

## EXECUTIVE SUMMARY

### E.1 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)**”, which is currently under preparatory stage. However, the key components for the project implementation have been identified. The APART project has 4 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

### E.2 SUB-PROJECT SCOPE

The objective 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.

### E.3 PROJECT LOCATION

Based on Agricultural Gross Domestic Product (AGDP) and MSME land scape of the state, 16 districts have been chosen under APART (**Figure 1**). The districts are further divided into the following categories.

- 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)

### E.4 DESCRIPTION OF THE ENVIRONMENT

The State of Assam, popularly known as the land of the red river and blue hills is the gateway to the North East India. Geographically it is located at 22°19' to 28°16' North Latitude and 89°42' to 96°30' East Longitude between the foot hills of the Eastern Himalayas and the Patkai and Naga Hill Ranges. The state spread across an area of 78,438 Sq.km, the state can be broadly divided into 3 physiographic domains viz. Brahmaputra valley, Central Assam Hills and Barak valley. The state experiences the south west tropical monsoon which is normally active from April to October. The annual average rainfall varies between 1600mm and 4300mm with maximum

precipitation during June and July. The average temperature varies from 4°C to 19°C during the winter and 26°C to 37°C during the summer.

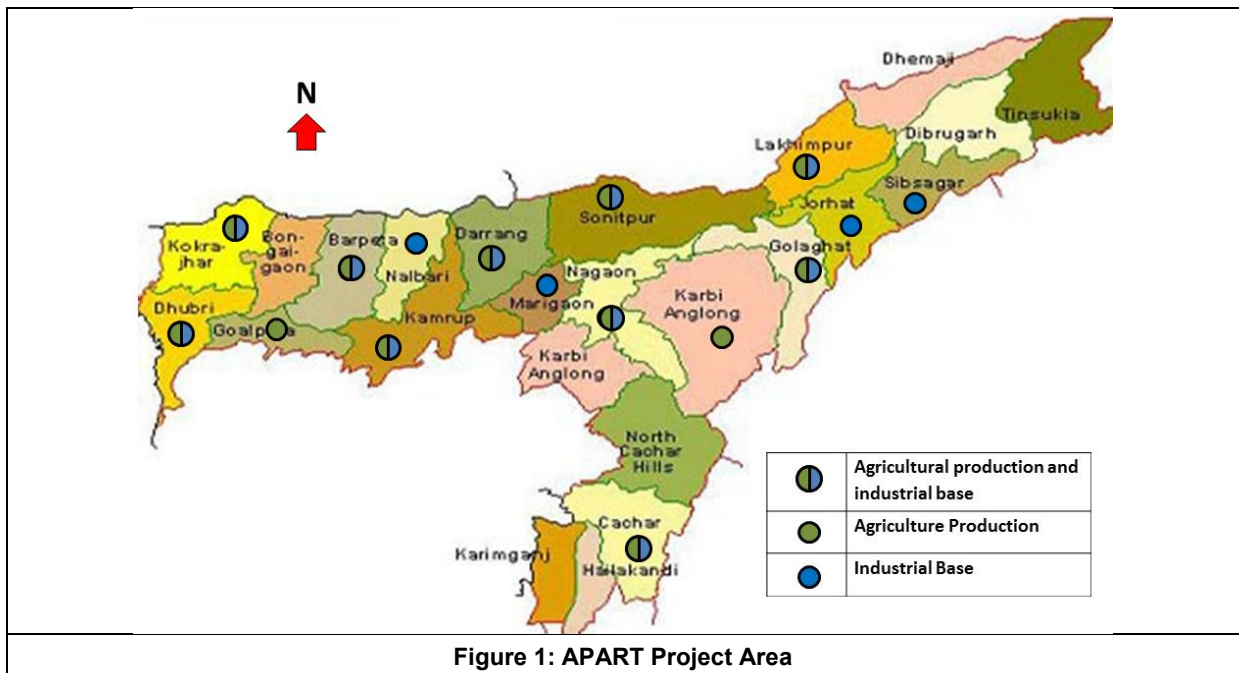


Figure 1: APART Project Area

The Brahmaputra and the Barak are the two major river systems of the State. All the rivers in Assam are liable to floods, mainly because they receive heavy rainfall within a short period of time. Geologically, the state has a diversified geological spectrum. It is located near the hairpin bend of the Himalayas. Hence the extreme geostatic pressures exerted on the landmass during the creation of the Himalayas have resulted in Assam having large areas of sedimentary deposits. Of the four kinds of Iron ore, Haematite, Magnetite, Limonite and Siderite, the region is predominant in Haematite deposits

