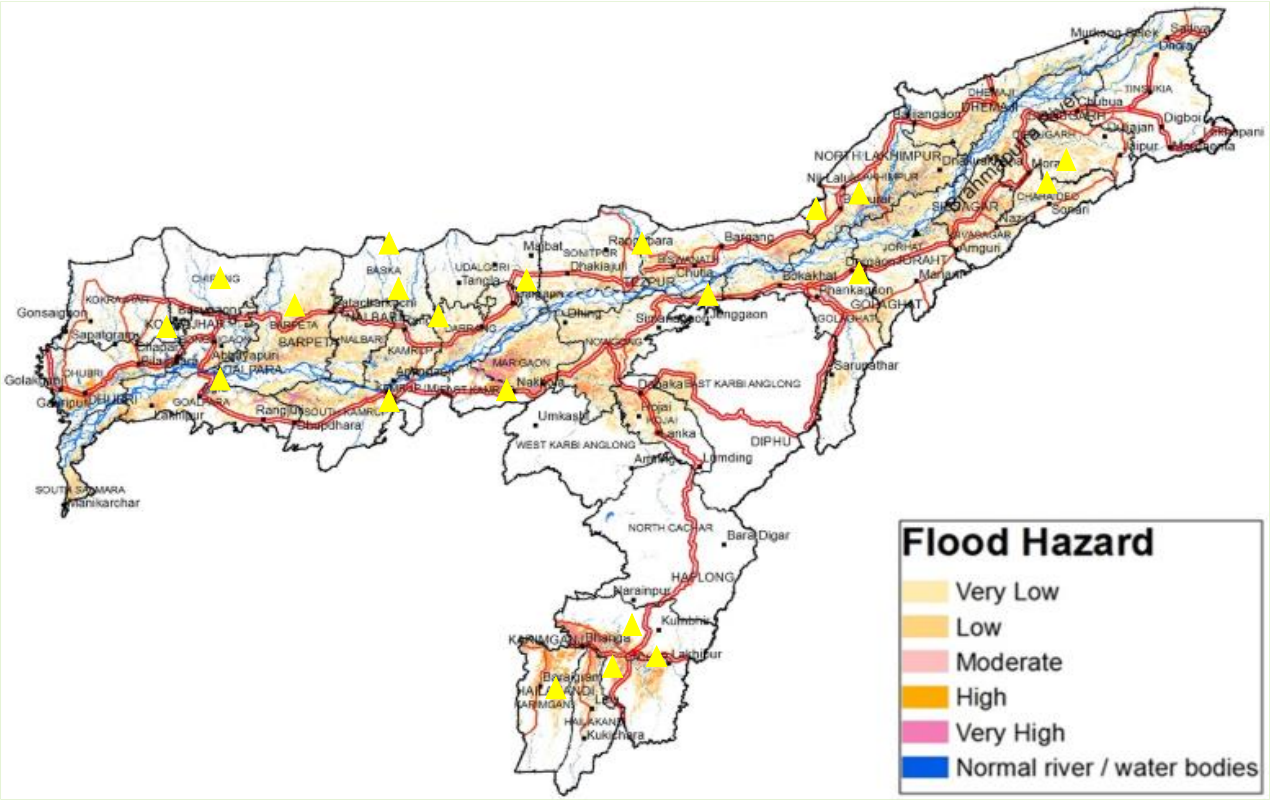
Tanks

Assam has several thousands of families owned small size tanks; these have not entered into reckoning as far as this report is concerned because of the scale factor. In Assam, a total of 115 number of tanks are identified from satellite data. These tanks occupy an area of 749.00 ha which constitutes 0.01 percent of the total geographical area of the state and 0.74 percent of the total area under wetlands. The smallest of them covers 2.5 ha while the largest one has 55.00 ha of areal coverage. Majority of this type of wetlands have low turbidity. An analysis of aquatic vegetation in these tanks indicates that most of them are free from vegetation. Highest number of tanks are observed in Sibsagar district (20 number) followed by Kamrup (18 number) and Sonitpur (16 number). But area wise, the highest area under this category is observed in Sibsagar district (267.00 ha) followed by Sonitpur (83.50 ha) and Kamrup (80.00 ha) districts. Some of the important wetlands under this category are Gaurisagar Pukhuri, Sibsagar Pukhuri and Joysagar Pukhuri in Sibsagar district. Besides providing water to the people of the nearby areas, these tanks can also be used for rearing fishes and raising plantation crops like coconut, arecanut etc. along the sides of the ponds. Ornamental gardens can also be developed on the banks of the ponds.

Flood Zonation

Assam is one of the flood prone States in the country. In order to minimise the impact of the floods in the State, Government of Assam approached National Remote Sensing Centre (NRSC), ISRO, Hyderabad for identifying the flood hazard level of various villages in the State. Satellite images depict the extent of flooding and flood inundated areas can be identified using digital image analysis techniques. Using 215 satellite images acquired during floods of last 18 years (1998-2015), most frequently inundated districts and villages were identified, based on the frequency of inundation. Villages were categorised into five hazard classes as Very High, High, Moderate, Low and Very Low.

Figure 5-3: Flood hazard map of Assam in respect to Sub-station Sites



https://www.isro.gov.in/updated-flood-hazard-atlas-assam-state

Image shows that all the visited sub-station are in the range very low flood hazard zone or few in low flood zone.

An updated 'Flood Hazard Atlas for Assam State' was prepared and the maps were validated by the Govt. of Assam through Assam State Disaster Management Authority (ASDMA). The atlas provides information on frequently flooded villages in the State of Assam and also provides the flood hazard severity in different districts based on flood hazard category, flood hazard area and intra-annual flood variations. About 28.75% (22.54 lakh hectares) of land in Assam State is affected by flood during 1998-2015. It is also observed that 17 out of 33 districts in Assam are severely flood affected. The climate resilient design consideration will be adapted to minimise any flood risk. The design prepared by the EPC contractor will be approved by the APDCL/IA/Authority before the implementation / civil works commences.

Water Quality

The table below presents quality issues pertaining to ground water as identified by CGWB across various districts of the state of Assam.

Table 5-9: Water Quality of River System in Assam

Contaminants	Districts affected (in part)
Fluoride (>1.5 mg/l)	Goalpara, Kamrup, Karbi Anglong, Naugaon, Golaghat, Karimganj
Iron (>1.0 mg/l)	Cachar, Darrang, Dhemaji, Dhubri, Goalpara, Golaghat, Hailakandi, Jorhat, Kamrup, Karbi Anglong, Karimganj, Kokrajhar, Lakhimpur, Morigaon, Nagaon, Nalbari, Sibsagar, Sonitpur, Bongaigaon, Dibrugarh.
Arsenic (above 0.05 mg/l)	Sibsagar, Jorhat, Golaghat, Sonitpur, Lakhimpur, Dhemaji, Hailakandi, Karimganj, Cachar, Barpeta, Bongaigaon, Goalpara, Dhubri, Nalbari, Nagaon, Morigaon, Darrang and Baksa

Source: *CGWB*

For any project footprints falling within few hundred meters of waterbody, the water quality data needs to be collected as baseline to compare impacts during construction, using GoI guidelines.

5.2.9 Wetlands

According to National Wetland Atlas[4] total 5,097 wetlands have been recorded in the state of Assam. In addition to that, 6081 small wetlands (of <2.25 ha) have also been identified. Total wetland area as estimated in the Atlas is 764,372 ha that is around 9.74 % of the total geographic area of the state. Natural wetlands dominate the state. The major wetland types are river/stream accounting for 84% of the wetlands (63,7164 ha), lake/pond (51,257 ha), waterlogged (47,141 ha) and ox-bow lake (14,173 ha). There are two reservoir / barrages mapped having total 2,833 ha area, which are the major man-made wetland type. Aquatic vegetation is observed in lake / pond, waterlogged, riverine wetland type. The geographical coverage of various types of wetlands and wetland map of the state are given in the table and figure below.

Figure 5-4: Wetland map of Assam

[4] Space Applications Centre (ISRO), Ahmedabad

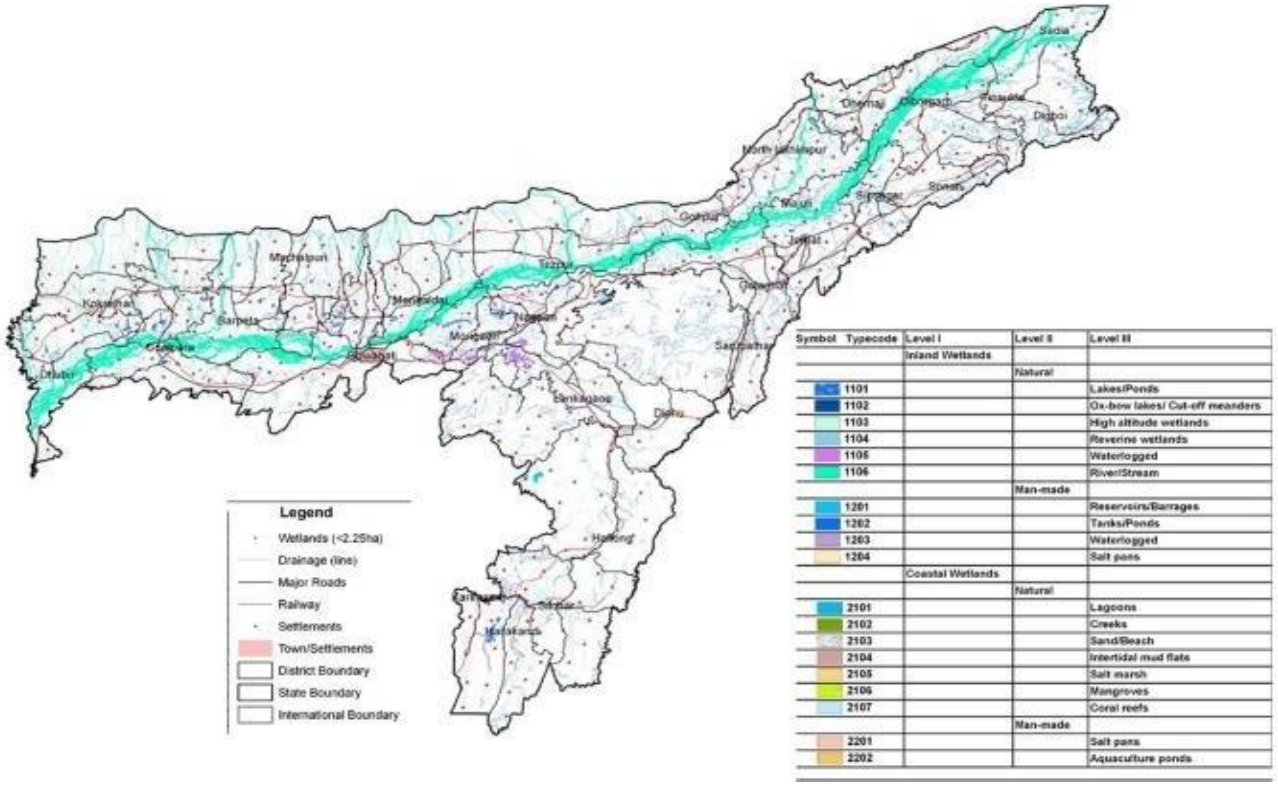


Table 5-10: Area of Wetlands in Assam

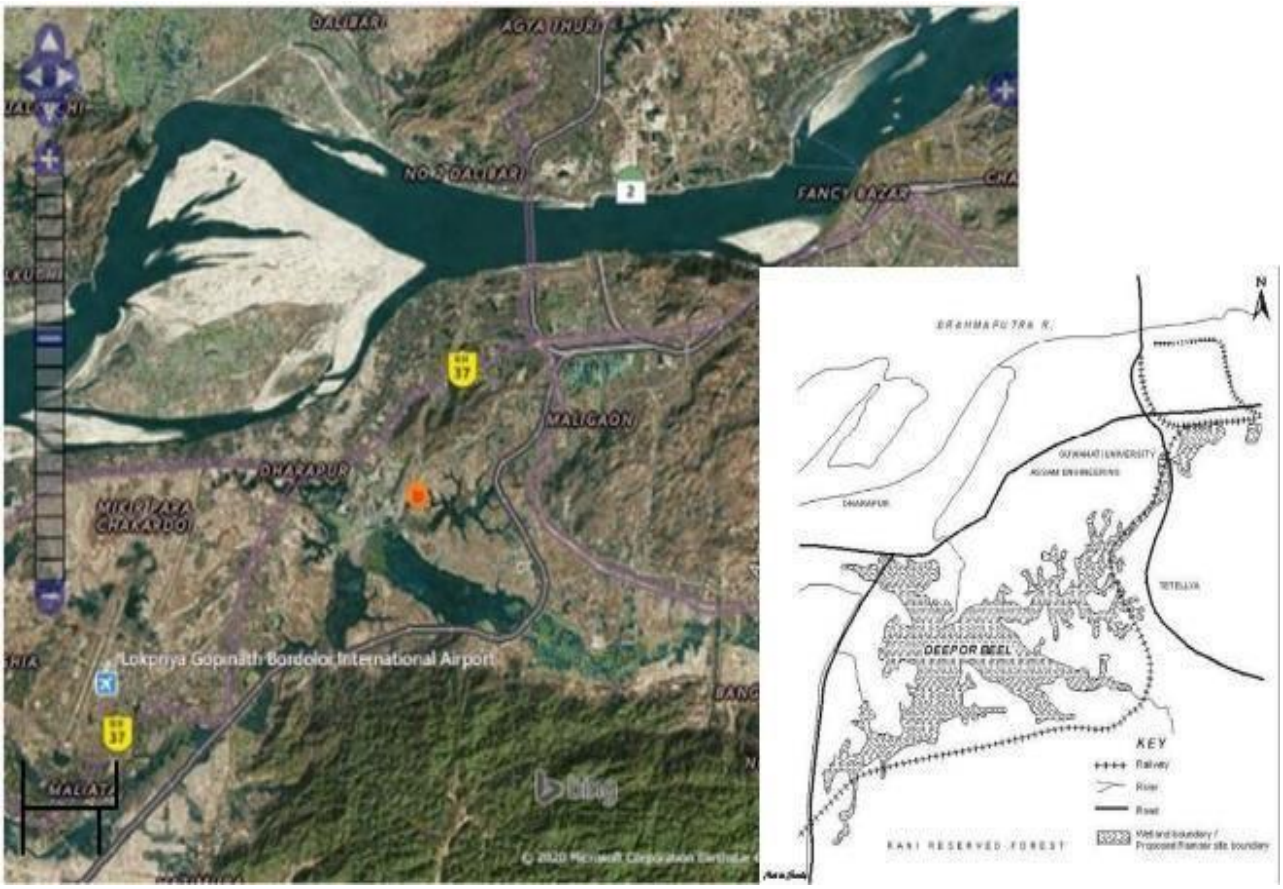
Assam State	Total Geographic Area (Ha.)	Area of Wetlands (in Ha)									
		Lake / Pond	Ox-bow lake Cut-off Meander	Riverine Wetland	Natural Waterlogged	River / Stream	Reservoir Barrage	Tank/Pond	Waterlogged (Manmade)	Wetland of <2.25ha	Total
Area Coverage	7843800	51,257	14,173	4,258	47,141	637,164	2,833	921	544	6,081	764,372
Numbers	-	1,175	873	139	2,461	213	2	180	54	6,081	11,178
% of Total Wetland Area	-	6.71	1.85	0.56	6.17	83.36	0.37	0.12	0.07	0.80	-

Source: *National Wetland Atlas*

Deepor Beel: The Ramsar Site of Assam

India has 27 Ramsar Sites and Deepor Beel is the only one in Assam. The Ramsar Convention is an international treaty for the conservation and sustainable utilisation of wetlands, recognising the fundamental ecological functions of wetlands and their economic, cultural, scientific & recreational value.

Figure 5-5: Location of Deepor Beel



Source: *Ramsar Sites Information System*

The Deepor Beel site located near Guwahati city is a freshwater lake formed in the abandoned channel of Brahmaputra River. It is a large natural wetland having great biological and environmental importance besides being the only major storm water storage basin for the Guwahati city. There is no identified migratory route as of now. India's National Action Plan for the Central Asian Highways aims to identify the various migratory bird routes in India including Assam. Pilot studies are in the offing.

5.2.10 Ecological Environment

Assam, one of the biodiversity hotspots occupies a special place in North Eastern India. The floristic richness has prompted many a scholar to describe Assam as the "Biological Gateway" of North East and Cradle of flowering plants. The climatic conditions cause prevalence of not and highly humid weather in this part of country and coupled with heterogenic physiography make possible luxuriant growth of a number of plant communities imparting Assam a distinct identity Phyto-geographically, many a species are endemic to this region and it is also the centre of origin for commercially important plants.

Table 5-11: Areas of Ecological Importance in Assam

Sl. No.	Category	Number	Remarks
1.	National Park	5	Listed in Table 5-14
2.	Wildlife Sanctuaries	20	Including 2 proposed
3.	Tiger Reserves	3	Manas, Nameri, Kaziranga
4.	Biosphere Reserve	2	Dibru Saikhowa, Manas
5.	World Heritage Site	2	Kaziranga, Manas
6.	Ramsar Site	1	Deepor Beel
7.	Important Bird Area (IBA)	46	
8.	Elephant Reserves	5	Chirang-Ripu ER, Sonitpur ER, Dining Patkai ER, Kaziranga-Karbi Anglong ER, Dhansiri-Lungding ER

A Brief Overview of Forestry Scenario

Assam is the land of enchanting aesthetic beauty with lush green hills, pastures, tea gardens, river plains and wilderness. Running and cascading through the entire length and breadth of the State are mighty rivers; the Brahmaputra in the north and the Barak in the south, which along with their tributaries nourish a wide range of precious flora and fauna in the State. The Kaziranga National Park, a UNESCO World Heritage site in the State is home to two-thirds of the world's population of the one-horned Rhinoceros. The one-horned Rhino which was almost extinct in India, with only a dozen left at the turn of last century, now stands restored to scientifically sustainable level. As per the Champion & Seth Classification of Forest Types (1968), the forests of Assam belong to seven Forest Type Groups further divided into 25 different Forest Types. Assam can boast of possessing a host of endangered and rare mammals, avian and amphibian species. These include pigmy hog, hispid hare, white winged wood duck and great Indian hornbill among many others.

Recorded Forest Area (RFA) in the State is 26,832 sq. km of which 17,864 sq. km is Reserved Forest and 8,968 sq. km is Unclassed Forest. In Assam, during the period 1st January 2015 to 5th February 2019, only 1 hectare of forest land was diverted for non-forestry purposes under the Forest Conservation Act, 1980 (MoEF&CC, 2019). Five National Parks and 18 Wildlife Sanctuaries constitute the Protected Area network of the State covering 4.87% of its geographical area.

Forest Cover

Based on the interpretation of IRS Resourcesat-2 LISS III satellite data of the period Nov 2017 to Feb 2018, the Forest Cover in the State is 28,326.51 sq. km which is 36.11 % of the State's geographical area. In terms of forest canopy density classes, the State has 2,794.86 sq. km under Very Dense Forest (VDF), 10,278.91 sq. km under Moderately Dense Forest (MDF) and 15,252.74 sq. km under Open Forest (OF). Forest Cover in the State has increased by 221.51 sq. km as compared to the previous assessment reported in ISFR 2017.

Table 5-12: Forest Cover of Assam

Class	Area	% of GA
VDF	2,794.86	3.56
MDF	10,278.91	13.1
OF	15,252.74	19.45
Total	**28,326.51**	**36.11**

Figure 5-6: Forest Cover of Assam

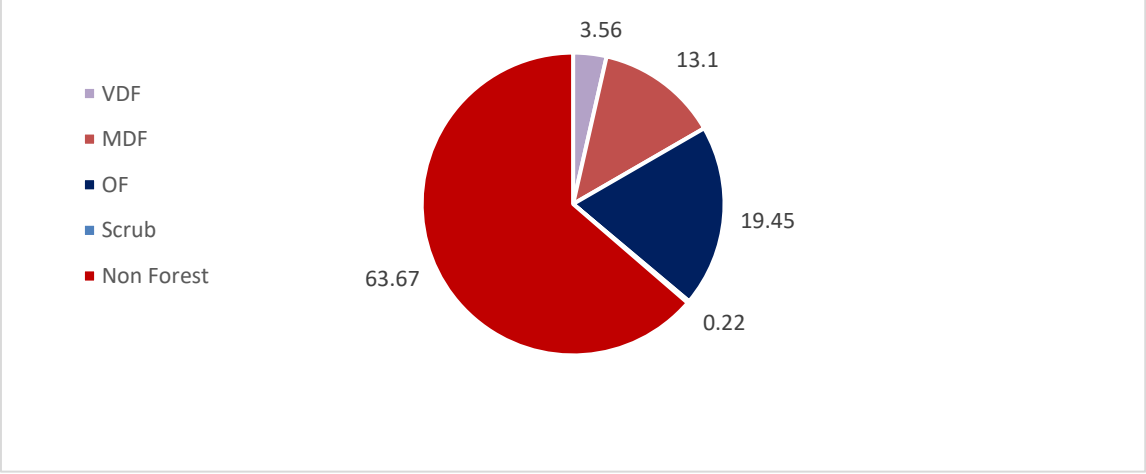


Table 5-13: District wise Forest Cover of Assam

Sl. No.	District	Geographical Area (GA)	Very Dense Forest	Mod. Dense Forest	Open Forest	Total	% of GA	Scrub
1	Baksa	2,457.00	156.00	130.01	273.66	559.67	22.78	6.00
2	Barpeta	2,282.00	-	33.21	81.97	115.18	5.05	1.00
3	Bongaigaon	1,093.00	-	62.18	187.95	250.13	22.88	-
4	Cachar	3,786.00	93.00	1,077.58	1,051.76	2,222.34	58.7	17.45
5	Chirang	1,923.00	402.00	110.45	187.39	699.84	36.39	3.00
6	Darrang	1,585.00	-	13.89	75.54	89.43	5.64	1.00
7	Dhemaji	3,237.00	68.00	124.66	152.14	344.80	10.65	4.00
8	Dhubri	2,176.00	1.00	22.44	75.02	98.46	4.52	4.00
9	Dibrugarh	3,381.00	105.86	68.10	581.27	755.23	22.34	1.00
10	Dima Hasao	4,888.00	209.00	1,519.73	2,478.20	4,206.93	86.07	4.00
11	Goalpara	1,824.00	14.00	137.66	244.80	395.74	21.7	1.72
12	Golaghat	3,502.00	21.00	119.30	529.61	669.91	19.12	4.00
13	Hailakandi	1,327.00	13.00	366.04	395.30	774.34	58.35	1.48
14	Jorhat	2,851.00	12.00	103.00	445.10	560.10	19.65	4.00
15	Kamrup	3,105.00	50.00	455.95	457.52	963.47	31.03	3.00
16	Kamrup Metro	955.00	-	225.00	235.05	460.05	48.17	1.00
17	karbi Anglong	10,434.00	583.93	3,766.62	3,538.63	7,889.18	75.61	84.38
18	Karimganj	1,809.00	3.00	300.23	548.20	851.43	47.07	0.76
19	Kokrajhar	3,296.00	438.00	270.19	458.38	1,166.57	35.39	1.00
20	Lakhimpur	2,277.00	29.00	85.88	191.69	306.57	13.46	0.96
21	Morigaon	1,551.00	10.00	42.00	122.11	174.11	11.23	4.00
22	Naogaon	3,973.00	50.00	363.00	498.26	911.26	22.94	9.00
23	Nalbari	1,052.00	-	30.84	76.27	107.11	10.18	-
24	Sibsagar	2,668.00	9.00	152.83	528.13	689.96	25.86	2.40
25	Sonitpur	5,204.00	108.97	257.53	703.11	1,069.61	20.55	3.38
26	Tinsukia	3,790.00	410.10	353.92	818.55	1,582.57	41.76	9.90
27	Udalguri	2,012.00	8.00	86.67	317.85	412.52	20.5	1.00
	Grand Total	**78,438.00**	**2,794.86**	**10,248.91**	**15,252.74**	**28,326.51**	**36.11**	**173.43**

India State of Forest Report 2019(http://fsi.nic.in/isfr-volume-ii)

5.2.11 Protected Areas

The Protected Area Network (PAN) in Assam occupies 3925 sq. km. area and constitute about 5 % of the State's geographical area. The PAN includes 5 National Parks and 18 Wildlife sanctuaries as well as 2 proposed Wildlife Sanctuaries, 4 Tiger Reserves, 5 Elephant Reserves, 2 Biosphere Reserves and 2 World Natural Heritage Sites and they play very important role in in-situ conservation of biodiversity.

Table 5-14: List of Protected Areas in Assam

Sl. No.	NP / WLS / Proposed WLS	Districts	Habitat / faunal Diversity	Distance to known Project sites (km)
1	Kaziranga National Park	Golaghat, Nagaon, Sonitpur	One horned Rhino, Swamp Deer, Wild Buffalo, Tiger, Elephant, Hoolock Gibbon, Capped Langur, Home to 25 globally threatened and 21 near threatened species of birds	Kaliabor Tinali-6.69 Kuthori- 1.3 Gingia-9.6 Tejpur University-6.51 Haleswar (GIS)-13.23 Burigang-3.06 Bongalmora-43.39 Simliguri-22.07 Dolamara – 0.2 Dillai-2.89 Harmutty-39
2	Manas National Park	Chirang, Baksa	Rhino, Elephant, Tiger, Pygmy Hog, Hispid hare, Golden Langur, Assamese Macaque, Rhesus Macaque, Leopard, Golden Cat, Fishing Cat, Leopard Cat, Jungle Cat, Large Indian civet, Small Indian civet, Toddy Cat	Koila Moila-23.98 Uttar Barpeta Road-10.46 Howly new (Bennibari)-19.12 Pathsala Town-27.83 Balagaon-29.84 Majdia-43.89 Rampur (Rangia)-25.65 Baganpara-25.71 Patbaushi-26.30 Gahiya-37.65 Kamargaon-3.99
3	Nameri National Park	Sonitpur	Tiger, Leopard, Elephant, Gaur, Wild Pigs, Sambar, Barking Deer, Hispid hare, Slow Loris, Capped Langur, White Winged Wood duck, Palla's fish eagle, Lesser Adjutant Stork, Greater spotted Eagle, White ramped vulture, Longo billed vulture, Black bellied Term, Rufous–necked Hornbill, Wreathed Hornbill, Great Pied Hornbill etc.	Tupia-4.65 Phulbari (Ghoramari AIDC)-12.23
4	Orang National Park	Darrang, Sonitpur	Rhino, Tiger, Elephants, Birds (Greater Adjutant Stork, Lesser Adjutant Stork, Brahminy Duck, Pintail Duck etc.)	Panbari Dhekiajuli-16.5 Kulsigate-15.7 Bahbari (Kuwari Pukhuri)-12.58 Arimari-4.36

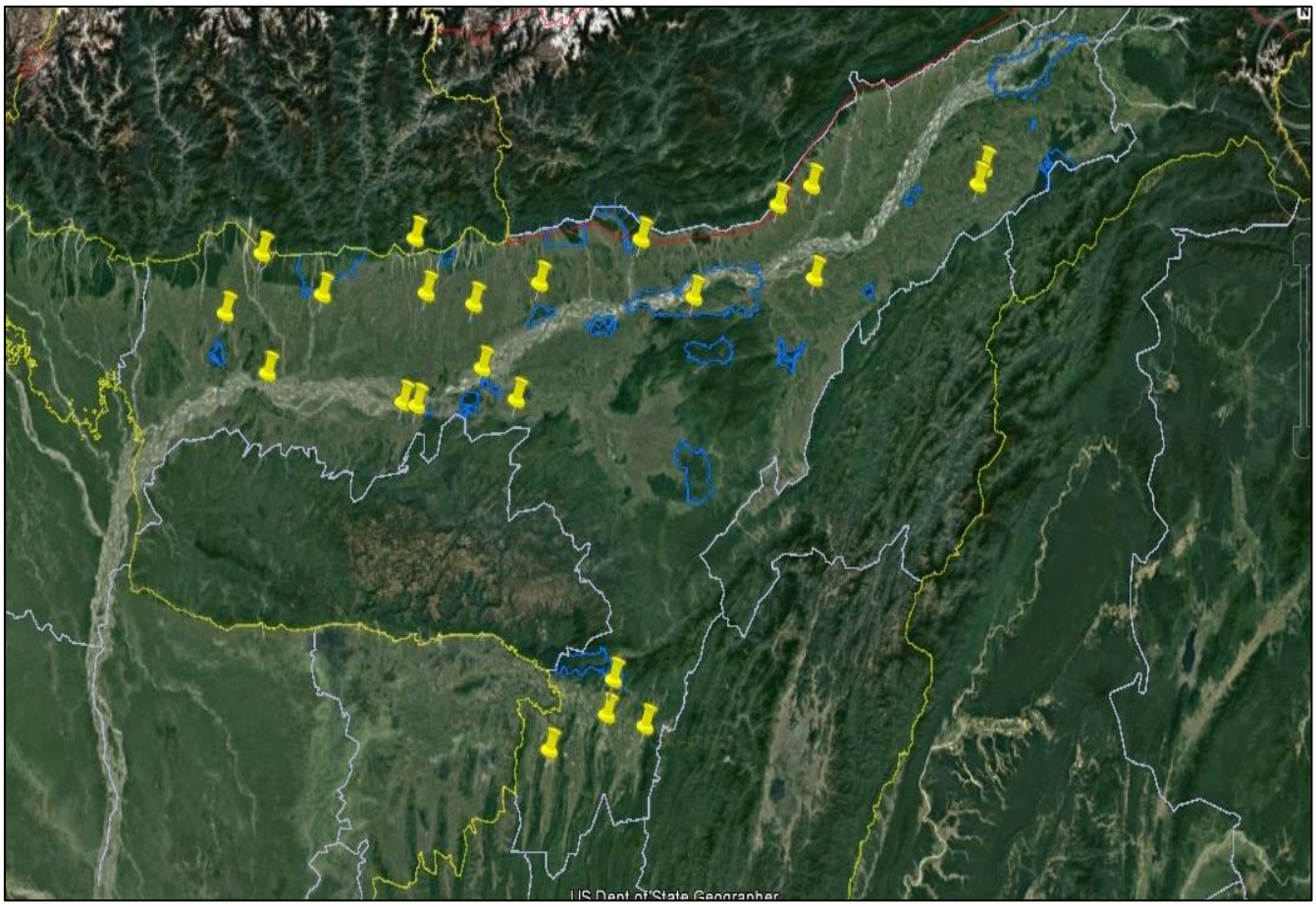
Sl. No.	NP / WLS / Proposed WLS	Districts	Habitat / faunal Diversity	Distance to known Project sites (km)
				Ekrabari (Kajiamati SS)-20.6 Bherbheri-21.53 Borjhar-2.91 Dhansiri ghat-13.13
5	Dibru-Saikhowa National Park	Dibrugarh, Tinsukia	Tiger, Elephant, Leopard, Jungle Cat, Bears, Small Indian Civet, Squirrels, Gangetic Dolphin, Slow Loris, Assamese Macaque, Rhesus Macaque, Capped Langur, Hoolock Gibbon. It is an identifies Important Bird Area (IBA)	Gali-6.8 Japisajia-17.51 Belbari Tinali-21.93
6	Bherjan-Borajan-Padumoni WLS	Tinsukia	Hoolock Gibbon, Capped Langur, Pig-tailed Macaque, Assamese Macaque, Chinese Pangolin, Slow Loris and Rhesus Macaque	Khermia-11.36
7	Panidehing WLS	Sivasagar	Elephants, Lesser Adjutant Stork, Greater Adjutant, Swamp Francolin, Spot-billed Pelican, White rumped Vulture, Greater Spotted Eagle, Slender billed Vulture, Pallas's Fish-eagle	Mechaki-31.36 Joyrampur-44.08 Mornoi-29.84 Goroimari (Dhemaji)-41.25 Butikur-28.52 Mahmora-33.23 Garchariali-36.50 Nayabazar-18.3 AIIDC, Industrial Estate, Sivsagar-9.2
8	Hollongpara Gibbon WLS	Jorhat	Primates (Hoolock Gibbon, Elephant, Tiger, Stump- tailed Macaque, Capped Langur, Pig-tailed Macaque, Assamese Macaque, Slow Loris and Rhesus Macaque)	Umabari-5.84 Madhopur (Pokamura)-19.9 Upper Gorumora-26.61 AIIDC Kundar Gaon-15
9	Nambor-Doigurung WLS	Golaghat	Gaur, Elephants, Hoolock Gibbon	Rongajan-2.6 Bokial-6 Kuralguri-17 Melamora-10.5
10	Garampani WLS	Karbi Anglong	Elephants, White-winged Duck, Lesser Adjutant Stork	Approx. 31 Km from the nearest proposed Kuralguri SS
11	Nambor WLS		Gaur, Elephants, Hoolock Gibbon	Approx. 31 Km from the nearest proposed Kuralguri SS
12	East Karbi Anlong WLS		Gaur, Elephants, Tiger, Hoolock Gibbon	Billgaon Ratanpur-23
13	Marat Longri WLS		Tigers, Leopards, Gaur, Elephants, Hoolock Gibbon	Sankardev Nagar-23 Ambari-32.76

Sl. No.	NP / WLS / Proposed WLS	Districts	Habitat / faunal Diversity	Distance to known Project sites (km)
				Borbali-56 Tumpreng-42.01 Langting-35.43
14	Burhachapori WLS	Sonitpur	Elephants, Aquatic Birds, Tiger, Bengal Florican	Jengani-6
15	Laokhowa WLS	Nagaon	Elephant, Tiger, Asiatic Wild Buffalo, Bengal, Florican	Magurgaon-34 Kachuwa-46.5 Charaibahi (old Jaluguti)-29.07
16	Pobitora WLS	Morigaon	Rhino, Leopards, Barking Deer, Lesser Adjutant, Greater Adjutant, White-bellied Heron, Greater Spotted Eagle	Dharamtul-27.35 Nelli (Spun Mill, Jagirod)-14.70 Dhula-24.3 Borbari (Mowamari)-13.9 Lakhimpur-27.84
17	Sonai-Rupai WLS	Sonitpur	White Winged wood duck, Great Hornbill, Oriental Pied Hornbill, Wreathed Hornbill, Bengal Florican, Elephant, Tiger, Gaur	Sonaigoan-23.13 Lamabari-10.61
18	Barnadi WLS	Udalguri	Hispid Hare, Pygmy Hog, Elephants, Tiger	Balipara-25.0 Bamunjuli-5.3 Khagrabari-8.49 Shikari Bangla (Nagasuba SS)-11.1 Suagpur-8.27 Dwarkuchi-24.12 Cowli-13.97
19	Chakrasila WLS	Kokrajhar and Dhubri	Golden Langur, Gaur, Rhesus macaque, barking deer, small Indian mongoose, leopard cat, jungle cat, leopard, common plam civet, Chinese pangolin	Tipkai-21 Dumurdaha-45.21 Biskhowa (Pabarchera)-47 Raniganj (Lutapara)-7 Srirampur-39.34 Bodofa Nagar (Boroland University)-9.37 Salakati-7.68 Chandamari-96 Nayapara-27.39 Matiabazar-48.46 Koshdhowa-64.16 Murulijhar-24.93 Sadullabari-84.08 Bhalukandi-57.86 Jelkajhar-20.43 Madhyam Runikhata-26.6

Sl. No.	NP / WLS / Proposed WLS	Districts	Habitat / faunal Diversity	Distance to known Project sites (km)
				Rowmari (Potabari)-28.6 Lengtisiga (Borkhata)-16.57 Ulubari-90.46
20	Dihing-Patkai WLS	Dibrugarh and Tinsukia	Hoolock Gibbon, Elephants, White Winged wood duck, Tiger, long-billed vulture	Namtola-40
21	Borail WLS	Cachar and Dima Hasao	Serow, Himalayan Black bear, Hoolock Gibbon	Sutarkandi (Akbarpur)-37.37 Sonakhira-54.9 Gamaria-41.7 Bazarghat-47.7 Aeynakhal-65.85 Serispur-13 Rajpur-3.65 Haticherra-6.17 Pailapool-21.59 Binnakandi-29.31 Kothal road-22.27 Sonai road-43.47 Palonghat-44.23 Dwarbond (West Jalenga)-40.40 Chirakundi near Industrial Estate-16.77
22	Amchang WLS	Kamrup (Metropolitan)	Hollockgibbon, Elephant, Gaur, Leopard and Chinese Pangolin	Dekabari-11.17 Bahgora (Ganesh Kuwari)-11.89 Chandrapur-1.4 Kalmoni (Kendukona)-29.28
23	Deepor Beel Wildlife Sanctuary		Greater Adjutant Stork, Whistling Teal, Open Billed Stork, Shoveler, Pintail, Garganey, Pheasant tail jacanas	Tiplai-65.45 Changchari-14.43 Singimari-Dadara-9.79 Bongara-8.2 Satpur-19.95 Jharobari-14.47 Rampur-15.6 Goroimari-37.6 Kukurmara-21.0 Dhupguri-52.8 Barkuchi-8
24	North Karbi Anglong Wildlife Sanctuaries (Proposed)	Karbi Anglong	Tiger, Lesser cats, Elephant, Gaur, Sambar, Bears, Barking deer, Rhesus macaque, Hoolock gibbon, Capped langur, Slow loris	Approx. 12 Km from proposed SS at Kuthori

Sl. No.	NP / WLS / Proposed WLS	Districts	Habitat / faunal Diversity	Distance to known Project sites (km)
25	Bordoibam Bilmukh Bird Sanctuary (Proposed)	Dhemaji and Lakhimpur	Kingfishers, Large whistling Teal, Lesser Adjutant Stork, Spotted Dove, Pheasant tailed Jacana, Bronze winged Jacana, Indian River Tern, Black Headed Gull, White Wagtail, Black Headed Oriole, Purple Moorhen, Openbill Stork	Approx. 46 Km from proposed SS at Bongalmora

Figure 5-7: Protected Areas of Assam



5.2.1 Flora & Fauna

The floral and faunal species present in project influence area are tabulated below. A number of these floral & faunal species have been listed as vulnerable, endangered or critically endangered as per IUCN and some these are also protected scheduled species under the WL Act. These species have been highlighted in the tables below. For any floral species with conservation values, if found within the proposed substation area, the EPC contractor shall strive to save the species from being felled through modifications of design as required. However, if the Contractor is unable to save the tree, then need to transplant those trees with close consultation with the forest department and advices as suggested by the forest department shall be adopted mandatorily.

Table 5-15: Plant Species in Project Influence Area

Sl. No.	Common Name	Scientific Name	IUCN Status
1	Ajhar	*Lagerstroemia speciosa*	Not Listed
2	Amlakhi	*Phyllanthus emblica*	Not Listed
3	Arjun	*Terminalia arjuna*	Not Listed
4	Bamboo	*Dendrocalamus strictus*	Not Listed

Sl. No.	Common Name	Scientific Name	IUCN Status
5	Bhomora	*Terminalia bellirica*	Not Listed
6	Bonsum	*Phoebe goalparensis*	Not Listed
7	Boriala	*Sida cordifolia*	Not Listed
8	Caoutchouc tree	*Hevea brasiliensis*	Not Listed
9	Carex	*Carex capillacea*	Not Listed
10	Ekra	*Saccharum ravennae*	Not Listed
11	Gomari	*Gmelina arborea*	Not Listed
12	Hillikha	*Terminalia chebula*	Not Listed
13	Hollock	*Terminalia myriocarpa*	Not Listed
14	Jam	*Acacia acuminata*	Not Listed
15	Jengu	*Licuala peltata*	Not Listed
16	Jutuli	*Rubus ellipticus*	Not Listed
17	Kathal	*Artocarpus heterophyllus*	Not Listed
18	Khair	*Acacia catechu*	Not Listed
19	Khokan	*Duabanga sonneratioides*	Not Listed
20	Koroi	*Abroma augusta*	Not Listed
21	Nahor	*Mesua assamica*	Not Listed
22	Outenga	*Dillenia indica*	Not Listed
23	Oxi	*Dillenia pentagyna*	Not Listed
24	Patidoi	*Schumannianthus dichotomus*	Not Listed
25	Priden Pilosa	*Ludwigia pilosa*	Not Listed
26	Pueraria subspicata	*Pueraria phaseoloides*	Not Listed
27	Segun	*Tectona grandis*	Not Listed
28	Semal	*Bombax ceiba*	Not Listed
29	Semal	*Bombax ceiba*	Not Listed
30	Siris	*Albizia lebbeck*	Not Listed
31	Sissoo	*Dalbergia sissoo*	Not Listed
32	Soalu	*Litsea polyantha*	Not Listed
33	Som	*Persea bombycina*	Not Listed
34	Teak	*Tectona grandis*	Not Listed
35	Tokopat	*Phoenix sylvestris*	Not Listed
36	Udal	*Sterculia villosa*	Not Listed
37	Ulu	*Artocarpus altilis*	Not Listed
38	Ursi	*Codariocalyx motorius*	Not Listed
39	Yellow flax	*Reinwardtia indica*	Not Listed
40	Haladi	*Curcuma longa*	Data Deficient
41	Mango	*Mangifera indica*	Data Deficient
42	Amari	*Amoora wallichii*	Least Concern
43	Bhelu	*Tetrameles nudiflora*	Least Concern
44	Champa	*Magnolia champaca*	Least Concern
45	Goat weed	*Ageratum conyzoides*	Least Concern
46	Jamun	*Syzygium cumini*	Least Concern
47	Khagari	*Saccharum spontaneum*	Least Concern
48	Khoir	*Duabanga grandiflora*	Least Concern
49	Kuhir	*Bridelia retusa*	Least Concern
50	Makai	*Zea mays*	Least Concern
51	Nal	*Arundo donax*	Least Concern
52	Poma	*Chukrasia tabularis*	Least Concern
53	Reed	*Phragmites australis*	Least Concern

Sl. No.	Common Name	Scientific Name	IUCN Status
54	Sal	*Shorea robusta*	Least Concern
55	Sonaru	*Cassia fistula*	Least Concern
56	Thatch	*Imperata cylindrica*	Least Concern
57	Titasapa	*Magnolia champaca*	Least Concern
58	Uriam	*Bischofia javanica*	Least Concern
59	Hollong	Dipterocarpus retusus	Endangered
60	Morhal	*Vatica lanceaefolia*	Critically Endangered

Table 5-16: Mammalian Species in Project Influence Area

Sl. No.	Common Name	Scientific Name	IUCN Status	Schedule under Indian WPA, 1972
1	Jungle Cat	*Felis chaus*	Least Concern	II
2	Indian Mongoose	*Herpestes edwardsii*	Least Concern	II
3	Rhesus Monkey	*Macaca mulatta*	Least Concern	II
4	Weasel	*Mustela*	Least Concern	II
5	Barking Deer	*Muntiacus muntjak*	Least Concern	III
6	Indian Porcupine	*Hystrix indica*	Least Concern	IV
7	Cheetal Deer	*Axis axis*	Least Concern	III
8	Wild Pig	*Sus scrofa cristatus*	Least Concern	III
9	Mice	*Mus musculus*	Least Concern	IV
10	Rat	*Rattus rattus*	Least Concern	IV
11	Palm Squirrel	*Funambulus pennantii*	Least Concern	IV
12	Indian Sloth Bear	*Melursus ursinus*	Vulnerable	I
13	Indian Bison	*Bos gaurus*	Vulnerable	I
14	Capped Langur	*Trachypithecus pileatus*	Vulnerable	I
15	Clouded Leopard	*Neofelis nebulosa*	Vulnerable	I
16	Hoolock Gibbon	*Hoolock leuconedys*	Vulnerable	I
17	Leopard	*Panthera pardus*	Vulnerable	I
18	Indian Slow Lorris	*Nycticebus bengalensis*	Vulnerable	I
19	Rhinoceros	*Rhinoceros unicornis*	Vulnerable	I
20	Otter	*Lutrogale perspicillata*	Vulnerable	II
21	Pigtailed Macaque	*Macaca leonina*	Vulnerable	II
22	Stump-tailed Macaque	*Macaca arctoides*	Vulnerable	II
23	Sambar Deer	*Cervus unicolor*	Vulnerable	III
24	Indian Elephant	*Elephas maximus indicus*	Endangered	I
25	Gangetic River Dolphin	*Platanista gangetica*	Endangered	I
26	Golden Langur	*Trachypithecus geei*	Endangered	I
27	Hispid Hare	*Caprolagus hispidus*	Endangered	I
28	Tiger	*Panthera tigris*	Endangered	I
29	Indian Wild Water Buffalo	*Bubalus arnee*	Endangered	I
30	Phayre's leaf monkey	*Trachypithecus phayrei*	Endangered	I
31	Pygmy Hog	*Sus salvanius*	Endangered	I
32	Indian Wild Dog	*Cuon alpinus*	Endangered	II

Table 5-17: Bird Species in Project Influence Area

Sl. No.	Common Name	Scientific Name	IUCN Status	Schedule under Indian WPA, 1972
1	Bagali	*Ardeola grayii*	Least Concern	IV
2	Balimahi	*Motacilla citreola*	Least Concern	IV
3	Bee-eaters	*Merops orientalis*	Least Concern	IV

Sl. No.	Common Name	Scientific Name	IUCN Status	Schedule under Indian WPA, 1972
4	Brahminy Duck	*Tadorna ferruginea*	Least Concern	IV
5	Red-vented Bulbul	*Pycnonotus cafer*	Least Concern	IV
6	Crested Serpent-Eagle	*Spilornis cheela*	Least Concern	IV
7	House Crow	*Corvus splendens*	Least Concern	IV
8	Dhora Kauri	*Corvus macrorhynchos*	Least Concern	IV
9	Spotted Dove	*Streptopelia chinensis*	Least Concern	IV
10	Cattle Egret	*Bubulcus ibis*	Least Concern	IV
11	Amur Falcon	*Falco amurensis*	Least Concern	IV
12	Chiloni	*Milvus migrans govinda*	Least Concern	IV
13	Greylag Goose	*Anser anser*	Least Concern	IV
14	Ghonchirika	*Passer domesticus*	Least Concern	IV
15	Grey-headed Myna	*Sturnus malabaricus*	Least Concern	IV
16	Pied Harrier	*Circus melanoleucos*	Least Concern	IV
17	Jungle Crow	*Corvus macrorhynchos*	Least Concern	IV
18	Kaleej Pheasant	*Lophura leucomelanos*	Least Concern	IV
19	Kam Charai	*Porphyrio porphyrio*	Least Concern	IV
20	Common Kingfisher	*Alcedo atthis*	Least Concern	IV
21	Magpie Robin	*Copsychus saularis*	Least Concern	IV
22	Common Myna	*Acridotheres tristis*	Least Concern	IV
23	Common Merganser	*Mergus merganser*	Least Concern	IV
24	Osprey	*Pandion haliaetus*	Least Concern	IV
25	Spotted Owlet	*Athene brama*	Least Concern	IV
26	Pan Kauril	*Phalacrocorax fuscicollis*	Least Concern	IV
27	Rose-Ringed Parakeet	*Psittacula krameri*	Least Concern	IV
28	Blue-Rock Pigeon	*Columba livia*	Least Concern	IV
29	Pintail Duck	*Anas acuta*	Least Concern	IV
30	Scarlet Minivet	*Pericrocotus flammeus*	Least Concern	IV
31	Red Jungle Fowl	*Gallus gallus*	Least Concern	I
32	Indian Peafowl	*Pavo cristatus*	Least Concern	I
33	Grey Hornbill	*Ocyceros birostris*	Least Concern	I
34	Great Pied Hornbill	*Buceros bicornis*	Vulnerable	I
35	Sarus Crane	*Antigone antigone*	Vulnerable	IV
36	Kurua	*Aquila clanga*	Vulnerable	IV
37	Spot-Billed Pelican	*Pelecanus philippensis*	Near Threatened	IV
38	Bortokola	*Leptoptilos dubius*	Endangered	IV
39	Masked Finfoot	*Heliopais personatus*	Endangered	IV
40	White-winged Wood Duck	*Asarcornis scutulata*	Endangered	IV
41	Bengal Florican	*Houbaropsis bengalensis*	Critically Endangered	I

Table 5-18: Fish Species in Project Influence Area

Sl. No.	Sl. No.	Scientific Name	IUCN Status
1	Ari	*Sperata aor*	Least Concern
2	Bhakua	*Gibelion catla*	Least Concern
3	Gagol	*Mystus montanus*	Least Concern
4	Goroi	*Channa punctata*	Least Concern
5	Kaliara	*Labeo calbasu*	Least Concern
6	Khalisha	*Trichogaster lalius*	Least Concern
7	Puthi	*Pethia conchonius*	Least Concern
8	Rohu	*Labeo rohita*	Least Concern

Sl. No.	Sl. No.	Scientific Name	IUCN Status
9	Singara	*Sperata seenghala*	Least Concern
10	Barali	*Wallago attu*	Vulnerable
11	Cheetal	*Chitala chitala*	Near Threatened

Table 5-19: Reptilian Species in Project Influence Area

Sl. No.	Scientific Name	Common Name	IUCN Status	Schedule under Indian WPA, 1972
1	Garden Lizard	*Calotes versicolor*	Not Listed	Not Listed
2	Indian Cobra	*Naja naja*	Not Listed	II
3	Indian Tortoise	*Geochelone elegans*	Vulnerable	IV
5	Hill Turtle	*Melanochelys tricarinata*	Vulnerable	I
6	Indian Flap-shelledTurtle	*Lissemys punctata*	Least Concern	I

Table 5-20: Amphibian Species in Project Influence Area

Sl. No.	Common Name	Scientific Name	IUCN Status	Schedule under Indian WPA, 1972
1	Indian Bull Frog	*Haplobatrachus tigerinus*	Least Concern	IV
2	Indian Toad	*Duttaphrynus melanostictus*	Least Concern	IV

5.3 Socio-Economic Condition

5.3.1 Demography of Assam

Assam is predominantly a rural based state, almost 86 per cent of its population still living in rural areas. The socio-economic position among the people in rural areas is very pathetic compare to urban area & all India figures. Rural poverty is more than twice that of urban poverty. The population growth in Assam also implied that there has hardly been any reduction in the absolute number of the poor over the years.

As per census of India 2011, the state of Assam with an area of 78,438 sq. Km. accounts for about 2.39% of the total geographical area of the country. It has a population of 31.20 million, which accounts for 2.58% of the population of the country. The adverse land-man ratio is 398 per sq. km. The decadal growth of population for 2001-2011 is 17.07%. According to 2011 census, the literacy rate in the state is 72.19% in which male literacy is 77.85% with respect to the male population and female literacy is 66.27% with respect to the female population, creating a gender gap of 11.58%. The Scheduled Caste population comprises 7.15% whereas tribal population constitutes a mere 12.45% of the total population. About 61.64% population of the state is non-working. Some of the salient demographic features of Assam State are listed below.

Table 5-21: Salient Demographic Feature of Assam

Indicators	Details
Area (sq. km)	78,438
Households (No.)	6406471
Population (No.)	31205576
Male Population	51.08
Female Population	48.92
Urban population	14.10
Rural population	85.90
SC Population	7.15
ST Population	12.45
Population growth rate	17.07
Population density (per sq. km.)	398
Sex Ratio (females+ 1000 males)	958
Total Literate	72.19

Indicators		Details
Total Male Literate		77.85
Total Female Literate		66.27
Work Participation Rate (WPR)		38.36
WPR (Male)		53.59
WPR (Female)		22.46
Main Workers		27.84
Main workers (Male)		44.13
Main workers (Female)		10.82
Main Workers	Cultivation Ratio	36.13
	Agriculture Ratio	10.40
	Household Ratio	2.79
	Others Ratio	50.69
Marginal workers		10.52
Marginal workers (Male)		9.45
Marginal workers (Female)		11.63
Marginal Workers	Cultivation Ratio	28.12
	Agriculture Ratio	28.70
	Household Ratio	7.59
	Others Ratio	35.59
Non-Workers		61.64
Male Non-workers		46.41
Female Non-workers		77.54

Source: *Census of India, 2011*

5.3.2 Economic Development

Assam's economy is based on agriculture and oil. Assam produces more than half of India's tea. The Assam-Arakan basin holds about a quarter of the country's oil reserves and produces about 12% of its total petroleum. Assam is predominantly an agrarian economy where majority of the rural labour force is engaged in agriculture and allied activities directly or indirectly. The paddy cultivation covers 93.0% of the total area under food grains production in 2008-09 according to the Economic Survey, Assam 2009-10 report. The report also suggests that in terms of the Gross State Domestic Product (GSDP) at factor cost is expected to grow at the rate of 6.35% as per Advanced Estimates for 2009-10 in sectors like Electricity, Gas & Water supply, Transport, Storage and Communication, Trade, Hotel & Restaurants, Banking & Insurance and Public Administration. At current prices State Income is estimated at Rs. 78822.48 crores in 2009-10.

The main industry of Assam is Tea which is about 170 years old. it is cultivated in 301000 hectares of land in Assam. There are 49102 numbers of tea gardens in Assam. Assam tea has a significant reputation in the global economy which constitutes of 505 of the total production of the country. The government is earning substantial amount of foreign exchange from the Tea production. Sericulture is a major industry of the state and it is identified by 'Muga Silk' or 'Golden thread' worldwide with 99% of the Muga Silk produced in Assam. Assam has 4 oil refineries situated in Noonmati, Bogaigoan, Numaligarh and Duliajaan. This sector plays an important role in the total economy of India.

The state has 64 commercial estates for the micro and small-scale units and 50 industrial estates (or areas) spread across the districts of Assam. Besides, there are 3 industrial growth centres (IGCs) located at Balipara (Sonitpur district), Matia (Goalpara district) and Chaygaon-Patgaon-Jambari (Kamrup district). Offering a host of facilities under one roof, Assam has 11 numbers of integrated infrastructure development centre (IIDs), out of which two were under construction. The state has 11 numbers of Integrated Infrastructure Development Centre (IIDs) out of which 2 are under construction. Two more projects on similar lines have been approved by the Central government under MSE-CDP scheme at Pathsala (Barpeta) and Moran (Dibrugarh).

The Bamboo is found in large quantity in Assam which comprises of around 60% of the total Bamboo of the country. The Bamboo industry is thus given ample importance by the government in recent years. The milk production of the state is 827 million liters in 2008- 09 according to Economic Survey, Assam 2009-10 report.

Agriculture

In Assam among all the productive sectors, agriculture makes the highest contribution to its domestic sectors, accounting for more than a third of Assam's income and employs 69% of workforce. Assam's biggest contribution to the world is Assam tea. It has its own variety, *Camellia sinensis* var *assamica*. The state produces rice, rapeseed, mustard seed, jute, potato, sweet potato, banana, papaya, areca nut, sugarcane and turmeric.

Assam's agriculture is yet to experience modernization in a real sense. With implications for food security, per capita food grain production has declined in the past five decades. Productivity has increased marginally but is still low compared to highly productive regions. For instance, the yield of rice (a staple food of Assam) was just 1531 kg per hectare against India's 1927 kg per hectare in 2000–01 (which itself is much lower than Egypt's 9283, US's 7279, South Korea's 6838, Japan's 6635 and China's 6131 kg per hectare in 2001). On the other hand, after having strong domestic demand, and with 1.5 million hectares of inland water bodies, numerous rivers and 165 varieties of fishes, fishing is still in its traditional form and production is not self-sufficient.

Floods in Assam greatly affect the farmers dependent on agriculture because of large-scale damage of agricultural fields and crops by flood water. Every year, flooding from the Brahmaputra and other rivers deluges places in Assam. The water levels of the rivers rise because of rainfall resulting in the rivers overflowing their banks and engulfing nearby areas. Apart from houses and livestock being washed away by flood water, bridges, railway tracks and roads are also damaged by the calamity, which causes communication breakdown in many places. Fatalities are also caused by the natural disaster in many places of the state.

5.3.3 Social Infrastructure

Rail Transport

Assam has a well-connected rail network connecting to the rest of the country. The Northeast Frontier Railway or NF Railway is one of the 17 railway zones in India. NF Railway is headquartered in Maligaon, Guwahati. NF Railways is responsible for rail operations in the entire Northeast and parts of West Bengal and Bihar.

Road Transport

The network of national highways and other roads make travel to Assam convenient. The national highways connect Assam to the entire Northeast, Bihar, Jharkhand and West Bengal and other parts of the country. The important national highways in Assam connects with the Bangladesh, Myanmar and Bhutan and all major cities of Assam, and other states of India.

Air Transport

The Lokopriya Gopinath Bordoloi International Airport at Borjhar in Guwahati is the main airport of Assam. All major domestic flights fly in and out of Guwahati from the important cities of India. Other domestic airports are located at Jorhat, Dibrugarh, Tezpur, North Lakhimpur and Silchar in Assam. Helicopter services are also available from Guwahati to Tura, Shillong and Tawang. Druk air connects Guwahati internationally to Bangkok and Paro twice a week.

Literacy

In 2011, the literacy rate in the state was 73.18%. The male literacy rate was 78.81% and the female literacy rate was 67.27%. In 2001, the census had recorded literacy in Assam at 63.3% with male literacy at 71.3% and female at 54.6%. The urbanisation rate was recorded at 12.9%.

Health

Assam State has good health facility. Assam state having 7 good medical colleges which is given below.

- Assam Medical College in Dibrugarh

- Fakhruddin Ali Ahmed Medical College, Barpeta
- Guwahati Medical College and Hospital in Guwahati
- Jorhat Medical College and Hospital, Jorhat
- Regional Dental College, Guwahati
- Silchar Medical College and Hospital, Silchar
- Tezpur Medical College & Hospital, Tezpur

5.3.4 Historical, Cultural and Archaeology Sites/Places

Historical Sites/Places

The historical places of Assam show consistency with contemporary events in mainland India and have been clearly documented since the 1st century AD. It was known as Kamarupa and ruled by subsidiaries of North Indian rulers. The 13th century saw invasions from the North and East by Delhi-based Islamic rulers and the Chinese army. The Ahoms ruled Assam at the time when Mughals were presiding over the rest of India and were deposed by the advent of the British in 1826. The important historical sites in the state are:

- Powa Mecca Masjid, Hajo
- Rang Ghar, Sibsagar
- Talatal Ghar, Sibsagar
- Surya Pahar, Goalpara
- Khaspur, Silchar
- Satras, Darang
- Charaideo, Sibsagar

Culture, Fair and Festivals

Assamese culture is traditionally a hybrid one developed due to assimilation of ethno-cultural groups of Austric, Dravidian, Tibeto-Burman and Tai origin in the past. Therefore, both local elements and the local elements in Sanskritised forms are distinctly found.

Archaeological Sites/Places

- Magazine House, Panbari, Dhubri
- Panbari Ruins, Panbari, Dhubri
- Moterjhar Temple, Moterjhar, Dhubri
- Mahadev Parvat, Sri SriSurya Pahar, Goalpara
- Paglatek Ruins, Paglatek, Goalpara
- Raush Monument, Kachari Road, Goalpara
- Tukreswari Temple, Krishnai, Goalpara
- Siva Than, Pancharatna, Goalpara

Baseline district socio-economic profile of proposed Sub Stations is enclosed as annexure 7.

5.3.4.1 Village Level

The proposed project is spread across the jurisdiction of 23 revenue villages. As per Census 2011, there are total of 20,371 households and the population of 94,826 with an average household size of 4.9. The average sex ratio in these villages is 928, which ranges between 472 to 1,121 across these 23 villages. The Literacy Rate is quite good at 78.74%. The village-wise details are given in Table below.

Table 5-22: Socio-economic features of the Proposed Villages

Sl. No	Name of Village	District / Tehsil	Number of Household	Population	Average HH Size	Sex Ratio	Literacy Rate
1	Chandrapur	Kamrup Metropolitan / Chandrapur	131	545	4.2	1,121	41.67
2	Bhakotgaon (Topatoli)	Kamrup Metropolitan	730	3,505	4.8	984	78.55
3	Dwarkuchi	Barpeta/Pathali wachi	495	2,758	5.6	953	77.38
4	Daranga Mela	Baksa	193	1,123	5.8	923	83.93
5	Lakhimpur	Darrang	298	1,345	4.5	NA	81.63
6	Silbori (Mangaldoi)	Darrang / Dalgaon	659	2,879	4.4	923	90.83
7	Kuthori (Nagaon)	Nagaon / Kaliabor	283	1,317	4.7	873	60.07
8	Tupia (Tezpur)	Sonitpur / Nadual	349	1,582	4.5	1,010	84.58
9	Koila Moila	Chirang / Borobajan	102	742	7.3	472	76.00
10	Uttar Barpeta Road	Barpeta	7,484	35,571	4.7	924	87.23
11	Nayapara	Goalpara / Lakhipur	31	138	4.5	944	86.29
12	Salakati (Kokrajhar)	Kokrajhor	985	4,863	4.9	863	76.93
13	Rampur (Gec-II)	Kamrup / Rampur	1,685	7,554	4.49	NA	NA
14	Bongara (Gec-II)	Kamrup	684	3273	4.8	979	88.84
15	Nirmolia 2 (Dibrugarh)	Sivasagar / Sonari	130	710	5.5	1,064	86.60
16	Mahmora (Mass Konwar	Dibrugarh/Dibrugarh West	229	1,152	5	969	70.86
17	Bongalmora (N. Lakhimpur)	Lakhimpur	437	2,138	4.9	937	82.14
18	Simluguri (N. Lakhimpur)	Sivasagar	1,989	8,286	4.2	867	91.1
19	Bazarghat (Badarpur)	Karimganj /R.K. Nagar	504	2,173	4.3		93.49
20	Kothal Road (Baijantipur I)	Cachar / Silchar	229	1,191	5.2	940	90.41
21	Binnakandy Estate (Cachar)	Cachar / Lakhipur	1,740	7,692	4.4	945	66.18
22	Hatichhera	Cachar	1,004	4,289	4.3	934	58.86
23	Kuralguri	Jorhat	NA	NA	NA	NA	NA
Total/Average			**20,371**	**94,826**	**4.9**	**928**	**78.74**

Source: *Census of India, 2011*

Over 13.79% of the total population falls under the marginalised section of the society with nearly 5.34% falling under the category of Scheduled Caste (SC) and 9.1% under the category of Scheduled Tribe (ST) as shown in Table below.

Table 5-23: Social Classification of the Villages in Proposed Project Locations

Sl. No	Name of Village	District / Tehsil	SC Population	% of SC	ST Population	% of ST
1	Chandrapur	Kamrup Metropolitan	43	7.89	0	0
2	Bhakotgaon (Topatoli)	Kamrup Metropolitian	59	1.68	754	21.51
3	Dwarkuchi	Barpeta / Pathali wachi	733	26.6	1	0.04
4	Daranga Mela	Baksa	0	0	6	0.53
5	Lakhimpur	Daranga	171	12.7	0	0
6	Silbori (Mangaldoi)	Daranga / Dalgaon	391	13.58	81	2.81
7	Kuthori (Nagaon)	Nagaon	6	0.5	0	0

Sl. No	Name of Village	District / Tehsil	SC Population	% of SC	ST Population	% of ST
8	Tupia (Tezpur)	Sonitpur / Nadual	0	0	6	0.4
9	Koila Moila	Chirang / Borobajan	0	0	20	2.7
10	Uttar Barpeta Road	Barpeta	4,025	11.3	970	2.7
11	Nayapara	Goalpara / Lakhipur	0	0	137	99.3
12	Salakati (Kokrajhar)	Kokrajhor	278	5.7	835	17.2
13	Rampur (Gec-II)	Kamrup / Rampur	1,137	15.05	8	0.1
14	Bongara (Gec-II)	Kamrup	0	0	0	0
15	Nirmolia 2 (DIBRUGARH)	Sivasagar	0	0	2	0.2
16	Mahmora (Mass Konwar	Dibrugarh	0	0	0	0
17	Bongalmora (N. Lakhimpur)	Lakhimpur	18	0.84	1,092	51.08
18	Simluguri (N. Lakhimpur)	Sivasagar	202	2.4	178	2.1
19	Bazarghat (Badarpur)	Karimganj / R.K. Nagar	573	26.37%	0	0%
20	Kothal Road (Baijantipur I)	Cachar / Silchar	0	0	0	0
21	Binnakandy Estate (Cachar)	Cachar / Lakhipur	1,161	15.09	3	0.04
22	Hatichhera	Cachar	170	4	18	0.42
23	Kuralguri	Jorhat	NA	NA	NA	NA
Total/Average			**8967**	**5.34**	**4111**	**9.1**

Source: *Census of India, 2011*

During the consultations in the project villages, it has been found that though there is nearly 9.1% ST population but these are integrated into the mainstream, however, the landholding amongst SC and ST population is very minimal and fall under the category of marginal and small farmers including the landless. These sections are predominantly dependent on the agriculture labour requirements in the land belonging to large landowners. The total work force Participation Rate in these villages as per Census 2011 is 36277, with male and female participation number is 28,481 (78.52%) and 7,796 (21.49%) respectively. It is important to highlight here that the main workers are only about 82% of the total workers, whereas the balance over 12% are marginal workers.

Table 5-24: Distribution of Population by Workers of the Proposed Villages

Sl. No.	Name of Village	District / Tehsil	Work Force Participation Rate			Main Workers as % of Total Workers		
			Male	Female	Total	Male	Female	Total
1	Chandrapur	Kamrup Metropolitan	166	149	315	163	147	310 (98.41%)
2	Bhakotgaon (Topatoli)	Kamrup Metropolitan	980	265	1,245	753	87	840 (67.47%)
3	Dwarkuchi	Barpeta / Pathali wachi	729	125	854	633	52	685 (80.21%)
4	Daranga Mela	Baksa	248	76	324	202	11	213 (65.74%)
5	Lakhimpur	Daranga	365	95	460	315	28	343 (74.56%)
6	Silbori (Mangaldoi)	Daranga / Dalgaon	731	135	866	652	100	752 (86.84%)
7	Kuthori (Nagaon)	Nagaon	348	65	413	322	56	378 (91.52%)
8	Tupia (Tezpur)	Sonitpur / Nadual	468	153	621	387	63	450 (72.46%)

Sl. No.	Name of Village	District / Tehsil	Work Force Participation Rate			Main Workers as % of Total Workers		
			Male	Female	Total	Male	Female	Total
9	Koila Moila	Chirang / Borobajan	388	155	543	351	81	432 (79.5%)
10	Uttar Barpeta Road	Barpeta	11,436	2,197	13,633	108,52	1,334	12186 (89.38%)
11	Nayapara	Goalpara / Lakhipur	33	36	69	27	13	40 (57.97%)
12	Salakati (Kokrajhar)	Kokrajhor	1,636	695	2,331	1,491	585	2076 (89%)
13	Rampur (Gec-II)	Kamrup / Rampur	2,206	1,031	3,237	1,743	294	2037 (76.75%)
14	Bongara (Gec-II)	Kamrup	847	108	955	659	74	733 (76.75%)
15	Nirmolia 2 (Dibrugarh)	Sivasagar	190	14	204	163	8	171 (83.82%)
16	Mahmora (Mass Konwar	Dibrugarh	348	222	570	334	207	541 (95%)
17	Bongalmora (N. Lakhimpur)	Lakhimpur	641	597	1,238	469	38	507 (40.95%)
18	Simluguri (N. Lakhimpur)	Sivasagar	2,516	297	2,813	2,292	252	2,544 (90.4)
19	Bazarghat (Badarpur)	Karimganj / R.K. Nagar	585	43	628	467	36	503 (80%)
20	Kothal Road (Baijantipur I)	Cachar / Silchar	273	38	311	264	12	276 (88.7%)
21	Binnakandy Estate (Cachar)	Cachar / Lakhipur	2,091	673	2,764	1,780	466	2,246 (81.3%)
22	Hatichhera	Cachar	1,256	627	1,883	913	413	1,326 (70.41%)
23	Kuralguri	Jorhat	NA	NA	NA	NA	NA	NA
Total			**28,481**	**7,796**	**36,277**	**25,232**	**4,357**	**29,589**

Source: *Census of India, 2011*

The distribution of workers given in Table below clearly shows that nearly 13.56% of the total main workers are dependent on agriculture out of which only about 9.72% are cultivators whereas the remaining 3.84% are dependent on agriculture labour workers:

Table 5-25: Distribution of Workforce of the Proposed Villages

Sl. No.	Name of Village	District / Tehsil	Cultivators	Agriculture Labour	HH Industry and Other Services
1	Chandrapur	Kamrup Metropolitan	0	0	310
2	Bhakotgaon (Topatoli)	Kamrup Metropolitan	252	94	494
3	Dwarkuchi	Barpeta / Pathali wachi	116	5	564
4	Daranga Mela	Baksa	1	1	211
5	Lakhimpur	Daranga	218	31	94
6	Silbori (Mangaldoi)	Daranga / Dalgaon	34	2	716
7	Kuthori (Nagaon)	Nagaon	80	2	296
8	Tupia (Tezpur)	Sonitpur / Nadual	182	36	232
9	Koila Moila	Chirang / Borobajan	81	5	346
10	Uttar Barpeta Road	Barpeta	67	49	12,070
11	Nayapara	Goalpara / Lakhipur	22	9	9
12	Salakati (Kokrajhar)	Kokrajhor	133	21	1,922
13	Rampur (Gec-II)	Kamrup / Rampur	160	107	1,770

Sl. No.	Name of Village	District / Tehsil	Cultivators	Agriculture Labour	HH Industry and Other Services
14	Bongara (Gec-II)	Kamrup	140	132	461
15	Nirmolia 2 (Dibrugarh)	Sivasagar	144	4	23
16	Mahmora (Mass Konwar	Dibrugarh	341	161	39
17	Bongalmora (N. Lakhimpur)	Lakhimpur	272	9	226
18	Simluguri (N. Lakhimpur)	Sivasagar District	87	8	2,449
19	Bazarghat (Badarpur)	Karimganj / R.K. Nagar	61	14	428
20	Kothal Road (Baijantipur I)	Cachar / Silchar	101	1	174
21	Binnakandy Estate (Cachar)	Cachar / Lakhipur	307	380	1,559
22	Hatichhera	Cachar	77	66	1183
23	Kuralguri	Jorhat	NA	NA	NA
Total			**2,876**	**1,137**	**25,576**

Source: *Census of India, 2011*

6 MODEL ESIA FOR THE SUB-PROJECTS

This Chapter presents the potential impacts that may occur during the pre-construction, construction and operation phases, and further suggests the mitigation measures to avoid or minimize such impacts.

The environmental and social baseline for the Project has been presented in Chapter 5 of this report. The state level data were also used for ascertaining the baseline meteorological data, from secondary sources. The baseline for biodiversity was collated from secondary data collected from Integrated Biodiversity Assessment Tool (IBAT) and Assam Environment and Forest department. The socio-economic baseline was established on the of district wise census data where the proposed substations shall be located. All of these were supplemented by public consultations and spot interactions by APDCL officials at Divisional offices and Head Quarters. Impacts of a natural disaster were studied from state's hazard risk maps which illustrate the impacts of hazards such as foods and earthquakes and the proposed design measures to address these impacts. In the absence of primary data for ambient air quality, water quality & noise quality, it is suggested that the full set of information is to be collected prior to contractors' mobilization and documented in the E&S monitoring report as part of the monitoring scheme.

Site specific, primary data including E&S components associated with individual subproject ranging from land status, presence of protected area, ecological sensitive area, water bodies, indigenous population, etc. is listed under section 5.1. The data obtained for study area comprises information collected within the vicinity of model substations. For ecologically sensitive receptors like Protected Areas the study area was taken as 5km, and for waterbodies, a 200m-diameter was considered as the influence of area. In addition, all the social and ecological aspects have been considered to assess the environmental and social impacts, if any.

6.1 E&S Profile of the Sites Visited

6.1.1 Introduction

The baseline profiling of subprojects at early stage of project cycle follows ESP's approach for E&S management through identifying actions to avoid, minimize, mitigate, offset or compensate for negative environmental and social impacts of Projects. This requires assessing different alternatives for the selection of the least impactful locations to avoid affecting forests / biodiversity / Eco-sensitive zone including animal / bird paths, protected areas, human habitations, cultural and historic sites etc. to the extent practical from Project conceptualization & Planning Stage. This also helps in establishing the grounds for proposal of tall towers to avoid / minimise the impact at the beginning of the project. The baseline assessment will also identify the need of additional studies required by independent agencies to ascertain the impacts and to plan management measures to minimize /mitigate such impacts.

6.1.2 Selection Criteria for Site Visit / Model Sub Stations

The details of a total of 135 proposed substation locations were shared with the consultant by APDCL. In line with the framework approach, 20% model representative locations were selected randomly based on the following criterion.

