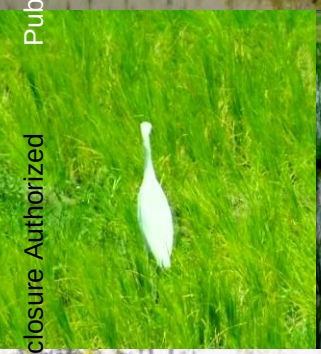
SFG2724 REV

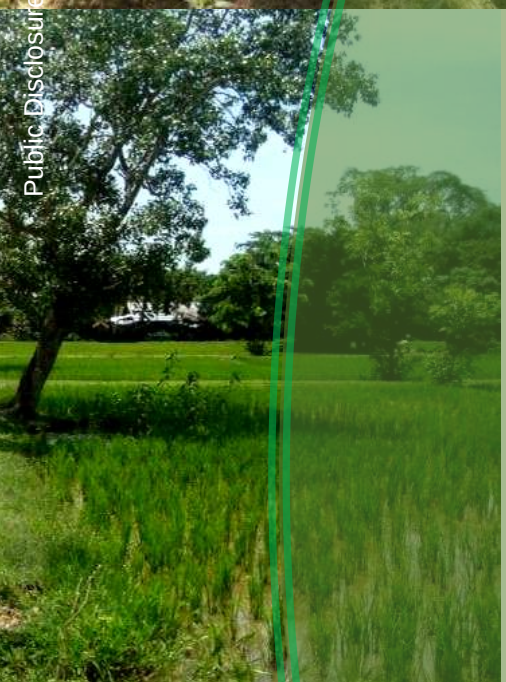
ARIAS SOCIETY

ASSAM AGRIBUSINESS AND RURAL TRANSFORMATION PROJECT (APART)

CONDUCTING ENVIRONMENTAL AND SOCIAL ASSESSMENT OF THE PROJECT APART AND PREPARATION OF MANAGEMENT PLANS AND/OR FRAMEWORK FOR MANAGING ADVERSE ENVIRONMENTAL AND SOCIAL IMPACTS, RISKS AND BENEFITS



ENVIRONMENTAL ASSESSMENT AND ENVIRONMENTAL MANAGEMENT FRAMEWORK



APRIL 2017

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ABBREVIATIONS

AGDP	:	Agricultural Gross Domestic Product
APART	:	Assam Project on Agribusiness and Rural Transformation
AI	:	Artificial Insemination
AACP	:	Assam Agricultural Competitiveness Project
ARIAS	:	Assam Rural infrastructure and Agricultural Services
CGWB	:	Central Ground Water Board
DICC	:	District Industries and Commerce Centres
DPIU	:	District Project Implementation Unit
EA	:	Environmental Assessment (EA)
EC	:	Environmental Clearances
EMF	:	Environmental Management Framework
EMP	:	Environmental Management Plan
EMU	:	Environmental Management Unit
FIG	:	Farmers Interest Group
FSSAI	:	Food Safety and Standards Authority of India
FPO	:	Fruit Products Order
GoI	:	Government of India
GoA	:	Government of Assam
ICT	:	Information Communication Technologies
IPM	:	Integrated Pest Management
MoEF& CC	:	Ministry of Environment, Forest and Climate Change
NGO	:	Non-Governmental Organisation
PDO	:	Project Development Objective
PCU	:	Project Coordination Unit
PIU	:	Project Implementing Unit
PWRD	:	Public Works Roads Department
QEMR	:	Quarterly Environmental Monitoring Report
ST	:	Schedule Tribes
SPIU	:	State Project Implementation Unit
WB	:	World Bank

1. INTRODUCTION

1.1 PROJECT BACKGROUND

In the State of Assam, agriculture and related sectors are the principal occupation of the vast majority of rural population in terms of employment and livelihood. Agriculture and the allied sectors, either directly or indirectly support more than 75% of the population, thus providing employment to about 50% of the total workforce. The recently concluded Assam Agricultural Competitiveness Project (AACP) was instrumental in increasing the cropping intensity, on-farm productivity and diversification of agriculture in the state. In view of this, the Government of Assam (GoA) through Government of India (GoI) has applied for a credit of US$200 million from the World Bank group for implementation of the "**Assam Project on Agribusiness and Rural Transformation (APART)**".

1.2 PROJECT OBJECTIVES

The objective[1] of the APART is:

- To "increase value-added and improve resilience in the production and processing of selected agriculture commodities, focusing on small farmers and agro-entrepreneurs in targeted districts".
- Project beneficiaries will include farmers and entrepreneurs especially in the MSME segment.
- Others would include farmer producer organizations, sector management companies, and other value chain participants.
- During preparation, specific attention would be given to gender inclusion in project design and implementation arrangements.

The proposed APART would support value addition in the production and post-harvest segments of selected agriculture value-chains; facilitate agribusiness investments through inclusive business models that provide opportunities to small farmers as well as stimulate the establishment of new small and medium agribusiness enterprises; and support resilience of agriculture production systems in order to manage increase in production and commercial risks associated with climate change, in the targeted districts. The project would adopt a cluster strategy within the targeted districts, by adopting a cluster approach; the project would enable all the value chain participants to develop competitive and innovative products that meet market demands rapidly and successfully.

The project would achieve[2] the Project Development Objective (PDO) by:

- Promoting investments in agri-enterprises, reducing the business and transaction costs, facilitating access to finance for agribusiness entrepreneurs, and, where appropriate, push for process, regulatory and/or policy change;
- Supporting the development of a modem supply chain; improved information communication technologies (ICT) based farm information and intelligence services, and alternative marketing channels; and
- Improving producer's access to knowledge, technologies and infrastructure so that they are able to respond to market opportunities and climate variability

1.3 PROJECT INTERVENTIONS

1.3.1 Project Area

Based on Agricultural Gross Domestic Product (AGDP) and MSME land scape of the state, 16 districts have been chosen under APART. The districts are further divided into the following categories.

[1]Section II A page no 8, Project Concept Note-P155617

[2]Paragraph no 19, Project Concept Note-P155617

- Districts with both agricultural production as well as industrial base
- Districts with Industrial base (not having primary agriculture production)
- Districts with agriculture production (not having substantial industrial presence)

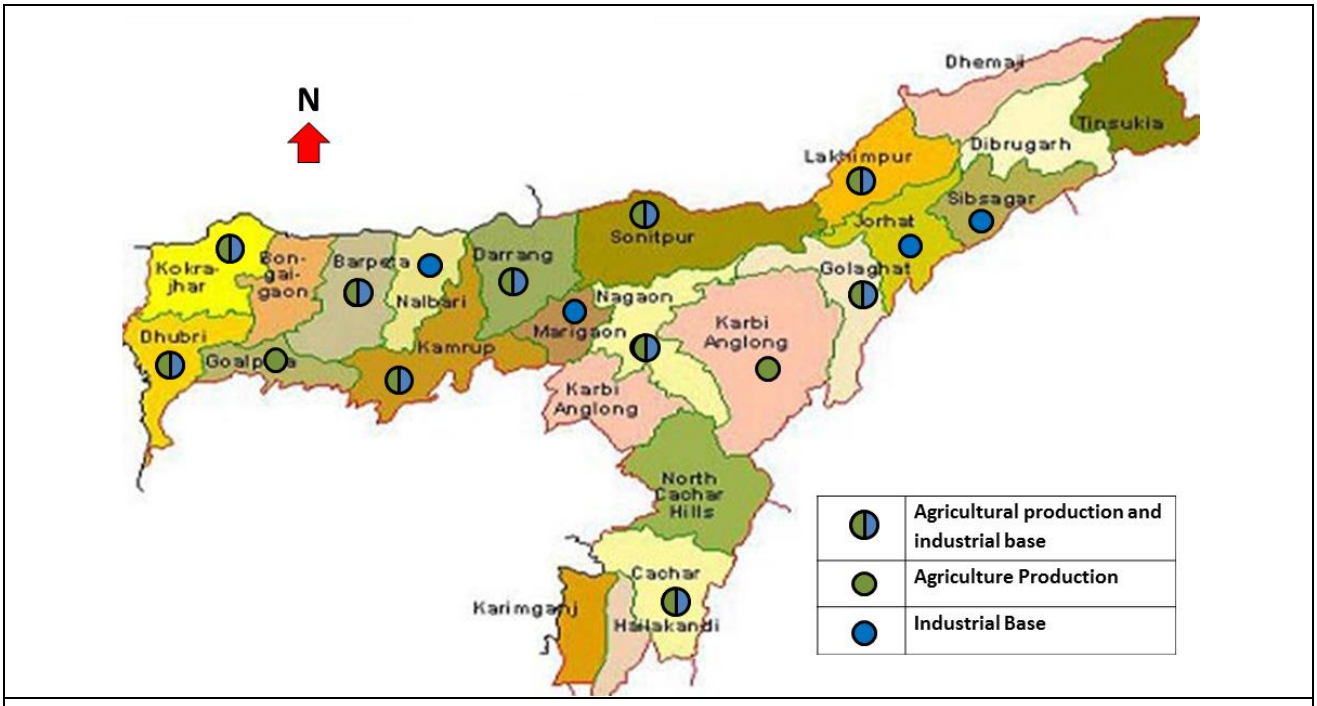


Figure 1: APART Project Area

1.3.2 Project Components

The APART project has four key components

(i) ***Component A***: Support to Agriculture Enterprise Development;

(ii) ***Component B***: Farm-Market Infrastructure Development;

(iii) ***Component C***: Market Led Production and Resilience Enhancement; and

(iv) ***Component D***: Project Management, Monitoring and Learning

Out of the four components, with an exemption to "component D" (which deals with the capacity development) all other "components (A, B and C)" shall have significant environmental impacts related to climate resilient production, infrastructure development and operation in the project clusters. Hence, the World Bank safeguard policies and other Government of India safeguard legislations are applicable. Though the "component A" (Environmental and Social) impacts are relatively low, the activities deals with the agriculture enterprise development which shall have minor localised impacts and hence it would require suitable mitigation measures (refer **Annexure 1** for detailed Project Components and Activities).

Table 1: Applicability of EMF in APART

Sl. No	Project Component	Project Subcomponent	EMF Applicability
1.	**Component A**: Enabling Agri Enterprise Development	**Sub-Component A1**: Enhancing State Capacity to Attract Private Investments- Assam Bureau of Investment Promotion **Sub-Component A2:** Setting up Enterprise Development and Promotion	The overview of the proposed project subcomponents presents as if there no environmental impacts. However, unknowingly there are possibilities that the fund shall be invested in projects having significant environmental impacts. Hence in

Sl. No	Project Component	Project Subcomponent	EMF Applicability
		Facility (EDPF) **Sub-Component A.3:** Setting up of Investment Fund **Sub-Component A.4:** Establishing stewardship councils	order to avoid that, a note/ guideline have been prepared for reference to screen the projects in the initial stage itself. **Please refer Chapter 6**
2.	**Component B**: Facilitate Agro Cluster Development	**Sub-Component B.1**: Support establishment of cluster level Industry Associations **Sub-Component B.2**: Supply chain support • Sub-Component B.2.1: Rehabilitation of access road • Sub-Component:B.2.2: Warehouse and warehouse receipts development • Sub-Component: B.2.3: Up-gradation & modernization of agricultural wholesale markets	For Implementing the project subcomponent the key infrastructure requirements are 1. Construction/ upgradation of Roads 2. Construction / upgradation of Warehouse 3. Construction/ Upgradation of the Markets 4. Community Service Centers (CSC's) The proposed project interventions are likely to have significant environmental impacts during the construction and operation stages and accordingly suitable mitigation measures for the anticipated impacts have been prepared. **Please refer Chapter 6**
3.	**Component C**: Fostering Market-led Production and Resilience Enhancement	**Sub-Component C1**: Development of climate resilient production clusters • Sub-Component C1.1: Horticulture, crop, spices and condiments value chains • Sub-Component C1.2: Pork Value Chain • Sub-Component C1.3.1: Milk Value Chain: Formal sector • Sub-Component C1.3.2: Milk Value Chain: Informal sector • Sub-Component C1.4: Fisheries Value Chain • Sub-Component C1.5: Sericulture and Handloom Value Chain • Sub-Component C.1.6: Cross cutting areas of Milk and sector animal health services **Sub-Component C.2**: Product Aggregation and Sale through Producer Associations and setting up market intelligence • Sub-Component C.2.1: Product Aggregation and Sale through Producer Associations • Sub-Component C2.2: Setting up market intelligence Cell **Sub-Component C3**: Facilitating access to and responsible use of financial services	As indicated in the project subcomponents, the proposed production clusters (Agriculture, Piggery, Dairy, Fisheries, Sericulture and Handloom) are likely to have environmental impacts at various stages and hence, to mitigate the anticipated impacts suitable mitigation measures have been prepared. **Please refer Chapter 6**
4.	**Component D**: Project Management, Monitoring and Learning	**Sub-Component D1**: Project Coordination and Implementation **Sub-Component D2**: Monitoring and Evaluation **Sub-Component D3**: Environment Management **Sub-Component D4**: Social Management	Environmental Impacts are not anticipated under this subcomponent during implementation. However as part of the capacity building (environmental monitoring, HR, budget allocation etc), safeguard training has been proposed at various levels (PMU/ OPIU / DLCC and ATMA's) for successful implementation of the EMF.

Sl. No	Project Component	Project Subcomponent	EMF Applicability
		Sub-Component D5: Procurement Management **Sub-Component D6**: Financial Management	Please refer Chapter 9

1.4 ENVIRONMENTAL MANAGEMENT FRAMEWORK (EMF)

APART ranges from small to large scale infrastructure projects. Development of these projects as per the envisaged objectives would have potential for negative environmental impacts. As an environmentally aware and socially responsible corporation, Assam Rural infrastructure and Agricultural Services (ARIAS) Society is cognizant to the need to mitigate the negative environmental impacts of projects in its portfolio and has developed systems to safeguard the environmental concerns through the preparation of an **Environmental Management Framework**.

1.4.1 Purpose and Objectives of the EMF

This Environmental Management Framework has been prepared to guide the Respective Line Departments under the project, in (i) subproject selection, (ii) screening and categorization, (iii) environmental assessment, (iv) preparation of environmental management plans, (v) preparation of Implementation and monitoring plan for the subprojects to facilitate compliance with the requirements specified in the World Bank Operational Policies and government rules and laws. This framework shall be applicable to all project components that are proposed to be taken up under APART.

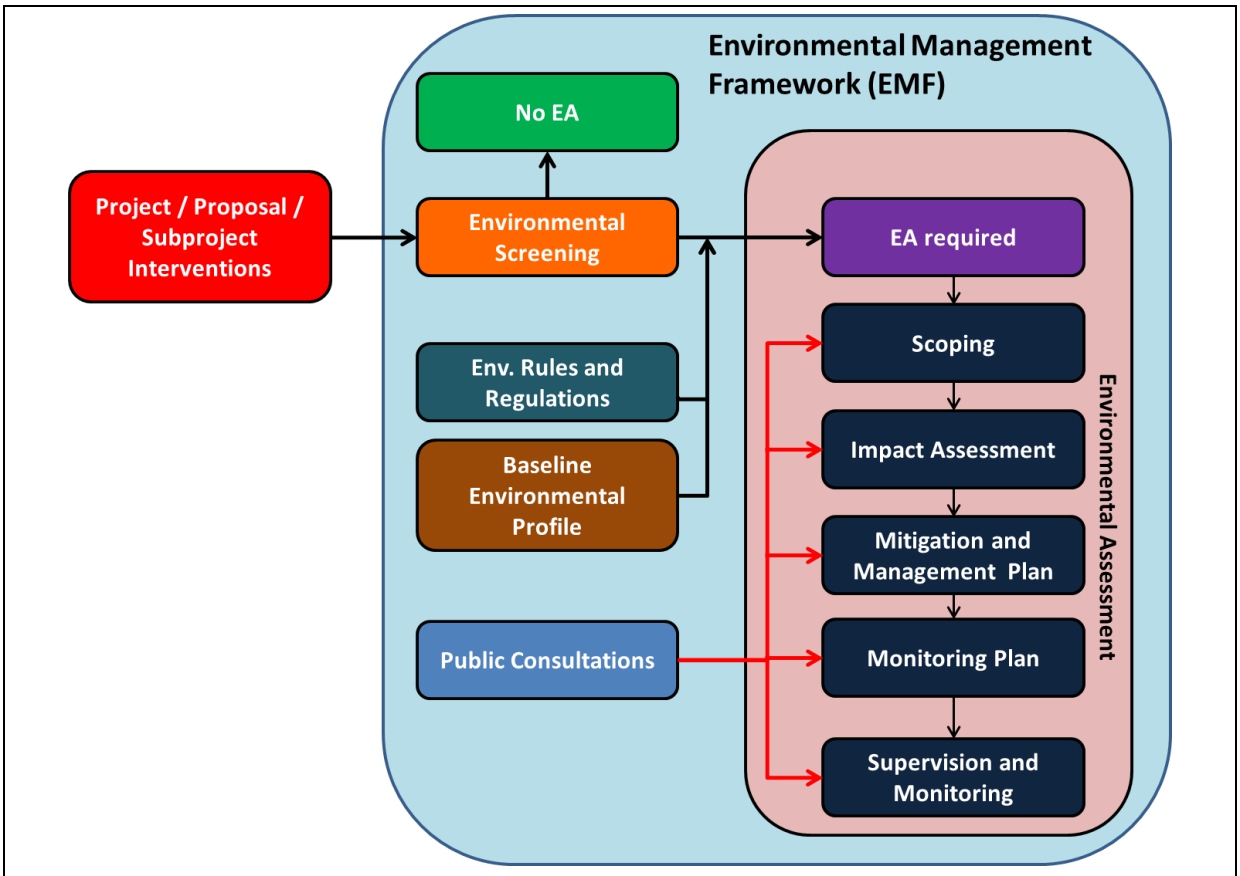


Figure 2: Environmental Management Framework for APART

The proposed development objective of APART is to increase value added and improve resilience in the production and processing of selected agricultural commodities and to support agriculture and

livestock productivity (including value and incomes) through essential technology transfer in production and improved post-harvest and market operations, and also explore and pilot possible financing modalities to support entrepreneurship and agri-business. Some of the projects activities will be carried out in environmentally sensitive areas and is most likely to disturb the existing condition. The frameworks assist ARIAS Society, in identification, assessment and management of environmental concerns at all stages of the project. The EMF outlines the policies, assessments and procedures that will enable ARIASS to ensure that the project is developed in accordance with EMF and is adequately protected from associated risks.

