ENVIRONMENTAL CLEARANCE

{Cat. B1 under Item 7 (a)' Airports}

Executive Summary in English

ENVIRONMENTAL IMPACT ASSESSMENT

Expansion of Barapani (Shillong) Airport Including Runway Extension, Expansion of Terminal Building & Apron And Other Allied Works

Baseline Data Collection :
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Project Proponent

Airports Authority of India
Barapani Airport.
Umroi, Shillong
Meghalaya

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Executive Summary

11.1 Introduction

Barapani (Shillong) Airport is the only operational airport in Meghalaya, serving Shillong. It's located in Umroi, about 30 km from the Shillong city center. The airport is situated at an elevation of 887 m above mean sea level, it has a single concrete runway (04/22), measuring 1,829 m in length. Barapani (Shillong) Airport is an operational Airport, belonging to AAI, with an area of 416.16 acres. The Airport has a runway length of 1829 m x 45m and is suitable for ATR - 72 type of aircraft operation. The Barapani airport has existing Passenger Terminal Building covering 5000 sqm and it handles 200 peak hour passengers. Existing apron is suitable for parking of 4 nos. ATR-72/Q - 400 type of aircraft with power - in and power - out configuration. The existing Barapani Airport is operating with valid Environmental clearance obtained from Ministry of Environment, Forest and Climate Change (MOEF&CC) vide file no. 10-28/2018-IA-III dated 7th January 2020. The certified copy of compliance report of conditions of Environmental Clearance by Regional Office of Ministry of Environment, Forest and Climate Change, Shillong has been provided**.**

Airports Authority of India (AAI) has planned for expansion of Barapani (Shillong) Airport Including Runway Extension, Expansion of Terminal Building & Apron And Other Allied Works. AAI has memorandum of understanding (MOU) with the Meghalaya State Government for providing incumbrance free 22 Acres land for the proposed runway extension and relocation of isolation pad. Under the proposed expansion of Barapani airport expansion of terminal building, runway extension, expansion of apron, relocation pad and associated facilities will be constructed.

The expansion of Barapani Airport is covered under category 'B1' of item 7 (a) *i.e.* 'Airports' of the schedule to the EIA Notification, 2006 and its subsequent amendments on 20 April 2022, and requires appraisal at State level by State Expert Appraisal Committee (SEAC) and environmental clearance from state Environmental Impact Assessment Authority (SEIAA) Meghalaya.

The proposal for grant of Terms of Reference (ToR) to the project ` Expansion of Barapani (Shillong) Airport Including Runway Extension, Expansion of Terminal Building & Apron And Other Allied Works' by M/s Airports Authority of India, was considered by the State Expert Appraisal Committee in meeting (EC/AGENDA/SEAC/585272/6/2025) held on 20 June, 2025 and TOR was finalized vide TOR Identification no. TO25B2902ML5691923N (File No. ML/SEAC/SEIAA/PP/RB/105/2025) dated 01/08/2025.

Location of Proposed Expansion of Barapani Airport

Barapani (Shillong) Airport is a domestic airport serving Shillong, the capital of Meghalaya, India. It is located at Umroi, situated 30 km from the city centre of Shillong. The Airport is located in Ri Bhoi district of Meghalaya state.

Airport Reference Point (ARP–WGS 84) is 25°42'12" N, 91°58' 41" E

Latitude and Longitude of corner points of Barapani (Shillong) Airport including proposed expansion area are given below:

Points	Latitude	Longitude
PT A	25°42'58.56"N	91°59'11.38"E
PT B	25°42'51.12"N	91°59'21.71"E
PT C	25°42'32.73"N	91°58'40.31"E
PT D	25°41'32.60"N	91°57'55.01"E
PT E	25°41'27.74"N	91°58'1.62"E
PT F	25°41'26.77"N	91°58'7.76"E

11.2 Description of Project

Under the proposed expansion, it is proposed to develop the following infrastructure at the existing Barapani (Shillong) airport considering A -320 as a critical aircraft for operations. The pavement strength has been considered with the potential for future upgrades to support A - 321 operations.

(i) Construction of Extended Runway from the existing length of 1829m x 45m to 2400m x 45m with provision of turn pads at both ends and strengthening of existing runway.

(ii) Expansion of Apron for parking of 5 nos. of Code - C Aircraft in power - in push - back configuration & associated GSE area. Strengthening of existing apron, isolation bay and associated taxiways.

(iii) Expansion of Existing Terminal Building by 5,550 sqm increasing the consolidated peak hour capacity to 1620 passengers (810 Arrival + 810 Departure) as per BCAS norms, with a provision of 2 nos. Passenger Boarding Bridge.