Table 6-1: Criterion for Model Selection for Sub Stations

Sl. No.	Criteria	Details
1.	Electrical Circle	At least 1 (one) representative Sub- Station from all Electrical Circles
2.	Proposed feeding	At least 1 (one) representative SS selected for 33/11 KV SS, 132/33 KV Grid Sub-Station (GSS), 400 KV GSS, 220/33 KV GSS, Tapping, etc under individual Electrical Circle.
3.	Ownership of the Land	One representation based on land ownership pattern (Govt. Land, Private Land, APDCL/AEGCL/APGCL Land, Tea Garden Land, Private Land on Donation)
4.	Environment Sensitivity	The sub-station proposed near the forest and Eco-sensitive Protected area are selected

Sl. No.	Criteria	Details
5.	Social Sensitivity	One representation from each Schedule-6 area

Based on above mentioned criteria, 23 SS had been selected for detailed site assessment and thorough scrutiny of applicable environment and social legislative frameworks. Detailed list along with selection criteria is tabulated below:

Table 6-2: Details of Model Sub Stations

Sl. No	Electrical Circle	Name of the Sub- Station	Criteria	Proposed feeding	Type of Land
1	Tezpur	Tupia	Near vicinity of Nameri TR	Jamuguri 33/11 KV SS	Govt land
2	N. Lakhimpur	Bongalmora	220/33 KV GSS on Govt. Land	New Bihpuria 220/33 KV GSS	Govt land
3	N. Lakhimpur	Simluguri	Near Forest Area	New Bihpuria 220/33 KV GSS	Govt land
4	Nagaon	Kuthori	Near vicinity of Kaziranga NP	Kohora 33/11 KV SS	Govt land
5	Dibrugarh	Mahmora	Private Land Donated	Sonari 132/33 KV GSS	Private Land Donated
6	Dibrugarh	Garchariali	Near Forest Land	Mahmora 33/11 KV SS (Proposed)	Govt land
7	Jorhat	Kuralguri	Representation of Jorhat	Ganakpukhuri 33/11 KV SS	APDCL Own Land
8	Bongaigaon	Nayapara	APDCL Land	Bhalukdubi 33/11 KV SS	APDCL Own land
9	Bongaigaon	Koila Moila	Probable Schedule- 6 area	Dhaligaon 132/33 KV GSS	Govt land
10	Barpeta	Uttar Barpeta Road	Govt. Land	Barpeta Road 33/11 KV SS	Govt land
11	Kokrajhar	Salakati	Near vicinity of chakrashila WLS, Probable Schedule- 6 area	Salakati 132/33 KV GSS	Govt land
12	Mangaldoi	Lakhimpur	Govt. Land	Dipila 33/11 KV SS	Govt land
13	Mangaldoi	Silbori	Near vicinity of Orang NP	Rowta 33/11 KV SS	Govt land
14	Rangia	Dwarkuchi	Govt. Land	Rangia 132/33 KV GSS	Govt land
15	Rangia	Daranga	Near Forest area, Tea Garden land	Kumarikata 33/11 KV SS	Tea Garden land
16	GEC-I	Chandrapur	Only representation of GEC-I	CTPS 132/33 KV GSS	APGCL Own land
17	GEC-II	Rampur	Private donated land	Bijoynagar 33/11 KV SS	Private donated land
18	GEC-II	Bongara	AEGCL land	Kukurmara 400 KV GSS	AEGCL Land
19	Cachar	Haticherra	Near vicinity of Borail WLS	Udarband 33/11 KV SS	Tea Garden Land
20	Cachar	Kothal road	Tea Garden Land	Srikona Mehepur Line (Tapping)	Tea Garden Land
21	**Badarpur**	**Bazarghat**	Temple Committe	Dulabchera 33/11 KV SS	Barren Land

6.1.3 E&S Profile of Model Sites

Out of 135 proposed Sub-station to be developed under Phase-1, in total 21 SSs has been selected (15% of the total proposed SSs) for site visits as per the selection criteria illustrated above. Listed in the table below are the substation selected for site visits along with the identified structures, water bodies and trees.

The adopted methodology for establishing the baseline data involves collection of data for existing conditions on physical, ecological, economic and social aspects, together with the anticipated environmental and social impacts and proposed mitigation measures. The assessment of physical, biological and social features in the proposed substations also involved data collection from secondary sources and has been done to support the findings of the field survey.

A baseline study was conducted to assess the environmental and socio-economic conditions within the substation premises and adjoining areas. The baseline data generation was supplemented with field observations, survey reports and interaction with the community and project personnel. The outcomes of assessment for the potential footprints conducted for new proposed substations in given in the environmental profile table below:

Figure 6-1: Some Photographs of Trees & Vegetations in Proposed Substation Locations

Koila Moila

Kural Guri



Kuthori **Simaluguri**


Haticherra (Daloo TE)


Table 6-3: Environmental Profile of the Selected Sub-stations

Sl. No.	Electrical Circle	Name of the Sub-Station	District	Proposed feeding	Associated Distribution Line (Length in Km)	Land Ownership	Land Use	No. of Households	No. of water bodies	Trees to be felled	Distance from Forest Area	Distance from WLS / NP
1	Tezpur	Tupia	Sonitpur	Jamuguri 33/11 KV SS	36	GoA	Barren Land	-	-	1 (*Julans regia*) out of 1 present	-	4.65 Km from Nameri National Park. Nameri, is IBA as per IBA criteria A1 & A2
2	N. Lakhimpur	Bongalmora	Lakhimpur	New Bihpuria 220/33 KV GSS	18	APDCL	Barren Land	-	-	-	4.9 km from Pabha Reserve Forest	Pabho RF is IBA as per IBA criteria A1 & A2
3	N. Lakhimpur	Simluguri	Sivasagar	New Bihpuria 220/33 KV GSS	12	APDCL	Barren Land	-	-	1 (*Fiscus religiosa*) out of 3	1.51 km from Gohpur Reserve Forest	-
4	Nagaon	Kuthori	Nagaon	Kohora 33/11 KV SS	25	GoA	Barren Land	-	-	1 (*Artocarpus chaplasha*) out of 3	-	1.3 Km from Kaziranga National Park
5	Dibrugarh	Mahmora	Dibrugarh	Sonari 132/33 KV GSS	15	Private Land Donated	Agricultural Land	-	-	-	2.77 km from Diroi Reserve Forest	-
6	Dibrugarh	Garchariali	Sivasagar	Mahmora 33/11 KV SS (Proposed)	18	APDCL	Barren Land	-	-	-	Within Diroi Reserve Forest[5] as per secondary information obtained from Forest Dept. Forest Clearance applicable as per FC Act	-
7	Jorhat	Kuralguri	Jorhat	Ganakpukhuri 33/11 KV SS	10	APDCL	Barren Land	-	-	21 (Bhello, Madhuri, Satiana, Mango, Kathal, Amlakhi, Bel, Rabab Tenga, Gamari) out of 21 trees	-	17 Km from Nambor Doigrung WLS
8	Bongaigaon	Nayapara	Goalpara	Bhalukdubi 33/11 KV SS	10	APDCL	Barren Land	-	-	-	3.74 km from Pancharatna Reserve Forest	-
9	Bongaigaon	Koila Moila	Chirang	Dhaligaon 132/33 KV GSS	41	GoA	Barren Land	-	01 (Canal adjacent to the proposed site, ~10 meter)	5 out of 22 trees present 1 *Terminalia arjuna* & 4 Shishir	0.08 km from Manas Reserve Forest	-
10	Barpeta	Uttar Barpeta Road	Barpeta	Barpeta Road 33/11 KV SS	12	GoA	Waste Land	-	-	8 (Jackfruit, Mango, Pama, Kodom, Bel) out of existing 10	-	10.46 Km from Manas national Park
11	Kokrajhar	Salakati	Kokrajhor	Salakati 132/33 KV GSS	10	GoA	Barren Land	-	-	-	-	7.68 km from Chakrasila WLS. It is IBA as per

[5] As per Letter No. 214 dated November 1971 from the Forest Dept., GOA, the ownership of the land was transferred to Hospital committee with a condition that the land shall revert back to the Forest dept, in case of original activity not undertaken. The construction of SS was not part of the original scheme and hence the ownership rights have to be revisited.

Sl. No.	Electrical Circle	Name of the Sub-Station	District	Proposed feeding	Associated Distribution Line (Length in Km)	Land Ownership	Land Use	No. of Households	No. of water bodies	Trees to be felled	Distance from Forest Area	Distance from WLS / NP
												IBA criteria A1, A4i, A4iii,
12	Mangaldoi	Lakhimpur	Daranga	Dipila 33/11 KV SS	22	GoA	Barren Land	-	-	-	24.62 km from Manik Nagar Reserve Forest	-
13	Mangaldoi	Silbori	Daranga	Rowta 33/11 KV SS	20	GoA	Barren Land	-	-	-	-	3 km from Orang National Park. It is IBA as per IBA criteria A1, A4ii
14	Rangia	Dwarkuchi	Barpeta	Rangia 132/33 KV GSS	26	GoA	Barren Land	-	-	-	21.84 km from Mora Padladiya Reserve Forest	-
15	Rangia	Daranga	Baksa	Kumarikata 33/11 KV SS	22	Tea Garden Committee	Agricultural Land	-	-	-	0.58 km from Daranga Reserve Forest	-
16	GEC-I	Chandrapur	Kamrup Metropolitian	CTPS 132/33 KV GSS	20	APGCL	Barren Land	-	-	7 out of 13 (Mango, Amara, Dumuru, Vet Veti, okathi, modar, Jiya, Sajana, Kardoi)	-	1.4km from Amchang WLS & 2.71 km from Pobitora WLS.
17	GEC-II	Rampur	Kamrup	Bijoynagar 33/11 KV SS	51	Private donated land	Barren Land	-	-	-	6.17 km from Maliyata Reserve Forest	-
18	GEC-II	Bongara	Kamrup	Kukurmara 400 KV GSS	10	AEGCL	Barren Land	-	-	-	0.83 km from Maliyata Reserve Forest	8.2km from Deepor Beel WLS.
19	Cachar	Haticherra	Cachar	Udarband 33/11 KV SS	18	Daloo Tea Estate	Barren Land	-	Daloo Lake more than 200m away from the proposed site	-	-	6.17 Km from Barail WLS, Barail is IBA as per IBA criteria A1, A2, A3
20	Cachar	Kothal road	Cachar	Srikona Mehepur Line (Tapping)	4	Tea Garden	Barren Land. No production loss	-		-	17.39 km from Cachar Reserve Forest	-
21	Badarpur	Bazarghat	Karimganj	Dulabchera 33/11 KV SS	20	Temple committee	Barren Land	-		-	7.66 km from Dohalia Reserve Forest	-

IBA: *Important Bird Area,* ***A1:*** *Globally threatened species,* ***A2:*** *Restricted-range species,* ***A3:*** *Biome-restricted species,* ***A4:*** *Congregations*

i. *This applies to 'water bird' species as defined by Delaney and Scott and is modelled on criterion 6 of the Ramsar Convention for identifying wetlands of international importance. Depending upon how species are distributed, the 1% thresholds for the biogeographic populations may be taken directly from Delaney & Scott, they may be generated by combining flyway populations within a biogeographic region or, for those for which no quantitative thresholds are given, they are determined regionally or inter-regionally, as appropriate, using the best available information. This includes those seabird species not covered by Delaney and Scott (2002). Quantitative data are taken from a variety of published and unpublished sources.*

ii. *This is modelled on criterion 5 of the Ramsar Convention for identifying wetlands of international importance. The use of this criterion is discouraged where quantitative data are good enough to permit the application of A4i and A4ii.*

iii. *The site is known or thought to exceed thresholds set for migratory species at bottleneck sites*

6.2 Anticipated Environmental and Social Impacts

Environmental impacts can be classified as primary or secondary. Primary impacts are those, which are attributed directly to the project while secondary impacts are induced by / associated with primary impacts. The following assessment was undertaken to identify the impacts and risks.

- Identify and assess the range of potential impacts and the extent of severity
- Suggest viable mitigation measures for the identified impacts
- Develop an Environment and Social Management Plan based on the proposed mitigation measures

Environmental impacts involve air and noise emissions, ground and surface water contamination, impacts on local biodiversity, disposal of construction waste and demolishing waste, etc. Social impacts are related to possible loss of property/ income of the landowners, impact of accessibility and irrigation drainage system and the other impacts such as better availability of power supply. Further impact evaluation has been done based on proposed project activities including pre-construction, construction and operational stages.

In addition to above, APDCL, while executing any project takes all necessary precautionary measures to ensure that project should not affect any E&S parameters. It will ensure that the detailed survey and development of master plan for substations will re-identify potential environmentally and socially sensitive sites / areas / issues, to avoid or minimize impact of any kind. During execution of work, if APDCL comes across any unexpected environmental and social issues, it will take prompt action by implementing mitigation measures in consideration of the best technical solutions and document in the E&S monitoring reports.

6.2.1 Significance of Impact

The significance of each potential impact is established using the impact significance matrix shown in table below:

Table 6-4: Significance of Impact Criteria

Magnitude of Impact[6]	Sensitivity of Receptors[7]			
	Very High	High	Medium	Low
Major	Critical	Major	Moderate	Minor
Moderate	Major	Major	Moderate	Minor
Minor	Moderate	Moderate	Minor	Minimal
Minimal	Minimal	Minimal	Minimal	Minimal

6.2.2 Impacts Matrix

The subprojects are largely situated on plain terrain and mostly under the ownership of various state government departments or APDCL / AEGCL land. A few locations are in private land and some has been donated. The present land use of the proposed locations varies from crop cultivation, Tea plantations or waste land areas. No substations are located within the Protected Areas (National Parks, WL Sanctuaries etc.). However, out of the proposed 135 substations under Priority / Phase I, Chandrapur sub-station is located within notified ESZs area of Amchang Wildlife Sanctuary and the Pobitora Sanctury, No Objection Certificate (NOC) from ESZ Monitoring Committee of Amchang

[6] The magnitude of impacts has been categorized as major, moderate, minor or minimal, based on consideration of parameters such as: (i) duration of the impact; (ii) spatial extent of the impact; (iii) reversibility; (iv) likelihood; and (v) legal standards and established professional criteria

[7] The sensitivity of E&S receptors (a parameter that may be affected by the project) has been determined based on review of the local population (including proximity/numbers/vulnerability) and presence of features at the project sites or the surrounding area

Wildlife Sanctuary and Pobitora Sanctuary shall not be required, according to the ESZ notification F.No. 6-60/2020WL Part(I) dated 16th July 2020. Project activities in ESZs will strictly follow the guidelines issued by MoEF&CC regarding the prohibited, regulated and permitted activities as below.

Activity	Prohibited	Regulated	To be promoted
Discharge of effluents and solid waste in natural water bodies or terrestrial area	Yes	--	--
Felling of trees	---	Yes	---
Commercial use of natural water resources including ground water harvesting	---	Yes	---
Erection of electrical cables	---	Yes	---
Widening of roads	---	Yes	---
Movement of vehicular traffic at night	---	Yes	---
Air and vehicular pollution	---	Yes	---
Sign boards and hoardings	---	Yes	---
Underground cabling	---	---	Yes
Rain water harvesting	---	---	Yes
Renewable energy	---	---	Yes
Green technology for all activities	---	---	Yes

No Resettlement and Rehabilitation issues are identified at this stage of project. Compensation of standing crop and trees is proposed be provided to affected people as per Electricity Act, 2003. The overall E&S risks associated with the project will be insignificant, whereas the project will contribute to major economic development in the relevant areas. A detailed analysis of E&S impacts as identified as part of baseline assessment is described in a matrix format in table below, for project pre-construction, construction and operation stages.

Table 6-5: Environmental and Social Impacts Matrix

Sl. No.	Project Activity	Potential Environment & Social Impact	Impact (Positive/ Negative)	Nature (Temporary/ Permanent)	Significance
Pre - Construction Phase					
1	Substation location and design	Exposure to noise. Disturbance to the adjacent lands and the people due to cut and fill operations	Negative	Temporary (during pre-construction activity only with medium sensitivity to receptors)	Minor
2	Location of distribution line alignment and design	Exposure to safety related risks. Impact on residences, railway, road, other utility for safe clearances	Negative	Temporary (w.r.t construction and tower footing with high sensitivity to receptors)	Moderate
3	Equipment specification s and design parameters	Release of chemicals and harmful gases in receptors (air, water, land)	Negative	Temporary (equipment to be stored or used as per specifications of manufactures / supplier	Minor

Sl. No.	Project Activity	Potential Environment & Social Impact	Impact (Positive/ Negative)	Nature (Temporary/ Permanent)	Significance
				with medium sensitivity to receptor)	
4	Encroachment into sensitive ecological areas	Loss of ecological values/ damage to protected species	Negative	Permanent impact with high sensitivity	Critical
5	Explosions / Fire	Hazards to life due to improper storage of combustible or flammable material	Negative	Temporary (Limited to Substation only and modern fire control systems/ fire protection walls is to be considered as part of design specifications. If occurs, sensitivity toward receptor will be high)	Moderate
6	Substation Land	Most of the selected land parcel is government land. Where *Patta* land or private land is considered, applicable compensation to be paid as per law of land.	Negative	Permanent impact with high sensitivity	Moderate
Construction Phase					
7	Removal or disturbance to other public utilities	Public inconvenience	Negative	Temporary (Limited to construction period only with high sensitivity to receptor)	Moderate
8	Temporary use of cultivable lands	Loss of agricultural productivity	Negative	Temporary (Limited to construction period only with medium impact, considering the compensation as per the law of land)	Minor
9	Temporary outage of the electricity	Loss of power supply to the local community when distribution lines are switched off	Negative	Temporary (Limited to construction period only and medium sensitivity)	Minor
10	Equipment layout and installation	Noise and vibrations SF_6 leakage during storage and erection of Switchgear	Negative	Temporary (Limited to Substation premise and as per prescribed guidelines with high receptibility)	Moderate
11	Substation construction	Loss of soil Interference in drainage of rain and wastewater at site Water pollution	Negative	Temporary (Limited to construction period only, considering the presence of canals / channels, water bodies near to proposed location the sensitivity will be high)	Moderate
12	Construction schedules	Noise nuisance to neighbouring properties	Negative	Temporary (Limited to construction period only	Minor

Sl. No.	Project Activity	Potential Environment & Social Impact	Impact (Positive/ Negative)	Nature (Temporary/ Permanent)	Significance
		Nuisance to wildlife if the construction in vicinity of their migratory path		with medium sensitivity to receptors)	
13	Provision of facilities for construction workers	Contamination of receptors (land, water, air)	Negative	Temporary (Limited to construction period only with high sensitivity to receptors)	moderate
14	Surplus soil / earthwork	Runoff to cause water pollution, solid waste disposal	Negative	Temporary (Limited to construction period only with high sensitivity to receptors)	Moderate
15	Air Pollution	Loose dust might blow in the area causing dusty conditions	Negative	Temporary (Limited to construction period only with medium sensitivity to receptors)	Minor
16	Wood / Vegetation harvesting, cut and fill operations	Loss of vegetation and deforestation Effect on fauna	Negative	Temporary (Limited to construction period only, low sensitivity to receptor in presence of regulations)	Minor
17	Site clearance	Vegetation Soil erosion and surface runoff	Negative	Temporary (Limited to construction period only, considering manual site clearance sensitivity will be low)	Minor
18	Mechanised construction	Noise, vibration and operator safety, efficient operation Noise, vibration, equipment wears and tear	Negative	Temporary (Limited to construction period only, with limited mechanized construction sensitivity will be low. However, in case of demolishing of structure which are generally not RCC it can be considered medium)	Minor
19	Construction of roads for accessibility	Increase in airborne dust particles Increased land requirement for temporary accessibility	Negative	Temporary (Limited to construction period only with medium sensitivity to receptors)	Minor
20	Transportation and storage of materials	Nuisance to the general public	Negative	Temporary (Limited to construction period only and within specific area with medium sensitivity to receptors)	Minor
21	Trimming / cutting of trees	Fire hazards Loss of vegetation and deforestation	Negative	Temporary / permanent (Only before commissioning of assets with high sensitivity	Moderate

Sl. No.	Project Activity	Potential Environment & Social Impact	Impact (Positive/ Negative)	Nature (Temporary/ Permanent)	Significance
				to rectors)	
22	Occupational & General Health and safety	Injury of workers and members of the public to be mitigated with adequate safety measures.	Negative	Temporary / Permanent (Limited to construction period only with high sensitivity to receptors)	Moderate
23	Nuisance to nearby properties	Losses to neighbouring land uses	Negative	Temporary (Limited to construction period only with low sensitivity to receptors)	Minor
24	Work execution into farmland	Loss of agricultural production	Negative	Temporary (Limited to construction period only with high sensitivity to receptors)	Moderate
25	Interference with drainage patterns / Irrigation channels	Temporary blockage/ loss of agricultural production	Negative	Temporary (Limited to construction period only with high sensitivity to receptors)	Moderate
Operation and Maintenance Phase					
26	Noise generation	Nuisance to the community around the site	Negative	Temporary (within prescribed limits with low sensitivity to receptors)	Minor
27	Soil Erosion	Removal of topsoil	Negative	Temporary with low sensitivity to receptors	Minor
28	Maintenance of Substation & distribution lines	Exposure to electromagnetic interference	Negative	Temporary (within prescribed limits with low sensitivity to receptors)	Minor
29	Oil spillage	Contamination of land / nearby water bodies	Negative	Temporary / Permanent (within substation boundaries with high sensitivity to receptors)	Major
30	Operation of Switchgear	Leakage of SF6 gas	Negative	Temporary (within prescribed limits with low sensitivity to receptors)	Minor
31	Occupational & General Health and safety	Injury to workers and members of the general public	Negative	Temporary/ Permanent with high sensitivity to receptors	Major
Positive Impacts brought from the Project					
1	Revenue / income Generation	Sale / purchase / procurement of construction material, selling of power, etc.	Positive	Temporary / Permanent	Major
2	Increase in socio-economic activities	Availability of improved and reliable quality power	Positive	Permanent	Major

Sl. No.	Project Activity	Potential Environment & Social Impact	Impact (Positive/ Negative)	Nature (Temporary/ Permanent)	Significance
3	Creation of Employment	Employment Opportunities for skilled/ unskilled labourer's	Positive	Temporary / Permanent	Major

6.3 Impact Mitigation Strategy

The impact mitigation strategy will follow the hierarchy of ***avoid, remedial and compensate/offset.*** In the consideration of the substation sites, the following parameters to avoid impacts to the farthest extent possible were observed:

- Avoidance of settlement clusters or villages habitation sites
- Distance to be maintained from villages and cultivable lands
- Avoid inclusion of waterbodies, marshy land, etc. for selection of sites
- Avoid ecological sensitive areas and proximity of sensitive receptors (school, hospitals, etc.)
- Government wasteland to be sought for the establishment of the substation sites, where unavoidable, compensation to be paid to private owners as per applicable laws

As per discussions with APDCL authorities, while considering the distribution line routes, alternative route assessments shall be conducted considering the following parameters.

- Avoiding Forestland: The route selection shall consider the best option to avoid forest land / PAs as far as possible
- Avoiding Habitation: The key considerations in selecting the corridor route included avoiding clustered settlements, common access routes and pathways, markets, community structures and private land to the extent possible
- Length / Crossings: The distribution route identified shall ensure the most feasible one after considering the environmental, ecological and social impacts of the same
- The alignment of the distribution line should be most economical from construction and maintenance point of view
- The number of angle points to be kept to a minimum
- The distance between the terminal points specified to be kept shortest possible and consistent with the terrain that it encounters
- Marshy and low-lying areas, riverbeds and earth slip zones to be avoided to minimize the risk to the foundations
- It would be preferable to utilise level ground for the alignment
- Crossing of power lines should be kept to minimum. Alignment shall be kept at a minimum distance of 250 meters from power lines to avoid induction problems on the lower voltage lines.
- Crossings of communication lines should be minimum and shall be preferably at right angles. Proximity and parallelism with telecommunication lines shall be eliminated to avoid danger of induction between them
- Areas subject to flooding such as channels, drains, canals shall be avoided
- Restricted areas such as civil and military airfields shall be avoided including aircraft landing approaches
- All alignments should be easily approachable in dry and rainy seasons to enable maintenance throughout the year
- Areas that will present the problems of "Right of Way" and "Way Leave" during construction and maintenance shall be avoided
- Effort shall be made to keep the route at a distance from mining areas

Depending on the magnitude of the impact, the next sequence would be to provide remedial measures for the identified impact. Wherever required, suitable remedial measures are considered for the incurred impact as part of design alternations. Wherever remedial measures are not possible, compensatory mechanisms to be followed for suitable compensation and payment for the losses incurred. The last sequence in the hierarchy, with foremost attention being paid to avoiding as many of the impacts as possible by conducting awareness programs and safety Audits as part of the mitigation strategy.

Awareness Programs: Some of the safety awareness activities such as:

- Public awareness by meeting with villagers, builders, transporters, schools, NGOs/ CBOs, and putting up safety posters, safety slogan and advertisement in print and electronic media
- District commissioner / electrical inspector / police department / local authority approached for removal / prevention of unauthorized construction nearby EHV transmission lines violating Electricity Act 2003
- Education to workers on Personal Protective Equipment (PPE), safety tools and prevention of risks

Safety Audits: Safety inspections to be undertaken by Environmental and Social Specialist of PMU and PMC as a regular practice. Steps needed to follow:

- Checking of safety tools - Availability and its present condition; Utilization and testing
- Safety awareness and identifying hazards for various maintenance activities in the switchyard
- Precaution to be taken while issuing permit for the work
- Operation of portable fire extinguishers and their healthiness
- Ensuring electromagnetic field (EMF) is minimized using proper design criteria as per Indian Electricity Act rules.

6.4 Environmental & Social Impacts Assessment and Mitigation

Generally, in development related projects, physical and biological issues / impacts are the most common ones. However, these are not exhaustive, and many issues are site-specific based on the existing environment. Before implementing development activities, the likely environmental impacts must be assessed and mitigated by proper measures.

The biodiversity sensitivity area such as Kaziranga National Park, Manas National Park, Orang National Park, Nameri National Park, Dibru-Saikhowa National Park, Panidehing WLS, Hollongpara Gibbon WLS, Nambor-Doigurung WLS, Burhachapori WLS, Laokhowa WLS, Sonai-Rupai WLS, Chakrasila WLS, Dihing-Patkai WLS, Borail WLS, Amchang WLS, Deepor Beel Wildlife Sanctuary lies in sub-project districts. However, the substations and distribution lines, does not lie in these sensitive areas and does not have major impacts in biodiversity. The project area mostly lies in the plain and partially hilly region which as susceptible to land slide and erosion due fragile nature of hill.

The E&S risks associated with sub-projects may involve influx of labour for construction activities. Labour working conditions, therefore, has potential impacts on physical, cultural and social environment. Moreover, there are risks related to transportation and access roads near sites. This aspect has also been considered during the assessment process.

In terms of the sub-projects, adverse environmental impacts are anticipated to be temporary in nature, like labour camps and contractor camps. Landslide, soil erosion, safety hazards, construction disturbance, disposal of debris, worker health and safety and irritation from dust and noise in the sub-project site are some of the impacts which occur during the construction stage -with short-term negative impacts. These impacts can be minimized to an acceptable level in accordance with the Financiers' safeguards and good environmental practices. The above adverse impacts are separately listed in environmental and social category.

6.4.1 Environmental Issues / Impacts

6.4.1.1 Positive Impacts

Reduction in Greenhouse Gas Emission

Availability of power lessen the demand of natural resources like firewood, charcoal etc. for daily needs, resulting in conservation/protection of forest/vegetation which will directly contributes in reduction of GHG emissions. Since, Residential emission itself stand on second place in contribution of air pollutant ion to the ambient level.

6.4.1.2 Adverse Impacts

Physical Impacts

Pre-Construction Phase - Land Use Change

The construction of substation and proposed lines will require APDCL to acquire the land and change its use type. Construction in agricultural land shall change its utilization from agriculture to build-up area. On an average the substation will require ~2500 - 4000 Sq.m.

- Construction of substation on agricultural land and access road to substation will convert the agricultural line into built up area.
- The area below distribution line will be clear and vegetated area will be clear,

Construction Phase - Land Pollution

Land pollution as discussed here, is the consequence of soil erosion, landslide, stockpiling of construction material on temporary land, waste and spoil disposal. The impacts on the land due to implementation of sub-projects are:

- The foundation excavation works will disturb the soil and rock condition of limited areas.
- The excavation for poles as well as substation foundation may lead to soil erosion and siltation issues in the vicinity. Besides the clearance of forest areas might involve erosion and siltation contaminating the nearby water bodies.
- Haphazard storage of construction material like storage of sand and gravel over fertile land will reduce the fertility of land

Construction Phase - Impact due to land stability and soil erosion

Particularly construction of distribution lines and substation require excavation works. Construction of distribution lines on hilly slope area may destabilize the slope which shall trigger landslides due to percolation of rainwater through loosened excavated earth. Further, the soil will be more prone to erosion due to rain, wind after excavation activity.

Construction Phase - Losses of standing crops

The construction of substations and stringing of distribution line will cause disturbance to the agricultural produce due to reduced productive land. This will affect farmers and their income. Operation of construction activities during cultivation period will damage the crop and hamper farmer economy.

Construction Phase - Impact due to stockpiling of construction material on temporary land

Unmanaged and haphazard stockpiling of construction material during construction period on temporary land will cause adverse impact on the land environment since the soil composition may change in presence of cement etc. Stockpiling of construction material in fertile land will degrade the fertility value and reduce the agricultural production level. Such as storing of construction material like sand, gravel, cement etc. on the fertile land will form a layer of deteriorate material will over the previous fertile land and will affect the root of plant. Further, the store material will be sweep by the rainwater and deposit on the low land and natural stream. Which block/reduce the flow of natural stream.

Ambient Impacts

Construction Phase - Impact due to waste disposal

Construction activities will produce the different waste material such as construction debris, solid waste from camp site. The nature of waste will be different on the basis of source. Construction wastes are mainly non-biodegradable solid waste and waste from camp sites are mainly decomposable.

- Haphazard disposal of construction waste will degrade the soil value and production level.
- The distribution wires, fittings, metals will cause injury to the local people if thrown haphazardly on the road and field.
- Unmanaged disposal of solid waste from camp site will cause water pollution, nuisance etc.

Construction Phase - Air Pollution

Dust particles are likely to be emitted during excavation for foundation works and breaking activities. Furthermore, the movement of vehicles for the hauling of materials and supervision works will also affect air quality of the project area. Since most of the area of distribution line and substation is accessible only by rural road and use of equipment is also minimum, the likely impact on air quality is insignificant.

Construction Phase - Water Pollution

For various construction activities, water will be used from the nearby rivers, rivulets etc. Inappropriate waste disposal of debris, solid wastes such as cement slurry, other construction material and human wastes from camp site may deteriorate the river water quality. There is the general trend of disposing of organic material and washing/cleaning of equipment in water bodies which will pollute the water resources.

Construction Phase - Noise and Vibration Pollution

Construction of distribution lines and substation will be done by semi-mechanized method such as manual excavation will be done, manual cable stretching using simple hand tools. Most of the area of distribution line is accessible only by foot track and use of equipment is also minimum. The workforce involved and machines used for the construction activities like excavation, concerting etc. will produce insignificant noise and vibration of low intensity. Therefore, the likely impact on noise and vibration is considered insignificant.

Operation & Maintenance Phase - Air Pollution

Air pollution during operation is due to emission of harmful gases from distribution line. The impacts are significant for high voltage distribution line. The efferent of corona are:

- Corona discharges from the distribution lines generate minute quantities of ozone (O_3), nitric oxide (NO) and nitrogen dioxide (NO_2).
- In general, the effects of Corona also include the production of ozone gas surrounding the distribution line conductors.

The proposed distribution lines are of 33 and 11 kV, so the impact is not much significant.

Operation& Maintenance Phase - Noise and Vibration Pollution

The noise and vibration produced in the distribution lines may cause impacts near settlement and wildlife habitat area. The audible level of corona in distribution line is usually measured at the edge of the RoW i.e. 10 m approximate from the outer conductors.

Operation& Maintenance Phase - Impact due to interference of distribution line with roads, other lines and infrastructure

The distribution lines will follow the RoW of roads, riverside and boundary of forest area. The likely impacts are:

- The construction of distribution line near road will reduce available sight and stopping distance of road.
- Furthermore, any infrastructure lying along the route of distribution line and in substation needs to be removed to facilitate the construction activities. Therefore, during distribution line route and substation location selection, information of existing infrastructure shall be collected and the route with minimum disturbance to facilities shall be selected.

6.4.2 Biological Environment

Construction Phase - Impact on Vegetation

When distribution lines pass through forest land, trees lying within the RoW need to be clear for sustainable operation and easy in maintenance. The clearance of RoW will cause loss of vegetation and trees.

Construction Phase - Possible collection of forest product for firewood and timber

The labour in the construction site and their dependents will increase the demand of fuel such as wood for their use and timber for making temporary sheds. However, it is assumed that priority will be given to local labour force which will reduce the fuel wood demand.

Construction Phase - Disturbance to wildlife and wildlife habitat

During construction period movement of labour and transportation of equipment and material at site will create threat to the wildlife and disturb their movement near work site. Further clearance of trees will reduce the availability of habitat for mammals and birds. The impact of loss or fragmentation of habitat varies in different animals.

Construction Phase - Impact on Avifauna Electrocution & Risk of Collision

Electrocution of birds is caused when a bird bridges the gap between either a live phase or an earth component (phase-earth electrocution) or two live phases (phase-phase electrocutions) (Harness and Wilson2001). Birds sitting on power poles and /or conducting cables could cause short circuits between energized wires or short to ground especially for numerous medium sized birds and large birds using the power poles as perching, roosting and even nesting sites. Birds can cause electrical faults (short circuits on power lines). Power lines pose several threats to a variety of birds especially those migrating, in large flocks and large birds with limited manoeuvrability. Birds of prey are vulnerable to mortality due to overhead lines.

Risk of Collisions are a significant threat posed by overhead lines to birds (van Rooyen 2004). Those that would be mostly impacted are Bengal Florican, storks, cranes and various species of ducks. These species are mostly heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding with power lines (van Rooyen 2004, Anderson 2001).

Note: The potential impacts of bird collision and electrocution are correspondent to the species and their flight heights. Vultures are at risk on power line structures in terms of both collisions and electrocutions due to their far-ranging nomadic habits and their colonial nature. They are gregarious and often attempt to perch together on one structure. Bird species including ducks and herons are more likely to die of power line collisions than from electrocutions others include storks and corvids due to their morphology and behaviour. These birds are most at risk of electrocution due to their relatively wide wingspans and tendency to use poles as nesting platforms and perches from which they survey for prey.

Construction Phase - Habitat fragmentation

The degree of impact on wild animals depends entirely on the species present, forest type and abundance of food. Clearance of vegetation within RoW will create the break line and divide the forest which will disturb their movement across the distribution corridor and break their natural route.

Construction Phase - Rare, endemic, threatened, endangered, protected plants due to site

clearance

No significant impact is expected on rare, endemic, threatened, endangered, protected plants due to site clearance during construction period of the proposed project. This has been confirmed during baseline survey.

Construction Phase - Impact on aquatic life

No significant impact is expected on natural habitats and communities due to construction of the proposed project as there is no water in dry season as well the construction work is not carried out in the rainy season.

Construction Phase - Forest fire hazard

The project area and the vicinity have a thick and dense forest which are prone to forest fire. Similarly, the current carrying wire shall be have high chances of lightning. Improper precaution against lightning shall damage the distribution line and cause fire.

6.4.3 Social Issues/Impacts

Beneficial Impacts

Project beneficiaries are mostly rural women, indigenous, disadvantaged groups Dalit, marginalized people, school children, pregnant women, senior citizens, service provider, GoA organizations and private service holders, farmers and marginal farmers, small and cottage industries, smalls firms, businessmen big investors etc. from rural electrification.

APDCL envisages construction and system reinforcement of 33 / 11 kV substations 33 kV lines, 11 kV lines, LT lines and facilities will enhance access of electricity supply to local people through 33/11kV distribution lines, which shall directly contribute to increased socio-economic wellbeing with improved access to different types of services and facilities. It ultimately aims to reduce poverty with and uplift the existing level of livelihood accompanied by increased income, employment and access to digital services. Considering the nature and scope of the project there can be multitude of positive environmental and social impacts:

- To help and achieve the Millennium Development Goal (MDG) targets directly or indirectly
- Helps poverty reduction through rural electrification
- Reduce dependency on natural resources
- Helps to decrease workload of women, marginal people and occupational castes
- Helps school children for in better education
- Provides all servicers providers quality service
- Helps to establish small business firm, other business activities and market economics related to the access of electricity

Employment Opportunities

One of the major benefits of the Project implementation for the local project affected people is the generation of job opportunities. Construction activities require both skilled and unskilled labour during project implementation. Priority will be given to the locals during labour selection. This will enhance the income of local people and enhance living standards in the project areas. Growth in employment can be tracked through compliance monitoring during implementation stage such as number of local persons involved in project, Number of new industries established etc.

Enhancement of local skills in rural areas

The development of the Project will require advanced equipment and a host of technical expertise that will be carried out in the project area. As the local people will be involved in the construction activities as

per their qualification and skill, this technical expertise shall be passed on to local people. Over time, it will boost the quest for technical knowledge and result in overall growth of knowledge quotient. This experience not only enhances the conventional skills at local level, it also helps the local people to get engaged in similar projects elsewhere in India.

Increase in trade and infrastructure

Electrification will help to increase trade and business through opening of business centres, new industries, hotels, shops, etc. Availability of electricity will increase income and production levels, thereby enhancing the spending capacity and boosting business growth.

Utilization of local commodities

Construction activities increase the disposable income of human resources in the project area thereby increasing the consumption of local commodities. Further, the construction activities require different construction materials like aggregate, sand, cement, steel etc. These materials shall be bought from the locally available market centres.

Enhancement in Rural Electrification

The implementation of the Project shall help to supply electricity to remote and rural areas of Assam. It will also help to meet the government's target of 100 % electrification and ***APDCL vision 2030.***

Formation of forest fire line zone

The construction of distribution line needs clearance of trees lying beneath and within RoW for sustainable operation. Such clearance of tree underneath the distribution line will create the open ground forming the fire line zone. Such clear zone prevents spreading of forest fire and protects flora and fauna within the forest area.

Enhancement of Education and Health Sector

The education and healthcare facilities in rural areas is not as good as in urban areas. This is mainly due to lack of proper infrastructure and availability of electricity required for the operation of necessary equipment. As there is no access to electricity, currently the students in these areas lack the awareness of technological changes brought about in the last few decades. Computer skills have become fundamental and basic for students elsewhere. However, students in the project lack these skills because their villages have been hitherto unconnected to the national grid.

Similarly, in healthcare sector many technological innovations such as X-ray machines, sonograms, MRI machines, etc. are being used in the urban areas. However, people in rural areas do not have such access, and in many cases, this results in fatality. This is the unfortunate consequence of lack of proper health instruments due to lack of access to electricity.

Enhanced Productivity

Assam is rich in resources such as natural herbs, agricultural products etc. which are the raw materials for the pharmacy industry. These materials are found in abundance in rural areas. Due to lack of industries for processing the raw material into finished product which can be sold to urban centres, the resources are not being utilized.

Adverse Impacts

Generally, gender, indigenous people, poverty, land, private structures, livelihoods, community facilities, healthcare and sanitation, wages related issues are common in development projects. Impacts on land acquisition and involuntary resettlement are categorized as permanent and temporary impacts. Permanent impacts include land and assets acquisition for construction of sub-stations. During project preparation, a site visit was conducted by both environmental and social experts in the month of January 2020 and based on the outcome of initial site visit, stakeholder consultations and available primary and secondary information of proposed projects, results of social impacts are as follows:

Land and Structures Impact

Small share of private, government, APDCL own land, AEGCL land, Tea Garden land required for each distribution Sub-stations, has been finalized and donated by the concerned landowner for the proposed project. Therefore, no land and structures acquisition and involuntary resettlement taking place due to the project. Land proposed in the tea estate are usually barren land without any tea plantation. Tea estate owners are usually in favour of sharing the land for the proposed s/s through mutual consent. Substations proposed in the government land are also barren land and free from encroachments and squatters. No physical and economic displacement will occur due to minor land acquisition.

Impact on Crops and trees

As expected, during construction, temporary impacts include loss of crops, trees etc along the Right of Way (RoW) of distribution lines from tapping point to construction site may be triggered. Distribution lines are pole based, will not have any permanent impact in this project.

Impact on livelihood

Project construction activities may disturb and affect the existing livelihood pattern. However, these issues are nominal in the sub-project. The project is not likely to impact the livelihood permanently by the project activities.

Impact in community infrastructure and utilities

No community properties such as irrigation canals, playgrounds, waiting places, access trails/roads, community buildings, etc. are likely to be disturbed permanently as well as temporarily by the project.

Impact on aesthetics, cultural and places of historical importance

No impact on aesthetics, cultural and places of historical importance during construction of the proposed project.

Impacts on vulnerable people and communities

No impacts will be triggered on vulnerable people and communities by the sub-projects.

Impacts due to Chance Find Archaeological Property and Procedures

All fossils, coins, articles of value of antiquity, structures and other remains of archaeological interest discovered on the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation. The chances of damage to remains of archaeological interest is higher in absence of pre- defined procedures for dealing with such articles or things.

Impacts on Occupational Health and Safety

Major occupational health and safety hazards specific to power substation primarily include:

- Live power lines: Workers may be exposed to occupational hazards from contact with live lines during operation & maintenance activities
- Working at height: Workers may be exposed to occupational hazards when working at elevation

During construction physical injury can result from workers slipping along the slopes, road accidents, accident to workers during erecting of towers and other occupational hazards. Stringing activity around low tension/ high tension wires and other electrical units can be a potential hazard if proper planning is not followed. Workers at times are not accustomed to use of Personal Protection Equipment (PPE), their attitude to avoid PPE may result in accident/hazard. Almost all of the environmental, health and safety aspects of the projects are very well governed by Indian standards, rules and guidelines, wherever such standards are not available, international standards and guidelines such as Environmental, Health, and Safety General Guidelines and Environmental, Health, and Safety Guidelines of International Finance Corporation (IFC) to be referred

Impacts on Labourers

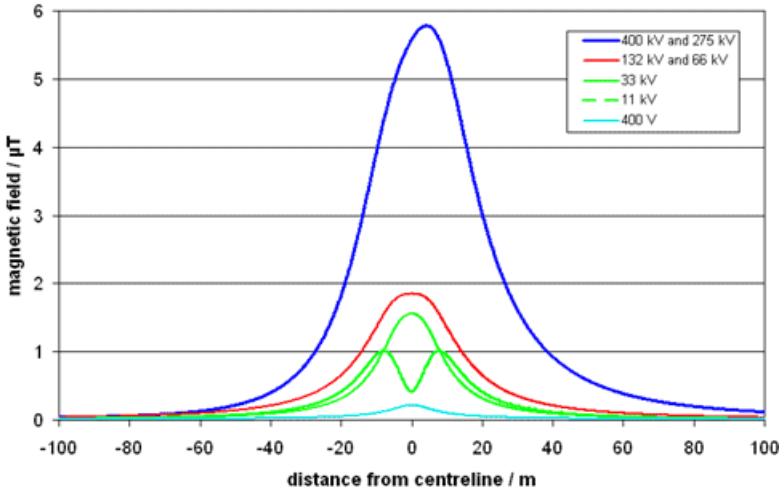
The risk for sexually transmitted disease and other communicable disease from other states in case of migratory labour will be higher due to lack of skilled labour in Assam, as discussed with APDCL. The sanitation conditions of the labour camps and availability of basic health care facility can also result in off spread of disease and safety issues. The project will also involve Safety and security concerns of women and other population around the construction site. The chances for violation of labour laws (No child labour, minimal wages, equal labour wages, migratory labour license, labour license, Insurance etc.) are minimal considering the contractual binding but cannot be left unaddressed. However, to keep a check on the compliance weekly monitoring of compliance towards contractual clauses as well as legal requirements is highly recommended by local officials of APDL as well Project Management Consultancy.

Impacts due to Electric and Magnetic fields

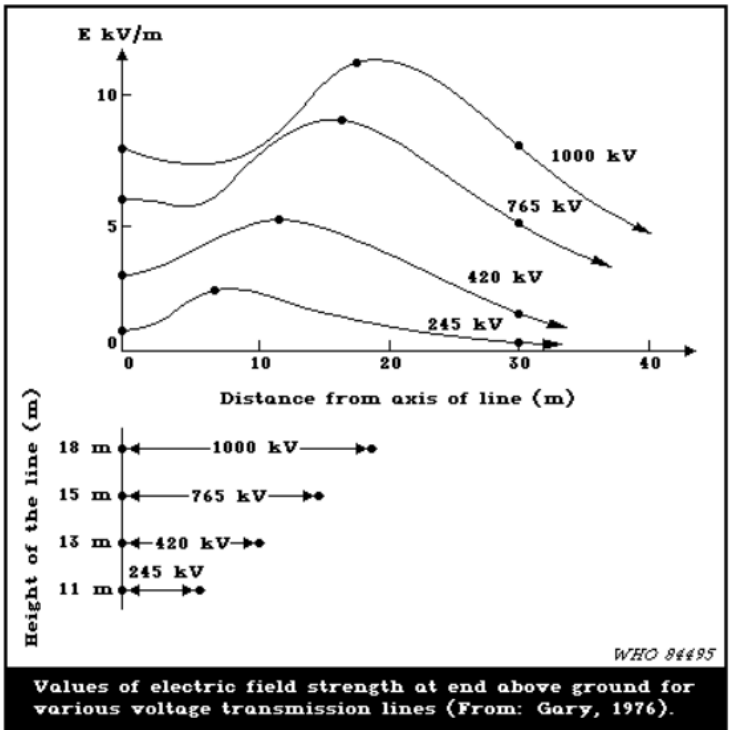
Electric and magnetic fields (EMF) are invisible lines of force emitted by and surrounding any electrical device (e.g. power lines and electrical equipment). Electric fields are produced by voltage and increase in strength as the voltage increases. Electric field strength is measured in kilo volts per meter (kV/m). Magnetic fields result from the flow of electric current and increase in strength as the current increases. Magnetic fields are measured in units of gauss (G) or tesla (T), where 1T equals 10,000 G. Electric fields are shielded by materials that conduct electricity, materials. Magnetic fields pass through most materials and are difficult to shield. Both electric and magnetic fields decrease rapidly with distance. Power frequency EMF typically has a frequency of 50 Hertz (Hz) and is considered Extremely Low Frequency (ELF).

Although there is public and scientific concern over the potential health effects associated with exposure to EMF there is no empirical data demonstrating adverse health effects from exposure to typical EMF levels from power transmissions lines and equipment. However, while the evidence of adverse health risks is weak, it is still enough to warrant limited concern. World Health Organization (June 2007) recommends using exposure guidelines published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). The ICNIRP (2010) has set the limits at 50 HZ for the public exposure as: (1) electric field strength (kV per meter) is 5 kV/m, and (2) magnetic field strength (micro tesla) is 200 μT (equivalent to 160 A/m); while for the occupational exposure as: (1) electric field strength is 10 kV/m and (2) magnetic field strength is 1000 μT.

Figure 6-2: EMF Cross Section for Typical Magnetic&Electric Fields of Overhead lines



Source: *EMFs. Info*



Values of electric field strength at end above ground for various voltage transmission lines (From: Gary, 1976).

Table 6-6: EMF Exposure Limits of ICNIRP

Exposure	Electric Field (kV/m)	Magnetic Field (μT)
Public	5	200
Occupational	10	1000

From the above given cross section figure it can be surmised that, the typical electromagnetic field of a 33 kV line at 7.5 m (i.e. the RoW on one side of the 33 kV line) is of the magnitude of 1 μT, which is far below than the permissible safe level of 200 μT and EMF level. Based on the above analysis no further environmental and occupational health impacts due to EMF generation are considered under this study. Based on the Figure 6-2 from literature review[8], the maximum electric field generated by the 245-kV double circuit line is estimated at 2 kV/m, around the distance of 7 m from axis of line, less than the 5 kV/m safe limit for public specified by ICNIRP. The electric field of 33 kV DC line will be far less than 2kV / m, besides, the RoW of 33 kV DC line is 15 m, which is wide enough to maintain 7 m.

Others

The other issues likely to occur in the sub-project areas are - change in demographic profile due to the contractor employee increase, business by the project activities. The healthcare and safety issues will be raised mainly in sub projects construction phase. All of the above issue shall address by the preparing Abbreviate / Resettlement Plan (A/RP), Tribal Peoples Plan (TPP). The other local issue will be address through Grievance Redress Committee (GRC). If extra land will be required during construction stage, Land acquisition process shall be followed. SIA will be carried out properly. Grievance redress mechanism shall be established as per the recommendation by ESMPF. Information will be disclosed timely. Meaningful consultation will be conducted with concern stakeholders. Land Acquisition Resettlement and Compensation (LARC) process shall be followed as per GoA, GoI and Financiers' requirements.

Summary of Social Safeguard Impacts and Risks

This section details out the potential social impacts of the project which were identified during the screening process of the proposed project.

[8] Extremely Low Frequency (ELF) Fields (http://www.inchem.org/documents/ehc/ehc/ehc35.htm) published by WHO 1984.

Table 6-7: Social Impacts Associated with the Selected Sub-Stations

Sl. No.	Name of/type of Sub-project	Impact on Land		Impact on Structures	Impact on Livelihoods
		Land Ownership	Approx. amount of land required (m^2)		
1	Tupia	State Govt	1000 to 4000	None	None
2	Bongalmora	State Govt			
3	Simluguri	State Govt			
4	Kuthori	State Govt			
5	Mahmora	Private Land Donated			
6	Garchariali	State Govt			
7	Kuralguri	APDCL			
8	Nayapara	APDCL			
9	Koila Moila	State Govt			
10	Uttar Barpeta Road	State Govt			
11	Salakati	State Govt			
12	Lakhimpur	State Govt			
13	Silbori	State Govt			
14	Dwarkuchi	State Govt			
15	Daranga	Tea Garden committee			
16	Chandrapur	APGCL			
17	Rampur	Private donated land			
18	Bongara	AEGCL			
19	Bhakotgaon (Topatoli)	State Govt			
20	Haticherra	Tea Garden committee			
21	Jaipur Rajabazar	Tea Garden committee			
22	Kothal road	Tea Garden committee			
23	Bazarghat	Temple committee			

6.4.4 Mitigation Measures

6.4.4.1 Beneficial Impact Enhancement Measures

With the Project implementation, the local rural people will be benefited. Key benefits are - rural electrification, employment opportunity, income generation, opening of new small- and large-scale industry, enhancement of education and health sector, operation of industry etc.

APDCL will ensure priority to local workforce while selecting labour for the project. This will increase the employment of local people. The availability of jobs at local level shall garner local support for the Project. This is essential for the sustainability of any project. The job opportunities will increase their income level and enhance their living standards The Project will provide the equipment operation training which will be used in project which will further help to enhance the technical skill. The knowledge of distribution line and substation construction form the Project will help the skill people to get job in for similar other projects.

6.4.4.2 Adverse Impact Mitigation Measures

Mitigations for Physical Impacts

Pre-Construction Phase - Land Use Change

Construct of distribution lines and substation structure will change the land use pattern. The project might affect agriculture land, forest land, Market Area or dense settlement and change their use pattern. Key steps to minimize the impact shall be taken while selecting the route for distribution line alignment. If possible, line alignments shall pass through barren land or RoW of existing road without hampering traffic movement, etc. Following mitigation measures shall be adopted to minimize the adverse impacts:

- Selecting line route which required least land acquisition.

- Wherever possible the line route will avoid forest and wet land
- To the extent of possible, barren land will be selected for line route and for construction of substation
- Wherever possible, the proposed line will be aligned along the existing RoW of road without hampering traffic movement.

Construction Phase - Land Pollution

Land pollution discussed here is the consequence of soil erosion, landslide, stockpiling of construction material on the temporary land, waste and spoil disposal.

Construction Phase - Losses of standing crops

The construction of lines and stringing of distribution line will cause disturbance to the agricultural produce due to reduced productive land. This will affect farmers and their income.

The following measures shall be followed to minimize the impacts –

- Stringing of the line and other construction activities will be done in off-farming season
- The proposed line will be aligned along the existing RoW of road and edges of the fields
- The affected farmers shall be suitably compensated of standing crops and fruits on the basis district agriculture rate valuation by district agriculture office.

Construction Phase - Impact due to land stability and soil erosion

Excavation work in the hills will cause further losses the slope. The exposed surface water can percolate easily reducing the strength and stability of hilly slope. Therefore, proper precaution shall be taken during excavation. To minimize the possibility of landslide and soil erosion at working site following mitigation measure will be adopted:

- The pole location identified for distribution line should be stable and in flat ground if possible.
- Proper geological study shall be conducted to determine the ground conditions if necessary.
- The excavation shall not be done during rainy season in hilly slope.
- Construction of line may over-burden the slope land and may trigger the slide. Therefore, soil bearing capacity and strength of slope land shall be checked before construction of lines and substation.

Similarly, improper dumping of debris will cause soil erosion in rainy season and impacts lower land in hill area, agriculture land and increase sediment flow in river.

- The debris generated from excavation will be removed from the site immediately or will be reused at the site. If possible, the debris shall be used for backfilling which reduce the need of dumping site.
- The debris will not be left at the site under any circumstances. Proper spoil dumping site will be located before start of the project.

Construction Phase - Impact due to stockpiling of construction material on temporary land

The project will apply high priority to safety and management of construction material. Materials like cement, aggregate, soil, electric wires, metals etc. shall be used in construction of lines and substations. Improper management may increase the wastage of construction material and pollution of land, water and air. Erosion of piled soil, sand and aggregate may damage the road, agriculture land, silting issues in nearby natural streams. Similarly, the wind causes dust issues in soil and sand stored in open ground without cover. Therefore, these hazards can be minimized by adopting following measures to large extent.

- The construction material stockpiling yard will be identified before start of construction activities and will be approved by site engineer
- The selected yard site will be barren land as far possible
- The land for storing the construction material shall be far from the agriculture land and water bodies
- Prior permission from the local stakeholders shall be taken before commencing the stockpiling of material
- Construction materials shall be covered with tarpaulin during stockpiling to prevent rainwater and dust emission generated from the stockpiling site. It should be encircled with side barriers and cover so that incidence of mix up with deleterious materials is imminent
- Stockpiles shall be kept wet by sprinkling water or covered so that erosion by wind causing dust does not occur
- Haphazard disposal of construction materials shall be strictly prohibited

Mitigations for Ambient Impacts

Construction Phase - Impact due to waste and spoil disposal

Careful management of waste produced from construction activities and camp site is very essential. Chances of erosion of spoil during rainy season is high due to flooding. This may damage the agriculture land and also deposition of spoil in water sources affects aquatic life. Following mitigation measures shall be followed to mitigate the likely impacts:

- The Contractor shall prepare a detailed site-specific Environmental Management Plan (EMP) including suitable disposal locations for spoils/wastes and that shall be approved by the Supervision Consultant
- Locations for disposal will be selected with the consent of local community, RMS representatives, and the sites shall be located at least 1 km away from the settlements, schools, hospitals, religious and cultural sites, water sources including other sensitive areas from environmental point of view
- The Contractor shall use such spoils/wastes for construction purposes as far as possible
- Proper drainage facility shall be provided around spoil disposal site
- Similarly, waste from camp site will be properly managed and disposal in river and open ground will be prohibited and shall be monitored
- Pit toilet facility will be provided at camp site and open defecation will be prohibited
- The organic solid waste from camp site will be decomposed in compost bin or by constructing pit ground and covered by the sufficient thick layer of soil
- The un-decomposed solid waste will be managed by the contractor and will not be allowed to seep through in water sources, forest land, agriculture land, etc.

Construction Phase - Air Pollution

Air pollution occurs mainly due to the emission of dust particles during excavation, transportation of spoil and construction material. Appropriate mitigation measure shall be adopted and will be included in the EMP to compel contractor to follow mitigation measures as follows:

- The vehicle plying on the road for transportation of construction material and spoil will be properly checked and proper condition and as per government law shall be ensured
- The construction material and spoil will be covered by tarpaulin during transportation
- Construction materials shall be covered with tarpaulin during stockpiling to prevent rainwater and dust emission generated from the stockpiling site. It should be encircled with side barriers and cover

so that incidence of mix up with deleterious materials as imminent

- At the work site, dust emission will be controlled by regular sprinkling of water

Construction Phase - Water Pollution

The main impacts on the water source is due to disposal of excavated spoil, solid and liquid waste from camp site. Proper arrangement shall be made at site for proper management of waste –

- The solid waste generated by workforce shall be disposed-safely away from water resources
- Onsite sanitation facility will be provided at the camp site
- Good construction practices and site management will be adopted to avoid impacting soil and ground water, and pollution of water bodies from accidental spills from fuels and lubricants etc.
- The construction equipment and vehicles shall not be allowed to wash and clean in the water bodies near site. Maintenance and cleaning will be carried out in garage.

Construction Phase - Noise and Vibration Pollution

The noise pollution and vibration occur at site during excavation works and civil works for substations. Therefore, these activities will be properly scheduled for site near settlement. The noise level above 90 dB will cause disturbance for animal and humans. So, noise level at work site shall be regularly monitored and maintain well below standard.

- The vehicle being used for transportation of construction material and spoil shall be regularly checked and kept in good condition. Vehicles producing high sound will not be allowed to move on the road and near working site
- Drilling equipment with low sound emission shell be used and if possible, sound trapping machine like silencer will be attached
- The drilling and excavation work will be carried out during daytime and not allowed in night-time

Operation & Maintenance Phase - Noise and Vibration Pollution

The noise and vibration level produced from 33 kV, 11 kV and LT distribution lines are very low. According to available information, for line voltages below 345 kV, amplitude modulated (AM) levels are of little or no significance.

- Noise levels decrease rapidly with distance from the 33 kV, 11 kV and LT distribution line and in the presence of trees or buildings
- Some noise is also expected in the substation area but will be within the permissible limit
- Transformers usually produce some moderate noise in the substation area, though it is generally less than 85 decibels, the overall magnitude is insignificant.

Operation & Maintenance Phase - Impact due to interference of 33 kV, 11 kV and LT distribution line with road, other lines and infrastructure

The infrastructure particularly road, building along the 33 kV, 11 kV and LT distribution line is significant when the structure is constructed near the infrastructure. The following mitigation measures shall be followed to minimize the impacts –

- 33 / 11 kV substation, 33 kV line, 11 kV line and LT line locations will be kept sufficiently away from road edge - not to hamper the setback and sight distance.
- 33 / 11 kV substation, 33 kV line, 11 kV line and LT line locations will be away from water source.
- While installing electric distribution lines of more than 11 kV across the road in a densely populated area, the double insulator system shall have to be used
- No electric wire shall be carried above the house

Operation & Maintenance Phase - Electromagnetic fields hazards

Electric and magnetic fields known as electromagnetic field (EMF) are created by the presence of voltage and current near to the power apparatus in a substation. The height of distribution lines will be made sufficiently high to ensure the proper ground clearance and away from structure to minimize the chance of EMF hazard.

Mitigations for Biological Impacts

Construction Phase - Impact on Vegetation

During construction of 33 / 11 kV substation and distribution lines, the following measures will be considered to minimize the impacts on vegetation:

- To the extent of possibility, 33 / 11 kV substation location and the distribution line route will be selected on barren land to minimize the need for vegetation losses
- Different alternative routes will be studied and the route with minimum requirement of tree losses will be selected
- The losses of trees and vegetation shall be compensation as per the prevailing rule by the concerned department
- The prior clearance approval from State forest department will be taken
- Only the trees lying on the distribution line route and 33 / 11 kV substation location as needed and approved by Forest Department will be cleared and the work will be monitored by the DFO, supervision consultant or agencies
- Unnecessary movement of vehicles in the forest land will be prohibited
- Wood and other forest products extracted as part of the site clearance from the forest will be handed over to the concerned forest user groups / DFO office

Construction Phase - Impact on Avifauna Electrocution & Risk of Collision

The following measures shall be adopted:

- Provide artificial bird safe perches and nesting platforms placed at a safe distance from the energized parts
- Cross-arms, insulators and other parts of the power lines can be constructed so that there is no space for birds to perch where they can be proximate to energized wires.
- All terminal structures (transformers) should be constructed with enough insulation on jumper wires and surge arrestors
- Line marking to increase the visibility of the line. There are three general types of line marking devices: aerial marker spheres, spirals, and suspended devices
- Managing surrounding land to influence bird use.
- Consider line placement that takes migratory patterns and high bird-use areas into account.
- All sections of line crossing rivers and the adjacent riparian habitat should be fitted with Bird Flappers on the earth wire.
- If practical, consider line orientation that considers biological and environmental factors such as bird flight paths, prevailing winds, and topographical features factors

Operation & Maintenance Phase - Possible collection of firewood and timber

Establishment of camp sites near forest will cause collection of forest resources like wood for fire and cooking, Chances of timber collection for camp site construction cannot be neglected. To minimize the chances of forest resource collection, following mitigation measures shall be followed:

- Contract documents shall include provisions to restrict workforces with regard to forest resources and wildlife exploitation and trade
- Contract documents must include provisions to instruct contractor to arrange alternate energy sources such as kerosene or LPG for labour
- The contractor must prevent illegal cutting of forest wood by labour force. The firm also shall be liable to penalize violators
- Equally, collection of non-timber forest resources (e.g. bamboo, medicinal plants, mushrooms) by workforce must be prohibited and enforced
- PIU should instruct the project officials, labour force, contractors, consultants and other stakeholders not to indulge in such activities and abide by the forest act and its regulations

Operation & Maintenance Phase - Disturbance to wildlife and wildlife habitat

The impacts are very significant when distribution lines pass through dense forest and national parks. When the distribution line route pass through forest and the trees lying on the route is cleared, the route previously and naturally followed by the wildlife may get destroyed and movement of wildlife will be hampered. To minimize the impacts following mitigation measures shall be followed:

- Distribution line route and 33 / 11 kV substation location shall be chosen in such a manner during screening that without disturbing their path and habitat will be determined
- The forestland will be avoided as far possible but where required to use forest land barren, thin forest location will be use.

Operation & Maintenance Phase - Hunting and Poaching

It shall be strictly prohibited for workforce to carry out hunting and poaching practices in the project area. The workforce/labour will be prevented from entering inside forest by developing a fencing mechanism and peer information network to identify incidents of non-adherence. To minimize the impacts following measure will be adopted:

- The labour camp will be established away from forest area.
- The hunting activities will be done for meat so the required food product will be supply from market by the contractor on need basis.
- To aware the contractor to prevent labour from hunting and trapping of wildlife appropriate clause will be mention in tender document (contract document).

Operation & Maintenance Phase - Habitat fragmentation

The impacts will be significant if the area along the line route will be cleared completely and the line passes through national park and dense forest which are habitats of various wild species.

- Attempt shall be carried out to minimize the clearance of trees and vegetation
- The cables/ wires / conductors can be strung in horizontal and vertical alignment. Poles will be used instead of towers which required less land coverage
- The cleared space can be planted with small shrubs which will link the forest on both side of RoW

Operation & Maintenance Phase - Rare, endemic, threatened, endangered, protected plants and animals due to site clearance

National parks, conservation areas, wetland and dense forests are the habitat of rare and endangered species. Once disturbed, habitat may not be again used by the wildlife and forces the species to migrate which affects ecosystem of that particular area. To minimize the impacts following measures will be adopted:

- The distribution line will not be passes through wildlife sensitive area like national park, wetland, conservation area etc.
- The habitat of wild animal will be avoided.

Operation & Maintenance Phase - Impact on aquatic life

The impact will be caused due to erosion of excavated spoil by the rainwater and deposited in the riverbed. Siltation problems is more significant when distribution line is near water bodies and management of spoil is not effective.

- The labour force will be prohibited for fishing activities.
- The flow of mud and spoil form construction site shall be properly checked by the construction of proper sized drain.
- Similarly, the excavated spoil should be immediately removed from site and dumped at identified location.

Operation & Maintenance Phase - Forest fire hazard

During dry seasons, dry leaves of this vegetation may catch fire from a small fire like matchstick or cigarette butts. This could create immense fire hazard. Therefore, any fire related activities inside forest shall be prohibited. Similarly, the cable carrying electricity may be struck by lightning and cause fire hazard in the forest area. Therefore, to minimize the impact all kinds of metallic supports under high voltage system will be permanently and effectively earthed by using perpetual earth wire. Further, there may be sparkling due to leakage of current and the catching of these spark by the dry leaves and grass may initiate forest fire.

6.4.4.3 Mitigation measures for Socio-economic Impacts

The mitigation measures are compiled by the project for unavoidable adverse social impacts. APDCL follows the country's law and regulation, practices conventions agreements and the Financiers' safeguard standards to mitigate undue harm to people during the development process when identifying and designing a project, the safeguard policies will help to assess and mitigate the potential risks and impacts (positive or negative) associated with a development intervention.

Table 6-8: Mitigation measures for Socio-economic Impacts

Impact/ Issue	Mitigation measure	Standard Guideline	Time	Implementation Agency	Monitoring Authority Agency
Impact in land and structures, livelihood, crops and trees.	• Impacts Assessment • Preparation of SIA report • Conduct detailed measurement survey • Consultation with concerned project affected people • Declaration of compensation • Compensation to project affected people (PAPs)	LARR Act, AIIB policies, other relevant Act, Preparation and implementation of RP and TPP	Pre-construction of sub-projects	APDCL / PMC	Third party monitors
Impact on community infrastructure and utilities	• Case by case assessment • Compensation	Technical assessment, preparation of	Construction phase	APDCL / PMC / Contractor	Consultant

Impact/ Issue	Mitigation measure	Standard Guideline	Time	Implementation Agency	Monitoring Authority Agency
	• Reconstruction and rehabilitation	report/plan and implement			
Impact on aesthetics, places of cultural and historical importance	• Case by Case Study • Approval from Department of Archaeology • Reconstruction	Prepare Separate technical assessment report/ plan	Construction phase	APDCL / PMC / Contractor	Consultant, Contractors
Change in demographic profile	Contractor shall consult the local people during construction	ESIA / ESMP	Construction phase	APDCL / PMC / Contractor	Consultant, Contractors
Employment	• The contractor shall recruit local people to the extent possible • Skill development training shall be provided to local people	As per ESIA provision / ESMP	Construction phase	Contractor	Consultant, Contractors
Health and Safety	• Provide adequate health and safety equipment and kits • Construction areas shall be fenced off at entry point to avoid disturbance & risk • Measures and emergency plan shall be prepared at locations with wildlife movement, to avoid the man-wildlife conflicts • Adequate PPE shall be provided by the contractor	Contract Documents	During construction	Contractor	Consultant, Contractors

Chance Find Archaeological Property and Procedures

It will be ensured that the Contractor takes the reasonable precautions to prevent his/her workers or any other persons from removing and damaging any such article or thing. He / She will, immediately upon discovery or thereof and before removal acquaint the Environmental Specialist – PMU/PMC of such discovery and carry out the PMU / PMC instructions for dealing with the same, awaiting which all work shall be suspended. The PMU / PMC will seek direction from the Archaeological Survey of India (ASI) or the State Archaeological Department before instructing the Contractor to recommence the work in the site. The Archaeological structures identified along the route alignment should be protected/ preserved or enhanced as per the law.

During excavation, if any treasure, archaeological artefacts are found the same will be intimated in

writing to District Collector or Commissioner /Archaeology department as per the provisions of Section-4 of "Indian Treasure Trove Act, 1878 as amended in 1949". The construction activity will be suspended temporarily during this process.

Occupational Health and Safety

To overcome/ prevent such occurrence, APDCL has prepared its Safety Manual, which is required to be followed during constructions and operations. Almost all the environmental, health and safety aspects of the projects are very well governed by Indian standards, rules and guidelines, wherever such standards are not available, international standards and guidelines such as Environmental, Health, and Safety General Guidelines of International Finance Corporation (IFC) to be referred.

Labour

- Contractor will follow labour standards as per applicable laws such as minimum wages, equal pay for equal work, no child labour, etc.
- Provision of welfare measures such as canteens, first aid facilities, housing accommodation for workers near the workplace etc. will be made available by the contractor
- Contractor and PMC consultant will disseminate information at worksites on risks of sexually transmitted diseases and HIV/AIDS as part of health and safety measures for those employed during construction
- Contractor will follow and implement legally mandated provisions on labour (including equal pay for equal work), health, safety, sanitation, working conditions like proper amenities at all labour camps such as safe drinking water, toilets facilities at substations, waste management at sites, day care for children staying in camps etc.
- Workers' camp management

Electric and Magnetic fields

The EPC contractor shall ensure the design to be compliant with above mentioned international standards and the EMF along the transmission line will be complaint with international standards. This will minimize the community-based health risks associated with 33 kV and below lines.

6.5 Generic Environmental and Social Management Plan

The Environmental & Social Management Plan (ESMP) is required to ensure managing environment & social impacts within acceptable limits in addition to enhancement during construction and operational phases. ESMP is location and time specific. In general, Client (with assistance from Contractor / Concessionaire and Monitoring Consultant) is the responsible entity for ensuring that the mitigation measures are carried out.

Table 6-9: Generic Environmental & Social Management Plan

Sl. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards / Measurement	Frequency	Institutional Responsibility	Implementation Schedule
PRE-CONSTRUCTION PHASE[9]								
A. Physical Environment								
1.	Substation and line alignment location and design	Disturbance to the adjacent lands and the people due to cut and fill operations	• Construction of retaining structures, peripheral drain, minimize cut and fill operations, etc.	• Setbacks to houses and other structures	Setback distances to nearest structures as per RoW 11 kV- 7 m; 33 KV- 15 m	Once during substation siting survey and detailed alignment survey and design	Contractor (Detailed design and layout development) PMC (Review of Detailed Design) APDCL -PMU (Approval of survey report, detailed design and design layout), APDCL Field Officials	Detailed alignment survey and design
2.	Interference with drainage patterns/landslide hazard/Irrigation channels	Temporary flooding, landslide hazards/loss of agricultural production	• Appropriate siting to avoid channel interference. • Marking of landslide zones along the route. Provision of strengthening pole base to mitigate landslide effect due to excavation to be included in the project cost.	• Site location and line alignment selection	Consultation with local authorities and design engineers	Once during substation siting survey and detailed alignment survey and design	Contractor (Detailed design and layout development), PMC (Review of Detailed Design) APDCL -PMU (Approval of survey report, detailed design and design layout), APDCL Field Officials	Detailed alignment survey and design
B. Ambient Environment[10]								
3.	Substation location and design	Noise generation Exposure to noise causing nuisance to neighbouring properties	• Substation designed to ensure noise will not be a nuisance. • APDCL – PMU and PMC to review the detail design to ensure substation noise level are designed as per required limits.	• Ambient noise levels in the project areas and distance from nearby dwellings	The Noise Pollution (Regulation and Control) Rules, 2000 and IFC/WB EHS General Guidelines and Guidelines for Electric Power Transmission and Distribution, whichever is stringent	Once during project planning and site finalization	APDCL (Project Management Unit) and Project Management Consultancy	Part of detailed alignment survey and design.
4.	Line alignment and design	Impact on water bodies / plantation/ residences	• Site and route selection to be done in such a way that there is no loss to existing settlements or very minimum loss to agricultural land/tea bushes/bamboo bushes and fruit bearing trees.	• Alignment selection (distance to dwelling, water and/or agricultural land)	Consultation with local authorities, landowners and tree enumeration	Once during project planning stage	Contractor (Detailed design and layout development) PMC (Review of Detailed Design) APDCL -PMU (Approval of survey report, detailed design and design layout), APDCL Field Officials	Part of detailed project sitting, and survey and design should include tree enumeration for the RoW
5.	Equipment specifications and design parameters	Release of chemicals and gases in receptors (air, water, land)	• PCBs forbidden in substation transformers or other project facilities or equipment	• Transformer design	Exclusion of PCB's in transformers (should be part of tender specifications)	Once	APDCL – PMU, PMC, APDCL Field Officials	Tender document/specifications
			• The equipment's and process should not use chlorofluorocarbons or halon. Their use (if any) in existing process should be phased out and disposed of in a manner	• Design stage of equipment's and process finalization	Part of tender specifications (Exclusion of CFC) Disposal/phase out of existing equipment's and process (IEC 61619 or ASTM D4059)	Once during project design and tender specifications	Contractor (during procurement of equipment) APDCL - PMU & PMC (during site inspections and approval for installation) & APDCL Field Officials	Part of tender document and detailed project design

[9] All clearance/permits will be obtained prior to construction commencement.
[10] A full set of ambient baselines will be collected prior to contractor mobilization and present in the first monitoring report as a benchmark for construction impacts monitoring.