1.1.1 Organisation of the EMF Report

The Environmental Management Framework (EMF) Report comprises of nine chapters. A brief description of the chapters is presented below.

Chapter – 1 Introduction

This chapter provides project background, brief description and objectives of the project, proposed subproject interventions and purpose of the EMF document

Chapter – 2 Legal and Regulatory Frameworks

This chapter details the relevant environmental rules and regulations that are applicable for this subproject, which are adopted by the Government of India (GoI) and Government of Assam (GoA). It also highlights the applicable World Bank safeguard policies which have to be adopted during the subproject preparation and implementation.

Chapter – 3 Environmental Profile of the Project Districts

This chapter presents the environmental profile of the project districts. This chapter has been formulated based on the primary and secondary information collected for the project districts. The environmental profile includes Topography, Geology and Soil, Climate and Rainfall, Agro climatic feature, Biodiversity and Forest, Biodiversity, Land use pattern, Natural Calamity, Water Resource and Wetlands.

Chapter – 4 Environmental Management Framework

This chapter details the procedures that are to be adopted during the environmental assessment. It details the screening, scoping, environmental assessment, environmental management plan, institutional arrangement, supervision and monitoring etc.

Chapter – 5 Stakeholders Consultations

This chapter highlights the outcome of the stakeholders consultation conducted in the project districts. The consultation outcome acts as an source of information for effecting project designing, impact identification and preparation of suitable mitigation/ management measures.

Chapter – 6 Analysis of Potential Environmental Impact and Mitigation Measure

This chapter details the inferences drawn from the environmental assessment of the proposed subprojects during construction and operation phase. It describes the overall impacts of the proposed subprojects and underscores the areas of concern, which need mitigation measures. This chapter also provides recommendations in the Environmental Management Plan (EMP) for minimising the negative environmental impacts of the subprojects and effective implementation of mitigation measures during construction as well as operation of the subcomponents.

Chapter – 7 Pest Management Plan (PMP)

This chapter details the requirement of the World Bank OP 4.09 (Pest Management) in the subproject interventions. It also specifies the use of WHO approved pesticides, its applications and safety measures to be adopted.

Chapter – 8 Supervision and Monitoring

This chapter specifies the supervision and monitoring measures that are to be adopted for the proposed mitigation/ management measures during the subproject implementation. This chapter also includes the monitoring indicators for regular and annual monitoring.

Chapter – 9 Institutional Arrangement and Capacity Building

This chapter presents the roles and responsibilities of the safeguard staffs at various institutional/ organisation levels (PMU, OPIU and DLCC) involved in implementing the safeguard requirements as proposed in the Environmental Management Plan. The roles and responsibilities include preparation of Environmental Assessment for the proposed subproject interventions, preparing EMP's, supervision and monitoring etc.

2. LEGAL AND REGULATORY FRAMEWORK

Compliance of the project with the relevant legislations of GoI (MoEF&CC), State level and local level and policies of World Bank have been ascertained. Applicable legislations during implementation of the project and necessary provisions for compliance have been examined and presented in the following sections of this chapter.

2.1 APPLICABLE RULE AND REGULATIONS OF GOI AND GOA

A review of the legislations of Government of India (GoI) and Government of Assam pertaining to environmental management in consideration with project interventions under APART has been carried out. The applicability of national and state level legislations to the project is presented in **Table 2**.The description of the rules and regulations that is applicable for implementation of the APART is given in the **Annexure 2**.

Table 2: Relevant Rule and Regulation under GOI and GOA

Name of relevant Act/Policies/Rules	Objective	Relevance to Subproject Interventions
Environment (Protection) Act 1986	EPA (1986) is an umbrella Act that provides for introduction of various regulations aimed at environmental conservation and protection	**Applicable** to this project because investment is likely to happen in bringing up food processing unit, Chilling plant for dairy and fishery, slaughter house , upgradation of approach roads, which would require Consent to Establish (CTE) from the Pollution Control Board
Water (Prevention and Control of Pollution) Act 1974, amendments	This Act is applicable for maintaining or restoring wholesomeness of water. Central Board and state board are empowered to enforce them	
Air (Prevention and Control of Pollution) Act 1981	Similar to Water Act, the Air Act vests regulatory authority on the State Pollution Control Boards and empowers them to enforce air quality standards to prevent air pollution in the country	
The National Green Tribunal Act, 2010	An act established for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto	**Applicable** Respected to area where development activities may cause any damage to environment and property
Disaster Management Act, 2005	The purpose is to have an effective management of disasters and for matters connected therewith or incidental thereto	**Applicable** The subproject areas falls under the seismic zone V and hence any construction activities/ interventions will be under purview of this act
Energy Conservation Act, 2001	the objective is for efficient use of energy and its conservation and for matters connected therewith or incidental thereto	**Applicable** Project intervention involves investment in energy efficient equipment, energy conservation building etc.,
Forest (Conservation) Act, 1980	Permits judicious and regulated use of forest land for non-forestry purposes.	**Applicable** though this project does not involve any acquisition or diversion in forest but development of common facilities, storage house will be under purview of this act.
Biological Diversity Act 2002,	Applicable for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for	**Applicable** It acts like a guideline in preventing the planning of project subcomponents

Name of relevant Act/Policies/Rules	Objective	Relevance to Subproject Interventions
Assam Biodiversity Rules 2010	matters connected therewith or incidental thereto.	near the environmental sensitive areas including national parks, wildlife sanctuaries etc.,
Prevention of Food Adulteration Act, 1954	It deals with parameters relating to food additives, preservatives, colouring matters, packing and labelling of foods, prohibition and regulations of sales and food standard etc.	**Applicable** The proposed project subcomponents in agriculture sector deals with the production, processing and packing of agriculture commodities and hence this act is applicable
Forest Right Act -2006, The Scheduled Tribe and Other Traditional Forest Dwellers (Recognition of Forest Right) Act, 2006	To recognize and vest certain forest rights in the forest dwelling Scheduled Tribes and other traditional forest dwellers such as collection of Minor forest produce, access to grazing grounds and water bodies, traditional areas of use by nomadic or pastoral communities etc.	**Applicable** Project Interventions related activities such infrastructure development, Producer Farmer Organization etc., coming in Tribal District shall be as per this purview of act.
Assam Forest Regulation, 1891 & Assam Forest Policy	The law regulates the collection sale and transit of forest produce.	**Applicable** though this project does not involve any acquisition or diversion in forest but development of common facilities centres, storage house will be under the purview of this act.
Bio-Medical Waste Management Rules, 2016	The Department or any other agency running the facility generating hazardous waste would be responsible to ensure that the hazardous wastes are handled, stored, managed and disposed without any adverse impacts.	**Applicable** Project Interventions with reference to processing facilities, common facility center, storage area, warehouse, road, market, Vaccination and Veterinary etc.,
Solid Waste Management Rules, 2016	The provisions of the act prevent littering and mandate proper segregation, collection, storage and disposal of municipal solid waste.	
Construction and Demolition Waste Management Rules, 2016	Rules and regulation for construction & Demolition Waste	
Rural Producers Companies Act, 2002	It aims at upliftment of rural producers. objectives of the producer is that Company shall relate to production, harvesting, procurement, grading, pooling, handling, marketing, selling, export of primary produce of the Members or import of goods or services for their benefit:	**Applicable** Agri enterprises and agri production, common facility center, Producer Farmer Group under project may come under purview of this act.
Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011 and subsequent amendment.	The Food Safety and Standards Authority of India (FSSAI) has been established under the Food Safety and Standards Act, 2006 as a statutory body for laying down science based standards for articles of food and regulating manufacturing, processing, distribution, sale and import of food so as to ensure safe and wholesome food for human consumption.	**Applicable** As per the project interventions related to enhancement of Agricultural based commodity productivity, Processing facility, Infrastructure facilities development with respect to sectors of agri-enterprise development and agri-production
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	This international convention, to which India is a signatory category, lists the endangered flora and fauna and regulates trade of these species.	**Applicable** Though Project Intervention does not involve any trade of significant Endangered species yet Environmental safety measures are to be adhered
Agriculture and Horticulture		
The Assam Irrigation Act 1983	Application of water and regulation of the use, supply and storage of water for purposes of irrigation.	**Applicable** Project Interventions with reference to enhancement of agriculture production.

Name of relevant Act/Policies/Rules	Objective	Relevance to Subproject Interventions
The Seeds Act, 1966	Regulating the quality of certain seeds for sale, and for related matter	**Applicable** This project promotes seed production farms at village or at Cluster level that will supply seeds to all member farmers of Producer Groups. Also applicable in cases where mass procurement and distribution of seed is done through Producer Groups.
Agricultural Produce (Grading and Marking) Act, 1937 (Act No. 1 of 1937) (as amended up to 1986)	Applicable for the grading and marketing of agricultural and other produce.	**Applicable** to Agricultural Production and marketing under this project
Insecticide Act 1968 & Rules 1971	The Rules makes it mandatory to obtain license from the board for person involved in stock or exhibit for sale or distribute insecticides. Further, it lays down procedures for destruction of pesticides after their date of expiry.	**Applicable** Project will not involve activities like procurement, stocking and sale of insecticides as all the crop productivity enhancement is planned through non chemical methods. But In case of emergency of outbreak of any disease this might be applicable
The Assam State Agriculture Policy	To ensure that the growth in agriculture is sustainable economically, environmentally and socially	**Applicable.** The proposed project interventions focuses on the agriculture sustainable growth with the state of Assam
National seed Policy 2002	Applicable for intellectual property protection to new varieties; usher this sector into planned development; protect the interest of farmers and encourage conservation of agro- biodiversity.	**Applicable** to Agricultural Production and marketing under this project
Fertilizer Control Order 1985	Registration is required for selling fertilizer at any place as wholesale dealer or retail dealer.	**Applicable** Procurement of fertilisers from the unauthorized vendors are not supported under this project
Fruit Products Order (FPO), 1955	Objective is to manufacture fruit & vegetable products maintaining sanitary and hygienic conditions in the premises and as per the quality standards laid down in the Order. It is mandatory for all manufacturers of fruit and vegetable products including some non-fruit products like non fruit vinegar, syrup and sweetened aerated water to obtain a license under this Order.	**Applicable** As per the project interventions, the agriculture sector shall have infrastructure facilities like warehouses, market areas and CSC's where the hygienic conditions have to be maintained. Some of the interventions have food processing and packaging clusters and hence the guideline given in the FPO, 1955 shall be applicable
Dairy		
Milk and Milk Products Order 1992	No person or manufacturer shall set up a new plant or expand the capacity of the existing plant without obtaining registration/permission as the case may be from the concerned Registering Authority (WAMUL).	**Applicable** The proposed clusters for dairy sector shall include milk producers in the surrounding areas. Hence as per the act, the milk producers should register themselves for supplying milk.
Piggery		
Meat Food Products Order,1973 Under Essential Commodities Act, 1955 (10 of 1955)	Under the provisions of this order no person shall carry on business as a manufacturer except under and in accordance with the terms and conditions of a license granted to him under this Order.	**Applicable** The pig breeding farms should get license under this act to enroll themselves in the proposed clusters for Piggery.

Name of relevant Act/Policies/Rules	Objective	Relevance to Subproject Interventions
Prevention of Cruelty to Animals (Slaughter House) Rules, 2001	To prevent the infliction of unnecessary pain or suffering on animals and for that purpose to amend the law relating to the prevention of cruelty to animals	**Applicable**. As per the project subcomponents, provision of slaughter house is one of the project interventions. Hence these rules should be adopted
Sericulture		
Central Silk Board Silkworm Seed Regulations, 2010 and amendment	Monitor the production and supply of silkworm seed including the parent seeds and parent seed cocoons for production of commercial seed etc.	**Applicable** This project will promote seed production farms at village or Cluster level in order to supply seeds to all members of producer groups for mass production.
Fisheries		
Fish Seed Rules 2002	Enacted with the aim of controlling the unorganized fish seed market and ensuring growth of the fish seed industry. It provides for registration of the seed producers and assurance from them not to indulge in activities that produce inferior quality fish seeds. Licenses have to be renewed each year based on the performance of the previous year	**Applicable** This project will promote seed production farms at village or Cluster level in order to supply seeds to all members of producer groups for mass production.
Assam Fish Seed Rule, 2010	To regulate the quality fish seed production, marketing and stocking in water bodies in the State of Assam	
Wetland (Conservation and Management) Rule 2010	To ensure better conservation and management and to prevent degradation of existing wetlands in India.	**Applicable** to this project because investment is likely to happen for fishery activities , beel cultivation etc.,

2.2 APPLICABLE WORLD BANK SAFEGUARD POLICIES

When identifying and designing a project/ subproject, World Bank's operational policies help to assess the possible environmental risks and the impacts (positive or negative) associated with the development interventions proposed for Agriculture, Animal Husbandry & Veterinary, Fisheries, Common Service Centres (CSC's), Rural Roads and Sericulture. During the project implementation, safeguards shall help in defining measures and also the processes to effectively manage risks and enhance positive impacts. The process of applying safeguard policies can be an important opportunity for stakeholder's engagement, enhancing the quality of project proposals and increase in ownership. Bank's applicable operational policies are listed under **Table 3**.

Table 3: Safeguard Policies of World Bank

Sl. No	Name of WB policies	Applicability (Yes/No)	Remarks
1.	Environment Assessment (OP/BP/GP 4.01)	Yes	The Bank requires Environmental Assessment (EA) of projects proposed for Bank financing to ensure that they are environmentally sound and sustainable, and thus to improve decision making. In view of this, the Environmental Assessment study has been conducted for this project
2.	Natural Habitats (OP/BP 4.04)	Yes	Applicable, where value chain and project interventions happen near to National Parks, Wildlife Sanctuaries, Beels etc. In view of this, the Chapter – 3 (Environmental Profile of the Project Districts) has been strengthened with Biodiversity information covering National Parks, Wildlife Sanctuaries, Beels etc.
3.	Pest Management (OP 4.09)	Yes	Applicable: Project Interventions will not finance pesticide procurement, but there is possibility of pesticide use by farmers as part of productivity enhancement efforts. The commonly used pesticides in India and their status as per WHO classification list

Sl. No	Name of WB policies	Applicability (Yes/No)	Remarks
			are attached and related IPMP applicable to APART.

2.3 NEGATIVE LIST OF ACTIVITIES

Compliance of the project with the relevant legislations of GoI (MoEF&CC), State level and local level and policies of World Bank have been ascertained. Applicable legislations during implementation of the project and necessary provisions for compliance have been examined. **Table 4** provides the list of applicable rules and regulations.

Table 4: List of applicable Rules and Regulations

Sl. No.	Type of Interventions	Types of Activities
1	Agricultural Production	• Purchase, stock, sale, distribution or exhibition of the following pesticides will not be supported such as Pesticides banned by GOI, and pesticide classified in class Ia, Ib, II of WHO classification. • Stocking, sale, purchase, distribution of chemical, pesticide without license is prohibited. • Digging of irrigation tube well without taking required permission from the relevant authority (Central Ground Water Board (CGWB)) at Block/district level will not be supported
2	Fishery	Culturing of banned fish (*Clariasgariepinus* (Thailand Magur), *Oreochromissp*. (Tilapia), *Aristichthysnobilis* (Bighead carp)) will not be supported.
		Fishing in beel in banned season (April 1st to July 15th) will not be allowed.
3	Food Processing Plants	Activities involving discharge into any water body any industrial waste, sewerage or other polluting substance will not be supported.
		Fruit and vegetable product manufacturing units are not allowed without license from Industrial (Development and Regulation) Act, 1951
		Any industrial activity (related to food processing or cottage industries) will not be supported without requisite permissions for establishment and operation from the State Pollution Control Board.
4	Cattle Grazing	Cattle grazing in the forest areas without permission from the Forest Department will not be supported. Livestock shall be vaccinated for grazing in the forest area/ wildlife sanctuaries. However, traditional forest dwellers have access to grazing areas, as per the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006
5	Forest Protection	Activities that involve use of forest land for non-forest purposes without the permission of the Forest Department will not be supported
		Extraction, transport, processing, sale of forest produce including non-timber forest produce without taking required permission from the Forest Department will not be supported. However traditional forest dwellers have access as per the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006
		Felling of trees without taking required permission from the Forest Department will not be supported.
6	Activities near to National parks, Wildlife sanctuaries, Biodiversity hotspots	Poaching of Species prescribed under Wild Life Protection act Schedule is prohibited.
		Activities that involve destruction of wildlife or of wildlife habitat will not be supported.

2.4 SUBPROJECT CLEARANCE REQUIREMENT

As per EIA notification 2006, agriculture and allied activities have not been incorporated under the ambit of the Environment Clearance (EC). However, few of the project activities/ interventions still

attract environmental clearances like obtaining NoC, consent etc., the applicable project clearance are detailed in the **Table 5**.

