

# Executive Summary of

## Darft Environmental Impact Assessment Report for the Proposed expansion of Civil Enclave of Bagdogra International Airport to Enhance the Passenger Handling Capacity up to 10 MPPA at Bagdogra, Dist: Darjeeling, West Bengal

**M/s. Airport Authority of India**  
**Bagdogra International Airport, Siliguri, District: Darjeeling**  
**West Bengal -734421**

**Project activity “7(a)”- Airports**  
**Category: B1**

**Period of Study: March 2023 – May 2023**  
**Proposal No: SIA/WB/INFRA2/445111/2023**

**Submitted by**



**Prepared by**



## 1.1 Introduction

Bagdogra Airport is an international airport and gateway to the hill stations of Darjeeling, Gangtok and other parts of the North Bengal region, located at the western part of the city Siliguri in northern West Bengal. The Airport belongs to IAF and AAI operates Civil Enclave which spreads over an area of 13.77 acres. The airport belongs to the Indian Air force and its civilian operations are overseen by Airports Authority of India. AAI maintains a civil enclave at the Airport. The present Airport has a single runway 18/36 having dimensions of 2744m X 45.75m and belongs to IAF. The existing apron has 05 nos. of parking bays (04 nos. Code C and 01 no. Code D). The existing Terminal Building has an area of 9241 sqm for handling 810 peak hour passengers having an annual capacity of 2.5 MPPA.

The proposed expansion project is Development of Civil Enclave with infrastructure such as New Terminal Building, Car Parking, Apron, Link Taxiways etc. and associated city side / airside infrastructure on approx. 105 Acres of Land is planned. This civil enclave is proposed in two phases, namely:

**Phase 1:** In Phase-1, terminal building having area of 69,162 sqm (including 16875 Sqm Basement) and 6 number aerobridges and 10 Code C apron “Apron Bays” with 2 Nos. Link Taxi will be constructed. Proposed construction of Phase-1 of New Integrated Terminal Building is expected to be completed by March 2036.

**Phase 2:** In Phase-2, terminal building having area of 50000 Sqm and 4 number aerobridges and 6 Code C apron “Apron Bays” will be constructed in future.

## 1.2 Brief Description of Project

### 1.2.1 Project Activities

M/s. Airport Authority of India proposes to develop civil enclave of *Bagdogra International Airport*. The brief description of the project is given in **Table 2.1**.

**Table 2.1: Salient Features of the proposed project**

<b>Name of project</b>	Proposed Expansion Of New Civic Enclave of Bagdogra International Airport to Enhance the Passenger Handling Capacity up to 10 MPPA at Bagdogra, West Bengal by M/S Airport Authority Of India.
<b>Location</b>	LR Plot Nos. 88/362, 122/364, 439, 440, 444, 137, 138, 123/350, 124, 123, 125, 139, 140, 141, 143/347, 143, 129, Mouza: Abhiram-67, P.S: Phansidewa, LR Plot No. 121/163, Mouza: Abhiram-67, PS:

	Bagdogra, LR Plot Nos. 16, 17, 18, of Mouza: Turibhita , PS: Bagdogra, Dist: Darjeeling, West Bengal.
<b>Land Area</b>	Total 104.65 acres land acquired/proposed for New Terminal Building out of which 98.72 acres has already been acquired and for 5.93 acres working permission given by IAF
<b>Screening Category</b>	7(a)- "AIR PORTS"
<b>Project Profile</b>	<p>The proposed expansion project is Development of New Civil Enclave with infrastructure such as New Terminal Building, Car Parking, Apron, Link Taxiways etc. and associated city side / airside infrastructure on approx. 105 Acres of Land is planned. These civil enclave is proposed in two phases, namely:</p> <p>➤ <b>Phase 1</b> In Phase-1, terminal building having area of 69,162 sqm (including 16875 Sqm Basement) and 6 number aerobridges and 10 Code C apron Apron Bays with 2 Nos. Link Taxi will be constructed. Proposed construction of Phase-1 of New Integrated Terminal Building is expected to be completed by March 2036.</p> <p>➤ <b>Phase 2</b> In Phase-2, terminal building having area of 50000 Sqm and 4 number aerobridges and 6 Code C apron Apron Bays will be constructed in future.</p>
<b>Cost of the Project</b>	1549 Crores
<b>Resource Requirement</b>	
<b>Source &amp; Quantity Of Water</b>	<p>Total Water Requirement: 2540 KLD  Fresh Water Requirement: 1153 KLD  Recycled Water: 1387 KLD  Waste Water Generation:1622.67 KLD</p>
<b>Power Requirement</b>	<p><b>Maximum Demand:</b> 5.84 MW  Transformer: 4 x 2500 KVA (3W + 1S)  DG Sets: 5 x 1500 KVA + 1 x 750 KVA</p>
<b>Man Power</b>	<p><b>Construction Phase:</b>  Total: 500 Nos.  Temporary/Contractual: 450 Nos.  Permanent: 50 nos.  <b>Operation Phase:</b>  Total: 2000 Nos.  Temporary/Contractual:  Permanent:</p>
<b>Solid &amp; Hazardous Waste Management and Disposal</b>	<p>Solid Waste: 5.12 TPD  Hazardous Waste: 0.6 TPD</p>
<b>Green Belt</b>	Green belt area 24926 Sqm. as proposed.