Sl. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards / Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			consistent with the required statutory guidelines.					
	C. Ecological Environment							
6.	Encroachment into precious ecological areas	Loss of precious ecological values/ damage to precious species	• Avoid encroachment by careful site and alignment selection and reconnaissance before final sitting of facilities.	• Presence of area of ecological sensitivity and Floral and faunal habitats to be identified	Enumeration of flora and fauna at site in discussion with local authorities, forest department, Wildlife authority etc.	Once during route survey	Surveyor (during route survey) Contractor (Detailed design and layout development) PMC (Review of detailed design) APDCL -PMU (Approval of survey report, detailed design and design layout) & APDCL Field Officials	Detailed survey and design
7.	Cutting of Trees	Loss of trees along the RoW, deforestation and loss to biodiversity	• Use of flexible pole placement, conductor heightening to avoid cutting of trees. • Avoid selection of route with higher intensity of vegetation or plantation • Tree replantation budget allocated as per Forest Department's requirement	• Trees loss, relevance of applicable clearances required from concerned authorities (forest department, revenue authorities)	Tree Enumeration, nearest ecological sensitive areas.	Consultation with local authorities (once) Statutory approval (clearance) from relevant authorities (once)	Surveyor/APDCL/Revenue Circle/Forest Department/ Contractor & APDCL Field Officials	Detailed Design and Planning stage
	D. Social Environment							
8.	Involuntary resettlement	Loss of lands and structures	• Compensation for temporary/ permanent loss of productive land, Development of stakeholder engagement plan as part of sub-projects' ESIA	• Public complaints / Grievance • RP Implementation	Consultation with relevant PAP's and authorities	Consultation with authorities – Once	Revenue Circle/APDCL – PMU/EPC Contractor/PMC & APDCL Field Officials	Pre-Construction/Prior to initiating Construction (during construction phase)
9.	Encroachment into farmland	Loss of agricultural productivity	• Avoid siting on farmland / orchards wherever possible. Compensation to be paid for any temporary or permanent loss of crops	• Implementation of crop compensation in discussion with Concerned Revenue circle.	Consultation with local authorities and design engineers	Consultation and design review - Once	Surveyor/Revenue Circle/ EPC Contractor PMC & APDCL	Part of detailed alignment survey and design
10.	Interference with drainage patterns / Irrigation channels / rivers	Flooding hazards/loss of agricultural production	• Appropriate siting to avoid channel interference / low laying areas	• Line alignment selection (distance to nearest flood zone)	Consultation with local authorities and design engineers	once	Surveyor (during route survey) Contractor (Detailed design and layout development) PMC (Review of detailed design) APDCL -PMU (Approval of survey report, detailed design and design layout) PMC & APDCL Field Officials	Part of detailed alignment survey and design
11.	Cutting of Trees	Livelihood loss	• Avoid cutting / trimming • Trees to be allowed to be growing up to a height within the RoW by maintaining adequate clearance between the top of tree and the	• Species-specific tree retention as approved by statutory authorities • Disposal of cleared vegetation as approved by the statutory authorities • Careful line alignment	Consultation with local authorities and design engineers	Consultation and design review - Once	Surveyor/Revenue Circle/ PMC/APDCL/Forest Department	Part of detailed alignment survey and design

Sl. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards / Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			conductor as per the regulations. • Trees that can survive trimming to comply with statutory distance should be lopped and not felled • Compensation to be paid for any temporary or permanent loss of productive fruit trees/non fruit trees and trimming/pruning of fruit bearing trees along RoW.	selection and applicable • Statutory approvals for tree trimming /removal from Horticulture department/Forest Department				
CONSTRUCTION PHASE								
A. Physical Environment								
12.	Site clearance	Soil erosion and surface runoff	• Construction near seasonal rivers, erosion and flood-prone areas should be restricted to the non-rainy season. • Provision and maintenance of drains and retention ponds.	• Soil erosion	Visual inspection (Turbidity and sedimentation)	Twice during construction phase	Contractor through contract provisions under supervision of PMC and PMU of APDCL	Construction period
13.	Disturbance to public utility services-Water supply, sanitation	Public inconvenience	• Advance notice to the public about the time and the duration of the utility disruption. • Use of well trained and experienced machinery operators to reduce accidental damage to the public utilities – pipelines/Power Lines/Road crossings etc. • Restoring the utilities immediately to overcome public inconvenience.	• Disruption to other commercial and public activities / public complaints • Contractor's obligation to restore the facilities such as blocked drains (if any) through contract provisions	Technical specification – per public complaint	At least Once during construction (as and when required)	APDCL and Contractor through contract provisions and PMC through public disclosure and consultations & APDCL Field Officials	Contractor provisions in planning stage and PMC monitoring in Construction period
14.	Uncontrolled erosion/silt runoff	Soil loss, downstream siltation;	• Minimize the need for access tracks, Use of existing roads.	• Design basis and construction procedures (suspended solids in receiving waters; area re-vegetated in m^2; number 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	Contractor through contract provisions under supervision of PMC and PMU & APDCL Field Officials	Construction period
B. Ambient Environment								
15.	Equipment layout and installation	Noise and vibrations	• Selection of construction techniques and machinery to	• Construction techniques and machinery	Minimal ground disturbance	Once – Commencement of construction phase	Contractor through contract provisions under supervision of PMC and PMU	Construction period

Sl. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards / Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			minimise ground disturbance.					
16.	Construction of roads for accessibility to substations	Increase in airborne dust particles	• Existing roads and tracks to be used for construction and maintenance for access to the site wherever possible. • New access ways to be restricted to a minimum of single carriage way width. • Sprinkling of water to settle down dust particles.	• Access roads, routes (length and width of access roads)	Use of established roads wherever possible Access restricted to a minimum of single carriageway width	Once at each site	Contractor through contract provisions under supervision of PMC and PMU	Construction period
17.	Surplus earthwork/soil	Runoff to cause water pollution, solid waste disposal	• Excess fill from excavation to be reused on site where earth filling is required.	Location and amount (m3) of fill disposal Soil disposal locations and volume (m3)	Appropriate recoding disposal and dispersal locations in quarterly reporting of contractor and PMC	At least Once during construction phase (as and when required)	Contractor through contract provisions under supervision of PMC and PMU	Construction period
18.	Wire stringing and poles erection	Water pollution	• Minimize construction activities involving significant ground disturbance during the monsoon season. Provide drains and retention ponds if required.	• Water Quality (pH, BOD / COD, suspended solids, other) during major earthworks	Water quality standards (WHO standards for drinking water. BIS drinking water standards IS:10500-2012. Effluent standards as per Environment (Protection) Amendment Rules, 2017	At least once (as and when required)	Contractor through contract provisions under supervision of PMC and PMU	Construction period
19.	Mechanized construction	Noise, vibration and operator safety, efficient operation Noise, vibration, equipment wears and tear	• Construction equipment to be well maintained. • Construction techniques and Machinery selection to minimize ground disturbance	• Construction techniques and equipment - estimated noise emissions and operating schedules	Technical specifications, safety regulations, Noise control regulations and IFC/WB EHS General Guidelines and Guidelines for Electric Power Transmission and Distribution, whichever is stringent	Once in a month	Contractor (implementation of proposed measures) through contract provisions under supervision of PMC (Site inspections) and APDCL – PMU (Validation of documentary evidence) & APDCL Field Officials	Construction period
20.	Provision of facilities for construction workers	Contamination of receptors (land, water, air) Heath Impact on labour due to lack of basic amenities	• Construction workforce facilities to include proper sanitation, water supply and waste disposal facilities (IFC - Worker's Accommodations: processes and standards or its equivalent can be followed)	• Amenities for Workforce, grievances filed by workers.	Presence of proper sanitation, water supply and waste disposal facilities Statutory clearances obtained under: Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 and	Once before commencing construction work	Contractor through contract provisions under supervision of PMC and PMU	Construction period

Sl. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards / Measurement	Frequency	Institutional Responsibility	Implementation Schedule
					Contract Labour (Regulation and Abolition) Act, 1970			
21.	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 GoI standards and IFC/WB EHS General Guidelines and Guidelines for Electric Power Transmission and Distribution, whichever is stringent	Once in a month	Contractor through contract provisions under supervision of PMC and PMU	Construction period
C. Ecological Environment								
22.	Site clearance	Vegetation	• Marking of vegetation to be completed prior to clearance, and strict control on clearing activities to ensure minimal clearance.	• Vegetation marking and clearance control (area in m2)	Clearance strictly limited to target vegetation	Once every month	Contractor through contract provisions under supervision of PMC and PMU	Construction period
23.	Trimming/cutting of trees within RoW	Loss of vegetation and deforestation	• Trees that can survive cutting should be pruned. • Felled trees and other cleared or pruned vegetation to be disposed of by authorized agents/forest department.	• Species-specific tree retention as approved by statutory authorities (average and maximum tree height at maturity, in meters) • Disposal of cleared vegetation as approved by the statutory authorities (area cleared in m2)	Presence of target species in RoW following vegetation clearance	On-going activity before Stringing of conductors	APDCL & PMC, Contractor through contract provisions under supervision of forest department, PMU (Validation of documentary evidence)	Construction period
24.	Wood/ vegetation harvesting, cut and fill operations	Loss of vegetation and deforestation	• Construction workers should be prohibited from harvesting wood in the project area during their employment.	• Illegal wood/vegetation harvesting (area in sq m, number of incidents reported)	Complaints by local people or other evidence of illegal harvesting	Monthly	APDCL & PMC, Contractor through contract provisions.	Construction period
		Effect on fauna (including avifauna)	• Preventing work force from disturbing the flora, fauna including hunting of animals and fishing in water bodies. • Proper awareness programme regarding conservation of flora, fauna including ground vegetation to all workers. • Construction is to be halted if breeding season is observed for any species.	• Habitat loss	Complaints by local people or other evidence of illegal hunting	Monthly	APDCL & PMC, Contractor through contract provisions.	Construction period

Sl. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards / Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			• Ensure no human-wildlife conflicts / poaching.					
D. Social Environment								
25.	Construction schedules	Noise nuisance to neighbouring properties	• Minimize construction activities should be undertaken during the night and local communities to be informed of the construction schedule.	• Timing of construction (noise emissions, dBA)	Construction as per Scheduled timings only/consultation with nearby dwellings	Once	APDCL & PMC, Contractor through contract provisions.	Construction period
26.	Encroachment of cultivable lands	Loss of agricultural productivity	• Avoiding faming/harvesting season for field crops wherever possible for the project activities. • Ensuring existing irrigation facilities to be maintained in working condition • Protecting /preserving topsoil and reinstate after construction is completed • Repairing /reinstating damaged bunds etc. after construction completion and • Providing Compensation for temporary loss in agricultural production	• Land area of agriculture loss • Usage of existing utilities • Status of facilities (earthwork in m3) • Implementation of crop compensation (amount paid, dates, etc.)	Loss of crops-work in post-harvest period but before next crop Documentary evidence as certified by revenue officer	Once	APDCL & PMC, Contractor through contract provisions.	Throughout construction period
27.	Temporary use of land	Losses to neighbouring land uses/ values	• Contract clauses specifying careful construction practices. • As much as possible existing access ways to be used. • Productive land to be reinstated following completion of construction • Compensation to be paid for loss of production, if any.	• Contract clauses • Design basis and layout. • Reinstatement of land status (area affected, m2). • Implementation of Tree/Crop compensation (amount paid).	Incorporating good construction management, design engineering practices. Consultation with affected parties immediately after completion of construction and after the first harvest	Twice (during pole erection and stringing activity)	APDCL & PMC, Contractor through contract provisions.	Construction period
28.	Transportation and storage of materials	Nuisance to the general public	• Transport loading and unloading of construction materials should not cause nuisance to the people by way of noise, vibration and dust Avoiding storage of construction materials beside	• Compliance to traffic management plan	CPCB Emission standards and Water Quality standards and IFC/WB EHS General Guidelines and Guidelines for Electric Power Transmission and Distribution,	Monthly	APDCL & PMC, Contractor through contract provisions.	Construction period

Sl. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards / Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			the road, around water bodies, residential or public sensitive locations Construction materials should be stored in covered areas to ensure protection from dust, emissions and such materials should be bundled in environment friendly and nuisance free manner		whichever is stringent			
		Road Safety	• Prepare the Traffic Management Plan; • Instruct drivers of construction vehicles to strictly follow road regulations; • Adequate and clearly visible warning signs (such as danger, detour, cross here, works in progress, people at work, etc.) will be posted at designated sites while scaffoldings will be placed over road crossing points	• Compliance to traffic management plan	Regular Monitoring and Daily Incident Reporting	Once in a month	Contractor through contract provisions under supervision of PMC and PMU	Construction period
29.	Worker's Health and safety Community health and safety	Injury and sickness of workers and members of the public; Incidents/accidents; GBV/SE	• Contract provisions specifying minimum requirements for construction camps. • Ensure no human-wildlife conflicts / poaching. • Contractor to prepare and implement a health and safety plan and provide workers with required PPE. • Contractor to arrange for health and safety awareness programmes including on AIDS and sexually transmitted diseases (STD). • Detailed workers camp management plan.	• Contract clauses (number of incidents and total lost-work days caused by injuries and sickness) • Valid Workers compensation insurance policies and periodic heath check-up details	Monitoring of Health and safety practices. IFC/WB EHS General Guidelines and Guidelines for Electric Power Transmission and Distribution,	Workers Compensation Insurance to be valid throughout the project. Twice - Heath check-up of works	Contractor through contract provisions under supervision of PMC and PMU	Construction period
		COVID-19 Response	• Taking cognizance of situation at time of mobilization, the Contractor	• PPE distributed • Plan implementation checklist	WHO/GoI COVID-19 Guidelines	Weekly	Contractor through contract provisions under supervision of PMC and PMU	Construction period

Sl. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards / Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			shall undertake a COVID-19 risk assessment of project area and prepare a COVID-19 Response and Management Plan (C-R&MP) and submit to APDCL and PMC for approval. • The preparation of C-R&MP shall consider guidance of GoI, World Health Organisation, International Labour Organisation etc. • The contractor shall submit a weekly monitoring and progress report to APDCL and PMC.					
		Electrocution, other accidents, potential conflict between migrant workers and local inhabitants.	• Adequate signage and barriers around charged components, conflict to be addressed through workshops to workers regarding local customs, and codes of conduct.	• Complaints by public or workers. Record of accidents, at which stretch and the frequency.	Regular Monitoring and Daily Incident Reporting	Continuous activity	Contractor through contract provisions under supervision of PMC and PMU GRC	Throughout the construction phase
30.	Impact on Migrant workers	Lack of proper contract, unregulated working hours, unsanitary living conditions, occupational hazards, spread of diseases in camps; Potential conflict between migrant workforce and local inhabitants.	• The provisions given in the Inter-state Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979, along with the Bonded Labour System (Abolition) Act 1976, and subsequent amendments, to be followed. • Potential conflict to be addressed through proper awareness and training session to the workforce, to sensitise the workforce	• As per provisions Regulation of Employment and Conditions of Service) Act, 1979, along with the Bonded Labour System (Abolition) Act 1976	Regulatory clearance documents	Continuous activity	Contractor through contract provisions under supervision of PMC and PMU	Throughout the construction phase
31.	Capacity Building	Improve standards of implementation and monitoring	• Training of APDCL staff & Contractors	• Training schedules	Number of training program	At least Once	PMC to provide training to EPC Contractor and APDCL.	Construction period
32.	Site clearance and excavation works	Chances of finding archaeological/cultural artefacts	• Instruction to workers to not remove such articles and immediately information to Contractors supervisor and	• Discovery of any artefact of such historical or cultural significance	-	As per occurrence of event	Contractor/APDCL	Throughout the construction Phase

Sl. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards / Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			further to Environmental Specialist PMU					
OPERATION AND MAINTENANCE PHASE								
	A. Ambient Environmental							
33.	Soil Erosion at pole location	Removal of topsoil	• Planting of buffer zone native species suitable for terrain	• Turbidity of water • (Visual Inspection)	Visual inspection (Turbidity and sedimentation)	Continuous activity	APDCL-Divisional Offices/PIU	Throughout the operations
34.	Oil Spillage	Contamination of land and nearby water bodies/aquifer	• Presence of Oil pit for collection of oil leakage (if any from transformer) • Storage of transformer oil drums on raised and solid surface.	• Design of transformer pad and availability of storage area for transformer oil drums	Visual inspections	Continuous activity	APDCL-Divisional Offices/PIU	Throughout the operations
35.	Switchgear operation	SF6 Leakage	• Record of all substation switchgear located within secure casings; • Training of personnel in storage, recording and operational characteristics of SF6 •	• Switchgear casings and substation boundary	Ozone Depleting substances	Monthly	APDCL-Divisional Offices/PIU	Throughout the operations
	B. Ecological Environment							
36.	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. Regular pruning is required.	• Species-specific tree retention as approved by statutory authorities (average and maximum tree height at maturity, in meters.	Presence of target species in RoW following vegetation clearance	Continuous activity	APDCL (Divisional Office and PIU), with forest department	Throughout the operations
	C. Social Environment							
37.	Operation and Maintenance of Substation and distribution line	Electric Shock Hazards	• Careful design using appropriate technologies to minimize hazards	• Usage of appropriate technologies (number of injury incidents, lost workdays)	Preparedness level for using these technologies in crisis	once a month	APDCL	Throughout the operations
		lightning	• Resistance of pole feet will be designed to limit lightning back voltage. Metallic components on structures located within the right of way will be grounded. • If there are structures with more than about 500m2 of metal surface, provision for reconstruction in alternative materials. If there are structures used to store highly flammable materials, alternative	• Usage of appropriate technologies (number of incidents)	Preparedness level for using these technologies in crisis	once a month	APDCL	Throughout the operations

Sl. No.	Project Activity	Potential Environmental and Social Impact	Mitigation Measures	Parameters to be Monitored	Standards / Measurement	Frequency	Institutional Responsibility	Implementation Schedule
			storage arrangements will need to be provided.					
		Injury and sickness of staff and workers	• Availability of Personal Protective Equipment's. • Safety awareness trainings. • Availability of emergency action plan and training of staff and worker on implementation of emergency action plan	• Availability of PPE's • Training records • Availability of emergency action plan • Documentation of fire drills and emergency action plan implementation drills •	Record of Number of staff trained in a year	Twice/year	APDCL – corporate office/HR	Operational stage
38.	Inadequate provision of staff/workers health and safety	Raising awareness for electrical safety measures	• Training of APDCL – Project Implementation Unit	• Training schedules	Number of training program	Twice/year	APDCL/HR	Operations

6.5.1 Tentative Budget for Implementation of ESMP

Table 6-10: ESMPF Budget

Sl. No.	Item	Details	Tentative Budget (INR)
1	Training	One Training at Every Zone every year for Two years (Total 50 Trainee) including training of the Environmental Officer and Social Officer for PMU, APDCL	30,00,000.00
2	Information Disclosure	Distribution of ESMPF	2,00,000.00
		Stakeholder meeting	10,00,000.00
		Disclosure of ESMPF, RPF, TPDF	10,00,000.00
3	Monitoring Cost for PIU		25,00,000.00
4	Plantation and other activities towards EMP implementation		25,00,000.00
5	External Monitoring Agency		35,00,000.00
		Total	**13,700,000.00**

The budget for Resettlement & Rehabilitation activities to be estimated and updated by APDCL after assessment from all proposed sites has been conducted with the help of PMC, if required.

Adequate financial provision is required to meet the management measures to be undertaken to mitigate the impacts as underlined in ESMPF. APDCL estimates about 0.05 - 1 % overall project towards such measures for which necessary budget provisions shall be made during planning stage itself.

6.6 Institutional Arrangement for Monitoring and Reporting

6.6.1 Monitoring of ESMP compliance

The proposed mitigation measures comprise of conducting environmental monitoring for Air Quality, Noise Level, Soil Quality and Water Quality during Pre-construction, construction and operational phases of the project. The Environment and Social staff of APDCL shall ensure the monitoring of the environmental and social aspects. During the construction phase, the contractor should ensure that activities like handling of earth works, disposal of debris, storage of materials, labour camps, putting proper traffic signals is done properly to have minimum impact on the environment and affected communities. The PMC for the project will monitor these parameters with the supervision of PMU's E&S staff. The PMU's E&S staff and Divisional E&S official at divisional level will supervise the contractor. Other environmental good practices include sanitary waste management, noise abatement, maintaining hygienic conditions, maintenance of fire and safety equipment.

The Environmental and Social staff of PMU will ensure that site engineers and contractors adhere and comply with all measures and procedures identified in the ESMP. Activities to be monitored should include, but are not limited to:

- All planning, coordination and management activities related to the implementation of E&S safeguard issues
- The identification of corrective and preventive actions
- Records of health and safety matters and training activities
- Consultations with project affected people (as and when needed, particularly during the implementation)
- Feedback, trouble shooting and project related grievances

- Ensuring that livelihoods, where negatively impacted, are restored to pre-Project levels;
- Preparation of progress and monitoring reports as required by the funding agency and
- Verifying the projects overall compliance with safeguard measures and its progress towards achieving the intended loan outcomes

6.6.2 Monitoring of Environmental & Social Monitoring Plan (ESMoP) Compliance Environmental Parameters to Be Monitored

To ensure that project would not generate negative impacts to the environment and affected communities, monitoring of environmental and social parameters has to be performed by PMU- APDCL and PMC as per contract provisions. The monitoring activities of the project include site supervision, verification of permit s, monitoring of water quality, soil, noise and air, traffic disruptions, livelihood restorations, Occupational, Health and Safety, etc. Monitoring of the quality of water, soil, air and noise during the construction stage is the responsibility of the PMC. The compliance will be monitored by E&S staff of PMU. To monitor the compliance of E&S matters, the monitoring plan is prepared to be implemented under the sub-projects.

Table 6-11: Environmental & Social Monitoring Plan for ESMPF

Types	Parameter	Indicator	Method	Schedule and frequency	Location	Responsible Agencies
Baseline Monitoring						
Physical Environment	Land use	Land use change	Observation	Prior to project implementation	Project acquired areas	Consultant, APDCL
	Land pollution due to soil erosion and landslide	Land Plot	Observation	Prior to project implementation	Construction sites	Consultant, APDCL
	Land contamination due to municipal solid waste	Waste at site	Observation	Prior to project implementation	Project site and nearby land	Consultant, APDCL
	Air, Noise, Vibration and water pollution	Dust, particulate matter, CO, NO, SO2, Noise level and vibration and water quality.	Sampling and analysis	Prior to contractors' mobilization	Construction sites	Consultant, APDCL
Biological Environment	Forest / vegetation and Rare, endangered, endemic and threatened of flora and fauna	Forest status and vegetation type	Field observation and discussion	Prior to project implementation	Proposed project structures and facilities sites	Consultant, APDCL, DFO
	Harvesting of non-timber forest product	Loss of non-timber product	Observation	Prior to project implementation	Project sites and nearby forest	Consultant, APDCL, DFO
Socio-economic/ Cultural Environment	Cultural and religious values	Change in lifestyle, value and skill transfer	Observation and discussion	Prior to project implementation	Local people	Consultant, APDCL

Types	Parameter	Indicator	Method	Schedule and frequency	Location	Responsible Agencies
	Local infrastructure	Stress on local infrastructure	Observation and discussion with local people	Prior to project implementation	Local people and affected MP/RMP	Consultant
Impact Monitoring for Construction Phase						
Physical Environment	Land pollution due to soil erosion and landslide	Land degradation	Inspection	Semi-annually	Construction sites	Consultant, APDCL
	Topography and soil	Topographical change	Observation	Quarterly	Project acquired areas	Consultant, APDCL
	Stockpiling of construction materials	Environmental nuisance (Land pollution)	Observation	Quarterly	Construction sites	Consultant, APDCL
	Solid waste / muck disposal	Disposal of construction and domestic waste (Land pollution)	Observation	Daily whenever there are construction activities.	Disposal sites	Consultant, APDCL
	Air Pollution	Dust particulate matter, CO, NO, SO_2	Sampling and analysis	Semi-annually before construction completion	Construction sites	Consultant, APDCL
	Watershed / drainage	Depletion of water resources, natural drainage system	Inspection	Quarterly	Project acquired areas	Consultant, APDCL
	Noise and vibration	Noise level, vibration	Observation and sampling	Quarterly	Construction sites	Consultant, APDCL
Biological Environment	Forest / vegetation	Number of trees removed	Observation and discussion	Monthly	Project sites and facilities	Consultant, APDCL
	Protected flora and fauna	Changes in protected flora and fauna	Observation and discussion with local people	Quarterly	Project sites and facilities	Consultant, APDCL
	Harvesting of forest product	Loss of forest product	Observation	Quarterly	Project site and nearby forest	Consultant, APDCL
	Habitat	Loss of vegetation	Observation	Weekly	Project site and nearby forest	Consultant, APDCL
	Hunting and poaching by workforce	Movement of wildlife	Observation and discussion	Quarterly	Project site and nearby forest	Consultant, APDCL

Types	Parameter	Indicator	Method	Schedule and frequency	Location	Responsible Agencies
Socio-economic	Loss of land	Compensation and use of it	Observation and discussion with local people	Quarterly	Members of affected families	Consultant, APDCL
	Community Health and sanitation	Occurrence of diseases	Observation and discussion with local people	Quarterly	Affected MP/RMP	Consultant, APDCL
	Occupational health and safety	Use of personal protective equipment PPE), warning and caution sign fencing of construction area COVID-19 response	Observation and discussion with local people	Daily	Project construction sites	Consultant, APDCL
	Existing law and order situation	Incidence of impact on existing law and order situation	Observation and discussion with local people	Weekly	Local People	Consultant, APDCL
	Local economy due to increased economic activities	Nos. of local people employed in the project and involvement in other economic activities	Observation and review of records	Quarterly	Project areas	Consultant, APDCL
	Gender and vulnerable group including child labour	Likely discrimination	Observation and discussion with local people	Weekly	Local people	Consultant, APDCL
Impact Monitoring for Operation Phase						
Physical Environment	Land use	Change in land use pattern	Observation and discussion with local people	Annually	In the vicinity of project sites	APDCL
Biological Environment	Losses of forest product	Losses and cutting of tress	Observation and discussion	Annually	Projects sites and nearby forest	APDCL
	Economic opportunity	Status of local economy	Observation and discussion	Annually	Project areas	APDCL

Types	Parameter	Indicator	Method	Schedule and frequency	Location	Responsible Agencies
Socio-economic and cultural Environment	Employment	Nos. of local people employed in operation phase	Observation and cross checking the list of employment	Annually	Project office	APDCL
	Quality of rural life	Status of local people	Observation and discussion	Annually	Project affected areas	APDCL

6.6.3 Reporting Line

Mitigation measures related to construction as specified in the ESMP to be incorporated into civil works contracts, and their implementation will be primarily the responsibility of the contractors. In addition, contractors are required to submit monthly progress reports on the implementation of ESMP measures to PMC/PMU. The PMU – APDCL will report to the AIIB E&S experts on progress achieved against the ESMP activities and milestones on a half-yearly basis. Progress reports will include a description of implementable activities and their status; identify the responsible parties involved in their implementation; and provide project management schedules and timeframes for doing so, along with their associated costs.

The environmental monitoring report will be submitted by the PMC- E&S staff to the PMU, which will include the result of environmental monitoring into its environmental report. The Environment and Social Staff of PMU after interaction with PMC E&S staff will ensure the adequacy of submitted monitoring reports and PMU will further submit these reports to AIIB twice in a year. This report will include the results of environmental monitoring to demonstrate that sound environmental management practices are applied, and the set environments targets are achieved.

In case the implementation of ESMP measures is not satisfactory, APDCL may engage external qualified experts to verify monitoring reports and assess the significant impacts and risks. These external monitoring experts shall recommend actions for APDCCL to enhance environmental compliance. AIIB will continue to monitor project compliance with safeguard plans and requirements on an on-going basis throughout the duration of the contract.

7 ENVIRONMENTAL & SOCIAL MANAGEMENT PLANNING FRAMEWORK

7.1 Introduction

The Environmental and Social Management Planning Framework is prepared since some of the subprojects' footprints are not decided. Hence, this framework shall act as a guidance for satisfactory assessment and management of E&S impacts at sub-project level through appropriate measures during the planning, design, construction and operation phases. APDCL shall prepare sub-projects' ESIA/ESMP and/or RP based on this ESMPF/ Generic ESMP and Entitlement Matrix and submit to AIIB for approval prior to the contractors' mobilization. The activities for conducting environmental and social assessment are discussed in sub-sections below.

7.2 Applicable Policies & Procedures for conducting Environment and Social Assessment

The applicable rules are guidelines as may be applicable for any of the sub-project are discussed under Chapter 3- Legal & Policy Framework. Applicability assessment shall be undertaken before selection of any site for sub-projects.

7.3 Screening and Project Categorization

7.3.1 E&S Screening

This step would involve review of the available environmental information about the sub-project and its influence area. The extent of influence area may vary from sub-project to sub-project depending on its siting, magnitude, components of Sub-Projects and local geographical condition.

Environmental and Social screening for construction of sub-stations and distribution line has been conducted to provide an initial indication of the significance of the sub-projects potential E&S impacts and risks. The E&S checklists (Annexure 3, 4 & 5) are provided to avoid sub-project with high E&S risks as the first priority.

All project components or sub-projects to be implemented under the proposed project will be subject to an environmental/social screening in order to prevent execution of projects with significant negative E&S impacts. The purpose of "environmental/social screening" is to get a preliminary idea about the degree and extent potential environmental impacts of a particular sub-project, which would subsequently be used to assess the need for further environmental/social assessment.

7.3.2 Project Categorization

AIIB determines the Project's category by the category of the Project's component presenting the highest environmental or social risk, including direct, indirect, cumulative and induced impacts, as relevant, in the Project area of influence. The Bank assigns each proposed Project to one out of the 4 designated Categories i.e. Category A, Category B, Category C and Category FI.

- **Category A**: A Projects is categorized A if it is likely to have significant adverse environmental and social impacts that are irreversible, cumulative, diverse or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works and may be temporary or permanent in nature.
- **Category B**: A Project is categorized B when: it has a limited number of potentially adverse environmental and social impacts; the impacts are not unprecedented; few if any of them are irreversible or cumulative; they are limited to the Project area; and can be successfully managed using good practice in an operational setting.
- **Category C:** A Project is categorized C when it is likely to have minimal or no adverse environmental and social impacts.

- **Category FI:** A Project is categorized FI if the financing structure involves the provision of funds to or through a financial intermediary (FI) for the Project, whereby the Bank delegates to the FI the decision-making on the use of the Bank funds, including the selection, appraisal, approval and monitoring of Bank-financed subprojects.

For construction of sub-stations and distribution line Environmental/social screening of Phase-1 sub-projects has been carried out, based on which the ESIA & ESMPS requirements will be determined. The sub-projects to be implemented under the proposed project do not appear to pose risk of significant adverse environmental and social impacts. ***APDCL will avoid siting the sub-projects in sensitive areas to minimize the E&S impacts.*** In any case, any subprojects may trigger category A will not be supporeted by this Project.

7.4 Scoping and Data Collection

Based on the screening exercise, the scoping for E&S study will be done. The main objective of the scoping study is:

- To get familiarized with the sub-project details
- To define the study area (Area of Influence, AoI)
- Outline the E&S interactions pertaining to the project, on which the ESIA study shall be focusing
- Define the scope of work and the approach and methodology towards conducting the ESIA/ESMP, RP

Primary and secondary sources of data collection were done to collect information about the Physical Environment, Ambient Environment, Ecological Envrionmetn, Socio-economic Environment within the Study Area. Data Collection Tools are attached as Annexure 1 & 2.

7.4.1 Secondary Data Collection

Secondary data collection can be done through cross reference of all relevant documents collected and readily available. The main sources include:

- Census Reports (2011)
- District census reports of AoI districts
- Reports /Publications from the Education/Health/Planning departments
- Reports and data from SC/ST departments
- Studies on Indigenous people of Assam
- Gender status reports
- Relevant Government policies, rules and regulations
- AIIB's Standards / Policies pertaining to this project
- Project related documents
- APDCL's previous projects' E&S documents

7.4.2 Primary Data Collection

Primary data was collected from the villages and urban wards in the core AoI, through key stakeholder consultations, including key informant interviews and focus group discussions (FGDs). Participatory appraisal techniques were used to collect information for some of the key informants such as women and indigenous people. The following data collection tools were used:

- Key Informant Interview Questionnaire and

- FGD formats for General Public, Gender groups, Indigenous groups and Labour groups/Livelihood groups.

7.5 Establishment of Baseline Condition

The 'baseline' essentially comprises of factual understanding and interpretation of existing environmental, social and health conditions of where the business activity is proposed. The consultant has conducted a baseline survey and collected of information on the existing physical, ambient, ecological, and socio-economic environment of the sub-projects.

7.5.1 Establishment of Physical Environment

Land use

The existing land uses in the project shall be recorded during E&S base line before implementation of project so that the change in land use pattern after implementation of project can be evaluated. Land use types include agriculture, horticulture, domestic settlement, and industries. For example, the land before construction may be used for agriculture, forest, settlement or could be barren land but after construction the area will be converted in to built-up area sub-stations. Similarly, forest land along distribution line route shall be cleared.

Geology of Area

During baseline survey, existing geological information shall be captured. The level of geology survey depends on the nature of project. For example, construction of heavy structure like tall poles etc. For small project, secondary data about soil, rock may be sufficient whereas for larger projects, a detailed geological survey and mapping may be necessary. The information shall help to screen suitable location to support the proposed structure.

Meteorology

Before agumenting any constrcution activity, the baseline environmental scenarion will be recorded / monitored throughout the constrcution activity involving Wind speed, direction, Temperature, Humidity, Rainfall, Barometric Pressure.

Topography

Baseline Topograpic condition shall be captured using approriate and latest technology, shall also kept the high resolution images to compile with the before and aftre scenario.

7.5.2 Ambient Environment

Surface and Ground Water

Percolation of surface water contributes to ground water level. The ground water flows through porous soil strata to reach the streams or ponds /lakes. The interception of ground water during slope cutting or foundation excavation shall disturb the ground water movement. Also, water leakages arising out of such activity shall hamper construction activities. Pre-identification of ground water level shall help to avoid flooding issues in the activity area.

Water Quality

The information on the quality of water near the project shall be collected and analyzed. During construction stage, disposal of soil, waste for camp site and also washing of machinery and equipment will pollute the water quality. The collected baseline data shall provide the level of pollution due to project and immediate mitigation needed.

Noise Level

Implementation of construction activities utilize construction activities which produces high noise level. The baseline study should identify the noise sensitive location and define baseline background noise level

in those area. The level of noise by the project should be monitored during construction and should be controlled to fall within permissible range.

Emissions and Effluents

The total amount of solid, liquid or gaseous pollutants emitted into the atmosphere from a given source within a given time, as indicated, shall be monitored. For example, in grams per cubic meter of gas or by a relative measure, upon discharge from the source.

7.5.3 Ecological Environment

Biological diversity

The variety of life forms - different plants, animals and micro-organisms, together with the genes they contain, their ecosystem, etc. constitute the biological diversity of the project area. It is usually considered at three levels: genetic diversity, species diversity and ecological diversity.

Ecosystems

A dynamic, complex relationship of plants, animals, fungi and microorganism communities and associated non-living environment interacting as an ecological unit form the ecosystem.

Key Species

Species in danger of extinction and whose survival is unlikely if the existing conditions continue to operate. This also includes species whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to suffer from immediate danger of extinction. Key species also includes those listed by IUCN - Vulnerable, Endangered, Critically Endangered. Endemic and Migaratory Species also will be marked here which may trigger Critical Habitat.

Vegetation

The information about the type of vegetation coverage in the project are should be collected. Some project which passes through forest land may need clearance of trees and vegetation. To assess the total losses of trees and vegetation and propose mitigation measures, the total losses must be determined first. The number, size, type and coverage of trees must be determined during baseline survey.

7.5.4 Socio-economic Environment

Project shall conduct social baseline survey of sub-project areas to collect the primary and secondary in very beginning. Risks and impacts on land, structures, livelihood, cultural values, rituals, public place and utilities etc. shall be clearly defined. A socio-economic survey shall be initiated to measure the excising condition and status, of household or communities as well as risks and impacts. This will help to solve or mitigate adverse impacts using appropriate methods/tools.

Land use: Types include agriculture, horticulture, settlement and public land barren, Government land, forest land, etc.

Structures: Types include house, boundary and shed, office building, public structure etc.

Livelihood: Types includes small business, teashops, traditional occupations, production / cottage industry, individual or community base, etc.

Cultural and archeological importance: The types are - cultural heritage structures, historical, religious, sentimental or aesthetic value, etc.

Community infrastructures: The types are - irrigation cannels, community building, water supplies, waiting places, traditional mills (Ghatta), play grounds etc. specially run by community.

Socio-economic: Types include castes, households, population, literacy, income, expenditure, access etc. of the project affected people

Public involvement / public consultation: A range of techniques that can be used to inform, consult or interact with stakeholders such as indigenous people, women, affected / to be affected by a proposal.

Reversible impact: An environmental impact that recovers either through natural process or with human assistance.

Stakeholders: Those who may be potentially affected by a proposal, e.g. local people, the proponent, government agencies, non-governmental organizations, donors and others, all parties who may be affected by the project or to take an interest.

7.6 Analysis of Alternatives

The primary objective of the "analysis of alternatives" is to identify the location/technology for a particular sub-project that would generate the least adverse impact, and maximize the positive impacts. The analysis of alternatives should be carried out at two different levels: (a) by APDCL along with environmental/social screening; and (b) during carrying out of assessment of a sub-project, if needed (e.g., by the consultant engaged for this purpose).

In general, for any sub-project, the analysis of alternative should focus on: (a) Alternative location (for substation) or route (for power line); (b) Alternative design and technology; (c) Costs of alternatives; and (d) No sub-project scenario.

The Consultant has been carried out screening for all proposed alternative sites for substations and routes of the distribution line based on the selection criteria. Important considerations has been taken in to account in analysis of alternatives routes (for new distribution lines) which include avoiding homestead areas, as much as possible; avoiding crossing of rivers/hills/bamboo groves/cash-in trees, as much as possible. If the homestead areas (or other sensitive infrastructure) are not avoidable in any of the options, the APDCL will consult with the owner/respective authority and get their written consent/permission for the construction of distribution lines. On the other hand, use of a government-owned land, donated land by private party and tea estate owner for construction of a new sub-stations would significantly reduce adverse socio-economic impacts.

Among alternative technologies, use of Gas Insulated Switchgear (GIS) instead of Air Insulated Switchgear (AIS) would reduce land requirement for substation and avoid possible generation of toxic fumes in control building due to flashover inside AIS (especially under high humidity and saline conditions). Under humid/saline environment, the switchgears and electrical accessories of the "Outdoor type" substations undergo considerable stress reducing their operating life, which could be avoided using Indoor type substation. For distribution lines, use of Axially Bundled Cables (ABC) or insulated cables instead of the conventional separate cables would prevent pilferage of power through illegal connections.

Subsequently, if a particular sub-project requires further environmental/social assessment, the analysis of alternatives should be carried out in more details (by the consultant engaged for this purpose), including quantitative estimates for some parameters (e.g., cost of different technologies). Based on the outcome of this detailed "analysis of alternatives", the subproject location/route, technology may have to be modified.

7.7 Impact Assessment & Mitigation Strategy

7.7.1 Anticipated Key E&S Risks and Impacts at sub-project level

E&S impacts analysis consists of comparing the expected changes in the biophysical and socio-economic environment with and without the project. For each potential E&S impact, the analysis should predict the nature and significance of the expected impacts or explain why no significant impact is anticipated.

Based on the site visit and information available for the selected proposed sub-projects for the development of ESMPF, a summary of the anticipated issues and potential risks and impacts during different phases is presented in the following paragraphs to guide preparation of sub-project assessment.

(a) Impacts on Natural Physical Environment

The proposed projects will require excavations for laying foundation, water for construction and operation stage, area for storage of spare parts/ equipment etc. The physical environment would be used differently at construction and operation stages.

The site climatic conditions are an integral part of the impact assessment, where the resource used for the project purpose will be used judiciously and conserving, replenishing techniques for these resources would be at utmost priority. The ESIA study should provide a detailed assessment for all the resources required for the project.

(b) Impacts on Ambient Environment

The sub-projects are likely to have minimal short-term adverse impacts due to increased noise levels during the construction phase. After proper mitigations, the impacts on the ambient noise levels, air and water qualities due to the sub-projects will be minimized within the limits.

(c) Impacts on Biological Environment

Wherever forest land is acquired for power projects would require the appropriate clearance procedures to be adopted for conversion of land use / compensatory land allocation. There is a high probability that these projects are likely to come up in remote / barren land parcels with minimal tree cover. The protection of existing tree cover is crucial in such areas and should not lead to removal of trees. This may lead to increased dust in these areas. Minimum alteration to existing ground cover in such sites is a chosen strategy.

The proposed Projects should be completely contained entities with controlled access thereby minimizing the risks of animals getting impacted in all aspects. The ESIA study shall establish the wildlife species movement corridors/ paths/ habitat if any applicable in and around the proposed site. The ESIA study shall establish the status of wildlife in vicinity of the proposed site and adequate mitigation measures to ensure no human-wildlife conflicts / poaching occurs during the various stage of project development.

(d) Impacts on Socio-economic Environment

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

Most of the proposed sub-projects would be in remote areas with arid conditions and scarcity of water generally. The ESIA study should provide a detailed assessment of the water requirements during the operations phase along with an adequate assessment of the existing available water resources.

Private Land, Livelihood and Human Environment

Based on the initial site visit and available information of proposed projects, each substation requires 2500-4000sq.mtr of land. Majority of land belong to the state govt., APDCL, APGCL and a few locations the required land is donated by the landowner for the project therefore no land acquisition and involuntary resettlement taking place due to the project. There will be no physical and economic displacement. Distribution lines are pole based, will not have any permanent impact in this proposed project. Land proposed in the tea estate are usually barren land without any tea plantation. Tea estate owners are usually in favour of sharing the land for the proposed s/s through mutual consent. Substations proposed in the government land are in barren land and free from encroachments and squatters. However, during construction phase temporary impacts include loss of crops, trees etc along the Right of Way (RoW) of distribution lines from tapping point to construction of proposed new sub-stations may be triggered. The review identified following social impacts:

- Loss of crops, trees,
- Loss of livelihood due to impacts on sources of earning;
- Impact on natural drainage leading to loss of water in downstream areas

- Probable loss of common property resources such as religious places and cremation ground;
- Impact on host community due to influx of construction workers

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

Labour Influx

At the peak of construction, it is expected that more labourers will be working at the site. The influx of workforce will put additional pressure on existing resources. The workforce normally consists of solitary migrant males and that can be potential risk for host population. Specifically, influx of labour force can lead to:

- Risk of conflict and social unrest due to cultural differences between the labourers and local community
- Risk of spread of communicable diseases due to interaction of the labourers and the local community
- Risk of gender-based violence
- Health hazard for host community due to lack of sanitation facilities and waste management.

7.8 Provisions for Stakeholder Consultation and Disclosure

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 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:

7.8.1 Environment Issues

- Impacts on forest and biodiversity area e.g. national parks, sanctuary, biosphere reserves, etc.
- Impacts due to waste (Used Oil or E-waste), oil spills, sanitation;
- Soil erosion and slope un-stability; and
- Any other adverse environment issues.

7.8.2 Social Issues

- Securing land for substation;
- Temporary damages to land, crops, trees or structures during construction;
- Occupational and community health and safety during implementation, operation and maintenance phase;
- Health and Safety risk including HIV/AIDS;
- Community participation during project cycle i.e. planning, implementation and operation
- Tribal/vulnerable groups;

- Locals, Women and Inter agency participation/coordination; and
- Ethnic and cultural conflicts.

The potential E & S issues identified shall be managed within the applicable regulatory framework and international best practices. The consultations findings, participants and photographs undertaken during field visits are summarized in Chapter 8 of this ESMPF.

7.9 Preparation of ESIA/ESMP and RP

A generic ESMP considering the site visit findings has been described under section 6.5, which will serve as a contractual obligation toward contractor and PMC, further this will be shared with all relevant stakeholders for effective implementation of ESMP.

The ESMP for the project identifies feasible and cost-effective measures to be taken to reduce potential significant, adverse, impacts to acceptable levels. Here, proper mitigation measures are proposed for each potential impact, including details on responsible parties for implementation of mitigation measures and supervision. However, due to the site-specific conditions, APDCL shall prepare sub-projects' ESIA/ESMP and/or RP based on this ESMPF/generic ESMP and Entitlement Matrix and submit to AIIB for approval prior to the contractors' mobilization.

The Contractor shall be responsible for carrying out the work in full compliance with this ESMP and applicable National, State, AIIB Policies governing E&S impacts, pollution control, waste management, and occupational health and safety. However, in the event of any disparity between the AIIB policies and Indian acts, the IFC general and sector EHS guidelines shall prevail. The ESMP has to be followed by the EPC contractor throughout the project life cycle. The provisions of ESMP are designed to avoid, minimize and mitigate any potential impact caused due to project execution & operations. EPC Contractor will follow such provisions in its day-to-day functions & work executions.

The Contractor shall be required to prepare detailed site-specific Safety, Health and Environment Social Management Plans (SHESMP) for implementing the subprojects. SHESMP should include plan for Environment, Social, health & safety, waste, emergency and debris disposal management plan etc.

The Contractor shall appoint one Environmental and one Safety officer with at least minimum 3 years of working experience in the same field. These officers will continuously be on site to ensure compliance. The Contractor will be responsible for obtaining environmental permits as required to comply ESMP.

8 RESETTLEMENT PLANNING FRAMEWORK (RPF)

8.1 Introduction

This Resettlement Planning Framework (RPF) is prepared for the Project Distribution System Enhancement and Loss Reduction in Assam, to be implemented by Government of Assam (GoA) through Assam Power Distribution Company Limited (APDCL). The following framework has been designed in accordance with the applicable ESP ESS2, National and State laws as well as with international standards for social impact management. The framework is built on the principle of avoidance, minimization and mitigation wherein preference is given to avoiding negative social impacts wherever possible. The rationale for the RPF is originated from the fact that specific subproject sites and activities are yet to be identified to understand the exact nature and scale of their impacts. Thus, this RPF has been developed to guide detailed resettlement planning to address land acquisition and resettlement impacts. This framework establishes the involuntary resettlement and compensation principles to be applied to meet the needs of the people who may be affected by the project activities resulting due to permanent or temporary land acquisition, loss of shelter, assets or livelihoods, and/or loss of access to economic resources. The framework has been developed based on the following policies/ legislations:

- The Right to Fair Compensation and Transparency in Land Acquisition and Rehabilitation and Resettlement Act 2013 (RFCTLARR Act 2013)
- Assam Right to Fair Compensation and Transparency in Land Acquisition and Rehabilitation and Resettlement Rules, 2015 (ARFCTLARR Rules 2015)
- The Asian Infrastructure Investment Bank (AIIB)'s Environmental and Social Policy and Environmental and Social Standards (ESS) 2 (Involuntary Resettlement) and ESS 3 (Indigenous Peoples)

8.2 Objectives of the Resettlement Planning Framework

The main objective of the RPF is to appropriately identify, address and mitigate adverse socio-economic impacts that may occur due to the implementation of projects that involve the securing of land and subsequent resettlement of affected families. Without proper planning and management, resettlement may result in long-term hardship for affected people. Hence, the RPF aims to avoid resettlement wherever possible and in cases where it is unavoidable, the RPF requires the Appropriate Government to develop of a robust rehabilitation and resettlement plan to effectively manage the social impacts created by the project. The plan would identify the full range of people affected by the project and justify their displacement after consideration of alternatives that would avoid or minimize displacement.

This RPF applies to the PAPs, whose lands will be permanently or temporarily affected by compulsory actions due to any land acquisition and/or restriction of access required for the Project's development. It also applies to people who lease private or state-owned lands or those who have no registered or legal rights over the land they use, and who will be adversely affected as a result of the Project. However, the RPF does not apply to state land that is transferred from one state entity to another, or used temporarily by the PIU during construction works, unless third parties are adversely affected by the transfer or use.

Based on the laws of Government of India, Government of Assam and AIIB's Environmental and Social Framework (ESF), specific objectives of the RPF are:

- Land acquisition, and other involuntary resettlement impacts will be avoided or minimized exploring all viable alternative sub-project designs.
- Where land acquisition is unavoidable, time-bound resettlement plans (RPs) will be prepared and PAPs will be assisted in improving or at least regaining their pre-project standard of living.
- Consultation with APs on compensation, disclosure of resettlement information to APs, and

participation of APs in planning and implementing sub-projects will be ensured.

- Vulnerable groups will be provided special assistance in all such instances
- Payment of compensation will be done to PAPs including non-titled persons (e.g., informal dwellers/squatters, and encroachers) for acquired assets at replacement rates.
- The payment of compensation and resettlement assistance will be done prior to the contractor taking physical acquisition of the land and prior to the commencement of any construction activities.
- There will be provision of income restoration and rehabilitation in cases displacement – physical or economic.
- Appropriate grievance redress mechanisms will be established prior to project works which will be open to Aps, as well as workers for each sub-project.

The sub-projects under the 'Environmental and Social Management Planning Framework for Distribution System Enhancement and Loss Reduction project, will broadly have three types of potential impacts that will require mitigation measures. The types of impacts are

- Loss of assets, including land and structures
- Loss of income or livelihood
- Collective impacts on groups, such as loss of common property resources and loss of access or limited access to such resources.

Every effort will be made during the preparation of detailed design to minimize acquisition of land and other assets and to reduce any involuntary resettlement impacts. Unforeseen impacts will also be compensated in accordance with the principles of this RPF.

Additionally, the issues related to the Right of Way (RoW) for the project will be dealt with proper care especially for the temporary loss. The loss of crop and agriculture during the construction of the transmission lines will be paid as instant cash compensation for the damaged period. Although, the Right of Way is reserved for future activities, i.e., repair etc. by the executing agency (APDCL), but in practice, people will be allowed to use the land below the lines after the construction. APDCL will provide cash compensation to the APs for the temporary loss of crop, if occurred, during the time of maintenance and repair.

8.3 Land and Asset Acquisition

Mandatory Social requirements for APDCL 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 sub-stations, fall under the realm of the Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act, 2013 (RFCTLARRA). The Right to Information Act, 2005 (RTI) ensures citizens to access information under the control of public authorities.

Table 8-1: Gaps & Measures to Bridge Gaps Between National Regulations & AIIB ESS 2

Subject	National Regulations	AIIB ESS 2	Gaps and Measures to Bridge Gaps
Additional assistance to PAPs	The Act has the provision of transportation cost of Rs. 50000/- for each displaced family and one-time resettlement allowance of Rs. 50000/- for each affected family to provide support during relocation.	It is necessary to aid during relocation; particular attention is to be paid to the needs of poor and vulnerable individuals and groups.	APDCL will ensure providing financial assistance to PAP's as per GoI regulations, which generally covers the provisions of AIIB's ESS2.

Subject	National Regulations	AIIB ESS 2	Gaps and Measures to Bridge Gaps
Livelihood restoration and assistance	The Act provides for various types of support to affected and displaced families. Its employment to one member of the displaced family if jobs are created under the project by providing suitable training **or** onetime payment of Rs. 5 lakhs to restore their livelihood and living standard. Besides, a subsistence grant @ Rs. 3000/- per month for 12 months to each displaced family. In addition to this amount, the Scheduled Castes and the Scheduled Tribes families displaced from the Scheduled Area shall be paid one-time financial assistance of Rs. 50000/-.	ESS 2 provides that the resettlement plan or policy include measures to ensure that the displaced persons are (i) offered support after displacement for a transitional period, based on a reasonable estimate of the time likely to be needed to restore their livelihood and standard of living; and, (ii) provided with development assistance in addition to compensation measures, such as land preparation, credit facilities, training or job opportunities.	APDCL will ensure the livelihood restoration and assistance as per GoI regulation. which generally covers the provisions of AIIB's ESS2.
Resettlement instruments, census and social impact assessment	Conducting Social Impact Assessment (U/s 4 of the Act) is mandatory before the land acquisition for the project is initiated under the RFCTLARR Act, 2013. Preparation of the Resettlement and Rehabilitation Scheme (U/s 16 of the Act) is compulsory. Census, the socio-economic survey, and consultations are carried out for the preparation of Resettlement Action Plan for all externally funded projects. Depending upon the magnitude of impacts, a RP shall be prepared for each sub-project separately.	Preparation of individual RPs, census survey and social impact assessment.	As per GoI norms development of RP or socio-economic survey is not required for transmission line projects as no land acquisition is required for area under tower footing. The preliminary assessment does not envisage and Land acquisition for substation land. Thus, does not require development of RP. APDCL will insure the development of subproject specific RP.
Meaningful consultations	Conducting meaningful consultations with affected persons and others and disclosure of the report mandatory exercise as per the Act. Section 5, Section 6, Section 18, and Section 19 are related to consultation and disclosure. The public hearing for SIA is conducted in the affected area after giving adequate publicity and pre-fixed date, time and venue.	Meaningful consultations with affected persons and communities, local authorities, and, as appropriate, nongovernmental organizations need to be carried out.	APDCL will ensure that public consultation and disclosure is carried out during entire project duration. Consultation is to be carried out with affected persons and other and disclosure is to be made as per GoI regulations and AIIB's policy.

Subject	National Regulations	AIIB ESS 2	Gaps and Measures to Bridge Gaps
Cut-off date for eligibility and census	The cut-off date is the date for determining the entitlements (compensation and assistance) to all those who are affected by the project irrespective of the ownership of titles. According to the Act, the cut-off date for assistance to those depending on affected private lands is three years preceding the acquisition and for the titleholders, it is the date of notification under the said Act. Thus, in case of land acquisition, the date of issue of public notice of intended acquisition under Section 4(1) under the Act will be treated as the cut-off date for title holders.	Normally, the cut-off date is the date the census begins. The cut-off date could also be the date the project area was delineated, prior to the census, provided that there has been an effective public dissemination of information at the area delineated, and systematic and continuous dissemination subsequent to the delineation to prevent further encroachment.	The Act does not cover encroachers, squatters, and others collectively known as non-titleholders. For non-titleholders, the cut-off date will be the start date of the census survey/enumeration of affected persons for each sub-project.
Timing of compensation of payments	The Act ensures that the possession of land is taken after full payment of compensation (within 3 months) as well as resettlement entitlements (within 6 months) to entitled persons from the date of award U/s 30 of the Act.	The compensation should be provided before construction work start and before taking possession of the assets	APDCL will ensure that compensation is provided before construction work start and before taking possession of the assets
Resettlement of formal owners of immovable property except agricultural land	The Act provides compensation and resettlement and rehabilitation assistance to entitled persons. The market value of the immovable property is determined as per the current BSR of the State/District and then solatium is added @ 100%. The value of the immovable property without depreciation along with solatium is the replacement cost. The entitled person is eligible for following resettlement and rehabilitation assistance: (i) provision of a housing unit in case of displacement; (ii) subsistence grant @ Rs. 3000/- per month for 12 months to each displaced family; (iv) transportation cost of Rs. 50000/- for each displaced family; (v) one-time	Option 1: Cash compensation: Cash compensation at replacement cost. Option 2: Resettlement: Replacement property of equal or higher value and similar productivity + Moving and transitional allowance + Administrative fees	APDCL will ensure the Resettlement of formal owners of immovable property as per GoI regulation. which generally covers the provisions of AIIB's ESS2

Subject	National Regulations	AIIB ESS 2	Gaps and Measures to Bridge Gaps
	resettlement allowance of Rs. 50000/- for each affected family; (vi) provision of stamp duty and registration fees if a house is allotted to the affected families. The Scheduled Castes and the Scheduled Tribes families displaced from the Scheduled Area shall be paid one-time financial assistance of Rs. 50000/- over and above the resettlement and rehabilitation assistance mentioned above.		
Acquisition of agricultural land	The Act provides compensation and resettlement and rehabilitation assistance to entitled persons. The market value of land is determined as per section 26 of the Act which is the replacement cost. The payment of compensation is four times the market value of the land determined in rural areas and 2 times the market value of land determined in urban areas. Besides, compensation entitled persons are eligible for resettlement and rehabilitation assistance which includes the following: (i) onetime payment of Rs. 5 lakhs to restore their livelihood and living standard; (ii) subsistence grant @ Rs. 3000/- per month for 12 months to each displaced family; (iii) provision of stamp duty and registration fees if the land is allotted to the affected families.	Resettlement: Replacement property of equal or higher value and similar productivity + Moving and transitional allowance + Administrative fees	APDCL will ensure that the Acquisition of agricultural land (if involved) will be as per GoI regulation. which generally covers the provisions of AIIB's ESS2

Subject	National Regulations	AIIB ESS 2	Gaps and Measures to Bridge Gaps
Resettlement of informal owners of buildings	The Act does not cover informal owners of buildings known as non-titleholders.	PAP is entitled to cash compensation at replacement cost for construction of similar quality construction with additional moving and transitional allowances AND The value of time invested in construction	AIIB does not differentiate between the titleholders and non-titleholders (encroachers, squatters, tenants, etc) except for compensation for land. Assam Electricity Grid Corporation Ltd. (APDCL), Govt of Assam, **recognizes** existence of such informal owners and occupants of the building (encroachers, squatters, tenants, etc) for the Enhancement of Intra State Transmission System of Assam Project and agrees to provide resettlement and rehabilitation assistance including cost of buildings (as per current BSR of the District/State – the value of time invested in constructed is subsumed in the BSR), shifting allowance, displacement allowance, subsistence grant, etc at par with titleholders in accordance with the Second Schedule of the RFCTLARR Act, 2013. Non-titleholders (encroachers, squatters, tenants) will not be eligible for compensation of land encroached upon or occupied without authority or squatted upon for whatever purpose(s).
Resettlement of informal users of agricultural land	The Act also provides rehabilitation and resettlement entitlements to families whose livelihood is primarily dependent on land acquired. The rehabilitation and resettlement entitlements include the following: (i) onetime payment of Rs. 5 lakhs to restore their livelihood and living standard; (ii) subsistence grant @ Rs. 3000/- per month for 12 months to each displaced family; (iii) one-time resettlement allowance of Rs. 50000/- for each affected family. The value of perennial crops shall be determined by the concerned department as the standard process followed.	PAP is entitled to cash compensation for any improvements made on the land e.g. irrigation, drainage, perennial crops, objects etc. at replacement cost, and support after displacement for a transition period to restore livelihood.	The replacement cost of improvements (irrigation channel, drainage, etc) made on the land shall be estimated without depreciation as per the method followed by the concerned department (Irrigation or Water Resources Department) based on the current year rate.

Subject	National Regulations	AIIB ESS 2	Gaps and Measures to Bridge Gaps
Resettlement of the lessee of agricultural land	The Act also provides rehabilitation and resettlement entitlements to families whose livelihood is primarily dependent on land acquired. The rehabilitation and resettlement entitlements include the following: (i) onetime payment of Rs. 5 lakhs to restore their livelihood and living standard; (ii) subsistence grant @ Rs. 3000/- per month for 12 months to each displaced family; (iii) one-time resettlement allowance of Rs. 50000/- for each affected family. The value of perennial crops shall be determined by the concerned department as the standard process followed.	PAP is entitled to cash compensation for any improvements made on the land i.e. Irrigation, drainage, perennial crops, objects etc. at replacement cost, assistance in provision of lease to corresponding public owned property for an equivalent period of time (if applicable), and support after displacement for a transition period to restore livelihood.	The lease amount for the remaining period of the lease agreement shall be deducted from the compensation amount of land to be paid to the landowner and the same will be paid to the lessee.
Annual crops (owner or lessee)	The Act provides for assessing the value of the standing crops damaged during the process of land acquisition. The value of crops shall be determined by taking the services of experienced persons in the field of agriculture as may be considered necessary.	PAP is entitled to compensation for lost crops at full replacement cost, including all not harvested crops.	Both AIIB and GoI norms insist on entitled to compensation for lost crops at full replacement cost, including all not harvested crops.
(Tea) Plantations	The compensation of the damage is governed by the Electricity Act, 2003 and the Indian Telegraph Act, 1885. The compensation towards the damage are provided without the acquisition of land which are assessed/reviewed by the Revenue Authorities.	PAP is entitled to compensation at replacement cost for the tea plantation including the net value of the production lost during the period it takes to restore the productivity of the plantation, and any investments (seedlings, treatment of land etc.) and labour needed for growing plantation.	As per GoI norms compensation is paid as per assessment done by revenue department, which is the net value of production loss Including shade trees and tree bushes. AIIB guidelines suggest additional support with regards to seedlings, treatment of land and labour needs.
(Tea) Plantations not yet yielding (owner, lessee, informal owner)	The compensation of the damage is governed by the Electricity Act, 2003 and the Indian Telegraph Act, 1885. The compensation towards the damage are provided without the acquisition of land which	PAP is entitled to compensation at replacement cost for the plantation including the net value of the production lost during the period it takes to restore the	As per GoI norms compensation is paid as per assessment done by revenue department. AIIB guidelines suggest additional support with regards to seedlings, treatment of land and labour needs.

Subject	National Regulations	AIIB ESS 2	Gaps and Measures to Bridge Gaps
	are assessed/reviewed by the Revenue Authorities.	plantation, and any investments (seedlings, treatment of land etc.) and labour needed for growing the plantation	
Business property	The Act has provision for determining the market value of the building and other immovable property or assets attached to the land or building which are to be acquired. The services of a competent engineer or any other specialist in the relevant field shall be used for the same. The market value of the business property shall be estimated based on current year BSR without depreciation.	Option 1. Cash compensation at replacement cost, loss of income and moving allowance Option 2. Alternative property with adequate tenure arrangements, full relocation cost, including the inventory, and the replacement cost for any investment, transitional allowance, appropriate level of support for skill upgrading training if necessary, to restore livelihood.	The route alignment for transmission lines are selected to avoid any damage to permanent structure or temporary structure. APDCL will ensure the compensation against damage to any business property in case of damage as per law of land, which is in coherence with AIIB policy.
Loss of benefits and income for workers and employees	The Act does not cover workers and employees who will experience loss of income.	Targeted assistance and opportunities to restore, and where possible improve, income-earning capacity, production levels and standards of living.	APDCL recognizes the existence of workers and employees whose livelihood will be disrupted due to the implementation of the proposed project. Workers and employees engaged with the business enterprise, industrial units, and others shall be identified and considered for rehabilitation and resettlement assistance including livelihood training at project cost.
Loss of civic infrastructure and community services.	The Act has the provision of Infrastructural Amenities. Infrastructural facilities and basic minimum amenities shall be provided at the cost of the Requisitioning Authority at the resettlement site/colony.	Assistance should be provided that will offset any loss of a civic infrastructure and community services. Identification of institutions tasked with setting up and maintaining specific public amenities and consult local communities on how to replace them. These provisions shall be specified in the RP.	The proposed project is not likely to have any large-scale involuntary resettlement leading to development of a new resettlement site/colony. However, common property resources are likely to be affected due to the implementation of the project. APDCL will replace or reconstruct or provide an alternate common property resources affected in consultation with the local community at project cost.
Grievance mechanism and	The Act mandates the establishment of land	Accessible and appropriate grievance	A multi-tier GRM (at sub-project and Project level) shall be

Subject	National Regulations	AIIB ESS 2	Gaps and Measures to Bridge Gaps
dispute resolution	acquisition, rehabilitation and resettlement authority for the purpose of providing speedy disposal of disputes relating to land acquisition, compensation, and rehabilitation and resettlement.	mechanism must be enabled for PAPs and local communities at the whole period of project implementation.	constituted prior to the start of the project works to resolve as many grievances as possible using an understandable and transparent process that is gender-responsive, culturally appropriate, and readily accessible at no costs and without retribution.
Monitoring of resettlement implementation	The formulation, execution and monitoring of the Rehabilitation and Resettlement Schemes shall vest in the Administrator who will work as per directions and control of the Commissioner for Rehabilitation and Resettlement. Further, the Act provides for establishing National Monitoring Committee & State Monitoring Committee for reviewing and monitoring the implementation of rehabilitation and resettlement schemes or plans under this Act.	PIU is responsible for appropriate monitoring of the activities, which were defined in this RPF and RPs.	Project level internal monitoring of RP implementation will be carried out by PMU/PIU/ESC of APDCL and PMC. Evaluation of RP implementation will be conducted by an external agency to be engaged by APDCL.
Vulnerable groups	Act governing land acquisition (Second Schedule) provides additional assistance to SC and ST families displaced from Scheduled Areas only which is Rs. 50000/-. This onetime financial assistance is in addition to the rehabilitation and resettlement as per the second schedule.	According to the ESS2, special attention must be given to vulnerable groups. They are entitled to additional compensation, legal assistance during resettlement and help during physical relocation. As well, these PAPs are given a priority of employment.	APDCL recognizes vulnerable groups. The ESMP Framework for the proposed project has been covered under the "Objectives of the RPF". It includes scheduled tribes residing in scheduled areas, physically handicapped HHs, disabled families, Women headed families, etc. Special assistance of Rs. 50,000/- shall be paid to vulnerable households.

8.4 Process of Land Acquisition as per GoI/GoA Regulations

Applicability: *Transmission projects which involve the construction of substations and involve acquisition of land*

Land is required for construction of substations and erecting transmission and distribution towers. Land secured for construction of substations is no longer accessible to the existing owner and hence in such cases ownership is transferred from the existing owner to the respective utility. *However, ownership of land used for erecting towers remains with the existing landowner and the utility only receives rights to use the land.* Therefore, when we talk of loss of land, it refers to land secured for substation construction.

If a sub-project requires acquisition of land or asset, necessary measure should be taken to ensure that the affected persons are:

- Informed about their options and rights pertaining to resettlement;

- Consulted on, offered choices among, and provided with technically and economically feasible resettlement alternatives;
- Provided prompt and effective compensation at full replacement cost for losses of assets attributable directly to the project.

If the impacts include physical relocation, the resettlement plan or RPF includes measures to ensure that the displaced persons are:

- Provided assistance (such as moving allowances) during relocation; and
- Provided with 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.

Where necessary to achieve the objectives of the policy, the resettlement plan or RPF also include measures to ensure that displaced persons are:

- Offered support after displacement, for a transition period, based on a reasonable estimate of the time likely to be needed to restore their livelihood and standards of living;
- Provided with development assistance in addition to compensation measures such as land preparation, credit facilities, training, or job opportunities.

Depending on extent of land requirement for sub-project, the nature of acquiring land for substation subprojects could be through the following three processes: Transfer of voluntary donation, purchase of land on negotiated price, involuntary acquisition of land. The pre-requisites to sub-project finalization and acquisition of land which should be followed by the concerned authorities are:

- Land record has been correctly updated in revenue record as well as cadastral maps by the concerned authorities
- The land and asset acquisition have been done in accordance to the regulation GoI, GoA and AIIB policies.
- Ensuring that the land and asset acquisition has been done in legal, documented and transparent manner. The documents pertaining to transfer of land, consents from owners should be properly documented and published in public domain.
- All grievances especially related to the land acquisition must be registered, recorded and informed to AIIB along with the redress process followed for them.

8.4.1 Voluntary Donation

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;
- Ensure that the landowner has the capacity to voluntarily donate land. In other words, land donation will be not accepted from landowners whose land holding is less than the minimum economical land holding size (2.5 acres).
- Voluntary donation shall not be more than 10% of the total land holding.
- The donation will not cause any economical or physical displacement of the current land users.
- All out efforts shall be made to avoid any physical relocation/displacement due to loss of land;
- The land in question must be free of squatters, encroachers, or other claims or encumbrances.
- The APDCL 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 APDCL

- 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 Government of Assam.

8.4.2 Purchase of Land on Willing Buyer & Willing Seller Basis on Negotiated Price

When land is purchased from a willing seller, the utility shall ensure:

- Consultation with the affected person has to be carried out and documented.
- All negotiations have to be carried out in a transparent manner.
- That landowners are aware of the basis on which compensation is calculated.
- In case of procurement of land through private purchase, APDCL shall ensure that compensation/rate for land is not less than the rate provided in the new land acquisition act, 2013 and the Assam Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Rules, 2015.
- The finalization of land price/negotiation shall be through a committee.
- In order to comply with this provision APDCL may organize an awareness camp where provisions of new act in respect of basis/modalities of compensation calculation shall be explained to landowners with specific State provision if any.

8.4.3 Involuntary Acquisition of Land

In order to avoid the loss of private / community lands or agriculture and forest lands, the transmission and distribution utilities will endeavour, wherever possible, to secure Government land for their projects and avoid private or community lands, even if this requires realignment of the proposed route. Only in rare cases when Government land is not available, other methods of securing land (as listed above) will be pursued. Involuntary acquisition of land will be the last resort and be undertaken when other methods are not feasible. In the case of involuntary acquisition, the provisions of RFCTLARR Act, 2013 and The Assam RFCTLARR Rules, 2015 will be applicable. The RFCTLARRA, 2013 authorizes the state Government, i.e. the Government of Assam, its authorized Government agency to complete the whole process of acquisition of private land including Social Impact Assessment (SIA), Resettlement Plan (RP) & its implementation. APDCL's responsibility is limited to identification and selection of suitable land based on technical requirement and ensuring budget allocation.

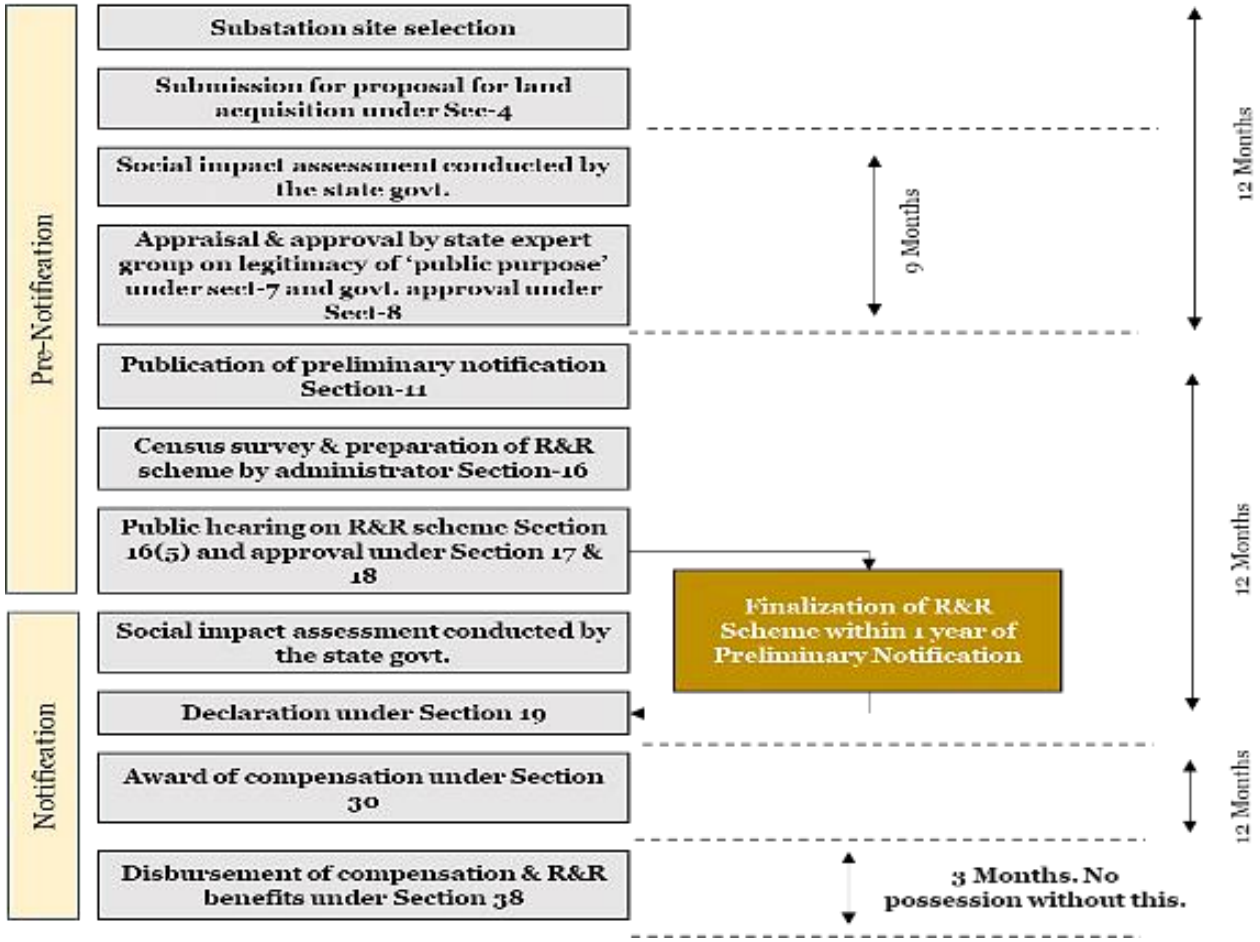
As per RFCTLARR Act, the appropriate government shall ensure that a Social Impact Assessment study is carried out in consultation with the concerned Panchayat, Municipality or Municipal Corporation in the affected area and hold public hearings in the process. Further, the Appropriate Government will ensure minimum displacement of people, minimum disturbance to the infrastructure, ecology and minimum adverse impact on the individuals affected. For this, the Appropriate Government shall ensure that:

- There is a legitimate and bona fide public purpose which necessitates the acquisition.
- The potential benefits and the public purpose shall outweigh the social costs and adverse social impact as determined by the Social Impact Assessment.
- Only the minimum area of land required for projects is to be acquired.
- There is no unutilized land which has been previously acquired in the area. Any land acquired earlier and remaining unutilized is used for the purpose.
- Also, as far as possible no acquisition of land shall be made in Scheduled Areas. Where this is done, it shall be only as a demonstrable last resort and with the prior consent of the concerned Gram Sabha or the Panchayats.

The process under the 2013 land acquisition act is provided below:

- On confirmation of the scheme and finalization of land after exploring alternative site, APDCL would submit a proposal for acquisition of private selected land detailing the extent of land and its exact location. After due process of approval, the government shall notify the affected area where selected land is situated for conducting detailed social assessment.
- A detailed Social Impact Assessment (SIA) studies shall be undertaken by an Independent Agency / Institution on a project specific TOR. The SIA agency shall first consult the concerned Panchayat, Municipality, District/Village Council at village level or ward level in the affected area to carry out SIA study. SIA shall assess the purpose of acquisition and estimate the affected families, gender, social group carry out analysis regarding impact on community properties, assets and infrastructure particularly roads, public transport, drainage, sanitation, sources of drinking water, sources of water for cattle, community ponds grazing land, plantations, public utilities electricity supply and health care facilities. The SIA agency shall also prepare a Social Impact Management Plan (SIMP) listing ameliorative measures required for addressing the likely impact vis-à-vis intended benefit of the project. The SIA report and SIMP shall be subject to public hearing in the affected area after giving adequate publicity for the venue, time etc. to ascertain the views of affected families/communities which shall be included in the SIA.
- The final SIA report shall be published including its translation in local language and shall also be made available to Panchayats, District/Village Councils & Deputy Collector/District Magistrate office for wider circulation. Explicit consent will be required in the case of lands in respect of tribal areas from ADC and the Village Councils. Tribal People Development Framework is given as Annexure 9. The process flowchart of SIA is presented in the Figure below:

Figure 8-1: The process of land acquisition as per RFCTLARR Act 2013



Compensation and rehabilitation settlement:

- 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 social impact management plan.
- The Collector shall take possession of land after ensuring that full payment of compensation as well as rehabilitation and resettlement entitlements are paid or tendered to the entitled persons within a period of three months for the compensation and a period of six months for the monetary part of rehabilitation and resettlement entitlements as approved and commencing from the date of the award.
- The Collector shall be responsible for ensuring that the rehabilitation and resettlement process is completed in all its aspects before displacing the affected families.

The Collector shall, as far as possible. not displace any family which has already been displaced by the appropriate Government for the purpose of acquisition under the provisions of this Act, and if so displaced, shall pay an additional compensation equivalent to that of the compensation determined under this Act for the second or successive displacements.