Table 5: Subproject Activities and Required Clearance

Project Intervention	Clearance Required	Legislation	Procedure	Responsibility	Time Frame
Dairy and dairy products	Consent to Establish and Operate from Assam State pollution Control Board	Air (Prevention and Control of Pollution) Act 1981 Water (Prevention and Control of Pollution) Act 1974, amended in 1988	Application in a Prescribed Format from SPCB	Owner of Processing Plant	Prior to Establishment and Operation
	Registration from Designated Department	Milk and Milk Product Order	--		Prior to Establishment
Food Processing, Vegetable oil manufacturing,	Consent to Establish and Operate from Assam State pollution Control Board	Air (Prevention and Control of Pollution) Act 1981 Water (Prevention and Control of Pollution) Act 1974, amended in 1988	Application in a Prescribed Format from SPCB	Owner of Processing Plant	Prior to Establishment and Operation
Fish feed and cattle feed	Consent to Establish and Operate from Assam State pollution Control Board	Air (Prevention and Control of Pollution) Act 1981 Water (Prevention and Control of Pollution) Act 1974, amended in 1988	Application in a Prescribed Format from SPCB	Owner of Processing Plant	Prior to Establishment and Operation
Fish feed	Registration from Fishery Department	Assam Fish Seed Rules	--	Owner of the Facility	Prior to Establishment
Fish processing and packing	Consent to Establish and Operate from Assam State pollution Control Board	Air (Prevention and Control of Pollution) Act 1981 Water (Prevention and Control of Pollution) Act 1974, amended in 1988	Application in a Prescribed Format from SPCB	Owner of Processing Plant	Prior to Establishment and Operation
Flour mills, Oil mill Ghani Hatchery and Piggery Rice mill (Rice hullers only) Grains processing	Consent to Establish and Operate from Assam State pollution Control Board	Air (Prevention and Control of Pollution) Act 1981; Water (Prevention and Control of Pollution) Act 1974, amended in 1988	Application in a Prescribed Format from SPCB	Owner of Processing Plant	Prior to Establishment and Operation
Storage Facility, Community Building, Common Service center	Clearance from Town Planning Department or Urban Local bodies.	Guwahati Building Construction (Regulation) Bye laws, 2015	Building plan has to be submitted to the responsible agency (Guwahati Municipal Corporation (GMC), Urban Local Bodies (ULBs) or the Panchayats)	Owner of the Facility	Before Construction
Veterinary	Application for	Bio-Medical Wastes		Owner of the	Prior to

Project Intervention	Clearance Required	Legislation	Procedure	Responsibility	Time Frame
Dispensary/ Hospital	Authorization as generator of Bio-Medical Waste	(Management & Handling) Rules 1998		Facility	Establishment and Operation
Slaughter House	Consent to Establish and Operate from Assam State pollution Control Board	Air (Prevention and Control of Pollution) Act 1981; Water (Prevention and Control of Pollution) Act 1974, amended in 1988	Application in a Prescribed Format from SPCB	Owner	Prior to Establishment and Operation
Road	Diversion of Forest Land to Non forest Purpose/ for tree felling	Forest Conservation Act, 1980	Application to the Forest Department in Specified Format	PWD	Before Construction
	Consent to Establish and Operate from Assam State pollution Control Board	Air (Prevention and Control of Pollution) Act 1981; Water (Prevention and Control of Pollution) Act 1974, amended in 1988	Application in a Prescribed Format from SPCB		
Beels& Natural Water Body	Using Beel area for commercial purposes (if the beel area/ waterbody falls under the protected waterbody)	Wetland (Conservation and Management) Rules, 2016	Application to the Forest Department in Specified Format	Owner of the Facility	Prior to Establishment

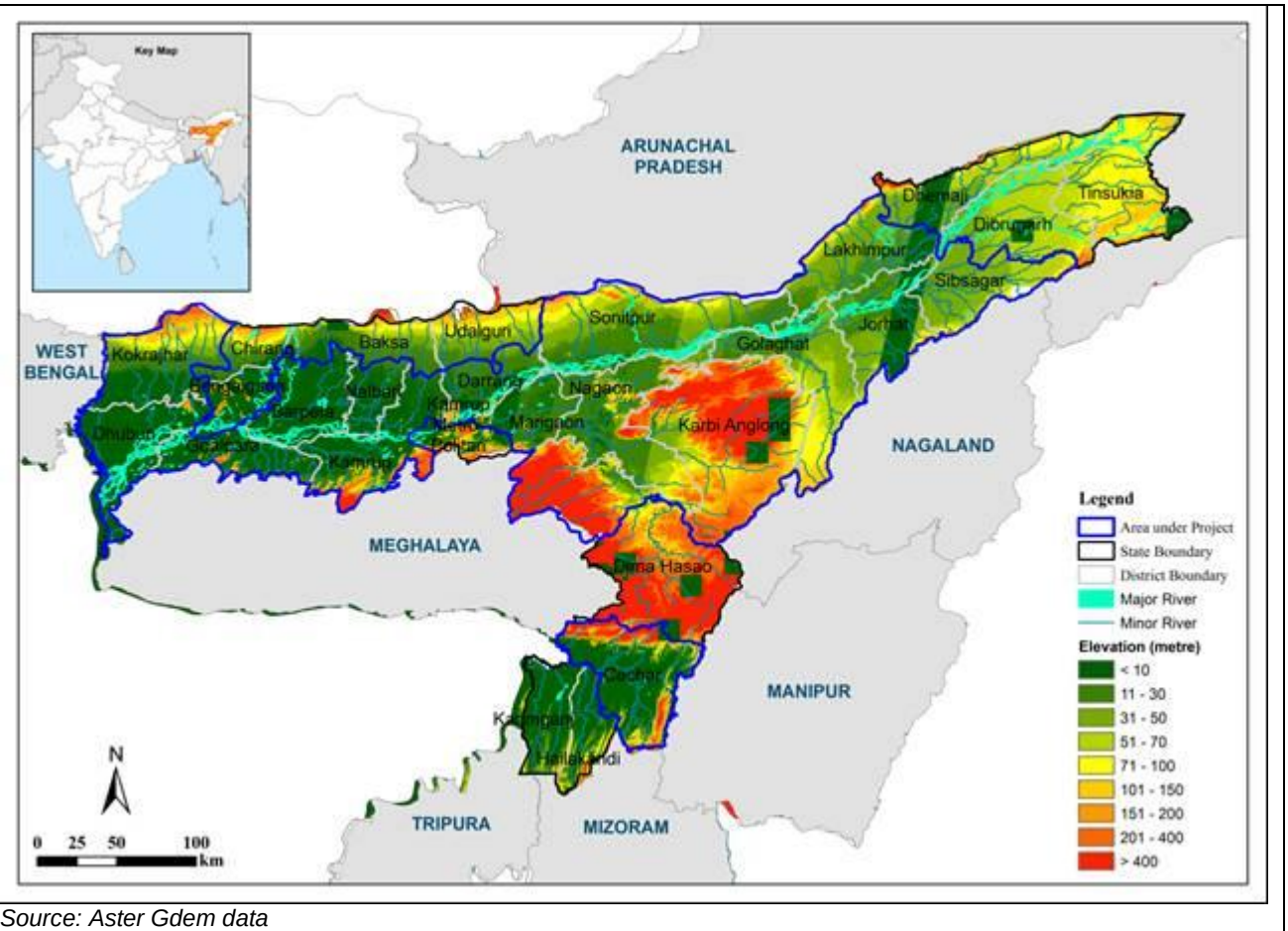
3. ENVIRONMENTAL PROFILE OF THE PROJECT DISTRICTS

3.1 ENVIRONMENTAL CHARACTERISTICS OF PROJECT AREA UNDER APART

This chapter details the existing environmental profile of the project districts namely *Nagaon, Sonitpur, Barpeta, KarbiAnglong, Kamrup, Dhubri, Golaghat, Kokrajhar, Lakhimpur, Darrang, Cachar, Sivsagar, Jorhat, Goalpara, Morigaon and Nalbari*. The environmental profile is based on the review of secondary information/ data collected from the respected departments, literature/ journals, websites and also observation obtained from the site visits to the project districts. District wise Environmental fact Sheet has been presented in **Annexure 3**.

3.1.1 Topography

Assam is located south of the eastern Himalayas situated between 89^0 5'- 96^0 1' East Longitude and 24^0 3'- 27^0 58' North Latitude. It can be divided into three principal geographical regions: (i) the Brahmaputra Valley in the north; (ii) the Barak Valley in the south; and (iii) the KarbiAnglong and North Cachar Hills in the central Assam range (refer **Figure 3**).



Source: Aster Gdem data

Figure 3: Relief Map of Assam

Physically the state can be divided into two divisions i.e. plains and hills. Brahmaputra and the Barak valley are two valleys of Assam which is separated by the hills. Most of the land area in the state of Assam is covered under Brahmaputra valley, which is spread around 56,000 sq.km and are rich in alluvial land interspersed with small hillocks and swampy low lands which are subjected to annual

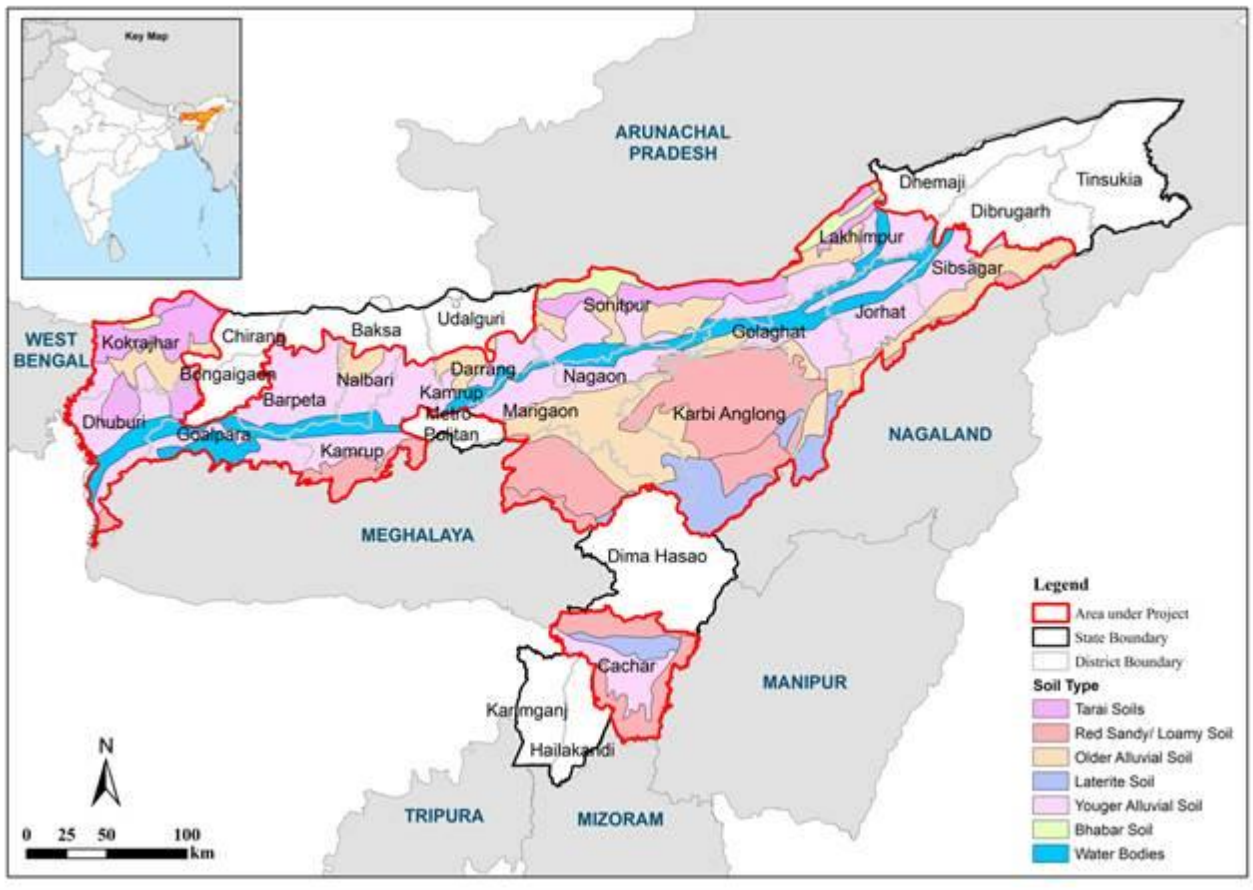
floods. The project districts like Lakhimpur, Sonitpur, Darang, Nalbari, Barpeta, Kokrajhar falls in the north bank of the River Brahmaputra and Jorhat, Sibsagar, Golaghat, Marigaon, Nagaon, Kamrup, Goalpara falls in the south bank. KarbiAnglong is the only hill district on the south bank of Brahmaputra.

The Barak valley is mainly plain land covering an area of 7,000 sq.km. The project district Cachar hills lies in the Barak Valley, which has characteristics of undulating plain with small hillocks and swamps at intervals. The river Barak dominates the valley and swells and creates devastation during the rains

3.1.2 Geology and Soil

Geologically, the Brahmaputra Valley of Assam is the eastern continuity of the Indo-Gangetic plain of North India. While, the peninsular rock masses are represented in the Mikir Hills of Karbi Anglong district of Assam which is an extension from the Meghalaya Plateau.

Soil of Assam have originated from residual or transported materials. The residual material is derived from the rocks of Archeans age which consists mainly of gneiss, schists and granites. The transported type consists of material brought from flowing rivers from Himalaya. The soil is very rich in nitrogen content and organic matter. Most of the project districts (Dhubri, Goalpara, Nalbari, Barpeta, Nagaon, Golaghat some part of Sivsagar and Lakhimpur districts) are dominated by the presence of alluvial soil, which is suitable for growing crops such as cereals, pulses, oilseeds, plantation crops etc. The Karbi Anglong district located in the hilly region shows the presence of Red Sandy and Loamy soil which is suitable for horticulture and plantation crops.



Source: National Bureau of Soil Survey and landuse planning of Assam

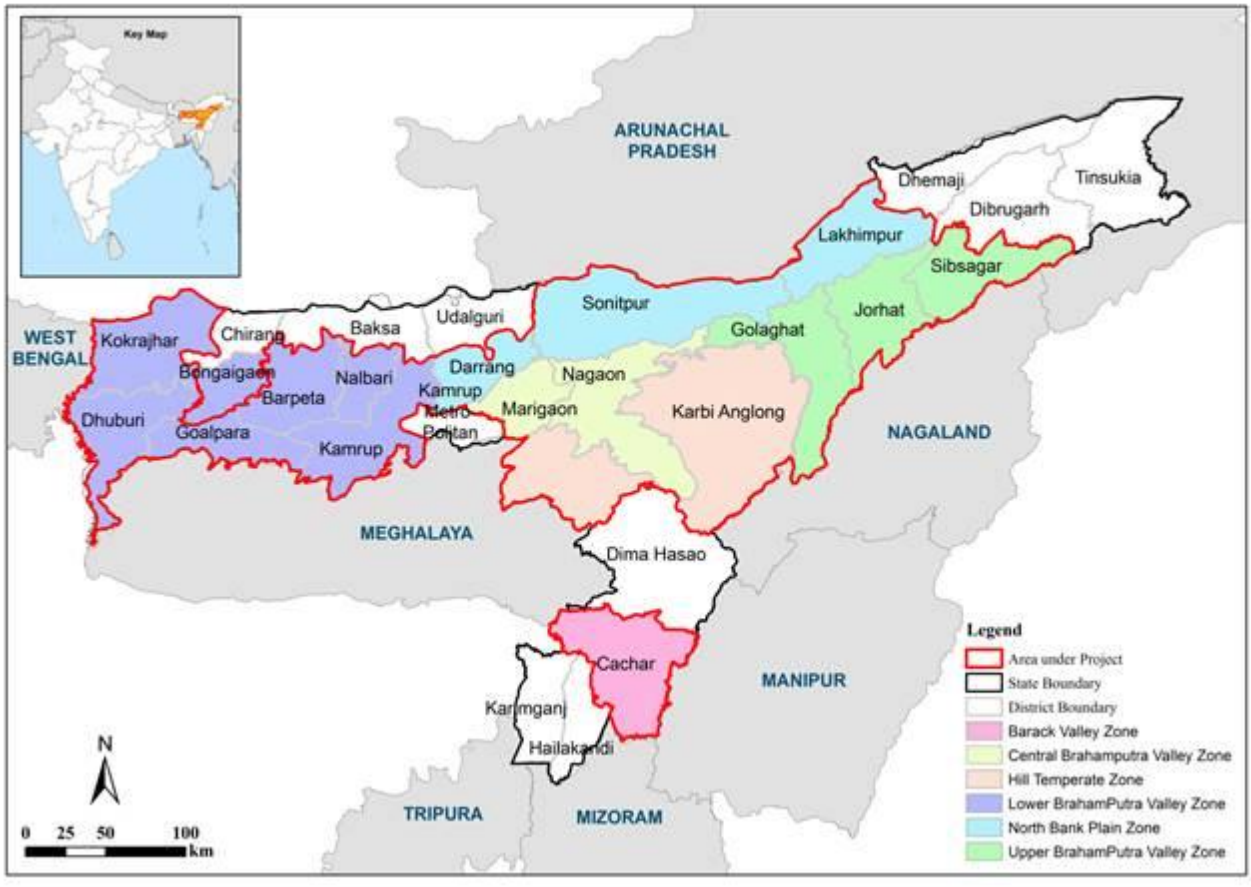
Figure 4: Type of Soil in Project Area

3.1.3 Climate and Rainfall

The climate of Assam is subtropical (Humid Meso-Thermal climatic type) with warm humid summer and cool dry winter. Due to its large variation of physiography, the state has wide variation of climatic conditions. In the summer, the maximum mean temperature reaches up to 35^{o} C, while in the winter, the mean minimum goes down to 7^{o}C. Being surrounded almost from all sides by hills and mountains, and having large number of rivers and water bodies, the state of Assam witnesses considerably high moisture content almost throughout the year. The annual average relative humidity never comes below 75%. The unique physiographic characteristics of the state and its surrounding mountain and hill ranges greatly influence the occurrence of rainfall in the state. Among the project districts Sibsagar, Lakhimpur, Kokrajhar and Dhubri in the Brahmaputra valley and Cachar, in the Barak valley experience more than 250 cm of rainfall (annual average). On the other hand, the southern part of Nagaon and its neighbouring Karbi hill receives comparatively less rainfall (the annual average being less than150 cm).

3.1.4 Agro climatic feature

As presented in **Figure 5**, most of the project districts fall under Lower Brahmaputra Valley Zone, which is suitable for growing crops like Paddy, Potato, Mustered and pulses. However, with exemption to the Karbi Anglong district (hilly zone), all other project districts experiences all agro climatic zone of the state, which is suitable for growing crops like Paddy, Pulses and Vegetables. The Karbi Anglong district has favourable situation for more horticulture and vegetable crop types.



Source: Assam online Portal

Figure 5: Agro-climatic Zone

Source:http://online.assam.gov.in/web/guest/agricultureandrrigation

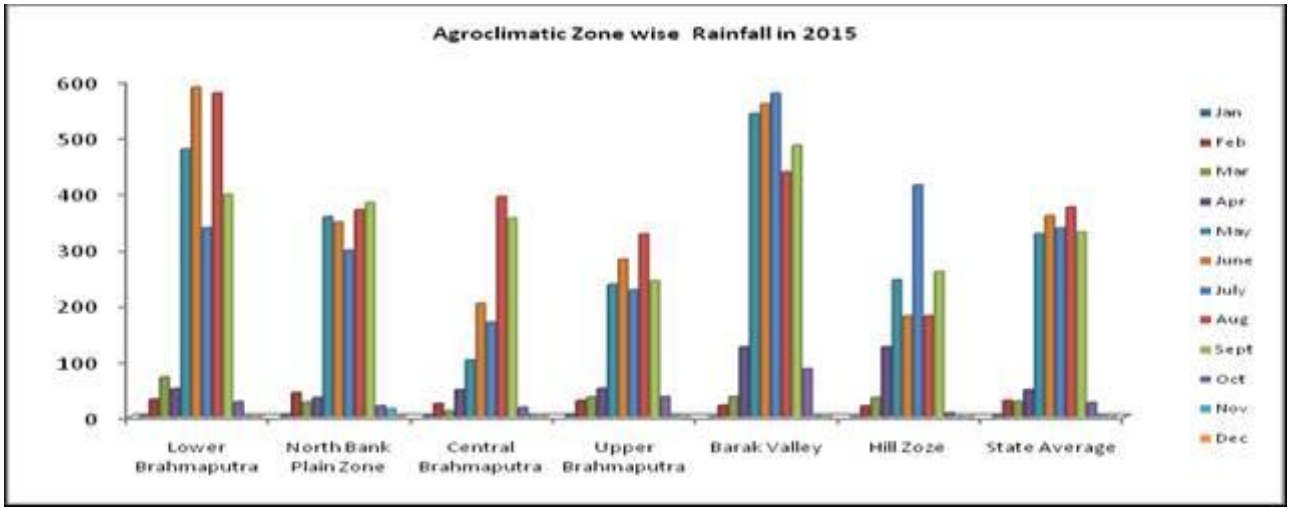


Figure 6: Agro climatic Zone wise Rainfall record[3]

3.1.5 Biodiversity and Forest

Assam lies between two significant biodiversity hot spots, "Himalaya" and "Indo Burma". Due to its physiographic heterogeneity and climatic behaviour it is endowed with numerous significant floral and faunal biodiversity.