### 1.2.2 Justification of proposed Development at Bagdogra International Airport

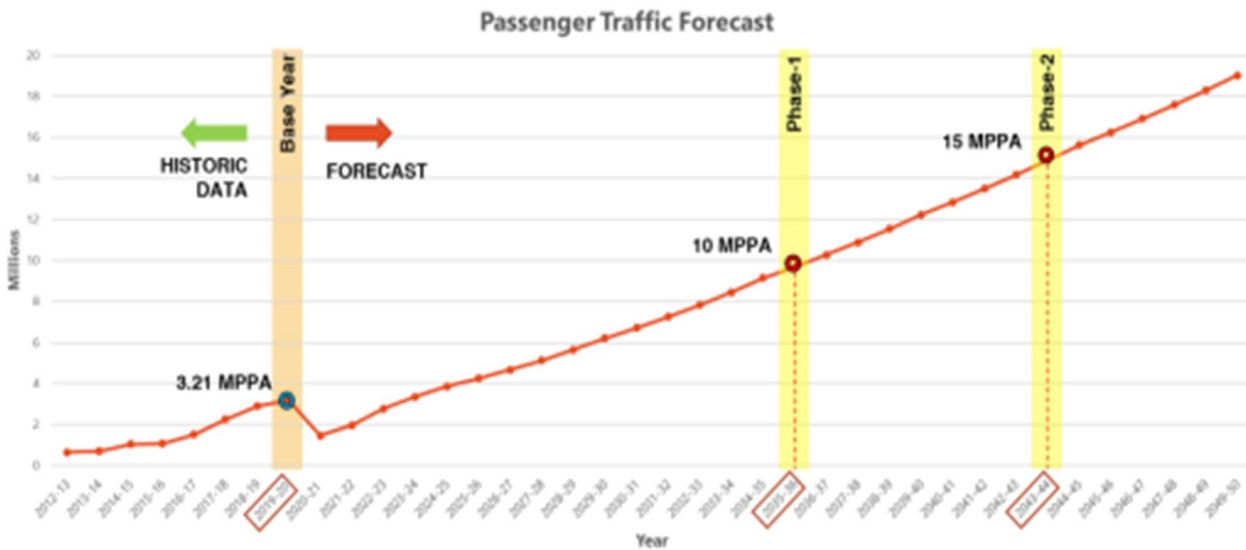
Air traffic at Bagdogra existing airport crossed 1 million for the first time growing at 43.6% percent in 2014–15. In 2019–20, the airport served 3.2 million passengers which was an increase of 11.2% from the previous year, making it the 17th-busiest airport in India. It is one of the few airports in India with zero sales tax on aviation turbine fuel.

With surging demand for large number of domestic and international companies into the sector, India’s aviation industry ensures to witness a phenomenal growth in the near future.

The passenger handling capacity in future may continue to increase. In view of rapid growth in passenger traffic & Aircraft movement, operational infrastructure needs to be upgraded to serve the estimated demand of 10 MPPA.

#### ❑ Traffic Projections for Bagdogra Airport

As per the traffic forecast with base year as 2019-20, the airport is likely to receive passenger footfall of 9.69 Million Passenger by next 15 Years and 19.02 Million Passenger by next 30 Years. To cater to the growing passenger demand, development of civil enclave has been proposed.