The State is one of the richest biodiversity zones in the world. Total Forest cover stands as 35.48% and consists of tropical rainforests, deciduous forests, riverine grasslands, bamboo, orchards and numerous wetland ecosystems. The state has 5 national parks, 16 wildlife sanctuaries and 3 bird sanctuaries.

According to the Census of India, 2011, the total population of Assam is 31.17 million; population density stands as 396.8/km<sup>2</sup> and literacy rate is 73.18%. The Economy of Assam is largely agriculture based with 69% of the population engaged in it

- (i) **Agriculture:** The contribution of agriculture sector to the State Domestic Product was 20.5 % during 2014 - 2015. The main agricultural products are varieties of rice, tea, jute, mustard, pulses, sugarcane, potatoes, oranges, pineapples, coconut, arecanut, black pepper, citrus fruits, banana, papaya, turmeric, spices, flowers, medicinal & aromatic plants, besides many types of vegetables.
- (ii) **Fisheries:** There are about 3.91 lakh hectares of waterbodies in the State. The waterbodies are in the form of rivers, beel, derelict waterbodies and pond sand tanks. There is a positive trend in fish productivity during recent pass. The estimated growth of 'Fishing' sector is expected to be higher with 6.69 per cent in 2014-15 against 4.08 percent in the previous year
- (iii) **Livestock and Poultry:** The estimated livestock and poultry population of different category for 2013-14 published by the State Animal Husbandry and Veterinary Department reveal that the population of indigenous cattle has decreased by 3.7 percent during 2013-14 compared to the previous year. On the other hand, population of cross breed cattle and goats have recorded increase of 3.0 percent and 3.2 percent respectively during the year 2013-14 over 2012-13. The estimation also revealed that the while the growth of fowl population was marginal, the growth of duck population recorded 4.0 percent during the same period.

- (iv) **Industries:** The Industrial scenario of the State is mainly confined within the growth of employment oriented Small Scale Sector, which comprises of manufacturing and processing industries. The Assam's Tea industry also possesses a significant reputation in the global economy. The tea production in Assam constitutes more than 50 percent of the total production of the country. Among the Plantation crops, Rubber cultivation is also gaining its popularity in the State due to congenial agro climate as well as its eco-friendly activity. Assam has ample scope for Bamboo based industry like Paper manufacturing industry, since this region has highest concentration of bamboo i.e., around 60% of the total Bamboo of the country. Sericulture, a major cottage industry of the State, is practiced in more than 10,500 villages and provided employment to 2.6 lakh of family. Assam has the monopoly in production of Muga, the Golden Silk in the world and 99% of Muga Silk produced in Assam. Assam has also achieved the right of "Geographical Indication" in Muga Silk.

## **E.5 NEED FOR 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.

This Environmental Management Framework (EMF) has been prepared to guide the Respective Line Departments under the project, *in subproject selection, screening and categorization, environmental assessment, and preparation and implementation, monitoring, and preparation of environmental assessments/management plans for project to facilitate compliance with the requirements specified in the World Bank Operational Policies and Government Rules and Laws.*

## **E.6 OVERVIEW OF SCREENING PROCESS**

Screening is the process by which the appropriate level and type of Environmental assessment (EA) is determined for a given subproject on the basis of its likely environmental impacts. For identification of sensitive subprojects with respect to the environmental issues a screening and review process has been worked out in the EMF. 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 Line Departments (SPIU/ DPIU) will carry out screening exercise (Refer EMF for subproject specific screening checklist) 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.