Forest: The project districts comprises forest types of (i)Tropical wet evergreen forest in upper Assam area (Sivsagar, Dolaghat, part of Lakhimpur district), (ii) Tropical Semi Evergreen forest in Darang, Nagaon, Morigaon and Sonitpur District, Cachar; (iii)Tropical Moist deciduous forest in Lower Assam areas of Kokarajhar, Dhubri, Goalpara, Barpeta, Kamrup Districts, and (iv) subtropical Hill forest in Karbi Anglong District. Dominating forest Species as per the forest type mentioned in above para is presented in **Table 6**.

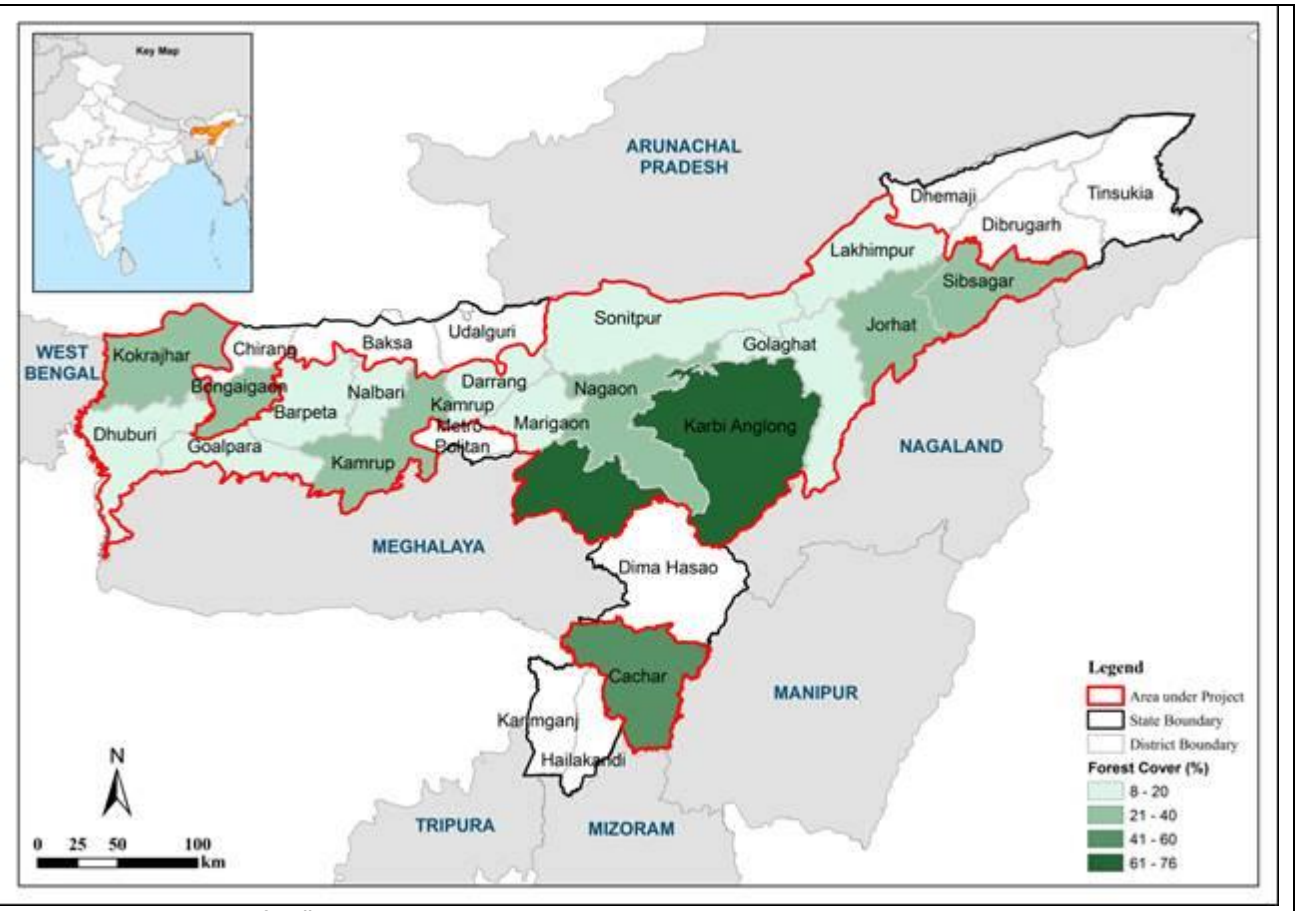
Table 6: Forest types and Dominant Species of Project Area.

Forest Type	Dominant Species
Tropical Wet Evergreen Forests.	• Hollong (*Dipterocarpusmacrocarpus*), Borpat, Jutuli, Sam, Dewa sam, Nahar, Teeta chap. Bhelu, and Mekai, Garjan (*Dipterocarpusterbinatus*), Nahar (*Mesuaferrea*), Bolong (*Mesua floribunda*), Champ (*Micheliaglabra*), Kathalua (*Palaquiumpolyanthum*)
Tropical Semi Evergreen Forests	• *Actinodaphneobovata* (Petarichawa), *Aesculus species* (Ramanbih), *Artocarpuschama*(Sam), *Albizia species*(Siris, Sau, Koroi), *Anthocephaluschinensis* (Kadam), *Duabanga grandiflora* (Khakan), *Castonopsis species* (Hingori, Dhobahingori, Kanchan), *Dilleniaindica* (Ou-tenga), *Bauhinia purpurea* (Kanchan), *Lagerstroemia species*(Jarul, Ajar,Sidha), *Magnolia species*(Phulsopa, Gahorisopa, Pansopa, Kharikasopa, Kathalsopa, Duleesopa), *Mallotus species*(Sinduri, Joral, Dudhloti, Buritokan), *Micheliachampaca*(Teetacampa), *Syzygium species*(Paharijam, Mokrajam, Berjamu, Kolajamu, Bogijamu, golapjamu). *Schimawallichii* (Bolem,Ghugra), *Terminalia species*, (Hilikha, Bohera, Bhomora), *Trewianudiflora*(Bhelkor), *Hatipolia, Holok*
Tropical Moist Deciduous Forests.	• Sal, *Lagerstroemia species*(Jarul, Ajar), *Schimawallichii*(Ghugra), *Stereospermumpersonatum*(Paruli), *Adina cordifolia* (Haldu), *Artocarpus species* (Sam), *Ficus species*(Bor, Dimoru, Dhupbor, Bot, Athabor, tengabor, Lotadioru, Khongaldimoru), *Bischofiajavanica* (Uriam), *Gmelinaarborea* (Gomari), *Micheliachampaca*(Teetachampa), *Terminalia species* (Hilikha, Bhomora, Bohera). *Toona ciliate* (Poma
Sub-tropical Hill Forests	• *Adina cordifolia* (Haldu), *Albizia species* (Siris, Kolasiris, Koroi, Sau) *Alstoniascholaris*(Satiana), *Artocarpuschama* (Sam), *Careyaarborea*(Kumbhi), *Dalbergia*

[3] Sehgal, J., MandaJ, D.K., MandaI, C. and Vadivelu, S. (1992). Agro-Ecological Regions of India, Second edition. Technical Bulletin, NBSS &LUP, Pub1.24, p.130. NBSS&LUP, Nagpur ,India.

Forest Type	Dominant Species
	species(Sissoo, Medelua*), Ficus species* (Bot, Bor, Dimoru), *Lagerstroemia species* (Jarul, Ajar), *Mallotu species* (Senduri, Joral, Dudhloti), Teak –Plantation
Endemic Flora	• *Acacia gageana*, *Adiantumassamicum*, *Alseodaphneandersonii, Alseodaphanekhasyana, Angiopterisassamica, Cedrelafabrifuga, Cinnamomumcacharensis, Coelogyneassamica, Combretumwallichii, Dinochloaindica, Diospyroscacharensis, Dipterocarpusmannii, Eugenia cyanophylla*, bamboos e.g. *Bambusacacharensis*, *Bambusamastersii, Chimnobambusagriffitheana*, orchids e.g. *Bulbophyllumelassonotum, Bulbophyllumvireus, Dendrobium assamicum* etc.

District wise forest density map pertaining to project has been presented in **Figure 7**. Highest forest density is in Karbi Anglong district followed by Cachar District. The list of Rare and Endangered species in the Red data Book for the state of Assam has been presented in **Annexure 4**.



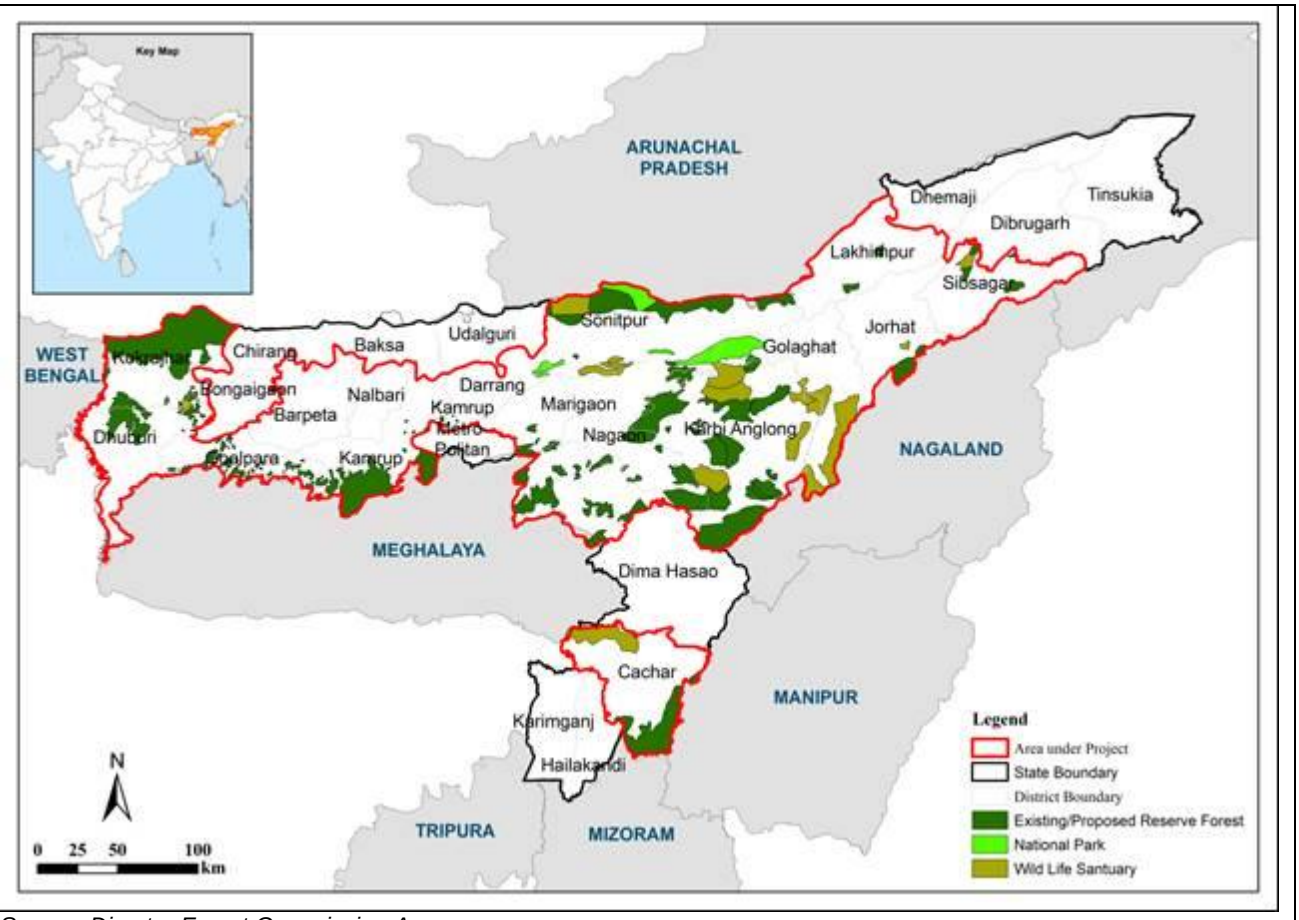
Source: Forest Survey of India 2011

Figure 7: Forest Cover to total geographical area

3.1.6 Biodiversity

Assam is endowed with rich biological diversity because of its physiographical heterogeneity and climatic behaviour. With exemption to Nalbari District, all other project districts (**Figure 8**) have protected areas and Important Bird Areas[4]. **Appendix 4** provides project's district wise occurrence of protected areas and Important Bird Areas. These protected areas (National Park and Sanctuary) has numerous schedule animals (protected animals) under Wild Life Protection act 1972 and some of them (around 25) are also identified as rare, endangered and threatened species as per the Red Data Book.

[4] As per Bird Life International



Source: Director Forest Commission Assam

Figure 8: Protected area and Forest of Project Area

With respect to the project background on the Agricultural Promotion, the following table provides the commodity wise exotic and indigenous species practiced/ used in project districts.

Fish:

- The Brahmaputra and Barak river system along with their tributaries and flood plain wetlands locally known as beels provide habitat for an array of fish species. There are more than 210 fish species (commercial and ornamental) that have been reported in Assam
- **Exotic fish species cultivated in Assam are** Common carp - *Cyprinuscarpo*, Grass carp - *Ctenopharyngodon idella*, Silver carp - *Hypophthalmichthys molitrix*, Big head carp - *Hypophthalmichthys nobilis*, Japani Kawai/ Mozambique cichlid/ Tilapia - *Oreochromis mossambica*, Thilandmagur - *Clarias garripinius*,
- **Indigenous species are** Pavda, Seniputhi, Neria, Koroti, Kanduli, Ritha, Mola and Kawoi, are among the fish stock affected by the changing landscape in the last couple of years. Moreover, the Maseer, which is found in many hilly streams are on the verge of extinct.

Sericulture:

- About 387 species of moths are reported from Assam. Most of the moth species are distributed throughout the State. Sericulture industry of Assam depends on this group. Assam supports many varieties of silk worms; some are domesticated while there are lots of other silk worms which are non-domesticated.

Muga	*Antheraea assamensis (*Cultivated semi domesticated muga) *Antheraea compta (Cultivates through cocoon collected from Wil areas)* *Antheraea helferi (Cultivates through cocoon collected from Wil areas)*
Eri	*Philosamia ricini (domesticated eri)* *Philosamia Cynthia (Cultivates through cocoon collected from Wil areas)* *Philosamia lunuloids (Cultivates through cocoon collected from Wil areas)* *Philosamia obscura (Cultivates through cocoon collected from Wil areas)*

Mulberi Silk (domesticated mulberry silkworm)	*Bombyx mori, Bombyx moritexor, Bombyx mori fortunatus, Bombyx mori tarracanensis, Bombyx meridionalis, Bombyx croesi, Bombyx sineusis.*
Other silk worm variety which is locally called as 'amphutukonimuga'	*Attacus atlas, Cricula trifenstrata, Cricula andrei, Leopa katinka, Leopa anther, Salassa lola, Caligula extensa, Caligula cachara, Theophila religiosa, Andraca bipunctata*

Dairy	**Indigenous cattle breed:** Red Sindhi, Sahiwal, Gir: Deoni, Ongole, Karan fries, Karan swiss, Nimari, Hariana, Rathi or Rath, Mewati, Krishavalley, Tharparkar, Kankrej
	Exotic Breeds: Commonly used breed are Jersy and, Holstein Friesian Other – Brown Swiss, Red Dane, Ayrshire and Guernsey, short horn, Red Pole, Welsh Black.

Piggery	In India there are no recognized breed of pigs , in Assam only one local variety is found namely Doom, which is originally from Bangladesh.
	Hampshire, Large black, Saddle back, Yorkshire, Landrace are some exotic breed which are commonly used in piggery in Assam

3.1.7 Land use pattern

The district wise land use pattern (**Table 7**) has been presented in following figure. Most of the area is under agriculture landuse pattern, because Assam is an agrarian state. Karbi Anglong is the only district having highest landuse share with a forest cover of about 70% and Darrang District has the highest share for agriculture (55%).