Source: AAI

**Figure 11.1: Passenger traffic Forecast of Bagdogra International Airport**

### 1.2.3 Project Schedule

The EIA studies have been carried out as per TOR approved by State Environmental Impact Assessment Authority (SEIAA), West Bengal vide its file no. **2807/EN/T-II-I/536/2023** dated 13.12.2023 (Proposal No. SIA/WB/INFRA2/445111/2023). The proposed project is required Public Hearing as per para 7(ii) of EIA Notification, 2006 and its subsequent amendments for preparation of EIA report as there is no R&R plan involved as a part of Bagdogra International Airport Master Plan.

### 1.2.4 Location Details and Environmental Setting

Bagdogra International Airport falls under Bagdogra and Phansidewa P.S. of Siliguri Sub-Division and Darjeeling District. Geographically, airport is situated at latitude 26°41'6.22"N, longitude 88°19'31.77"E, and altitude of range 143-150 m above MSL. Bagdogra International Airport is located near National highway, NH-27 (Purnea-Siliguri Road) connecting Siliguri with many districts of West Bengal and other states like Assam, Bihar etc. Environmental setting of the study area of 10 km radius around the Airport is tabulated in **Table - 11.1**.

**Table Error! No text of specified style in document.1.1: Details of Environmental Setting**

Sl. No	Particulars	Details
1	Project location	LR Plot Nos. 88/362, 122/364, 439, 440, 444, 137, 138, 123/350, 124, 123, 125, 139, 140, 141, 143/347, 143, 129, Mouza: Abhiram, P.S: Phansidewa, LR Plot No. 121/163, Mouza: Abhiram, PS: Bagdogra, LR Plot Nos. 16, 17, 18, of Mouza: Turibhita , PS: Bagdogra, District: Darjeeling, West Bengal
2	Latitude	26°41'06.22"N
3	Longitude	88°19'31.77"E
4	Elevation above MSL	143-150
5	Topography	The topography of the study area is crisscrossed with rivulets, rivers and hills.
6	Climatic Conditions (As per IMD)	May is the hottest month with temperature as high as 37°C while January is the coldest month with temperature as low as 6°C. Annual rainfall in this area is of the tune of 3736 mm and mean relative humidity rises more than 80%.
7	Nearest Highway	NH-27 (Purnea-Siliguri Road), 1.0 Km, East
8	Nearest Railway station	Bagdogra railway Station - 0.4 Km, from the north boundary of the Airport. Siliguri Junction Station- 9.62 Km, ENE
9	Nearest Airport	Pakyong Airport, 62 Km, NNE
10	Nearest Habitation	Bagdogra- 0.3 Km, WNW

Sl. No	Particulars	Details
11	Nearest Town	Siliguri Town - 9 Km, ENE
12	Forests	Dalkajhar Forest- 7.37 Km, NW
13	Nearest Waterbody	Balason River – 4.5 Km, NNE Mahananda River – 8.1 Km, East
14	Ecologically sensitive zones within 10-km distance	No notified eco-sensitive areas are present within 10 km radius from the project site
15	Historical/ Archaeological places	No historical/ archaeological places within 10 km radius from the project site.
16	National Parks/ Wild Life Sanctuary	No national parks or wild life sanctuary are present within 10 km radius from the Project site.
17	Defense Installation	Bengdubi Military Base- 3.0 Km, North Airforce Station Bagdogra - 0 Km
18	Seismic Zone	Zone V

### 1.2.5 Resources Requirement

#### □ Land Requirement

A total **139.32 Acres** of land is required for the project. In which **34.68 Acres** is existing land area and 104.65 acres land has been proposed for development of civil enclave (including New Terminal Building, Aprons etc.) out of which 98.72 acres has already been acquired and for 5.93 acres working permission given by Indian Air Force.

#### □ Water Requirement

##### ➤ Construction phase:

Total Domestic water consumption during construction phase for approx. 50 nos. of workers will be 20 KLD, which will be met through bore-wells.

##### ➤ Operation phase:

The daily consumption of water during operation phase after proposed expansion will be about **~2540 KLD** out of which **~1153 KLD** will be fresh water and **~1387 KLD** will be recycled water. The water requirement will be met through ground water (bore-wells). The water requirement for plantation, HVAC & flushing will met through STP Treated water.