An example of Land Transfer Documents for each type of land ownership is given as Annexure 8.

8.5 Temporary restrictions to land use due to RoW

Applicability: *Transmission and Distribution Projects which involve laying of power lines and erection of towers*

Unlike in the case of substations, for construction of transmission towers / distribution poles and laying of power lines, ownership of the land remains with the existing owner and is not transferred to the requesting body. ***The Electricity Act 2003 provides the utilities with powers under the Telegraph Act 1885 which in turn states that states that land for the lines and poles (towers) will not be acquired.*** The utility will have the right of user only in the property under, over, along, across in or upon which the lines and poles / towers are placed.

However, the Act allows the utilities to from time to time, place and maintain transmission / distribution lines under, over, along, or across, and towers / poles in or upon any immovable property. Further, the utility may at any time for the purpose of examining, repairing, altering or removing any transmission / distribution line or tower, enter on the property under, over, along, across, in or upon which the line or tower / pole has been placed.

In addition, the MoEF provides guidelines for maintaining a Right of Way (RoW) corridor which shall be kept clear of any obstruction. The RoW width depends upon the voltage of the line, for example, a 220Kv transmission line will have to maintain a clear RoW of 35 meters width whereas, a 132kV line will have to maintain 27 meters.

In a similar manner, tress in the RoW have to be cut or pruned to the extent required for preventing electrical hazards by maintaining the prescribed minimum clearances (from the lines). Therefore, while the ownership of land used for towers and lines remains with the existing owners, the construction of towers and laying of lines could lead to damage of crops or trees on the land. Further, the construction of the tower may restrict the use of land under the tower footing. Similarly, use of the land in the RoW corridor may also be restricted.

Most of the impacts are temporary in nature in terms of loss of standing crops/trees and other damages for which compensation will be paid to the affected persons/ community for all damages including cost of land for tower base and RoW corridor to its owner without acquiring it asper the Ministry of Power

(MoP) guidelines, and Assam has already adopted MoP guidelines for land compensation vide notification dated 10.03.2017. Regarding this, compensation is made for the following:

- land cost of tower footings;
- standing crops;
- trees, if any;
- other assets like well and
- any other damages/ effects.

8.6 Identification of persons, land & properties to be affected by restriction of access for Project needs

The extent of impacts caused by the Project will be estimated during the detailed design stage. As information about design documents is currently unknown, the need for land acquisition and resettlement may occur in the future. If that turns out to be the case, PIU will prepare a social impact assessment and develop a Resettlement Plan in line with all applicable requirements and principles set herein.

The social impact assessment should use the following actions to assess affected persons and anticipated impacts:

- Desktop research to identify such features as population settlements, infrastructure, soil composition, natural vegetation areas, water resources, and land use patterns;
- a census that enumerates the affected people and registers them according to location;
- an inventory of lost and affected assets at the household, enterprise, and community level;
- socioeconomic surveys and studies of all affected people;
- analysis of surveys and studies to establish compensation parameters, to design appropriate income restoration and sustainable development initiatives, and to identify baseline monitoring indicators; and
- consultation with affected populations regarding mitigation of effects and development opportunities.

In case unregistered land users are affected, the PIU or relevant responsible authorities will assist the affected land users to register or update the registration of their lands in order to compensate them under this RPF.

The non-land assets/structures on the affected plots of land users without titles will be evaluated and compensated by exactly the same criteria as those with titles.

8.7 Eligibility, Evaluation and Entitlement

8.7.1 Persons Eligible for Compensation

According to this RPF, the following persons are entitled for compensation, if present in the Project area prior to cut-off date:

- PAPs who are formal owners or lessees, or legal users under the provisions of the GoI/A law, or unregistered owners11 and informal users12 of privately or publicly owned affected agricultural or construction land, or part of the land;
- PAPs who are owners and informal users of crops that are affected by the Project;

[11] Owners with recognisable legal right or claim
[12] Persons who have established usage of public or private land and have invested in immovable objects, crops, woods, trees, fruit bearing trees, plantations, etc.

- PAPs who are owners and informal users of perennial plants and trees such as fruit bearing trees and plantations that are affected by the Project;
- PAPs who are owners and informal users, of affected plantations that have not given yield yet that are affected by the Project;
- PAPs who are owners and informal users, of any plant nursery which has not yield yet that are affected by the Project;
- PAPs who are owners of the affected non-agricultural business on the whole plot or a part of it that are affected by the Project;
- Workers, agricultural processors and farmers on affected property, whose incomes and livelihoods are temporarily affected due to Project's impact.
- Communities or households whose access to their buildings and usual economic, social or cultural resources are affected by the Project;
- PAPs who are formal owners, or lessees, or legal users under the provision of GoI/A law, or unregistered owners and informal users, and who are affected by the Project because of the temporarily occupation of their land;
- Vulnerable groups (VG), persons below the poverty line in accordance with national laws, members of scheduled tribes, women led households, single parents, elderly, disabled persons or those with long-term health problems which are affected by the Project;
- PAPs who are formal or informal owners (building constructed without building permit on one's own land plot, or someone else's or state-owned plot) or lessees of the building (residential, commercial, industrial, institutional, auxiliary, etc.), or persons with occupancy rights on flats in expropriated residential building or apartment, or a part of the building that is affected by the Project, or informal users of public buildings; and
- PAP's whose losses cannot be determined or foreseen at this stage of the Project.

8.7.2 Cut-off Date

The cut-off date is a moratorium date. Persons encroaching into the Project area after the Cut-off date are not eligible for compensation or for any other resettlement assistance. Also, any investments in fixed assets (such as structures, crops, fruit, trees, woodlots, etc.) as result of activities commencing after the Cut-off date will not be eligible for compensation. This cut-off date policy will not include persons who became owners after the cut-off date by court decision of a property existing prior to cut-off date. The date counters opportunistic claims from those moving into the Project area solely in anticipation of benefits.

In order to establish a cut-off date for determine the eligibility of PAPs for resettlement compensation and assistance, a census of persons and inventory of assets shall be produced, as soon as the sub-project is identified, to enumerate all likely impacts and, if possible, supported by video and photo material. The report on the surveys shall be signed off by the PAPs and representative of PIU. The date of beginning of census will be considered as cut-off date. Before the census, PIU will disseminate information about the cut-off date in appropriate local media, informing all owners and users of the initiation of the expropriation process. The cut-off date will also be publicly disclosed on notice boards in local communities and at consultation meetings, with an accompanying explanation. The public announcement will also be posted, as necessary, on frequently visited locations throughout the affected areas.

8.7.3 Evaluation of Affected Assets

Some general rules shall apply when evaluating assets for compensation:

Compensations for buildings and land. Compensation for agricultural land, an expropriated building or land can be another appropriate replacement property, which corresponds in value, quality,

accessibility, etc. If there is a difference of values at replacement cost between expropriated and offered property, the PIU and property owner can agree on additional cash payment to bridge the gap. Cash compensation at replacement cost (including all associated costs of transaction, for example, registration costs in land/cadastral registries, transfer and administrative fees, if any), will be provided for land and buildings. The compensation will also be provided for all possible damages caused by any construction activities.

Compensation for crops and trees. During the expropriation, it is preferable to comply with the rule that access to site is performed only after all remaining annual crops are collected, whenever possible. For annual crops harvested before access to site the compensation will not be paid. Annual crops that cannot be harvested prior to access to site the compensation shall be provided at replacement costs. The PAP shall have the choice to harvest the crops even after the access to site by PIU, if possible. Compensation for perennial plants and trees will be ensured at a replacement cost. Determining full replacement cost requires consideration not only of yield, but also of costs of setting up the plantation from the start (seedlings, ground preparation etc.), as well as income lost during the period necessary to achieve yield again.

Compensation for other losses. If the project activities result in loss or resettlement of livelihood sources (for example beehives), such persons will be compensated for a loss of production of one season plus reasonable costs in relation to relocating production resources.

8.8 Entitlement Matrix

8.8.1 Comprehensive Entitlement Matrix

A detailed description of each compensation measure and assistance is provided in the entitlement matrix in Table 8.2. APs will be entitled to a combination of compensation measures and resettlement assistance, depending on the nature of ownership rights of lost assets and scope of the impact, including social and economic vulnerability of the APs.

Table 8-2: Comprehensive Entitlement Matrix

Sl. No	Type of Loss	Application	Definition of Entitled Persons	Entitlement
1.	Loss of private land	Agricultural land, vacant plot, of homestead land	Legal titleholders/ APs with customary land right/APs with Permit from local authority	• Compensation at replacement value or land for land where feasible. Determination of compensation will be as follows: *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 as applicable: • In case of rural areas (other than Scheduled Areas) within 10 km radial distance from urban areas, a multiplication factor of 1.5 will be applied • In case of rural areas beyond 10 kms of urban areas, a multiplication factor of 2 will be applied • In case of urban areas, a multiplication factor of 1.00 will be applied

Sl. No	Type of Loss	Application	Definition of Entitled Persons	Entitlement
				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 land compensation* ***Total Compensation= 1+2+3*** • One-time Resettlement allowance of Rs. 50,000 per affected family • One-time assistance option from: (i) Job for at least one member of the displaced family in project which has created impact or in similar such other project; or (ii) One-time payment of INR 5,00,000 per displaced family. • All displaced families will receive (i) monthly Subsistence allowance of Rs. 3,000 for one year from the date of award, and (ii) SC/ST households will receive additional onetime payment of INR 50,000/- • 60 days advance notice to harvest standing seasonal crops prior to damage. If notice cannot be given, compensation for share of crops will be provided. • Additional compensation for vulnerable households. • Exemption from fees and taxes related to compensation (registration, stamp fees, etc.)
			Tenants and leaseholders (whether having written tenancy/lease documents or not)/ sharecroppers	• Compensation for rental deposit or unexpired lease. • Share of the crop loss between owners and sharecroppers/tenants/lease holders as per the agreement (50% of crop) • All displaced families will receive (i) monthly subsistence allowance of Rs. 3,000 for one year from the date of award, and (ii) SC/ST households will receive additional onetime payment of Rs. 50,000. • 60 days advance notice to harvest standing seasonal crops prior to damage. If notice cannot be given, compensation for share of crops will be provided. • Additional compensation for vulnerable households. • Exemption from fees and taxes related to compensation
2.	Loss of Government land	Vacant plot, Agricultural land and homestead land	Leaseholders	• Reimbursement of unexpired lease. • All displaced families will receive (i) monthly Subsistence allowance of Rs. 3,000 for one year from the date of award, and (ii) SC/ST households will receive additional onetime payment of Rs. 50,000.

Sl. No	Type of Loss	Application	Definition of Entitled Persons	Entitlement
				• 60 days advance notice to harvest standing seasonal crops prior to damage. If notice cannot be given, compensation for share of crops will be provided. • Additional compensation for vulnerable households. • Exemption from fees and taxes related to compensation
			Squatters	• 60 days advance notice to shift from occupied land. • 60 days advance notice to harvest standing seasonal crops prior to damage. If notice cannot be given, compensation for share of crops will be provided. • All displaced families will receive (i) monthly Subsistence allowance of Rs. 3,000 for one year from the date of award, and (ii) SC/ST households will receive additional onetime payment of Rs. 50,000. • Additional compensation for vulnerable households.
			Encroachers	• 60 days advance notice to shift from encroached land. • Notice to harvest standing seasonal crops. If notice cannot be given, compensation for share of crops will be provided. • Additional compensation for vulnerable households.
3.	Loss of residential structure	Residential structure	Legal Titleholders	• Replacement value of the structure and other assets (or part of the structure and other assets, if remainder is viable). Compensation will be at replacement value excluding depreciation (part of land compensation in S. No. 1 of the entitlement matrix) • If house lost in rural areas, constructed house as per Indira Awas Yojana specifications. If in urban area, house of minimum 50 sq. m. plinth area. This benefit should be extended irrespective of title if the affected family is residing in affected area for continuously at least for three years prior to issue of notification. In either case the equivalent cost of the house may also be provided in lieu of the house as per the preference of the PAP. • One-time Resettlement allowance of Rs. 50,000 per affected household • Subsistence/grant allowance for displaced families of Rs 3000 per month for 12 months • All physically displaced families will receive both: (i) One time Shifting assistance of Rs. 50,000 towards transport costs etc.; and (ii) monthly Subsistence allowance of Rs. 3,000 for one year from the date of award, and (iii) SC/ST households will receive additional onetime payment of Rs. 50,000.

Sl. No	Type of Loss	Application	Definition of Entitled Persons	Entitlement
				• Each affected family having cattle shed shall get one-time financial assistance of such amount as the appropriate Government may, by notification, specify subject to a minimum of Rs. 25,000 for construction of cattle shed • Right to salvage materials from structure and other assets with no deductions from replacement value. • Additional compensation for vulnerable households. • Exemption from fees and taxes related to compensation
			Tenants and Leaseholders	• Replacement value of the structure and other assets (or part of the structure and other assets, if remainder is viable). Compensation will be at replacement value excluding depreciation Compensation for rental deposit or unexpired lease. • Right to salvage materials (of the portion constructed by tenants or leaseholders) from structure and other assets • One-time Resettlement allowance of Rs. 50,000 per affected family • All displaced families will receive both: (i) One time Shifting assistance of Rs. 50,000 towards transport costs etc.; and (ii) monthly Subsistence allowance of Rs. 3,000 for one year from the date of award, (iii) SC/ST households will receive additional onetime payment of Rs. 50,000 • Each affected family having cattle shed shall get one-time financial assistance of such amount as the appropriate Government may, by notification, specify subject to a minimum of Rs. 25,000 for construction of cattle shed • Right to salvage materials from structure and other assets with no deductions from replacement value. • Additional compensation for vulnerable households. • Exemption from fees and taxes related to compensation.
			Squatters	• Replacement value of the structure and other assets (or part of the structure and other assets, if remainder is viable). Compensation will be at replacement value excluding depreciation • Right to salvage materials from structure and other assets • One-time Resettlement allowance of Rs. 50,000 per affected family • All displaced families will receive both: (i) One time Shifting assistance of Rs. 50,000 towards transport costs etc.; and (ii) monthly Subsistence allowance of Rs. 3,000 for one year from the date of award.

Sl. No	Type of Loss	Application	Definition of Entitled Persons	Entitlement
				SC/ST households will receive additional onetime payment of Rs. 50,000 • Each affected family having cattle shed shall get one-time financial assistance of such amount as the appropriate Government may, by notification, specify subject to a minimum of Rs. 25,000 for construction of cattle shed • Right to salvage materials from structure and other assets • Additional compensation for vulnerable households.
			Encroachers	• 60 days advance notice to shift from encroached structure. • Right to salvage materials from structure and other assets • Additional compensation for vulnerable households.
4.	Loss of commercial structure	Commercial structure	Legal titleholders	• Reconstruction cost (without depreciation) for lost frontage/structure; affected person shall be allowed to take salvaged material from the demolished structure at no costs. • Each affected family having petty shop shall get one-time financial assistance of such amount as the appropriate Government may, by notification, specify subject to a minimum of Rs. 25,000 for construction of petty shop • Right to salvage materials from structure and other assets with no deductions from replacement value. • Additional compensation for vulnerable households. • Exemption from fees and taxes related to compensation
			Tenants and leaseholders	• Replacement cost of part/whole of structure constructed by the tenant/leaseholder, and this will be deducted from the compensation amount of the total structure. Compensation will be at replacement value excluding depreciation. • Compensation for rental deposit or unexpired lease. • One-time Resettlement allowance of Rs. 50,000 per affected family • Each affected family having petty shop shall get one-time financial assistance of such amount as the appropriate Government may, by notification, specify subject to a minimum of Rs. 25,000 for construction of petty shop • Right to salvage materials from structure and other assets with no deductions from replacement value. • Additional compensation for vulnerable households.

Sl. No	Type of Loss	Application	Definition of Entitled Persons	Entitlement
				• Exemption from fees and taxes related to compensation
			Squatters	• Replacement cost of structure constructed by the squatter. Compensation will be at replacement value excluding depreciation • One-time Resettlement allowance of Rs. 50,000 per affected family • Each affected family having petty shop shall get one-time financial assistance of such amount as the appropriate Government may, by notification, specify subject to a minimum of Rs. 25,000 for construction of petty shop • Right to salvage materials from structure and other assets. • Additional compensation for vulnerable households.
			Encroachers	• 60 days advance notice to shift from encroached structure. • Right to salvage materials from structure and other assets • Additional compensation for vulnerable households.
5.	Loss of livelihood	Livelihood	Legal titleholder/ tenant/leaseholder/non-titled/employee of commercial structure, farmer/ agricultural worker/artisan/ small trader/self employed	• One-time financial assistance of minimum Rs. 25,000 or as decided by the appropriate government, whichever is higher. • Income restoration and training to eligible APs • Additional compensation for vulnerable households. • Consideration for project employment.
6.	Loss of trees and crops	Standing trees and crops	Legal titleholder/ tenant/leaseholder/sharecropper /non-titled AP	• 60 days advance notice to harvest standing seasonal crops prior to damage, fruits, and timber. • Compensation to actual cultivator at market rate for crops and 8 years income for fruit bearing trees*. • Compensation for trees based on timber value at market price. • All timber* will be allowed to retain by the owner.
7.	Impacts on vulnerable APs	All impacts	Vulnerable[13] APs	• One-time lump sum assistance of Rs. 25,000 to vulnerable households. This will be paid above and over the other assistance. • Vulnerable APs will receive preferential income restoration training program under the Project. • Consideration for project employment.

[13] Vulnerable APs include scheduled tribes residing in scheduled areas/ physically handicapped HHs/ disabled families, Women headed families, etc.

Sl. No	Type of Loss	Application	Definition of Entitled Persons	Entitlement
8.	Temporary loss of land	Land temporarily required for sub-project construction (below tower base and in the RoW)	Legal titleholders	**For land area below tower base:** • 85% land cost at market value as ascertained by revenue authorities or based on negotiated settlement without actual acquisition/title transfer. **For land coming in corridor of width of Right of Way:** • Maximum of 15% of land cost as decided by Deputy Commissioner based on the circle rate/ guideline value/ Stamp Act rates • Restoration of land to previous or better quality
			Non-titleholder APs	• 60 days' notice to harvest standing crops • If notice cannot be given the, compensation to actual cultivator at market rate for crops and 8 years income for fruit bearing trees*. • Restoration of land to previous or better quality • Compensation for actual damages (as assessed by concerned authority)
9.	Loss of common resources	Common resources	Communities	• Replacement or restoration of the affected community facilities – including public water stand posts, public utility posts, temples, shrines, etc. All community facility and utility replacement are compensated and also re-built following the principles of this RPF.
10.	Other damages (if applicable)	-	All APs	• Unanticipated involuntary impacts will be documented and mitigated based on the principles of the Resettlement Framework. • Actual cost as assessed by the concerned authority.

8.9 Preparation of Individual RP

8.9.1 Individual RP Development, Approval and Implementation

Based on this RPF, if expropriation and resettlement is needed, A/RPs will be prepared. The objective of any A/RPs shall be to specify what procedures to follow and what actions to take to properly acquire land and compensate affected people by allowing and providing for adequate participation, consultation and full functioning of the grievance mechanism. Any site-specific A/RP shall be based on up-to-date and reliable information about (a) the proposed resettlement and its impacts on the displaced persons and other adversely affected groups, and (b) the legal issues involved in resettlement.

Irrespective of the complexity of project circumstances any site-specific A/RP shall include at minimum the following:

- Description of the project and identification of the project area,
- Identification of project activities that give rise to resettlement,
- Analysis of alternatives to avoid or minimize resettlement and conduct meaningful consultations with affected people about acceptable alternatives,
- Established mechanisms to minimize resettlement, to the extent possible, during project implementation,
- Comprehensive socioeconomic studies including:

- census survey covering current occupants of the affected area to establish a basis for the design of the resettlement program and to exclude subsequent inflows of people from eligibility for compensation and resettlement assistance,
- standard characteristics of displaced households, including a description of production systems, labour, and household organization; and
- baseline information on livelihoods (including, as relevant, production levels and income derived from both formal and informal economic activities) and standards of living (including health status) of the displaced population.
- the magnitude of the expected loss--total or partial--of assets, and the extent of displacement, physical or economic, information on vulnerable groups or persons, legal framework.

- Analysis of legal framework, covering gaps, if any, between local laws covering eminent domain and resettlement and ESS2, and the mechanisms to bridge such gaps,
- Established institutional framework, institutional responsibility for implementation, eligibility, valuation of and compensation for losses and the methodology to be used in valuing losses,
- Established grievance procedures, implementation arrangements, monitoring and evaluation and cost and budget.

8.9.2 Objectives of the A/RP

The objectives of the A/RP are as follows:

- To minimize possible adverse impacts of resettlement on population and property,
- To mitigate adverse social and economic impacts of expropriation and temporary or permanent losses by providing compensation for losses of property on the basis of replacement costs and ensure implementation of the activities of resettlement with appropriate data disclosure, consultations and participation of PAPs;
- To re-establish or improve, where possible, sources of income and living standards of resettled persons on the level before Project impact,
- To establish organizational systems and procedures for monitoring the realization of resettlement plan and to take corrective measures.

It is necessary to carry out a socio-economic census in order to identify the following:

- Current beneficiaries of the area in the scope of the Project, in order to establish baseline for creating the resettlement program and to avoid opportunistic claims,
- Standard characteristics of affected households, including description of production system, work and organization of household, with the basic information about livelihood (including, if relevant, level of production and income obtained from formal and informal economic activities) and standard of living (including health condition),
- Range of expected loss of property (total or partial) and range of resettlement, whether physical or economic,
- Information on vulnerable groups, particularly those below the poverty line, old and infirm persons, women and children, ethnic groups and other resettled persons not protected by Law of Expropriation, and for whom special measures must be taken,
- Measures for regular update of information on resettled persons and their livelihood and living standards, so that at the right moment, i.e. when the resettlement begins, the latest information is available. If updated information differs significantly from the original, measures will be defined how to record these changes and to update the resettlement program, in the way which is in accordance with the originally approved program.

A/RP will be submitted to AIIB for review and clearance. No activities on construction works can commence until and unless compensation has been paid, or appropriate budget set aside on an escrow account or account alike, or replacement property administered to PAPs, or court procedure initiated to determine the compensation in case no amicable settlement is reached.

Implementation of A/RP is an obligation of PMU, APDCL shall monitor overall implementation, collaborate with its Electrical Circles in whose jurisdiction the works are taking place, collaborate with contractors and disclose information to PAPs and communities.

8.9.3 Public Consultation in RP Preparation and Implementation

Activities on the preparation of site-specific A/RP will be disclosed in the way to encourage meaningful participation of PAPs. That assumes the phase of preliminary preparations, disclosure of preparations for population census, disclosure of census results while respecting privacy of personal information, disclosure of social assessment, as well as disclosure of A/RP drafts. The purpose of public disclosure and discussions is to ensure meaningful participation of PAPs in the process of preparation, implementation and monitoring of resettlement instruments.

APDCL will adopt a pro-active approach, which involves public disclosure of all appropriate information about the preparation of the A/RP, meaningful consultation with PAPs and local communities and an effective procedure or mechanism by which people can make comments or raise grievances. As part of A/RP preparation, APDCL will include following steps to ensure proper communication about key issues and full A/RP disclosure:

- define PAP engagement strategy in A/RP preparation, as part of overall planning of the Project;
- map specific issues (e.g. the definition of entitlements, surveys, census, specific engagement with vulnerable groups etc.) and PAP groups (e.g. owners of property, women, persons and businesses affected by economic displacement, tea plantation owners/employees etc.) to be communicated to define criteria for identifying and prioritizing and select an engagement mechanism;
- define clear internal and management roles, responsibilities and authority as well as designate specific personnel to be responsible for the implementation and monitoring of A/RP disclosure activity;
- provide with effective procedure by which PAPs can express grievances and comments about A/RP at all phases of its preparation, identify opportunities from feedback and determine actions, revisit goals and plan next steps for follow-up and future engagement;
- conduct the engagement itself, disclose information in a way appropriate for groups, type of loss and local circumstances, hold public consultation ensuring equitable PAP contribution and mitigating tension while remaining focused on the issues;
- after final A/RP has been adopted, in addition of appropriate full RP disclosure, prepare and make available to all affected persons and groups a summary document of the A/RP;

9 INSTITUTIONAL ARRANGEMENT & CAPACITY BUILDING

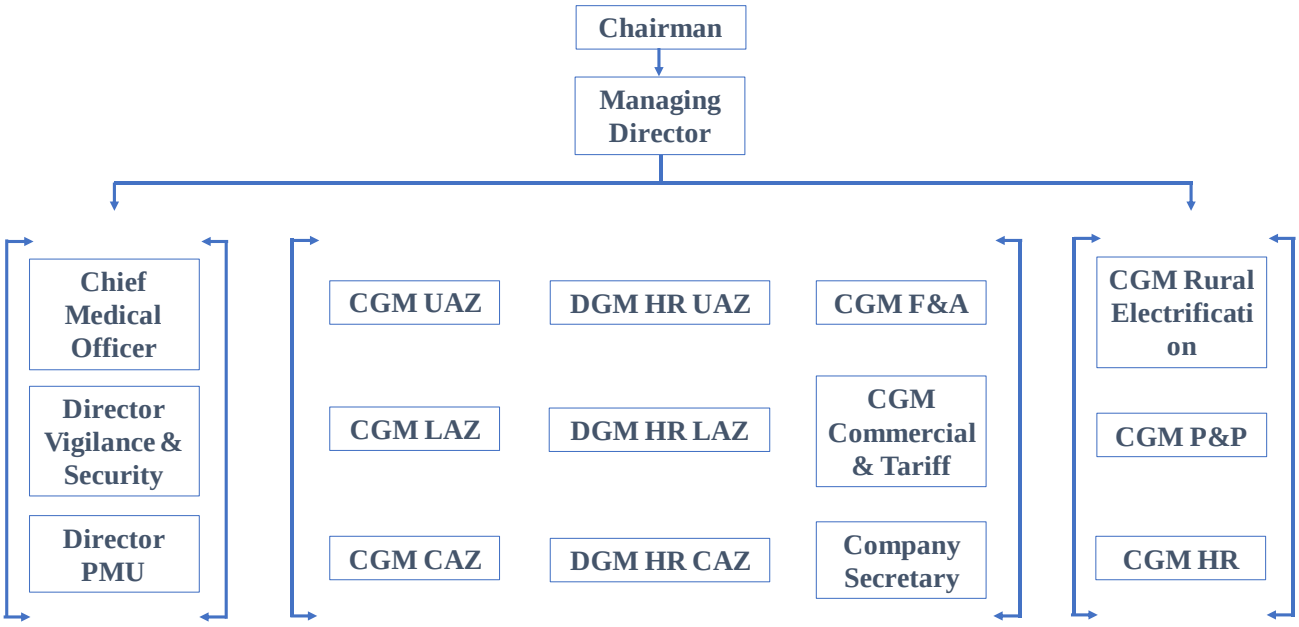
9.1 Institutional Arrangement, Staff, Budget, Environmental & Social related Procedures

APDCL will take all responsibilities of implementing the ESMPF and supervising the implementation of ESMPF. The Project Management Unit (PMU) at corporate level is headed by General Manager (Project) under the supervision of Managing Director; APDCL. The GM (Project) shall be assisted by corresponding personnel from various functions – Administration and Finance, Projects Planning and Design, Procurement and contracts and Environment & Social Staff of PMU.

Project Implementation Units (PIUs) at divisional level of the project construction unit will be headed by Assistant General Manager. The PMU is responsible for implementing the AIIB loan and is also responsible for the preparatory work for the sub-projects.

Keeping in view the capacity of APDCL and its existing PMU, it is proposed that an Environment and Social Management Unit (ESMU) be set up within the PMU along with other engineering units to address E&S issues of the sub-projects and will be headed by Environmental and Resettlement Specialist. The Environmental and Resettlement Specialist will be assisted by one Environment and one Social Development cum Resettlement Specialist who will be responsible for the field activities. For subproject's ESIAs/ESMPs/RPs/TPPs if required, PMU will do the overall coordination, preparation, planning, implementation, and financing. APDCL will ensure that key institutions including local governments are involved in RP/ESIAs preparation, updating and implementation. Further details on agencies responsible for ESIAs/RPs activities are mentioned in table below. The present organization structure of APDCL is as provided in the figure below.

Figure 9-1: Present Organization Structure of APDCL



9.2 Implementation Arrangement for Environment & Social Management

Apex position: Project Director (GM level) shall be responsible for overall supervision, coordination and responsibility of the Project planning, implementation, and monitoring.

The **Environmental and Social (E&S) Staff** shall be dedicated for projects funded by the Asian Infrastructure Investment Bank (AIIB) to streamline decision-making and provide more autonomy for project execution and delivery. The E&S Staff of AIIB project is part of PMU, which is headed by Project Director (General Manager Project). At divisional level, the Assistant General Manager (AGM) will act as

Nodal officer for E&S management. At divisional level, the charge of E&S Officer is given to the concern's AGM. The AGM's will also act as project Manager for individual subprojects. The AGM's will work under the under the supervision of DGM at circle level.

The Project Director (PD) will have overall responsibility for implementation and procurement of projects. Two each E&S Specialists will be part of the Project Management Unit (PMU). He / She will have an overall responsibility for overseeing the development of subprojects' specific ESIAs/ESMPs/RPs, as well as implementation of ESMPs and coordinating with Experts from PMC and contractors with the help of all the Divisional Offices. The E&S staff of PMU will also be responsible for progress monitoring of E&S compliance during project execution and submission of semi-annual/ annual report on E&S compliance to AIIB. The structure of PMU is described in Figure below:

Figure 9-2: Present Structure of PMU

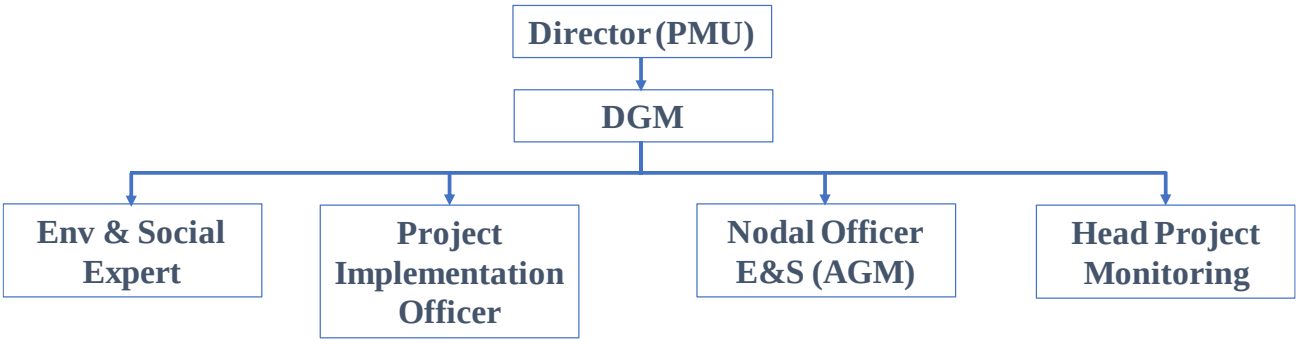
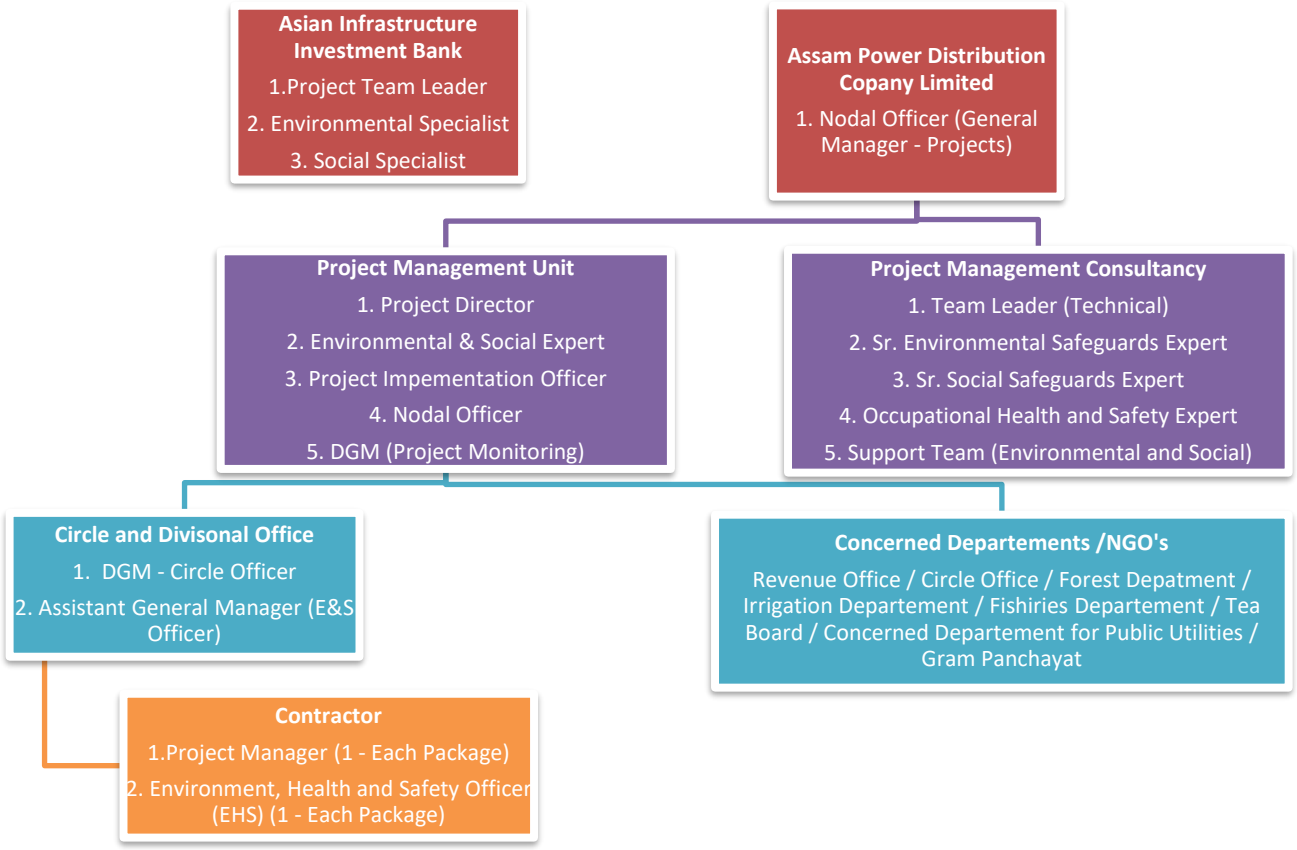


Figure 9-3: Proposed Institutional Arrangement for Environment & Social Management



In divisional offices, the Assistant General Manager (AGM) will act as Nodal officer for E&S management. The AGM's will also act as Project Manager for individual subprojects and will look into

the E&S compliance, liaising with local authorities in connection with different permits and licenses, redressing the public complaints on E&S issues, etc. The organization structure for Environmental and Social Management is described in Figure 9-3.

9.3 Organizational Responsibilities

The Environment and Social staff at the PMU level will be responsible for monitoring the policy and implementation related environmental and social impacts of all projects of APDCL. The Environmental and Social Staff of PMU will assist both PMU and PIU's in all environmental aspects of the projects in compliance with ESMPF. This E&S staff is responsible for ensuring the implementation of ESMPF for all the sub-projects funded by AIIB. As per AIIB's Policies, PMU is required to conduct regular monitoring of environmental compliance of projects funded by AIIB to ensure compliance with the ESP.

APDCL shall be assisted by a Project Management Consultant (PMC) in implanting the project. The PMC shall have in its payroll 1 Senior Environmental Safeguard expert (National origin) & 1 Senior Social Safeguard expert (National origin) besides the other technical staff. The Safeguards Experts shall have intermittent inputs of a minimum 15 (fifteen days) in a month at site office. The Environmental Expert shall have a master's degree in Environmental Science / Environmental Management or similar field while the Social Expert shall have a master's degree in Social science / Social Welfare / Social Management or similar field. Both the Senior Safeguards Expert's should have 15 years of total experience and minimum of 5 years' experience overseeing linear Infrastructure projects. Regional experience will be an added advantage. Both these senior safeguards experts shall be assisted by a fulltime junior expert of national origin each, having master's degree in Environmental Science / Environmental Management or Social science / Social Welfare / Social Management. These junior experts shall be based out of the Project office and should have 10 years of total experience and minimum of 2 years' experience in linear infrastructure / similar projects. Regional experience will be an added advantage.

The responsibility of implementing the ESMP during the construction phase is mainly with the Contractor. The PMU is responsible for ensuring all measures suggested in the ESMP are included in the design and bid documents. The E&S experts at divisional level under supervision of E&S staff of PMU are responsible for monitoring and enforcement of the ESMP during construction.

In addition to Contractor's general arrangement to carry out the project works, the Contractor must hire at least one environment, health and safety personnel for each subproject before the commencement of work. The EHS officer of the Contractor shall be based out of the site offices and shall provide full time inputs. The EHS officer should have a degree in Environmental Science / Environmental Management / Environmental Engineering and have minimum 5 years of total experience and minimum of 2 years' experience in similar projects. Diploma in Safety & first aid shall be of advantage. The Contractor/Subcontractor shall abide by the rules of regulation of the Occupational Health and Safety as stipulated in the Labour Act 2006 and BNBC codes. The contractor shall also abide by the clauses of health and safety in General Conditions and Particular Conditions of Contract of the bid document.

The duties of the Environmental and Social Staff at PMU level are to:

- Monitor the implementation of mitigation measures during construction and operation phases of the project.
- Advise and coordinate field unit's activity towards effective environment and social management.
- Liaise with the Ministry of Power, Central Electricity Authority (CEA), MoEF&CC, GoA and state agencies such as APCB, Assam Forest Department, District Revenue department and seek their help to solve the environment and social related issues of the project implementation.
- Advice to project planning/design cells on environmental and social issues while route selection of the alignment at the planning/design stage to avoid negative environmental and social impacts. Similarly advise for inclusion of environment and social safeguard provisions in contract documents.

- Advise PIU on training and awareness raising for environmental and social issues to the project/contract staff.
- Monitor and ensure safety labour practices, with particular focus on Occupational Health and Safety and GBV/SE risk prevention.

The duties of the Environmental and Social Staff at Divisional (site) level are to:

- Ensure implementation of the environment and social policy guidelines and environmental good practices at the sites.
- Advise and coordinate the contractor(s) activity towards effective environment and social management.
- Liaise with the local officers of forest department, APCB and seek help of their officers in resolving environment monitoring related issues, wherever applicable.
- Carry out environmental and social survey to avoid negative environmental impact.
- Make the contractor staff aware of environmental and social issues so that ESMP could be managed effectively.
- Prepare site visit report for environment and social compliance.

The duties of the Sr. Environmental Safeguard Expert of PMC are to:

- Review the ESMPF report prepared for the project to understand the background, environmental issues, proposed project activities, mitigation and monitoring requirements of the project
- Prepare the necessary environmental documents for each sub-project in accordance with the ESMPF, including but not limited to, preparing sub-projects' Environmental & Social Impact Assessment (ESIA), and/or site-specific ESMP and RP wherever required
- Analyse siting of medium and low voltage lines and substations in terms of their environmental impacts and benefits. The analyses should include the siting process, based on the description of the selected route
- Identify project stakeholders and hold consultations with them to delineate the appropriate boundaries of the environmental assessment and to screen potential adverse environmental issues;
- Identify potential environmental issues of distribution lines in terms of their nature, magnitude, extent and location and timing and duration. These impacts may relate to the sub-project design stage, construction stage and/or the sub-project operation and decommissioning stage. Based on impact prediction methods and as the result of public consultations, the Expert will screen adverse environmental impacts for inclusion in mitigation measures and environmental management plan
- Propose appropriate mitigation measures for the adverse environmental impacts
- Assist APDCL with environmental issues that may arise during the construction stage
- Based on review of the ESMPF, generic ESMP & ESMoP, make necessary amendments if any issues are not covered and ensure that the location and timing of checking / testing all environmental parameters are in accordance with the site conditions
- Support APDCL to prepare documents and fulfil steps required to process all environment safeguards related clearances that may be required including but not limited to forest clearances (including preparation of Biodiversity Assessment Plans, if required), tree cutting permits etc. that are to be obtained / processed by APDCL
- Ensure that the Contactors obtain all necessary clearances, consents & permissions (including but not limited to CTE, CTO, Hazardous wastes handling, labour licenses etc.) from ASPCB, Forests and other line departments
- Prepare or review (if already existing) monitoring checklists for weekly, fortnightly and monthly

checklists (as necessary) for monitoring implementation of the ESMP by the contractor

- Prepare or review (if already existing) reporting formats for monthly, quarterly, biannual and annual monitoring reports of the contractor
- Assist APDCL in implementation & Monitoring of mitigation measures and monitoring program as detailed in the sub-projects' ESIA and ESMP for each sub-project on monthly basis
- Visit each sub-project area and consult APDCL and other line departments to establish the baseline conditions in terms of physical chemical and biological environment conditions in the sub-project area;
- Prepare monthly, quarterly, biannual & annual E & S Monitoring reports based on site visits and completed checklists for submission to the APDCL during project implementation. The biannual E & S Monitoring reports submitted to AIIB will follow the template in Annexure 13. The monthly report submitted to APDCL shall report all violations of environmental & social performances (including but not limited to safety, health of the labourers and locals and the compliance conditions of consents & permissions) and measures taken to restore compliance
- Conduct a Training Need Assessment and then conduct training workshops for field level APDCL staff and contractors on the requirements and implementation of the ESMP on half yearly basis
- Assist APDCL in identifying training needs for PMU / PIU and corporate staff and identify suitable trainings on environmental issues including on-site trainings in other similar on-going projects. In doing so assist APDCL on capacity building
- Conduct on the job or site based practical training for the contractors' environmental and safety staff while implementing the ESMP during every site visit with particular focus on Occupational Health and Safety and GBV/SE risk prevention.
- Maintain a copy of all environment related statutory clearances required for implementation ESMP for all sub projects
- Preparation of mid-term evaluation & closure report at the end of the project on the implementation activities of the ESMP. The reports shall document with photographs all good practices adopted in the sub projects (so that such practices can be incorporated in future projects), trainings and workshops conducted, and the improvements noticed after training, consultations and analysis of grievances addressal
- Facilitate consultations between the contractor and local people or other relevant agencies where necessary and assist APDCL in conflict resolution on environmental issues during executing stage of the project. Maintain proper records of all environment related grievances & consultations and details on how they were addressed.

The duties of the Sr. Social Safeguard Expert of PMC are to:

- Review the ESMPF and prepare the necessary social documents for each sub-project in accordance with the ESMPF, including but not limited to, RP and TPP, wherever required
- Ensure that the social and resettlement issues are properly addressed as per the guidelines given in ESMPF and in compliance with AIIB's ESP and ESS2, 2016
- Assist APDCL in implementation of the mitigation measures and monitoring program as detailed in the ESMP for each sub-project
- Report the progress of implementation of the ESMP for each sub-project to APDCL twice a year. Report any violation of standard social safeguards and measures taken to restore compliance twice a year to APDCL
- Prepare monitoring checklists for weekly, fortnightly and monthly checklists (as necessary) for monitoring & implementation of the ESMP by the contractor

- Prepare or review (if already existing) reporting formats for monthly, quarterly, biannual and annual monitoring reports. Also develop specific monitoring indicators for undertaking monitoring of RP
- Visit each sub-project area and consult APDCL and other line departments to establish the baseline conditions in terms of socio-economic in the sub-project area;
- Analyse siting of medium and low voltage lines and substations in terms of their social impacts and benefits. The analyses should include the siting process, based on the description of the selected route
- Identify project stakeholders and hold consultations with them to delineate the appropriate boundaries of the potential adverse social issues; Special arrangements shall be made to accommodate for gender-inclusive engagements and participation of vulnerable people. Also, shall ensure implementation of the social development and gender relevant features included in the design of the project, including monitoring of HIV/ AIDS, community awareness activities, compliance of core labour standards by the civil works contractors (if any) etc.
- Identify potential social issues of distribution lines in terms of their nature, magnitude, extent and location, and timing and duration. These impacts may relate to the project design stage, construction stage and/or the project operation and decommissioning stage. Based on impact prediction methods and as the result of public consultations, the consultant will screen adverse social impacts for inclusion in mitigation measures and social management plan;
- Propose appropriate mitigation measures for the adverse and enhancement of positive social impacts
- Facilitate consultations between the contractor and local people or other relevant agencies where necessary in conflict resolution for social issues during executing stage.
- Facilitate the functioning of the Grievance Redress mechanism and maintain proper records of all social related grievances & consultations and details on how they were addressed
- Assist APDCL with social issues that may arise during the construction stage
- Provide monthly, quarterly, semi-annual and annual reports on resettlement implementation including close monitoring of resettlement implementation of Indigenous Peoples (if necessary), and provide updates on the schedule and financial aspects of resettlement to the team based on site visits and completed checklists for submission to the APDCL and AIIB during project construction. The monthly report submitted to APDCL shall include all violations of social safeguards
- Prepare the due diligence reports on resettlement implementation as needed for processing of subsequent loans
- Provide training on AIIB's ESP and ESSs as necessary
- Preparation of mid-term evaluation & closure report at the end of the project on the implementation activities of the ESMP. The reports shall document with photographs all good practices adopted in the sub projects (so that such practices can be incorporated in future projects), trainings and workshops conducted, and the improvements noticed after training, consultations and analysis of grievances addressals

The duties of the EHS Officer of Contractor are to:

- Ensure compliance of the instructions given by the PMC
- Maintain close interaction with PMC and the field representative and seek instructions and guidance from PMC's E&S Experts and HSE Expert on any issue related to implementation of environment, social and safety measures.
- Record keeping and reporting to the PMC through project manager (contractor) on actions taken.

- Providing in-house training to the workers on environment and safety.
- Securing pertaining clearances / permissions / NOCs from respective concerned authorities with respect to labour laws, applicable insurances for workers, heath check-up of workers, height pass generation for workers working on height etc.

Table 9.1 & Table 9.2 describes the institutional responsibilities for E&S management and subsequent of roles and responsibility of various entities for Environmental and Social Activities.

AIIB's E&S specialists will monitor the E&S compliance through reviewing E&S monitoring reports and conducting supervision missions, coordinated via Project Team Leader and Project Director.

Table 9-1: Roles and Responsibilities for Environmental and Social Management

Position	Roles and Responsibilities
Environmental and Social Staff (PMU)	• Preparation and finalization of project specific ESIAs/ ESMPs with inputs from PMC and approval from AIIB (where required) • Confirm integration of ESMPs provision related to works in the contract documents • Provide guidance on E&S issues to Divisional Offices • Coordination with field officers for forest /wildlife & other clearances that are prerequisite for initiation of construction work • Coordinate with regulatory agencies like SPCB & Forest Department • Prepare regular reports on progress on ESMPs implementation across the project with inputs from the PMC's E&S specialist & Divisional staff • Document experiences of developing and implementing E&S mitigation measures, convert into training material for internal capacity building • Facilitate interaction between E&S teams of PMC and Contractor to allow cross-fertilization of ideas, successes and learnings • Budgetary allocation/sanction for ESMP implementation • Implementation of RPF/RPs and Disclosures
Environmental and Social Expert at Divisional Level (Concern AGM's)	• Coordinate with PMC's E&S experts to monitor and report on progress on ESMPs implementation as part of works contracts • Participate in and facilitate consultations with stakeholders • Coordinate with regulatory agencies like SPCB, Forest Departments, and at request of PMC and/or Contractor/Divisional Office. • Obtain forest / wildlife clearance whichever is prerequisite for construction work. • Report on the issues related to environmental management to provide for any mid-course corrections based on situation on the ground. • Periodic consultation & assistance to PAPs to resolve their grievances • Coordinate on the training and capacity building initiatives

Position	Roles and Responsibilities
Environmental & Social Safeguards Experts, PMC	• Develop sub-projects specific ESIAs, ESMPs, RPs, TPPs (if applicable), Public consultation & community engagement plan for the entire project • Development of monthly, quarterly & semi-annual monitoring reports with respect to environmental and social safeguard compliances to local, national regulations and AIIB's ESP • Ensure collection of primary baseline monitoring for water quality, air quality and noise level data for pre-construction, construction and post construction phase as per the parameters and frequencies specified under Generic ESMP. • Inclusion of climate change and mitigation measures in project designing stage • Maintain the record/ documentary evidences for all statutory clearances as applicable to the project • Review contract documents to ensure that ESMPs provisions related to works are included in the contract documents • Oversee and report to the PMU on implementation of ESMPs provisions included in the works contract for the sub-projects • Act as a resource person in trainings based on experience on implementing this project and previous relevant work • Provide capacity development training to PMU and contractor personals • Ground truthing of documents submitted by contractor
Contractors' Community Consultation Officer & EHS officer	• To collect a full set of primary baseline data at each site as a benchmark, prior to the mobilization • Implement ESMPs measures included in the Contract. • Prepare schemes including details of land and other resources required • Develop inventory for tree cutting/pruning along RoW, liaise with various government departments & obtain regulatory clearances in consultation with APDCL officials • Public consultations in presence of PMU, PMC, district authorities, divisional officers and E&S cell staff to be undertaken in case of resistance • Maintaining statutory clearance documents (labour license, migratory labour license, Primary monitoring documents, pollution under control certificate for vehicles, workers compensation insurance etc.) • Health and Safety Training of workers (Use of PPEs, fire safety and electrical safety trainings, construction safety trainings, training for working on height, HIV/AIDS trainings etc.) • Organizing health check-up camps for workers, authorizing height pass for workers, maintaining register for issuing PPEs. • Daily report on incidents and near miss, monthly report on ESMPs implementation for each subproject, Report

Position	Roles and Responsibilities
	on progress and shortcomings of the measures implemented to E&S Expert of PMC

Table 9-2: Institutional Roles and Responsibilities for Environmental Resettlement activities

Milestones	Process	Output / Indicators	Preparation /Execution	Internal Responsibility		External Responsibility
				Review	Approval	Preparation
I. Project Conceptualisation						
Environmental & Social Screening and Scoping for Transmission/ Distribution Lines	Screen and scope Transmission/ Distribution Lines from an environmental & social perspective	E & S screening and scoping documents as part of Concept Paper	Circle (Site) office	Engg. Dept. ESMU	APDCL Management Appraisal	Pre-appraisal by Planning Dept., GoA
Environmental & Social approval	Submit Concept paper (with E&S details) for Management Approval	AEGCL/APDCL Mgmt. Appraisal	ESMU Corp. Plg.	ESMU Engg. Dept. Corp. Plg.	APDCL Management Appraisal	In-principle approval by GoA
II. Project Planning						
Environmental & Social Screening and Scoping for substations	Screen and scope substations sites from an environmental & social perspective Consultation with Revenue Authorities	E & S Screening and Scoping reports for substation sites Scope for land acquisition	Circle office ESMU	ESMU Engg. Dept. Corp. Plg.	APDCL Management Approval	Ext. agency like revenue, forest dept etc. for Social Screening & Scoping
Environmental & Social Assessment and Management Planning	To prepare ESMP • Distribution line • Substations • Public Consultation	E&S Impact Assessment / E & S Management Plan	ESMU Circle office	ESMU	APDCL Management Approval	State Forest Dept
Social Assessment for Temporary Damages	To prepare RP • Assessment of temporary damages • Compensation plan • Public consultation	RP	ESMU Circle office	ESMU	APDCL Management Approval	Revenue Dept
III. Project Approvals						
Forest Clearance	• Submit forest proposal to State Govt • Forest Proposal to MoEF&CC for 1st stage approval • Compliance to MoEF&CC for Final Forest Clearance	Final Forest Clearance by MoEF&CC	ESMU Circle office	ESMU Finance Dept.	APDCL Management Approval	MoEF&CC
State Govt.	Submit DPR (with E & S details) to State Govt.	Project approval by State Govt.	Circle Office Corp. Plg.	ESMU Corp. Plg.	APDCL Management Approval	Budget/fund allocation
FA Acceptance	Submit ESMPF to AIIB for appraisal	ESMPF concurrence by FA	ESMU Corp. Plg.	ESMU Corp. Plg. Dept.	Internal Management Approval	Detailed appraisal and concurrence
IV. Detailed Design & Award						
ESMPF Implementation	Engage authorised agencies for E & S management plan work	Authorised agencies engaged to execute management works	ESMU Circle office Engg. Dept.	Corp. Plg. ESMU / Circle office Engg. Dept.	Management Approval	Monitoring /Supervision
Generic ESMP part of bidding documents	Project generic ESMP to be included in bidding document	ESMP part of contract document	Circle office	ESMU	Management Approval	Monitoring /Supervision
V. Project Implementation						
Subprojects Approval	Subprojects' ESIA, ESMP, RP preparation and submission to AIIB	ESIA, ESMP, RP	ESMU Circle office, PMC	ESMU	Management Approval	Review and concurrence
Execution of Environmental Management Works	Execute environmental management works (ESMP)	Environmental management measures executed	Circle office, Authorised agency	ESMU, Circle office	Management Approval	Environment management works executed
Execution of RP	Execute RP	RP	Circle office GoA	ESMU Circle office Corp. Plg.	Management Approval GoA	Social management works executed Possession of Land
VI. Operation & Maintenance						
Environmental & Social Monitoring	Monitor ESMP measures	Periodic monitoring reports	ESMU Circle Office	ESMU Circle office	Management Approval	Periodic monitoring report
	Monitor RP Measures by GoA		Circle office GoA	O&M Circle office	GoA	Periodic monitoring reports
VII. Project Review						
Periodic Environmental & Social Review	Review and report on E & S performance of project during construction, O &M	Annual environmental and social review report	Circle office ESM/Circle office	Corp. Plg. Engg. Dept Fin. dept	Management Approval	AIIB appraisal GoA

Budget: Each sub-project will have its own budget to cover the ESMP costs relating to mitigation measures, enhancements, wherever included in the plan, and monitoring costs. In addition, training and capacity building costs need to be added for specific issues that ESIAs and ESMPs may bring out. For instance, there may be a need to have short courses on specific topics, experience exchanges on common issues etc.

9.4 Capacity Building

APDCL has experience in implementing multiple projects funded by ADB, Non-Lapsable Central Pool of Resources (NLCPR) Scheme and the World Bank. The review of APDCL's past experience in implementation of E&S management highlights its approach towards dealing with environmental and social concerns which included both strengths as well as shortcomings when dealing with regulatory frameworks. For instance, transmission line projects are exempted for environment clearances in the country, hence the weak application of environmental regulations and CEA regulations was an outcome of the low staff awareness about the related regulatory guidelines. In addition, as a general practice APDCL relies on hired consultants for the development and implementation Resettlement plan. However, APDCL lags behind in the consideration of social aspects at project conceptualization, planning and implementation stages. Further, the monitoring of social aspects beyond compensation has suffered from delay of information/data from contractors and bureaucratic issues.

Considering the strengths, APDCL has addressed environmental and social concerns based on principles of avoidance, minimization and mitigation in their past funded projects along with the support of consultant. Some common practices being followed by APDCL include minimizing the loss to standing crops by avoiding any construction activity in harvesting season, to honour its commitments and to maintain the social fabric of the community, APDCL tries to avoid Resettlement and Rehabilitation (R&R) in all its projects by trying to use Government waste land for most of their new proposed substation sites. As part of regulatory compliance APDCL ensures proper valuation of land and assets of PAPs by the revenue department. All stakeholders including the public and the local authorities are consulted on socioeconomic issues that arise from its project activities prior to commencing the construction activity.

Recognizing its weaknesses which include lack of inhouse Environmental and Social expertise and greater dependency on E&S consultants, absence of a centralized Grievance redressal committee and mechanism for all the projects, incorporation of E&S aspects from project conceptualization stage, APDCL has plans to incorporate appropriate changes by means of recruiting and capacity building of in house Environmental and Social Staff to oversee the work by consultant, development of GRC as well as defining criteria to include public consultation and E&S preliminary assessment activity part of project initiation stage to address the same, in view of the proposed project.

Consultations with APDCL reveal the steps already being initiated in this direction. This largely involves expanding its ESC, and the coordination of both PIU and PMU under one authority (Project Director); and plans for orientation and training of its staff.

Proposed Trainings:

The PMC's E&S staff will liaise and coordinate with PMU staff to undertake the prescribed project activities. It is envisaged that field visits will be conducted jointly by PMC, PMU and PIU, on case basis. The PMC will report to Project Director on regular basis. To strengthen the capacity of APDCL's staff in E&S management, customized robust training **(Refer Table 9.3)** is to be conducted for both in-house (PMU and PIU), select/concerned Divisional-level Officers, and contractors. This would include:

Table 9-3: Proposed Trainings and Capacity Building Programs

Type of Training	Aim	Stage
E&S orientation	To increase awareness and ensure the proper implementation of safeguard requirements.	Planning / Pre-construction / Subprojects' ESIA

Type of Training	Aim	Stage
Occupational and community health and safety	To enhance awareness and reduce potential incidents.	Pre-construction
Refresher	To hone existing skills and refresh newly acquired knowledge.	Monitoring Construction
Custom (on demand)	To cater to specific topics/issues as requested.	Construction to Maintenance

The training could be organized by the PMC in consultation with PMU-PIU through 1-3-day workshops with PMC's in-house and external resource persons. Besides above, the contents will also focus on the ESMPF concept, regulatory requirements, E&S priority issues, the R & R policies and procedures, Land Acquisition process, identification of PAPs, entitlement frameworks, project cycle, outline of ESIA and RP report formats and Risk Assessment and management skills. A separate budgetary allocation will be incorporated in the PMC's funding to this effect.

Monitoring Reporting

Mitigation measures related to construction as specified in the ESMPF to be incorporated into civil works contracts, and their implementation will be primarily the responsibility of the contractors. In addition, contractors are required to submit monthly progress reports on the implementation of ESMP measures to PMC/PMU. The PMC are required to submit quarterly progress report to PMU, APDCL and PMU, APDCL are required to submit report to the AIIB E&S experts on progress achieved against the ESMP activities and milestones on a half-yearly/semi-annual basis.

Progress reports will include a description of implementable activities and their status; identify the responsible parties involved in their implementation; and provide project management schedules and timeframes for doing so, along with their associated costs. The environmental monitoring report will be submitted by the PMC- E&S staff to the PMU, which will include the result of environmental monitoring into its environmental report. The Environment and Social Cell after interaction with Nodal officers at divisional levels and PMC E&S staff will ensure the adequacy of submit monitoring reports and PMU will further submit half-yearly/semi-annual reports to AIIB twice in a year. This report will include the results of environmental monitoring to demonstrate that sound environmental management practices are applied, and the set environments targets are achieved.

In case the implementation of ESMP measures is not satisfactory, APDCL may engage external qualified experts to verify monitoring reports and assess the significant impacts and risks. These external monitoring experts shall recommend actions for APDCL to enhance environmental compliance. Funding agency will continue to monitor project compliance with safeguard plans and requirements on an on-going basis throughout the duration of the contract.

10 PUBLIC CONSULTATION & INFORMATION DISCLOSURE FRAMEWORK

10.1 Introduction

Public participation and community consultation have been taken up as an integral part of social and environmental assessment process of the project. Stakeholders' consultations have been in progress from the inception stage of the project and the same will be continued during the entire project cycle, i.e., preparation, implementation and post implementation. Consultation was used as a tool to inform the people about the project. Public consultations were carried out in various locations of subproject areas with the objectives of making the people aware about the project and to involve them as stakeholders in project planning and further during implementation. It was also meant to minimize probable adverse impacts of the project by accommodating suggestions of local people which plays key factors in speedy implementation of the project.

During project preparation stages, consultations have been carried out with various concerned government officials such as APDCL and concerned revenue officials as part of the social and resettlement study in order to gather their views on the proposed program. Consultations were also carried out with the likely affected persons (APs) and local communities in the project area as part of the social and environmental due diligence work. Focused Group Discussions (FGD) were conducted with the local community at 23 locations especially in the proposed new 33/11 kV sub-stations sites and its associated lines in different project locations having a total of 153 participants. All the stakeholders were also consulted on a one to one basis through questionnaire surveys for the first phase of priorities of project activities. Additionally, FGDs were also conducted separately among the women group. Local communities generally support the proposed investment components, as better electricity supply is expected to improve. They also expect that employment opportunities will be created. The consultations and its findings undertaken during field visits are summarized in tables below and the detailed consultation matrix and photographs is presented in subsequent sections.

10.2 Sub-project Consultations Conducted by the Project Team

The consultants team conducted FGD's / stakeholder consultations during first week of January 2020, using a consultation proforma / checklist attached as annexure in selected villages in the sub-project locations involving the team of social and environmental experts, community mobilizer and other key experts to gauge the stakeholder perception about the sub-project. A total of 23 local level consultations were carried out in the selected 23 villages/locations. The stakeholders included local people, program beneficiaries, tea garden manager, landowners losing, and landless labourer, vulnerable households, local government and relevant government agency representatives; and Program staff, PMU, IA and consultants.

10.2.1 Key Issues & Concerns Identified During the Consultations

Since the project is focused on electricity distribution and consequently to enhance the economic condition and livelihood of the locals, most of the stakeholders welcomed the project, specially the farmers, local residence, factory owner, business owners. They were keen for the immediate implementation of the project. Some in the local community hoped increase of more job opportunities, enhanced export/ sale of locally made cultural products and better infrastructure. The government agencies and relevant departments were also ready to provide their services and support in overall projects' implementation. Some of the important points identified are as follows:

- Provision of benefits for the local people especially in terms of employment?
- Whether local people will get employment?
- Impact on the health of the people and the crops being grown in the area?

- Rate for land payable to the landowners?
- Whether NOC has been given to Executing Agencies or not?
- What is the mechanism to ensure timely payment of lease rent for land being pooled for proposed project?
- What will be the fate of agricultural labour that do not own land and are dependent on landowners for labour work on agricultural land owned by big farmers?
- How would the APDCL ensure that the noise / dust / labour camps setup during the construction phase of the project does not impact the local village community?
- Will the construction activity have any adverse impacts on our existing surface water resources?

10.2.2 Summary of Consultation Meetings of Proposed Settlement Wise

Tables 10-1 & 10-2 presents the of commutations with primary and secondary stakeholders of the project.

Table 10-1: Summary of Consultation Meeting with the Primary Stakeholders

Sl. No.	Sub-Station Location	District	Date	No. of Participants		
				Male	Female	Total
1	Tupia	Sonitpur	06/01/2020	6	0	6
2	Bongalmora	Lakhimpur	09/01/2020	6	3	9
3	Simluguri	Sivasagar	09/01/2020	6	1	7
4	Kuthori	Nagaon	07/01/2020	4	2	6
5	Mahmora	Dibrugarh	07/01/2020	10	1	11
6	Garchariali	Sivasagar	07/01/2020	6	0	6
7	Kuralguri	Jorhat	10/01/2020	6	0	6
8	Nayapara	Goalpara	03/01/2020	3	0	3
9	Koila Moila	Chirang	09/01/2020	7	0	7
10	Uttar Barpeta Road	Barpeta	09/01/2020	3	0	3
11	Salakati	Kokrajhor	04/01/2020	3	0	3
12	Lakhimpur	Daranga	06/01/2020	6	0	6
13	Silbori	Daranga	06/01/2020	5	0	5
14	Dwarkuchi	Barpeta	05/01/2020	2	0	2
15	Daranga	Baksa	05/01/2020	5	0	5
16	Chandrapur	Kamrup Metropolitian	04/01/2020	4	0	4
17	Rampur	Kamrup	09/01/2020	8	2	10
18	Bongara	Kamrup	09/01/2020	3	0	3
19	Bhakotgaon (Topatoli)	Kamrup Metropolitian	04/01/2020	5	0	5
20	Bazarghat Part 1, Village Manora	Karimganj	06/01/2020	11	8	19
21	Bajrangpur T. Estate	Cachar	06/01/2020	10	6	16
22	Binnakandy T. Estate	Cachar	07/01/2020	6	0	6
23	Hatichhera	Cachar	10/01/2020	5	0	5

Table 10-2: Issues Discussed and Suggestions of Consultation Meeting

Issues Covered / Raised by participants	Suggestions/Responses to the Issues	Compliances
General Perception about Project	Majority were aware of the proposed sub-stations and distribution line passing through their areas. Almost all the people were positive and supportive towards the proposed project.	

Issues Covered / Raised by participants	Suggestions/Responses to the Issues	Compliances
Support of local people for proposed project	All people expressed their full support during implementation of the project as the project has been perceived to be great potential for the people of the area. People also hoped that the project will help to address their electricity problem such as low voltage and irregular power supply.	
Critical issue and concern by the local people for the project	Most of the communities expressed that there were no critical issues regarding the project. However, few people raised issues/concerns that included (a) fear of losing the land for construction of sub-station especially from tapping point to construction site; (b) fear of not receiving reasonable compensation for the affected assets like agricultural land, assets and crops, if affected	APDCL / Contractor will ensure that the construction, will be done during the off season only. Compensation & assistance will be given as per applicable policy and guidelines.
Employment potential in the project	Majority felt that the project will provide employment opportunities to local unemployed people. Some of them requested that they should be involved not only in unskilled labour job but also in the supervisory works.	APDCL / contractor will use the local available unskilled / skilled labour doing construction, O&M phase.
Tapping Point for Line distribution	Concerned SDO and along with key members suggested that tapping point will be from Dullavchera Sub-station. Total length from taping point to sub-station location would be 15 kms. They opined that line will be distributed above existing 11 KV line or besides of existing 11KV line where no social and environmental impact will be triggered.	-
Support of local people for proposed project	All people expressed their full support during implementation of the project as the project has been perceived to be great potential for the people of the area. People also hoped that the project will help to address their electricity problem such as low voltage and irregular power supply.	-
Socio economic standing: land use, cropping pattern	The major sources of livelihood for the communities are agriculture, wage labour in the tea garden, and small tea business. Most of the communities practiced one times cropping in a year, mainly paddy and vegetable cultivation. The average land holding size was reported to be between 1 to 2 bigha (1,338 to 2,676 sq. m).	-
Opportunity for employment generation for the village landowners and the agricultural labour - Semiskilled / unskilled	The local community members will be preferred for employment during construction. Those losing livelihood will be provided opportunities for alternative livelihood.	-
What other benefits for the village / landowners	Developers/Executing Agency/Contractors will carry out developmental activities in the villages as part of CSR. The activities will be identified in consultation with the community.	-
Impact of dust on standing crops during construction phase	Contactor will ensure watering of construction site / tracks on regular basis.	-

Issues Covered / Raised by participants	Suggestions/Responses to the Issues	Compliances
What impact the project will have on the surrounding areas.	The construction of sub-stations does not have any adverse impacts on the health due to lightening/ sparking/radiations etc.	APDCL / contractor will take proper measure to mitigate any risk to the surrounding areas.
General Perception about Project	Most of the people were aware of the proposed sub-stations and distribution line passing through their areas. Almost all the people were positive and supportive towards the proposed project.	-
Stakeholder expects better power supply situation in villages after the implementation of Project	People opined that the project will help to address their electricity problem such as low voltage and irregular power supply.	-
What will be the rate for acquiring land and structures if acquired	The land and structures owners will be paid as per LARR Act 2013 and Assam LARR Rules 2015	-
Negative impact on food grain, availability /land use	In general, the communities did not see any adverse impact on food/grain availability. However, there was apprehension that if electricity polls/towers are installed in between the paddy fields or other cultivable land, it would reduce the cultivable area of the farmers	IA will ensure that poles will be installed from the assessable / existing roads to minimize any crop loss during construction, O&M stage.
Type of compensation expected	Majority of the communities did not foresee and compensation as there was hardly any loss of agricultural land or any losses to their houses. However, some people requested that prospective income losses from cultivations and trees should be considered	-
Perceived benefits from project	Majority of them viewed that the proposed project would benefit the country as a whole. Some people believed that the upcoming project would contribute to minimize the prevailing energy crisis such as load shedding, and low voltage in the region. For some it will increase the rate of rural electrification and provide impetus to open small and medium business units in the area. At community level, the people hoped that project will address the problems of low voltage, and irregular power supply to the households.	-

10.3 Mechanism/Framework for Consultation

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

10.3.1 Sub Project identification stage

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

10.3.2 Planning Stage

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

and Grievance Redress mechanisms to be adopted.

Dissemination of project information to the community and relevant stakeholders is to be carried out by APDCL at this stage of the project initiative. The community at large shall be made aware of the project alternatives and necessary feedback is to be obtained. Community and other stakeholders should be involved in the decision making to the extent possible. Information generated at this stage should be documented for addressal of queries arising out of the Right to Information Act, 2005. Consultations with Project Affected Persons and their profiling are mandatory as per the requirements of SIA and preparation of RP. This needs to be done as socio-economic and census surveys as part of the ESIA study. Consultations with respect to cultural aspects are to be carried out as part of the Social Impact Assessments for all alternatives and the selected alternative sub-project option.

10.3.3 Implementation Stage

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

With the implementation of the R&R provisions in progress, consultations and information dissemination is to be undertaken to let the affected persons informed of the progress. Implementation stage also involves redressal of grievances in case of R&R aspects as well as relocation of common property resources through the grievance redress mechanisms. These would usually be one to one meeting of PAP or community representatives with the grievance redressal committee established for the project.

A Consultation Framework has been prepared to ensure involvement of stakeholders at each stage of project planning and implementation. To ensure community participation at different stages of the project the consultation framework for APDCL has been proposed in Table below.

Table 10-3: Summary of Consultation Framework

Project Phase	Activity	Details	Responsible Agency	Target Stakeholders
Conceptualization / Identification Stage	Screening Surveys	Identification of the Environmental and Social Sensitive Areas which needs to be excluded	Environmental and Social Consultant	APDCL Circle/Divisional Office, Forest Department, District Land Revenue Office
	Stakeholder Mapping	Cross-section of stakeholders to be identified in order to facilitate their participation in the subproject	Environmental and Social Consultant	APDCL Circle/Divisional Office, Forest Department, District Land Revenue Office.
	ESMPF Disclosure	Reference Framework for APDCL Environmental & Social Sensitivities Issues and & Mitigations in APDCL Procedures to be followed	Environmental and Social Consultant	APDCL Circle/Divisional Office, Forest Department, District Land Revenue Office, District Magistrate.
Planning	Detailed Surveys	Identification of the Environmental and Social Sensitivities	Environmental and Social Consultant	Local Land Revenue officer, Village

Project Phase	Activity	Details	Responsible Agency	Target Stakeholders
		which needs to be avoided		Panchayat, Local Community people
	Stakeholder meetings	Stakeholder meetings for determining land compensation value	Contractor along with APDCL Sub-Division/ Division Level and IR Implementing Agency	Community People especially the Landowners, Local Land Revenue officer, Village Panchayat
Implementation	Check Surveys	Identification of sensitivities along RoW Identification of landowners	Contractor along with the APDCL Circle/Divisional along with IR Implementing Agency	
	Disclosure of Final Compensation or any other entitlements	Dissemination of translated (in local language) entitlement / compensation details along with process of disbursement		

10.3.4 Stakeholder Mapping

Through the formal and informal consultation, following stakeholder mapping has been done, identifying their interests concerned with the project activities. The key stakeholders can be grouped into two categories viz., primary and secondary.

Table 10-4: Stakeholder Mapping

Stakeholder Category	Interests	Potential/Probable impacts
Primary stakeholders		
Project affected people	Access to the facility, Project entitlement, Time-bound delivery of benefits, enhanced quality of life	(+/-)
Beneficiaries	Access to the facility, Project entitlement, Time-bound delivery of benefits, enhanced quality of life	(+/-)
Secondary stakeholders		
APDCL, ASEB, Developers, Village Panchayat	Project implementation, contracting; Project management, Monitoring and evaluation	(+/-)
NGOs, CBOs, Research institutes	Development, Community participation, and Community welfare	(+/-)

This is a tentative mapping is likely to change during the project implementation. Each of these stakeholders will be part of the consultation process and their views will be incorporated into the project design. Their respective roles are presented below:

10.3.4.1 Primary Stakeholders

Project Affected Persons (PAPs) have the following roles:

- Participate in public meetings and identify alternatives to avoid or minimize displacement
- Assist APDCL in developing and choosing alternative options for relocation and income generation
- Participate in census survey

- Provide inputs to entitlement provisions, thus assisting in preparation of the resettlement action plan
- Participate in grievance redress as members of grievance redress cells (GRC)
- Decide on relocation and management of common properties
- Labour and other inputs in the project
- Members of implementation committee

Beneficiaries and Host Population has the following roles:

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

10.3.4.2 Secondary Stakeholders

APDCL, ASEB, Developer, Village Panchayat has the following roles:

- Establish separate cell for environment and social development
- Notification at various stages for land acquisition and joint measurement of land to be
- acquired along with the revenue department
- Design and approval of resettlement policy
- Coordinate with line departments such as telephone, state electricity board, and forest department for shifting of utilities and cutting of trees.
- Participate with NGOs in verification survey of PAPs and categorization of PAPs
- Participate in consultations with PAPs and beneficiaries
- Coordinate with local community in identifying land for relocation of common property resources
- Coordinate with civil construction contractor to relocate common property resources
- Coordinate with revenue department for facilitating disbursement of compensation and resettlement and rehabilitation assistances
- Monitoring of physical and financial progress
- Participate in training programmes for income restoration
- Consult with panchayat and block office to facilitate inclusion of PAPs' name for poverty Alleviation schemes of government of India.