Table 7: Landuse Pattern of Project District

Sl. No.	District	Geographical Area (Area in Hectare)	Forest (Area in Hectare)	Non-Agricultural land (Area in Hectare)	Barren and Uncultivable Land (Area in Hectare)	Uncultivated Land (Area in Hectare)	Fallow Land (Area in Hectare)	Agricultural Land (Area in Hectare)
1	**Kokrajhar**	329,600	173,465 (52.63%)	18,647 (5.66%)	19,386 (5.88%)	20,676 (6.27%)	2,913 (0.88%)	94,513 (28.68%)
2	**Dhubri**	217,600	29,155 (13.40%)	62,688 (28.81%)	14,005 (6.44%)	9,003 (4.14%)	16,030 (7.37%)	86,719 (39.85%)
3	**Goalpara**	182,400	36,458 (19.99%)	18,533 (10.16%)	28,872 (15.83%)	17,413 (9.55%)	559 (0.31%)	80,565 (44.17%)
4	**Barpeta**	228,200	0 (0.00%)	28,842 (12.64%)	16,360 (7.17%)	26,240 (11.50%)	14,148 (6.20%)	142,605 (62.49%)
5	**Morigaon**	155,100	6,611 (4.26%)	49,693 (32.04%)	3,569 (2.30%)	15,792 (10.18%)	5,881 (3.79%)	73,554 (47.42%)
6	**Nagaon**	397,300	77,580 (19.53%)	45,890 (11.55%)	13,713 (3.45%)	33,658 (8.47%)	8,020 (2.02%)	218,439 (54.98%)
7	**Sonitpur**	520,400	162,982 (31.32%)	151,053 (29.03%)	21,353 (4.10%)	16,983 (3.26%)	5,533 (1.06%)	162,496 (31.23%)
8	**Lakhimpur**	227,700	31,108 (13.66%)	46,662 (20.49%)	37 (0.02%)	21,137 (9.28%)	16,113 (7.08%)	112,643 (49.47%)
9	**Sivasagar**	266,800	30,465 (11.42%)	57,009 (21.37%)	7,336 (2.75%)	29,211 (10.95%)	7,641 (2.86%)	135,138 (50.65%)
10	**Jorhat**	285,100	25,247 (8.86%)	70,000 (24.55%)	10,395 (3.65%)	25,713 (9.02%)	17,019 (5.97%)	136,726 (47.96%)
11	**Golaghat**	350,200	157,642 (45.01%)	15,265 (4.36%)	6,243 (1.78%)	18,622 (5.32%)	9,107 (2.60%)	143,321 (40.93%)
12	**Karbi Anglong**	1,043,400	320,840 (30.75%)	134,853 (2.92%)	460,231 (44.11%)	----------[5]		127,476 (12.22%)
13	**Cachar**	378,600	138,409 (36.56%)	44,745 (11.82%)	3,432 (0.91%)	47,306 (12.49%)	4,405 (1.16%)	140,303 (37.06%)

[5] *Separate classifications of area for Hills Districts are not available. All included under Barren & Unculturable Land*

Sl. No.	District	Geographical Area (Area in Hectare)	Forest (Area in Hectare)	Non-Agricultural land (Area in Hectare)	Barren and Uncultivable Land (Area in Hectare)	Uncultivated Land (Area in Hectare)	Fallow Land (Area in Hectare)	Agricultural Land (Area in Hectare)
14	**Kamrup**	310,500	79,961 (25.75%)	47,743 (15.38%)	10,910 (3.51%)	45,724 (14.73%)	12,438 (4.01%)	113,724 (36.63%)
15	**Nalbari**	105,200	0 (0.00%)	18,730 (17.80%)	7,445 (7.08%)	5,972 (5.68%)	3,664 (3.48%)	69,389 (65.96%)
16	**Darrang**	158,500	7,927 (5.00%)	18,417 (11.62%)	14,214 (8.97%)	16,043 (10.12%)	8,442 (5.33%)	93,457 (58.96%)
Total		**5,156,600**	**1,277,850 (24.78%)**	**828,770 (16.07%)**	**637,501 (12.36%)**	**349,493 (6.78%)**	**131,913 (2.56%)**	**1,931,068 (37.45)**

Source: Statistical handbook 2015

3.1.8 Natural Calamities

3.1.8.1 Earthquake

The North-eastern region of India is an earthquake prone area and falls under Zone V. The region has experienced a large number of earthquakes of tectonic origin. The risk probabilities of earthquake are less over the entire Brahmaputra valley. The region of Northeast India is seismically very active. All the subproject districts fall under the seismic Zone V.

3.1.8.2 Flood:

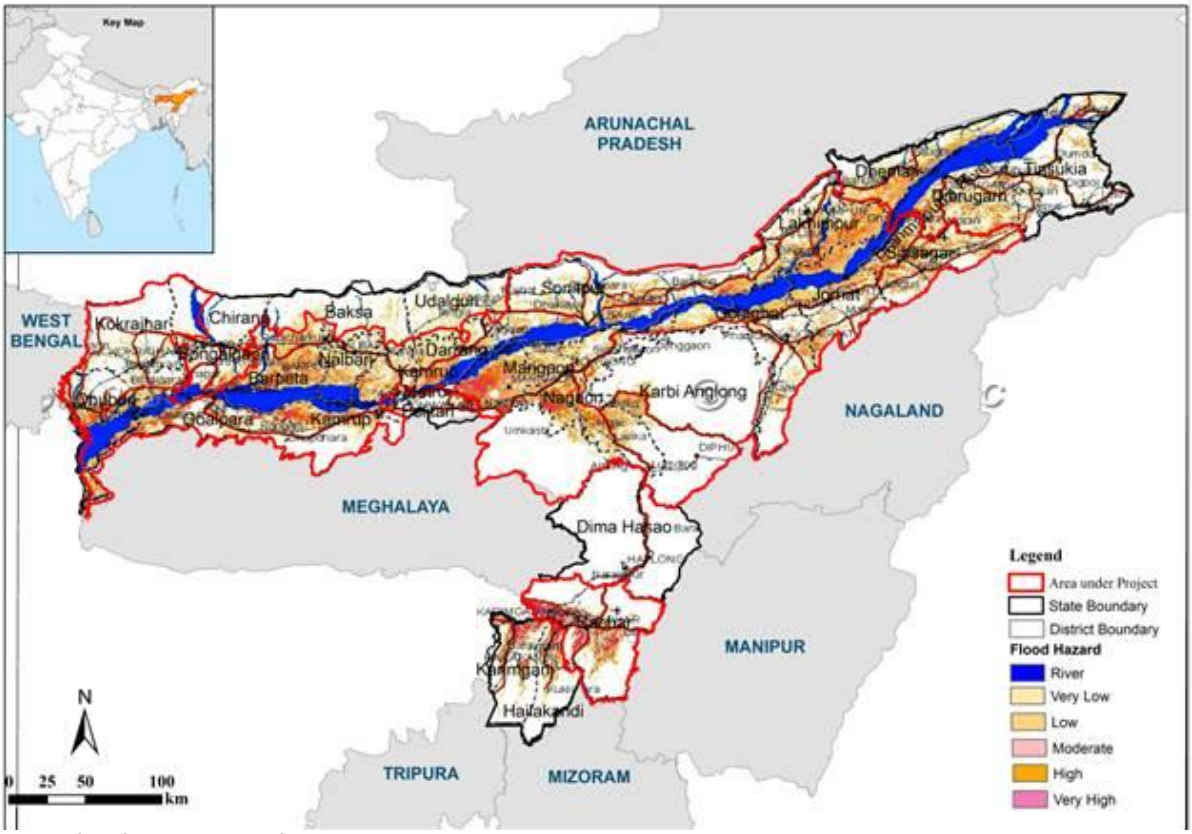
Every year Brahmaputra and Barak River basin experiences flood and the farmers are the worst-affected as they incur heavy loss in terms of standing crops as well as fishery, poultry and farm animals. Except Karbi Anglong all the project districts are vulnerable to flood. Refer **Figure 10**.

Source: Maps of India

Figure 9: Seismic Zones

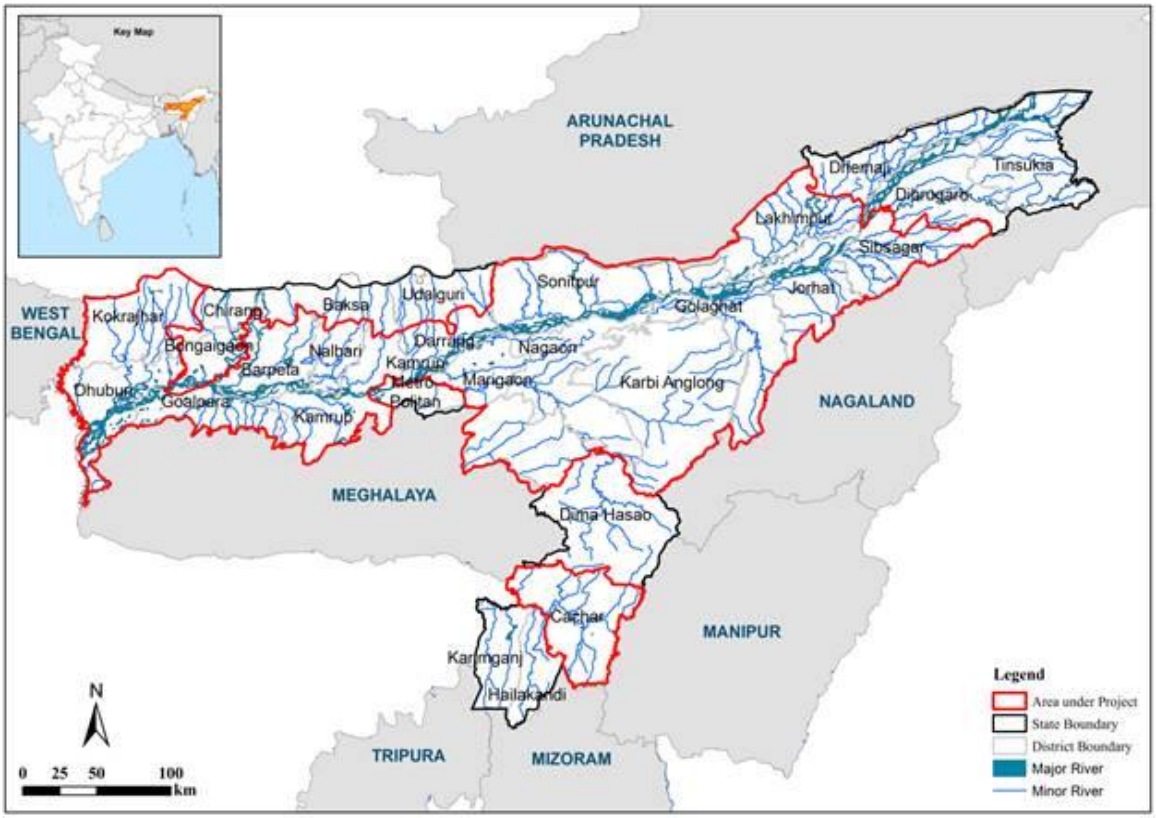
3.1.9 Water Resource

The drainage pattern is mainly governed by Brahmaputra Basin with sub basin of Subansiri, Jia Bharali, Badeng-Pubnoi, Dhansiri, Manas, Champamati Kalang. Meghna Basin with sub Basin of Barak River. Apart from rivers, Assam has numerous wetlands, Beel and Pond. In Assam, there are 690 lakes and ponds as recorded. This constitutes about 0.20 percent of the total geographical area of the state and 15.30 percent of the total area under wetlands. As per the Central Ground Water Board (CGWB), the state level record of ground water development is 22%, which is considered as safe category. There are no overexploited zones in the Assam.



Source: National Remote Sensing Center

Figure 10: Flood Zone Map



Source: bhuvan.nrsc.gov.in

Figure 11: River Map of Project Area

3.1.10 Wetlands

Wetlands are unique ecosystems which provide water and habitat for a diverse range of plants and animals. Natural wetlands occur where surface water collects or where groundwater discharges to the surface. Wetlands that contain water all year round are called permanent wetlands and those that fill seasonally are called temporal wetlands. The various types of wetlands found in Assam are as follows. An Aquatic Management Plan has been prepared and enclosed in the **Annexure 5**.

Sl. No	Wetland Category	Significances
1.	Lakes / Ponds	There are 690 lakes and ponds recorded in Assam. These lakes/ ponds cover an area of 15494.00 ha which constitutes 0.20 percent of the total geographical area of the state and 15.30 percent of the total area under wetlands.
2.	Ox-bow Lakes / Cut-off Meanders	A total of 861 number of ox-bow lakes/cut-off meanders are observed throughout the state of Assam, covering an area of 15460.60 ha which constitutes 0.20 percent of the total geographical area of the state and 15.27 percent of the total area under wetlands
3.	Swampy/Marshy areas	A total of 712 number of swampy/marshy areas have been identified from satellite data which cover an area of 43433.50 ha constituting 0.55 percent of the total geographical area of the state and 42.91 percent of the total area under wetlands
4.	Reservoirs	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
5.	Tanks	A total of 115 number of tanks are identified from satellite data. Majority of this type of wetlands have low turbidity

Source: State of Environment of Assam

Table 8: Wetlands under each project districts

Sl. No.	District	No. of Beel Fisheries	Area (in Hect.)
1	Barpeta	23	6,299
2	Cachar	75	3,359
3	Darrang	27	5,959
4	Dhubri	156	7,000
5	Goalpara	57	6,820
6	Golaghat	15	2,600
7	Jorhat	124	6,298
8	Kamrup	59	1,418
9	KarbiAnglong	19	60
10	Kokrajhar	14	955
11	Lakhimpur	20	6,499
12	Morigaon	84	8,300
13	Nagaon	134	9,919
14	Nalbari	19	2,248
15	Sivasagar	66	3,878
16	Sonitpur	60	7,032
Assam		**3,197**	**100,817**

Source: Statistic Hand Book of Assam, 2015

4. APPLICATION OF ENVIRONMENTAL MANAGEMENT FRAMEWORK

4.1 INTRODUCTION

The Environmental Management Framework (EMF) provides guidance on how environmental aspects shall be identified, assessed and managed during the subproject implementation. Specific project locations have not been clearly identified at this stage, hence it provides a general impact identification framework to assist ARIAS Society to screen the projects and institute measures to address adverse environmental impacts.

4.2 STEP 1: SCREENING

Screening is the process by which the appropriate level and type of Environmental assessment (EA) is determined for a given project on the basis of its likely environmental impacts. For identification of sensitive sub-projects with respect to the environmental issues a screening and review process has been worked out. This exercise will be a useful tool to identify the environmental issues and integrate them into the project preparation, and not as an exclusion criterion for avoiding environmental impacts. The OPIU/ DLCC (Line Departments) will carry out screening exercise for all proposed subproject interventions (department wise) to be further identified in the subsequent stages of the project prior to initiation of the activities. The screening criteria shall include the following environmental factors (not limited to):

- Sensitive areas, natural habitats, protected areas
- Felling of trees in the subproject area
- Clearance of vegetative cover
- Presence of water bodies (pond, lake, beel etc.,)
- Loss of productive agricultural land
- Cuts across perennial streams or surface water bodies
- Vulnerability to natural hazards, landslides/slips and
- Environmental features as marshy areas, barren land etc.

(i) Desk Study: To collect the secondary information and chalking out the methodology for carrying out EA study and fixing of responsibilities of EA team members. The desk study shall include

- Gathering and reviewing existing environmental data (Secondary Data) relevant to theproposed development. The secondary data shall include climate, soil type, geology, seismic activity, hydrology, biodiversity (flora and fauna) etc
- Collect literature and secondary information on environmental studies or some case studies/ project documents with respect to agriculture, livestock development, irrigation etc., in the project influence area

(ii) Reconnaissance survey: To collect the first hand information about the project area and develop a perspective of the entire team and revise the methodology and work programme.

- Verifying the data collected during desk study, assessing the likely impacts, identifying the major/main issues and preparing the methodology for detailed investigation. Sample Survey / inventory formats for all sectors (New projects and Enhancement of Existing activities) are enclosed in the **Annexure 6.**

(iii) Screening Statement: compiles the primary & secondary data thus collected, and checking with the legal framework of State and National level and World Bank policies thus suggesting the requirement/category of Environmental Assessment (EA) Required.

- The proposed subproject interventions are not in the ambit of the projects that requires Environmental clearance (category A and B) from the state and national levels. However, if the project activities are proposed near environmental sensitive areas / protected areas, the general condition of the EIA notification dt 14th September, 2006 shall be refered for the type of EA requirement
- In view of the World Bank Safeguard Policies, with an exemption to "Component D" (which deals with the capacity development) all other "Components (A, B and C)" shall have significant environmental and social impacts related to infrastructure development and its operation of the project clusters. Hence the subproject activities/ interventions shall be categorised and the type of EA requirement shall be decided based on the significance of the environmental Impacts which is detailed as follows

Project Category	Key decision criteria	Indicative List of projects
Category A	• Significant adverse impacts that are sensitive, diverse, or unprecedented, or that affect an area broader than the sites or facilities subject to physical works • Conversion/alteration of natural habitats • Significant quantities of hazardous materials • Major resettlement	• Large-scale agriculture, aquaculture; agro industries, production forestry, solid waste collection and disposal, hazardous waste management and manufacture and large-scale use of pesticides
Category B (Compared with Category A)	• Potential impacts less adverse & more limited, fewer, site-specific, likely reversible • Mitigation measures can be more easily designed/implemented	• Small-scaleagricultural, aquaculture; agro industries, rural development projects, production forestry, solid waste collection and disposal
Category C	• Expected to have no adverse environmental impacts, or only minimal impacts easily and fully mitigated through routine measures	• Projects with no impacts (Green Industries)
Category F1	• Project provides funds to a bank, credit institution, etc. for on-lending at FI's own risk (OP/BP 8.30 – FI lending)	

4.3 STEP 2: ENVIRONMENTAL ASSESSMENT (EA)

The assessment process will constitute a systematic approach to the evaluation of a project in the context of the natural, regulatory and environment of the area in which development is proposed

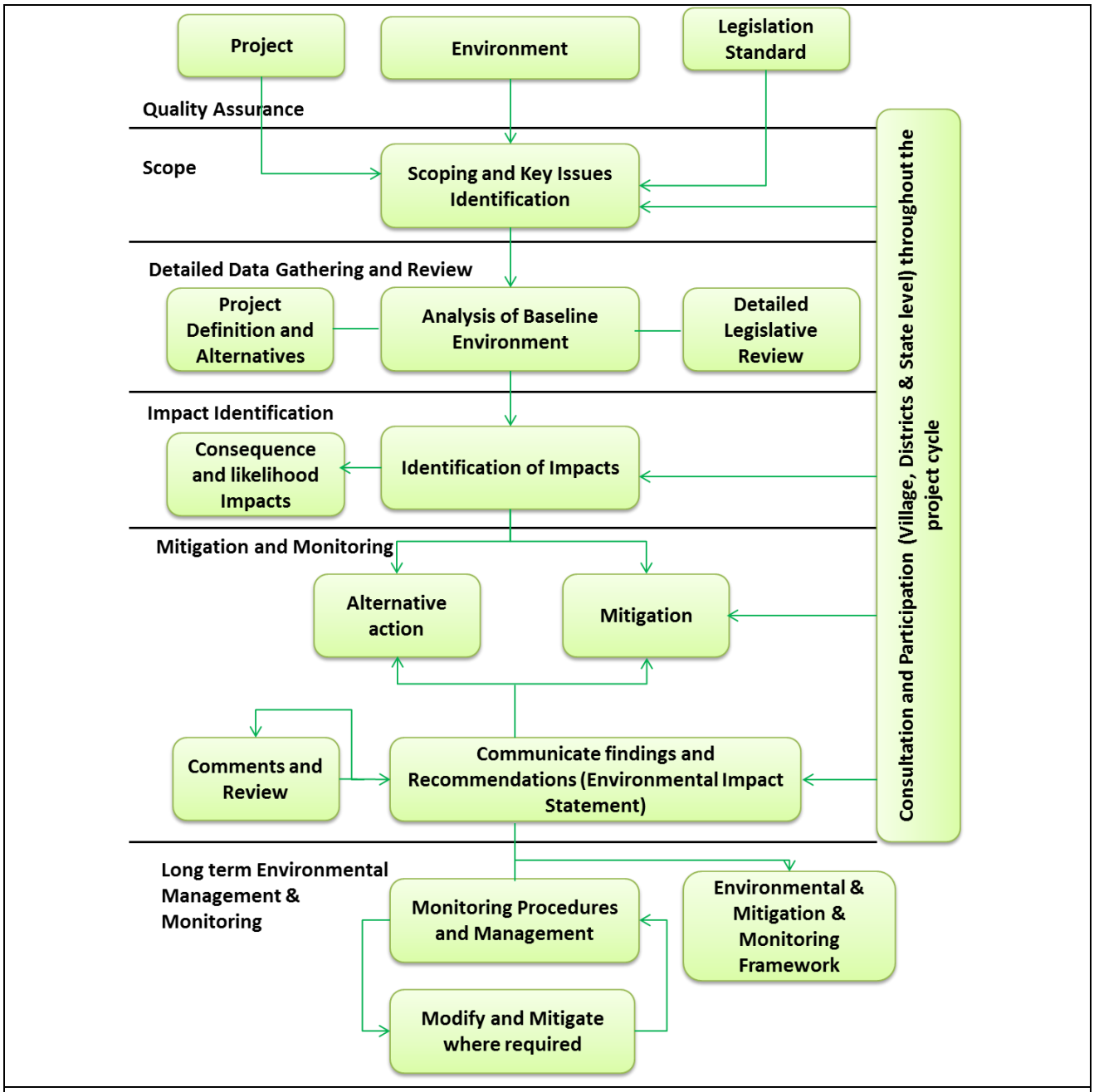


Figure 12: Environmental Assessment Process - Flow Chart

4.3.1 Scoping

The next step in the EA will be to define the proposed project activities and the natural, regulatory (i.e. legal) and environment of the area in which development will occur. This will be achieved through Scoping. Scoping will identifies which of the project interventions/ activities has a potential to interact with the environment. Scoping will be conducted early in the EA process so that a focus on the priority issues (i.e. those that have the greatest potential to affect the natural and/or environment) can be established for the rest of the EA process.