#### Sewage Treatment

As a part of existing operations, Soak Pits are used for treatment of waste water. For development of this project 1800 KLD capacity of STP (MBR/MBBR/SBR etc.) is proposed. To reduce the load on fresh water demand AAI is committed in implementing the Zero discharge concept for sewage system. The entire sewage that is generated will be recycled and reused for non-potable purposes. About **1622.67** KLD of wastewater will be generated from airport operations, which will be treated through STP (MBR/MBBR/SBR etc.) total capacity of **1800 KLD**, will be developed on modular basis. Treated wastewater will be used for Landscaping or other purposes.

#### **Power Requirement**

The total estimated power demand for Bagdogra International Airport Operations is:

- ✓ Maximum Demand: 5.84 MW
- ✓ Connected Load: 7.18 MW
- ✓ Main Source: WBSEDCL
- ✓ Transformer Capacity : 4 x 2500 KVA (3W + 1S)
- ✓ DG Sets: 5 x 1500 KVA + 1 x 750 KVA

#### **Solid Waste generation**

Solid waste generated from the airport area comprises of Food waste, bottles and cans, newspaper and mixed paper, plastic cups and service ware, food waste, food soiled paper, paper towels, Sludge from STP etc. Total quantity of **~5.12 TPD** of Solid Waste will be generated from Bagdogra International Airport Operation. All the waste will be handled inline to 5R principles of waste management (Reduce, Reuse-Recycle-Recover-Reprocess) to avoid the disposal of waste back to the environment, and to be aligned to the vision of Zero Waste to Landfill.

#### **Hazardous Waste generation**

Hazardous waste (0.6 TPD) Used Oil, Contaminated filters, Oily cotton waste, discarded drums etc. will be and will be handled in accordance with HWM rules 2016, amended till date and will be handled in line Hazardous Waste Management Rules, 2016 amended till date.

All other waste including biomedical waste, E-waste, C&D waste and others wastes will be disposed as per the applicable rules amended till date

#### **Storm Water Drainage Network**

Presently the Airside area is graded with open surface drain and the outlets of the same is connected to panchayat drains.

The storm water drainage system for existing developments & future development is planned with EC guidelines for SWID discharge of runoff. Considering the topography, development and grading requirements from operational and functional perspective, the entire Bagdogra International Airport area is demarcated into 5 major catchments. The storm water run-off generated from airside areas, paved surfaces like runway, apron, taxiways, are collected through extensive network of pipe / RCC / open channels / storm water drains and conveyed through oil water separator units in order to discharge oil free water into rainwater storage pond.

### **1.2.6 Project Cost**

The cost of proposed development of Bagdogra International Airport is estimated as **Rs. 1549 Crores.**

### **1.3 Description of Environment**

**Topography and Physiography:**—The entire topography is crisscrossed with rivulets, rivers and hills. The study area lies in the middle of the vast fertile plains (Tarai) south of the Himalayas, watered by innumerable rivers and rivulets rising from and flowing down the Himalayas. Topography of this district and its environs is characterized by uneven elevation of this region varies from 62 m to 350 m. The altitude falls from 350 m to above mean sea level at the foot of the Himalayas to 150 m above mean sea level over a distance of 25 km and then falls to about 60 m above mean sea level over a distance 110 km further south

**Geology:** Stratigraphically and petrographically, the whole region shows features of unusual variation. The first group of rocks to be met with, while going northward from the plains of newer alluvial deposits are the Siwaliks (Nahun Series), made up of hard and highly feldspathic and slightly micaceous sandstones, pebbles of quartz and schist. Along the entire base of this Siwalik zone there occurs a continuous belt of stratified and unstratified deposits of gravels, boulders, sands and clay thus forming a sort of transition between the hills and the plains.

**Soil Characteristics & Soil Quality:** The entire district has deposits which are mostly Sandy loam to loam consists of sand of various grades. These soils are very light in texture and are highly porous. The soil of this region is alluvial in nature and has a light texture and defined as sandy loam to loamy sand which highly permeable porosity. The Geological point of view soils are mainly the products of weathering of fluvial clastics. Pedagogically the deposits can be grouped into five unit based on soil formation, colour of topsoil and composition of soil, quaternary terrace deposits.

The first one has no soil cover which is the present-day flood plain, the second unit consists of enormous well developed coarse to fine sand size grading southward away from the foot hills, to silt and clay. The third- and fourth-unit ranges from boulder to sand size fraction, which is developed highly porous and permeable soil. The last unit mainly made up of boulder of various sizes, with little or no matrix.