NGOs have following roles:

- Develop rapport with PAPs and between PAPs and EAs.
- Verification of PAPs
- Consultations with the community
- Assess the level of skills and efficiency in pursuing economic activities, identify needs for training and organize programmes either to improve the efficiency and/or to impart new skills
- Assist PAP in receiving rehabilitation entitlements due to them
- Motivate and guide PAP for proper utilization of benefits under R&R policy provisions

- Assist PAPs in obtaining benefits from the appropriate development programmes
- Complete the consultation at the community level and provide support by describing the entitlements to the entitled persons (EPs) and assisting them in their choices
- Accompany and represent the EPs at the Grievance Redress Committee meeting
- Assist EPs to take advantage of the existing government housing schemes and employment and training schemes that are selected for use during the project
- Promote location specific Community Based Organizations (CBOs) of PAPs to handle resettlement planning, implementation and monitoring
- Create awareness among PAPs of health and hygiene

10.4 Information Disclosure

The mechanism of information dissemination should be simple and be accessible to all. Two of the important means that have been followed until now include briefing material and organization of community consultation sessions. The briefing material (all to be prepared in local language) can be in the form of:

- brochures (including project information, land requirements and details of entitlements including compensation and assistance to be given to the PAPs) that can be kept in the offices of local self-government (municipal office in case of urban area and gram panchayat office in case of rural area) and APDCL;
- posters to be displayed at prominent locations and (c) leaflets that can be distributed in the impacted zone of the sub project. Consultation meetings should also be organized at regular intervals by the APDCL to acquaint the PAPs of the following:
    - Timeline and progress of the project
    - Information on compensation and entitlements
    - Information on land acquisition and market valuations of property
    - Timeline for acquisition

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

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

10.4.1 Information to be Disclosed

Table below specifies the type of additional information and frequency of dissemination for projects which are financed either from domestic or donors' funds. The type and timing of the disclosure, channels to be used, frequency and duration of disclosure in APDCL are presented in Table below.

Table 10-5: Summary of Information Disclosure Plan

Topic	Documents to be Disclosed	Frequency and Duration of Disclosure	Where/Channel of Disclosure
Resettlement, Rehabilitation and Land Acquisition	English Resettlement Plans (RPs) and Tribal People Plans (TPPs, if required), with Executive Summaries in Assamese.	Once in the entire project cycle. But to remain on the website and other disclosure locations throughout the project period.	AIIB's website. On the website of APDCL, the client would make the RP available at a place accessible to displaced persons and local NGOs, in a form, manner, and language that are understandable to the PAPs in the following offices: DM's Office State and District Libraries Local municipal and gram panchayat office of the contractor
	Resettlement & Rehabilitation Policy translated in local language	Once in the entire project cycle.	Distributed among Project Affected Persons (PAP)
	Information regarding impacts and their entitlements in local language. R&R and LA monthly progress report.	Once at the start of the project and as and when demanded by the PAP. 10th day of every month	Through one-to-one contact with PAPs. Community consultation List of PAPs with impacts and entitlements to be pasted in the APDCL office and website of APDCL. Hard copies of all disclosed documents in the office of contractor
	RP Impact Assessment Report	At midterm & end of RP implementation	APDCL website in local language.
	Land Acquisition notifications	As required under the RFCTLARR Act 2013 and Assam RFCTLARR Rules 2015	APDCL, website. Hard copy in the office of contractor in local language
	Grievance redressal process.	Continuous process throughout the project cycle.	AIIB Bank's Info shop. On the web sites of APDCL Hard copies of all disclosed documents in the following offices: DM's Office Local municipal and gram panchayat office of the contractor PAPs to be informed on one to one contact
Public Consultation	Minutes of Formal Public Consultation Meetings	Within two weeks of meeting	On the web sites of APDCL Hard copies of all disclosed documents in the following offices: DM's Office Local municipal and gram panchayat office of the contractor
Environmental and Social Management	• Construction Schedule including movement of heavy machinery • English ESIAs with Executive Summaries in Assamese • Hazardous Waste Disposal • E&S monitoring report	Before the start of the project construction phase	• On the web sites of AIIB and APDCL Hard copies of all disclosed documents in the following offices: DM's Office Local municipal and gram panchayat office of the contractor • On the web sites of APDCL Office of the contractor

Topic	Documents to be Disclosed	Frequency and Duration of Disclosure	Where/Channel of Disclosure
Implementation	Information regarding Land losers and their entitlements in local language (in case of land acquisition by LARR 2013/ LARR Assam Rules 2015)	Once at the start of the project and as and when demanded by the PAP	Through leaflets, or other IEC materials, especially developed for the purpose in local language One to one consultations with project affected people APs) Community consultations List of land losers along with the compensation amount to be put up at APDCL PIU, APDCL Divisional Office /Sub-Divisional Office

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

- Project specific information need to be made available at each contract site through public information kiosk
- Project Information brochures shall be made available at all the construction sites as well as the office of implementation agency and the office of Engineer in charge.
- Wherever civil work will be carried out a board will be put up for public information which will disclose all desired information to the public, for greater social accountability.
- All information will be translated into local language and will be disclosed to the public through the Panchayat, District Magistrate's office, concerned project offices, websites of APDCL.

Figure 10-1: Some Photographs of Stakeholder Consultations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11 GRIEVANCE REDRESSAL FRAMEWORK

The project does not involve the permanent acquisition of land and does not fall under Land Acquisition Act, 2013; hence the requirement stated under the Act such as Grievance Redress Mechanism (GRM) related to land acquisition is not applicable here. However, some of the substation locations will entail acquisition of private land where suitable government-owned land is not available. Thus, Grievance Redress Mechanism (GRM) will be applicable to the project in its entirety.

APDCL does not have its in-house Environment or Social Safeguards Policy regarding transmission subprojects currently. To honour the GRM, APDCL will adopt the practice to resolve any major/ minor grievances, where APDCL shall accept, review and address issues or problems raised by PAPs and Project workers arising from Project-related works.

Overall responsibility for timely implementation of GRM lies with the APDCL involved in managing and supervising the civil works and other activities under the Project.

The GRM should have suitable grievance redressal procedure for the project affected persons. It should address affected persons' concerns and complaints related to environmental and social impacts promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to the affected persons at no costs and without retribution. This will consist of site level persons responsible for accepting the grievances and a Grievance Redressal Committee to address the same. For handling grievances, Grievance Redress Committee/s (GRCs) shall be established at project/ scheme level. The GRCs shall include members from APDCL field offices, local administration, head/representative of village-level institution (Panchayat), Affected Persons representative under the chairmanship of project head or its representative. Information about GRCs is to be provided to panchayat of all the villages where APDCL is executing the Project (Refer Table 11.1).

The GRM should be communicated to stakeholders by community consultation and as part of information disclosure both in English and local/Assamese language. Additionally, at the time of construction key project level details and primary grievance contact should also be posted on a notice board near the construction site, concerned electrical circle and office of district administration.

11.1 Roles and Responsibilities

- Focal Point for managing the Complaints Process: Resident Engineer for the subproject and Representative of EPC contractor for individual subproject.
- Person who will manage the grievance database and record keeping: Representative of contractor and E&S Specialist of PMU in direct interaction with Nodal E&S officers (AGM-Concerned Divisional offices).
- Person who will respond to and manage simple queries and complaints: Nodal E&S officer (AGM) and E&S safeguard Specialist-PMU
- Person who will manage difficult complaints or grievances: Grievance Redressal Committee under supervision of Project Director.
- Person who will prepare grievance report for Half Yearly reporting: E&S Specialist PMU

Table 11-1: Constitution of Grievance Redressal Committee

Sl. No.	Members of GRC	GRC Designation
1	General Manager (Zonal)	Chairman
2	Sub District Magistrate/District Revenue Officer or their nominee	Deputy - Chairman
3	AGM* of each Divisional office	Member
4	Representative of local Panchayat/Council	Member
5	Women representative of village/council	Member

Sl. No.	Members of GRC	GRC Designation
6	Environmental and Social Specialist – PMU	Member
7	Resident APDCL Engineer	Focal Point of contact
8	Representative of EPC contractor	Focal Point of contact
9	CBO/NGO representative TBD	Member

The PMU shall formulate procedures for implementing the GRM (Figure 11.1). The Nodal E&S officers shall undertake GRM's initiatives that include procedures of communicating the existence of the taking/ recording complaints, handling of on-the-spot resolution of minor problems, taking care of complainants and provisions of responses to distressed stakeholders, etc. escalating unresolved issues while paying particular attention to the impacts on vulnerable groups.

Environmental and social grievances shall be handled in accordance to the project's GRM. Open and transparent dialogue to be maintained with project-affected persons as and when needed, in compliance with ESP. The GRM for the project should provide an effective approach for complaints and resolution of issues made by the affected community in a reliable way. This mechanism shall remain active throughout the life cycle of the project. The affected persons can approach the court of law at any time of the GRM procedure, if they so wish.

Mode of Communication for Raising Complaint

Complaints can be anonymous and can be communicated through the following means.

- By Phone: Dedicated phone line to be announced by PMU prior to construction phase
- By email: Dedicated email to be announced by PMU prior to construction phase with copy to aiibworks.apdcl@gmail.com
- In person: To EPC contractor, Resident Engineer (Concern office) & AGM (Nodal E&S officer) (List of selected EPC contractor along with their contact number email address to be made available at local offices of APDCL)

Process of Addressing grievances

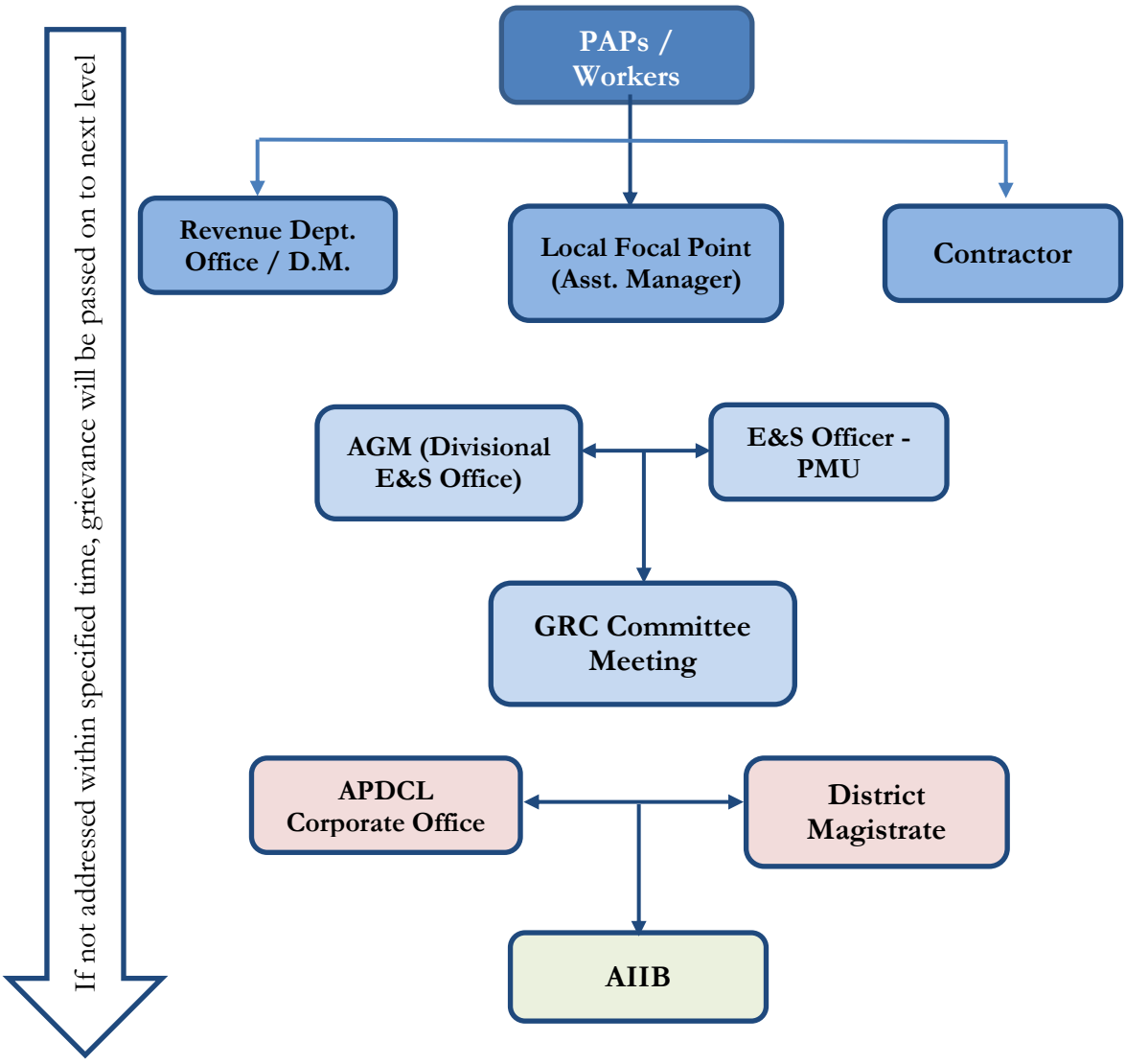
The complainant will be allowed to submit his/her complaint in writing or verbal to contractor, Revenue office, District Magistrate office and local project official who shall pass it to Nodal E&S officer or E&S Specialist of PMU-APDCL within 2 days from receiving the compliant. Receipt of grievances lodged in person or via phone will be acknowledged immediately, while those logged in person, email, and mail submissions will be acknowledged within two working days. The acknowledgment should provide the complainant with the basic information about the next steps. The officer will then investigate by trying to understand the issue from the perspective of the complainant and understand what action he/she requires. The officer will investigate facts and circumstances, interview all parties involved and confer with relevant stakeholders. Once investigated, and depending on the severity and type of grievance, a provisional decision shall be discussed with the complainant in the timeframe of 10 working days after the acknowledgement of the grievance. The final agreement should be specific and agreed with the complainant no later than 20 working days after the acknowledgement of the grievance. Closing out the grievance occurs after the implementation of the resolution has been verified. Even when an agreement is not reached, or the grievance was rejected, the Project officer shall document the result, actions and effort put into the attempted resolution.

If not resolved at this stage, the Nodal officer shall put forward the complaint as non-addressed in GRC committee meeting which shall convene every fortnight from the date of formation of GRC. The first meeting of GRC shall be organized within 15 days of its constitution/disclosure to formulate procedure and frequency of meetings. However, GRC meeting shall be held within 15 days of receiving a grievance for its solution if not resolved by Nodal officer. Detailed report should be submitted for complaints resolved at local level. Such report should also be presented before the GRC during the meeting. In case

complainant/appellant is not satisfied with the decision of GRC they can approach APDCL - PMU /District Collector or Court of law for solution.

The corporate level GRC shall function under the chairmanship of Director (PMU) who will nominate other members of GRC including one representative from corporate ESMC who is conversant with the environment and social issues. The meeting of Corporate GRC shall be convened within 10 days of receiving the reference from project GRC or complainant directly and pronounce its decision within next 15 days. These GRCs shall act as a supplement and in no way substitute the legal systems, especially embedded within RFCTLARR Act 2013, The Electricity Act, 2003, and Right to Information Act.

Figure 11-1: Grievance Redress Mechanism



Affected Persons can approach the court of law at time during the Grievance redressal process.

Note: The grievance redress mechanism is also applicable to the workers under contractors and subcontractors. Grievances raised by workers and staff will be forwarded to the project engineers and management. Any fatality should be informed to PMU and AIIB immediately.

11.2 Recording, Monitoring, Reporting and Evaluation

The GRM system shall keep a grievance register log. Each grievance will be recorded in the register with the following information at the minimum:

- Type of grievances

- Description of grievances
- Gender-disaggregate data of complainant/grievance
- Date of receipt acknowledgement returned to the complainant
- Description of actions taken (investigation, corrective measures) and
- Date of resolution and closure / provision of feedback to the complainant OR Date of escalation to Tier II
- Description of actions taken (investigation, corrective measures) by Tier II
- Date of resolution and closure / provision of feedback to the complainant by Tier II

The monitoring of Grievance management will be through a set of indicators ensuring effective and timely resolution of grievance. The indicators will be measures within the regular E&S Monitoring report. The indicators are listed below:

- Number of Grievances received
- Number (%) of Grievances acknowledged within the timeframe
- Number (%) of Grievances unilaterally decided
- Number (%) of Grievances closed within the specified timeframe
- Number (%) of grievance related to a same or repeated event and /or location to identify areas most affected by potentially negative impacts of the project
- Number (%) of grievance received comparing to the previous reporting period
- Number (%) of complainant satisfied with the process (timely, fair)
- Number (%) of complainant satisfied with the outcome
- If there are more than 30 complaints / grievances recorded, the Project Manager may decide to investigate any patterns or repetition of issues that need addressing. The Project Manager may decide to get an independent consultant to review and provide advice

Annexure 1: Safeguards Consultation Format

Name of the Proposed Substation: ----------

Site/Location: ----------Village ----------Tehsil / Block----------

District---------- Region ----------

Date & Time of Consultation: ----------

Type of Area (Urban/Rural/Highly Congested Urban: ----------

Sl. No.	Issues	Participants' Opinion, Comments and Suggestions
Social and General		
1	Have you heard about the Project or Do you have any information about the project?	
2	What is your opinion about this Project?	
3	Do you support this Project?	
4	Total households in the village and how many approximately have agriculture land and what is the average landholding size?	
5	Are all houses electrified and if yes then what is average hours of electricity per day for domestic consumption?	
6	Are there separate agriculture connections in the village and if yes then what is the percentage of farmers who have existing agriculture connections?	
7	How many agricultural pumps do you have in your village?	
8	Out of the total agricultural pumps how many are electrified and how many are run on diesel?	
9	What is the average horsepower of the pumps?	
10	How many farmers depend on one pump and how they manage. Who is responsible for getting the pump installed and maintenance including the payment of electricity bill?	
11	How many hours of electricity you get for your pump and how much you pay monthly?	
12	How much land can be irrigated with an average size of horsepower pump?	
13	How much expenditure does it take for a diesel-based pump to run for one hour and how many hours on an average, it is run?	
14	Do you think electrified pump will be beneficial and if yes then please share how?	
15	What are the major crops and how many crops you cultivate in a year?	
16	Do you face any problem regarding current electric supply as far as home connection and agriculture connections are concerned?	
17	Do you think that the Project is necessary?	
18	What are your main concerns/issues about the project?	

Sl. No.	Issues	Participants' Opinion, Comments and Suggestions
19	The Project is about establishment of new substations. There might be loss of crops and trees during construction. Would you volunteer to cooperate with the APDCL during construction / operation & maintenance?	
20	Specifically, what concerns/issues do you have on the implementation of the project with respect to the following: • Community health and safety • Land • Agricultural production • Cultural heritage • Displacement • Loss of income and business Others (Specify)	
21	**What positive impacts and/or benefits do you think the project will have?**	
a)	Minimize power cut	
b)	Enhance local economy	
c)	Increase employment opportunity	
d)	Increase facilities (health / education / infrastructure)	
e)	Increase in property value	
f)	Improvements in transportation system using electric vehicle	
g)	Decrease burning of wood/ brushwood (decrease green gas house emission)	
h)	Others (Specify)	
22	**What negative impacts do you think the project will have?**	
a)	Land acquisition	
b)	Loss of livelihood	
c)	Increase in migration	
d)	Disruption of social-economic / culture	
e)	Loss of crops/trees etc.	
f)	Others (Specify)	
23	How long have you been living in this area?	
24	Are there any indigenous people/ tribal people or ethnic minority living in this area? If yes, how far and what is the name of tribe group and what is their number of households etc.?	
25	If you are from indigenous people/tribal do you expect any impacts from projects on your culture, territory, and livelihood impacts?	
Environment		
1	Protected areas (national park, protected forest, religiously sensitive sites, historical or archaeological sites), if any	
2	Access to the forest land and the use of the forest land (if any)	
3	Current environmental conditions in the area – air, dust, noise conditions in the area.	
4	Will the project siting adversely impact the water or soil resource in the locality	
5	Type of trees in the area: Fruit/non fruit/forest/ rare/endangered species etc.	
6	Wild, endemic, endangered animals in the area.	

Sl. No.	Issues	Participants' Opinion, Comments and Suggestions
7	Shortage of water for human consumption, irrigation, and how extensive are they?	
8	What is the general ground water level in this area and does the ground water used for drinking water purpose? Do you think agriculture pumps will have negative impact on ground water being used for drinking water?	
9	What is your prime source of drinking water? And what are the other sources of drinking water?	
10	Any conflicts on water use rights and social impacts?	
11	Health status, Availability of Hospitals and over all environmental condition. Is there any chronic disease prevalent in this area and are you aware about HIV/AIDS and STP?	
12	Any other Suggestions if any	

Annexure 2 Community Consultation Attendance Sheet

Project							
District		Sub-division		Block / Ward No		GMC	
Settlement		PS / Thana		Sub-station Location			
Date		Time		Total No. of Participants	Male	Female	Total

Sl. No.	Name	Age	Gender	Gen / SC / STs	Occupation / Designation	Contact Details	Signature

Annexure 3: Environment Screening Checklist

Sl. No.	Screening Question	Yes	No	Remark
1	**Project's sitting:** Is the Project site adjacent to or within any of the following environmental sensitive areas?			
a)	Cultural heritage site			
b)	Scared Forest			
c)	Protected areas			
d)	Wetland			
e)	Forest			
f)	Estuary			
g)	Buffer zone of Protected areas			
h)	Nature reserves like bird yard, mangrove forests, IBAs, any other special area for protecting biodiversity etc.			
i)	Habitat Corridors			
j)	Rivers and reservoirs			
k)	Canals and irrigation system			
l)	Agricultural land			
2	**Potential environmental impacts** **Will the Project cause:**			
a)	Encroachment on historical/cultural areas			
b)	Encroachment on critical ecosystem (e.g. sensitive or protected area, national park, nature reserve etc....)			
c)	Will facilitation of access to protected areas be provided in case the DLs traverse protected areas?			
d)	Disfiguration of landscape and increase Change of surface water quality or water flows waste generation			
e)	Increase water turbidity due to runoff and erosion			
f)	Wastewater from camping sites is directly discharged to the surface water resources or not?			
g)	Deterioration of surface water quality due to silt runoff, sanitary wastes and wastewater from camping sites, construction wastes, as well as chemicals used in construction?			
h)	Increase the dust level?			
i)	Increase noise and/or vibration due to blasting & other civil works?			
j)	Permanent land acquisition			
k)	Temporary land acquisition			
l)	Is there any household need to be relocated? If yes, how many households?			
m)	Would the resettlement site environmentally and/or culturally sensitive disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
n)	Is there any risk of disease dissemination from construction workers to the local peoples due to poor sanitation and solid waste disposal in construction camps and work sites (and vice versa)?			
o)	Will creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?			
p)	Is there any potential for conflict between construction workers and local peoples for instance, increased burden on social infrastructure and services (such as water supply and sanitation systems)?			

Sl. No.	Screening Question	Yes	No	Remark
q)	Are explosive and hazardous chemicals used within the Project like PCB, CFCs, SF6?			
r)	chemical pollution resulting from chemical clearing of vegetation for construction site, or herbicides for vegetation height control?			
s)	In the past, there was any accident incurred due to landmines or explosive materials remaining from the war?			
t)	Will Project's construction cause disturbance to the transportation in the Project's site?			
u)	Will Project's construction cause hazardous driving conditions where construction interferes with pre-existing roads?			
v)	Project's construction will cause any damage to the existing local roads system?			
w)	Will soil excavation during Project's construction cause soil erosion?			
x	Will Project need to open new access roads?			
y)	Will Project cause fragmentation of habitat of flora and fauna?			
z)	Will Project cause impact on air transportation?			
aa)	Will Project cause risk to safety and human health (EMF, electric shock, lightening etc.)?			
bb)	Will Project cause risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation? (risks due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals			
cc)	Will environmental disturbances have associated with the maintenance of lines (e.g. routine control of vegetative height under the lines)?			

Screening Questions		Score	Remarks
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather-related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g. the drainage systems, the strengthened pole foundations) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) (e.g. line sag)?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. power distribution efficiency) of project output(s) (e.g. distribution lines) throughout their design lifetime?		

Annexure 4: Involuntary Resettlement Checklist

Sl. No.	Screening Question	Yes	No	Remark
1	**Involuntary Acquisition of Land**			
a)	Will there be land acquisition?			
b)	Is the site for land acquisition known?			
c)	Is the ownership status and current usage of land to be acquired known?			
d)	Will there be loss of shelter and residential land due to land acquisition?			
e)	Will there be loss of agricultural and other productive assets due to land acquisition?			
f)	Will there be loss of crops, trees, and fixed assets due to land acquisition?			
g)	Will there be loss of businesses or enterprises due to land acquisition?			
h)	Will there be loss of income sources and means of livelihoods due to land acquisition?			
2	**Involuntary restrictions on land use or on access to legally designated parks and protected areas**			
a)	Will people lose access to natural resources, communal facilities and services?			
b)	If land use is changed, will it have an adverse impact on social and economic activities?			
c)	Will access to land and resources owned communally or by the state be restricted?			
d)	Any estimate of the likely number of persons that will be displaced by the Subproject?			
e)	If yes, approximately how many?			
f)	Are any of them poor, female-heads of households, or vulnerable to poverty risks?			
g)	Are any displaced persons from indigenous or ethnic minority groups?			

Annexure 5: Indigenous People Checklist

Sl. No.	Screening Question	Yes	No	Remark
1	**Indigenous Peoples Identification**			
a)	Are there socio-cultural groups present in or use the sub-project area who may be considered as "tribes" (hill tribes, schedules tribes, tribal peoples), "minorities" (ethnic or national minorities) or "indigenous communities" in the subproject area?			
b)	Are there national or local laws or policies as well as anthropological researches / studies that consider these groups present in or using the subproject area as belonging to "ethnic minorities", scheduled tribes, tribal peoples, national minorities, or cultural communities?			
c)	Do such groups self-identify as being part of a distinct social and cultural group?			
d)	Do such groups maintain collective attachments to distinct habitats or ancestral territories and/or to the natural resources in these habitats and territories?			
e)	Do such groups maintain cultural, economic, social, and political institutions distinct from the dominant society and culture?			
f)	Do such groups speak a distinct language or dialect?			
g)	Have such groups been historically, socially and economically marginalized, disempowered, excluded, and/or discriminated against?			
h)	Are such groups represented as "Indigenous Peoples" or as "ethnic minorities" or "scheduled tribes" or "tribal populations" in any formal decision-making bodies at the national or local levels?			
2	**Identification of Potential Impacts**			
a)	Will the subproject directly or indirectly benefit or target Indigenous Peoples?			
b)	Will the subproject directly or indirectly affect Indigenous Peoples' traditional socio-cultural and belief practices? (e.g. child-rearing, health, education, arts, and governance)			
c)	Will the subproject affect the livelihood systems of Indigenous Peoples? (e.g., food production system, natural resource management, crafts and trade, employment status)			
d)	Will the subproject be in an area (land or territory) occupied, owned, or used by Indigenous Peoples, and/or claimed as ancestral domain?			
3	**Identification of Special Requirements Will the subproject activities include:**			
a)	Commercial development of the cultural resources and knowledge of Indigenous Peoples?			
b)	Physical displacement from traditional or customary lands?			
c)	Commercial development of natural resources (such as minerals, hydrocarbons, forests, water, hunting or fishing grounds) within customary lands under use that would impact the livelihoods or the cultural, ceremonial, spiritual uses that define the identity and community of Indigenous Peoples?			
d)	Establishing legal recognition of rights to lands and territories that are traditionally owned or customarily used, occupied or claimed by indigenous peoples?			
e)	Acquisition of lands that are traditionally owned or customarily used occupied or claimed by indigenous peoples?			
4	**Anticipated subproject impacts on Indigenous People:**			

Annexure 6: Districts Baseline Profiles – Physical Environment

A. BAKSA

Baksa was formed on June 14, 2004 as one of the four districts under the Bodoland Territorial Autonomous District vide notification No. GAG(B)137/2002/Pt/117 dated 30.10.2003 under the provision of the Sixth Schedule. The District is located in North-western part of Assam with the District headquarter at Mushalpur which is 105 Kms. away from State Capital Guwahati. The District is bounded by Bhutan in the North, Udalguri District in the East, Barpeta, Nalbari and Kamrup Districts in the South and Chirang District in the West. This district covers a total area of 2457 Sq. Km. In terms of total area covered, this district occupies the 14th rank among the districts of the state.

Climate: The district enjoys a sub-tropical humid climate with a hot summer and moderate winter. January is the coldest month and July/August is the warmest month. The winter temperature drops to 10°C and summer temperature goes up to 35°C. South-West monsoon activates from June and continues up to September-October. Due to varied distribution of rainfall, the district experiences heavy flood during wet period and moisture stress in the dry period.

Physiography: The district is characterized by almost plain topography with a gentle slope from North towards south. The District shares the privilege of being the International boundary with Bhutan in the North with a mixed topography of plains and foothills. The gentle and gradual slopes can be seen stretching from the foot hill of Bhutan and reaching out to the southern tips of Barpeta, Nalbari and Kamrup districts. The ground undulates considerably as it approaches the hills so much so that the edge of the plain is not easily defined. The villages in this part of the district are exceedingly picturesque and bear a good appearance.

Soil: The district forms a part of the vast alluvial plains of Brahmaputra River system and sub-basin of River Manas. Physiographically, it is characterized by the different landforms resulting from a) denudation structural hill and b) alluvial plain. The low mounds/hillocks are covered by a thick lateritic mantle and these are occupied by evergreen mixed forests. The alluvial plains comprise of Older and Newer alluvium. The Older alluvium occupies the piedmont zone towards the north of the district bordering Bhutan. The narrow zone at the Himalayan foothill is known as the Bhabar zone and it supports grow of dense forests. To the south of the Bhabar zone and parallel to it, the flat Terai zone lays where the ground remains damp and sometimes, spring oozes out. The Terai zone is covered by tall grass. The Newer alluvium includes sand, gravel, pebble with silt and clay. Soil in greater parts of the district is sandy and silty loam, or clayey loam. The variation in composition is mainly due to the varying composition of the river borne 2 materials deposited at different times and under different conditions. The younger alluvial soil has a high phosphorous content whereas, in Older Alluvial soils, it is very low. In general, the soil is acidic to slightly alkaline in nature and is moderately permeable and characterized by the presence of low organic carbon and low soluble salts. Soils restricted to inselberg areas are more clayey, lateritic and less permeable and are highly acidic in nature. From agricultural point of view, the soils in major parts of the district are suitable for all sorts of crops.

Land and land use pattern: Land resource is one the most important and valuable free gift of the nature and its proper utilization by the inhabitants is of great value. Land should be fully used as per its capability. Lack of proper or profitable use means wastage of land resource and it result to loss of productivity. It therefore requires proper and timely use of this kind of asset.

Flora & Fauna: Evergreen and semi evergreen forests flourish in alluvial soil, having capacity to retain much water throughout the district. The main species found in these forests are Sam, Guserai, Titasapa, Makai, Nahar, Khair, Ajhar, Kathal, Sanalu, Gumari and Uriam. These are used for posts, planks, scantling and sleepers. In addition, enough bamboos, canes etc. are also found in the forest areas. In thick forests, there are herds of elephants and bison and numerous deer. Buffaloes, tigers, leopards, mithun and various kinds reptiles and amphibians are found in the district. The district is also a home to Manas National Park. The park is well known for species of rare and endangered wildlife that are not found anywhere else in the world like the Assam roofed turtle, hispid hare, golden langur and pygmy hog. It has the largest population of the endangered Bengal florican to be found anywhere. Other major bird species include great hornbills, jungle fowls, bulbuls, Brahminy ducks, kalij pheasants, egrets, pelicans, fishing eagles, crested serpent-eagles, falcons, scarlet minivets, bee-eaters, magpie robins, pied hornbill, grey hornbills, mergansers, harriers, ospreys and herons. The combination of Sub-Himalayan Bhabar Terai formation

with riverine succession leading up to the Himalayan subtropical broadleaf forests makes it one of the richest biodiversity areas in the world.

Table 11-2: Kamrup Rural Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Kamrup R/GEC-II	322245	1169	321076	24	475.53	4108.92	0598.08	330.30	17	85&98

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 24 nos. of substation in Kamrup Rural GEC-II electrical circle which fulfil the requirement of 322245 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(85%) and collection efficiency(98%) is generating total revenue collection about 330.30 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

B. KAMRUP METROPOLITAN

Kamrup (M) was created on 3 February 2003 vide notification No. GAG(B)181/2002/91 dated 30.03.2003 by bifurcating the erstwhile Kamrup district. The district is situated at the Longitude between 90.36 degree & 92.12-degree East and Latitude between 25.43 degree & 26.51 degree north. Administrative headquarters of Kamrup Metropolitan district is at Guwahati. The district occupies an area of 692.57 km². In terms of area, the district has the smallest area but with the highest density of 1313 persons per sq.km

Climate: The climate of Kamrup (M) does not differ from that of the other districts of Assam. Its principal characteristics are a cold and foggy winter, a moderately hot spring and a temperately hot but humid summer. In March and April, the weather begins to grow a little warmer. During the height of the rains, the climate is decidedly oppressive. The air is absolutely saturated with moisture and the damp heat gets very trying. Climatically from February to May, the weather is dry and moisture less and the heat is gentle; from June to October, there is enough rain and moisture and the heat is very unbearable and from November to January, the climate is cold and foggy. During the latter part of December and early part of January, the Brahmaputra fog can be very cold while in March, the wild wind carrying the Brahmaputra sand can be seen everywhere. From the end of February, the mercury level gradually goes up and in June July and August the temperature reaches the maximum point. During these months, the mean maximum temperature does not generally come down below 31 degrees centigrade and even sometimes it goes to above 40 degree centigrade. These months are treated as hottest months for the district in each year.

Physiography: As the name itself represents this metropolitan district is mainly an Urban district comprising of Guwahati city as its main component. The rural areas of the district are mainly covered by Chandrapur Revenue Circle and Sonapur Revenue Circle. The mighty river Brahmaputra forms the Northern boundary of the district with a small part of North Guwahati Revenue Circle forming part of the district situated in the south bank of the Brahmaputra. The river has a lot of influence in the physiography of the district. The entire Guwahati city and Chandrapur stands as immediate neighbourhood of the Brahmaputra and are exposed to annual inundation. The Brahmaputra is navigable by river steamers throughout the year. Large number of Government and private steamers especially in the rainy season to connect North Guwahati with Guwahati. At a comparatively short distance from the riverbanks the ground begins to rise in undulating knolls towards the Khasi Hills in the South. The swampy tracts of land rise up to a height of 3000 feet above mean sea level. All hills are covered with evergreen grass, bamboos and forests. Among them, Sal is the valuable forest product. There are no high mountains in the Kamrup(M) district but small hills can be found almost everywhere, the most beautiful of which is the Kamakhya Hill. The district is being dissected by many rivers like Digaru, Basistha, Bharalu etc. All the rivers start from Meghalaya and meet with the Brahmaputra. There are numerous small lakes and marshes in Kamrup(M) district. The lakes or beels are generally sheets of water in the centre of a saucer-like basin. The largest and best-known waterbody is the Dipor beel. These beels are generally natural fisheries which are sold on auction by the local authorities. Dipor beel has also been declared as a wildlife sanctuary.

Soil: The soil of Kamrup (M) district is not much different from those of the other district of Assam. The district is characterized by an abundance of marshes and lowlands, the soils of which contain a large percentage of organic matter. In winter the soil becomes excellent for growing crops like pulses and oil seeds. The soils in Kamrup(M)

district are generally fertile due to annual deposing of silt. A major portion of total sown area of this district is under agricultural crops and vegetables.

Land and land-use-pattern: Land resource is one the most important and valuable free gift of the nature and its proper utilization by the inhabitants is of great value. Land should be fully used as per its capability. Lack of proper or profitable use means wastage of land resource and its results loss of productivity. It therefore requires proper and timely use of this kind of asset.

Flora & Fauna: The forests of the district are the principal raw materials supplier to sawmills and factories. The forests are generally ever green in type and consist of a host of tree species. The important trees from the commercial point of view are sal, sundis, teak, champa, Gamari, san, nageswar, jam, bunsum, kokoi, mangoes etc. The forest also provides a large section of the people living in the periphery with firewood, timber, bamboo, ikara, thatch etc to build their houses. In 1989 erstwhile Kamrup district became home to the Dipor Beel Wildlife Sanctuary, which has an area of 4.1 km2 (1.6 sq mi). At present, the Beel falls in Kamrup (M) district. Wild Asian elephants, leopard, jungle cat, the protected barking deer, Chinese porcupine and sambar are found in the beel. The Beel is a natural habitat to many varieties of birds. 219 species of birds including more than 70 migratory species are reported in the Beel area. In the district, there is also a plantation where seedlings of teak, sal, sissu, sum, and nahor are reared, and experiments are being made with the caoutchouc tree.

Table 11-3: Kamrup Metropolitan Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Kamrup Metro/GEC-I	236104	3162	232942	37	544.64	4706.01	2138.13	566.70	7	93&100

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 37 nos. of substation in Kamrup Metropolitan GEC-I electrical Circle which fulfil the requirement of 236104 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(93%) and collection efficiency(100%) is generating total revenue collection about 566.70 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

C. BARPETA

The district lies approximately between 90°39' 30" E and 91°23' 00" E longitude and between 26°05' 30" N to 26°48' 30"N latitude. It lies elongating in south-north direction extending from the Brahmaputra in the south to Baksa District in the north. The district is bounded by Nalbari district in the east, by Baska District in the north, by Bongaigaon and Chirang District in the west and by Goalpara and Kamrup District in the south. The river Brahmaputra lies in southern boundary of the district which runs along the southern bank of the river. The total area of Barpeta district is 2282 sq/km. and rank 15 in comparison to other districts in Assam.

Climate and Rainfall: The climate of the district is characterized by excessive humidity during summer and moderately cold and foggy winters. Generally, the weather goes dry and moisture less from February to April. From May to September sufficient rainfall sweeps over the district with heavy moisture in the atmosphere. During the months of October and November, the weather becomes pleasant and the atmosphere gets foggy. Fogginess remains in the atmosphere till the end of January. Winter starts in the month of November and continues for about four months. The climate / atmosphere is somewhat dry and dusty during the months of February and March. As per Statistical Handbook, 2012 the highest rainfall recorded in June 2011 as 455.7 mm as against the state average of 267.6 mm followed by 424.3 mm in July 2011. The lowest rainfall was recorded in the months of December and January 2011.

Physiography: The land characteristics of the district is not deviated from that of the neighbouring districts. The district is characterized by a plentiful of marshes and lowlands, the soil of which contain a large percentage of organic matter. The district has a large number of big and small rivers. The Brahmaputra, Manas and Beki are the main rivers of the district. The Chaulkhoa, Bhelengi, Pahumara, Mora Manas, Nakhanda, Kaldia, Palla, Moranadi etc though are the small rivers flowing through the district can cause devastating flood and severe soil erosion in their nearby areas. Unlike the northern part, the southern part of the district depicts a contrasting physical character where lot of low-lying areas are scattered throughout the region. Locally known as 'beels', these features dominate

the economy of the region to a large extent. Lachange, Chikartari, Chilla, Tarakandi, Garaiamri, Ari, Bogdoba, Bumirpathar, Gomi, Baira, Vella etc. are some important beels of the district. Like other district of Assam, Barpeta is a seismic area where earthquakes are by no means a rare phenomenon. The district has been affected by several major earthquakes in the past. The earthquake that occurred in 1869 had caused great damage to life and property. There were damages also in the earthquakes of 1897, 1950 and 1957

Soil: The solid geology of the district which mostly lies under the board level plain is covered by alluvium. The older alluvium composed of light terrance gravel stretches from the Bhutan border. The soil is composed of sand and clay in varying proportion ranging from pure sand near the rivers to a stiff clay. The new alluvium soils are mostly found in the narrow flood-prone tracts bordering southern part of the Brahmaputra. They vary in texture, mostly from clay to sandy loams. The soils are less acidic. The percentage of Nitrogen and organic matters are suitably proportioned for agricultural purpose. The soils in the district are mostly fertile due to annual deposit of silt carried by the rivers.

Land and Land-use–Pattern: The land characteristic of the district is mostly flat plain with few forested hills. Agriculture is the predominant occupation of the people of the district. The area of the Government waste land is very large. However presently it is seen that with the inflow of immigrant's large char areas and forest lands have been taken up for habitation and cultivation.

Flora & Fauna: Forestry plays a significant role in the economy of the district. A large portion of the people of the district depends on forests for firewood to cook their day to day meals and timber, bamboo, Ikra, thatch etc to build their houses. The forests are generally evergreen in nature and consist of a host of tree species. The principal forest wealth of the district is Sal, Sissoo, Kharin, Kuhir, Simul, Koroi, Gamari, Bansum, Jam and Titasepa. Evergreen and semi evergreen forests are found in the district particularly Manas area which consists several types of trees. These are mainly Sal, Sida, Bahera, Gomari, Segun, Bansum etc. The common herbs and shrubs are Agerratun, Conyzoides, Cares, Specials of Curcuma etc. Besides, there are grass lands having some kinds of grasses. The grass lands are subjected to fire in the summer season. Manas area of the district is very rich in Flora and Fauna. The rare flora is mainly *Reinwardia indica, Desmodium motorium, Puerania subspicata and Priden Pilosa*. The notable trees are Semal, Sissoo, Owtenga Bhelkhore, Poma, Uriam, Khoir, Amlakhi, Sida, Siris, Kum, Sonaru, Oxi, Parali etc. In respect of fauna, different types of mammals, reptiles, amphibians, fishes and variety of insects are found in the district. The rare Pygmy hog is found in Manas Reserve forest. Different species of Birds are also found in the district. Many rare species adorn the Manas reserve forest while birds like crows' sparrows crane kingfisher woodpecker, myna, dove, pigeon etc are found in large. Many types of migratory birds are also seen in the beels in large numbers. Hill Turtle is also another fauna of the Manas. The various kinds of tortoises are also found in the district particularly near to the Brahmaputra rivers and beels. The killing of turtles for personal consumption and commerce have been banned by the forest department.

Table 11-4: Barpeta Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Barpeta	481657	474	481183	21	560.47	4842.82	2491.02	123.60	36	72&89

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 21 nos. of substation in Barpeta electrical circle which fulfil the requirement of 481657 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(72%) and collection efficiency(89%) is generating total revenue collection about 123.60 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

D. CHIRANG

Chirang district was formed on June 14, 2004 as one of the four districts under the Bodoland Territorial Autonomous District vide notification No. GAG(B)137/2002/Pt/117 dated 30.10.2003 under the provision of the Sixth Schedule. This district was curved out mainly from Bongaigaon district, Kokrajhar district and partly from Barnagar Revenue Circle of Barpeta district. The district is situated at the Longitude of 90.30 to 90.35-degree East and Latitude of 26.30/ to 26.37-degree North. Kajalgaon is the headquarters of the district. The district shares the

international boundary with Bhutan on the north. It is bounded by Kokrajhar district in the west, Bongaigaon and Barpeta district on the south and Baksa district on the east. This district covers a total area of 1923 Sq. Km. In terms of total area covered, this district occupies the 19th rank among the districts of the state.

Climate: Chirang district falls under Lower Brahmaputra Valley Agro-Climatic Zone. The climate of the district is sub-tropical in nature with warm and humid summer followed by dry and cool winter. The average annual rainfall is 1900 mm out of which 75% is received during monsoon months (June to September). The monsoon months are wet and winter is dry. Both pre and post monsoon months have unpredicted and erratic rainfall. The mean maximum and minimum temperature vary from 330 to 380 C and 90 to 100C, respectively. The average radiation is the highest during March – April, while overcast sky reduces the solar radiation to the least during July. The average radiation is the highest during March – April, while overcast sky reduces the solar radiation to the least during July. The climatic season is classified as follows: (a) winter (b) pre-monsoon, (c) monsoon and (d) retreating monsoon the winter covers the months of December, January and February. In this season, fair weather prevails occasionally associated with fogs and haze. December and January are the driest months and January is the coldest. The minimum temperature ranges between 8 C and 10 C and the maximum between 27 C and 29 C. The average rainfall in the season is 20 cm. The months of March, April and May constitute the pre-monsoon season. From March the land surface gets steadily heated and the temperature starts rising. Strong convection develops due to the local depressions formed especially in the afternoon. The nor'westers locally called Bordoichilla appears during the period. Rainfall ranges between 59 and 160 cm and maximum temperature ranges between 28 C and 32 C. This season is, in fact, a transitional phase between the dry cool winter and the warm moist monsoon. With the onset of monsoon in early June, heavy rainfall occurs. Widespread low clouds and high humidity together maintain almost uniform temperature over the area. The maximum temperature ranges between 33 C and 37 C. The average annual rainfall during the period is 300 cm. The occurrence of thunderstorms is the most conspicuous characteristics of the monsoon weather. This is the season of dominant agricultural operation in the area. The monsoon withdraws from the area in the last week of September or first week of October. The geographic low is replaced by high pressure and a flat pressure gradient occurs. Rainfall decreases abruptly and the sky becomes progressively clear. Sunny days prevail till the end of November. It is most suitable for the cultivation of a variety of grain and horticultural crops.

Physiography: The Chirang district possesses a plain topography. The entire area of the District is situated at the plains of the Brahmaputra Valley. The soil type is generally sandy to sandy loam with alluvial deposits. It also has undulating areas and the northern parts of the district lie on the foothills of Bhutan that has slightly higher elevation which is decreasing towards the southern parts of the district. Four types of soil found here are Alfisoles, Ultisole, Inceptisole and Entisole. Rivers like Champamati, Aie, and Manas flows through the district which are originated from the foothills of the Himalayan Range are wild in nature and falls into the mighty river Brahmaputra. Besides, many tributaries, small rivulets and streams flow in the district. The agro climatic conditions of the district is conducive for various agricultural activities. Chirang district is characterised by the different landforms a) inselbergs and b) alluvial plains. The inselbergs are Archaean inliers occurring in the form of disconnected hillocks in the alluvial plains. They are found occurring in the south-eastern part of the district. The hillocks are covered by a thick lateritic mantle and are occupied by evergreen mixed forests. The alluvial plains are comprised of Older and Newer alluvium. The Older alluvium occupies the piedmont zone towards the north of the district bordering Bhutan. The high narrow zone at the Himalayan foothill is known as the Bhabar zone and supports dense forests. To the south of the Bhabar zone and parallel to it, there lies the flat Terai zone where the ground remains damp and sometimes springs oozes out. Tall grasses cover the Terai zone. The formation is comprised of sand, clay with mixtures of pebble, cobble and boulders. The Newer alluvium includes sand, gravel, pebble with silt and clay

Soil: Soil in greater parts of the district is sandy and silty loam, or clayey loam. The soils of the alluvium are partly new or recent and partly old. The variation in composition is mainly a result of the varying composition of the river borne materials deposited at different times and under different conditions. The younger alluvial soil has a high phosphorous content whereas in Older Alluvial soils, the content is very low. In general, the soil is acidic to slightly alkalaine in nature and is moderately permeable and characterised by the presence of low organic carbon and low soluble salts. Soils restricted to inselberg areas are more clayey, lateritic and less permeable and are highly acidic in nature. From agricultural point of view, the soils in major part of the district are suitable for all sorts of crops.

Land and land use pattern: Land resource is one the most important and valuable free gift of the nature and its proper utilization by the inhabitants is of great value. Land should be fully used as per its capability. Lack of proper or profitable use means wastage of land resource and its results loss of productivity. It therefore requires proper and timely use of this kind of asset.

Flora & Fauna: The forest plays a pivotal role in the economy of the people of the district. A large section of the people of the district rests on forest for firewood to cook their meal and timber, bamboo, ikra, thatch etc. to build their houses. The forests of the district are the principal raw materials supplier to sawmills and factories. The forests are generally ever-green in type and consist of a host of tree species. The important trees from the commercial point of view are sal, sundis, tik, champa, Gamari, san, nageswar, jam, bunsum, kokoi, simul, mangoes etc.As per Statistical Handbook, 2012 the total reserve forest area of the district is 55957.55hect. Manas, Teklai, Dadgiri, Bengtol, Khuklung, Rani, Sisubari are the reserve forest. The total forest area does not include unclassified state forest. Evergreen and semi evergreen forests flourish in alluvial soil, having capacity to retain much water throughout the district. The main species found in these forests are Sam, Guserai, Titasapa, Makai, Nahar, Khair, Ajhar, Kathal, Sanalu, Gumari and Uriam. These are used for posts, planks, scantling and sleepers. In addition enough bamboos, canes etc. are also found in the forest areas. In thick forests, there are herds of elephants and bison and numerous deer. Buffaloes, tigers, leopards, mithun and various kinds reptiles and amphibians are found in the district. The district home to Manas National Park. The park is well known for species of rare and endangered wildlife that are not found anywhere else in the world like the Assam roofed turtle, hispid hare, golden langur and pygmy hog. It has the largest population of the endangered Bengal florican to be found anywhere. Other major bird species include great hornbills, jungle fowls, bulbuls, Brahminy ducks, kalij pheasants, egrets, pelicans, fishing eagles, crested serpent eagles, falcons, scarlet minivets, bee-eaters, magpie robins, pied hornbill, grey hornbills, mergansers, harriers, ospreys and herons. The combination of Sub-Himalayan Bhabar Terai formation with riverine succession leading up to the Himalayan subtropical broadleaf forests makes it one of the richest biodiversity areas in the world

Table 11-5: Bongaigaon Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Bongaigaon	517004	550	516454	26	636.56	5500.27	4186.76	132.40	47	68&78

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 26 nos. of substation in Bongaigaon electrical circle which fulfil the requirement of 517004 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(68%) and collection efficiency(78%) is generating total revenue collection about 132.4 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

E. DARRANG

The district of Darrang lies between 260 11' 15" N and 260 56'15" latitude and 910 42' 00" and 920 23' 30" longitude. The district lies between the Brahmaputra River on the south and the newly formed Udalguri district in the north. To the east, it is bounded by the Sonitpur and Marigaon districts to the west by Kamrup district. This district covers a total area of 1585 Sq. Km. In terms of total area covered, this district occupies the 22nd rank among the districts of the state.

Climate: The climate of the district is characterised by the absence of a dry hot summer season; the highest temperatures being experienced during the south-west monsoon season along with abundant rains and highly humid atmosphere throughout the year. Winter starts from December and ends in February, which is followed by a season of thunderstorms, from March to May. Next from June and up to the beginning of October is the season of south-west monsoon and October and November are marked as post-monsoon season Rainfall, mostly as thundershowers, amounting to about a fifth of the annual rainfall is received in the pre-monsoon months of April and May. The southwest monsoons arrive over the district by about the beginning of June. The rainfall in the period June to September accounts for about two thirds of the annual rainfall. The cold season starts towards the end of November when both day and night temperatures begin to decline. January is the coldest month of the year with the mean daily maximum temperature at about 240C and the mean daily minimum at 90C to 110C. In association with low pressure waves passing eastwards during the winter season, the district experiences cold spells for a day or two when the minimum temperatures may fall below 50c. Temperature begins to rise from the beginning of March. The rise in temperature continues well into the south-west monsoon season, when temperatures are higher than even in the period March to May. The highest mean daily temperatures experienced in July and August. This together with high humidity (highest during the year) makes the south-west monsoon season rather unpleasant

particularly when not raining. With the termination of the monsoon season the weather becomes gradually cooler. The air is highly humid throughout the year, except during the period February to April when the relative humidity is comparatively less (less than 70 percent), particularly in the afternoons. Skies appear heavily clouded to overcast during the south-west monsoon seasons. There is a decrease in cloudiness after the withdrawal of the monsoon and during the period December to April, skies remain usually clear or lightly clouded. Winds are light throughout the year except for short spells of strong winds during thunderstorms in the period March to May.

Topography: The district intersected by numerous hill streams is almost quadrilateral block of alluvial plain, with an abrupt southward slope in the north and the level falls in the south, with a dip towards the south-west. The soil is composed of loose sandy texture with occasional sands and gravels. Water is scarce in the upland country, primarily because the turbulent hill rivers do not inundate large tracts for long and the rainwater is quickly soaked in the sandy soil. A part of this district, forming the natural division where the slope of the landscape is gentler than the northern sub-mountain tract of Udalguri district is an alluvial plain. Towards the south it is the most populous part of the district, where the flat alluvial plain is covered with stretches of rice lands interspersed with homesteads. The tract on the northern bank of the Brahmaputra is a low flat alluvial plain, covered with reeds or tall grasses. In the eastern part of this district on the plain situated on higher level and broken here and there by the old bed of the Dhansiri River. The District comprises mainly of plain areas dotted by small hillocks. There are no such high hills in the mainland except a range of nine low hills in the south-western corner on the banks of the Brahmaputra. One of these hills is the Kurua, which is traditionally associated with Kauravas. On another hill, there is a shrine of Ganesh. Besides, there are few spurs on the northern sub-mountain tract, which are offshoots of the Bhutan hills.

Soil: Acidity is the general characteristic of the soil of the district and more so in the order alluvium soil. New alluvial soils representing the lands of the riverbanks are less acidic. These are often neutral and even alkaline. The phosphoric content is good in the river side of the Brahmaputra where tea is grown. Acidic alluvial soils are suitable for cultivation of tea. Major part of the district, mainly southern part, is Younger alluvial entisols. The central portion is covered by older alluvial alfisols. Heavy clay with high percentage of nitrogen in low land areas give a good return of rice, while sandy looms above inundation level give a good yield of crops. Overflowing of the rivers replenishes the soil every year by depositing silt. The potash (k20) content is low in some soils and moderate in others.

Land and land-use pattern: Land resource is one the most important and valuable free gift of the nature and its proper utilization by the inhabitants is of great value. Land should be fully used as per its capability. Lack of proper or profitable use means wastage of land resource and it results loss of productivity. It therefore requires proper and timely use of this kind of asset.

Flora & Fauna: Forestry occupies a significant place in the economy of the district. A considerable section of the people of the district depends upon forests for firewood, timber, bamboo, ekra, reed, thatch, tokopat, cane, gravel etc., for building of houses. A number of forest-based industries such as sawmill, plywood factories, match industry, furniture workshop, bamboo and cane industries etc., have been opened in the district. Evergreen and semi evergreen forests flourish in alluvial soft, having capacity to retain much water throughout the district. The main species found in these forests are Sam, Guserai, Titasapa, Makai, Nahar, Khair, Ajhar, Kathal, Sanalu, Gumari and Uriam. These are used for posts, planks, scantling and sleepers. In addition, enough bamboos, canes etc. are also found in the forest areas. In thick forests, there are herds of elephants and bison and numerous deer. Buffaloes, tigers, leopards, mithun and various kinds reptiles and amphibians are found in the district.

Table 11-6: Mangaldoi Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Darrang/Mangaldoi	367980	366	367614	21	478.28	4132.66	0659.31	106.10	36	77&83

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 21 nos. of substation in Mangaldoi electrical circle which fulfil the requirement of 367980 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(77%) and collection efficiency(83%) is generating total revenue collection about 106.10 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

F. GOALPARA

Goalpara district is extended on the south of the Brahmaputra River in between 25°07'30" and 26°13,15" North Latitude and 90°07'00" and 91°06'30" East Longitudes. It is bounded by the district of Bongaigaon and Barpeta on the North, Kamrup district on the East, by the state of Meghalaya on the South and the Dhubri district on the West. Total area of the district is 1824 Sq. Km. Goalpara ranks 20th in comparison to other districts in terms of area the district is situated on the North western corner of the State to the south of the Brahmaputra River.

Climate and Rainfall: The district experiences a hot and humid climate during summer, but strong spell of cold winter can also be felt in the region. Rainfall continues in abundance for more than six months in a year with occasional shower throughout the rest of the year. The maximum humidity lies from June to October. The south west monsoon season is from June to September, and October, November constitutes post Monsoon season. The average annual rainfall in the district. Is 2575.3mm. The actual total rainfall during the year 2011 was 1631.0mm against the average rainfall of the state which was 1566.6 mm. the highest rainfall during the year was in the month of June 2011 having rainfall of 4072.2mm against state rainfall of 267.6 mm in June, 2011. The year may be divided in to four seasons. The cold season is from December to January. The next three months may be termed the season of thunderstorms. The southwest monsoon season is from June to September, October and November constitute the post monsoon season. The average annual rainfall in the district is 1591.5 mm. The rainfall increases from the South to North. The rainfall in May to August constitutes 69% of the annual rainfall. During the months January to April, the relative humidity is comparatively less. Skies are heavily clouded in the monsoon season winds are generally light. Some of cyclonic storms and depressions from the Bay of Bengal in the monsoon and post monsoon seasons that more towards North Bengal affect the district. Fog occurs in the winter months on a few days.

Physiography: The land characteristic of the district is mostly flat plain expect a few forested hills with elevation between 100 to 500 meters. The district also includes a large number of riverine tracts and sandy river island in the river Brahmaputra. The district also has several large natural lakes such as Urpad beel, Hasila beel, Kumari beel and Dhamar Risan beel. The land near Brahmaputra is affected by annual floods. The region slopes from south to the north. The highest point in the district is only 1029 ft located near Andharmua of the Pancharatna hills. The geological formation of the region is of alluvial soils and suitable for cultivation whereas the soils vary from sandy to loamy with poor sand near Brahmaputra to stiff clay towards south which become unfit for cultivation. Away from the river the level of the rivers and swamps give way to rice fields. The homesteads of the cultivation are surrounded by dense grass, areaca plams, plantains and bamboos.

Land and Land use pattern: The land characteristic of the district is mostly flat plain except a few forested hills with elevation between 100 to 500 meters. The district also includes a large number of riverine tracts and sandy river island in the river Brahmaputra. Agriculture is the main occupation of the people of the district. The area of the govt. waste land is very large but with the inflow of Immigrants a large area of the virgin soil has been upturned. A large area of waste land such as char area has been taken up for habitation. According to data submitted by Agriculture dept. Govt. of Assam, the total cultivable land in Goalpara district is 62,262 hectares at present.

Flora & Fauna: Evergreen and semi evergreen forests are found in the district which consists of several types of trees. These are mainly Sal, Kydia, Udal, Sioa, Bombax, Bahera. The common herbs and shrubs are *Ageratun conyzoides*. Species of Circuma, *Cardx beacrispa* etc are found here Wild animals mostly represented by elephants, rhinoceros, bisons, buffaloes, tigers, leopards, bears, wild pigs and deer were found in large numbers in the district in the past. But at present most of above varieties of animals have disappeared from the district. As B.C. Allen remarked-"wild animals used at one time to the numerous, but they are rapidly decreasing in numbers." Various types of colourful land birds, water birds and marsh birds are seen in this district. Birds include wild geese duck, snipe, jungle fowl, peafowl, pelicans, various kinds of cranes, paddy birds etc. Birds like crows, jungle crows (Dhora kauri), sparrows, salika, balimahi etc are found to be living in close association with humans. Water birds of various kinds of both indigenous and migratory habits are also seen in beels. The Storks or Bortokolas and Bogali are seen in plenty in all beels and rivers of the district. Tortoises of different kinds are found in the beels and rivers of the district. They come to the sandy shore to lay eggs. Frogs and toads are found equally at home in both land and water is found in every part of the district. Fishes of different kind big and small are generally found in beels and rivers of the district. The bigger fishes are Rou, Barali, Cheetal, Bahu,Kaliajara, Bhakua, etc. The small fishes are Puthi, Singara, garoi, Khaliha, etc.

Table 11-7: Bongaigaon Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Goalpra/Bongaigaon	517004	550	516454	26	636.56	5500.27	4186.76	132.40	47	68&78

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 26 nos. of substation in Bongaigaon electrical circle which fulfil the requirement of 517004 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(68%) and collection efficiency(78%) is generating total revenue collection about 132.40 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

G. NAGAON

The district of Nagaon stands on the south bank of the mighty river Brahmaputra. It is located in a central geographical position in the State of Assam. The district lies between 25°45" and 26°45" North latitudes and 91°50" and 93°20" East longitudes. On the north the district is bounded by the river Brahmaputra, on the east by Golaghat and Karbi Anglong district, on south by Karbi Anglong and Dima Hasao districts and west by the Marigaon district which had been carved out of erstwhile Nagaon District. The districts consist of 10 revenue circles. All the Revenue circles comprise a total of 1412 villages. The names of revenue circles are Kaliabor, Samaguri, Rupahi, Dhing, Nagaon, Raha, Kampur, Hojai, Doboka and Lanka. The district covers an area of 3,973 Kms out of the State total areas of 78,438 Kms. The rank of the district in term of area is 4th among the district of Assam. The district has 8 stationary towns.

Climate and Rainfall: The climate of the Brahmaputra valley is characterized by excessive humidity all through the year, the absence of dry hot summer season and plentiful rainfall. The climate is moderately cold and foggy during winter with very much humidity in the air at the time of summer. Generally, the weather goes dry and moisture less from February to April. From May to September sufficient rain fall sweep over the district with heavy moisture in the atmosphere. In the month of October and November, the weather becomes pleasant and the atmosphere gets foggy. Fogginess remains in the atmosphere till the end of January. The real winter starts in the month of November and continues for about four months. The atmosphere is dusty during the month of February and March of each year. Skies are heavily clouded or overcast during April and May. In the period March to May, northeaster lies, and easterlies winds are more common. Cyclonic storms and depressions which originate in the Bay of Bengal and move into Assam including Nagaon district during May and June. Thunderstorms also occur during the period March to October, their frequency being highest in April. Fog occurs on some days during the last part of December and the beginning of January. The rainfall in the district generally increases from the south towards the north. A major portion of the annual rainfalls received during the period June to September, July being the rainiest month of the year. The highest rainfall recorded varies in months. The highest average monthly rainfall is recorded in June in 2011 as 243.1 mm. followed by 240.0 mm. in July 2011. The lowest rainfall was recorded in the month of November and December 2011 as per Statistical Handbook Assam 2012.

Physiography: Topographically, the district Nagaon is a heterogeneous land composed of both high hills, lowlands and level plains like that of other districts of Assam. Across the centre of the plain there are wide fields of cultivated land extending from Silghat on the North- East to Jaji on the south- west. There are wide expanses of grassland on the north- west and of forest and hills on the south and east. The general appearance of the district is extremely picturesque. On every side there are swamps and rivers, hills and woods, which depict variety of scene. The land bordering the south bank of the Brahmaputra is low-lying area and is deeply flooded during the rainy seasons. For the greater part of the year the area is covered with grasses and reeds such as Khagari, Ekra and Nal (reed) which grow from three to six meters high. The higher land produces Ulu and other kinds of shorter grasses used for thatching. Nepali grazers generally keep large herds of Buffaloes and Cows on the chars or sand banks, which are formed by the Brahmaputra. The South of the Kopili between Dharamatul and the hills is also low-lying areas It is also subject to flood and is covered with high grasses.

Soil: The characteristics of soils of the district are not deviated from that of the soils of the neighbouring districts. The district is characterized by an abundance of marshes and lowlands, the soils of which contain a large percentage

of organic matter. The solid geology of the district, which mostly lies under the broad level plain, is covered by alluvium. The alluvium soils are mostly loamy and consist of a mixture of clay and sand in varying proportion, ranging from pure sand on the banks of the Brahmaputra to a stiff clay which is quite unfit for cultivation. Marshy soil is mainly found in the low-lying waterlogged areas. The red soil generally finds in the hill slopes and foothills formed by the watering of the Pre-Cambrian rocks. The laterfic soil of recent age is also found near Lumding. The new alluvium soils are mostly found in the narrow flood-prone tracts of the district. They vary in texture, mostly from clay to sandy loams. The soils are less acidic. The percentage of nitrogen and organic matters are suitable propositioned for agricultural purpose. The soils in the district are mostly fertile due to annual deposit of silt carried by the large number of rivers.

Land and Land-Use-Pattern: Agriculture is the pre-dominant occupation of the people of the district. The area of the government wasteland was very large in the past but with the inflow of immigrants, large char areas of the virgin soil has been upturned. At the same time, large areas of wasteland such as forest area has been taken up for habitation. A large tract of wastelands has also been brought under tea cultivation.

Flora & Fauna: In 1974 Nagaon district became home to Kaziranga National Park, which has an area of 175 km2 within Nagaon district. It shares the park with Golaghat district. It is also home to the Laokhowa Wildlife Sanctuary in India. Botanically, the district is very rich. The tropical evergreen forests consist of Amari, Gonsarai, Sapa, Sam, Bhomora, Sida, Jamu, Ajhar, Gomari, Sonaru etc. The undergrowths are mostly shrubs and grasses like thatch, reed and hay. The wet miscellaneous type of forest is characterized by ever green and semi-evergreen species. There are Bhelu, Sam, Hollock, Amari, Khokan, Hatipaila etc. Nagaon is rich in Khagari, Ekara, Nal, Ulu that are used in building thatch houses. These grasslands are subject to fire in the summer season. Fauna of Nagaon district is represented by most of the animals and birds commonly found in other parts of Assam and the adjoining states. These are classified as vertebrata and invertebrate from the zoological point. Invertebrate includes different kinds of insets, spiders, scorpions and crabs. Vertebrates include mammals, birds, reptiles, amphibians and fishes. The forests of this district were full of wild animals. But with the passage of time various kinds of animals have been disappearing from the forests due to cruelty of human and also spread of diseases and flood. Still then, there are elephants, tigers, deers, mithuns, buffaloes, bears, pigs, and monkeys etc. in the forest of the district. Mongooses, otters, squirrels, weasels, various kinds of mice and rats are also found everywhere in the district. Various kinds of colorful land and water birds are available in this district. Birds like fowls, crow, parakeets or bhatau, Horn bills or dhanesh, maina charai, gray mynas, pigeons, doves or kapon charai, bulbuls, woodpeckers, salika etc are some of the various kinds of other jungle birds and hill birds. The birds who live in the neighbourhood or human habitation are crows, sparrow, ghanchirika, salika, balimahi, owls etc. There are vultures or sagun, chalani, kuruha in the district. Water birds or both indigenous and migratory nature are seen in the beels, swamps and rivers. Storks or bartokola, bagali, panikauri, kam charai, ganga chilani, manihari (snake bird) are some of the water and marsh birds seen in the district. Ducks are generally found in the beels as winter visitors. Chakai chakua, saralihanh, and Pintail ducks are some of the winter visitor birds which come to the district in winter season. Tortoises, crocodiles, lizards and sakes are grouped as reptilian. Tortoises of various kinds are found in the beels and Rivers of the district. Crocodiles are rarely seen in the Brahmaputra. The green lizards are found almost in every part of the district. Among the snakes the most common are king cobras, adders and water snakes of the district. Pythons are normally found in the forest areas of the district. Among the amphibian's frogs and toads are found in all part of the district. Fishes of various kinds are found in the beels and rivers. The bigger fishers are rau, barali, chital, bahu, kalijara, ari, gagal, bhakuwa, etc.

Table 11-8: Nagaon Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Nagaon	536004	688	535316	21	599.76	5182.34	3366.73	195.80	42	68&85

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 21 nos. of substation in Nagaon electrical circle which fulfil the requirement of 536004 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(68%) and collection efficiency(85%) is generating total revenue collection about 195.8 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is

proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

H. SONITPUR

The district of Sonitpur lies between 26^{0}28'00" and 27^{0}02'15"N latitude and 92^{0}19'00"and 93^{0}47'15"E longitude. To the east, it is bounded by Lakhimpur district and to the west by Darrang and Udalguri districts. The district of Sonitpur covers a total area of 5,204 Sq. Km and a population of 192, 4,110 as per Census 2011. In terms of total area covered, this district occupies the second rank in Assam, next to Karbi Anglong, which has an area about 10,434 Sq. Km

Climate and Rainfall: The climate of the district is similar to that in the neighbouring districts of upper Assam and is characterized by the absence of a dry hot summer season. The highest temperatures being experienced during the south-west monsoon season, along with abundant rains and a highly humid atmosphere throughout the year. The cold season is from December to February. This is followed by a season of thunderstorms from March to May. The southwest monsoon season is from June to about the beginning of October. October and November constitute the post-monsoon season.

Physiography: Physiographically, the district is mainly a flat alluvial tract; in its southern part, a few scattered 'inselbergs' of gneissic rocks not exceeding 90 to 140 m., high above mean sea level, lie along the north bank of the Brahmaputra. In the northern front along the base of the foothills of the eastern Himalayas, from where the alluvial plain gradually slopes down to the Brahmaputra, there are several low-lying mounds made up of unsorted river terraces. Some parts of the district are hills, covered with long grass jungle interspersed here and there with patches of rice fields. The eastern part of the district is intersected by numerous rivers and streams divided it into several tracts of varying characteristics. The area, especially in Gohpur Sub-Division is practically one unbroken plain sloping gently towards the south. There is, however, a belt of high land under low grass jungle along the banks of Burai River. To the west of Behali, the Vishwanath plain lies in between Bargang River on the east and the Ghiladhari River on the west. It is an elevated region stretching to the bank of Brahmaputra River and is of older geological formation than other parts of the district. The jungle at the foot of the hills has been cleared and the region is now dotted with tea gardens and the plain is covered with paddy fileds. The area west of Chatia in between the Ghiladhari River and the Bharali River gently slopes down towards the Brahmaputra. Rice is grown in great stretches having villages in the background. Feathery bamboo, slender palms and broad-leafed plantations add to the wealth of the greenery of the district. The area to the west of the Mara Bharali contains the most populous Assamese villages up to some distance from Brahmaputra. The Tezpur town, the district Headquartes is situated on an elevated tract of about 78 meters above mean sea level and in and around which are situated a few low hills along the bank of the Brahmaputra. To the north of Tezpur, the landscape is generally high and uneven. The best tea gardens in the district are situated in this region, which is fringed by villages of ex-tea garden labourers on the east and west of it. The tract between the Gabharu River and Pachnai river is one continuous high plain, rising slowly towards the west. The northern region at the foot of the hills is covered with wide stretches of forests and the southern region along the Brahmaputra by high reeds and elephant grass jungles.

Soil: Acidity is a general characteristic of the soil of the district and more so in the older alluvial soil. New alluvial soils representing the lands of the riverbanks are less acidic. There are often neutral and even alkaline. The phosphoric content is good in the river side of the Brahmaputra where tea is grown. Acidic alluvial soils are suitable for cultivation of tea. Heavy clay with high percentage of nitrogen in low land areas give a good return of rice, while sand looms above inundation level give a good yield of crops. Overflowing of the rivers replenishes the soil every year by depositing silt. The potash (k20) content is low in some soils and moderate in others.

Land and land use pattern: In the district, the area of the government wasteland was very large, till the later part of the 19th century but with waves of influx of immigrants, a large chunk of the virgin soil has been upturned. At the same time, large tracts of wasteland have also been taken up for tea cultivation. However, an analysis of the land use pattern shows that the area of land not available for cultivation is still quite considerable.

Flora & Fauna: Evergreen and semi-evergreen forests are found in the district, which consist of several types of species of wood, bamboos and canes. In some thick forests, there are herds of elephants and bison and some rhinos, tigers, leopards mithuns, bears, wild pigs, monkey, parkapiens, common langur, hares and different kinds of deer etc. Birds like Peacocks, pelican, hornbill, jungle-owl, quails partridge, parrot, woodpecker, kingfisher etc., are also found in the district forests.

Table 11-9: Tezpur Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Sonitpur/Tezpur	374726	696	374030	32	594.33	5135.38	3245.61	203.30	25	81&93

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 32 nos. of substation in Tezpur electrical circle which fulfil the requirement of 374726 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(81%) and collection efficiency(93%) is generating total revenue collection about 203.30 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

I. KOKRAJHAR

Kokrajhar district lies in between 26'18 N to 26'54 N latitudes and 89'46 E to 90'58 E longitudes. This district is located on the northern bank of Brahmaputra river. It forms the gateway to the seven sister states. It is bounded in the north by Bhutan, in the east by the district of Chirang and Bongaigaon, in the south by the Dhubri district and in the west by the state of West Bengal. The district extends on the north side of the Brahmaputra river. The total area of the district is 3296.00 sq. kms which accounts for 4.04 percent of the total area of Assam (78.438.00 sq. kms.). Kokrajhar ranks ninth in comparison to other districts in terms of area.

Climate and Rainfall: The climate in Kokrajhar district as in the entire state is hot and humid during summer. It also experiences strong spell of cold winter. Rainfall continues in abundance for more than six months in a year with occasional shower throughout the rest of the year. The maximum humidity lies from June to October. The south west monsoon season is from June to September and October, November constitute post monsoon season. The actual total rainfall during the year 2011 was 2674.6 mm against the average rainfall of the state which was 1566.6 mm. The highest rainfall during the year was in the month of July,2011 having rainfall of 812.0 mm against the state rainfall 382.0mm in July 2011.

Physiography: The major portion of the district is a flat plain and characterized by its configuration, drainage pattern and geological structure. The northern part forms the foothills topography of the Bhutan range. It is one of the most fertile zones of the state with luxurious vegetation growth. Except a few small hillocks in the south, the entire district exhibits an even topography with a gradual lift towards the valley down to south where Bau-kumari cheera (458m) the highest point in the district located.

Land and Land Use Pattern: The entire district Kokrajhar is located on a flat alluvial plain. It is one of the most fertile zones of the state with luxurious vegetarian growth. Agriculture is the main occupation of the people of district. The land put to different uses in the district may be classified as forest, agriculture, wasteland etc.

Flora & Fauna: Forestry has played a very important role in the district economy. It is one of the major revenue earners in the district. A large number of villages depend upon these forests and the forest products for their livelihood. There are number of sawmills in the district and these mills used to engage local people in great numbers. But due to the recent supreme Court ban on cutting trees, some sawmills have closed down for want of sufficient supply of forest product. In Kokrajhar district, there are hundreds of valuable species of plants abundantly found in both the reserved and proposed reserved forest. Sal, Poma, Outenga, Simalu ,Kori ,Azar Bhomora (*Terimintia belevioa*l) etc. are the valuable trees in the forest of the district. In 1990 Kokrajhar district became home to Manas National Park, which has an area of 500 km. sq. (193.1 sq. m.). It shares the part with four other districts. Contrary to the other district of the valley major part of the district is covered by forest both reserved and unreserved. The Chirang R.F., the Manas R.F., the Panbari R.F., the Bengtol R.F. and the Kachugaon R.F. are worth mentioning. These forests are covered by evergreen and semi evergreen types of forest which are unusually dense mixed jungle. Sal wood, Khair, Akoi,etc. are the famous wood of the district which are famous all over the country. The physical setting of the region coupled with excellent climate conditions prompt the govt. to set up sanctuaries in the district like the one near Saralpara on the north east, famous for wild animals particularly one horned Rhino and other animals like Elephants, Tiger, Bears, Buffalos, Deer, Mongoore and beautiful bird like Peacocks, Cranes etc.