The outcome of the screening exercise forms the base for the scoping exercise for conducting the Environmental Assessment (EA). Scoping will identify which of the subproject 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 /or environment) can be established for the rest of the EA process. 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

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

## **E.7 PROJECT CATEGORISATION**

Based on the project screening exercise performed for the proposed interventions, the subprojects shall be classified as Environmental Category “B” as per World Bank Safeguard Policies as no significant impacts are envisioned. However, the prepared Environmental Management Framework (EMF) guides the ARIAS society to prepare Environmental Assessment reports for all categories of the subprojects as per the Government of India (GoI) and Government of Assam (GoA) applicable environmental rules and regulations and WB safeguard policies.

## **E.8 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

The anticipated Environmental Impacts and Mitigation Measures for all sectors proposed under APART have been prepared and detailed in the EMF ( *section 4.3.8 Environmental Impacts Identification*). The impacts has been assessed for four stages of the subproject implementation namely pre construction stage, construction stage, operation stage and post construction and operation stage.

The **pre-construction and construction stage impacts** would be similar for all sectors. During the construction phase, the major impacts may arise due to an increase in air and noise pollution, generation of solid waste, health and safety of workers and disturbances caused by the construction activities to the local community/ people. These are common construction impacts and can be mitigated through appropriate mitigation measures such as reduction of air and noise pollution through use of appropriate modern equipment and methodologies, use of proper personal protective equipment and minimizing the inconvenience caused by adopting appropriate work plan.

In the **operational phase**, the environmental impacts shall be unique to the sectors. However, some of the impacts like air pollution (odour), water pollution and health and safety issues of the labours are common. The use of feed materials containing/ contaminated with pesticides in the piggery, fishery and dairy sectors may cause health impacts to the human. The water runoff from the cattle shed may cause impact to the soil quality in the nearby agriculture areas. Interaction of human with the animals may lead to contiguous diseases. In the **post construction and operation stages** all the infrastructure facilities will be operated efficiently by routine

maintenance, which will not affect the environment. The anticipated environmental impacts during the operation period will arise mainly due to repair works and the impacts will be much less than those of the construction period. Supervision and monitoring program will ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks and consultation with workers and beneficiaries.

## **E.9 ENVIRONMENTAL MANAGEMENT PLAN**

The purpose of the Environmental Management Plan (EMP) in the EMF is to outline the mitigation, monitoring and administrative measures to be taken during project implementation to avoid or eliminate negative environmental impacts. The EMP identifies feasible and cost-effective measures that may reduce potentially significant adverse environmental impacts to acceptable levels. The plan includes compensatory measures if mitigation measures are not feasible, cost-effective, or sufficient. Specifically, the EMP

- (i) Identifies and summarizes all anticipated significant adverse environmental impacts (including those involving indigenous people or involuntary resettlement);
- (ii) It describes with technical details each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate;
- (iii) Estimates any potential environmental impacts of these measures; and
- (iv) Provides linkage with any other mitigation plans (e.g., for involuntary resettlement, indigenous peoples, or cultural property) required for the project.

## **E.10 INTEGRATED PEST MANAGEMENT (IPM)**

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 Integrated Pest Management (IPM) 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. A pest management plan has been developed for the Agriculture and Horticulture Sector (Refer EMF).

The Pest Management Plan contain pest management requirements, outlines the resources necessary for surveillance and control. The Plan shall provide guidance for operating and maintaining an effective pest management program/ activities. Pests considered in the Plan may be weeds and other unwanted vegetation, crawling insects and other vertebrate pests. Without proper control, these pests may lead to plants' diseases. Adherence to the Plan will ensure effective, economical and environmentally acceptable pest management and will maintain compliance with pertinent laws and regulations.