It was observed that

- The pH values ranging from 6.57 to 7.08 indicating the slightly alkaline.
- The conductivity of the soil ranges from 0.069 to 0.157 mS/cm.
- The bulk density in the study locations ranged from 1.36 g/cc to 1.48 g/cc.
- The Available Nitrogen Content ranges between 44 kg/Ha to 91 kg/Ha in the locality
- The value of Phosphorus content varies between 19.6 kg/Ha to 40.5 kg/Ha. This indicates that the soil has medium quantities of Nitrogen and Phosphorus.
- The Potassium content varies from 216 kg/Ha to 358 kg/Ha, which indicates that the soils have high levels of potassium.
- The Texture of the soil sample is predominantly Sandy loam and loam in most of the places. The sand, silt and clay properties were found to be in the range of 38.9% to 63.9%, 24.4% to 35% and 8.74% to 27.3%.

#### **Ground Water Quality:**

- The pH value of all ground water samples ranges from 6.74 to 7.41 and meets the Acceptable limit of drinking water standards.
- The TDS in ground water samples range from 109 to 241 mg/l meets the Acceptable limit of 500 mg/l in the ground water sampling locations
- The total hardness of ground water samples range between 64 mg/l to 130 mg/l, meets Acceptable limit of 200 mg/l at the ground water sampling locations.
- The chloride content in ground water samples range from 24 mg/l to 66 mg/l, meets Acceptable limit of 250 mg/l at all the ground water sampling locations.
- Sulphate content in ground water sample ranges from 4 mg/l to 17 mg/l, meets Acceptable limit of 200 mg/l at all the ground water sampling locations.
- Fluoride content in ground water samples ranges from 0.11 mg/l to 0.29 mg/l, meets the Acceptable limit of drinking water standards.
- Nitrate content in ground water samples ranges from 1.0 to 9.0 mg/l, meets the acceptable limit of 45 mg/l at all the ground water sampling locations.

- The Calcium content in ground water samples range from 19 mg/l to 44 mg/l, meets permissible limit of 200 mg/l at all the ground water sampling locations.

#### **Surface Water Quality:**

- The pH value of all surface water samples ranges from 7.17 to 7.95.
- Electrical conductivity in surface water samples ranges from 258  $\mu\text{S}/\text{cm}$  to 556  $\mu\text{S}/\text{cm}$ .
- The TDS in surface water samples range from 142 to 309 mg/l which is below tolerance limit for all surface water samples.
- The total hardness of surface water samples range between 62 mg/l to 120 mg/l.
- The chloride content in surface water samples range from 39 mg/l to 84 mg/l which is below tolerance limit for all surface water samples.
- Sulphate content in surface water sample ranges from 8 to 28 mg/l which is below tolerance limit for all surface water samples.
- Fluoride content in surface water samples ranges from 0.1 mg/l to 0.21 mg/l which is below tolerance limit for all surface water samples.
- Nitrate content in surface water samples ranges from 2 mg/l to 21 mg/l which is below tolerance limit for all surface water samples.

**Micro Meteorology:** The ambient temperature during the study period was ranging between 15.0°C to 39.0°C. The relative humidity recorded at site ranged between 23% to 99% Predominant winds from East direction were observed. Total rainfall was observed 2.5 mm during the study period.

**Ambient Air Quality:** Ambient air quality monitoring have been carried out at eight locations during winter season for PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub>, NH<sub>3</sub>, O<sub>3</sub>, C<sub>6</sub>H<sub>6</sub>, BaP, Pb, As, Ni and CO. All monitored parameters at all AAQM locations met National ambient quality standards for industrial, residential, rural & other areas.

**PM<sub>10</sub>:** The maximum and minimum concentrations of PM<sub>10</sub> were recorded as 67  $\mu\text{g}/\text{m}^3$  and 37  $\mu\text{g}/\text{m}^3$  respectively. The maximum concentration was recorded at Babupara, Siliguri (AAQ7) and the minimum concentration was recorded at Chaupukuria (AAQ3).

**PM<sub>2.5</sub>:** The maximum and minimum concentrations for PM<sub>2.5</sub> were recorded as 33.0  $\mu\text{g}/\text{m}^3$  and 18.0  $\mu\text{g}/\text{m}^3$  respectively. The maximum concentration was recorded at the Babupara, Siliguri (AAQ7) and the minimum concentration was recorded at Chaupukuria (AAQ3).