Key elements/inputs to the Scoping exercise will be as follows:

- Gathering and reviewing existing environmental data like land availability, type of land use pattern (agriculture, residential, commercial, forest area, barren land etc.), Human settlements (if any), drainage pattern, surrounding water bodies, cultural heritage sites/ archaeological importance, eco sensitive areas etc.

- Identifying project stakeholders; including Agriculture Department, Industries and commerce Department, Fisheries Department, Animal Husbandry & Veterinary Department, PWD, Panchayat & RD Department, Handloom textile and sericulture Department, Autonomous Entities etc.
- Assemble and review relevant legislative requirements, environmental standards and guidelines (national and international) associated with the proposed development as well as World Bank's operational policies and standards.
- Gathering existing information sources and local knowledge;
- Informing stakeholders of the project and its objectives and get input on the EA;
- Identifying the key environmental concerns (community and scientific) related to a project and the relative importance of issues;
- Defining/preparing the EA work program, including a plan for public and stakeholder involvement;
- Carrying out monitoring of natural environment including air, water, soil, noise etc.
- Defining the range of project alternatives to be considered.
- Obtaining agreement/consensus on the methods and techniques to be used in EA studies and document preparation;
- Determining/freezing the spatial and temporal boundaries for the EA studies.

Focus of Scoping will be on the collection and analysis of pertinent data and the assessment of significant environmental attributes. The following issues will be addressed through Scoping, but will not be limited to.

- To improve the quality of EA information by focusing scientific efforts and EA analysis on truly significant issues;
- To ensure environmental concerns identified and incorporated early in the project planning process, at the same time as cost and design factors are considered;
- To ensure research efforts are not wasted on insignificant issues, rather focused on core issues.
- Reducing the likelihood of overlooking important issues;
- Thinning the chance of prolonged delays and conflicts later in the EA process by engaging stakeholders in a constructive participatory process early in the EA process

4.3.2 Environmental Impact Assessment

Following Scoping, assembled legislative requirements, project/ subproject interventions, environmental and socio-economic data will be assessed in greater detail to ensure that all of the proposed activities and their consequences / likely impacts are considered in full.

4.3.3 Existing Environmental Conditions

In order to identify any potential impact on and potential change to the natural and socio-economic environments, the existing baseline environmental data are to be collected. Baseline data includes collection of primary and secondary information belonging to Meteorology (climate, rainfall, temperature, wind direction, humidity, cloud cover etc.,), Soil quality, Water quality, Air quality, Noise quality, Land use, Geology, Topography, Hydrogeology, Surface and Groundwater sources, Cultural properties, Seismicity, Biodiversity (flora & fauna), protected and reserve forests and socio – economic profile of the project area.

4.3.4 Assessment of Policy and Regulations

Regulatory and administrative framework at the national and state level, applicable World Bank requirements are presented in **Chapter 2: Environmental Regulatory Framework**.

4.3.5 Impact Prediction

Impact prediction being the challenging and controversial stage of the EA process will be dealt with carefully. Reliable methods (as per MoEF&CC) available for predicting some environmental parameters, e.g. air quality impacts should be used, whereas other predictions should be based on professional judgment as these will be qualitative and no reliable models exist for quantification of the predicated impacts e.g. impacts of construction activity on animals/cattle.

4.3.6 Analysis of Alternatives

Analyses of various alternative options for the project are to be assessed for varying level of impacts and their addressal as part of the EA. The best alternative with respect to the subproject interventions, social and environmental aspects are to be considered for implementation. Various alternatives including (i) With or without the project, (ii) Analysis criteria to include environmental, social, technical and economic options and (iii) Other project alternatives.

4.3.7 Stakeholder Consultation

Stakeholder consultations are an integral part of the project implementation process. The stakeholders are to be consulted atleast at two stages of the project, once in the initial stage of the project conceptualisation and alternative analysis and another after finalisation of the subproject interventions. Both stages of consultations are critical for the success of the project with the community.

4.3.8 Environmental Impacts Identification

As mentioned in the *section 1.3* (APART – Proposed Interventions) the project is having series of activities/ interventions which might cause some adverse environmental impacts that would fall under the Category B subprojects in accordance with the Bank OP/BP 4.01(small scale agro-industries; small scale rehabilitation, maintenance, and upgrading of various premises,storages; animal production; plantation of new orchards and/or vineyards, etc.). For such activities the Bank requires a simple and/or a partial Environmental Assessment and/or preparing an EnvironmentalManagement Plan.The potential adverse environmental impacts of proposed types of subprojects might be summarized as follows

- ***Agricultural production***: soil erosion, loss of soil productive capacity, soil compaction, soil pollution, surface and underground water pollution, loss of biodiversity;
- ***Agro-processing***: contribution to surface water pollution, wastes generation, odor;
- ***small scale construction and/or rehabilitation of the existing premises***: soil and air pollution; acoustic, construction wastes, and potential asbestos issues, etc.

Table 9: Potential negative impacts generated by sectorial and construction activities

Project Category	Potential Impacts	Level of Significance
Agro-processing	• Water and energy consumption • Water pollution • Waste disposal • Air quality • Human health and safety	High High High Moderate Moderate
Agriculture	• Soil degradation (soil erosion, loss of Soil organic content, compaction, etc.) • Soil and water pollution • Loss of agricultural biodiversity (e.g., due to cattle grazing) • Human health and safety	High High High Moderate

Project Category	Potential Impacts	Level of Significance
Construction (Construction Phase)	• soil erosion • soil pollution • land degradation/ aesthetics • air pollution • acoustic • water pollution	Moderate High High Moderate High Moderate
Operation Phase	• Soil Pollution • Air pollution • Water Pollution • Waste Disposal	Moderate Moderate Moderate High

Anticipated Environmental Impacts and Mitigation Measures for all sectors (Agriculture and Horticulture, Dairy, Fishery, Piggery, Sericulture handloom and Textile) proposed under APART have been discussed in the **Annexure 7**.

4.3.9 Determining Degree of Impact

Once all project environmental aspects are identified, the level of impact that may result from each of the activity/ intervention -receptor interactions will be assessed. In assessing the level of impact that an activity may cause, two key elements are considered namely:

- **Consequence**: the resultant effect (positive or negative) of an activity's interaction with the legal, natural and/or socio-economic environments; the categorization for consequence is presented in **Table 10** below.

Table 10: Consequence categories and rankings

Consequence Category	Addressed
Catastrophic	Most Severe, Alternative will be proposed
Major	Severe, alternative/avoidance will be proposed
Moderate	Less Severe, measures will be proposed to minimize impact
Minor	Lesser Severe, mitigation measures will be proposed
Negligible	Least Severe, mitigation and enhancement measures will be prepared.
None	No impact, enhancement measures will be proposed.
Positive	Positive Impact

- **Likelihood**: the likelihood that an activity will occur. The categorization for likelihood is presented in **Table 11** below.

Table 11: Likelihood categories and rankings

Likelihood Category	Definition
Very Likely	The activity is very likely to occur under normal operating condition
Likely	The activity is likely to occur at some time under normal operating condition
Unlikely	The activity is unlikely to occur but may occur at some time under normal operating conditions
Very unlikely	The activity is very unlikely to occur under normal operating conditions but may occur in exceptional circumstances.

4.3.10 Mitigation and Monitoring Plan

Mitigation measures are an integral part of impact evaluation. It looks for better ways of doing things so that the negative impacts of the projects/ subprojects are eliminated or minimized and the benefits are enhanced. As soon as significant adverse impacts are identified, discussions should be held to see if they can be 'designed out' through changes in project interventions, location or operation. For measures that were unavoidable, the Environmental Management Plan should address the anticipated impacts. The Environmental management Plan should also have Environmental Monitoring Plan for the environmental attributes which shall be measured at site. The Environmental management Plan should

be enclosed/ attached in the Bid Document following appropriate Environmental Protection clauses (refer **Annexure 8**) in the Technical specification for effective implementation of the EMP during the project construction.

4.3.11 Environmental Guideline for Individual Sectors

Sector specific environmental guidelines including the site selection, infrastructure requirements, construction management, waste management, integrated pest management etc., have been prepared to guide the ARIAS Society in preparing the project specific environmental code of conduct for Contractor. The guidelines are presented as **Annexure 9** for reference and implementation in the Environmental Management Plan for the specific projects.

5. STAKEHOLDERS CONSULTATIONS

In accordance with the World Bank Safeguard policies, public consultations were conducted with local farmers and other stakeholders (officials of project administration, ARIASS and line department officials/staff) Their opinions and concerns have been taken into account in preparing the Environmental Management Framework (EMF). This chapter provides information on the stakeholder consultations conducted at various districts where project is being planned.

5.1 SECTOR WISE CONSULTATION

The stakeholders' consultation has been organized to ascertain the environmental benefits and risks associated with the subproject implementation for various sectors (including Fishery, Dairy, Sericulture, Piggery, Agriculture and Horticulture).The Stakeholders Consultation has been carried out with the following objectives:

- To find out whether the communities are likely to accept the measures suggested under the APART
- To find out whether these measures have no or little environmental impacts on the communities; and
- To assess the present situation in these areas on how people are coping with the climate changes

The sample subproject locations at Nagaon, Kamrup, Morigaon, Jorhat and Sivsagar districts have been visited and a formal interaction has been carried out with the aggregators, feed suppliers, Market and farmers (The sector wise detailed consultation has been presented in **Annexure 10**). The summary of the consultation outcome has been depicted in the following Table.

Table 12: Stakeholder Consultations at sample project areas.

Sectors	Venue & date	Observation
Fishery	**Village**: Godaimari and Sullong (Fish Market) **District**: Nagaon **Date**: 15.09.2016	• Poor condition of the existing link/ approach road • Inadequate transportation facility • Non-availability of quality seeds • Lack of training among farmers (not aware of apt cultivation methods and modern techniques) • Improper waste disposal and unhygienic practice • High yield of hybrid varieties has led to an increased use of them. The farming of local varieties has been reduced drastically and it causes a direct threat to the local fish population • Migratory bird population has been reduced due to the unavailability of suitable vegetation for shelter • Lack of ice plant in the market for preservation

Meeting at the Fish Market

View of Juria village Fish pond

Sectors	Venue & date	Observation
Dairy (Production Cluster)	**Village**: Rangia andHoja, **District**: Kamrup **Date**: 19.09.2016	• Unavailability of grazing land • Lack of proper milk carrying vehicles and small scale mills in their locality • Non-functional veterinary department. • Road which leads to the market is in poor condition; moreover the location of the market is far from the village. Due to longer travelling distance, sometimes the milk gets spoil/ deteriorated • Lack of vaccination and treatment facilities. • Farmers are unaware of conserving local breeds. • High cost and poor supply of input materials. • Lack of Solid waste management
Dairy (Dairy Plant)	**Village**: Khanajan (MPI)&BMC unit, Purabi Dairy **District**: Morigaon **Date**:19.09.2016 & **Village**: Guwahati (Purabi Dairy Plant) **District**: Kamrup **Date**: 20.09.2016	• BMC unit does not have proper waste disposal site. The waste water has been discharged in the nearby agriculture field • Chemicals like Sulfuric acid, Isoamyl alcohol is used for calibration of the instruments • Safety and hygienic methods are not adopted (like, gloves, hair caps, masks, proper wash basin, first aid box, etc.) by the workers. • Purabi Dairy Plant has an ETP with 2 lakhs capacity, the treated water has been discharged into the city drains
		
Cattle Farm at Morigoan		**Milk Testing Unit**
Sericulture	**Village**: KhongiaNazira **District**: Sivasagar **Date**:28.09.2016 & **Village**: Deoghoria (Titabor) for Eri and Mulberry **District**: Jorhat **Date**: 29.09.2016	• Lack of modern reeling machines. • Non-availability of land and Village Grazing Reserve (VGR's). • Chemicals, fertilizers and pesticides are not used by the farmers. • Lack of training and modern facilities. • Usage of firewood for processing purposes (boiling water). • Unavailability of proper Grainage house. • Unavailability of air conditioned cocoon carrying vehicles. • Lack of solid waste management practices • Farmers are not aware of diseases like allergic cough, skin itches, lung diseases, etc., due to sericulture

Sectors	Venue & date	Observation
		
Meeting with Mulberry Silk farmers		**View of Sericulture activities**
Handloom and textile	**Village**: Choladhora **District**: Jorhat **Date**: 28.09.2016	• No proper market facility is available for the farmers. • Non-availability of feeds and nursery. • Lack of training and modern facilities, which has forced the farmers to follow their traditional methods
		
Discussion with Department Officials		
Piggery	**Village**: Gobardhan **District**: Kamrup **Date**:	• Mortality rate among species is very high; • Inadequate extension service by AH &V Department; • Inadequate marketing facility, traditional marketing; • Unhygienic waste disposal practice at slaughter houses leading to health hazard; • Traditional way of farming; and • Use of locally available cheaper feeds.
		
Interaction with Pig Farmer		**Slaughter House at Gobardhan**

6. ANALYSIS OF POTENTIAL ENVIRONMENTAL IMPACT AND MITIGATION MEASURE

This chapter details the anticipated environmental impacts and mitigation measures under various components that are proposed under this project (APART). The impacts are predicted based on the site visits and in consultation with the line departments. The following sections will highlight the components and subcomponents interventions that are likely to impact the environment.

6.1 COMPONENT – A: ENABLING AGRI ENTERPRISE DEVELOPMENT

The objective of this component is to enable investments in agriculture enterprises, improve investment environment and promote investment, reduce business and transaction costs, facilitate access to finance for agribusiness MSMEs and where appropriate, facilitate process and regulatory changes.

The key activities to be financed include:

(i) investor outreach programs (road shows, investor meets), sector scan and resource mapping studies, value chain studies, organizing trainings, workshops, and exposure visits;

(ii) hiring services of consulting firm to assist MSMEs in preparing business plans, establishing mentor networks, and post investment incubation services;

(iii) contributing capital for the investments made by the fund, the technical assistance facility to be managed by the fund, and the fund management fee; and

(iv) technical assistance to the proposed sector stewardship councils to improve overall value chain and to develop a market based vision and strategic action plan for each value chain

From the proposed activities, it is evident that the implementation of the component – A shall not have any impact on the environment. However, unknowingly there are possibilities that the investments in agriculture enterprises shall have significant environmental impacts. Hence in order to avoid that, a note/ guideline (**Annexure 11a**) have been prepared for reference to screen the projects in the initial stage itself.

6.2 COMPONENT – B: FACILITATING AGRO CLUSTER DEVELOPMENT

The objective of this component is to enhance competitiveness of agri enterprises in specific geographic clusters, and upgrade infrastructure for agricultural trade, in these clusters to enable producers and other value chain participants to access new markets.

The key activities to be financed include:

(i) hiring the services of cluster facilitation teams for mobilizing and building the capacity of agri enterprises into IA, and partial financing for the IAs plans through grants;

(ii) modernizing and upgrading warehouses, markets and rural roads;

(iii) technical assistance for preparing detailed architectural designs and work estimates; and

(iv) hiring independent field engineers for review and quality assurance of civil works

The modernization and upgradation of the warehouse, market and roads shall have significant environmental impacts. Hence Environmental Management Plan (EMP) has been prepared for specific subcomponents (warehouses, markets and Roads) and have been attached with this document (refer **Annexure 11b**). The prepared EMP shall also be included in the Bid Document, so as to enforce the Contractor to implement EMP during the project construction. Environmental protection clauses (**Annexure 8**) have also been developed that has to be included in the Technical Specification of the bid document. The EMP talks about various anticipated environmental impacts and mitigation

measures, it also includes necessary project clearance that has to be obtained by the Contractor from the competent authorities.