Table 11-10: Kokrajhar Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Kokrajhar	437351	453	436898	30	619.39	5351.96	3804.23	102.60	52	67&72

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 30 nos. of substation in Kokrajhar electrical circle which fulfil the requirement of 437351 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(67%) and collection efficiency(72%) is generating total revenue collection about 102.60 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

J. LAKHIMPUR

Lakhimpur District is situated on the North East corner of Assam. The district lies between 26048' and 27053' northern latitude and 93042' and 94020' east longitude (approx.). The District covers an area of 2277 Sq km out of which 2257 Sq km is rural and 20 sq km is urban.

Climate and Rainfall: The absence of dry hot summer is the characteristic feature of the climate of Lakhimpur district. The prevalence of cold water, cold and pleasant spring is enjoyable. High humid temperature and exorbitant rains during summer, like the other districts of Assam, are experienced. The temperature rises high during South-West monsoon season which generally starts in the month of June and last till the beginning of the month of October every year. The cold season starts from the early part of November till late February the winters are generally Cold and foggy. The climatic feature of February March is usually dry and windy. April to May is a period of thunderstorm and heavy cyclonic rainfall. Rainfall occurs almost throughout the year. The South-West monsoon arrives and blows over the district by about the beginning of June every year.

Physiography: The district is at the foothill of the Eastern Himalayas. The district is rich in the production of bamboos and reeds. The dense forests are found in a long stripe along the northern boundary. The Subansiri is the main river of the district with shallow beds and meandering courses. The river originates high on the mountains of Tibet and enjoys the continuous flow of water. Besides 'Ranga Nadi' flows through the district rising from the Dafla Hills. Dikrong, Ganga, Charikoria etc. are the other important rivers of the district.

Soil: The district is consisted of alluvial soil the rivers have played a domineering role in respect of soil composition. The soil in most places is the mixture of sand and clay on a variegated proposition. The riverbeds are full of rocks and pebbles.

Land and Land use pattern: Agriculture is the main stay of the people of the district. Sail, Ahu, Bawdhan, Mustard, Wheat, Potato, Sugarcane are the principal production. Tea and Jute are grown extensively. Traditional method of cultivation is still in practice. Minor irrigation facilities have been extended in a few areas only. There are 9 tea gardens and 629 small scale industries. The prospect of building various industries is still bright having innumerable infrastructure.

Flora & Fauna: The District of Lakhimpur have a good varies of varieties of wood and bamboo. Gamari, Jutuli, Chapa, Sissu, Silkha, Chom, Sualu, Neem etc. are abundantly found in the District. Besides Hollock, Urium, Nahar, Ajhar, Simul, Silikha etc. are also available in the forests of Lakhimpur District in quite large numbers. Silk and Beeway Indian rubber form a bulk of main jungle products. Cane is found in unclassified forests areas in great abundance. The forest of Lakhimpur district offer the much-needed shelter to wild elephants, Rhinos, Tigers, Deer, Hogs, Sambhow Deer, Buffalo, Pigs, Methan etc. On the other hand, Cobra, Lizard, Python are valuable reptiles found in the forest. Parrot with vivid colours, Queh Aorican, Blue coat pelician, Hornbill, Duck, Goose etc. are common in these forests. Besides various kinds of colorful land and water birds like fowls, Crow, Parakeets or Bhatau, Maina Charai, Gray mynas, Pigeons, Doves or Kapon charai, Bulbuls, Woodpeckers, Salika etc are some of the various kinds of other jungle birds and hill birds. The birds who live in the neighbourhood or human habitation are Crows, Sparrow, Ghanchirika, Salika, Balimahi, Owls etc. There are Vultures or Sagun, Chalani, Kuruha in the district. Water birds or both indigenous and migratory nature are seen in the beels, swamps and rivers. Storks or Bartokola, Bagali, PaniKauri, Kam Charai, Ganga Chilani, Manihari (snake bird) are some of the water and marsh birds seen in the district. Ducks are generally found in the beels as winter visitors. Chakai chakua,

Saralihanh, and Pintail ducks are some of the winter visitor birds which come to the district in winter season. Tortoises, crocodiles, lizards and sakes are grouped as reptilian. Tortoises of various kinds are found in the beels and Rivers of the district. Crocodiles are rarely seen in the Brahmaputra. The green lizards are found almost in every part of the district. Fishes of various kinds are found in the beels and rivers. The bigger fishers are Rau, Barali, Chital, Bahu, Kalijara, Ari, Gagal, Bhakuwa, etc. With the increase of human population and large-scale deforestation of existing forest, the wild animal of various species is dwindling due to loss of habitat etc. Government and other concerned individuals should take up steps to preserve the great varieties of Flora and Fauna available in the district.

Table 11-11: Lakhimpur Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Lakhimpur	381683	358	381325	27	548.83	4742.22	2231.53	90.30	36	71&89

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 27 nos. of substation in Lakhimpur electrical circle which fulfil the requirement of 381683 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(71%) and collection efficiency(89%) is generating total revenue collection about 90.30 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

K. NORTH CACHAR

Cachar District is located in the southernmost part of Assam. It is bounded on the North by Dima Hasao, on the South by the state of Mizoram and on the East by Manipur and on West by the Districts of Hailakandi and Karimganj. The district was created in 1830 after annexation of Kachari Kingdom by the British. In 1854, North Cachar was annexed and made a part of the District. In 1951, the North Cachar Sub-division was taken out of Cachar and made a separate district of present Dima Hasao. In 1983, Karimganj Sub-Division was made a separate district and finally in 1989, Hailakandi Sub-Division was culled out to form a new district. The district lies between 92°24'E and 93°15'E longitude and 24°22'N and 25°8'N latitude. The district has an area of 3786 sq. kms. In respect of area, the district occupies the sixth place among the districts of Assam

Climate: In Cachar district the cold season start from the beginning of November when both the day and night temperature begin to fall considerably. From the last of December to January, the cold reaches the minimum degree. This is coldest period of the year when the mean daily minimum temperature generally comes below 130 C. From the end of February, the mercury level gradually goes up and in July, August and September the temperature reaches the maximum point. During these months mean maximum temperature does not generally come below 310 C. These months can be treated as hottest month for district in each year. The high percentage moisture in the atmosphere makes the weather irritating. The percentage of relative humidity in this month is between 85 and 88. In the month of October, the temperature gradually comes down and night becomes quite cool and pleasant.

Rainfall: Winter, summer, rainy and the autumn seasons are well marked in the district. Generally, the rainy season commences from the beginning of July and continues up to the last week of August but sometimes it may advance by a fortnight and extended even up to month of September. There is no rainfall in the month of December to February. These are dry months of the year. As per Statistical Handbook, 2012 in Cachar district average monthly rainfall is found to be highest in the month of July 2011 with 480.1 mm whereas the lowest rainfall recorded 0.1 mm during the month of December 2011.

Physiography: The topography of the district varies from small hillocks to plain areas and low-lying areas as beels etc. Crops cannot be grown in more than 20 percent of geographical area of the district during April to September due to water stagnation. On the other hand, due to lack of rain from November to April, most of the cultivable land remains fallow during the period. The district was under Barak river basin. The soil is highly porous and therefore, lacks moisture retention capacity and is susceptible to erosion. The water level in the district is very low.

Land, soil and its quality: Among the 15 agro-climatic regions of the country, categorized/identified on the basis of homogeneity in agro-characteristic. Cachar falls in the Barak valley zone. The agro climatic conditions of the district are conductive for various agricultural activities.

Land and land used pattern: Agriculture is the principle occupation of the people of the Cachar district. Agriculture is the main stay of the rural economy of the district. The district is spread over the valley and higher elevations. The cultivation is possible only in the small terraces in the hills. The cultivations are spared over a vast area in the district.

Flora & Fauna: The vegetation is mostly Tropical evergreen and there are large tracts of Rainforests in the northern and southern parts of the district, which are home to Tiger, Asian elephants, hoolock gibbon, Gaur etc. The forests of Cachar were once rich in wildlife but now vanishing due to human encroachment. Rare species found are Hoolock gibbon, Phayre's leaf monkey, Pigtailed macaque, Stump-tailed macaque, Masked Finfoot, White-winged Wood Duck etc., have been recorded. The Asian elephant is already extinct. Barail is the only wildlife sanctuary of the district as well as Barak valley region. This sanctuary was ultimately notified in 2004.

Table 11-12: Cachar Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Cachar	301381	648	300733	17	389.71	3367.31	8685.24	150.00	37	77&82

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 17 nos. of substation in Cachar electrical circle which fulfil the requirement of 301381 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(77%) and collection efficiency(82%) is generating total revenue collection about 150 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

L. SIVASAGAR

Sivasagar district lies between 260 41' 00' and 270 17' 00' latitude and 940 24' 00' and 950 29' 00' longitudes. On the north and east it is bounded by the district of Dibrugarh and on the west and southwest by the district of Jorhat and by Nagaland in South. The district now covers an area of 2,668 square kms and has a population of 11, 51, 050. The district occupies 13th rank in terms of area and 11th rank in terms of 2011 population in the State.

Climate and Rainfall: Just like the rest of upper Assam, this district has a climate, which is characterized by a highly humid atmosphere, abundant rains and general coolness. The cold season from December to February is followed by the season of severe thunderstorms from March to May. The southwest monsoon season is from June to about the beginning of October. October and November constitute the post monsoon season. As per Statistical Handbook Assam 2012, the highest rainfall occurred 500.3 mm in the month of July 2011. Temperature: There is a meteorological observation at Sibsagar. The cold season starts about the end of November when both day and night temperatures begin to drop rapidly. January is the coldest month of the year with the mean daily minimum temperature at 9.8 0 c (49.6 0 F) and the mean daily maximum at 21.6 0 c (70.90 F). Temperatures begin to rise from about the beginning of March and by July they attain the highest point, the mean daily maximum temperature being 31.80 c (89.30 F) The monsoon season is the period of the year with the highest temperatures. Being also the period with high moisture in the air, the weather is often unpleasant with the damp heat particularly in between the spells of rain.

Topography: The natural topography of the district of Sivasagar is a flooded tract which is a wide, healthy and homogeneous plain lying between the Naga hills and the low-lying area along the Brahmaputra. It is the populous and important portion in which there is hardly any jungle to be seen and where cultivation brings in considerable prosperity and progress. On the lower land the staple crop is rice, while the higher levels have been planted with tea. The landscape, as a rule, is one of rural plenty. On every side stretch fields of waving rice the view is bounded by groves of feathery bamboos and slender areca nut trees in which the houses of the cultivators lie concealed. The tea gardens themselves have lot to appeal to the lover of the picturesque landscapes. The rows of the bushes are permed down to one uniform level and the monotony of this expanse of green is only relieved by the labourer's lines, the factory and the manager's bungalows. On the west of the Disai, the appearance of this plain is diversified by the protrusion of sub-soil and rice is often grown in curious depressions, called holas, which are three or four feet below the level of higher land. The ground between these holas is used for grazing or for the village site and is

often planted out with sugar cane. A wonderful view of the plain and forest can be obtained from one of the outer ranges of the Naga Hills near Kanching Basti.

Soil: The arable soils of the Sivasagar district may broadly be grouped into (1) Old alluvial soils, (2) New alluvial soils of riparian tracts and (3) Hilly soils. The major portions of the arable soils of the district are, however, alluvial soils. The textures of soils of the district vary from sandy loams to sands. There are also some clayey loams or clayed soils. Both old alluvial soils and hills are acid in reaction and deficient in calcium. They are usually deficient in "available" phosphate and potash also. As regards to total nitrogen, it varies from high to low in the case of old alluvial soils, it is medium in most of new alluvial soils. While hill soils are usually comparatively rich in nitrogen apparently due to the virgin nature of the soils.

Land and land use pattern: The land put to different uses in the district may be classified as forests, agriculture, wasteland etc. The following table gives the clear picture of the area of land put to different uses in the district.

Flora & Fauna: Forestry has played an important role in the economy of the district. There are two types of forests in the district, tropical evergreen forests and miscellaneous forests. A vast majority of the people of the district depends upon forests for firewood for domestic consumption and for timber, bamboo, ekora, reed, thatch, jengu, tokoupat, cane etc for house building purposes. Botanically the forest of Sivasagar can roughly be divided into two divisions: - the tropical and evergreen forests. The first category includes climatic climax vegetation such as Hollong, Nahor, Sam, Amri, Gunseroi, Makai, and Sopa etc. They are the best-stocked stand of the district. The evergreen forests as the name suggests are evergreen in character and are generally found in Dilih Sapekhati, Geleki, Tiruhill, Disai and Disai valley reserves. In some reserves, Makai is also found associated with Hollong in this canopy. In some parts of the western areas number of wild elephants, bear, jungle cats, crab-eating mongoose etc., are found. In the Northern parts, variety of bird species are found in Panidihing Bird Sanctuary.

Table 11-13: Shivsagar Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Shivsagar	263734	766	262968	25	443.34	3830.72	9880.51	145.40	29	76&93

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 25 nos. of substation in Shivsagar electrical circle which fulfil the requirement of 263734 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(76%) and collection efficiency(93%) is generating total revenue collection about 145.4 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

M. DIBRUGARH

Dibrugarh is situated in the eastern part of Assam. The District lies between 27 C and 27.42 North latitude and 94.34 and 95.31 east longitude. The district covers an area of 3381 sq. Kms. In terms of area, the district occupies the 8th rank among the district of the state.

Climate and Rainfall: Dibrugarh has a humid subtropical climate with extremely wet summers and relatively dry winters. Rainfall starts normally in the month of April and continues up to the month of October. Scattered rainfall also occurs in the remaining month of the year. As per Statistical Handbook, 2012 it is seen that total rainfall is recorded as 3603.5 mm as against the state total rainfall of 2296.3 mm. The highest rainfall 463.4 mm is recorded in the months of April and July 2011 in the district. The lowest rainfall 20 is recorded in the month of December in the district.

Physiography: Buridihing, a tributary of Brahmaputra divides the district from east-to-west. Buridihing flows through Naharkatia and Khowang, and at a later stage in its course, Buridihing acts as a divider between Dibrugarh and Sivasagar districts. Dibrugarh is famous as the "Tea City of India". Oil and Timber are other two big industries in and around Dibrugarh. Apart from an outlying spur of the Naga Hills stretches from the Disang river through the south of the Joypur and the Tipling ranges and a few isolated hills in the Buri Dihing mauzas, there is nothing to break the even level of the plain. The extensible plain of the district which is fairly high and fertile is covered with fields of waving paddy which changes from vivid green luster into a rich gold as the harvest time draws near

or with stiff bushy tea bushes that spread over like a dark green carpet. Villages are encircled by groves of slender palms, broad leaved plantains, feathery bamboos and juicy fruit trees.

Soil: The soil of the district is fertile, acidic and alluvial. Acidic phosphorous are good for tea cultivation. On the other hand, heavy clays with high percentage of nitrogen in low lying areas of the district give better yield of rice. Abundant rainfall and high humidity throughout the year favour cultivation of tea and rice in the district.

Land and land-use pattern: The district, though has a large number of tea gardens with flourishing business and a number of industries based on its rich natural resources the economy of the people is mainly dependent on agriculture. The land which was very much abundant once is now shrinking with the increase of population.

Flora & Fauna: Dibrugarh has a rich flora and fauna in the surrounding wildlife sanctuaries and rainforest. In 1999 Dibrugarh district became home to Dibru-Saikhowa National Park, which has an area of 340 km² (131.3 sq km.) The Dibru Saikhowa National Park is the fourth National Park of Assam that lies partly in Dibrugarh district and partly in Tinsukia district. The national park is about 13 kms from Tinsukia Town, which is 483 kms from Guwahati. This national park covers an area of about 340 square kms. Of the seven parts of the park one part is wet land and the rest is mainly grassland and dense forest. The main attractions of this park are its semi-wild horse and White winged Wood Duck. Besides this, other animals like Leopard, Clouded Leopard, elephant, Sambar, Slow Loris, Indian wild water Buffalo, Capped Langur, Gangetic River Dolphin, Indian Wild Dog can be seen in this park. Various reptiles are found in the district including King- Cobra and Python. More than 250 varieties of local and migratory birds are also found in this park. The best season to visit this park is from November to March. The main marketable species are Outenga, Hillikha, Morhal, Jululi etc. The open area of the forest is covered with grasses, weeds, sorat, digholoti, etc. And low- lying areas are full of patidoi, reeds, nal, cane etc. Famines and droughts are little known in the district while widespread flood has become a regular phenomenon here. The incidence of flood and erosion is rooted in the typical physiographical features and meteorological conditions obtaining in this part of the State. The heavy water and slit discharge occurring in the upper region during the peak monsoon season, and rivulets resulting in excessive spilling on the banks of the rivers and their tributaries and consequently results water logging in extensive areas on the plain areas. Sometimes, the flood level rises very rapidly, and the swirling currents make it extremely risky to move from one place to another. Very often, the villages appearing to be isolated islands could be reached only by boats. In some Char areas, the roofs of houses are swift away and only the treetops remain visible above the water. It is also believed that the great earthquake of 1950 causing extensive hill slides in the catchment of the Brahmaputra is also one of the reasons for floods in this district.

Table 11-14: Dibrugarh Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Dibrugarh	213061	718	212343	25	406.70	3514.15	9064.00	149.80	25	79&95

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 25 nos. of substation in Dibrugarh electrical circle which fulfil the requirement of 213061 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(79%) and collection efficiency(95%) is generating total revenue collection about 149.80 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C lossesand also capacity building of the organization.

N. KARIMGANJ

Karimganj is a South West district of Assam which has been carved out of the erstwhile Cachar district in the year 1983. The district is bounded on north by the district of Cachar and Bangladesh, on the west by Bangladesh and Tripura, on the east Hailakandi district and on the south by Tripura and Mizoram. The district is situated between longitude 91.15 and 93.15 east latitude 24.8 and 25.8 north and covers an area of 1809 km out of the state total areas of 78438 km. In term of geographical area, the rank of the district is 21 compared to other districts of Assam. The district is comprised of 936 villages with 7 Community Development Blocks. The district possesses 5 Revenue Circles namely, Karimganj, Badarpur, Nilambazar, Patharkandi and Ramkrishna Nagar. There is one Sub-Division namely Karimganj. The district area is divided among 7 Police Stations, namely Karimganj, Badarpur, Patharkandi, Ramakrishana Nagar, Ratabari, Nilambazar and Bazerichera.

Climate and rainfall: The climate of the Barak Valley is characterised by excessive humidity. Being shut in by ranges of hills on almost every side, the heat can become decidedly oppressive during certain seasons of the year. So is the case in Karimganj district also. During the rainy season, the air is surcharged with moisture and the rainfall is extremely heavy while the temperature is considerably higher than upper Assam. The winter is not so cold. The rainy season starts from the month of May and continues up to October. About 80% of the annual rainfall is received during these months. The highest rainfall recorded in August 2011 as 508.4mm as against State average of 268.8 mm for the year 2011. The lowest rainfall was recorded in the months of February, November and December,2011. The annual rainfall recorded as 1885.2 mm as against State average of 1566.6mm (Source: Statistical Handbook, Assam 2012) In the district, the day temperatures in April and May are nearly the same as in the monsoon months. The cold season is from December to February. The next three months may be termed the season of thunder and storm. The monsoon season is from June to September. October and November constitute the post monsoon season. The district is highly humid throughout the year. During the months, January to April, the relative humidity is comparatively less. Skies are heavily clouded in the monsoon season. Winds are generally light. Some of cyclonic storms and depressions from the Bay of Bengal in the monsoon season affect the district. Fog occurs in the winter months on few days.

Physiography: The district Karimganj is a heterogeneous land composed of high hills, lowlands and level plains. The general appearance of this district is picturesque. The river Kushiara flows through the centre of Karimgnaj town.The district is gifted with large number of swamps and beels and varieties of grass and reeds which add beauty to the landmass. Karimganj district is landlocked in between two hill ranges namely Chhatachura and Adamail or Patharia.The Chhatachura hill range lies to the southeast of the district. The Chhatachura (height 2,087 ft) is the highest peak of this hill but the height of this peak has degraded towards the mid-range and it stands only about 1,000 ft high in the Sarashpur region. The Singla and Langai reserve forest enrich the beauty of the district with dense ever green forest and bamboo jungle.

Soil: The soils are composed of recent alluvium. The land near the Kushiara and Langai is subject to floods and is covered by dense grass and reeds. Away from the river, the level of the land rises and swamps give way to rice fields. The homesteads of the cultivators are surrounded by dense grass, areca palms, plantains and bamboos. The beels and rivers are main fishing grounds for the rural population and is a source of income too. Karimganj like the rest of the districts of Assam is a seismic area where earthquakes are by no means rare phenomena. This district in fact has been the target of several major earthquakes in the past. Considerable damage was done by the earthquake occurred in 1869. The earthquakes occurred in 1897, 1950 and 1957 had also made some minor damages in the district.

Land and Land-use pattern: Agriculture is the pre-dominant occupation of the people of the district. There were large areas of the government waste land which with the inflow of have got converted to cultivable lands.Forest area has also been taken up for habitation of-late by the influx of immigrants into the district over the years.

Flora & Fauna: Evergreen and semi-evergreen forests are found in the district which consists of several types of trees. These are mainly Sal, Sida, Bahera etc. The common herbs and shrubs are Ageratun Conyzoides, Carex, species of Curcuma etc. Besides, there are grass lands having some kinds of grasses. The grass lands are subject to fire in the summer season. Wild animals mostly represented by elephants, bisons, buffaloes, tigers, leopards, bears, wild pigs and deer were found in the past. But at present most of above varieties of animals have disappeared from the district. Different kinds of land birds, water birds and marsh birds are seen in this district. Birds include wild Geese and Duck, Snipe, Jungle Fowl, Pelicans, Cranes, Paddy birds etc. Among different kinds of birds which are associated in our daily life are Crows, Jungle Crows, Sparrows, Salika, Balimahi etc. Water birds of various kinds of both indegenous and migratory are also seen in rivers and beels. The Storks and Bog are found in plenty in beels or large lakes. Tortoises of different varieties were available in the past but now-a-days most of the variety has disappeared. Different varieties of snakes are also found in the district. Frogs and toads are equally at home in both land and water are found in every part of the district. Fishes of various kinds big and small are generally found in rivers and beels of the district. The bigger fishes are Rui, Borali, Cheetal, Bahus, Kaliajor etc. The small varieties of fishes are Puthi, Khaliha, Singara, Puthi, Garoi, Chelkona, Darikona etc.

Table 11-15: Badarpur Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Karimganj/Badarpur	327086	326	326760	16	398.18	3440.57	3874.20	83.3	55	64&70

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 16 nos. of substation in Badarpur electrical Circle which fulfil the requirement of 327086 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(64%) and collection efficiency(70%) is generating total revenue collection about 83.3 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

O. JORHAT

Jorhat district lies between 26.20" and 27 10.30" north latitude and 93.39" and 94 36.30" east longitudes. The district is bounded on the north by Lakhimpur districts; on the south by the state of Nagaland; on the east by Sivasagar and Dibrugarh district and on the west by Golaghat district. The district has an area of 2851 km^2. It has an average elevation of 116 metres (381 feet). The rank of district in comparison to other districts in term of area in the State of Assam is 12th. It comprises of 6 Revenue Circle with 848 villages. It has 5 Community Development Blocks. In the district, there are four statutory and seven Census Towns. In the north of the district, the Brahmaputra River forms the largest riverine island of the world, Majuli, which had a total area of 1,250 square kilometres (483 sq mi), but having lost significantly to erosion it is barely 400 sq km. The island, threatened by constant erosion by the mighty and unstable Brahmaputra River, had been the principal place of pilgrimage of Vaishnavites since the age of the Ahom rulers. Several Satras (monasteries) resembling those of medieval times are headed by Satradhikars teaching Vaishnavism which was initiated by Sankardeva (1449–1568). Each Satra has an unknown wealth of Vaishnav Scriptures and extensive revenue-free lands cultivated by the Bhakats (celebrated monks) of the Satras.

Climate and rainfall: Like other parts of Assam and the adjoining districts of Golaghat and Sivasagar, Jorhat also enjoys similar climate with slight variation during winter. It is characterized by highly humid atmosphere, abundant rainfall and coolness. A little away from the district HQ, a place Barbheta where the Agricultural University is located is known as the foggiest area in the district and the state as well. Cold season starts from November to January and summer starts from May to July every year. Heavy rainfall coupled with storms and thunderstorms; the result of south-west monsoon characterizes the rainy season in the district.

Temperature: Temperature starts falling from November and rises from the month of March every year. The highest maximum temperature in the district is 42^0c and the lowest is 8^0c.

Physiography: The district can be divided into three broad natural divisions. The first one is a belt of flooded land. The expanse of flooded belt runs four to 12 kms in width on the southern bank of Brahmaputra. The area is covered with jungle reed interspersed, some swamps and rich variety of fodder grass. Summer cultivation of rice is carried on and in winter rabi crops are grown. A few patches of dense forests serve as abode of wild animals. Secondly a vast area plain area lies between Nagaland and the Brahmaputra. The area is thickly populated with enormous plain area for cultivation of any sort. On the high area's tea is grown exorbitantly and while the plain area is surfaced with rice cultivation and is, therefore, regarded as surplus rice grown area in the district. The third division embraces the entire Majuli subdivision. Majuli is a gift of nature. Majuli is the only riverine island in the world. Subansiri and Kherkatia Suti have separated Majuli from Lakhimpur district. Only transplanted rice is grown there during summer. Winter cultivation is carried out in plenty. The reeds when bloom in winter adds picturesque scenery on all sides when flood water recedes, and a vast tract is visible where reeds naturally grow. 'Ahu', 'Bao', Mustard, Sali plant and other rabi crops are the principal items of cultivation. Topographically the whole of Jorhat district is a level plain. It has, therefore, no lake, beel and marshy land. A few of them are seen in Majuli. These are as a result of changes of course of the rivers. The river 'Bhogdai' is the only major river in the district. The river rises from the high hills of Nagaland and passes through the district in northwesterly direction till it mingles with the water of Dhansiri. The entire course of the river is named as Disai for the upper course and the lower is known as Bhogdai. The riverbed is full of silts and in winter all these are taken away as one building material. Due to enormity of silts on the riverbed ranging from 2 ft. and more navigation has become simply impossible. It has a total length of 160 km. and at places in Jorhat and Mariani two bridges have been constructed to facilitate connection and communication with places of the either banks. Mariani Railway Junction and a host of tea gardens are situated on the left-hand side of the riverbank. Climate of the district is quite akin to what it is enjoyed in the Brahmaputra valley. Mild winter and hot-wet summer, Generally, November to January is termed as period of winter while June to August is the summer months.

Land and land-use pattern: The land and land-use pattern of the district has been published by the Directorate of Economics and Statistics, the Government of Assam in its handbook, 2012.

Flora & Fauna: The forests of Jorhat district can be classed into two categories – Tropical evergreen forest and miscellaneous forest. The first category includes Hollong, Nahar, Sham, Amri, Makai, Chopa etc. In the remaining category those species have been included which are deciduous and the middle and lower canopies of evergreen in character. The forest wealth plays an important role in uplifting the district economy. A large chunk of rural inhabitants in the district depends upon forest resources. Forests serve as fuel supplier in the tune of fire-woods and bamboo, ekora, reed, thatch, cane, etc. are used for both housebuilding and making furniture. It goes without saying that the forests of Assam are the principal source of medicinal plants. The same is equally applicable in case of forests of this district. Animals are there like elephants, tigers, wild buffaloes etc. Various migratory birds are seen in the Char areas of the Brahmaputra while one makes in road to Majuli during winter. Fishes of all varieties are sufficiently found in the district.

Table 11-16: Jorhat Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Jorhat	273844	804	273040	23	430.43	3719.23	9592.95	155.30	30	77&92

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 23s nos. of substation in Jorhat electrical circle which fulfil the requirement of 273844 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(77%) and collection efficiency(92%) is generating total revenue collection about 155.30 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

P. BONGAIGAON

Biongaigaon District is located in western part of Assam and in northern Bank of the River Brahmaputra between N Latitudes 26º09'52" and26º30' 03" and E Longitudes 92º22'47" covering an area of 1,806 sq. km. The district receives heavy rainfall of 3219.1 mm in an average under the influence of south west monsoon' In general, the temperature of the atmosphere varies from 12 to 36ºc throughout the year. Humidity is high ranging upto 9}%oduring rainy season. Physiographicaily, the district is more or less a flat terain with general gradient towards south. The area is divided into three major units, i.e. hilly area represented by marshy lands represented by consolidated inserbergs, plain by ailuviar sediments and the 'bils' etc. A numbers of perennial streams flow through the district. These are Manas, Kujia, Champavati. They are all tributaries of River Brahmaputra. Geologically, three groups of rocks namely Pre-cambrian Gneissic complex, older Alluvium and Newer Alluvial formation. The older and Newer Alluvium comprises clay, sand, gravel, cobble and pebble.

Rain Fall and Climate: The climate of the district is characterized by high rainfall and sub-humid-climate. The annual rainfall of 3,219 mm is distributed throughout the year from the month of April to October. The maximum rainfall occurs during the month of July-August, December and January are the driest months generally. Humidity of air is very high observed during the month of July.

Geomorphology and Soil: Physiographically, the district is divided into three units. The Older alluvium is represented on northern border, followed by Younger alluvium in the middle part and the flood plain zones in the southern part along the courses of River Brahmaputra and River Manas. The northern piedmont zones attain the higher elevation while the flood plain or southern border attains the lowest elevation. The altitude difference between the inselbergs and the plain area is 20 - 460 m. A number of perennial streams as tributaries of the River Brahmaputra flow through the district. The principal rivers are Manas, Kujia and Champavati. Among these tributaries, Manas is the largest tributary and forms eastern boundary and the river Champavati forms the western boundary of the district. The soil of the district is broadly classified into three categories i.e. (1) Soil capping over older alluvium is sandy, highly permeable, grayish brown in colour, (2) Soil on inselberg zones are clayey, lateritic, yellowish to reddish in colour and (3) The soil of the flood plain are sandy to silty loam and clayey loam in nature.

Table 11-17: Bongaigaon Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Biongaigaon	517004	550	516454	26	636.56	5500.27	4186.76	132.40	47	68&78

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 26 nos. of substation in Bongaigaon electrical circle which fulfil the requirement of 517004 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(68%) and collection efficiency(78%) is generating total revenue collection about 132.40 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

Q. GOLAGHAT

Golaghat district of Assam bifurcated from old Jorhat district form a part of the vast alluvial plain of Assam and covers an area of 3,502 sq. km. The district is bounded on the North by the River Brahmaputra, on the South by the Nagaland state, on the East by Jorhat and in the West by Karbi-Anglong and Nagaon districts. The district with its Headquarters at Golaghat has three sub-divisions, eight development blocks and 1,086 villages. The istrict can be approached by road, rail.

Climate and Rainfall: The district enjoys sub-tropical humid climate. Average annual rainfall in the district is 2,012 mm. About 60 to 65% of the annual precipitation is received during south-west monsoon from June to September. The pattern of rainfall varies in the district, from south to north, the intensity of rainfall increases and the maximum rainfall is recorded in the north eastern parts of the district. Annual average temperature of the district during winter period varies from 6 to 140C and during summer, it varies from 29 to 360C .The relative humidity varies from 93 to 95% during morning hours and during afternoon hours it varies from 53 to 75%.

Geomorphology: Physiographically, the district shows a monotonous plain topography towards north and southeast, while the southwestern part of the area represents an undulating topography. The general elevation of the elevated area is around 100 meters above Mean Sea Level(MSL) and low lying areas show altitude about 80 m above MSL. Maximum height of about 128 m above MSL is observed in the southern parts of the district, where it merges with the hills of the Nagaland as well as Karbi-Anglong district of Assam. The slope of the district is towards north east from south.

Land Use and Soil: Land use pattern of the district as per Statistical Hand Book of Assam, 2006, reveals that about 40% of the total district area is covered by forest, 18% by uncultivable land, 2% by fallow land, 40% by total cropped area. Principal crop grown in the district is paddy followed by pulses, mustard, sugarcane, potato, vegetables and jute. Tea plantation also is seen in the highlands covered by older alluvium. Two important soil groups are seen in the district. These are (i) deep reddish coloured soil developed over older geological formation and (ii) light grey to dark grey coloured soil covering the major parts of the district. Low nitrogen, low phosphate, medium to high potash, acidic characters of the soil are representative of the soil cover found in the hills. In the plain areas, the other type of the soil covers is found to be feebly alkaline.

Table 11-18: Golaghat Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Golaghat	224332	500	223832	20	364.32	3147.94	8119.44	91.90	35	74&87

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 20 nos. of substation in Golaghat electrical circle which fulfil the requirement of 224332 nos. of Consumers. Which will reduce

considerably AT&C losses. Due to enhancement of billing efficiency(74%) and collection efficiency(87%) is generating total revenue collection about 91.90 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

R. KARBI ANALONG

The Karbi Anglong district is located on south central part of Assam and predominantly represents a hilly terrain inhabited by tribal population. The district covers an area of 10,434 sq.km. and forms an isolated hill in the core of the district, separating from the Brahmaputra alluvials. The district has three sub-divisions with eleven blocks, administrative divisions of the district is shown in Plate – I. It has total inhabited villages of 2633 Nos. The normal rainfall of the district is 1097 mm and the normal monsoon rainfall is 686 mm. Monsoon rainfall comprises 63% of the annual rainfall. During 2008 annual rainfall was 1209 mm, out of that monsoon rainfall was 874 mm. The temperature and humidity values are similar with other parts of the State. Geomorphologically, the district can be divided into three units – Denudational hills, Pediment zone and valley areas. The oldest Archaean land mass is highly weathered representing a rugged topography with extensive pediment zone surrounding it. The western part of the Diphu Sub-division and north eastern part of Hamren Sub-division constitute the alluvial deposition by Jamuna and Kopili rivers.

Geology: Geologically, the district comprises the oldest Archaean gneissic rocks followed by Precambrian Shillong Series with rock types of phyllites, schists, quartzites etc. Tertiary rocks starting from Eocene to Miocene age are available. This comprises Jaintia, Barail, Surma and Tipam series with various grades of shales, siltstone and sandstones. The recent to sub-recent alluvial deposit above it comprises clay, silt, sand and gravel admisstures with sands.

Rainfall and Climate: The average annual rainfall of the district is 1121.5 mm. The rainfall is unevenly distributed over the period of six months from April to September. About 60% of rainfall is received during July to September.

Geomorphology and Soil: Geomorphologically, the area can be divided into three parts viz. (1) Denudational Hills, (2) Pediment Zone and (3) Valley Hills Areas.
The hills form a stable shield with rugged and rolling surface which represents a mature to sub-mature topography with rounded to sub-rounded crest and acquires dome shape at places. The hills are generally NE-SW trending with height acquiring maximum of 1400 m amsl.
The foothill zone of Mikir hills comprises the vast denudational pediplain known as the pediment zone. It includes surface run-off zone with moderate infiltration zone and comprises admixture of cobble, pebble and gravel with clay matrixes.
The western part of Diphu sub-division and North Eastern part of Hamren sub-division constitutes the flood plain areas of Jamuna and Kopili rivers. The thickness of sediments in these valleys is more than 250 m. Deposit constitutes coarse to fine sands, clay and occasional gravel beds.
Two types of soils are mainly observed in the district. These are (1) Brown to pale brown soil developed on the top of the hills, lateritic in places and (2) the alluvial soil, sandy loam or clayey developed on the low lying terrain.

Table 11-19: KANCH Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Karbi Analong and N C	218209	296	217913	22	380.10	3284.34	3471.25	90.60	34	74&90

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 22 nos. of substation in KANCH electrical circle which fulfil the requirement of 218209 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(74%) and collection efficiency(90%) is generating total revenue collection about 90.60 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

S. MORIGAON

The present Morigaon district of Assam lies in the Central part of Assam on the southern bank of the Brahmaputra River. It is bounded on south by Karbi Anglong and West Khasi Hills district, on east by Nagaon district and on west by Kamrup district, Assam. The district occupies part of the Brahmaputra valley and the mighty river Brahmaputra flows on westerly direction along its northern boundary. The district is drained by several perennial rivers flowing from south to north. Rivers Kalong and Kopili are two most important rivers.

Rain fall and Climate:
The average annual rainfall of the district is 1770 mm out of which monsoon contribution is 83%. The maximum temperature is 29.5°C (average) while minimum temperature is 17.5°C (average). The numbers of rainy days is 24 from May to September. Morigaon district has sub-tropical and humid type of climate. The humidity data reveal that the air is humid throughout the year. It has the value of 67 to 79 % during dry period.

Geology: Geologically, the district comprises two distinct Geological formations. The oldest Archaean rocks comprising Biotile-Hornblende gneisses and schist are intruded by granite with pegmatite veins. The rocks mass forms remnant hills highly weathered and isolated hills among the alluvial sediments as inselbergs. The unconsolidated alluvial sediments occupies the major part of the district. On northern part along the river Brahmaputra, the sediments comprise fine grained nature with occasional gravel beds with pebbles and represent its silty nature. It represents younger alluvial sediments. They comprise sands of various grades with bands of silt and clay along the river Kalong and Kopili representing older alluvial sediments.

Table 11-20: Morigaon Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Morigaon	197795	300	197495	10	244.07	2108.91	5439.48	52.50	43	76&75

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 10 nos. of substation in Morigaon electrical circle which fulfil the requirement of 197795 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(76%) and collection efficiency(75%) is generating total revenue collection about 52.50 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

T. KAMRUP RURAL

Kamrup district is an administrative district in the state of Assam. The erstwhile Kamrup district bifurcated into two parts in the year 2003; other being Kamrup Metropolitan district. A part of Kamrup district was also cut to form part of the newly created Baksa district of BTAD. The district, along with Nalbari and Barpeta together formed the Kamrup region of yore having the Kamrupi culture and language. Kamrup District is situated between 25.46 and 26.49 North Latitude and between 90.48 & 91.50 East Longitude. The district is bounded in the east by Darrang and Kamrup(M) districts, in the north by Baksa district, in the West by Nalbari, Barpeta and Goalpara districts and in the south by the state of Meghalaya. The district covers an area of 1068 sq. Kms. In terms of area, the district occupies the 11th rank among the district of the state.

Climate: The climate of Kamrup does not differ from that of the other districts of Assam. Its principal characteristics are a cold and foggy winter, a moderately hot spring and a temperately hot but humid summer. In March and April, the weather begins to grow a little warmer. During the height of the rains, the climate is decidedly oppressive. The air is absolutely saturated with moisture and the damp heat is very trying indeed. Climatically from February to May, the weather is dry and moisture less and the heat is gentle; from June to October, there is enough rain and moisture and the heat is very unbearable and from November to January, the climate is cold and foggy. During the latter part of December and early part of January, the Brahmaputra fog can be very cold while in March, the wild wind carrying the Brahmaputra sand can be seen everywhere. From the end of February, the mercury level gradually goes up and in July, August and September the temperature reaches the maximum point. During these months, the mean maximum temperature does not generally come down below 31 degrees centigrade and even

sometimes it goes to above 40 degree centigrade. These months are treated as hottest months for the district in each year.

Rainfall: Most of the rainfall occurs in Kamrup district during the monsoon, i.e. from June to October each year, while during the other months of the year some rainfall also occurs due to the north western winds. The monsoon brings with it a big amount of humidity which makes the climate very oppressive although the real temperature may not be so high. As per Statistical Handbook, 2012 the average monthly rainfall was highest in the month of July with 373.4 mm. The lowest rainfall recorded was 0.3m.m. in October.

Physiography: The mighty river Brahmaputra bifurcates the district into nearly equal parts. The river thus has a a lot of influence in the physiography of the entire district. In the immediate neighbourhood of the Brahmaputra the land is low and exposed to annual inundation. In this marshy tract reeds and canes flourish luxuriantly, and the only cultivation is that of rice. At a comparatively short distance from the riverbanks the ground begins to rise in undulating knolls towards the mountains of Bhutan on the north, and towards the Khasi hills on the south. The hills south of the Brahmaputra in some parts reach the height of 800 feet (240 m). The Brahmaputra is navigable by river steamers throughout the year and receives several tributaries navigable by large native boats in the rainy season. The chief of these are the Manas, Chaul Khoya and Barnadi on the north, and the Kulsi and Dibru on the south bank. Geologically, the hills are for the most part formed of gneissic rocks from which excellent building stone can be obtained. The plain is of alluvial origin and consists of sand and clay in varying proportions, ranging from pure sand near the banks of the Brahmaputra to a blue stiff clay, utterly unfit for cultivation. Surface lime was discovered over a small area at the foot of the Bhutan Hills. The hills are represented by a group of Siwalik sediments consisting of clays, sand stones and grits conglomerated with pieces of fossil wood and lignite's.

Soil: The soil of Kamrup district is not much different from those of the other district of Assam. The district is characterised by an abundance of marshes and lowlands, the soils of which contain a large percentage of organic matter. Kamrup is an important crop region of the valley. The agriculture in the rainy season is mainly confined to the high lands which are free from waterlogging. In winter the soils are excellent for growing crops like pulses and oil seeds. The soils in Kamrup district are generally fertile due to annual deposing of silt. A major portion of total sown area of this district is under rice and tea.

Land and land-use pattern: Land resource is one the most important and valuable free gift of the nature and its proper utilization by the inhabitants is of great value. Land should be fully used as per its capability. Lack of proper or profitable use means wastage of land resource and it results loss of productivity. It therefore requires proper and timely use of this kind of asset

Flora & Fauna: The forest plays a pivotal role in the economy of the people of the district. A large section of the people of the district rests on forest for firewood to cook their meal and timber, bamboo, ikra, thatch etc. to build their houses. The forests of the district are the principal raw materials supplier to sawmills and factories. The forests are generally ever green in type and consist of a host of tree species. The important trees from the commercial point of view are sal, sundis, tik, champa, Gamari, san, nageswar, jam, bunsum, kokoi, simul, mangoes etc.

Table 11-21: Kamrup Rural (GEC-II) Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Kamrup Rural	322245	1169	321076	24	475.53	4108.92	0598.08	330.30	17	85&98

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 24 nos. of substation in Kamrup rural GEC-II electrical circle which fulfil the requirement of 322245 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(85%) and collection efficiency(98%) is generating total revenue collection about 330.30 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

U. TINSUKIA

Tinsukia district of Assam is located in the easternmost part of the State lies between 27o14'03" and 27o48'05" North Latitudes and 95o13'30" and 96o00'00" East Longitudes. It covers an area of 3,790 sq. Km of Brahmaputra

Basin. For administrative convenience, the district has been divided into 3 sub-divisions, 7 blocks and 88 Gram Panchayats. The district is drained by mighty River Brahmaputra flowing NE-SW direction and its tributaries Dibru and Burhi-Dihing flowing from Naga-Patkai hill range in the south. All the rivers are ephemeral in nature and carry huge quantities of water and sediment during rainy season and cause submergence of low lying areas. The irrigation facilities have been mostly confined to a few river lift and flow schemes. However, farmers accustomed with single rainfed paddy crop have now slowly switched over to multiple cropping practices by utilising ground water from shallow tube wells. The detailed hydrogeological surveys aided by exploratory drilling have been carried out in the district by Central Ground Water Board. In addition, C.G.W.B. is monitoring Ground Water Monitoring Stations and ground water has been assessed for future planning and development. A number of investigations for the feasibility of construction of tube well have been carried out for various agencies and also providing required assistance to State Government as and when required.

Rain fall and Climate: The area experiences sub-tropical humid climate where winter temperature goes up to 37o C. Humidity is also more than 90 percent during rainy season.
The area is endowed with high rainfall during all the months in a year. The South West monsoon sets in the month of June and lasts up to September. Out of 2323 mm normal annual rainfall, about 65 percent rain is received from monsoon.

Geomorphology and Soil Type: Physiographically the area is characterised by Brahmaputra plains and hills in the southern part, with gentle slope towards north-west. The distinguishable geomorphic units are as follows :
Flood plain,Younger and older alluvium plain and Structural hill. The soil in the area may be grouped into three broad categories depending upon the origin and occurrence. These are given below :

Newer alluvial Soil : Flood plain areas of River Brahmaputra and the tributaries in the northern part are characterised by light grey clay with sand and silt.

Older alluvial Soil : It occurs mainly in the central part with limonite yellow to reddish yellow clay.

Soil cover in forest and hilly areas : It is deep reddish in colour and occurs over the older geological formation in the southern most part of the district.

Flora & Fauna: Tinsukia has a rich flora and fauna in the surrounding wildlife sanctuaries and rainforest. In 1999 The Dibru Saikhowa National Park is the fourth National Park of Assam that lies partly in Dibrugarh district and partly in Tinsukia district. The national park is about 13 kms from Tinsukia Town, which is 483 kms from Guwahati. This national park covers an area of about 340 square kms. Of the seven parts of the park one part is wet land and the rest is mainly grassland and dense forest. The main attractions of this park are its semi-wild horse and White winged Wood Duck. Besides this, other animals like Leopard, Clouded Leopard, elephant, Sambar, Slow Loris, Indian wild water Buffalo, Capped Langur, Gangetic River Dolphin, Indian Wild Dog can be seen in this park. Various reptiles are found in the district including King- Cobra and Python. More than 250 varieties of local and migratory birds are also found in this park. The best season to visit this park is from November to March. The main marketable species are Outenga, Hillikha, Morhal, Jululi etc. The open area of the forest is covered with grasses, weeds, sorat, digholoti, etc. And low- lying areas are full of patidoi, reeds, nal, cane etc. Famines and droughts are little known in the district while widespread flood has become a regular phenomenon here. The incidence of flood and erosion is rooted in the typical physiographical features and meteorological conditions obtaining in this part of the State. The heavy water and slit discharge occurring in the upper region during the peak monsoon season, and rivulets resulting in excessive spilling on the banks of the rivers and their tributaries and consequently results water logging in extensive areas on the plain areas. Sometimes, the flood level rises very rapidly, and the swirling currents make it extremely risky to move from one place to another. Very often, the villages appearing to be isolated islands could be reached only by boats. In some Char areas, the roofs of houses are swift away and only the treetops remain visible above the water. It is also believed that the great earthquake of 1950 causing extensive hill slides in the catchment of the Brahmaputra is also one of the reasons for floods in this district.

Table 11-22: Tinsukia Electrical Circle details

Sl No.	District/ Circle	Total Consumer No.	Total HT Consumers	Total LT Consumers	Total Substation (33/11KV)	33kV Line length (Km)	11kV line length (Km)	LT line length (Km)	Total Revenue Collection (Cr.)	Total AT&C Loss(%)	Billing & Collection Efficiency (%)
1.	Tinsukia	284600	749	283851	31	519.06	4485.02	1568.15	169.90	28	79&91

Source: APDCL Field survey

The proposed project will enhance the energy efficiency to the Consumer and also enhances the billing and collection efficiency. Installation of Smart metering system is already in process. There are total 31 nos. of substation in Tinsukia electrical circle which fulfil the requirement of 284600 nos. of Consumers. Which will reduce considerably AT&C losses. Due to enhancement of billing efficiency(79%) and collection efficiency(91%) is generating total revenue collection about 169.90 Cr. Out of 135 Nos. of Sub stations, 23 Nos. of Sub stations is proposed in phase-I which will further enhance billing, collection and revenue generation by reducing the AT&C losses and also capacity building of the organization.

Annexure 7: Districts Baseline Profiles – Socio-Economic

The ESMPF document has been prepared based on social baseline studies carried out for concerned selected districts and its proposed sites covering secondary data on different environmental and social components.

A. Barpeta

The Barpeta District was carved out of erstwhile Kamrup District of Assam in July 1983. The district derived its name from the head-quarter town of Barpeta. Created as a Civil Sub-Division in 1841 by the British Administration, John Batlor was the first administrative Officer of erstwhile Civil Sub-Division. Today the District consists of two-Civil Sub-Divisions, (1) Barpeta and (2) Bajali. This Lower Assam District covers an area of 2282 square kms and is bounded by Baksa District in the North, Nalbari District in the East, Kamrup and Goalpara District in the South and Bongaigaon District in the West. The latitude and longitude of Barpeta is 26.19' North & 91.00' East respectively. The general Topography of the Barpeta District varies from low-lying plains to highland having small-hillocks in the South-West-corner of the District, namely Baghbar, Fulora and Chatala overlooking the scenic and mighty Brahmaputra river.

Salient feature of the Barpeta District

Indicators		Details
Area (sq. km)		2282
Households (No.)		337929
Population (No.)		1693622
Male Population		51.19
Female Population		48.81
Child Population 0-6		16.99
Male Population 0-6		16.93
Female Population 0-6		17.06
Urban population		8.70
Rural population		91.30
SC Population		2.90
ST Population		1.61
Population growth rate		21.43
Population density (per sq. km.)		742
Sex Ratio (females+ 1000 males)		953
Total Literate		63.81
Total Male Literate		69.29
Total Female Literate		69.29
Work Participation Rate (WPR)		33.17
WPR (Male)		26.29
WPR (Female)		6.88
Main Workers		25.95
Main workers (Male)		22.99
Main workers (Female)		2.96
Main Workers Distribution	Cultivation Ratio	42.05
	Agriculture Ratio	12.96
	Household Ratio	3.75
	Others Ratio	41.24
Marginal workers		7.23
Marginal workers (Male)		3.30
Marginal workers (Female)		3.92
Marginal Workers Distribution	Cultivation Ratio	16.74
	Agriculture Ratio	34.33
	Household Ratio	11.31
	Others Ratio	37.61
Non-Workers Ratio		66.83

Indicators	Details
Male Non-Workers	24.90
Female Non-Workers	41.93

Source: *Census of India, 2011*

B. Baksa

Baksa district is located in North-Western part of Assam with the district headquarter at Mushalpur which is 105 Km away from State Capital Guwahati and 20 Km away from National Highway No. 31 towards North. The district headquarter is linked to the National Highway 31 mainly at two junction point namely Barama and Kadamtola which is about 14 and 18 Km away from Nalbari district HQ towards West via NH 31. The main mode of connectivity to the district is through Road. The district shares the privilege of being the International Boundary with Bhutan in the North with a mixed topography of plains and foothills. The gentle and gradual slopes can be seen stretching from the foot hill of Bhutan and reaching out to the southern tips of Barpeta, Nalbari and Kamrup district. The East and Western boundaries of the district respectively share with the neighbouring district of Odalguri (Earlier Udalguri) or Chirang.

Salient feature of the Baksa District

Indicators		Details
Area (sq. km)		2,457
Households (No.)		191701
Population (No.)		950075
Male Population		50.66
Female Population		48.71
Child Population 0-6		12.93
Male Population 0-6		12.98
Female Population 0-6		12.88
Urban population		1.29
Rural population		98.71
SC Population		7.69
ST Population		34.84
Population growth rate		10.74
Population density (per sq. km.)		387
Sex Ratio (females+ 1000 males)		974
Total Literate		69.25
Total Male Literate		77.03
Total Female Literate		61.27
Work Participation Rate (WPR)		42.81
WPR (Male)		55.39
WPR (Female)		29.90
Main Workers		29.29
Main workers (Male)		44.86
Main workers (Female)		13.30
Main Workers Distribution	Cultivation Ratio	44.72
	Agriculture Ratio	15.97
	Household Ratio	3.75
	Others Ratio	35.56
Marginal workers		13.52
Marginal workers (Male)		10.53
Marginal workers (Female)		16.60
Marginal Workers Distribution	Cultivation Ratio	19.34
	Agriculture Ratio	39.04
	Household Ratio	7.69
	Others Ratio	33.94

Indicators	Details
Non-Workers Ratio	57.19
Male Non-Workers	44.61
Female Non-Workers	70.10

Source: *Census of India, 2011*

C. Kamrup

The district of Kamrap has been carved out from the erstwhile undivided Kamrup District comprising present Barpeta and Nalbari Districts in 1983. The district is situated between 25°46' and 26°49 North latitude and between 90°48' and 91°50' East longitude. It is bounded by Udalguri and Baksa districts in north, Meghalaya in south, Darrang and Kamrup Metropolitan in east and Goalpara and Nalbari districts in west. From the ancient times, the days of the great Indian epics of the Ramayana and the Mahabharata, the city of present Guwahati, the district headquarters of the Kamrup district and adjacent areas was known as Pragjyotishpur. Historically, present Assam was referred to as Kamrup in many of the ancient Indian literatures.

Salient feature of the Kamrup District

Indicators		Details
Area (sq. km)		3,105
Households (No.)		311114
Population (No.)		1517542
Male Population		51.30
Female Population		48.70
Child Population 0-6		13.18
Male Population 0-6		13.07
Female Population 0-6		13.31
Urban population		9.38
Rural population		90.62
SC Population		7.11
ST Population		12.00
Population growth rate		15.69
Population density (per sq. km.)		489
Sex Ratio (females+ 1000 males)		949
Total Literate		75.55
Total Male Literate		81.30
Total Female Literate		69.47
Work Participation Rate (WPR)		41.45
WPR (Male)		55.04
WPR (Female)		27.12
Main Workers		27.76
Main workers (Male)		44.56
Main workers (Female)		10.06
Main Workers Distribution	Cultivation Ratio	35.55
	Agriculture Ratio	10.00
	Household Ratio	6.99
	Others Ratio	47.46
Marginal workers		13.69
Marginal workers (Male)		10.49
Marginal workers (Female)		17.06
Marginal Workers Distribution	Cultivation Ratio	17.36
	Agriculture Ratio	27.64
	Household Ratio	19.09
	Others Ratio	35.91
Non-Workers Ratio		58.55

Indicators	Details
Male Non-Workers	44.96
Female Non-Workers	72.88

Source: *Census of India, 2011*

D. Kamrup Metropolitan

Kamrup (M) was created on 3 February 2003 vide notification No. GAG(B)181/2002/91 dated 30.03.2003 by bifurcating the erstwhile Kamrup district. The district is situated at the Longitude between 90.36 degree & 92.12-degree East and Latitude between 25.43 degree & 26.51 degree north. Administrative headquarters of Kamrup Metropolitan district is at Guwahati. The district occupies an area of 955 km². In terms of area, the district has the smallest area but with the highest density of 1313 persons per sq.km. There are 6 sub districts in the district, among them Dispur is the most populous sub district with population of about 5.3 lakh and North Guwahati (Pt) is the least populous sub district with population of about 28 thousand. There is only one city in the district that comes under the district administration which is Guwahati Municipal Corporation and Out Growth.

Salient feature of the Kamrup Metropolitan District

Indicators		Details
Area (sq. km)		955
Households (No.)		293112
Population (No.)		1253938
Male Population		51.64
Female Population		48.36
Child Population 0-6		10.00
Male Population 0-6		9.95
Female Population 0-6		10.05
Urban population		82.70
Rural population		17.30
SC Population		8.12
ST Population		5.99
Population growth rate		18.34
Population density (per sq. km.)		1,313
Sex Ratio (females+ 1000 males)		963
Total Literate		88.71
Total Male Literate		92.13
Total Female Literate		85.07
Work Participation Rate (WPR)		39.15
WPR (Male)		58.00
WPR (Female)		19.02
Main Workers		32.95
Main workers (Male)		51.69
Main workers (Female)		12.93
Main Workers Distribution	Cultivation Ratio	5.00
	Agriculture Ratio	2.00
	Household Ratio	1.93
	Others Ratio	91.07
Marginal workers		6.20
Marginal workers (Male)		6.31
Marginal workers (Female)		6.08
Marginal Workers Distribution	Cultivation Ratio	5.88
	Agriculture Ratio	11.23
	Household Ratio	5.77
	Others Ratio	77.12
Non-Workers Ratio		60.85

Indicators	Details
Male Non-Workers	42.00
Female Non-Workers	80.98

Source: *Census of India, 2011*

E. Darrang

Darrang District is one among 25 Districts of Assam State, India. Darrang District Administrative head quarter is Mangaldai. It is Located 51 KM South towards State capital Dispur. Darrang District population is 928,500. It is 18th Largest District in the State by population. It is Located at Latitude-26.4, Longitude-92.0. Darrang District is sharing border with Kamrup District to the west, Sonitpur District to the East, Udalguri District to the North. Darrang District occupies an area of approximately 1,585 square kilometres. It's in the 89 meters to 102 meters elevation range. This District belongs to Eastern India. Assamese is the Local Language here. People also speaks Bengali & Bodo. The district is situated in the central part of Assam and on the Northern side of the river Mighty Brahmaputra. The district Sonitpur and Kamrup districts are in the East and West respectively.

Salient feature of the Darrang District

Indicators		Details
Area (sq. km)		1,585
Households (No.)		187783
Population (No.)		928500
Male Population		51.19
Female Population		48.81
Child Population 0-6		16.85
Male Population 0-6		16.71
Female Population 0-6		16.98
Urban population		5.98
Rural population		94.02
SC Population		4.34
ST Population		0.91
Population growth rate		22.19
Population density (per sq. km.)		586
Sex Ratio (females+ 1000 males)		954
Total Literate		63.08
Total Male Literate		67.87
Total Female Literate		58.04
Work Participation Rate (WPR)		34.99
WPR (Male)		51.94
WPR (Female)		17.21
Main Workers		26.00
Main workers (Male)		44.15
Main workers (Female)		6.98
Main Workers Distribution	Cultivation Ratio	44.51
	Agriculture Ratio	19.22
	Household Ratio	1.91
	Others Ratio	34.36
Marginal workers		8.98
Marginal workers (Male)		7.79
Marginal workers (Female)		10.23
Marginal Workers Distribution	Cultivation Ratio	26.36
	Agriculture Ratio	42.21
	Household Ratio	7.12
	Others Ratio	24.31
Non-Workers Ratio		65.01

Indicators	Details
Male Non-Workers	48.06
Female Non-Workers	82.79

Source: *Census of India, 2011*

F. Dibrugarh

The district of Dibrugarh with only one sub-division is situated in the eastern part of Assam. The district occupies an area of 3,381 Sq Km.

The river Brahmaputra flows throughout the North Western boundary of the district. The only tributary falling at Brahmaputra in the district is Buridihing tributary which divided the district from East to West. It touches the town Naharkatia in the East, Khowang in the middle and at the last part of its course forms the boundary line between Dibrugarh and Sivasagar districts. The Dibrugarh district is a plain district of Assam. The soil of the district is mostly fertile Alluvial soil and this adjourning with the river Brahmaputra are composed sand and clay in varying proportion.

Salient feature of the Dibrugarh District

Indicators		Details
Area (sq. km)		3,381
Households (No.)		276867
Population (No.)		1326335
Male Population		51.00
Female Population		49.00
Child Population 0-6		12.31
Male Population 0-6		12.30
Female Population 0-6		12.32
Urban population		18.38
Rural population		81.62
SC Population		4.44
ST Population		7.76
Population growth rate		11.92
Population density (per sq. km.)		392
Sex Ratio (females+ 1000 males)		961
Total Literate		76.05
Total Male Literate		82.82
Total Female Literate		68.99
Work Participation Rate (WPR)		42.26
WPR (Male)		54.40
WPR (Female)		29.63
Main Workers		29.52
Main workers (Male)		42.13
Main workers (Female)		16.41
Main Workers Distribution	Cultivation Ratio	21.98
	Agriculture Ratio	5.56
	Household Ratio	1.67
	Others Ratio	70.79
Marginal workers		12.74
Marginal workers (Male)		12.28
Marginal workers (Female)		13.22
Marginal Workers Distribution	Cultivation Ratio	29.07
	Agriculture Ratio	23.33
	Household Ratio	4.64

Indicators		Details
	Others Ratio	42.97
Non-Workers Ratio		57.74
Male Non-Workers		45.60
Female Non-Workers		70.37

Source: *Census of India, 2011*

G. Goalpara

The present Goalpara district was created in the year 1983 with two sub-divisions viz Goalpara Sadar sub-division and North Salmara Civil sub-division, carved out from erstwhile Goalpara district. However, the same was again reconstituted in the year 1989 with only Sadar sub-division of Goalpara and the Civil sub-division of North Salmara was taken away in that year and merged with newly created Bongaigaon district. The Geographical location is in between Latitude 25053' - 26030' North and Longitudes 9007' - 9105' East. At present the district of Goalpara is situated entirely on the south bank of the river Brahmaputra. The district covers an area of 1,824 sq. km. and is bounded by West and East Garo Hill districts of the state of Meghalaya on the south and Kamrup district on the East, Dhubri district on the West and mighty river Brahmaputra all along the North. Goalpara district is an administrative district in the state of Assam in India.

Salient feature of the Goalpara District

Indicators		Details
Area (sq. km)		1,824
Households (No.)		198454
Population (No.)		1008183
Male Population		50.91
Female Population		49.09
Child Population 0-6		17.03
Male Population 0-6		17.04
Female Population 0-6		17.01
Urban population		13.69
Rural population		86.31
SC Population		4.47
ST Population		22.97
Population growth rate		22.64
Population density (per sq. km.)		553
Sex Ratio (females+ 1000 males)		964
Total Literate		67.37
Total Male Literate		71.46
Total Female Literate		63.13
Work Participation Rate (WPR)		35.96
WPR (Male)		52.04
WPR (Female)		19.29
Main Workers		26.42
Main workers (Male)		43.38
Main workers (Female)		8.83
Main Workers Distribution	Cultivation Ratio	40.89
	Agriculture Ratio	14.08
	Household Ratio	2.89
	Others Ratio	42.14
Marginal workers		9.54
Marginal workers (Male)		8.66
Marginal workers (Female)		10.46

Indicators		Details
Marginal Workers Distribution	Cultivation Ratio	18.34
	Agriculture Ratio	39.83
	Household Ratio	6.90
	Others Ratio	34.93
Non-Workers Ratio		64.04
Male Non-Workers		47.96
Female Non-Workers		80.71

Source: *Census of India, 2011*

H. Kokrajhar

Kokrajhar is one of the twenty-three districts of Assam and can be described as the gateway to the North-eastern region of India. Both road and rail touch this district at Srirampur before they go on to other districts in Assam and the other northeast states. Kokrajhar district is located on the north bank of the river Brahmaputra that slices the state of Assam into two, identified as north and south banks. The district lies roughly between 89.46' E to 90.38' E longitudes and 26.19" N to 26.54" N latitudes. The district is bounded on the north by the Himalayan kingdom of Bhutan, by Dhubri district on the south, Bongaigaon district on the east and the Indian state of West Bengal on the west. The district can be easily reached as both the mainline road and rail passes through this district. There are beautiful places to visit in the district, especially in the northern side, where the natural scenery is exquisite. There are also numerous natural picnicking spots.

Salient feature of the Kokrajhar District

Indicators		Details
Area (sq. km)		3,296
Households (No.)		181081
Population (No.)		887142
Male Population		51.05
Female Population		48.95
Child Population 0-6		15.43
Male Population 0-6		15.47
Female Population 0-6		15.39
Urban population		6.19
Rural population		93.81
SC Population		3.33
ST Population		31.41
Population growth rate		5.21
Population density (per sq. km.)		269
Sex Ratio (females+ 1000 males)		959
Total Literate		65.22
Total Male Literate		71.89
Total Female Literate		58.27
Work Participation Rate (WPR)		38.45
WPR (Male)		52.18
WPR (Female)		24.14
Main Workers		28.53
Main workers (Male)		43.90
Main workers (Female)		12.51
Main Workers Distribution	Cultivation Ratio	50.63
	Agriculture Ratio	11.66
	Household Ratio	2.90
	Others Ratio	34.81
Marginal workers		9.92
Marginal workers (Male)		8.28
Marginal workers (Female)		11.63
Marginal Workers Distribution	Cultivation Ratio	32.50
	Agriculture Ratio	30.46
	Household Ratio	5.78
	Others Ratio	31.27
Non-Workers Ratio		61.55
Male Non-Workers		47.82
Female Non-Workers		75.86

Source: *Census of India, 2011*

I. Lakhimpur

Lakhimpur District is situated on the North East corner of Assam and at the north bank of the River Brahmaputra. The district lies between 26.48' and 27.53' Northern latitude and 93.42' and 94.20' East longitude. The river Brahmaputra along with Majuli District stands on the southern side and Gahpur subdivision of Biswanath District is on the West. The district is divided into two subdivisions viz. North Lakhimpur and Dhakuakhana. The name Lakhimpur is believed to be originated from the word Lakshmi, the goddess of prosperity. The district is mainly dependent upon agriculture and paddy. Paddy is regarded locally as Lakhimi. The word pur means full. Lakhimpur therefore means full of paddy or the place where paddies are grown abundantly. Besides, the soil of the district is alluvial and fertile for which crops flourish without use of any artificial manure or hard labour. Over and above fish, meat, vegetables, milk were abundant in this district.

Salient feature of the Lakhimpur District

Indicators		Details
Area (sq. km)		2,277
Households (No.)		204307
Population (No.)		1042137
Male Population		50.83
Female Population		49.17
Child Population 0-6		15.04
Male Population 0-6		15.11
Female Population 0-6		14.97
Urban population		8.76
Rural population		91.24
SC Population		7.85
ST Population		23.93
Population growth rate		17.22
Population density (per sq. km.)		458
Sex Ratio (females+ 1000 males)		968
Total Literate		77.20
Total Male Literate		83.52
Total Female Literate		70.67
Work Participation Rate (WPR)		41.26
WPR (Male)		53.29
WPR (Female)		28.83
Main Workers		27.21
Main workers (Male)		42.25
Main workers (Female)		11.66
Main Workers Distribution	Cultivation Ratio	52.50
	Agriculture Ratio	5.70
	Household Ratio	1.66
	Others Ratio	40.14
Marginal workers		14.05
Marginal workers (Male)		11.04
Marginal workers (Female)		17.17
Marginal Workers Distribution	Cultivation Ratio	61.81
	Agriculture Ratio	18.96
	Household Ratio	4.28
	Others Ratio	14.95
Non-Workers Ratio		58.74
Male Non-Workers		46.71
Female Non-Workers		71.17

Source: *Census of India, 2011*

J. Nagaon

The present district of Nagaon is one of the historically famous districts in the state of Assam of north-east India. Nagaon is a centrally located district in Assam, situated on the Southern bank of the Brahmaputra River between 25"45' to 26"45' North latitudes and 91"50' and 93"20' East longitude. It is bounded by Sonitpur and the Brahmaputra to the North, West Karbi Anglong, Hojai and Dima Hasao to the South, East Karbi Anglong and Golaghat to the East and Morigaon to the West. The district headquarters are located at Nagaon. Kaziranga National Park is nearby. Agriculture is the backbone of the district and of Assam state. Rice is the principal crop and is the staple food. Fisheries are another major economy of Nagaon. Situated on the south bank of the Brahmaputra, the district is divided into three distinctive civil subdivisions, Nagaon, Hojai and Koliabor. There are around 7 towns in the district, Nagaon topping the list with most of the population constituting both the rural and urban areas. It has around 10 revenue circles, 18 development blocks and 240 gram panchayats.

Salient feature of the Nagaon District

Indicators		Details
$A = \pi r^2$ (sq. km)		3,973
Households (No.)		559340
Population (No.)		2823768
Male Population		50.96
Female Population		49.04
Child Population 0-6		16.29
Male Population 0-6		16.27
Female Population 0-6		16.30
Urban population		13.09
Rural population		86.91
SC Population		9.43
ST Population		4.08
Population growth rate		22.00
Population density (per sq. km.)		711
Sex Ratio (females+ 1000 males)		962
Total Literate		72.37
Total Male Literate		76.51
Total Female Literate		68.07
Work Participation Rate (WPR)		34.71
WPR (Male)		53.28
WPR (Female)		15.40
Main Workers		26.03
Main workers (Male)		44.23
Main workers (Female)		7.11
Main Workers Distribution	Cultivation Ratio	39.11
	Agriculture Ratio	14.65
	Household Ratio	2.74
	Others Ratio	43.51
Marginal workers		8.68
Marginal workers (Male)		9.05
Marginal workers (Female)		8.29
Marginal Workers Distribution	Cultivation Ratio	23.95
	Agriculture Ratio	36.13
	Household Ratio	7.34
	Others Ratio	32.58
Non-Workers Ratio		65.29

Indicators	Details
Male Non-Workers	46.72
Female Non-Workers	84.60

Source: *Census of India, 2011*

K. Sonitpur

Sonitpur district is spread on northern bank of the river Brahmaputra. In terms of area Sonitpur is the second largest district of Assam after Karbi Anglong district. The District lies between 26" 30' N – 27" 1' N latitude and between 92" 16' E – 93" 43'E longitude. Brahmaputra River forms the south boundary of the district. Several rivers which originate in the Himalayan foothills flow southwards and ultimately fall in Brahmaputra River.

Salient feature of the Sonitpur District

Indicators		Details
$A = \pi r^2 A = \pi r^2$ (sq. km)		5,204
Households (No.)		392919
Population (No.)		1924110
Male Population		51.14
Female Population		48.86
Child Population 0-6		14.44
Male Population 0-6		14.37
Female Population 0-6		14.52
Urban population		9.04
Rural population		90.96
SC Population		5.67
ST Population		12.07
Population growth rate		15.55
Population density (per sq. km.)		370
Sex Ratio (females+ 1000 males)		956
Total Literate		67.34
Total Male Literate		73.65
Total Female Literate		60.73
Work Participation Rate (WPR)		40.05
WPR (Male)		54.60
WPR (Female)		24.83
Main Workers		29.02
Main workers (Male)		44.83
Main workers (Female)		12.47
Main Workers Distribution	Cultivation Ratio	38.25
	Agriculture Ratio	8.26
	Household Ratio	2.16
	Others Ratio	51.32
Marginal workers		11.03
Marginal workers (Male)		9.77
Marginal workers (Female)		12.36
Marginal Workers Distribution	Cultivation Ratio	24.89
	Agriculture Ratio	30.08
	Household Ratio	5.61
	Others Ratio	39.42
Non-Workers Ratio		59.95
Male Non-Workers		45.40
Female Non-Workers		75.17

Source: *Census of India, 2011*

L. Sivasagar

Sivasagar district formerly known as Sibsagar, is one of the 33 districts of Assam state in Northeast India. Sivasagar city is the administrative headquarters of this district. This historic place is also known for its rich biodiversity. The districts cover an area of 2,668 square kilometers (of the total area of 78438 square kilometers of Assam). The district comprises two sub-divisions – Sivasagar and Nazira. The district of Sivasagar lies between 26.45°N and 27.15°N latitudes and 94.25°E and 95.25°E longitudes. The district is bounded by the Brahmaputra River to the north, Nagaland to the south, the Charaideo district to the east and the Jhanji River to the west. The Sivasagar district has acquired its distinct identity due to the co-existence of different races, tribes, languages and cultures. The main industries in Sivasagar are oil industry, tea industry & tourism industry. Majority of the population are agrarian.

Salient feature of the Shivsagar District

Indicators		**Census, 2011**
Area (sq. km)		2,668
Households (No.)		248367
Population (No.)		1151050
Male Population		51.19
Female Population		48.81
Child Population 0-6		12.11
Male Population 0-6		12.07
Female Population 0-6		12.15
Urban population		9.56
Rural population		90.44
SC Population		3.68
ST Population		4.26
Population growth rate		9.44
Population density (per sq. km.)		431
Sex Ratio (females+ 1000 males)		854
Total Literate		80.41
Total Male Literate		85.84
Total Female Literate		74.71
Work Participation Rate (WPR)		42.20
WPR (Male)		55.17
WPR (Female)		28.59
Main Workers		27.71
Main workers (Male)		40.32
Main workers (Female)		14.48
Main Workers Distribution	Cultivation Ratio	22.03
	Agriculture Ratio	4.39
	Household Ratio	1.93
	Others Ratio	71.66
Marginal workers		14.49
Marginal workers (Male)		14.85
Marginal workers (Female)		14.11
Marginal Workers Distribution	Cultivation Ratio	40.68
	Agriculture Ratio	20.66
	Household Ratio	5.03
	Others Ratio	33.62
Non-Workers Ratio		57.80
Male Non-Workers		44.83
Female Non-Workers		71.41

Source: *Census of India, 2011*

M. Jorhat

Jorhat acts as a gateway to upper Assam and to the state of Nagaland. It was the last capital of the Ahom Kingdom and home to many historical monuments of Assamese culture. Jorhat is an administrative district of Assam, located in the central part of Brahmaputra Valley. The district is bounded by Lakhimpur district on north, Nagaland state on the south, Sibasagar on the east and Golaghat on the west. On the North of the district, the river Brahmaputra forms the largest riverine island of the world. The administrative seat is located at Jorhat town. It is one of the main administrative, educational and cultural centres of Assam (India) and is situated at the central part of the Brahmaputra valley. It is located between 27”15° N to 26”30° N latitudes and 93”45° E to 94”30° E longitudes.

Earlier Jorhat was a sub-division of undivided Sibsagar district. In 1983 Jorhat was carved out of Sibsagar District and was made a separate district. The cultural diversities which prevailed in Jorhat nearly a century ago has inspired the people to participate in cultural activities through the decades and as a result Jorhat has been able to produce many creative writers, musician, actors, historians and journalists, terming Jorhat "The Cultural Capital of Assam".