**SO<sub>2</sub>:** The maximum and minimum SO<sub>2</sub> concentrations were recorded as 12.2 µg/m<sup>3</sup> and BDL (<5 µg/m<sup>3</sup>). The maximum concentration was recorded at Babupara, Siliguri (AAQ7) and the minimum concentration was recorded at Chaupukuria (AAQ3).

**NO<sub>x</sub>:** The maximum and minimum NO<sub>x</sub> concentrations were recorded as 22.4 µg/m<sup>3</sup> and 12.4 µg/m<sup>3</sup>. The maximum concentration was recorded at Babupara, Siliguri (AAQ7) and the minimum concentration was recorded at Dakshin Bagdogra (AAQ2).

**CO:** The maximum and minimum CO concentrations were recorded as 0.5 mg/m<sup>3</sup> and BDL(<0.1 mg/m<sup>3</sup>).

**O<sub>3</sub>:** The maximum and minimum O<sub>3</sub> concentrations were recorded as 16.6 µg/m<sup>3</sup> and 9.5 µg/m<sup>3</sup>.

**HC (methane and non-methane) and Volatile Organic Compounds (VOCs):** It has been observed that the concentrations of Benzene (C<sub>6</sub>H<sub>6</sub>), BaP, Lead, Arsenic, Nickel and Ammonia are also below detectable limits at all locations and O<sub>3</sub> present in locations are well within the standards prescribed by the Central Pollution Control Board (CPCB) for Industrial, Rural, Residential and Other area.

#### **Ambient Noise Quality:**

##### ***Day time Noise Levels***

Noise levels during daytime in the study area are found to be in the range 50.8 to 57.9 dB(A). The maximum noise level was observed to be 57.9 dB(A) at Project Site (N2) and a minimum of 50.8 dB(A) was observed at Chaupukuria (N3).

##### ***Night time Noise Levels***

Noise levels observed to fall in the range 42.8 to 48.9 dB (A) during the night time in the study area. A maximum of 48.9 dB (A) was observed at Babupara, Siliguri (N7) and a minimum of 42.8 dB (A) was observed at Chaupukuria (N3). Measured noise levels in study area are found to be in compliance with prescribed standards for ambient noise for the respective applicable categories.

**Land use & Land Cover in the Study Area** – It is observed that Agricultural land/fallow land is around 49.36% of the total area. Settlement (Built-up area) is located and occupies around 29.62% of the total study area. The proposed Project activities will not have any significant impact on the surrounding villages and habitation. The water bodies (Tank/pond/lake/reservoir) cover 0.32% of the total area and River/stream/canal covers 10.19% of the total area. Wetland area covers 1.27% of the total area and forest area covers about 8.6% of the total study area.

## **Terrestrial Ecology:**

### **Faunal Community**

**Mammals:** No wild mammalian species was directly sighted during the field survey. Dialogue with local villagers located within the study area also could not confirm presence of any wild animal in that area. Rhesus Monkey, Common Grey Langur, Common Indian Mongoose, Palm squirrel, Banberal Katas, Five striped squirrel, Indian flying Fox, Three stripped Palm Squirrel, Indian Field Mouse, Indian Hare, Indian Crested Porcupine, Small India civet, House Shrew, Common otter were observed during primary survey.

**Avifauna:** Since birds are considered to be the indicators for monitoring and understanding human impacts on ecological systems (Lawton, 1996) attempt was made to gather quantitative data on the avifauna by walk through survey within the entire block area and surrounding area. From the primary survey, a total of 78 species of avifauna were identified and recorded from the entire block area and surrounding area. The diversity of avifauna from this region was found to be quite high and encouraging

### **Floral Community**

During the primary survey, about 96 floral species observed. The most dominant tree species in the entire study area was dominated *Acacia auriculiformis*, *Shorea robusta*, *Ziziphus jujuba*, *Borassus flabellifer*, *Lannea coromandelica*, *Cordia pinnata*, *Azadirachta indica* etc. Most dominant shrubs in the study area were *Calotropis procera*, *Hibiscus rosa-sinensis*, *Leea asiatica*, *Woodfordia fruticosa*, *Caesalpinia pulcherrima*, *Nerium odorum*, *Ziziphus xylopyrus* etc. Among the herb species observed are *Cynodon dactylon*, *Datura metel*, *Amaranthus spinosus*, *Cyperus rotundus*, *Oplismenus burmannii*, *Imperata cylindrica* etc.