6.3 COMPONENT – C: PRODUCTION CLUSTERS

The objective of this component is to enable producers of the priority value chains, in the targeted clusters, to take advantage of the rapidly changing market demand, and enhance resilience of agriculture production systems for increasing production and managing risks associated with climate change

The key activities to be financed include:

(i) upgrading technology, breed quality, and management practices of priority value chains, through demonstrations, training and capacity building of producers and line department staff;

(ii) hiring services of consulting firms/NGOs to mobilizing and organizing farmers and establish FPOs as well as provide technical assistance and market linkage services to these FPOs and implementing the financial services activities;

(iii) matching grant to finance demand-driven investments to FPOs, for establishing CSCs; and

(iv) program cost for collaboration with CGIAR centres and other relevant agencies

The key environmental impacts that are anticipated from the Component – C are towards the implementation of the production clusters. The major construction related environmental impacts are anticipated in the implementation of the Common Service Centers (CSC's). For construction of the CSC's an Environmental Management Plan (EMP) has been prepared and enclosed as **Annexure 11c-1**. The prepared EMP has to be included in the Bid document along with the Environmental Protection clauses (**Annexure 8**) so as to enforce the Contractor to implement EMP during the project construction. Environmental impacts and mitigation measures for selected agro-products are also prepared and enclosed in the **Annexure 11c-2**. The prepared mitigation measures shall assist the line departments in managing the environmental impacts during the Productivity Enhancement; Infrastructure allied activities and Processing, Grading and Value Addition etc.

6.4 COMPONENT – D: PROJECT MANAGEMENT, MONITORING AND LEARNING

Environmental Impacts are not anticipated under this Component – D during implementation. However as part of the capacity building, environmental safeguard training has been proposed at various levels (PMU/ OPIU / DLCC and ATMA's) for successful implementation of the EMF.

7. PEST MANAGEMENT PLAN (PMP)

The pest management issues which can be potentially raised by the project may relate to possible indirect effect of stimulating greater use of agro-chemicals associated with more intensive cultivation and/ or higher crop value. The objective of EMF in this regard is to encourage adoption of Pest Management Plan (PMP) approach and increase beneficiaries' awareness of pesticide-related hazards and good practices for safe pesticides use and handling as well as to provide relevant training and information dissemination activities. The following table depicts the necessary annexures that have been prepared for easy reference

Sl. No	Pesticide Management Measures	References
1.	Pest Management Plan (PMP)	**Annexure 12**
2.	Hazardous Class II, 1a and 1b – Pesticides (not allowed to use) as per World Health Organization (WHO)	**Annexure 12a**
3.	List of Recommended Pesticides (shall be used) and Banned Pesticides(not allowed to use)	**Annexure 12b**
4.	Disposal of Pesticide Containers and Safety Measures for Pesticide Applications	**Annexure 12c**

7.1 PRINCIPLES OF THE PEST MANAGEMENT PLAN

The primary aim of pest management plan is to manage pests and diseases that may negatively affect production of crops so that they remain at a level that is under an economically damaging threshold. Pesticides should be managed to reduce human exposure and health hazards, to avoid their migration into off-site land or water environments and to avoid ecological impacts such as destruction of beneficial species and the development of pesticide resistance. Pest management plan consists of the judicious use of both chemical and nonchemical control techniques to achieve effective and economically efficient pest management with minimal environmental contamination. PMP therefore may include the use of:

- Mechanical and Physical Control;
- Cultural Control;
- Biological Control, and
- Rational Chemical Control

Pest Management Plan is to enhance Integrated Pest Management (IPM) within the project implementing areas of different agro-clusters in the state of Assam. IPM is the use of multiple techniques to prevent or suppress pests in a given situation. Although IPM emphasizes the use of nonchemical strategies, chemical control may be an option used in conjunction with other methods. Integrated pest management strategies depend on surveillance to establish the need for control and to monitor the effectiveness of management efforts. World Bank Group in the Environmental, Health, and Safety Guidelines prepared in 2007 provides the following stages should be considered when designing and implementing an Integrated Pest Management Strategy, giving preference to alternative pest management strategies, with the use of synthetic chemical pesticides as a last option. As a first essential step, those who make pest management decisions should be provided with training in identification of pests and beneficial (e.g. natural enemy) species, identification of weeds, and field scouting methods to evaluate which pests are present and whether they have reached an economic control threshold (the density at which they begin to cause economically significant losses).

7.2 AGRO PESTS AND DISEASE IN ASSAM

Common pests and diseases, which are prevalent in the state of Assam, are detailed in the following **Table 13**.

Table 13: Agro Pest and Diseases in Assam

Sl. No	Crop	Key Insect Pests	Key Diseases
1.	Rice (Autumn, Summar Winter, Bao&Boro rice)	Stem borer, Leaf folder, Rice bug, Whorl maggot, Gall midge, mealy bug Nematode (*Melodogyne graminicola*)	Blast, Brown spot, Sheath blight, Bakane
2.	Rapseed/ Mustard	Leaf webber, Aphid, Saw fly	Alternaria blight, Downy Mildew, White Rust
3.	Lentil	Aphid, Pod borer, Storage pest (*Bruchid*)	Fusarium wilt, White blight, Rust
4.	Maize	Stem or stalk borer, Pink borer, Termite, Cut worm, Aphid, cob borer	Banded blight, Maydis leaf blight, Turcicum leaf blight, Pythium stalk rot, Charcoal rot.
5.	Black gram	Aphids, Pod borer, Pod bug, Gren stink bug, Spotted pod borer, Bihari Hairy caterpillar	Cercospora leaf spot, Powdery mildew , Anthurrium, Yellow Vein Mosaic Virus (YVMV), Leaf crinkle
6.	Pea	Pod borer, Leaf miner, aphid	Fusarium wilt, Ascochyta blight, Yellow Vein Mosaic Virus (YVMV)
7.	Cauliflower	Cut worm, Diamond black moth, Tobacco caterpillar, aphid	Damping-off, Black leg, Black rot, Alternaria leaf spot, Downy mildew, Hollow stem
8.	Cabbage	Cut worm, Diamond black moth, Tobacco caterpillar, aphid	Damping-off, Black leg, Black rot, Alternaria leaf spot, Sclerotinia white rot
9.	Tomato	White fly, Fruit borer, Aphid, Leaf miner	Fusarium wilt, Bacterial wilt, Late blight, Early blight, Tomato leaf curl virus, Tomato spotted wilt virus disease
10.	Brinjal	White fly, Fruit borer, Aphid, Leaf miner	Fusarium wilt, Bacterial wilt, Late blight, Early blight, Tomato leaf curl virus, Tomato spotted wilt virus disease
11.	Potato	Potato tuber moth, Cut worm	Late blight, early blight, Bacterial wilt Potato leaf roll virus
12.	Onion	Thrips	Purple blotch, Stemphyllium leaf blight, Basal rot
13.	Pumpkin	Fruit fly, Cut worm, Red pumpkin beetle	Anthracnose, Powdery mildew, Downy mildew
14.	Okra	Fruit and shoot borer	YMV, Okra enation leaf curl virus disease
15.	Ginger	Shoot borer, Leaf roller, Nematode	Rhizome rot, Phylocsticta leaf spot
16.	Turmeric	Leaf roller, Shoot borer, Nematode problem	Taphrina laf blotch, Colletotrichum leaf spot
17.	Papaya	Papaya mealu bug	Damping-off, Stem/foot rot, Anthracnose, Papaya leaf curl virus disease, Papaya Ring Spot Virus disease
18.	Banana	Banan aphid, Pseudostem borer, Rhizome Weevil,	Panama wilt, Sigatoka leaf spot, Rhyzome rot, Banana Bunchy top virus disease

Source: Directorate of Economics & Statistics, Assam & Directorate of Agriculture, Assam

7.3 ALTERNATIVES TO PESTICIDE APPLICATION

Where feasible, the following alternatives to pesticides should be considered:

- Rotate crops to reduce the presence of pests and weeds in the soil ecosystem;

- Use pest-resistant crop varieties;
- Use mechanical weed control and / or thermal weeding;
- Support and use beneficial organisms, such as insects, birds, mites, and microbial agents, to perform biological control of pests;
- Protect natural enemies of pests by providing a favourable habitat, such as bushes for nesting sites and other original vegetation that can house pest predators and by avoiding the use of broad-spectrum pesticides;
- Use animals to graze areas and manage plant coverage;
- Use mechanical controls such as manual removal, traps, barriers, light, and sound to kill, relocate, or repel pests

7.4 PEST MANAGEMENT PLAN

The Pest Management Plan shall contain pest management requirements, outlines the resources necessary for surveillance and control. The Plan should provide guidance for operating and maintaining an effective pest management program/ activities. Pests considering in the plan may be weeds and other unwanted vegetation, crawling insects and other vertebrate pests. Without control, these pests provoke plants' deceases. Adherence to the plan will ensure effective, economical and environmentally acceptable pest management and will maintain compliance with pertinent laws and regulations (including WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification, 2009). The Pest Management Plan prepared for the agriculture and horticulture Sector is presented in the **Annexure 12**.

7.5 PESTICIDE APPLICATION

If the use of pesticide application is justified, then the users are recommended to take the following actions:

- Train personnel to apply pesticides and ensure that personnel have received applicable certifications or equivalent training where such certifications are not required;
- Review and follow the manufacturer's directions on maximum recommended dosage or treatment as well as published reports on using the reduced rate of pesticide application without loss of effect, and apply the minimum effective dose;
- Avoid routine "calendar-based" application, and apply pesticides only when needed and useful based on criteria such as field observations, weather data (e.g. appropriate temperature, low wind, etc.),
- Avoid the use of highly hazardous pesticides, particularly by uncertified, untrained or inadequately equipped users. This includes:
    - Pesticides that fall under the World Health Organization Recommended Classification of Pesticides by Hazard Classes 1a and 1b should be avoided in almost all cases, to be used only when no practical alternatives are available and where the handling and use of the products will be done in accordance with national laws by certified personnel in conjunction with health and environmental exposure monitoring;
    - Pesticides that fall under the World Health Organization Recommended Classification of Pesticides by Hazard Class II, 1a and 1b (**Annexure 12a**) should be avoided if the project host country lacks restrictions on distribution and use of these chemicals, or if they are likely to be accessible to personnel without proper training, equipment, and facilities to handle, store, apply, and dispose of these products properly;
    - Avoid the use of pesticides listed in Annexes A and B of the Stockholm Convention, except under the conditions noted in the convention and those subject to international bans or phaseouts;
    - Use only pesticides that are approved by the WHO, that are slightly hazardous (Class III) and are unlikely to present acute hazards (Class IV). Kindly refer **Annexure 12b** for list of recommended pesticides and banned pesticides.
    - Use only pesticides that are manufactured under license and registered and approved by the appropriate authority and in accordance with the Food and Agriculture Organization's (FAO's) International Code of Conduct on the Distribution and Use of Pesticides;
    - Use only pesticides that are labelled in accordance with international standards and norms, such as the FAO's Revised Guidelines for Good Labelling Practice for Pesticides;

- Maintain and calibrate pesticide application equipment in accordance with manufacturer's recommendations. Use application equipment that is registered in the country of use;
- Establish untreated buffer zones or strips along water sources, rivers, streams, ponds, lakes, and ditches to help protect water resources;
- Avoid use of pesticides that have been linked to localized environmental problems and threats

7.6 PESTICIDE HANDLING AND STORAGE

Contamination of soils, groundwater, or surface water resources, due to accidental spills during transfer, mixing, and storage of pesticides should be prevented by following the measures.

- Store pesticides in their original packaging, in a dedicated, dry, cool, frost-free, and well aerated location that can be locked and properly identified with signs, with access limited to authorized people. No human or animal food may be stored in this location. The store room should also be designed with spill containment measures and sited in consideration of potential for contamination of soil and water resources;
- Mixing and transfer of pesticides should be undertaken by trained personnel in ventilated and well-lit areas, using containers designed and dedicated for this purpose
- Containers should not be used for any other purpose (e.g. drinking water). Contaminated containers should be handled as hazardous waste, and should be disposed (refer **Annexure 12c** for safe disposal of pesticides container) in specially designated for hazardous wastes sites.
- Purchase and store, no more pesticide than needed and rotate stock using a "first-in, first-out" principle so that pesticides do not become obsolete. Additionally, the use of obsolete pesticides should be avoided under all circumstances; a management plan that includes measures for the containment, storage and ultimate destruction of all obsolete stocks should be prepared in accordance to guidelines by FAO and consistent with country commitments under the Stockholm, Rotterdam and Basel Conventions.
- Collect rinse water from equipment cleaning for reuse (such as for the dilution of identical pesticides to concentrations used for application);
- Ensure that protective clothing worn during pesticide application (refer **Annexure 12c** for safety precautions to be adopted during pesticide applications) is either cleaned or disposed of in an environmentally responsible manner;
- Maintain records of pesticide use and effectiveness

8. SUPERVISION AND MONITORING

Supervision, monitoring and auditing requirement has been suggested to assess the efficacy and efficiency of the proposed system. Indicators for evaluation have been developed to ascertain the sustainability of the subproject interventions. To ensure a systematic assessment and evaluation of implementation, an audit mechanism has been developed. The frequency, scope of the audit has been detailed and the Audit Protocols would define the operations to be audited and aspects to be reviewed.

8.1 SUPERVISION AND MONITORING

Supervision and Monitoring of mitigation/ management measures as per the safeguard requirements will be done at two level i.e. Regular and Annual monitoring.

(i) **Regular monitoring** shall be carried out by the District Environment Specialist and Environmental Nodal Officer of the respective department under the District PIU. The regular monitoring will be based on the performance of environmental monitoring indicators **(Table 14)**, which have been identified and it is necessary to figure out from possible environmental concern, mitigation plan and with the help of initial consultations, regular monitoring will be done quarterly. The monitoring checklist has been prepared and given in the **Annexure 13**. The observations shall be included in the Quarterly Environmental Monitoring Report (QEMR).

(ii) **Annual monitoring** will be done by Environment Specialist at PCU/PMU and state level nodal officers at PIU. The method of monitoring includes monitoring environmental performance indicators (**Table 15**), desktop review, record check-up, management plan, and external site visit and stakeholder consultations.

Table 14: Environmental Monitoring Indicators

Sl. No	Environmental Parameters	Environmental Status – Monitoring Indicators
1	Soil Quality (nutrient)	• Amount of organic manure used • Number of improved compost units (pit, vermicomposting etc.,) • Ratio of N:P:K use • Area treated with green manure
2	Water Quality	• Water Quality Monitoring as per the **IS:2296 (Class C).** • Key parameters that has to be monitored includes pH, BOD, COD, DO coliform count, total suspended solids, total dissolved solids, Iron, etc
3	Air Quality	• Key parameters that are to be monitored includes Sulphur Dioxide (SO_2), Oxides of Nitrogen (NO_X), Carbon Monoxide (CO), Particulate matter (PM_{10}& $PM_{2.5}$) (refer National Ambient Air Quality Standards)
4	Noise Quality	• Parameters as specified in the Ambient Noise Quality standards
5	Pesticides/insecticides	• Amount of pesticides used (to ensure if it's used as indicated in the Integrated Pest Management Plan) • Expenditure on chemical pesticides
6	Soil and Water conservation	• Area treated with soil moisture conservation practices • Area under drip or sprinkler irrigation • Area under crop rotation • Area under intercrops
7	Groundwater level	• Number of percolation/recharge pits

Sl. No	Environmental Parameters	Environmental Status – Monitoring Indicators
		• Number of water harvesting structures • % fluctuation in water table
8	Livestock density	• Percentage of livestock that is stall-fed • Percentage increase in livestock health care through vaccination • percentage breed improvement through artificial insemination (AI)
9	Availability of green and dry fodder	• Area under fodder cultivation • Area under pasture development/protection • Number of chaff-cutters
10	Shifting Cultivation	• Area coverage under shifting cultivation • Productivity • Soil nutrient status • Soil moisture content • Area coverage under sustainable shifting cultivation

Table 15: Environmental Performance Indicators

Sl. No.	Sectors	Environmental Performance Indicators
1.	Agriculture	• Number of farmers implementing sustainable agriculture practices as a percentage of the total farmers in the sample size • Extent of area under sustainable agriculture practices supported by the project as a percentage of all agricultural area supported by the project • Increase in expenditure on agro-chemicals by households supported by the project (as compared to the pre-project situation) • Number of farmers undertaking water conservation measures as a percentage of the total farmers in the sample size • Extent of area under water conservation (recharge, harvesting, drip/sprinkler irrigation, etc.) as a percentage of all area that has been brought under irrigation through the project support in the sample size
2.	Dairy (livestock - cattle)	• Number of farmers undertaking better fodder management as a percentage of the total farmers in the sample size • Percentage increase in number of livestock (in sample villages) as a result of the livestock funded through the project support. • Percentage decrease in diseases/ death/ fatality to the livestock as a result of the livestock funded through the project support. • Increased milk productivity in comparison to the pre-project situation • Expansion of the farm area to cater the space for the increased number of livestock (cattle)
3.	Fishery	• Number of farmers undertaking sustainable fishery approach of the total farmers in the sample size • Percentage increase in fish production and income (in sample villages) as a result of the fisheries funded through the project support • Expansion of the waterbody for increased pisciculture practice
4.	Piggery	• Number of farmers undertaking better fodder management as a percentage of the total farmers in the sample size • Percentage increase in number of livestock (in sample villages) as a result of the livestock funded through the project support. • Percentage decrease in diseases/ death/ fatality to the livestock as a result

Sl. No.	Sectors	Environmental Performance Indicators
		of the livestock funded through the project support. • Increased productivity (pork meat) in comparison to the pre-project situation • Expansion of the farm area to cater the space for the increased number of livestock (pig)
5.	Sericulture	• Number of farmers undertaking better pesticide management as a percentage of the total farmers in the sample size • Increased production and income in comparison to the pre-project situation • Expansion of the sericulture farm area
6.	Infrastructure Development	• Area covered under various infrastructure development projects • No of trees felled and compensatory afforestation done • Estimated quantity of generated solid waste • Increased usage of alternative energy (solar, bio gas etc.,)

8.2 ENVIRONMENTAL AUDIT

Two types of environmental audit shall be performed including (i) Internal Audit and (ii) External Audit to check the impact of the subproject interventions

(i) **Internal Audit** is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of processes. Internal audit will not be done for the execution of APART activities (project interventions); it is for advising management (OPMU &DLCC) regarding how to better execute their responsibilities. It is recommended at the end of first year one internal audit should be carried out by the Environmental Specialists (APART) for effective and smooth operation of the project

(ii) **External Audit** Independent external audits should be conducted twice during the project duration—one at the end of the second year and another at the end of the fourth year. An external environment agency should be hired by the APART in accordance with the World Bank's procedures for procurement.

8.3 ENVIRONMENTAL BUDGET

The environmental budget has been prepared under two heads

(i) Environmental safeguard budget for administration purposes: The budget plan (**Table 16**) should be included in the overall APART project cost. The budget has a provision for Human Resource (HR) specifically for recruiting Environmental experts/ specialists under various levels of the proposed institutional arrangement. It covers the overall expenditure required for the capacity building program (various trainings/ workshops/ printing handouts, manuals etc,). The budget also covers the provision for environmental monitoring that is to be conducted by the line departments during the project implementation/ operation phase.