## **E.11 SUPERVISION AND MONITORING**

Supervision, monitoring and auditing requirement has been suggested in the EMF to assess the efficacy and efficiency of the proposed system. Indicators for evaluation has been developed to ascertain the sustainability of the subproject interventions. Two levels of monitoring i.e. Regular and Annual monitoring has been suggested in the EMF. The regular monitoring will be based on the performance of environmental monitoring indicators (*Soil Quality (nutrient), Water Quality, Air Quality, Noise Quality, Pesticides/insecticides, Soil and Water conservation, Groundwater level, Livestock density, Availability of green and dry fodder and Shifting Cultivation*). The annual

monitoring will be based on the performance of environmental performance indicators, which has been defined sector wise. Further appropriate monitoring formats are also enclosed in the EMF.

To ensure a systematic assessment and evaluation of implementation, an audit mechanism has been developed. Two types of environmental audit shall be performed including (i) Internal Audit and (ii) External Audit to check the impact of the subproject interventions. The frequency, scope of the audit has been detailed in the EMF.

## E.12 EXECUTING AND IMPLEMENTING AGENCIES

The project will be implemented by the Project Coordination Unit (PCU)/ Project Management Unit (PMU), which will be headed by State Project Director (ARIAS Society). The PMU shall have an Senior Environmental Safeguard Specialist who will be responsible to tackle the environmental issues related to project intervention and Implementation of EMF. He will be supported by Environmental Safeguard Specialists.

For sector wise project Interventions, State Project Implementation Unit (SPIU) shall be developed. An Environmental Management Cell shall be developed in each SPIU, 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 Environmental Management Framework, environmental issues pertaining to project Intervention.

For successful implementation of Environment Management Framework and Other Environmental Guidelines, a District Level PIU shall be developed (DPIU). Each DPIU will have an environmental expert to look after implementation of EMF at cluster levels, Common Service Centres, Market and Rural Haats, Warehouses and Roads, he will supported by field assistants.

## E.13 CONCLUSION AND RECOMMENDATIONS

The proposed sub-project interventions are not covered in the ambit of the EIA notification as they are not covered either under “Category A” or “Category B” of the notification. As a result, the categorization, and the subsequent environmental assessment and clearance requirements, either from the State government or the GoI is not triggered. However, as per the World Bank safeguard policy, the proposed subprojects are classified as Category B as there are no significant impacts that are envisioned.

Based on the Sector wise assessment and consultations held with the stakeholder’s, beneficiary level and field level following recommendations has been made.

### (i) Agriculture/Horticulture

- **Integrated Pest Management system:** it is endorsed to adopt integrated pest management system in the agricultural practice. This system follows the hierarchy of using bio fertilizer, bio pesticides initially and then uses certain pesticides in case of acute problem. The pesticides that been recommended by WHO and also prescribed under the Govt. of India are only allowed and the same should be procured from licensed vendor.
- **Crop Rotation:** To manage the soil nutrient efficiency, crop rotation practice should be followed such as before sowing paddy, any crop related to legume family (pea, pulse, lentil) should be practiced so as to restore the nitrogen and other micronutrients.
- **Varietal Selection:** resilient crop varieties with the climate suitability should be opted. Like Flood tolerant varieties, soil type wise crop varieties, Agro Climatic Zone wise etc.
- **Sustainable Agriculture Cultivation practice:** it involves following approaches

- Integrated Soil Fertility management using organic manures, bio-fertilizers.
- Organic manure such as cow dung, crop residue etc should be used to keep the soil healthy.
- More efficient method of irrigation should be promoted like drip irrigation.
- Low or minimum Tillage to restore the soil moisture.
- Suitable soil selection as per requirement of particular crop
- Integrated Farming system such paddy – fish farming, livestock- agri farming, pig-fish farming etc.

## (ii) Dairy

- **Breed Selection:** Breed selection should be done based on the climate adaptability. So Indigenous species should be promoted in artificial insemination facility. Careful interaction with the technicians of artificial insemination would be helpful to select the best cattle breed.
- **Cattle Rearing:** In cattle rearing, issues related to food, shelter and health is prevalent. Thus system should follow the proper management of quality food; Cattle shed management which includes shed spacing, sanitation and better dung management practises by turning it into compost to reduce the GHGs; and proper vaccination of cattle to prevent disease and thus increase the overall productivity.
- **Quality management:** In order to meet the requirements of best quality milk, it should be free from contamination and chemicals, thus it is recommended to adopt good hygienic practice while milking, not to use hormones to cattle's to enhance the milk production and cattle feed should be free from pesticides and chemicals.