## **Socio-Economic Environment of Study Area:**

### **Demographic Structure**

- The study area located inside Darjeeling district in West Bengal State which includes total 140 villages within study area.
- Total population in the study area is 364367 with 187616 male and 176751 female populations. Overall sex ratio is 942 females per 1000 male, indicating male population is marginally higher in the region as compared with the female.
- Total Scheduled Caste population is 113275 (31.08%) and total Scheduled Tribe population is 58330 (16%).

### **Educational Structure**

The literacy rate of the total population is worked out to 239727 (65.79%). Male literacy 135159 (56.38%) and female literacy is 104568 (43.62%). The illiteracy rate of the total population is worked out to 124640 (34.21%).

### **Occupational Pattern**

The total population of Total Worker 137262 (37.67%) and non-worker population is 227105 (62.32%). During survey it was reported monthly family income are Rs. 8000/- to Rs. 30000/-

### **Economy and Industry Profile**

The main industries in Darjeeling are Tea, agriculture and tourism. Majority of the population are agrarian.

### **1.4 Anticipated Environmental Impacts & Mitigation Measures**

The potential environmental impacts due to the proposed project have been assessed in detail. These include impact on air quality, noise, water quality, solid waste, ecology and socio economics, etc. The modelling and analysis of the data indicate that the predicted impacts are minimal and are within the prescribed norms and standards. Comprehensive mitigation measures have been incorporated in the environmental management plan to ensure that the environmental quality is protected and enhanced. These have been summarized in **Table 11.1**.

**Table 11-1: Summary of Impacts and Mitigation Measures**

<b>Discipline</b>	<b>Potential Impacts/Issues</b>	<b>Mitigative Measures</b>	<b>Remarks</b>
<b>Construction Phase</b>			
Air Quality	Increase in dust and NOx concentration	Sprinkling of water in the construction area and paving of unpaved roads	The impact is likely to be for short duration and confined locally to the construction site itself
Water Quality	Increase in suspended solids due to soil runoff during heavy rainfall.	Temporary sedimentation pond will be constructed	-
Noise Levels	Increase in noise level	Equipment will be kept in good condition to keep the noise level within 90 dB(A)	Workers will be provided necessary personal protective equipment e.g. ear plug, ear-muffs
Solid waste	Generation of domestic sewage	Proper care will be taken in segregating wastes & maintaining areas in a clean pest free state	Will be disposed suitably.

Terrestrial Ecology	Clearing of Vegetation	Plantation will be done along with construction of project	The area being an aviation zone, impact on terrestrial fauna will be negligible
<b>Operation Phase</b>			
Air Quality	Increase in CO, HC and NO <sub>x</sub> levels in the ambient air	Methods of abatement suggested in the EIA report will be employed for the air pollution control at the source level.	The resultant concentrations after superimposing on the maximum ground level concentrations indicate that the resultant levels would be well within the prescribed standards
Water Quality	Risk of contamination of ground or surface water	Adequate treatment facilities will be provided so that the treated effluents conform to the regulatory standards.	The wastewater after treatment will be reused to maximum possible extent. Hence, no significant impact is envisaged because of the project.
Noise Levels	Increase in noise levels	A noise management program will be developed and implemented.	Noise modeling results indicate that the noise levels after implementation of the project will be within the prescribed standards.
Solid waste	Food waste/Medical Waste/Oily Waste etc.	OWC will be Installed.	Solid Waste will be disposed off as per norms
Terrestrial Ecology	Interaction of wildlife and aircraft operation	Greenbelt will be developed	As emissions will be within limits, no active injury to the vegetation is envisaged
Socio-Economics	Strain on resources and infrastructure facilities	Local people will be preferred for about 50% of jobs.	Positive social changes are anticipated which leads to regional development

### 1.5 Analysis of Alternative

No alternative site was analyzed for development of proposed project as the project involves expansion of existing airport. Alternatives were analyzed in terms of technology. Alternative energy options, building material options, fixtures etc. were analyzed. Options having low cost (both capital & maintenance), low environmental impacts and high life are tried to be selected. Some of the chosen alternatives have high capital cost but low O&M cost. It is expected that reduction in traffic, congestion on roads, development of safe, reliable, fast & cost-effective public transportation system, reduced air & noise pollution and increased employment generation will be occurred.