Salient feature of the Jorhat District

Indicators		Details
Area (sq. km)		2,851
Households (No.)		236262
Population (No.)		1092256
Male Population		50.98
Female Population		49.02
Child Population 0-6		11.41
Male Population 0-6		11.39
Female Population 0-6		11.42
Urban population		20.19
Rural population		79.81
SC Population		8.12
ST Population		12.81
Population growth rate		9.31
Population density (per sq. km.)		383
Sex Ratio (females+ 1000 males)		962
Total Literate		82.15
Total Male Literate		87.63
Total Female Literate		76.45
Work Participation Rate (WPR)		45.65
WPR (Male)		57.60
WPR (Female)		33.22
Main Workers		31.00
Main workers (Male)		44.72
Main workers (Female)		16.74
Main Workers Distribution	Cultivation Ratio	29.14
	Agriculture Ratio	5.96
	Household Ratio	4.26
	Others Ratio	60.64
Marginal workers		14.65
Marginal workers (Male)		12.88
Marginal workers (Female)		16.48
Marginal Workers Distribution	Cultivation Ratio	29.51
	Agriculture Ratio	20.61
	Household Ratio	10.70
	Others Ratio	39.18
Non-Workers Ratio		54.35
Male Non-Workers		42.40
Female Non-Workers		66.78

Source: *Census of India, 2011*

N. Chirang

Chirang district was formed on June 14, 2004 as one of the four districts under the Bodoland Territorial Autonomous District vide notification No.GAG(B)137/2002/Pt/117 dated 30.10.2003 under the provision of the Sixth Schedule. This district was carved out mainly from Bongaigaon district, Kokrajhar district and partly from Barnagar Revenue Circle of Barpeta district. The district is situated at the Longitude of 90.30 to 90.35-degree East and Latitude of 26.30 to 26.37-degree North. Kajalgaon is the headquarters of the district. The district shares the international boundary with Bhutan on the north. It is bounded by Kokrajhar district in the west, Bongaigaon and Barpeta district on the south and Baksa district on the east. This district covers a total area of 1,923 Sq.Km. In terms of total area covered, this district occupies the 19th rank among the districts of the state.

Salient feature of the Chirang District

Indicators		Details
Area (sq. km)		1,923
Households (No.)		97395
Population (No.)		482162
Male Population		50.78
Female Population		49.22
Child Population 0-6		15.18
Male Population 0-6		15.19
Female Population 0-6		15.18
Urban population		7.33
Rural population		92.67
SC Population		7.29
ST Population		37.06
Population growth rate		11.34
Population density (per sq. km.)		251
Sex Ratio (females+ 1000 males)		969
Total Literate		63.55
Total Male Literate		70.24
Total Female Literate		56.65
Work Participation Rate (WPR)		40.21
WPR (Male)		52.59
WPR (Female)		27.45
Main Workers		28.83
Main workers (Male)		43.37
Main workers (Female)		13.83
Main Workers Distribution	Cultivation Ratio	48.03
	Agriculture Ratio	11.43
	Household Ratio	3.05
	Others Ratio	37.49
Marginal workers		11.38
Marginal workers (Male)		9.21
Marginal workers (Female)		13.61
Marginal Workers Distribution	Cultivation Ratio	24.70
	Agriculture Ratio	35.23
	Household Ratio	6.25
	Others Ratio	33.82
Non-Workers Ratio		59.79
Male Non-Workers		47.41
Female Non-Workers		72.55

Source: *Census of India, 2011*

O. Karimganj

Karimganj is a South West district of Assam which has been carved out of the erstwhile Cachar district in the year 1983. The district is bounded on north by the district of Cachar and Bangladesh, on the west by Bangladesh and Tripura, on the east Hailakandi district and on the south by Tripura and Mizoram. The district is situated between longitude 91° 15' and 93°15' east latitude 24°8' and 25°8' north and covers an area of 1809 km out of the state total areas of 78438 km. The district is comprised of 936 villages with 7 Community Development Blocks. The district possesses 5 Revenue Circles namely, Karimganj, Badarpur, Nilambazar, Patharkandi and Ramkrishna Nagar. There is one Sub-Division namely Karimganj. The district area is divided among 7 Police Stations, namely Karimganj, Badarpur, Patharkandi, Ramakrishana Nagar, Ratabari, Nilambazar and Bazerichera.

Salient feature of the Karimganj District

Indicators		Details
Area (sq. km)		1809
Households (No.)		247714
Population (No.)		1228686
Male Population		50.94
Female Population		49.06
Child Population 0-6		17.25
Male Population 0-6		17.20
Female Population 0-6		17.31
Urban population		8.93
Rural population		91.07
SC Population		12.85
ST Population		0.16
Population growth rate		21.90
Population density (per sq. km.)		679
Sex Ratio (females+ 1000 males)		963
Total Literate		78.22
Total Male Literate		84.12
Total Female Literate		72.09
Work Participation Rate (WPR)		32.49
WPR (Male)		51.10
WPR (Female)		13.17
Main Workers		23.88
Main workers (Male)		40.94
Main workers (Female)		6.16
Main Workers Distribution	Cultivation Ratio	27.30
	Agriculture Ratio	12.48
	Household Ratio	2.79
	Others Ratio	57.43
Marginal workers		8.61
Marginal workers (Male)		10.16
Marginal workers (Female)		7.00
Marginal Workers Distribution	Cultivation Ratio	13.48
	Agriculture Ratio	28.75
	Household Ratio	8.75
	Others Ratio	49.02
Non-Workers Ratio		67.51
Male Non-Workers		48.90
Female Non-Workers		86.83

Source: *Census of India, 2011*

P. Cachar

Cachar District is located in the southernmost part of Assam. It is bounded on the North by Dima Hasao, on the South by the state of Mizoram and on the East by Manipur and on West by the Districts of Hailakandi and Karimganj. The district lies between 92º24'E and 93º15'E longitude and 24º22'N and 25º8'N latitude. The district has an area of 3786 sq. kms.

Salient feature of the Cachar District

Indicators		Details
Area (sq. km)		3786
Households (No.)		379955
Population (No.)		1736617
Male Population		51.04
Female Population		48.96
Child Population 0-6		14.79
Male Population 0-6		14.83
Female Population 0-6		14.74
Urban population		18.17
Rural population		81.83
SC Population		15.25
ST Population		1.01
Population growth rate		20.19
Population density (per sq. km.)		459
Sex Ratio (females+ 1000 males)		959
Total Literate		79.34
Total Male Literate		84.78
Total Female Literate		73.68
Work Participation Rate (WPR)		35.01
WPR (Male)		53.00
WPR (Female)		16.27
Main Workers		27.14
Main workers (Male)		44.64
Main workers (Female)		8.89
Main Workers Distribution	Cultivation Ratio	22.13
	Agriculture Ratio	7.89
	Household Ratio	2.38
	Others Ratio	67.59
Marginal workers		7.88
Marginal workers (Male)		8.36
Marginal workers (Female)		7.38
Marginal Workers Distribution	Cultivation Ratio	11.74
	Agriculture Ratio	23.00
	Household Ratio	9.68
	Others Ratio	55.59
Non-Workers Ratio		64.99
Male Non-Workers		47.00
Female Non-Workers		83.73

Source: *Census of India, 2011*

Annexure 8: Land Transfer Documents

1. **Mahmora,** District Dibrugarh, Private Land

भारतीय गैर न्यायिक

दस रुपये रु.10

भारत

TEN RUPEES Rs.10

INDIA

INDIA NON JUDICIAL

Sri Anil Konwar

असम असम ASSAM

29AA 245238

20/07/19

Deed of Agreement (NOC)

I Sri Anil Konwar son of Late Mongla Konwar an inhabitant of Konwar Gaon, P.O.- Bharalipukhuri, P.S. – Kakotibari, Rev. Circle- Mahmora, Dist- Charaideo (First Party) here agreed to donate my own land measuring 1.5 Bigha Potta No. 83 Dag No. 554 to second party namely Tingkhong Electrical Sub Division (APDCL) Dist- Dibrugarh (Assam) for establishing 33/11 KVA Power sub station on the said land.

From today I have no reject upon the donated land.

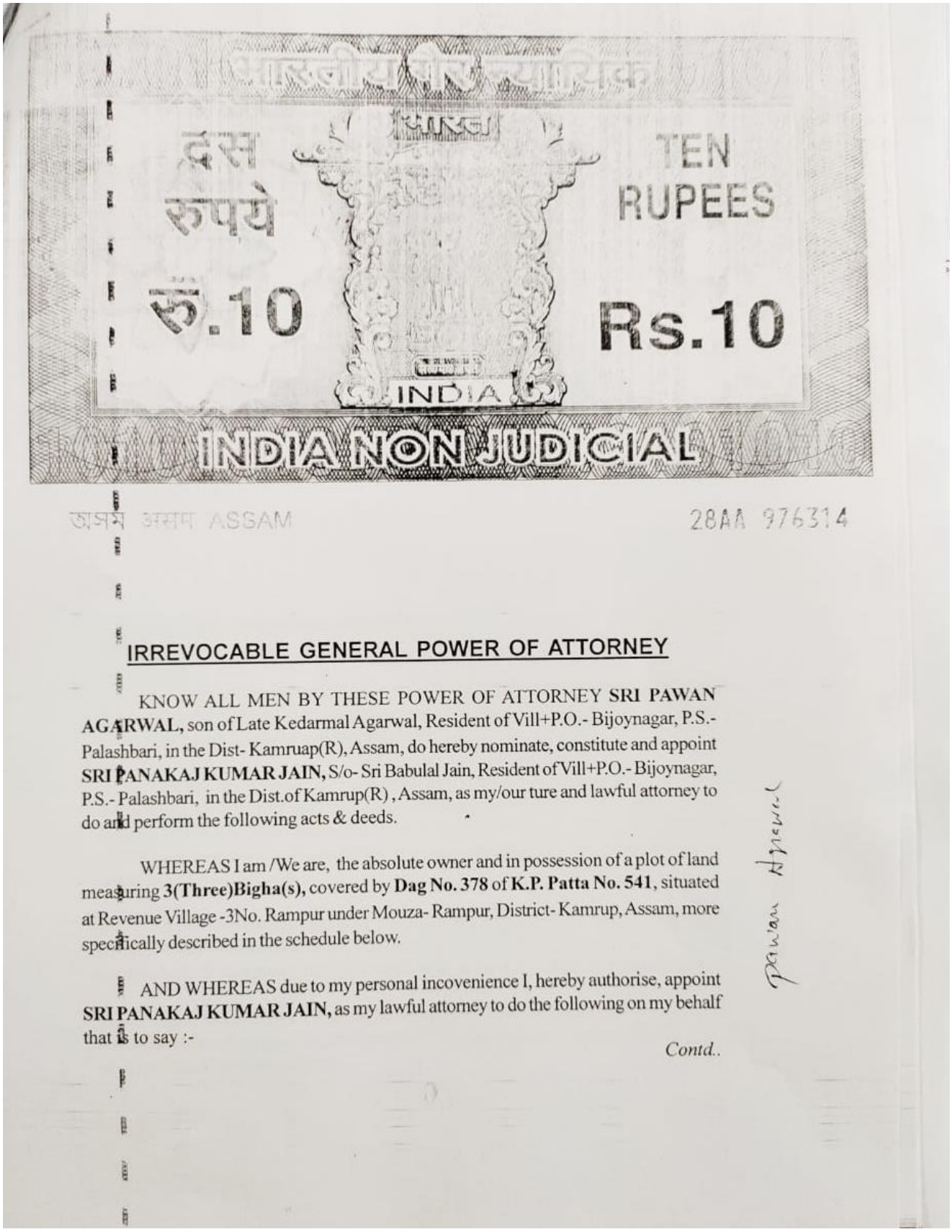
Signature of Second Party

Sub-Divisional Engineer
Tingkhong Electrical Sub-Division
APDCL Tingkhong

Signature of First Party

LT. Sri Anil Konwar

2. **Rampur**, District Kamrup, Private Land



दस रुपये
TEN RUPEES
रु.10
Rs.10
INDIA
INDIA NON JUDICIAL
असम ASSAM
28AA 976314

IRREVOCABLE GENERAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE POWER OF ATTORNEY **SRI PAWAN AGARWAL,** son of Late Kedarmal Agarwal, Resident of Vill+P.O.- Bijoynagar, P.S.- Palashbari, in the Dist- Kamruap(R), Assam, do hereby nominate, constitute and appoint **SRI PANAKAJ KUMAR JAIN,** S/o- Sri Babulal Jain, Resident of Vill+P.O.- Bijoynagar, P.S.- Palashbari, in the Dist.of Kamrup(R) , Assam, as my/our ture and lawful attorney to do and perform the following acts & deeds.

WHEREAS I am /We are, the absolute owner and in possession of a plot of land measuring **3(Three)Bigha(s),** covered by **Dag No. 378** of **K.P. Patta No. 541**, situated at Revenue Village -3No. Rampur under Mouza- Rampur, District- Kamrup, Assam, more specifically described in the schedule below.

AND WHEREAS due to my personal incovenience I, hereby authorise, appoint **SRI PANAKAJ KUMAR JAIN,** as my lawful attorney to do the following on my behalf that is to say :-

Contd..

-2-

1. To work, manage, control and supervise my property as described in the schedule below.

2. To appoint advocate/ pleader regarding any dispute or disputes which may arise in connection with the settlement, possession, vacation or any other legal matter as and when required and think fit and proper by the said Attorney.

3. To negotiate on terms for and agree to and enter into and conclude any agreement or sale, mortgage to make any kinds of transfer and sell my land as fully mentioned and described in the schedule hereto to any puchaser or purchasers or any person or persons at such price which my said attorney in my absolute discrretion thinks proper and/ or cancel or repudiate the same.

4. To receive from the indending purchaser or purchasers any earnest money and or advance or advances and also the balance of purchase money and to give good valid receipt and to discharge for the same which will protect the purchaser or purchasers.

5. Upon such receipt as aforesaid in my name and my act and deed, to sign, execute and deliver any conveyance or convayances of the said property in favour of the purchaser or his nominee(s) or assigns(ees).

Pawan Agrawal

contd....

6. To sign and execute all other deeds, instruments and assurances which he shall consider necessary and to enter into and / or agree to such covenient and conditions asmay be required fully and effectually conveying the said as I/ we could do myself/ourself if personally present.

7. To transfer, grant, convey and assign by way of absolute sale, gift, mortgage or lease or exchange or other assignments of the schedule property in compliance of and conformity with the law of the land in force.

8. To develope the schedule property and construct buildings by my said attorney, through any agency or builder / developer and to seek proper permission for the same from the concerned authorities appoint under law.

9. To present any such conveyance or conveyances for registration to admit execution and receipt of consideration the sub-registrar or Registrar having authority for and to have said conveyance registered and ao do all acts, deeds and things which my/our said attorney shall consider necessary for converting the said property to the said purchaser or purchasers as fully and effectually in all respect as I/ We could do the same myself/ourself.

10. To apply for sale permission for sale of land to any purchaser / purchasers before the competant authorities and to sign and file application, petitions, documents to swear affidavit etc, as are required for sale of land.

11. To institute, file and defend suit/case/cases to any court having jurisdiction to file written ststement, to receive summon etc. in respect of the said land, to appear before any Court/Courts, Police Stations, S.D.C. office, Settelement Office, Municipal Corporation Office and to sign and file applications, demarcations, documents and papers and all that are necessary or expenient for that purposes.

12. To file applications before the Settlement Officer, or S.D.C., or any other concerned authority for demarcation of land and to settle up any boundary dispute if any in respect of the land.

And I/We do hereby agree that whatever all acts, deeds and things lawfully and bonefide done by my Attorney which shall be construed as acts, deeds and things done by me/us and I/We shall undertake to ratify and confirm all and whatsoever that my/our said Attorney shall lawfully do or cause to be done for my virtue of this Irrevocable Power of Attorney hereby given.

Contd...

-4-

IN WITNESS WHEREOF we sign this power of attorney on this ..... day of ....., 20 at ..... in presence of the following witnesses.

SCHEDULE OF PROPERTY

All that piece and parcel of a plot of land measuring **3(Three)Bigha(s),** covered by **Dag No. 378** of **K.P. Patta No. 541**, situated at Revenue Village -3No. Rampur under Mouza- Rampur,District- Kamrup, Assam.

WITNESSES:-

1. Hemanta Kumar Sarma
S/o late Suresh Sarma
Bijoynagar Kamrup
Assam 781122

2. Tapan Rajbongshi
S/o. late Padma Rajbongshi
VILL+P.O- Rangamati

1. Pawan Agrawal

SIGNATURE OF THE EXECUTANT(S)

1.

SIGNATURE OF THE ATTORNEY HOLDER

NOW THIS DEED WITNESS AS FOLLOWS:-

1. In pursuarance of the aforesaid agreement of donee's covenanth hereinafter contained the Donar does hereby voluntarily and absolutely grants,conveys,transfer and assures unto and to the use of the Donee the Plot of the land more particularly described din the Schedule, hereunder written, to hold the said to the Donee for construction of the sub-station.

2. **The Donor hereby covenathwith the Donee as follows:-**

i. APDCL will contract a 33/11KV sub-station on the said property for supplying quality and reliable power to the locality.
ii. Necessary right of way for the Electrical network will be provided by the Donor within the area of this jurisdiction.
iii. Donor will develop the sub-station site as well as the approached road to the proposed sub-station for under taken construction work of the sub-station without any difficulties.
iv. Donor will assist all sort of help in obtaining site top of the sub-station plot of the land by APDCL.

IN WITNESS WHEREAS the Donor has executed this deed of gift and delivered the same to the Donee, who has signed the same in token of acceptance the day and year first above written.

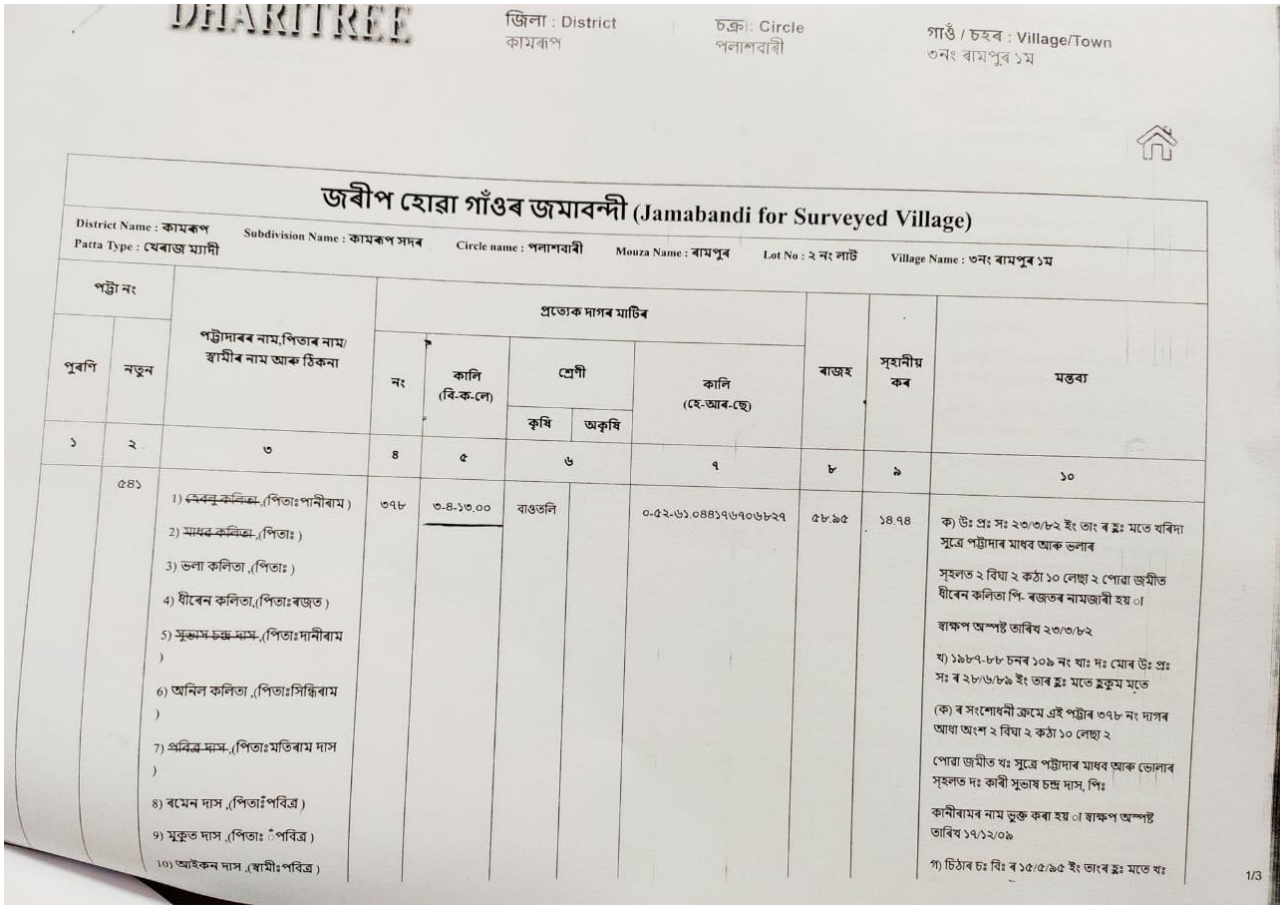
The Schedule of land: A plot of land measuring approx 3 Bigha, (Three).
(length.....Meter and Breath..... Meters) covered by Dag No. 378
K.P No:-541 under Village 3no Rampur, Mouza Rampur Dist. Kamrup® Assam.

Boundary of Land

North : Dag No.1
South : Dag No.1
East : Dag No.1
West : Dag No.1

Signed and delivered by the within named Donor:

Witness:-
1. 23/12/19
2. Md. Mamtaz Ali



DHARITREE

জিলা : District
কামৰূপ

চক্ৰ: Circle
পলাশবাৰী

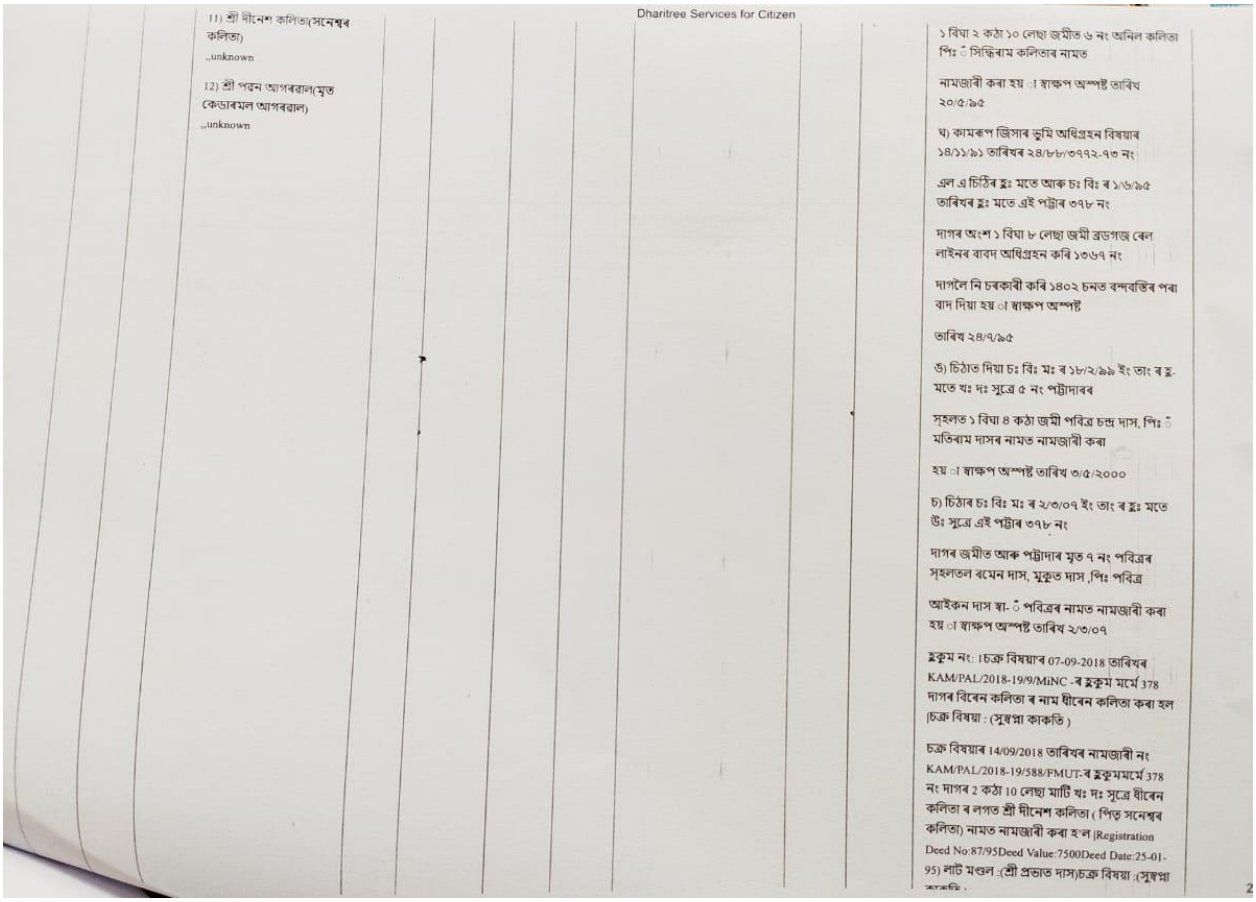
গাওঁ / চহৰ : Village/Town
৩নং ৰামপুৰ ১ম

জৰীপ হোৱা গাঁওৰ জমাবন্দী (Jamabandi for Surveyed Village)

District Name : কামৰূপ Subdivision Name : কামৰূপ সদৰ Circle name : পলাশবাৰী Mouza Name : ৰামপুৰ Lot No : ২ নং লাট Village Name : ৩নং ৰামপুৰ ১ম
Patta Type : যেৰাজ ম্যাদী

পট্টা নং		পট্টাদাৰৰ নাম,পিতাৰ নাম/ স্বামীৰ নাম আৰু ঠিকনা	প্রত্যেক দাগৰ মাটিৰ				ৰাজহ	স্থানীয় কৰ	মন্তব্য
পুৰণি	নতুন		নং	কালি (বি-ক-লে)	শ্রেণী	কালি (হে-আৰ-ছে)			
					কৃষি / অকৃষি				
১	২	৩	৪	৫	৬	৭	৮	৯	১০
	৫৪১	1) ~~কেবলু কলিতা~~ ,(পিতাঃপানীৰাম)	৩৭৮	৩-৪-১৩.০০	বাওতলি	০-৫২-৬১.০৪৪১৭৬৭০৬৮২৭	৫৮.৯৫	১৪.৭৪	ক) উঃ প্রঃ সঃ ২৩/৩/৮২ ইং তাং ৰ ব্লুঃ মতে খৰিদা সূত্রে পট্টাদাৰ মাধব আৰু ভলাৰ
		2) ~~মাধব কলিতা~~ ,(পিতাঃ)							স্হলত ২ বিঘা ২ কঠা ১০ লেছা ২ পোৱা জমীত ধীৰেন কলিতা পি- ৰজতৰ নামজাৰী হয় ।।
		3) ভলা কলিতা ,(পিতাঃ)							স্বাক্ষপ অস্পষ্ট তাৰিখ ২৩/৩/৮২
		4) ধীৰেন কলিতা,(পিতাঃৰজত)							খ) ১৯৮৭-৮৮ চনৰ ১০৯ নং খাঃ দঃ মোৰ উঃ প্রঃ সঃ ৰ ২৮/৬/৮৯ ইং তাৰ ব্লুঃ মতে ব্লুকুম মতে
		5) ~~সুভাস চন্দ্র দাস~~ ,(পিতাঃদানীৰাম)							(ক) ৰ সংশোধনী ক্রমে এই পট্টাৰ ৩৭৮ নং দাগৰ আধা অংশ ২ বিঘা ২ কঠা ১০ লেছা ২
		6) অনিল কলিতা ,(পিতাঃসিদ্ধিৰাম)							পোৱা জমীত খঃ সূত্রে পট্টাদাৰ মাধব আৰু ভোলাৰ স্হলত দঃ কাৰী সুভাষ চন্দ্র দাস, পিঃ
		7) ~~প্রবিত্র দাস~~ ,(পিতাঃমতিৰাম দাস)							কানীৰামৰ নাম ভুক্ত কৰা হয় ।। স্বাক্ষপ অস্পষ্ট তাৰিখ ১৭/১২/০৯
		8) ৰমেন দাস ,(পিতাঃ~~পবিত্র~~)							গ) চিঠাৰ চঃ বিঃ ৰ ১৫/৫/৯৫ ইং তাংৰ ব্লুঃ মতে খঃ
		9) মুকুত দাস ,(পিতাঃ ~~পবিত্র~~)							
		10) আইকন দাস ,(স্বামীঃপবিত্র)							

1/3



11) শ্রী দীনেশ কলিতা(সনেশ্বৰ কলিতা)
,,unknown

12) শ্রী পৱন আগৰৱাল(মৃত কেডাৰমল আগৰৱাল)
,,unknown

Dharitree Services for Citizen

১ বিঘা ২ কঠা ১০ লেছা জমীত ৬ নং অনিল কলিতা পিঃ ঁ সিদ্ধিৰাম কলিতাৰ নামত

নামজাৰী কৰা হয় া স্বাক্ষপ অস্পষ্ট তাৰিখ ২০/৫/৯৫

ঘ) কামৰূপ জিসাৰ ভুমি অধিগ্রহন বিষয়াৰ ১৪/১১/৯১ তাৰিখৰ ২৪/৮৮/৩৭৭২-৭৩ নং

এল এ চিঠিৰ ষ্ট্রঃ মতে আৰু চঃ বিঃ ৰ ১/৬/৯৫ তাৰিখৰ ষ্ট্রঃ মতে এই পট্টাৰ ৩৭৮ নং

দাগৰ অংশ ১ বিঘা ৮ লেছা জমী ব্রডগজ ৰেল লাইনৰ বাবদ অধিগ্রহন কৰি ১৩৬৭ নং

দাগলৈ নি চৰকাৰী কৰি ১৪০২ চনত বন্দবস্তিৰ পৰা বাদ দিয়া হয় া স্বাক্ষপ অস্পষ্ট

তাৰিখ ২৪/৭/৯৫

ঙ) চিঠাত দিয়া চঃ বিঃ মঃ ৰ ১৮/২/৯৯ ইং তাং ৰ ষ্ট্র-মতে খঃ দঃ সুত্রে ৫ নং পট্টাদাৰৰ

সহলত ১ বিঘা ৪ কঠা জমী পবিত্র চন্দ্র দাস, পিঃ ঁ মতিৰাম দাসৰ নামত নামজাৰী কৰা

হয় া স্বাক্ষপ অস্পষ্ট তাৰিখ ৩/৫/২০০০

চ) চিঠাৰ চঃ বিঃ মঃ ৰ ২/৩/০৭ ইং তাং ৰ ষ্ট্রঃ মতে উঃ সুত্রে এই পট্টাৰ ৩৭৮ নং

দাগৰ জমীত আৰু পট্টাদাৰ মৃত ৭ নং পবিত্রৰ সহলতল ৰমেন দাস, মুকুত দাস ,পিঃ পবিত্র

আইকন দাস স্বা- ঁ পবিত্রৰ নামত নামজাৰী কৰা হয় া স্বাক্ষপ অস্পষ্ট তাৰিখ ২/৩/০৭

ষ্ট্রকুম নং: 1চক্র বিষয়াৰ 07-09-2018 তাৰিখৰ KAM/PAL/2018-19/9/MiNC -ৰ ষ্ট্রকুম মৰ্মে 378 দাগৰ বিৰেন কলিতা ৰ নাম ধীৰেন কলিতা কৰা হল |চক্র বিষয়া : (সুস্বপ্না কাকতি)

চক্র বিষয়াৰ 14/09/2018 তাৰিখৰ নামজাৰী নং KAM/PAL/2018-19/588/FMUT-ৰ ষ্ট্রকুমমৰ্মে 378 নং দাগৰ 2 কঠা 10 লেছা মাটি খঃ দঃ সুত্রে ধীৰেন কলিতা ৰ লগত শ্রী দীনেশ কলিতা (পিতৃ সনেশ্বৰ কলিতা) নামত নামজাৰী কৰা হ'ল |Registration Deed No:87/95Deed Value:7500Deed Date:25-01-95) লাট মণ্ডল :(শ্রী প্রভাত দাস)চক্র বিষয়া :(সুস্বপ্না

প্ৰতি, মাননীয় উপ-সংমণ্ডল অভিযন্তা
নিৰ্জা উপ-সংমণ্ডল।
অসম শক্তি বিতৰণ কোম্পানী লিমিটেড।
তাং - ২০/৯/২০১৯

মহোদয়,

আপোনাৰ কাৰ্য্যালয়-আলোচনাৰ লোকসকলে কোম্পানীৰ প্ৰতি আমাৰ পাৱাৰ কেন্দ্ৰ আমাৰ অঞ্চলত স্থাপন কৰিব বিচাৰিছে। সেই কেন্দ্ৰৰ বাবে আমাৰ শ্মশানৰ নিচপালে মাত্ৰ চৰকাৰী মাটি-নিৰ্মাণত আলোচনাৰ স্থান নিৰ্বাচন কৰে পূৰ্বৰ আপোনাৰ কাৰ্য্যালয়। নিয়েহে উক্ত মাটি চৰকাৰী হয় যেহেতু কাৰণ বিভাগত লগত [illegible] উক্ত সংস্থাৰ অনুমতি দিলে তাত আলোচনাৰে পাৱাৰ কেন্দ্ৰটি স্থাপন কৰাত কোনো আপত্তি নাই।

সেয়ে, মহোদয়ক অনুৰোধ জনাও যে দ্ৰুতভাৱে অঞ্চলটিত এখনমাত্ৰ শ্মশান থকাৰ বাবে তিলমাত্ৰ ক্ষতি নোহোৱাকৈ কেন্দ্ৰটি স্থাপন কৰিব দিয়ে।

বিনীত
ভৱানী [illegible]
অসমবাসী গাঁওৰ
২ নং দাগৰ চৰকাৰী (গো-বিৰ্জোট)
জমী।

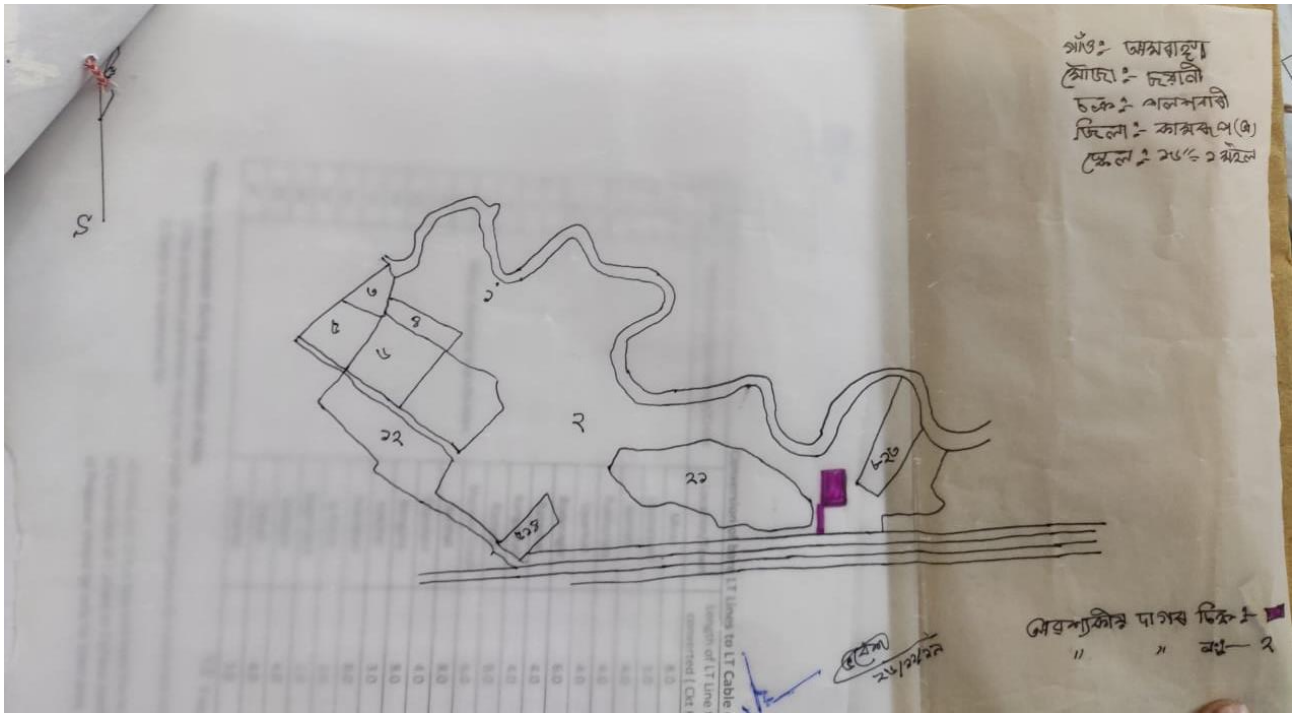
২০/৯/১৯

খগেৰাজা মেথিপাৰা উন্নয়ন সমিতি

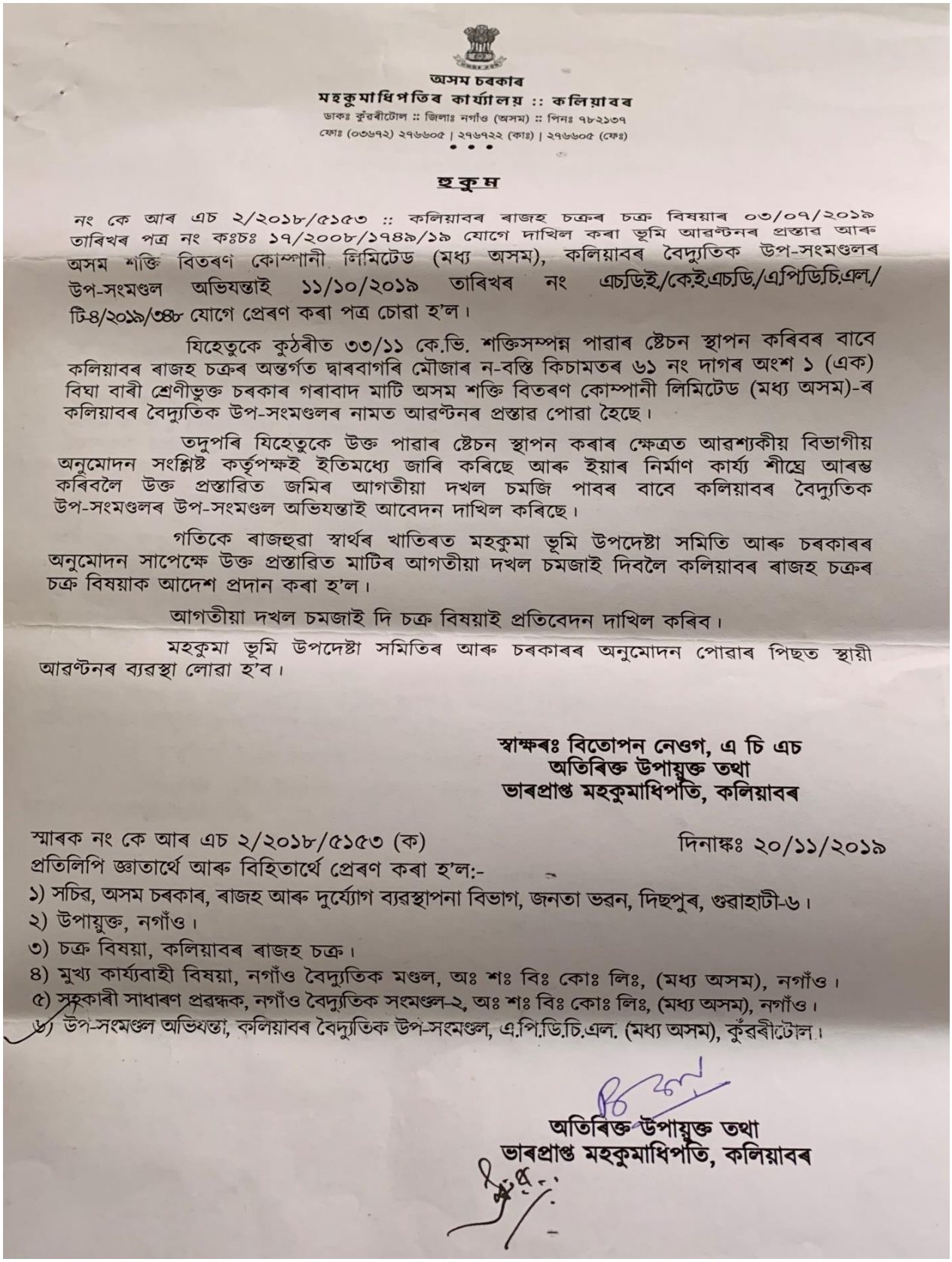
ধন্যবাদ সহকাৰে
[illegible]
সম্পাদক
খগেৰাজা মেথিপাৰা উন্নয়ন সমিতি
সম্পাদক,
খগেৰাজা মেথিপাৰা উন্নয়ন সমিতি

									চক্র বিষয়ক 30/09/2019 তারিখৰ নামজাৰী নং KAM/PAL/2019-20/920/FMUT-৪ ক্রমমতে 378 নং দাগৰ 2 বিঘা মাটি যঃ মঃ সূত্রে অনিল কলিতা ৰ লগত শ্ৰী দীনেশ কলিতা ৰ লগত শ্ৰী পৰন আগৰৱাল (পিতৃ মৃত কেডাৰমল আগৰৱাল) নামত নামজাৰী কৰা হ'ল [Registration Deed No:3367/19Deed Value:600000Deed Date:24-09-19) লাট মণ্ডল :(শ্ৰী প্ৰভাত দাস)চক্র বিষয়া :(সুৰমা কাকতি)
				৩-৪-১৩			০-৫২-৬১.০৪৪১৭৬৭০৬৮২৭		
				৩-৪-১৩			০-৫২-৬১.০৪৪১৭৬৭০৬৮২৭	৫৮.৯৫	১৪.৭৪

Software Powered By: National Informatics Center, Assam State Unit, Assam



3. Kuthori, District Nagaon, Land near Kaziranga National Park



অসম চৰকাৰ
মহকুমাধিপতিৰ কার্য্যালয় :: কলিয়াবৰ
ডাকঃ কুঁৱৰীটোল :: জিলাঃ নগাঁও (অসম) :: পিনঃ ৭৮২১৩৭
ফোঃ (০৩৬৭২) ২৭৬৬০৫ | ২৭৬৭২২ (কাঃ) | ২৭৬৬০৫ (ফেঃ)

হুকুম

নং কে আৰ এচ ২/২০১৮/৫১৫৩ :: কলিয়াবৰ ৰাজহ চক্ৰৰ চক্ৰ বিষয়াৰ ০৩/০৭/২০১৯ তাৰিখৰ পত্ৰ নং কঃচঃ ১৭/২০০৮/১৭৪৯/১৯ যোগে দাখিল কৰা ভূমি আৱণ্টনৰ প্ৰস্তাৱ আৰু অসম শক্তি বিতৰণ কোম্পানী লিমিটেড (মধ্য অসম), কলিয়াবৰ বৈদ্যুতিক উপ-সংমণ্ডলৰ উপ-সংমণ্ডল অভিযন্তাই ১১/১০/২০১৯ তাৰিখৰ নং এচ.ডি.ই./কে.ই.এচ.ডি./এ.পি.ডি.চি.এল./টি-৪/২০১৯/৩৪৮ যোগে প্ৰেৰণ কৰা পত্ৰ চোৱা হ'ল।

যিহেতুকে কুঠৰীত ৩৩/১১ কে.ভি. শক্তিসম্পন্ন পাৱাৰ ষ্টেচন স্থাপন কৰিবৰ বাবে কলিয়াবৰ ৰাজহ চক্ৰৰ অন্তৰ্গত দ্বাৰবাগৰি মৌজাৰ ন-বস্তি কিচামতৰ ৬১ নং দাগৰ অংশ ১ (এক) বিঘা বাৰী শ্ৰেণীভুক্ত চৰকাৰ গৰাবাদ মাটি অসম শক্তি বিতৰণ কোম্পানী লিমিটেড (মধ্য অসম)-ৰ কলিয়াবৰ বৈদ্যুতিক উপ-সংমণ্ডলৰ নামত আৱণ্টনৰ প্ৰস্তাৱ পোৱা হৈছে।

তদুপৰি যিহেতুকে উক্ত পাৱাৰ ষ্টেচন স্থাপন কৰাৰ ক্ষেত্ৰত আৱশ্যকীয় বিভাগীয় অনুমোদন সংশ্লিষ্ট কৰ্তৃপক্ষই ইতিমধ্যে জাৰি কৰিছে আৰু ইয়াৰ নিৰ্মাণ কাৰ্য্য শীঘ্ৰে আৰম্ভ কৰিবলৈ উক্ত প্ৰস্তাৱিত জমিৰ আগতীয়া দখল চমজি পাবৰ বাবে কলিয়াবৰ বৈদ্যুতিক উপ-সংমণ্ডলৰ উপ-সংমণ্ডল অভিযন্তাই আবেদন দাখিল কৰিছে।

গতিকে ৰাজহুৱা স্বাৰ্থৰ খাতিৰত মহকুমা ভূমি উপদেষ্টা সমিতি আৰু চৰকাৰৰ অনুমোদন সাপেক্ষে উক্ত প্ৰস্তাৱিত মাটিৰ আগতীয়া দখল চমজাই দিবলৈ কলিয়াবৰ ৰাজহ চক্ৰৰ চক্ৰ বিষয়াক আদেশ প্ৰদান কৰা হ'ল।

আগতীয়া দখল চমজাই দি চক্ৰ বিষয়াই প্ৰতিবেদন দাখিল কৰিব।

মহকুমা ভূমি উপদেষ্টা সমিতিৰ আৰু চৰকাৰৰ অনুমোদন পোৱাৰ পিছত স্থায়ী আৱণ্টনৰ ব্যৱস্থা লোৱা হ'ব।

স্বাক্ষৰঃ বিতোপন নেওগ, এ চি এচ
অতিৰিক্ত উপায়ুক্ত তথা
ভাৰপ্ৰাপ্ত মহকুমাধিপতি, কলিয়াবৰ

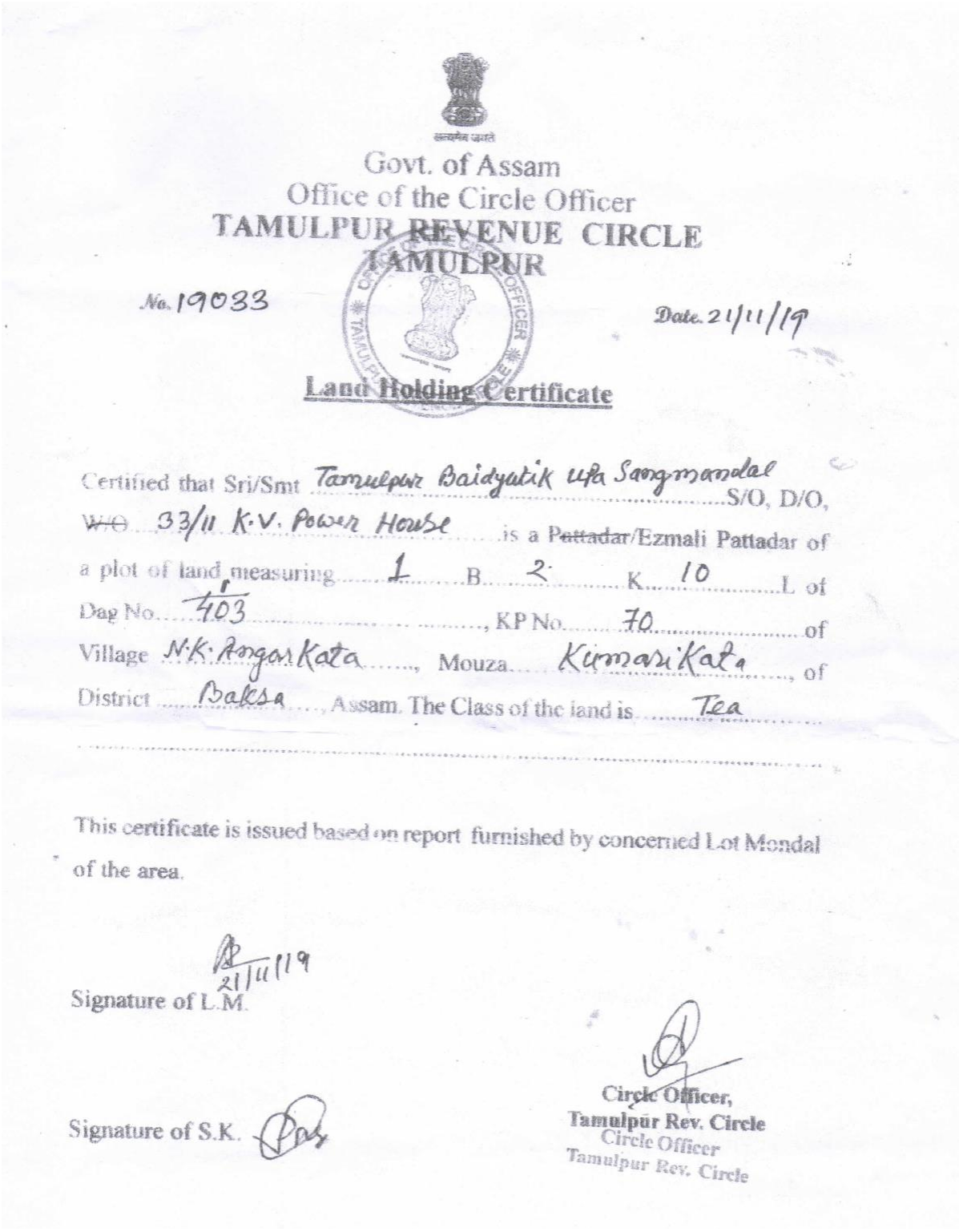
স্মাৰক নং কে আৰ এচ ২/২০১৮/৫১৫৩ (ক) দিনাঙ্কঃ ২০/১১/২০১৯

প্ৰতিলিপি জ্ঞাতাৰ্থে আৰু বিহিতাৰ্থে প্ৰেৰণ কৰা হ'ল:-

১) সচিব, অসম চৰকাৰ, ৰাজহ আৰু দুৰ্য্যোগ ব্যৱস্থাপনা বিভাগ, জনতা ভৱন, দিছপুৰ, গুৱাহাটী-৬।
২) উপায়ুক্ত, নগাঁও।
৩) চক্ৰ বিষয়া, কলিয়াবৰ ৰাজহ চক্ৰ।
৪) মুখ্য কাৰ্য্যবাহী বিষয়া, নগাঁও বৈদ্যুতিক মণ্ডল, অঃ শঃ বিঃ কোঃ লিঃ, (মধ্য অসম), নগাঁও।
৫) সহকাৰী সাধাৰণ প্ৰৰন্ধক, নগাঁও বৈদ্যুতিক সংমণ্ডল-২, অঃ শঃ বিঃ কোঃ লিঃ, (মধ্য অসম), নগাঁও।
৬) উপ-সংমণ্ডল অভিযন্তা, কলিয়াবৰ বৈদ্যুতিক উপ-সংমণ্ডল, এ.পি.ডি.চি.এল. (মধ্য অসম), কুঁৱৰীটোল।

অতিৰিক্ত উপায়ুক্ত তথা
ভাৰপ্ৰাপ্ত মহকুমাধিপতি, কলিয়াবৰ

4. **Daranaga,** District Baksa, Land donated by Tea Garden



Govt. of Assam
Office of the Circle Officer
TAMULPUR REVENUE CIRCLE
TAMULPUR

No. 19033 Date. 21/11/19

Land Holding Certificate

Certified that Sri/Smt Tamulpur Baidyatik Upa Sangmandal S/O, D/O, W/O 33/11 K.V. Power House is a ~~Pattadar~~/Ezmali Pattadar of a plot of land measuring 1 B. 2 K. 10 L of Dag No. 403, KP No. 70 of Village N.K. Angarkata, Mouza Kumarikata, of District Baksa, Assam. The Class of the land is Tea

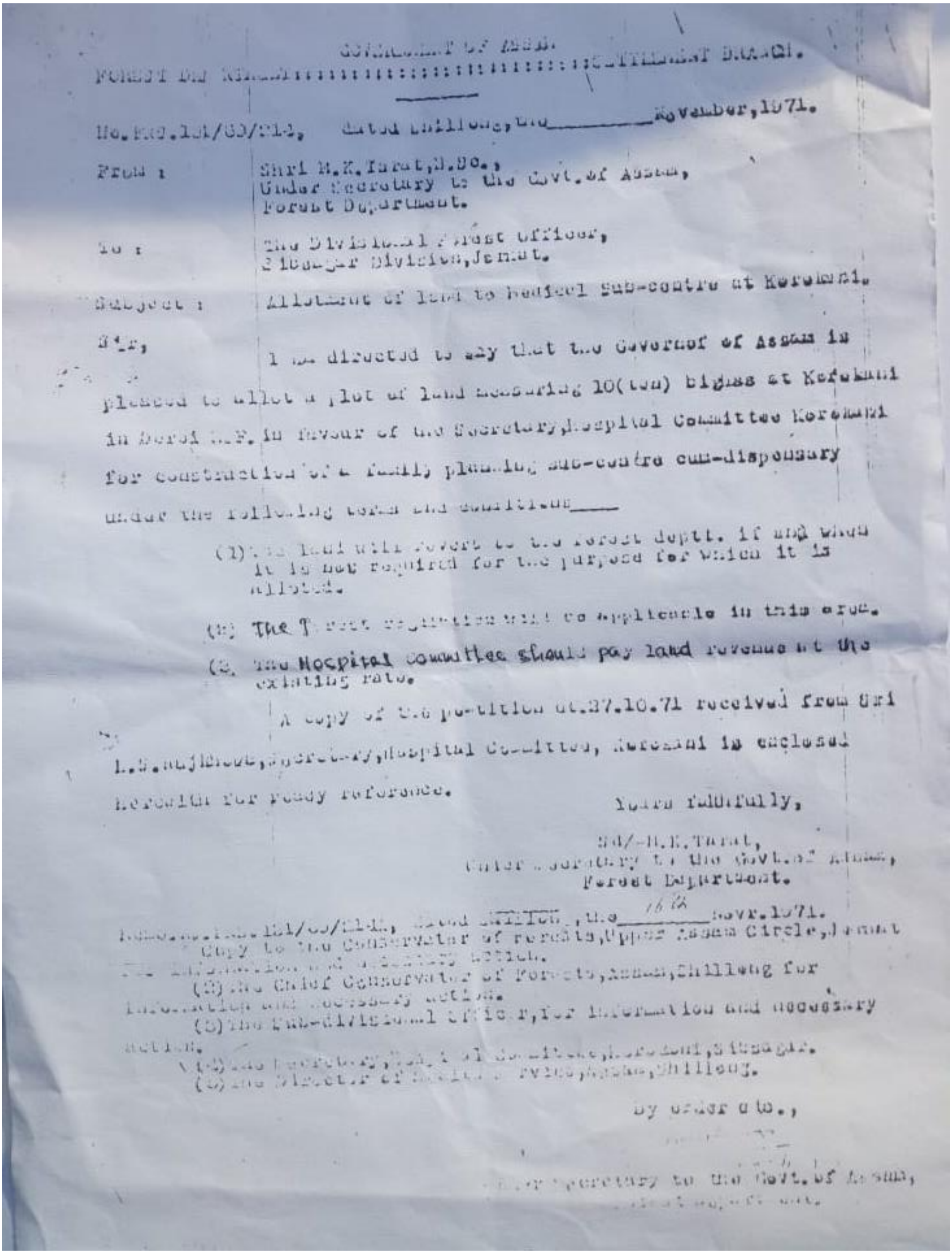
This certificate is issued based on report furnished by concerned Lot Mondal of the area.

21/11/19
Signature of L.M.

Signature of S.K.

Circle Officer,
Tamulpur Rev. Circle
Circle Officer
Tamulpur Rev. Circle

5. **Garchariali,** Dist. Sivasagar



GOVERNMENT OF ASSAM.
FOREST DEPARTMENT [illegible] SETTLEMENT BRANCH.

No. FRS.131/69/214, Dated Shillong, the ________ November, 1971.

From : Shri M.K. Tarat, M.Sc.,
Under Secretary to the Govt. of Assam,
Forest Department.

To : The Divisional Forest Officer,
Sibsagar Division, Jorhat.

Subject : Allotment of land to Medical Sub-centre at Korokani.

Sir,

I am directed to say that the Governor of Assam is pleased to allot a plot of land measuring 10(ten) bighas at Korokani in [illegible] R.F. in favour of the Secretary, Hospital Committee Korokani for construction of a family planning sub-centre cum-dispensary under the following terms and conditions____

(1) The land will revert to the Forest deptt. if and when it is not required for the purpose for which it is allotted.

(2) The [illegible] will be applicable in this area.

(3) The Hospital committee should pay land revenue at the existing rate.

A copy of the petition dt. 27.10.71 received from Sri L. [illegible], Secretary, Hospital Committee, Korokani is enclosed herewith for ready reference.

Yours faithfully,

Sd/- M.K. Tarat,
Under Secretary to the Govt. of Assam,
Forest Department.

Memo No. FRS.131/69/214, Dated Shillong, the 16th Novr. 1971.

Copy to the Conservator of Forests, Upper Assam Circle, Jorhat for information and necessary action.

(2) The Chief Conservator of Forests, Assam, Shillong for information and necessary action.

(3) The Sub-divisional Officer, for information and necessary action.

(4) The Secretary, [illegible], Sibsagar.

(5) The Director of [illegible] Services, Assam, Shillong.

By order etc.,

[illegible] Secretary to the Govt. of Assam,
[illegible]

Annexure 9: Tribal People Development Framework

The preliminary assessments made during the project preparation have established that there are no tribal people in the project area. It is also ascertained that they do not have a collective attachment to the project area and that they may get affected by the project interventions. Since proposed investment programs involve many subprojects/schemes linear in nature running in different geographical area of state due to which precise information about the tribal people likely to be impacted is not yet firmed up. In order to overcome this limitation, a Tribal People Development Framework (TPDF) is developed which sets out approach and methodology for the preparation of a TPP.

TPDF Objectives and Policies

The objectives of the TPDF are to ensure that if indigenous peoples (referred to as tribal in India) tribal are affected by a project/scheme they are

a) adequately and fully consulted;

b) receive benefits and compensation equal to that of the mainstream population:

c) provided with special assistance as per laws and policies because of their vulnerabilities in relation to the mainstream population; and

d) receive adequate protection against project adverse impacts on their culture identities.

There are several policies which provide a legal framework for ensuring dedicate attention to the tribal. Article 366 (25) of the Indian constitution refers to Scheduled Tribes (STs) as those communities who are scheduled in accordance with Article 342 of the Constitution. According to Article 342 of the Constitution, STs are the tribes or tribal communities or part of or groups within these tribes and tribal communities which have been declared as such by the President through a public notification. Identification of tribes is a State subject. Thus, classification of a tribe would depend on the status of that tribe in the respective State. Further the Fifth and Sixth Schedule of the constitution provides special provision for tribal in selected regions of the country.

The AIIB's Policy on ESS-3: Indigenous Peoples aims at ensuring that the development process fosters full respect for Indigenous Peoples' identity, dignity, human rights, economies and cultures, so that they: (a) receive culturally appropriate social and economic benefits; (b) do not suffer adverse impacts as a result of Projects; and (c) can participate actively in Projects that affect them.

Identification of Indigenous Peoples

The term "Indigenous Peoples" is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees:

a) Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;

b) Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;

c) Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and

d) An indigenous language, often different from the official language of the country or region.

In Assam, certain areas have been declared as scheduled area as Specified by the Scheduled Areas under the Sixth Schedule of Indian Constitutions. Six schedule areas in Assam are Bodoland Territorial Council, Karbi Anglong Autonomous Council, Dima Hasao Autonomous District Council.

Tribal People Development Framework (TPDF)

The TPDF seeks to ensure that tribal communities are informed, consulted, and mobilized to participate in the subproject preparation. The Framework is intended to guide selection and preparation of additional subprojects under the Project where impacts on tribal people are identified to ensure better distribution of the Project benefits and promote development of the indigenous peoples in the Project areas. The framework is prepared in accordance with both the Indian Constitution provisions, RFCTLARRA, 2013, Assam RFCTLARR Rules 2015 and AIIB's ESS 3 and serves the following purposes:

- Identification of tribal people likely to be impacted by the project interventions:
- Assess the nature and extent of impacts likely to occur as a result of the project interventions;
- Prepare a plan (TPP) outlining measures towards avoiding/ minimizing the negative impacts as well as enhance positive impacts;
- Outlines an approach for the conduction of social assessment for ensuring free, prior, and informed consultation with the affected tribal communities at each stage of project preparation and implementation;
- Putting in place an implementation arrangement of the TPP, its disclosure and mechanisms to address any grievances.

TPDF – Land Acquisition and Resettlement

Whenever, if some land belonging to tribal community /communities will be needed to be involuntary acquired for setting up of a substation demonstrating/substantiating such acquisition will be done only as a last resort by completing the technical investigation including assessment of alternatives and detailed surveys. The detailed report along with land requirement will be submitted to the Government of Assam (GoA) for further processing as per provisions of RFCTLARRA, 2013. GOA then initiates a SIA through an Independent Agency with a project specific terms of reference. The SIA agency shall first consult the concerned Panchayat, Municipality, District/Village Council at village level or ward level in the affected area to carry out SIA study. SIA shall assess the purpose of acquisition and estimate the affected families, gender, social group carry out analysis regarding impact on community properties, assets and infrastructure particularly roads, public transport, drainage, sanitation, sources of drinking water, sources of water for cattle, community ponds grazing land, plantations, public utilities electricity supply and health care facilities. The SIA agency shall also prepare a Social Impact Management Plan (SIMP) listing ameliorative measures required for addressing the likely impact vis-à-vis intended benefit of the project. The SIA report and SIMP shall be subject to public hearing in the affected area after giving adequate publicity for the venue, time etc to ascertain the views of affected families/communities which shall be included in the SIA. The final SIA report shall be published including its translation in local language and shall also be made available to Panchayats, District / Village Councils & Deputy Collector / District Magistrate office for wider circulation. Detailing of the same is provided below:

a) the prior consent of the concerned Gram Sabha or the Panchayats or the autonomous District Councils at the appropriate level in Scheduled Areas under the Fifth Schedule to the Constitution, as the case may be, shall be obtained in all cases of land acquisition in such areas, before issue of a notification under this Act, or any other Central Act or a State Act for the time being in force.

b) Provided that the consent of the Panchayats or the Autonomous Districts Councils shall be obtained in cases where the Gram Sabha does not exist or has not been constituted.

c) In the case of a project involving land acquisition on behalf of a Requiring Body which involves involuntary displacement of the Scheduled Castes or the Scheduled Tribes families, a Development Plan shall be prepared in such a form as may be prescribed. laying down the details of procedure for settling land rights due, but not settled and restoring titles of the Scheduled Tribes as well as the Scheduled Castes on the alienated land by undertaking a special drive together with land acquisition. This plan is targeted at both SCs and STs, but, for the current purpose, it is referred to as Tribal Peoples Plan (TPP) and contents of such a Plan are provided at the end.

d) the TPP also contain a program for development of alternate fuel, fodder and non-timber forest produce resources on non-forest lands within a period of five years enough to meet the requirements of tribal communities as well as the Scheduled Castes.

e) In the case of land being acquired from the members of the Scheduled Castes or the Scheduled Tribes, at least one-third of the compensation amount due shall be paid to the affected families initially as first instalment and the rest shall be paid after taking over of the possession of the land.

f) The affected families of the Scheduled Tribes shall be resettled preferably in the same Scheduled Area in a compact block so that they can retain their ethnic, linguistic and cultural identity.

g) The resettlement areas predominantly inhabited by the Scheduled Castes and the Scheduled Tribes shall get land, to such extent as may be decided by the appropriate Government free of cost for community and social gatherings.

h) Any alienation of tribal lands or lands belonging to members of the Scheduled Castes in disregard of the laws and regulations for the time being in force shall be treated as null and void. and in the case of acquisition of such lands, the rehabilitation and resettlement benefits shall be made available to the original tribal landowners or landowners belonging to the Scheduled Castes.

i) The affected Scheduled Tribes, other traditional forest dwellers and the Scheduled Castes having fishing rights in a river or pond or dam in the affected area shall be given fishing rights in the reservoir area of the irrigation or hydel projects.

j) Where the affected families belonging to the Scheduled Castes and the Scheduled Tribes are relocated outside of the district, then they shall be paid an additional 25% rehabilitation and resettlement benefits to which they are entitled in monetary terms along with a onetime entitlement of Rs. 50,000/-.

k) All benefits, including the reservation benefits available to the Scheduled Tribes and the Scheduled Castes in the affected areas shall continue in the resettlement area.

l) Whenever the affected families belonging to the Scheduled Tribes who are residing in the Scheduled Areas referred to in the Fifth Schedule or the tribal areas referred to in the Sixth Schedule to the Constitution are relocated outside those areas, then, all the statutory safeguards. entitlements and benefits being enjoyed by them under this Act shall be extended to the area to which they are resettled regardless of whether the resettlement area is a scheduled Area referred to in the said Fifth Schedule or a tribal area referred to in the said Sixth Schedule. or not.

m) Where the community rights have been settled under the provisions of the Scheduled 'tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. The same shall be quantified in monetary amount and be paid to the individual conceded who has been displaced.

Following entitlement matrix shall be the basis for providing compensation and compatible R&R measures for tribal peoples:

MINIMUM COMPENSATION & R&R ENTITLEMENTS FOR LAND ACQUISITION

A. Comprehensive Compensation Package

Eligibility for Entitlement	Provisions
The affected families • **Landowners: includes any person-** whose name is recorded as owner of the land or building or part thereof, in the records of the authority concerned; or 1. 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 2. who is entitled to be granted Patta rights on the land under any law of the State including assigned lands: or 3. any person who has been declared as such by an order of the court or Authority;	**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**
(*) 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	
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

Elements of Rehabilitation and Resettlement Entitlements for all the affected families (both landowners 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:	Where jobs are created through the project, mandatory employment for one member per affected family; or Rupees 5 lakhs per family; or 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	1. A constructed house shall be provided as per the Indira Awas Yojana specifications. 2. 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 St. 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		

Consultations and Participation Framework

The AIIB's ESP on Indigenous Peoples too emphasizes "a process of free, prior, and informed consultation with the affected tribal People's communities at each stage of the project, and particularly during project preparation, to fully identify their views and ascertain their broad community support for the project. To ensure peoples participation in the planning phase and aiming at promotion of public understanding and fruitful solutions of developmental problems various sections of project affected persons and other stakeholders were and will be engaged in consultations throughout the project planning and implementation stages.

Public participation, consultation and information dissemination begins with initial phases of project preparation. Public consultation activities and information dissemination to PAPs and local authorities continues as the project

preparation activities proceed in a project. Through respective local governments and civil society, PAPs are regularly provided with information on the project and the resettlement process prior to and during the project preparation and implementation stages. Information dissemination and consultations shall be a continuous process during preparation, implementation, Monitoring and Evaluation. The information dissemination and consultation with PAPs shall include but not be limited to the following:

(i) Project description and its likely impacts,

(ii) Objective of the surveys

(iii) entitlement provisions for different impacts.

(iv) Mechanisms and procedures for public participation and consultation

(v) Resettlement options

(vi) Grievance redress mechanisms and procedures

(vii) Tentative implementation schedule

(viii) Role and responsibilities of different actors

(ix) Preferences for mode of compensating for affected fixed assets

(x) Household consultations for skill improvement training, use of compensation amount and livelihood restoration

A detailed consultation and communication procedure placed in Chapter 8 i.e. Public Consultation Framework be used for each sub-project as part of the TPP. The following information shall be included in the TPP:

- Description followed by analysis of the social structure of the population.
- Inventory of the resources and analysis of the sources of income of the population
- Information about the systems of production practiced by tribal peoples
- Relationship of tribal groups to the proposed project
- Examination of land tenure issues including lands under customary rule and assurance of continued use of these resources by the groups involved.
- Strategy for local participation including mechanisms defined with the assistance and in consultation with tribal peoples for their participation in decision making process throughout project planning, implementation and evaluation cycle.
- Summary of Public Consultation process.
- Identification of development interventions or mitigation activities including measures to enhance tribal participation in the activities proposed under the project
- An implementation schedule with benchmarks to assess progress
- Monitoring and evaluation, including specific indicators
- Detailed cost estimates/budget and financing plan and sources of funds for the TPP covering planned activities. Organisation support/ institutional capacity like the government institutions responsible for tribal development
- Maps

Tribal Land Acquisition Process:

Special provisions as applicable to the lands acquisition in Tribal /scheduled areas are enumerated below:

Sl. No.	Aspects	Actions	Special provisions for tribal /Scheduled Areas
1	Preliminary Investigation for determination of	Notification for the commencement of Social Impact assessment study to be made available in local language to concerned	As far as possible, no acquisition of land shall be made in the Scheduled Areas Where such acquisition does take place it

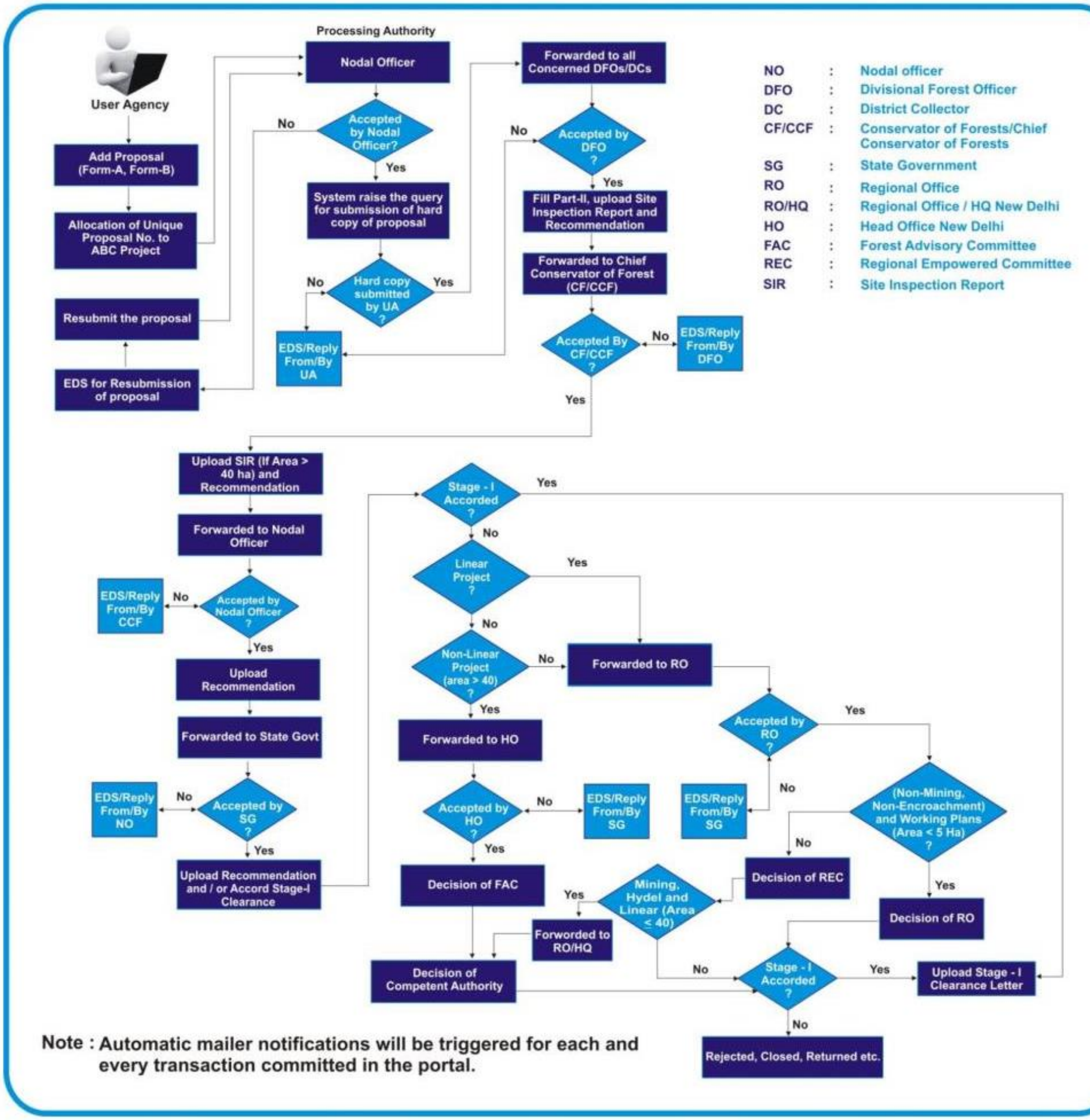
Sl. No.	Aspects	Actions	Special provisions for tribal /Scheduled Areas
	Social Impact and public purpose.	Panchayat/Municipality and to offices of district collector/sub divisional magistrate/tehsil (hereinafter referred to as local bodies)	shall be done only as a demonstrable last resort
		Consultation with the concerned Panchayat, Municipality or Municipal Corporation, as the case may be and carry out a social impact assessment (SIA) study	Land for traditional tribal institutions and burial and cremation grounds taken into consideration while conducting the SIA
		SIA study to be made public in manner specified in the Act	
		Preparation of Social Impact Management Plan (SIMP)	In case of a project involving land acquisition /involuntary displacement of the Scheduled Castes or the Scheduled Tribes families, a Development Plan shall be prepared laying down the details of procedure for settling land rights due but not settled and restoring titles of the scheduled Tribes as well as the Scheduled Castes on the alienated land by undertaking a special drive together with land acquisition The Development Plan shall also contain a programme for development of alternate fuel, fodder and non-timber forest produce resources on non-forest lands within a period of five years sufficient to meet the requirements of tribal communities as well as the Scheduled Castes.
		Public hearing for Social Impact Assessment (when prepared under section-4 of the act)	
2	Appraisal of SIA by expert group	SIA report is evaluated by an independent multi-disciplinary Expert Group, as may be constituted by appropriate Govt.	
		Recommendations of the expert group made available to the local bodies and in the affected areas in local language	
		The appropriate govt. would recommend the such area for acquisition after examining the expert group report (and report from the collector if any)	
3	Publication of preliminary notification	Notification (hereinafter referred to as preliminary notification) to that effect along with details of the land to be acquired in rural and urban areas shall be published (Notification to be issued within 12 months from DoA of SIA)	ln case of acquisition or alienation of any land in the Scheduled Areas, the prior consent of the concerned Gram Sabha or the Panchayats or the autonomous District Councils, at the appropriate level in Scheduled Areas under the Fifth Schedule to the Constitution, as the case may be, shall be obtained. in all cases of land acquisition in such areas, including acquisition in case of urgency, before issue of a notification under this Act, or any other Central Act or a State Act for the time being in force.
		Immediately after issuance of the notification, the concerned Gram Sabhas at the village level, municipalities in case of municipal areas and the Autonomous Councils in case of the areas referred to in the Sixth Schedule to the Constitution, shall be informed of the contents of the notification issued under the said sub-section in all cases of land acquisition at a meeting called especially for this purpose.	
		After issuance of notice, the Collector shall, before the issue of a declaration under section 19, undertake and complete the exercise of updating of land records as prescribed within a period of two months.	