(ii) Environmental management budget for construction phase: The prepared budget shall form part of the Detailed Project Report (DPR's) cost, which shall be utilised for monitoring the Environment Management Plan (EMP) during the project construction phase. The given budget in the **Table 17** is tentative and it shall be revised during the DPR stage. The budget is applicable for the project subcomponents which involve construction related works

(Construction/upgradation of Roads, Construction/upgradation of Warehouses, Construction/upgradation of Market areas and Construction of Common Service Centres (CSC)).

Table 16: Environmental Safeguard Budget

Sl. No	Head	Details	Cost Estimate
1.	***Human Resource***		
	Environmental Specialist (PMU) - Engineer	1 Environmental Specialist (Engineer) for 7 years	10,000,000.00
	Environmental Specialist (PMU)- Agriculture& Livestock	1 Environmental Specialist (Agriculture& livestock) for 7 years	10,000,000.00
	District Level sector Environmental Specialists (Agriculture - 3 nos Livestock - 3 nos Fisheries - 3 nos Civil works - 3 nos Processing Plant (Pork, Dairy, Fish) - 3 nos)	15 Environmental Specialist (3 per sector)for 7 years	63,000,000.00
2.	***Capacity Building***		
	Capacity Building - Staff		
	State level Capacity Building for Nodal persons (PIU, DLCCs)	1 main training (for 40 trainees)	200,000.00
		6 refresher trainings at 1,00,000 per training	600,000.00
	Beneficiary trainings	50,000 per FPO for 90 FPOs	1,500,000.00
	Trainings to FPO		
	Training to DCS	Lump sum at 2 lakhs (budget shall be included in the DCS project cost)	-
	Environmental Safeguard Training program for Warehouse (Nodal Engineer preparing DPR)	2 trainings (Initial and Midterm) at1 lakh each	200,000.00
	Environmental Safeguard Training Program for PWD (Roads)	2 training at district level (16) at 1 lakh each	3,200,000.00
	Environmental Safeguard Training Program for Market yards (100 nos)	2 training at State level in 3 batches at 2 lakhs each	1,200,000.00
	Environemntal Safeguard Training Program for CSC (100 nos)	2 training at State level in 3 batches at 2 lakhs each	1,200,000.00
	IEC material	Agriculture Posters	20,000,000.00
		Ware houses	400,000.00
		Markets	500,000.00
		Posters for enterprises	500,000.00
		Handbook for enterprises (2000 copies)	100,000.00
3.	***Monitoring***		
	Monitoring by nodal persons at PIU	1 visit per year in 16 districts	200,000.00
	Visits by Environmental Specialist	1 visit per district per year	200,000.00
	Monitoring by Sector wise Environmental Specialist	at 5000 per visit to 16 project districts	10,000,000.00
	External audit	2 audits during the project period at 25,00,000	5,000,000.00
	Consultancy services (if required)		2,000,000.00
	Baseline monitoring (indicators) soil, water		1,000,000.00
	Total		**131,000,000.00**

Table 17: Environmental Management Budget (Construction Phase)

Sl. No	Description of Items	Quantity	Unit	Unit Rate	Amount
A	**Environmental Monitoring**				
1	Soil Quality analysis (nutrient)	2 samples per year (construction period 2 years)	8	8000.00	64000.00
2	Air quality	1 sample per year (construction period 2 years)	4	10000.00	40000.00
3	Noise Quality	2 samples per year (construction period 2 years)	8	5000.00	40000.00
4	Water Quality	2 samples per year (construction period 2 years)	8	10000.00	80000.00
B	**Green Interventions**				
5	Landscaping	At open space / available space in the market areas, CSC, Warehouses and at Road Junctions	LS	25000.00	25000.00
6	Rainwater Harvesting	As per the Standards/ guideline available with PWD (2 RWH pits @ 50000 each)	LS	100000.00	100000.00
	Total				**3,49,000.00**

8.4 CAPACITY BUILDING TIMELINE

Sl.no	Task		Responsibility	Year 1		Year 2		Year 3		Year 4		Year 5		Year 6		Year 7	
A	**State Level Capacity Building**	**Topics to Cover**		**0-6**	**6-12**	**0-6**	**6-12**	**0-6**	**6-12**	**0-6**	**6-12**	**0-6**	**6-12**	**0-6**	**6-12**	**0-6**	**6-12**
1	State level orientation programme for PMU staffs	• Introduction to Environment • Basic Concept of environment • Environmental Regulations and Statutory requirements as per Govt. of India and World Bank • Conducting Environmental Assessment for various sector • Preparation of Environmental Management Plan • Implementing Environmental Management Plan • Environmental Monitoring and Reporting Mechanism • Roles and Responsibilities of officials / contractors towards protection of environment • Implementation Arrangements	ARIAS														
2	State level Capacity Building for Nodal persons (PIU, DLCCs)		ARIAS														
B	**District Level Capacity Building**																
3	Training to District Cooperative society (DCS)		WAMUL														
4	Environmental Safeguard Training program for Warehouse (Nodal Engineers preparing DPR's and Implementation)		OPIU														
5	Environmental Safeguard Training program for PWD (Roads engineers preparing DPR's and Implementation)		OPIU														
6	Env Safeguard Training Program for Market yards (100 nos) - Nodal Engineers preparing DPR's and Implementation		OPIU														
7	Environmental Safeguard Training Program for CSC (100 nos) - Nodal Engineers preparing DPR's and Implementation		OPIU														
8	Beneficiary trainings for FPO's		DLCC														

9. INSTITUTIONAL ARRANGEMENT AND CAPACITY BUILDING

The existing institutional arrangement in ARIAS Society for implementing the Environmental Safeguards has been reviewed and found that it is sufficient to cater to the likely environmental issues arising during the project implementation. However, with respect to the proposed APART project, the consultants have discussed with the ARIAS society and have suggested few modifications in the structure of the Institutional arrangement. The following sections shall detail the suggested modifications with defined roles and responsibilities.

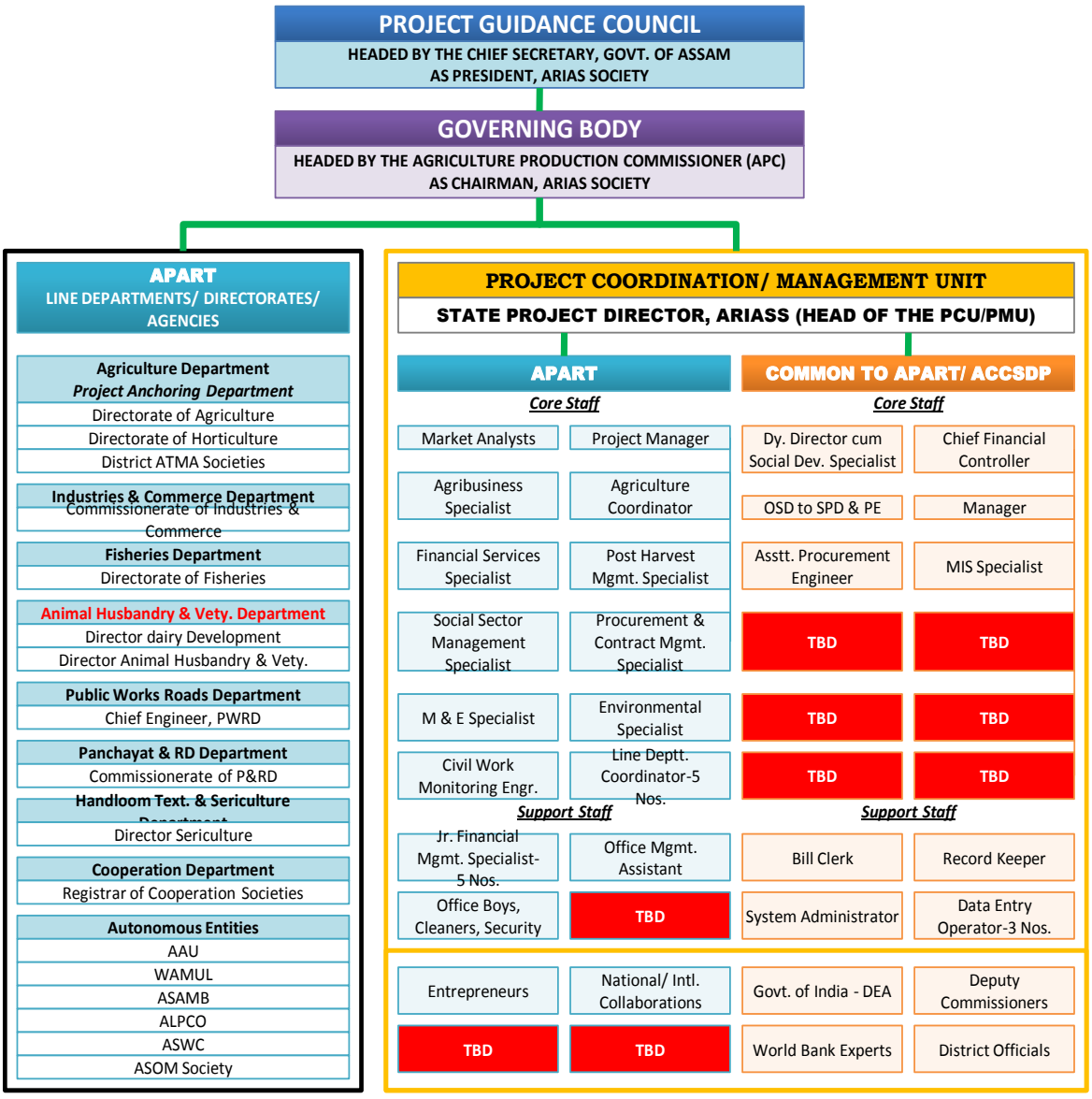


Figure 13: Organization Chart of ARIAS

The project will be implemented by the Project Coordination Unit (PCU), which will be headed by State Project Director (ARIAS Society). The relevant Line Departments of Government of Assam would act as Project Implementing Units (PIU's) for all the project/ sub-project activities falling within their domain/ responsibility. For the cluster initiative, Department of Industries and Commerce will be the anchor

department through its District Industries and Commerce Centres (DICCs) in each of the 16 project districts.

Project Coordination Unit (PCU) / Project Management Unit (PMU) of APART shall have an Environmental Specialist at central level (in ARIAS); he will be responsible to tackle the environmental issues related to project intervention and Implementation of EMF by coordinating with the line department of different sector, World bank, Appointed Consultant and NGOs (if any).

For sector wise project Interventions, Operational Project Implementation Unit (OPIU) shall be developed. An Environmental Cell shall be developed in each OPIU, which will be having one Environmental Safeguard Specialist and a Support Staff to build the capacity of the executing agencies for implementing the provisions of the EMF, environmental issues pertaining to Project Intervention.

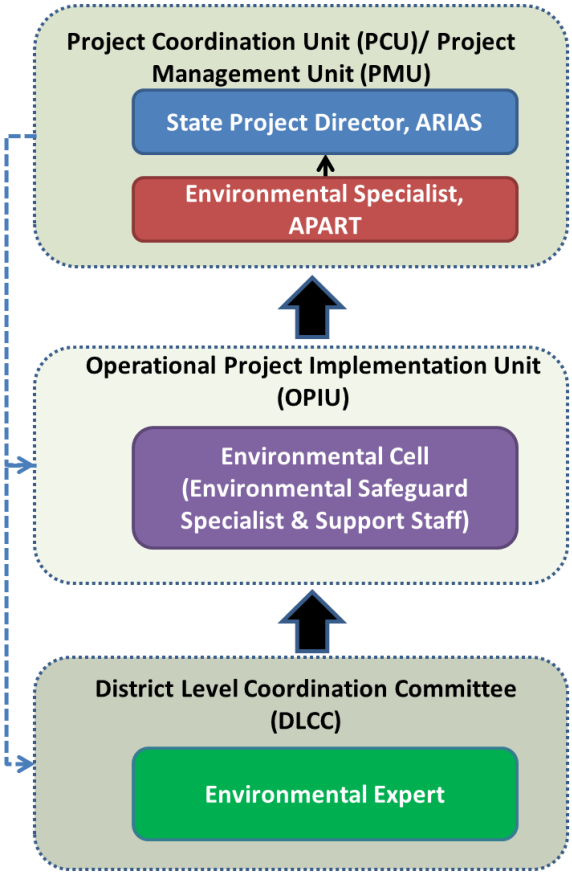


Figure 14: Implementation Arrangement for EMF Implementation

For successful implementation of EMF and Other Environmental Guideline, at District Level DLCC, each DLCC will have an Environmental Specilaist to look after implementation of EMF at production cluster levels, Common Service Centres, Market and Rural Haats, Warehouses and Roads.

Project activities & communications would be channelled from the PCU/PMU to the Operational Project Implementation Unit (OPIU). End Implementation Agencies for this subcomponent will be facilitated by the District Level Coordination Committee (DLCC) located in the respective districts, specifically the selected 16 districts.

Table 18: Implementation Arrangement – Roles and Responsibilities

Experts	Responsibility
Environmental Specialist	• Shall be responsible for providing PMU with technical inputs on implementation of the different interventions

Experts	Responsibility
(PMU/PCU)	• Shall be responsible for overall coordination of assessing/screening environmental impacts of projects that are being undertaken • Shall be responsible for supervising the implementation of the Environmental Guideline Sector wise • Shall undertake site visits to different districts to supervise the implementation of EMF • Shall be responsible for coordinating training sessions and awareness programs. • Shall provide necessary inputs towards formulating training modules and imparting State Level Training. Training modules at district level shall be approved before imparting such training. • Shall be responsible for coordinating between line departments for preparing Environment Information Dissemination Brochures for the interventions. • Shall be responsible for conducting Internal Environment Audit • Shall review the Quarterly Environment Monitoring report (QEMR) and sharing it with the World Bank (if required) • Shall formulate and co-ordinate environment research studies undertaken as part of the project.
Environment Nodal Officer (OPIU)	• To coordinate with Environment Specialists at PMU/PCU and DLCC for effective implementation of EMF • Shall be responsible for reviewing the screening and assessment and forwarding the same to the PCU/PMU for further analysis. • To obtain statutory clearances, if required, from forest department, MoEF&CC. PWD etc., • Shall assist to provide technical and environmental inputs for each of the interventions • Shall provide inputs on implementation of EMF for the interventions • Assessing specimen EMPs and Environmental Assessment that are carried out for the different interventions • Shall assist/ involve in developing modules and training material for District Level Training. • Shall scrutinise and finalize training modules and dissemination material • Monitor/review DPRs / project designs of the interventions towards incorporation of EMF provisions • Reviewing the QEMR and sharing it with the Environmental Specialist (PMU/PCU) • To monitor on a quarterly basis, the effectiveness of implementation of the EMF provisions on ground • To report progress, highlighting environmental issues that are not addressed to provide for course Correction in subsequent interventions
Environmental Specialist (DLCC)	• Shall provide technical inputs on environment aspects of interventions that are being undertaken in the project. • Responsible for conducting environmental screening and assessment for the project subcomponents • Shall undertake site visits to different cluster, common facility, FPOs etc. as directed by the PMU • Carry out supervision and monitoring of the implementation of EMFs with the help of identified project functionaries of below level. • Shall conduct regular environmental monitoring of the interventions to Field level • Shall be responsible for preparing and compiling the Quarterly Environmental Monitoring Report (QEMR). • Shall be responsible for training on EMF aspects to all field level project functionaries, beneficiaries, training module and preparing dissemination material

9.1 CAPACITY BUILDING

Capacity Building schedule for the project functionaries and beneficiaries shall be worked out as follows.

(i) An orientation program will be organized involving the State level representatives and other project personnel from each line departments and decision makers (including the nodal persons from OPIU's and DLCC's). The orientation program also includes the industry associations who are likely to be engaged during the implementation phase. The workshop will be organised twice during the project cycle, Initially it will be organised prior to start of the project and then during the midterm review.

(ii) The next level of training (at state level) will be arranged for district environmental specialists line department representatives or for the responsible professional and extension officer dealing with Roads, Warehouse's, Markets and CSC's. This will be organized twice a year to acquaint all experts into the project line with respect to environmental safeguard implementation.

(iii) The District level training will be held twice a year for the project beneficiaries, extension workers/resource persons, field member of all common infrastructure services and other project functionaries.

The Capacity Building Program should include the following Topics

Environment Management Framework aspect

- Environmental issues in the context of Climate resilient production, value chains, infrastructure creation
- Purpose and components of EMF for the APART
- Greening rural value chains
- Environmental Appraisal process – screening, environmental appraisal.
- Implementation of environmental Management Plan guidelines
- Institutional arrangements for EMF
- Key aspects for monitoring of EMF in the APART

Other Aspects

- ***Resilient Agriculture*****:** importance of Sustainable Agriculture, commodity wise environmental interventions will be required in the value chain process, Pest Management, Post-harvest Management etc.
- ***Fisheries*****:** Species selection, quality seeds and feeds, water quality management, best management practices in aquaculture system, beel management plan, environmental code of practices in production , harvesting and in post-harvest etc.
- ***Dairy*****:** breed selection, fodder management, manure management, quality management, environmental interventions required in dairy value chain.
- ***Piggery*****:** breed selection, fodder management, manure management, environmental interventions required in Pork value chain.
- ***Seri Farming:*** breed selection, fodder management, manure management, environmental interventions required in value chain.
- ***Climate Change Adaptation:*** impact of climate variability on crops and livestock and fisheries, importance of adaptation measures, contingency plan etc.
- ***Environment guidelines*** for Producer, processing and common service center level.
- ***Energy:*** use of renewable energy and fuel efficient devices in processing.
- ***Infrastructure*****:** environmental issues concerning location, construction and waste disposal.

Table 19: Training Plan and Target Group

Type of Training	Target Group	Method of Training	Frequency
Orientation Program	• Decision Makers, Officials of Coordinating Agencies and industry associations	• Lecture Presentation, Case Studies	• Prior to initiation of the project and then during the midterm review.
State level Workshop	• OPIU staff, Extension officers, District representative from respected line department dealing with Roads, Warehouse's, Markets and CSC's	• Lecture Presentation, Case Studies, Demonstration Visits	• Twice a year to acquaint all experts into the project line with respect to environmental safeguard implementation
District Level Work training program	• Extension Officer, representatives of FPO, Field staff of different infrastructure related, Project beneficiaries	• Demonstration Visits	• Twice a year till the project completion period