## **1.6 Environmental Monitoring Plan**

To ensure the effective implementation of the mitigation measures and environmental management plan during construction and operation phases of proposed development of Bagdogra International Airport, it is essential that an effective Environmental Monitoring Plan should be designed and followed. After development, environmental monitoring plan have been prepared for ambient air quality, water quality, soil characteristics and noise monitoring. Suitable mitigation measures will be taken in case of monitored parameters are exceeding the stipulated limits.

## **1.7 Additional Studies - Risk Assessment & Disaster Management Plan**

Hazard occurrence at Bagdogra Airport may result in on-site implications, like, fire at the storage of HSD in barrels for DG sets followed by fire, bomb threat at terminal building, cargo terminal & aircraft and natural calamities like, earthquake, flood, etc. Other incidents, which can also result in a disaster at the Bagdogra International Airport are agitation/forced entry by external group of people, sabotage, air raids; and aircraft crash while landing or take-off. Disaster management plan has been prepared comprising key functions of Airport operator, other supporting organizations/agencies/services for response during emergency at the Bagdogra International Airport.

## **1.8 Project Benefits**

The proposed airport project shall cater to future aviation needs in terms of air space management and airport operations to derive maximum benefits for passengers, stakeholders, all other airport users and surrounding communities.

Improvements in the physical infrastructure by way of addition of project infrastructure, ancillary industries that may come up on account of the project; Improvements in the social infrastructure like roads, railways, water supply, electrical power, drainage, effluent treatment plants, improved waste disposal systems, improved environmental conditions, etc.

Employment potential skilled, semi-skilled and unskilled labour both during construction and operational phases of the project with specific attention to employment potential of local population as well as necessity for imparting any specialized skills to them to be eligible for such employment in the project on a long term basis i.e., during operational and maintenance stages of

the project and Other tangible benefits like improved standards of living, health, education etc. The direct and indirect benefits of the development of Bagdogra Airport are as follows:

- Better infrastructure facilities to the passenger at new terminal building,
- Increase in regional economy as it will boost tourism and commercial activities in the region.
- Generation of more revenue to the state, hence more development of the region.
- Boost in tourism and more people to travel in the state
- Employment opportunity to people
- More business and industrial opportunities

### **1.9 Environmental Management Plan**

Airport Authority of India will be responsible for the implementation of mitigation measures identified in Environmental Management Plan (EMP) for construction and operation phases of Bagdogra International Airport. An Environmental Management Cell (EMC) will be supported by adequate number of personnel having sufficient educational and professional qualification and experience to discharge responsibilities related to environmental management including statutory compliance, pollution prevention, environmental monitoring, preventive maintenance of pollution control equipment and green belt development & maintenance.

AAI consider sustainable development which emphasize on environmental protection & green development as an integral part of the business and are committed to conducting business in an environment-friendly and sustainable manner. As part of this commitment, AAI have taken the following green initiatives:

- Greening the Airport;
- Energy Conservation;
- Water Conservation;
- Wastewater Management;
- Solid Waste Management;
- Noise Management; and
- Carbon Neutrality.

AAI will committed to environmental conservation and protection & will constantly take comprehensive measures to prevent the pollution and enhance the environmental performance of Bagdogra International Airport operations.

### **1.10 Budget for Environmental Management and Monitoring Plan**

Total budget of Rs. 3.87 Crores has been kept for implementation of environmental management plan during construction and operation phases of Bagdogra International Airport. Total budget of Rs. 5 Crore has been kept for environmental monitoring during construction and operation phases. The recurring cost per annum for Environmental Management, fund of Rs. 0.5 Crores has been allocated.

### **1.11 Conclusions**

Anticipated adverse environmental impacts from development of Bagdogra International Airport will be localised, short term and low/moderate in nature, and visible only during construction phase. Adverse environmental impacts identified in EIA study due to the proposed project will be mitigated by implementation of mitigation measures/environmental management plan (EMP) described in EIA report and compliance of applicable environmental regulations. The proposed project will have long term and regional beneficial/positive direct and indirect impacts on employment, socioeconomic conditions, state economy, tourism and development of the area and region.