Sl. No.	Aspects	Actions	Special provisions for tribal /Scheduled Areas
		Preliminary survey of land	
		Payment for damage (if any) during survey	
4	Preparation of Rehabilitation and Resettlement Scheme by the Administrator	Upon the publication of the preliminary notification by the Collector, the Administrator for Rehabilitation and Resettlement shall conduct a survey and undertake a census of the affected families	The affected families of the Scheduled Tribes shall be resettled preferably in the same Scheduled Area in a compact block so that they can retain their ethnic, linguistic and cultural identity. The resettlement areas predominantly inhabited by the Scheduled Castes and the Scheduled Tribes shall get land, to such extent as may be decided by the appropriate Government free of cost for community and social gatherings. The affected Scheduled Tribes, other traditional forest dwellers and the Scheduled Castes having fishing rights in a river or pond or dam in the affected area shall be given fishing rights in the reservoir area of the irrigation or hydel projects.
		The Administrator shall, based on the survey and census prepare a draft Rehabilitation and Resettlement Scheme (including time limit)	
		The draft Rehabilitation and Resettlement scheme referred to in sub-section (2) shall be made known locally by wide publicity in the affected area and discussed in the concerned Gram Sabhas or Municipalities	
		A public hearing shall be conducted in such manner as may be prescribed, after giving adequate publicity about the date, time and venue for the public hearing at the affected area:	Provided further that the consultation with the Gram Sabha in Scheduled Areas shall be in accordance with the provisions of the Provisions of the Panchayats (Extension to the Scheduled Areas) Act, 1996.
		The Administrator shall, on completion of public hearing submit the draft Scheme for Rehabilitation and Resettlement along with a specific report on the claims and objections raised in the public hearing to the Collector.	
		The Collector shall review the draft Scheme submitted by the Administrator with the Rehabilitation and Resettlement Committee at the Rehabilitation project level constituted under section 45:	
		The Collector shall submit the draft Rehabilitation and Resettlement Scheme with his suggestions to the Commissioner Rehabilitation and Resettlement for approval of the Scheme.	
		Approved Rehabilitation and Resettlement Scheme to be made public	
		Publication of declaration and summary of Rehabilitation and Resettlement.	
5	Land to be marked out, measured and planned to include marking of specific areas	The Collector shall thereupon cause the land to be marked out and measured, and a plan to be made of the same.	
6	Notice to persons interested and making of statements	The Collector to publish the public notice on his website and cause public notice to be given at convenient places, to stating that the Government intends to take possession of the land, and that claims to compensations and rehabilitation and resettlement for all interests in such land may be made to him	
		The collector may require a statement containing the name of every person possessing any interest in the land and nature of interest for three years preceding the date of statement	

Sl. No.	Aspects	Actions	Special provisions for tribal /Scheduled Areas
7	Enquiry and land acquisition award by Collector	the Collector shall proceed to enquire into the objections (if any) which any person interested has stated	
		The Collector shall make an award within a period of twelve months from the date of publication of the declaration under section 19	
8	Determination of amount of compensation	Determination of market value of the land by the collector	In case of land being acquired from members of the Scheduled Castes or the Scheduled Tribes, at least one-third of the compensation amount due shall be paid to the affected families initially as first instalment and the rest shall be paid after taking over of the possession of the land.
		The market value is multiplied by a factor as described in the first schedule of the Act	
		Determination of value of things attached to land or building	
		Determination of value of things attached to land or building	
9	Rehabilitation and Resettlement Award for affected families	The Collector shall pass Rehabilitation and Resettlement Awards for each affected family in terms of the entitlements provided in the Second Schedule	Where the affected families belonging to the Scheduled Castes and the Scheduled Tribes are relocated outside of the district, then, they shall be paid an additional twenty-five per cent R&R benefits to which they are entitled in monetary terms along with a one-time entitlement of fifty thousand rupees. b) Where the community rights have been settled under the provisions of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, the same shall be quantified in monetary amount and be paid to the individual concerned who has been displaced due to the acquisition of land in proportion with his share in such community rights.
		Provision of infrastructural amenities in resettlement area	All benefits, including the reservation benefits available to the Scheduled Tribes and the Scheduled Castes in the affected areas shall continue in the resettlement area b) Whenever the affected families belonging to the Scheduled Tribes who are residing in the Scheduled Areas referred to in the Fifth Schedule or the tribal areas referred to in the Sixth Schedule to the Constitution are relocated outside those areas, than, all the statutory safeguards. Entitlements and benefits being enjoyed by them under this Act shall be extended to the area to which they are resettled regardless of whether the resettlement area is a Scheduled Area referred to in the said Fifth Schedule or a tribal area referred to in the said Sixth Schedule or not.

Annexure 10: Forest Clearance Process Flow Diagram

Workflow for the Forest Clearance (Stage - I) Process (Form-A, Form-B)



Note : Automatic mailer notifications will be triggered for each and every transaction committed in the portal.

Annexure 11: E&S Due Diligence Checklist for Sub-projects Selection

Subproject Details

Subproject Name:

Block Name:

District Name:

Division/Subdivision:

Total Length of the line: km

Total Area of substation: ha

Construction time:

Subprojects Selection Criterial (Fundamental)

- All subprojects included in the AIIB Environmental and Social Exclusion List should be excluded from the Project;
- The environmental criteria shown in AIIB's ESP will be followed in the selection and development of new subprojects;
- Subprojects located within any sensitive areas like national parks, wildlife sanctuaries and nature reserves, or wetlands will not be selected;
- Clearing of any existing forest resources will be avoided;
- All equipment procured under the investment program shall be free from polychlorinated biphenyl (PCBs);
- Monuments of cultural or historical importance will be avoided;
- All subprojects with high E&S risks and significant E&S impacts should be excluded;
- Potential E&S impacts will be minimized by routing and siting to avoid sensitive areas;
- For any proposed new substations, the land shall be on government land free from informal settlers or shall be on private land to be purchased through negotiated settlement or shall be donated voluntarily without coercion by the beneficiaries;
- Only if there is no alternative land available in the area, which restricts continuation of the system, then involuntary land acquisition will be considered, after consulting AIIB.

Annexure 12: Project Screening Checklist

Sl. No.	Potential Environmental Impacts Will the Project cause	Yes	No	Remarks (If yes, what is the proposed mitigation measures and indicate which Environmental Management Standard will be implemented)
1.	Encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?			
2.	Encroachment on precious ecosystem (e.g. sensitive or protected areas)?			
3.	Alteration of surface water hydrology of waterways crossed by roads and resulting in increased sediment in streams affected by increased soil erosion at the construction site?			
4.	Damage to sensitive coastal/marine habitats by construction of submarine cables?			
5.	Deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?			
6.	Increased local air pollution due to rock crushing, cutting and filling?			
7.	Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?			
8.	Chemical pollution resulting from chemical clearing of vegetation for construction site?			
9.	Noise and vibration due to civil works?			
10.	Dislocation or involuntary resettlement of people?			
11.	Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
12.	Social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?			
13.	Hazardous driving conditions where construction interferes with pre-existing roads?			
14.	Creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?			
15.	Dislocation and compulsory resettlement of people living in right-of-way of the power transmission lines?			
16.	Environmental disturbances associated with the maintenance of lines (e.g. routine control of vegetative height under the lines)?			
17.	Facilitation of access to protected areas in case corridors traverse protected areas?			
18.	Disturbances (e.g. noise and chemical pollutants) if herbicides are used to control vegetative height?			

Sl. No.	Potential Environmental Impacts Will the Project cause	Yes	No	Remarks (If yes, what is the proposed mitigation measures and indicate which Environmental Management Standard will be implemented)
19.	Large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
20.	Social conflicts if workers from other regions or countries are hired?			
21.	Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?			
22.	Risks to community safety associated with maintenance of lines and related facilities?			
23.	Community health hazards due to electromagnetic fields, land subsidence, lowered groundwater table, and salinization?			
24.	Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			
25.	Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., high voltage wires, and transmission towers and lines) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			
26.	Involuntary Resettlement Screening			
27.	Will the activity be undertaken in public land or existing right of way (RoW)?			
28.	If no 1 is yes, are there any non-titled people (squatters) who live at the site or within the public land/RoW?			
29.	Will the activity be undertaken in private land but acquired, then it has been acquired in the anticipation of the program or in the last three years?			
30.	If no 3 is yes, when the private land was acquired, the land acquired legally under GoI law? (unknown = No)			
31.	If no 3 is yes, are there any outstanding complaints about the land acquired?			
32.	Will the activity require new private land acquisition or use?			
33.	If no 6 is yes, the land will be obtained through negotiated settlement or donation?			
34.	If no 6 is yes, will it require compulsory land acquisition?			

Sl. No.	Potential Environmental Impacts Will the Project cause	Yes	No	Remarks (If yes, what is the proposed mitigation measures and indicate which Environmental Management Standard will be implemented)
35.	If no 6 is yes, then will the activity require permanent or temporary relocation or displacement of any people (titled or non-titled)?			
36.	If no 8 is yes, then will there be any loss of housing/accommodation or severely affected households more than 10% of their productive asset?			
37.	In all cases, will there be any loss of vegetable gardens or agriculture?			
38.	In all cases, will there be any losses of crops, fruit trees or private structures?			
39.	In all cases, will any small or informal businesses have to be moved or closed temporarily or permanently?			
40.	In all cases, will there be temporary or permanent loss of employment as a result of the renovation?			

Note:
Project which requires compulsorily land acquisition should not be considered. Only if there is no alternative land available in the area, which restricts continuation of the system, then direct purchase through negotiation following state government act is regarded.
Project which requires compulsorily housing relocation or land acquisition more than 10% of the productive assets from more than 200 persons should not be considered to exclude category A.
Project marked as yes, please see the due diligence checklists and the other attachments as applicable.

Indigenous Peoples Screening

		Yes	No	Not Known	Remarks
1	Are the subproject areas located in scheduled tribe area?				
2	Do the applicants belong to scheduled tribes?				
3	Will the project directly or indirectly affect Indigenous Peoples' traditional socio-cultural and belief practices? (e.g. child-rearing, health, education, arts, and governance)				
4	Will the project affect the livelihood systems of Indigenous Peoples? (e.g., food production system, natural resource management, crafts and trade, employment status)				
5	Commercial development of the cultural resources and knowledge of Indigenous Peoples?				
6	Physical displacement from traditional or customary lands?				
7	Commercial development of natural resources (such as minerals, hydrocarbons, forests, water, hunting or fishing grounds) within customary lands under use that would impact the livelihoods or the cultural, ceremonial, spiritual uses that define the identity and community of Indigenous Peoples?				

Sl. No.	Potential Environmental Impacts Will the Project cause	Yes	No	Remarks (If yes, what is the proposed mitigation measures and indicate which Environmental Management Standard will be implemented)
8	Establishing legal recognition of rights to lands and territories that are traditionally owned or customarily used, occupied or claimed by indigenous peoples?			
9	Acquisition of lands that are traditionally owned or customarily used, occupied or claimed by indigenous peoples?			

Note:
If the projects are located in scheduled tribe area or the applicants are from schedule tribes, then consultation and consent process should be carefully implemented and documented.
If the projects have impacts regarding number 3-9 questions, the subproject will be categorized as B and A and cannot proceed.

Annexure 13: Environmental and Social Monitoring Report Template

Environmental and Social Monitoring Report

Reporting Period {From Month Year to Month Year}
Date {Month Year}

Title of the Project
{Example: IND: Assam Distribution System Enhancement and Loss Reduction Project}

Prepared by Client {replace with the full name} for the Asian Infrastructure Investment Bank

This environmental and social monitoring report is a document of client in accordance with AIIB's Environmental and Social Framework. The views expressed herein do not necessarily represent those of AIIB's Board of Directors, Management, or staff.

Environmental and Social Monitoring Report

{Red text serves as guide for report preparation, please delete when report is finalized.}

TITLE PAGE

TABLE OF CONTENTS

LIST OF ABBREVIATIONS {All abbreviations in the report test should be listed here}

EXECUTIVE SUMMARY

{a summary of the project's status and environmental and social (ES) compliance during the reporting period}

1. Introduction

1.1 Brief Project Description {Include maps showing site location and vicinity if needed}

1.2 Land Acquisition Progress

Name of the Place	Govt Land Required	Govt Land Obtained	Private Land Required	Private Land Acquired
Total				

{A brief description of the status of land acquired, procedure of land acquisition and any major bottleneck}

1.3 Summary of Resettlement & Compensation

Total Land Required	Total Land Acquired	Balance land to be acquired	Total number of PAPs		
			Land sellers	Physically displaced	Commercially displaced

{A brief description of the status of land acquired, number of PAPs involved, number of PAPs already compensated. If a RP has been prepared for the project, please provide progress on the implementation of the RP in section 6}

1.4 Project Progress Status and Implementation Schedule

{Describe the project milestones during the reporting period and highlight any change from original scope, alignment, methodology, and/or schedule.}

{The project Gantt chart may be included}

{Include a simplified table like the sample below}

Project Component • Stage	Commencement Date	Target Date {and Revised Target Date if delayed}	Progress Status {not yet started; ongoing; completed}	Percent Completed	Remarks
Elevated Component	*Example for reporting period Jan-June 2020*				

Project Component • Stage	Commencement Date	Target Date {and Revised Target Date if delayed}	Progress Status {not yet started; ongoing; completed}	Percent Completed	Remarks
• Contract Award • Construction (e.g. civil works, installation of equipment, …) • •	1 Apr 2019	31 Jan 2019 31 Mar 2022 (original target completion was 31 Dec 2021)	Completed On-going	100% 15%	Contract Awarded to XYZ Contractor There was a delay in the delivery of equipment…

2. Compliance with Applicable Regulations/Standards

{Include the applicable ES Regulations/Standards following the sample table below}

Regulations / Standards	Compliance Requirements under the Regulation	Compliance Status {complied; not complied; n/a at current stage of the project}	Remarks {provide details to show how compliance was achieved; or explain the corrective action done if there was non-compliance}
	e.g. clearance/permit/consents etc.		

3. Compliance with Environmental and Social Covenants from the AIIB Loan Agreement

{Include Loan Agreement covenants on environment and social following the sample table below}

Schedule #, Para. #	Covenant	Compliance Status {complied; not complied; n/a at current stage of the project}	Remarks {provide details to show how compliance was achieved; or explain the corrective action done if there was non-compliance}

4. Compliance with the Civil Work Contracts

{Include EHS and Labour Clauses following the sample table below}

Schedule #, Para. #	EHS and Labour Clauses	Compliance Status {complied; not complied; n/a at current stage of the project}	Remarks {provide details to show how compliance was achieved; or explain the corrective action done if there was non-compliance}
	GCC Sub-Clause Health and Safety		

5. Compliance with Environmental and Social Management Plan

{With reference to the ESMP and its cost, include a table with the compliance status during the reporting period, with remarks to show how compliance was achieved or not}

6. Compliance with Resettlement Plan

{With reference to the RP and its budget, include a table with the compliance status during the reporting period, with remarks to show how compliance was achieved or not}

7. Compliance with Gender Action Plan

{With reference to the GAP and its budget, include a table with the compliance status during the reporting period, with remarks to show how compliance was achieved or not}

8. Compliance with Indigenous People[14]'s Plan (If Any)

{With reference to the IPP, include a table with the compliance status during the reporting period, with remarks to show how compliance was achieved or not}

9. Summary of Monitoring Results

9.1 Environmental and Social Monitoring

{With reference to the Environmental and Social Monitoring Plan (ESMoP) (if any) of the project, include a table to summarize the results of the monitoring done during the reporting period, covering all monitoring elements in the ESMoP. Please summarize the inspections of implementation status, the analysis results, to suggest corrective actions in section 12. Please indicate the environmental elements monitoring locations, date, time (or duration as applicable), parameters measured, the standards, tests and limits used, and provide the corrective action plan in section 12 if there was any exceedance to the standards}

9.2 Capacity Building Monitoring

{With reference to the ES instruments of the project, include the trainings/drills conducted during the reporting period following the table below. Include as appendices the training/drill agenda, attendance sheets, and photos}

Trainings/Drills/ Inspections	Number and Position of Participant/s	Location/s and Date/s	Remarks
Example: Fire Drill	50 Laborers	Camp site DD MMM YYYY	Participants safely evacuated the site…
PIU capacity building	3 staff	Guwahati APDCL HO DD MMM YYYY	Monitoring data review

9.3 Health and Safety Monitoring

{If there was any accident, near-miss, illness, or other incidents during the reporting period (or previously reported accident with ongoing rectification), provide the corrective action done following the table below. Include as appendices the work safety checklists, incident reports, and other relevant supporting documents}

[14] In case of India, it should be Scheduled Tribe

Health and Safety	Number and Position of Person/s Involved	Location/s and Date/s of Incident	Description of Incident	Root Cause Analysis	Corrective Action
Fatality					
Non-fatal Injury					
Near-miss					
Illness					
Other Incidents					

9.4 Highlighted Actions

Items	Description
Vulnerable Groups	
Differently Abled	
Climate	
Others	

10. Stakeholder Engagement

{Summarize the stakeholder engagement activities and the results of the consultations conducted during the reporting period; assess if they conform to the Stakeholder Engagement Plan (SEP, if any); update the SEP for next stages if needed}

11. Implementation of Grievance Redress Mechanism and Complaints Received

{Include a description of the GRM, provide a flowchart and list of grievance redress committee members}

{If there was any grievance or complaint during the reporting period (or previously reported complaint with ongoing rectification), provide remarks following the table below}

Complainant/s (Worker or PAP)	Location/s and Date/s of Complaint	Description of Grievance/Complaint	Timeline*	Remarks (Resolution Status)

*As specified in the GRM arrangement of ES instruments

12. Corrective Action Plan

{Based on all the analysis above, prepare a time-bound corrective action plan if there was non-compliance or unanticipated ES impacts, and check the implementation status in the subsequent phase monitoring}

13. Conclusion and Recommendations

{Limit the conclusion to ES highlights or issues resolution during the reporting period, and the recommendations or actions to be done in the next period}

APPENDICES

Photographs {Include photographs of the project site taken during the reporting period. For each photo, provide a caption with description, location and date}

১. কার্য্যকৰী সাৰাংশ

১.১ প্ৰকল্পৰ প্ৰস্তাৰক

এই প্ৰকল্পৰ মূল প্ৰস্তাৱক হ'ল অসম শক্তি বিতৰণ কোম্পানী লিমিটেড, চমুকৈ **এ পি ডি চি এল (Assam Power Distribution Company Limited – APDCL)।** এই কোম্পানী অসম চৰকাৰৰ মালিকানাৰ এক প্ৰতিষ্ঠান। এ পি ডি চি এল-ৰ মূল দ্বায়িত্ব হল অসমৰ ভিতৰত বিদ্যুতৰ বাণিজ্য কৰি সকলো উপভোক্তালৈ বিদ্যুতৰ বিতৰণ তথা যোগান সুনিশ্চিত কৰা। অৱশ্যে বিদ্যুতৰ বিতৰণৰ ক্ষেত্ৰত প্ৰযোজ্য আইনৰ নীতি বা বিনিয়ম অনুসৰি এই প্ৰতিষ্ঠানে কেতিয়াবা ৰাজ্যৰ বাহিৰতো বিদ্যুতৰ যোগান ধৰিব পাৰে।

এই কোম্পানী গঠন কৰাৰ প্ৰধান উদ্দেশ্য আছিল বিদ্যুৎ আইন, ২০০৩ৰXIII অনুচ্ছেদ অনুসৰি অসম ৰাজ্যিক বিদ্যুৎ পৰিষদৰ বিভংগনৰ পাছত এই পৰিষদৰ অধীনস্থ সকলো বিতৰণ প্ৰণালী, সম্পদ, চুক্তি, ঋণ, বাধ্যবাধ্যকতা আদিৰ দায়িত্ব এই নৱগঠিত প্ৰতিষ্ঠানক অৰ্পণ কৰা।

১.২ প্ৰকল্পৰবিৱৰণ

অসম চৰকাৰেঅদূৰ ভৱিষ্যতে শক্তি খণ্ডত বিভিন্ন প্ৰকল্প ৰূপায়ণ কৰি এই ৰাজ্যৰ প্ৰবহন আৰু বিতৰণ আন্তঃগাঁথনিৰ বৃহৎ বিকাশ আৰু উন্নীতকৰণ কৰাৰ পৰিকল্পনা কৰিছে আৰু তাৰ বাবে ভাৰত চৰকাৰৰ সাহায্য / অনুদানৰ উপৰিএছিয়ান ইনফ্ৰাষ্ট্ৰাকছাৰ ইনভেষ্টমেন্ট বেংকৰ (Asian Infrastructure Investment Bank - AIIB) দৰে বহুমুখী বিত্তীয় সংস্থাৰ পৰা সাহায্য / ঋণ আদি লোৱাৰ কথাও চিন্তা কৰিছে। অসমৰ আৰ্থ-সামাজিক, সাংস্কৃতিক আৰুপাৰিৱেশিক সম্পদৰ পূৰ্ণ ব্যৱহাৰেৰে এই ৰাজ্যৰ এনে প্ৰয়োজনীয়তাসমূহ পূৰণ কৰিবলৈ এ পি ডি চি এল দায়বদ্ধ।

অসমৰ বিদ্যুৎ বিতৰণ নেটৱৰ্কৰ সবলীকৰণ কৰি এই ৰাজ্যৰ সকলো গ্ৰাহকক অধিক মানসম্পন্ন, বিশ্বাসযোগ্য আৰু নিৰাপদ বিদ্যুতৰ যোগান ধৰিবলৈ এপি ডি চি এল-য়ে এক অভিলাসী আঁচনিৰূপায়ণ কৰাৰ পৰিকল্পনা কৰিছে আৰু তাৰ নাম দিয়া হৈছে **'আছাম ডিষ্ট্ৰিবিউছন ছিষ্টেম এনহেন্সমেন্ট এণ্ড লছ ৰিডাকছন প্ৰজেক্ট' (Assam Distribution System Enhancement and Loss Reduction Project)**এই প্ৰকল্পটোও সেই বিশাল আঁচনিৰে এক অংশ। এই প্ৰকল্পৰ অধীনত দুৰ্গম অঞ্চলত অৱস্থিত বসতিসমূহতোবিদ্যুৎ সংযোগ দিয়াৰ সুবিধা সৃষ্টি কৰা হ'ব, বিতৰণ পদ্ধতিৰ সামৰ্থ্য আৰু বিশ্বাসযোগ্যতা বৃদ্ধি কৰা হ'ব, বিতৰণ ভল্টেজউন্নীত কৰা হ'ব, বিদ্যুত-ক্ষতি কমোৱা হ'ব আৰু শেষপৰ্য্যন্ত সকলো শ্ৰেণীৰ বিদ্যুৎ উপভোক্তাক তেওঁলোকে আশা কৰাতকৈও অধিক সন্তুষ্ট কৰি তোলা হ'ব। ইয়াৰ জৰিয়তে ৰাজ্যখনৰ বিকাশৰ হাৰ বৃদ্ধি

হ'ব আৰুৰাজ্যখন সমৃদ্ধিশালী হৈ উঠিব। বিদ্যুৎ বিতৰণ পদ্ধতিৰএনে সবলীকৰণ ৩৩ কেভি আৰু তাৰ কম পর্য্যায়ৰ ভল্টেজ নেটৱর্কত কৰিবলৈ লোৱা হৈছে।তাৰ বাবে নিম্নোক্ত কামবোৰ কৰা হ'বঃ

(ক) গুৰুত্বপূর্ণ ল'ড চেন্টাৰত (Load Centre) ১৯৬ টা ৩৩/১১ কেভি বৈদ্যুতিক উপকেন্দ্র স্থাপন কৰা হ'ব। এই কাম দুটা পর্য্যায়ত কৰা হ'ব।

(খ) নতুন ৩৩ কেভি আৰু ১১ কেভি অভাৰহেড (Overhead) লাইন টনা হ'ব।

(গ) বিতৰণ ক্ষতি কমাবলৈ আৰু বিশ্বাসযোগ্যতা বঢ়াবলৈ নির্বাচিত স্থানসমূহত ১,১০০ টা 'উচ্চ ভল্টেজ বিতৰণ প্রণালী' (High Voltage Distribution System - HVDS) স্থাপন কৰা হ'ব।

১.৩ পৰিৱেশ আইন

ৰাষ্ট্রীয় আইনঃ কেন্দ্রীয় পৰিবেশ, বন আৰু জলবায়ু পৰিবর্তন মন্ত্র্যালয়ৰ (Ministry of Environment, Forest and Climate Change - MoEF&CC) ২০০৬ চনৰ'পাৰিৱেশিক প্রভাৱ মূল্যায়ণ' (Environmental Impact Assessment - EIA) জাননী আৰু তাৰ পৰৱর্তী সংশোধনীসমূহৰ মতে বৈদ্যুতিক উপকেন্দ্র স্থাপনকে ধৰি শক্তি প্রবহন প্রকল্পসমূহ আগতীয়া পাৰিৱেশিক অনুমতি লবলগীয়া প্রকল্পসমূহৰ সূচীত অন্তর্ভুক্ত নহয়। গতিকে ৰাষ্ট্রীয় বিনিয়ম অনুসৰি এই প্রকল্পৰ বাবে কোনো 'পাৰিৱেশিক প্রভাৱ মূল্যাংকণ' (Environmental Impact Assessment - EIA) প্রতিবেদন প্রস্তুত কৰাৰ প্রয়োজন নাই আৰু আগতীয়া পাৰিৱেশিক অনুমতি ল'বও নালাগে। অৱশ্যে যদি উপকেন্দ্র নির্মাণ আৰু বিতৰণ লাইনৰ বাবে বনভূমি ব্যৱহাৰ কৰিবলগীয়া হয়, তেন্তে বন বিভাগৰঅনুমতিৰ প্রয়োজন হ'ব। কিন্তু প্রথম পর্য্যায়ত নির্মাণ কৰিবলৈ লোৱা ১১৩ টা উপকেন্দ্রৰ বাবে প্রস্তাৱিত স্থানসমূহ (এটা বাদ দি) বন বিভাগৰ সংৰক্ষিত এলেকাত (ৰাষ্ট্রীয় উদ্যান, বন্যপ্রাণী অভয়াৰণ্য আদি) নপৰে। কেৱল চন্দ্রপুৰ উপকেন্দ্রটোৰ প্রস্তাৱিত স্থান আমচাং বন্যপ্রাণী অভয়াৰণ্যৰ 'ইক'লজিকেল ছেনছিটিভ জ'ন'ত (Ecological Sensitive Zone - ESZ) অৱস্থিত। গতিকে 'ইক'লজিকেল ছেনছিটিভ জ'ন'ত (Ecological Sensitive Zone - ESZ) ৰ জাননী F.No. 6-60/2020WL Part (I) Dated. 16.07.2020 অনুসৰি তাৰ বাবে আমচাং বন্যপ্রাণী অভয়াৰণ্য আৰু পবিতৰা অভয়াৰণৰ বাবে 'ই এছ জেড মণিটৰিং কমিটি'ৰ (ESZ Monitoring Committee) আপত্তিহীনতাৰ প্রমাণপত্রৰ (No Objection Certificate – NOC) প্রয়োজন নহ'ব। কাৰণ প্রচলিত আইন অনুসৰিএনে অঞ্চলৰ মাজত 'বৈদ্যুতিক আৰু যোগাযোগ টাৱাৰ নির্মাণ, আন আন্তঃগাঁথনি স্থাপন, কেবল (Cable) টনা আদি কাম নিয়ন্ত্রিত কর্মসূচীৰ অন্তর্গত। এই প্রসংগত যাৱতীয় বিধিবদ্ধ অনুমোদন অবিহনে কোনো নির্মাণ কার্য আৰম্ভ কৰিব নোৱাৰিব।

এ আই আই বি-ৰ (AIIB) নীতিঃ এ আই আই বি হ'ল এছিয়া মহাদেশৰ বিভিন্ন দেশৰ আন্তঃগাঁথনিসমূহৰ বিকাশ কৰিবলৈ আৰু দেশসমূহৰ মাজৰ আন্তঃসংযোগ বৃদ্ধি কৰিবলৈ বহুমুখী বিত্তীয় সাহায্য আগবঢ়োৱা আৰুলগতে বিনিয়োগ বঢ়োৱা এক বিত্তীয়

সংস্থা। এ আই আই বি-য়ে বিশ্বাস কৰে যে এছিয়াৰ দেশসমূহৰ আন্তঃগাঁথনিৰ উন্নয়ণ আৰু ইয়াৰ বিভিন্ন দেশসমূহৰ মাজত আন্তঃসংযোগ স্থাপনৰ লক্ষ্যত উপনীত হোৱাৰ ক্ষেত্ৰত পাৰিৱেশিক আৰু সামাজিক (Environmental and Social – E&S) বহনক্ষমতাৰক্ষা কৰাটো এক প্ৰাথমিক চৰ্ত আৰু গুৰুত্বপূৰ্ণ প্ৰয়োজনীয়তা। এ আই আই বি-ৰপাৰিৱেশিক আৰু সামাজিক নীতিৰ (Environmental and Social Policy - ESP) উদ্দেশ্য হ'ল প্ৰকল্পসমূহৰ লগত সঠিক পাৰিৱেশিক আৰু সামাজিক ব্যৱস্থাপনা সমন্বিত কৰা আৰু তেনে পদ্ধতিৰ জৰিয়তেহে সেই বিকাশৰ লক্ষ্যত উপনীত হোৱাত সহায় কৰা।

এ আই আই বি-ৰপাৰিৱেশিক আৰু সামাজিক নীতিয়ে (ESP) প্ৰতিটো প্ৰকল্পৰ বাবে পাৰিৱেশিক আৰু সামাজিক (E&S)প্ৰয়োজনীয়তা বাধ্যতামূলক কৰিছে। এনে পাৰিৱেশিক আৰু সামাজিক মানদণ্ডসমূহৰ (Environmental and Social Standard – ESS) ভিতৰত আছে,

- ESS 1: পাৰিৱেশিক আৰু সামাজিক মূল্যাংকণ আৰু ব্যৱস্থাপনা;
- ESS 2: অনিচ্ছাপূৰ্বক পুনৰ্বাসন ৰোধ; আৰু
- ESS 3: স্বদেশী বা স্থানীয় লোকৰ সুৰক্ষা;

১.৪ সামাজিক আইন

এই প্ৰকল্পৰ অধীনৰ বৈদ্যুতিক উপকেন্দ্ৰ আৰু বিতৰণ লাইনসমূহ এনেদৰে ডিজাইন আৰু নিৰ্মাণ কৰা হ'ব, যাতে তাৰ নেতিবাচক সামাজিক প্ৰভাৱ নিম্নতম হয়। সামাজিক প্ৰভাৱ পেলাব পৰা বিষয়সমূহৰভিতৰত আছে - স্থায়ী/অস্থায়ী ভূমি অধিগ্ৰহণ, কৃষিখণ্ডত আৰু/বা জীৱিকানিৰ্বাহ পদ্ধতিত বিৰূপ প্ৰভাৱ, নিৰ্মাণৰ লগত সম্পৰ্কিত ব্যাঘাত আৰুসংকট (লিংগ-ভিত্তিক হিংসাকো ধৰি)। যদি কিছুমান ক্ষেত্ৰত স্থায়ী বা অস্থায়ীভাবে ভূমি অধিগ্ৰহণ কৰাৰ প্ৰয়োজন হয়, তেন্তে সেই কাম জিলা ৰাজহ বিষয়াৰ উপস্থিতিত মাটিৰ গৰাকীৰ লগত আলোচনা তথা বুজাবুজিৰে হ'ব লাগিব। এই ক্ষেত্ৰত 'ৰাইট টু ফেয়াৰ কমপেনছেছন এণ্ড ট্ৰেন্সপাৰেন্সী ইন লেণ্ড একুইজিছন, ৰিহেবিলেছন এণ্ড ৰিছেটলমেন্ট এক্ট, ২০১৩', 'নেছনেল ৰিছেটলমেন্ট এণ্ড ৰিহেবিলিটেছন পলিচী, ২০০৭ (এন আৰ আৰ পি)' আদি বিভিন্ন ৰাষ্ট্ৰীয় আইন, 'ইণ্ডিয়ান টেলিগ্ৰাফ এক্ট, ১৮৮৫'ৰসম্পৰ্কিত অনুচ্ছেদৰসৈতে সংগতি থকা 'বিদ্যুৎ আইন, ২০০৩'ৰ ব্যৱস্থাসমূহ' আৰু এ আই আই বি-ৰপাৰিৱেশিক আৰু সামাজিক নীতিসমূহ মানি চলিব লাগিব।

১.৫ প্ৰকল্পৰ শ্ৰেণীবদ্ধকৰণ আৰু পাৰিৱেশিক আৰু সামাজিক (E&S)সাধন

এ আই আই বি-ৰপাৰিৱেশিক আৰু সামাজিক নীতি(ESP) অনুসৰি এই প্ৰকল্পটোক 'বি' বিভাগত (Category B) অন্তৰ্ভুক্ত কৰা হৈছে। কাৰণ এই প্ৰকল্পটোৰে সীমিত পৰিমাণৰ হ'লেও নেতিবাচক পাৰিৱেশিক আৰু সামাজিক (E&S)প্ৰভাৱ পেলোৱাৰ সম্ভাৱনা আছে। অৱশ্যে এনে নেতিবাচক প্ৰভাৱ কোনো নতুন প্ৰকাৰৰপ্ৰভাৱ নহয়। ইয়াৰে কিছুমান প্ৰভাৱ অপৰিবৰ্তনীয় আৰু ক্ৰমে বাঢ়িহে গৈ থকাৰ আশংকা

আছে। কিন্তু সেইবোৰো কেৱল প্ৰকল্পৰ ভিতৰতে সীমাবদ্ধ থাকিব আৰু প্ৰকল্পটো কার্য্যক্ষম হোবাৰ পাছত কিছু কার্য্যকৰীব্যৱস্থা ল'লে এই প্ৰভাৱসমূহ সফলভাবে প্ৰতিৰোধ কৰিব পৰা যাব। আনহাতে 'কেটেগৰী-বি'ত পৰাৰ বাবে সৃষ্টি হ'ব পৰা সমস্যাসমূহৰ উপৰি এখন পৰিৱেশ সংবেদী ৰাজ্য হিচাপে অসমত আন কিছুমান সমস্যাও সৃষ্টি হ'ব পাৰে আৰু সেইবোৰ দূৰ কৰাটোও গুৰুত্বপূর্ণ। গতিকে এ পি ডি চি এল-য়ে প্ৰকল্পৰৰূপায়ণৰ সময়ত নির্দেশক নীতি হিচাপে ব্যবহাৰ কৰিব পৰাএক 'পাৰিৱেশিক আৰু সামাজিক ব্যৱস্থাপনা পৰিকল্পনাকাঠামো' (Environmental and Social Management Planning Framework – ESMPF) বিকাশ কৰাৰবিশেষ প্ৰয়োজন আছে। তাৰ বাবে এ পি ডি চি এল-য়ে উপ-প্ৰকল্পৰ লগত সম্পর্কিত 'পাৰিৱেশিক আৰু সামাজিক প্ৰভাৱ মূল্যাংকণ' (Environment and Social Impact Analysis – ESIA)প্ৰস্তুত কৰিব লাগিব আৰু প্ৰকল্পৰ কামৰ বাবে কোনো ঠিকাদাৰী প্ৰতিষ্ঠানক নিয়োগ কৰাৰ আগতেই সেই মূল্যাংকণ এ আই আই বি-ৰ দ্বাৰা অনুমোদন কৰাব লাগিব। প্ৰকল্পটোৰ পৰা হ'ব পৰা নেতিবাচক প্ৰভাবসমূহ প্ৰশমিত কৰিবলৈ আৰু প্ৰকল্পৰ সংবহনীয়তা বৃদ্ধি কৰিবলৈ এ পি ডি চি এল-য়ে'পাৰিৱেশিক আৰুসামাজিক ব্যৱস্থাপনা পৰিকল্পনা' (Environmental and Social Management Plan–ESMP), 'সংক্ষিপ্তকাল/স্থায়ী পুনর্বাসন পৰিকল্পনা' (Abbreviated/Resettlement Plan – A/RPs) আৰু'জনজাতি লোক পৰিকল্পনা' (Tribal People Plans–TTPs) (যদিহে থাকে) আদি আগতীয়াকৈ ৰূপায়ণ কৰিব লাগিব।

ESMPF প্ৰতিবেদনত অঞ্চলটোৰ ভৌগোলিক, পাৰিৱেশিক, অর্থনৈতিক আৰু সামাজিক বৈশিষ্ট্য সম্পর্কীয় আধাৰবা মূল তথ্যসমূহ সন্নিবিষ্ট হৈ আছে। লগতে আছে ইতিমধ্যেই চিনাক্ত হোৱা আৰু সম্ভাব্য বুলি পৰিগণিত হোৱা পাৰিৱেশিক আৰু সামাজিক প্ৰভাৱ আৰু তাৰ প্ৰতিৰোধমূলক ব্যৱস্থা। নাতিদূৰত আগতেই স্থাপন কৰা উপকেন্দ্ৰৰ পৰিৱেশ-পৰিস্থিতি অধ্যয়ন কৰি পাৰিৱেশিক আৰু সামাজিক বিপদসমূহ দূৰ কৰাৰ উপায় উলিয়াবলৈ চেষ্টা কৰাহৈছে। ESMPF প্ৰস্তুত কৰোতে তাৰ মূল আধাৰহিচাপে লোৱা হৈছে - স্পষ্ট পদাংকযুক্ত উপ-প্ৰকল্পৰ নমুনা (Sample)। তাৰপৰাপ্ৰস্তুত কৰা হৈছে - আধাৰ ESIA, সাধাৰণ (Generic) ESMP আৰুৰূপায়ন কৰিব পৰাবিধৰ এক RPF।আনহাতে পৰৱর্তীপাৰিৱেশিক আৰু সামাজিক প্ৰভাৱ মূল্যাংকণৰ বাবেও ই এক সঠিক নির্দেশনা দিব পাৰিব। TPP (যদিহে প্ৰয়োজন হয়) প্ৰস্তুত কৰা আৰু সেইমতে কাম কৰাৰপথনির্দেশনাৰ বাবে এক 'জনজাতি লোক বিকাশ পদাংক'ও (Tribal People Development Framework - TPDF)তৈয়াৰ কৰাহৈছে। এ আই আই বি-ৰ নিয়ম অনুসৰি এ পি ডি চি এল-য়ে প্ৰকল্প ৰূপায়নৰ সময়ত ঠিকাদাৰী প্ৰতিষ্ঠানক নিয়োগ কৰাৰ আগতেই সকলো অ-মূল্যাংকিত উপ-প্ৰকল্পৰপাৰিৱেশিক আৰু সামাজিক মূল্যাংকন কৰিব লাগিব আৰু এয়া ESMPF ৰ লগত সংগতি ৰাখি কৰিব লাগিব। সম্ভাব্য পাৰিৱেশিক আৰু সামাজিক বিপদসমূহ এৰাই চলিবলৈ এ পি ডি চি এলে-ইয়ে এ আই আই বি-ৰ লগত আলোচনা কৰি প্ৰকল্পৰ স্থানসমূহ সাৱধানেৰে নির্বাচন কৰিব, যাতে সামাজিক, সাংস্কৃতিক আৰু প্ৰত্নতাত্বিকভাবে সংবেদী অঞ্চলসমূহ (যেনে – উদ্যান, শ্মশান, ধর্মীয়

উপাসনাস্থলী, কীর্তিস্তম্ভ আদি) অধিগ্রহণ নকৰিলেও হয়। লগতে প্রকল্পৰ প্রস্তাৱিত স্থানসমূহ যাতে কোনো ৰাষ্ট্রীয় উদ্যান, বন্যপ্রাণী অভয়াৰণ্য, জীৱমণ্ডল সংৰক্ষিত অঞ্চল বা জীৱবৈচিত্র্য 'হটস্পট'ত নপৰে তাৰ প্রতিও চকু ৰখা হ'ব। উল্লেখিত অঞ্চলসমূহত যদি কোনো কাম-কাজ চলোৱাৰ প্রস্তাৱ ৰখা হৈছিলেও, তেতিয়াও পা�ৰিৱেশিক আৰু সামাজিক নিৰীক্ষণ আৰু প্রকল্পৰ শ্রেণীবিভাগসম্পর্কীয় নির্দেশনাৰ জৰিয়তে সেই কাম প্রকল্পৰআওতাৰ পৰা আঁতৰাই ৰখা হ'ব।

১.৬ অসমৰসামগ্রিক ৰেখাচিত্র

অসমক প্রধানকৈ তিনিটা ভৌগোলিক অঞ্চলত বিভক্ত কৰা হৈছে – নামনি অসম, মধ্য অসম আৰু উজনি অসম। প্রধান উপপ্রকল্পৰ স্থানসমূহ এই তিনিটা অঞ্চলৰ৩৩ খন জিলাত / ১৯ টা বৈদ্যুতিক চক্রত জিলাত অৱস্থিত। অসমৰ জলবায়ু হ'ল সেমেকা 'ক্রান্তীয় মৌচুমী বর্ষাৰণ্য জলবায়ু' আৰু অসমত যথেষ্ট বৰষুণ হয়। উত্তৰ পূৱ ভাৰততে এক জীৱবৈচিত্র্যৰ অঞ্চল হিচাপে অসমৰ বিশেষ স্থান আছে। বিচিত্র ধৰণৰ উদ্ভিদৰ ক্ষেত্রত অসম ইমানেই চহকী যে ইয়াক উত্তৰ পূৱৰ 'জীৱবৈজ্ঞানিক দ্বাৰ' আৰু 'ফুলগছৰ দোলা' বুলি অভিহিত কৰা হয়।

২০১৭ চনৰ নবেম্বৰৰ পৰা ২০১৮ চনৰ ফেব্রুৱাৰিলৈকে – এই সময়চোৱাৰ ভিতৰত উপলব্ধ 'ইণ্ডিয়ান ৰিম'ট ছেন্সিং' (Indian Remote Sensing – IRS) ৰিছর্ছেট–২ 'লিনিয়েৰ ইমেজিং ছেলফ-স্কেনাৰ–III'ৰ (Linear Imaging Self-Scanner–III) উপগ্রহীয় তথ্যৰ ওপৰত ভিত্তি কৰি প্রস্তুত কৰা এক পৰিসংখ্যামতে অসমৰ বনাঞ্চলৰ মুঠ ক্ষেত্রফল হ'ল – ২৮,৩২৬.৫১ বর্গ কিলোমিটাৰ। এয়া হ'ল ৰাজ্যখনৰ মুঠ মাটিকালিৰ ৩৬.১১%। 'বনাঞ্চল ছত্র ঘনত্ব' (Forest Canopy Density) শ্রেণী অনুসৰি এই ৰাজ্যৰ ২,৭৯৪.৮৬ বর্গ কিলোমিটাৰ অঞ্চল 'অতিশয় ঘন বনাঞ্চল' (Very Dense Forest – VDF), ১০,২৭৮.৯১ বর্গ কিলোমিটাৰ অঞ্চল 'মধ্যমীয়া ঘন বনাঞ্চল' (Moderately Dense Forest – MDF) আৰু ১৫,২৫২.৭৪ বর্গ কিলোমিটাৰ 'মুক্ত বনাঞ্চল' (Open Forest – OF)। ২০১৭ চনৰ 'ইণ্ডিয়া ষ্টেট অব ফৰেষ্ট ৰিপর্ট'ত (ISFR) উল্লেখিত আগৰ পৰিমাণৰ তুলনাত অসমৰ বনাঞ্চল ২২১.৫১ বর্গ কিলোমিটাৰ বৃদ্ধি পাইছে।

অসমত সংৰক্ষিত বনাঞ্চলৰ সংখ্যা ২৫। ইয়াৰ ভিতৰত আছে ৫ খন ৰাষ্ট্রীয় উদ্যান আৰু ২০ খন বন্যপ্রাণী অভয়াৰণ্য (প্রস্তাৱিত ২ খন বন্যপ্রাণী অভয়াৰণ্যক ধৰি)। এই অঞ্চলসমূহে বহুতো বিলুপ্তপ্রায় আৰু বিৰল জীৱ প্রজাতিক সুৰক্ষা দি আহিছে। অসমত পাঁচখন 'হস্তী সংৰক্ষিত অঞ্চল' আছে (শোণিতপুৰ, দিহিং-পাটকাই, কাজিৰঙা-কার্বি আংলং, ধনশিৰি-লুংডিং আৰু চিৰাং-ৰিপু)। আঠটা 'হস্তী-কৰিডৰে' এই স্থানসমূহ সংযুক্ত কৰিৰাখিছে। অসমত দুখন 'জীৱমণ্ডল সংৰক্ষিত অঞ্চল' আৰু দুখন 'বিশ্ব ঐতিহ্য ক্ষেত্র' আছে আৰু এইবোৰে অসমৰ বর্তমানৰ জীৱবৈচিত্র্যৰ সংৰক্ষণত গুৰুত্বপূর্ণ ভূমিকা পালন কৰি আছে। এইবোৰ সংৰক্ষিত অঞ্চলত কোনো উপপ্রকল্প স্থাপন কৰা নহ'ব।

অসম মূলতঃ এখন গ্রামভিত্তিক ৰাজ্য। এই ৰাজ্যৰ প্রায় ৮৬% লোক গাঁও অঞ্চলত বাস কৰে। এই অঞ্চলসমূহৰ অর্থ-সামাজিক পর্য্যায় নগৰ অঞ্চল আৰুৰাষ্ট্রীয় গড় পর্য্যায়তকৈ নিম্ন। গ্রাম্য অঞ্চলৰ দৰিদ্রতা, নগৰ অঞ্চলৰ দৰিদ্রতাৰ প্রায় দুগুণ। অসমৰ দৰিদ্রতাৰ হাৰ তুলনামূলকভাবে যে বেছি, তাত অসমৰ জনসংখ্যা বৃদ্ধিৰো বিশেষ অৱদান আছে।

ভাৰতৰ ২০১১ চনৰপিয়ল অনুসৰি অসম ৰাজ্যৰ মাটিকালি ৭৮,৪৩৮ বর্গ কিলোমিটাৰ আৰু এই মান ভাৰতৰ মুঠ ভৌগোলিক অঞ্চলৰ ২.৩৯%। পাছে ইয়াৰ জনসংখ্যা হ'ল ৩.১২ কোটি আৰু এই মান ভাৰতৰ মুঠ জনসংখ্যাৰ ২.৫৮%। অসমৰ গড় মাটি-মানুহ অনুপাত প্রতি বর্গ কিলোমিটাৰত ৩৯৮ জন। ২০০১-২০১১ দশকটোত অসমৰ জনসংখ্যাৰ বৃদ্ধিৰ মান হ'ল – ১৭.০৭%। ২০১১ ৰ লোকপিয়ল অনুসৰি অসমৰ সাক্ষৰতাৰ হাৰ ৭২.১৯%। তাৰ ভিতৰত পুৰুষৰ সাক্ষৰতাৰ হাৰ ৭৭.৮৫% আৰু মহিলাৰ সাক্ষৰতাৰ হাৰ ৬৬.২৭%। পুৰুষ-মহিলাৰ মাজত সাক্ষৰতাৰ পার্থক্য ১১.৮৫%। অসমৰ মুঠ জনসংখ্যাৰ ৭.১৫% হ'ল অনুসূচীত জাতি আৰু পাহাৰীয়া জনজাতিৰ পৰিমাণ হ'ল ১২.৪৫%।

১.৭ পাৰিৱেশিক আৰু সামাজিক প্রভাৱ

ধাৰণা কৰামতে এই প্রকল্পটোৱে ওচৰপাজৰৰপাৰিৱেশিক আৰু সামাজিক অৱস্থাত বিশেষ নেতিবাচক পৰিবর্তন সাধন নকৰে, কিন্তু এই অঞ্চলৰ বৃহৎ অর্থনৈতিক বিকাশত ই উল্লেখনীয় বৰঙণি যোগাব। সম্ভাৱ্য নেতিবাচক পাৰিৱেশিক আৰু সামাজিক প্রভাৱ আৰু তাৰ প্রতিৰোধমূলক ব্যৱস্থাসমূহৰ বিষয়ে সাধাৰণ (Generic) ESMP ত বিশদভাবে কোৱা হৈছে। প্রকল্পৰ জীৱনচক্রতে সেইব্যৱস্থাসমূহ ৰূপায়ণ কৰা হ'ব। যিহেতু ESMP ৰ বহুতো ব্যৱস্থাঠিকাদাৰসকলেই ৰূপায়ণ কৰিব লাগিব, সেইবাবে ইয়াৰৰূপায়ণ আৰুনিৰীক্ষণ সুনিশ্চিত কৰিবলৈ ESMP,নিবিদাখনৰ এক অংশ হ'ব। প্রস্তাৱিত উপ-প্রকল্পৰ স্থান পৰিদর্শন আৰুESMPবিকাশ কৰিবলৈ কেনে ব্যৱস্থাৰ প্রয়োজন হ'ব পাৰে সেই সম্পর্কত তথ্য সংগ্রহৰ পাছত ধাৰণা কৰা বিষয়সমূহ আৰুলগতে বিভিন্ন পর্য্যায়ত আহিব পৰা সম্ভাৱ্য বিপদ বা প্রভাৱসমূহ তলত উল্লেখ কৰা হ'ল।

(ক) ভৌতিক পৰিবেশত প্রভাৱঃ প্রস্তাৱিত উপ-প্রকল্পসমূহত গাঁথনি নির্মাণৰ বাবে মাটি খান্দিবলগীয়া হ'ব, প্রকল্পৰ নির্মাণ আৰু কর্মসম্পাদনৰ সময়ত যথেষ্ট পানীৰ প্রয়োজন হ'ব আৰু 'স্পেয়াৰ পার্টছ'/সা-সঁজুলিসমূহ ৰাখিবৰবাবে স্থানৰ প্রয়োজন হ'ব। এই কামসমূহৰ বাবে উপকেন্দ্রসমূহ স্থাপন কৰাৰ ঠাইত ভূ-প্রকৃতিৰ স্থায়ী পৰিবর্তন হ'ব।

(খ) কাষৰীয়া পৰিবেশত প্রভাৱঃ বেছিভাগ উপ-প্রকল্পই নির্জন / খালী স্থানত স্থাপন কৰা হ'ব আৰু তাত গছ-গছনি খুব কমেই থাকিব। তথাপি যদি কিছু গছ ওচৰেপাজৰে থাকে, সেইবোৰযিমান পাৰি সংৰক্ষণ কৰিবলৈ চেষ্টা কৰা হ'ব, যিহেতু তেনে সংৰক্ষণ সেই অঞ্চলৰ পৰিৱেশ সুৰক্ষাৰ বাবে খুবেই জৰুৰী। এৰাব নোৱৰা

পৰিস্থিতিৰ বাহিৰে সেইবোৰ কটা বা ধ্বংস কৰা উচিত নহয়, কাৰণ সেইবোৰে ধূলি সৃষ্টিতো বাধা দিয়ে। এই ক্ষেত্ৰত ল'বলগীয়া কৰ্মপদ্ধতি হ'ল যে মাটিৰ ওপৰত যিবোৰ উদ্ভিদ আছে, সেইবোৰৰ ওপৰত নিৰ্মাণ-কাৰ্য্যৰ প্ৰভাৱ নিম্নতম হ'ব লাগিব। কোনো প্ৰকল্পৰ স্থান বন্যপ্ৰাণী অভয়াৰণ্যত হ'ব নোৱাৰিব। যি ক্ষেত্ৰত উপ-প্ৰকল্পৰ স্থান বনভূমিত হয় বা গছ কটাৰ প্ৰয়োজন হয়, সেই ক্ষেত্ৰতহে বন বিভাগৰ অনুমতিৰ প্ৰয়োজন হ'ব। বনভূমিৰ ব্যৱহাৰ যিমান পাৰি কম হ'ব লাগিব। যদি সেয়া সম্ভৱ নহয়, তেন্তে এ পি ডি চি এল-য়ে এ আই আই বি-ৰ লগত সেই নিৰ্বাচন সম্পৰ্কত আলোচনা কৰিব আৰু প্ৰকল্পৰ কামৰ বাবে কৰ্মাদেশ দিয়াৰ আগতেই প্ৰয়োজনীয় অনুমতি যোগাৰ কৰিব লাগিব।

প্ৰস্তাৱিত উপ-প্ৰকল্পবোৰ সম্পূৰ্ণভাবেসীমাবদ্ধ এক স্থিতি বা চৌহদ হ'ব লাগিব। চৌপাশে শক্তিশালী বেৰা থাকিব আৰু সেই স্থানৰ ভিতৰত প্ৰৱেশ আৰু যাতায়ত নিয়ন্ত্ৰিত হ'ব। প্ৰকল্পটো স্থাপন কৰাৰ বাবে জীৱ-জন্তুবোৰৰ ওপৰত যাতে কোনো ধৰণৰ নেতিবাচক প্ৰভাৱ নপৰে, তাৰ প্ৰতিও দৃষ্টি ৰাখিব লাগিব। ESIA অধ্যয়নত এই কথা স্পষ্ট হ'ব লাগিব যে প্ৰস্তাৱিত স্থান যাতে বন্যপ্ৰাণীৰ আবাসস্থলী, কৰিডৰ, অহা-যোৱা কৰা অঞ্চল আদিৰ ভিতৰত নপৰে। গতিক এনে অধ্যয়নে চৌপাশৰ বন্যপ্ৰাণীৰ প্ৰসংগটোও সামৰি ল'ব লাগিব আৰু প্ৰকল্পটোৰ অগ্ৰগতিৰ বিভিন্ন পৰ্য্যায়ত মানুহ-বন্যপ্ৰাণীৰ সংঘাত, বন্যপ্ৰাণী চিকাৰ আদি যাতে নহয়, সেই সম্পৰ্কতো পৰ্য্যাপ্ত আৰু কাৰ্য্যকৰী প্ৰতিৰোধমূলক ব্যৱস্থাৰ পৰামৰ্শ দিব লাগিব।

(ঘ) আৰ্থ-সামাজিক পৰিৱেশত প্ৰভাৱঃ নিৰ্মাণ কৰিবলৈ লোৱা বৈদ্যুতিক উপকেন্দ্ৰ আৰু বিতৰণ লাইনসমূহৰ আৰ্হি প্ৰস্তুত কৰোতে এই কথাত গুৰুত্ব দিয়া হ'ব যাতে নেতিবাচক সামাজিক প্ৰভাৱ নিম্নতম হয়। এনে ধৰণৰ সামাজিক প্ৰভাৱৰ ভিতৰত পৰিব – স্থায়ী/অস্থায়ী ভূমি অধিগ্ৰহণ, কৃষিখণ্ডত আৰু/বা জীৱিকানিৰ্বাহ পদ্ধতিত বিৰূপ প্ৰভাৱ, নিৰ্মাণৰ লগত সম্পৰ্কিত ব্যাঘাত আৰু সংকট (লিংগ-ভিত্তিক হিংসাকো ধৰি) আদি। যদি কিছুমান ক্ষেত্ৰত স্থায়ী বা অস্থায়ীভাবে ভূমি অধিগ্ৰহণ কৰাৰ প্ৰয়োজন হয়, তেন্তে সেই কাম RPF (Resettlement Plan Framework) ত উল্লেখ থকা নিৰ্দেশনা অনুসৰিজিলা ৰাজহ বিষয়াৰ উপস্থিতিত মাটিৰ গৰাকীৰ লগত আলোচনা তথা বুজাবুজিৰে হ'ব লাগিব। এই ক্ষেত্ৰত 'ৰাইট টু ফেয়াৰ কমপেনছেছন এণ্ড ট্ৰেন্সপাৰেন্সী ইন লেণ্ড একুইজিছন, ৰিহেবিলেছন এণ্ড ৰিছেটলমেন্ট এক্ট, ২০১৩', 'নেছনেল ৰিছেটলমেন্ট এণ্ড ৰিহেবিলিটেছন পলিচী, ২০০৭ (এন আৰ আৰ পি)' আদি বিভিন্ন ৰাষ্ট্ৰীয় আইন, 'ইণ্ডিয়ান টেলিগ্ৰাফ এক্ট, ১৮৮৫'ৰ সম্পৰ্কিত অনুচ্ছেদৰ সৈতে সংগতি থকা 'বিদ্যুৎ আইন, ২০০৩'ৰ ব্যৱস্থাসমূহ' আৰু এ আই আই বি-ৰৰপাৰিৱেশিক আৰু সামাজিক নীতিসমূহ মানি চলিব লাগিব।

প্ৰাথমিক স্থান-পৰিদৰ্শনৰ পাছত জানিব পৰা গৈছে যে এটা বৈদ্যুতিক উপকেন্দ্ৰৰ বাবে ১,৭৫০ বৰ্গ মিটাৰ ভূমিৰ প্ৰয়োজন হয়। প্ৰস্তাৱিত স্থানসমূহৰ প্ৰায়বোৰৰে ভূমিৰ গৰাকী এ পি ডি চি এল, এ পি জি চি এল বা অসম চৰকাৰ। প্ৰস্তাৱিত ১৯৬ টা বৈদ্যুতিক উপকেন্দ্ৰৰ বাবে প্ৰায় ৩,৪৩,০০০ বৰ্গ মিটাৰ ভূমিৰ প্ৰয়োজন হ'ব (প্ৰতিটো উপকেন্দ্ৰৰ

বাবে গড়ে ১,৭৫০ বর্গ মিটাৰ মাটিৰ হিচাপত)। যিবোৰ উপকেন্দ্ৰৰ বাবে চৰকাৰী বা এ পি ডি চি এল / এ পি জি চি এল-ৰ নিজা মাটি নাই আৰু ব্যক্তিগত মালিকানাৰ ভূমি আহৰণ কৰিব লাগিব, সেইবোৰ ক্ষেত্ৰত এ পি ডি চি এল-য়ে ভূমিৰ গৰাকীৰ লগত কথা পাতিছে আৰু লগতে এই কথালৈও লক্ষ্য ৰাখিছে যাতে তেনে অধিগ্ৰহণৰ ফলত সেইসকলৰ জীৱিকা নিৰ্বাহত কোনো বাধাৰ সৃষ্টি নহয়। সেইবাবে মূলতঃ মাটি বিক্ৰী কৰিবলৈ ইচ্ছুক লোকসকলৰ লগতহে আলোচনা কৰা হৈছে। ইচ্ছাবিহীন লোকৰভূমি অধিগ্ৰহণ, অনিচ্ছাপূৰ্বক পুনৰ্বাসন আৰু/বা জীৱিকা নিৰ্বাহত সম্ভাব্য নেতিবাচক প্ৰভাৱ পেলাব পৰা ক্ষেত্ৰসমূহ চিনাক্তকৰণ কৰা হ'ব। RPF ৰ লগত সংগতি ৰাখি A/RPs প্ৰস্তুত কৰা হ'ব। বিতৰণ লাইনসমূহ পৰাপক্ষত চৰকাৰী ভূমিৰ ওপৰেদি টনা হ'ব আৰু ব্যক্তিগত ভূমিৰ ওপৰত সেইবোৰৰ কোনো স্থায়ী প্ৰভাৱ নাথাকিব। চাহ বাগিছাসমূহৰ বাবে যিবোৰ ভূমিৰ প্ৰস্তাৱ ৰখা হৈছে, সেইবোৰ হ'ল চাহ খেতি নথকা খালী ঠাই। চাহ বাগিছাৰ মালিকসকল সাধাৰণতে এ পি ডি চি এল-ৰ সৈতে পাৰস্পৰিক বুজাবুজিৰে বৈদ্যুতিক উপকেন্দ্ৰৰ বাবে ভূমি দিবলৈ ইচ্ছুক, কাৰণ তেনে উপকেন্দ্ৰই তেওঁলোককে বিশ্বাসযোগ্য আৰু মানবিশিষ্ট বিদ্যুৎ যোগান ধৰিব। উপকেন্দ্ৰ স্থাপনৰ বাবে যি চৰকাৰী ভূমিৰ প্ৰস্তাৱ ৰখা হৈছে, সেই ভূমিসমূহ বেদখল বা অবৈধ বসবাসৰ পৰা মুক্ত। অৱশ্যে নিৰ্মাণৰ সময়ত শস্যৰ ক্ষতি, কাটিববলগীয়া হোৱা গছ, টেপিং স্থানৰ পৰা নতুন উপকেন্দ্ৰলৈ বিতৰণ লাইন টানোতে 'ৰাইট অব ৱে' (Right of Way – ROW) আদি সমস্যা হ'ব পাৰে। এই প্ৰসংগবোৰ পুনৰ্বিচাৰ কৰোতে তলৰ বিষয়বোৰ চিনাক্ত কৰা হৈছে, যিবোৰ এৰাই চলিব নোৱাৰিআৰু যিবোৰৰ বাবে স্থানভিত্তিক ESPMs আৰুA/RPs অনুসৰি প্ৰতিৰোধমূলক ব্যৱস্থা ল'ব লাগিব বা ক্ষতিপূৰণ দিব লাগিবঃ

- শস্য, গছ আদিৰ স্থায়ী ক্ষতি,
- জীৱিকাৰ উৎসৰ ওপৰত পৰা প্ৰভাৱৰ বাবে জীৱিকা নিৰ্বাহত অস্থায়ী নেতিবাচক ক্ষতি,
- তলৰ অঞ্চলত পানী গৈ পৰিব পৰা প্ৰাকৃতিক খালবোৰৰ ক্ষতিৰ বাবে জলনিকাশৰ সমস্যা,
- ধৰ্মীয় উপাসনাস্থলী, শ্মশানস্থলী আদি ৰাজহুৱা স্থানৰ সম্ভাৱ্য ক্ষতি,
- বাহিৰৰ পৰা যথেষ্ট সংখ্যক নিৰ্মাণ শ্ৰমিকৰ আগমনৰ ফলত স্থানীয় লোকৰ ওপৰত প্ৰভাৱ, আৰু
- কোভিড-১৯ ৰোগৰ সামাজিক সংক্ৰমণৰ বিপদ।

প্ৰস্তাৱিত প্ৰকল্পসমূহৰ চৌহদসমূহত শক্তিশালী বেৰা থাকিব, যাতে তাৰ ভিতৰত প্ৰৱেশ নিয়ন্ত্ৰিত কৰিব পৰা যায়। প্ৰস্তাৱিত স্থানসমূহত পথ / উপপথ আদিও থাকিব পাৰে আৰু সেইবোৰ স্থানীয় লোকে নিজৰ দৈনন্দিন কাম-কাজত সঘনাই ব্যৱহাৰ কৰা বিধৰো হ'ব পাৰে। স্থানীয় ব্যৱহাৰকাৰীসকলৰ লগত আলোচনা কৰিএই পথ / উপপথসমূহ উপ-প্ৰকল্পৰESIA পৰ্য্যায়তে ভালকৈ চিনাক্তকৰণ কৰাৰ প্ৰয়োজন আছে, যাতে প্ৰকল্প

পৰিকল্পনাৰ সময়তে সেইবোৰ অন্তর্ভুক্ত কৰিব পৰা যায় আৰু যদি অপৰিহার্য্য হয়, তেন্তে বিকল্প পথৰ সন্ধান কৰিব পৰা যায়।

শ্রমিকঃ নির্মাণ কার্য্য পূর্ণ গতিত চলি থকাৰ সময়ত সর্বোচ্চ সংখ্যক শ্রমিক প্রকল্পথলীলৈ আহিবলগীয়া হ'ব পাৰে। অৱশ্যে প্রকল্পটোৰসামর্থ্য আৰুআকাৰৰ ওপৰত নির্ভৰ কৰি এনে প্রভাৱ উপেক্ষণীয়ও হ'ব পাৰে, কাৰণ বেছিভাগ ক্ষেত্রতে কুশলী শ্রমিকৰ বাহিৰে আন শ্রমিকৰ ক্ষেত্রত স্থানীয় লোককে নিয়োগ কৰা যায়। কিন্তু কিছুমান ক্ষেত্রত যথেষ্ট সংখ্যক বহিৰাগত কুশলী শ্রমিক অনাৰ প্রয়োজন হয় আৰু সেয়া স্থানীয় লোকৰ বাবে বিপদৰ কাৰণ হ'ব পাৰে। এই বিপদ এনে ধৰণৰ হ'ব পাৰেঃ

- বহিৰাগত শ্রমিক আৰু স্থানীয় লোকৰ মাজত থকা সাংস্কৃতিক পার্থক্যৰ বাবে দ্বন্দ আৰু সামাজিক অস্থিৰতাৰ আশংকা।
- বহিৰাগত শ্রমিক আৰু স্থানীয় লোকসকলৰ মিলামিছাৰ বাবে কোভিড-১৯ ৰ দৰে সংক্রমণীয় ৰোগৰবিস্তাৰৰ আশংকা।
- লিংগভিত্তিক হিংসা (Gender-based Violence – GBV) আৰু যৌন নির্য্যাতনৰ (Sexual Exploitation - SE) আশংকা।
- অনাময় ব্যৱস্থাৰ সুবিধাৰ অভাৱ আৰু আবর্জনা ব্যৱস্থাপনাৰ অভাৱৰ বাবে স্থানীয় লোকৰ জনস্বাস্থ্য হানিৰ আশংকা।

১.৮আলোচনা আৰু উদ্ঘাটন

এই প্রকল্পৰপা�ৰিৱেশিক আৰু সামাজিক মূল্যাংকণৰ ক্ষেত্রত জনসাধাৰণৰ অর্থপূর্ণ অংশগ্রহণ আৰু সামাজিক আলোচনাবোৰে বিশেষ গুৰুত্ব লাভ কৰিছে। প্রায় ২৩ টা স্থানত 'বিষয়কেন্দ্রিক সামূহিক আলোচনা'(Focused Group Discussion – FGD) অনুষ্ঠিত হৈছে। ইয়াৰ বেছিভাগেই হৈছে প্রস্তাৱিত নতুন ৩৩/১১ কেভি উপকেন্দ্রৰ স্থান আৰু ইয়াৰ লগত সম্পর্কিত বৈদ্যুতিক লাইন টনা সম্পর্কত। মুঠ ১৫৩ জন লোকে ইয়াত অংশগ্রহণ কৰিছিল। তদুপৰিপ্রকল্পৰৰূপায়ণৰ সময়ত 'প্রকল্প-প্রভাৱিত লোক'ৰ (Project-affected People – PAP) লগত ব্যক্তিগত আলোচনাও কৰা হ'ব আৰু তাত কোভিড-১৯ ৰোগ সংক্রমণ প্রতিৰোধৰ দৰে প্রসংগয়ো স্থান লাভ কৰিব। আলোচনাৰ ফলাফলসমূহ নৱম অধ্যায়ত অন্তর্ভুক্ত কৰা হৈছে।

১.৯ প্রাতিষ্ঠানিক ব্যৱস্থা (নিয়ন্ত্রণৰ সৈতে)

প্রতিৰোধমূলক ব্যৱস্থাসমূহ ঠিকমতে লোৱা হৈছে নে নাই, এই সম্পর্কত দায়িত্বপ্রাপ্ত প্রতিষ্ঠান হৈছে এ পি ডি চি এল (ঠিকাদাৰী প্রতিষ্ঠান / অধিকাৰপ্রাপ্ত আৰু নিয়ন্ত্রক পৰামর্শদাতাৰ সৈতে)। এ পি ডি চি এল-য়ে ইতিমধ্যে আন কেবাটাও বহুমুখী বিকাশ বেংকৰ (উদাহৰণ স্বৰূপে – বিশ্ব বেংক) বাবে পাৰিৱেশিক আৰু সামাজিক ব্যৱস্থাপনা পদ্ধতিৰ বিকাশ কৰিছে। সম্প্রসাৰিত ব্যৱস্থাৰ সৈতে একেই পদ্ধতি এই প্রকল্পতো প্রয়োগ কৰা হ'ব। এই ESMPF ৰ সার্থক ৰূপায়ণ কৰিবলৈ উপ-প্রকল্পৰ সম্পর্কত অধিক পাৰিৱেশিক আৰু সামাজিক মূল্যাংকণ কৰি আৰুপাৰিৱেশিক আৰু

সামাজিক কৰণীয়খিনি সঠিকভাবে কৰা হৈছে নে নাই, তাৰ নিৰীক্ষণৰ যোগেদি এ পি ডি চি এল-য়ে পাৰিৱেশিক আৰু সামাজিক বিষয়বোৰৰব্যৱস্থাপনা সুদক্ষভাবে কৰিব পাৰিব। এই ব্যৱস্থাপনাৰ বাবে এ পি ডি চি এল-ৰ এক উপযুক্ত সাংগঠনিক গাঁথনি আছে। কর্প'ৰেট পর্য্যায়ত আছে এক 'প্রকল্প ব্যৱস্থাপনা গোট' (Project Management Unit – PMU) আৰু সংমণ্ডল পর্য্যায়ত 'প্রকল্প ৰূপায়ণ গোট'সমূহ (Project Implementation Unit – PMU) আছে। আনহাতে সকলো ক্ষেত্রতে এ পি ডি চি এল-ক সহায় কৰিবলৈ 'প্রকল্প ব্যৱস্থাপনা পৰামর্শদাতা'ও (Project Management Consultant – PMC)আছে। যিসকলে দৈনিক ভিত্তিত এই প্রকল্পত কাম কৰিব, সেইসকলৰ বাবে এ পি ডি চি এল-য়ে 'কেপাচিটি বিল্ডিং প্রগ্রেম' (Capacity Building Program) অনুষ্ঠিত কৰিব।

১.১০ অভিযোগ নিষ্পত্তি প্রক্রিয়া

'প্রকল্প-প্রভাৱিত লোক' (PAP)আৰু শ্রমিকসকলৰ আপত্তি বা অভিযোগসমূহ নির্দিষ্ট সময়-সীমাৰ ভিতৰত সমাধান কৰিবলৈ এক 'অভিযোগ নিষ্পত্তি প্রক্রিয়া' (Grievance Redress Mechanism – GRP) শীঘ্রে প্রতিষ্ঠা কৰা হ'ব। তাত থাকিব এ পি ডি চি এল-ৰ প্রতিনিধিৰে গঠিত এখন 'অভিযোগ নিষ্পত্তি সমিতি' (Grievance Redress Committee – GRC), পঞ্চায়তৰ মুৰব্বী আৰু'প্রকল্প-প্রভাৱিত লোক'ৰ(PAP) প্রতিনিধি। ইয়াৰ সভাপতি হিচাপে থাকিব প্রকল্প সঞ্চালক (Project Director) বা তেওঁৰ প্রতিনিধি। PAP সকলৰ ভিতৰত যিসকলে ভাবে যে এই প্রকল্পটোৰESP বোৰৰূপায়ণ কৰাত এ আই আই বি বিফল হ'লে তেওঁলোকৰ যথেষ্ট ক্ষতি হ'ব, সেইসকলে নিজৰ বক্তব্যখিনি এ আই আই বি-ক দাখিল কৰিব পাৰিব। এ আই আই বি-ৰপ্রকল্পসমূহৰ 'প্রকল্প-প্রভাৱিত লোকৰপ্রক্রিয়া' (Project-affected People's Mechanism) সম্পর্কত বেংকৰ যি নীতি আছে, সেই নীতি অনুসৰি সেই আপত্তিসমূহ বিবেচনা কৰা হ'ব।

মুঠতে ক'বলৈ গ'লে প্রকল্পৰ লগত সম্পর্কিত পাৰিৱেশিক আৰু সামাজিক প্রভাৱসমূহৰ বেছিভাগ দীঘলীয়া সময়ৰ বাবে নাথাকিব আৰু নির্মাণ-সময়তে সীমাবদ্ধ হৈ থাকিব আৰুসেইবাবে ESMPF ৰব্যৱস্থাসমূহ এক গ্রহণযোগ্য পর্য্যায়ত ৰূপায়ণ কৰি, লগতে সর্বোত্তম আভিযান্ত্রিক আৰুপাৰিৱেশিক আৰু সামাজিক ব্যৱস্থা গ্রহণ কৰি সেইবোৰ দূৰ কৰিব পৰা যাব। তথাপি সামান্য পৰিমাণৰ যি নেতিবাচক প্রভাব থাকি যাব পাৰে, সেয়া এই প্রকল্পৰ পৰা হ'বলগীয়া লাভৰ তুলনাত একেবাৰে নগণ্য।

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