## (iii) Fishery

- **Conservation of Local Species:** Locally suitable fish species that respond well to the local condition and thereby reducing external inputs and maintenance costs should be promoted.
- **Water Quality management:** In order to manage the water quality, preference should be given to the use of bio manure, bio food and traditional feed such as mustard Oil cake, by-products of polished rice etc instead of fertilizer and chemicals. Water quality testing for at least four times in a year should be carried out.
- **Integrated farming:** Integrated fish farming practices should be promoted so as to promote the use of farm waste. Livestock manure can be used as a fertilizer in fish farming and this in turn can minimize the chance of using chemicals and pesticides in fishery.
- **Natural calamity:** Flood protection measures such as proper embankment should be constructed to tackle the flood situation. In drought prone area, Shallow areas can be made use for raising table size fishes and prawns in enclosure (pens). Fish which has better acclimatization with higher temperature should be selected.

## (iv) Piggery

- **Breed Management:** Breed selection should be done based on the climate adaptability. Indigenous species should be promoted by artificial insemination facility. For increased productivity, introduction of exotic breed may not have proper suitability and immunity to adapt to the local climate this could in turn lead to long term problem. So local breed should be promoted which would require lesser care and reap more benefits.
- **Pig Rearing:** Issues related to health, shed and food is prevalent in rearing of pigs. Therefore antibiotics without any medical guidance should not be used as it may lead to early death of the pigs prior to increase in weight to be sold in the market as growth hormones are injected to speed up the growth of the pigs.
- Effluent and manure by-products generated in a piggery are valuable sources of water, nutrients and organic matter. So the by-products are re-used in ways which do not harm the environment through recycling, used as bio gas, promoting as farm manure.

- Integrated farming practices should be promoted so as to encourage the use of farm waste as food for pigs such as kitchen waste, by-products of food grains etc. can be used.
- **Quality maintenance:** Knowledge of public hygiene and food safety issues should be disseminated among traders and producers.
- **Health and Vaccination:** A proper vaccination schedule should be followed for pigs. An awareness program to farmers on precaution measures that are to be taken care during an outbreak should be provided.

#### (v) **Seri Culture/ Handloom**

- **Sustainable Silk Rearing Practice:** In order to maintain hygiene during silk rearing and make it sustainable, it is suggested that
  - The culture area should be not close to common living area and should be away from child.
  - Proper training on sustainable sericulture farming should be provided.
  - Waste water from boiling or other activities should not be flushed directly in to agricultural field. Alternatives of waste water and manure should be used.
  - Indigenous species suitable to local climate should be promoted.
  - Alternative power source like solar, biomass energy should be used to meet the energy requirements (in boiling operations, controlling the room temp. etc.)

#### (vi) **Market Infrastructure such as Common Service Centre, Road, Storage facility, Warehouse etc.**

- **Storage Management:** The storage area should be located in clean and dry places with tightly packed containers or containers with lids, covers. Pest control should be done through the use of neem leaves, dry chillies, garlic, black pepper etc.
- **Legal Formulation:** all equipment, processing units, vehicles, processing activities etc should be in line with state and government legal regulation. Unlicensed units, illegal activities, other food safety regulations will be prohibited. All consents, permits should be properly checked and renewed accordingly.
- **Waste management:** Waste should be disposed off in a designated place and should not be close to water body. Alternate use of waste should be practiced.
- **Health Safety:** health and safety awareness among workers should be provided. Proper hygiene should be maintained to workers in grading, processing, packaging, storing, transportation and handling of the agri products. Basic amenities for worker should be facilitated to avoid nuisance in the area.
- **Training:** training at all levels from implementation agency, stake holders, small medium entrepreneurs; field beneficiary level should be facilitated.