(iv) Miscellaneous Works.

Barapani (Shillong) Airport has an area of 416.16 Acres. 22 Acres of additional land (16 acres for Runway Extension by 571m and another 6 Acres of land for Relocation of Isolation Bay)

would be handover by Meghalaya State Government for the proposed expansion. Out of 22 Acres additional land for proposed expansion, 10.3 Acres land will be taken from Defence by Meghalaya State Government by land swap and remaining 11.7 Acres of land will be given by Meghalaya State Govt.

The domestic passenger terminal building at Barapani (Shillong) Airport will comply "Green Rating for Integrated habitat Assessment (GRIHA)" 5 star Rating.

For the proposed project 1273976 cum cutting and 197136 cum filling will be required, which will be utilized at site and disposed in environmental sound manner.

At the Barapani (Shillong) Airport, parking facilities will be provided for 148 cars and 60 bikes. In addition, airport staff parking will also be provided for 49 cars and 40 two wheelers.

The storm water management has been designed by providing storm water drains and culverts. Drains and culverts will meet the requirement of DGCA -CAR requirement.

Total power requirement is estimated as 1750 kW after expansion of Barapani (Shillong) Airport including runway extension. Power will be supplied by Meghalaya Power Distribution Corporation Limited (MPDCL). Presently, 2 DG sets of 380 kVA capacity are available at the Airport. After expansion of Barapani airport 3 DG sets of 1000 kVA will be installed to meet the power requirement during grid power failure

Barapani airport maintains 50 kL underground storage tank (UST) for HSD. Aircraft refueling at Shillong airport is carried by oil companies.

After expansion 300 TR HVAC will be required at the Barapani Airport. During operation phase, total fresh water requirement is estimated as 371 kld. 257 kld waste water will be generated from the Barapani Airport, which will be treated in 275 kld capacity sewage treatment plant (STP).

Total fresh water requirement will be 371 kld including domestic, fire testing and HVAC. Water requirement will be extracted through bore wells after obtaining permission from CGWA.

Approx. 1240 kg per day municipal solid wastes will be generated from terminal building, residential area and from deplaning of aircraft. From the deplaning of aircraft approx. 300 kg per day waste is estimated to be generated. Solid wastes will be segregated and disposed as per Solid Waste Management Rules, 2016 by engaging third party.

During construction phase 220 manpower and during operation phase 165 manpower will get direct employment. From the project indirect employment will be generated for more than 2000 persons per day.

The estimated project cost for expansion of Barapani (Shillong) Airport Including Runway Extension, Expansion of Terminal Building & Apron and Other Allied Works is estimated as Rs 489 Crores.

11.3 Description of Environment

Topography and Physiography:–The airport is located at an elevation of about 887 meters above mean sea level. The landscape of the includes low-lying valleys and isolated hillocks, which affect both wind flow patterns and visibility—important considerations for aviation. The airport is located at an elevation of about 887 meters above mean sea level. The site of the expansion of Barapani airport is not affected by flood.

Soil Characteristics: The main types of soils occurring in the area are clayey and Clay loam in texture.

Water Resources:–Umiam is river flowing at about 15 m the proposed expansion boundary of Barapani Airport. In the study area is drained by Umiam and other natural drainage channels. Umiam lake is about 8 km in WSW direction.

Water Quality: Ground water monitoring was carried out in the study area. The results of ground water samples were compared to Indian Standard Specification of drinking water IS: 10500:2012. All analysed parameters meet acceptable limit. The ground water resources in the study area were found fit for drinking purpose. Surface water samples are meeting Class of Water - C as per CBCB Criteria for designated use.

Micro Meteorology:–The maximum ambient temperature recorded near the site during the study period was 32.8 °C, while minimum temperature was recorded as 4.2 °C. During the study period, maximum relative humidity recorded near site was 76.4 % while minimum humidity was recorded as 57.1%. During the study period, maximum wind speed recorded near the site was 6.6 kmph while minimum wind speed was recorded as 5.1 kmph. Mean wind speed during the study period recorded as 5.3 kmph. During the study period, predominant wind direction was recorded from NE-E towards SW-E direction.

Ambient Air Quality: Ambient air quality monitoring have been carried out at eight locations during winter season for $PM_{2.5}$, PM_{10}, SO_2, NO_2, NH_3, O_3, C_6H_6, BaP, Pb, As, Ni and CO.

The 24-hourly $PM_{2.5}$ concentrations during the study period vary in the range of 16 to 26 $\mu g/m^3$. The mean $PM_{2.5}$ concentration was 20 $\mu g/m^3$ and 98% tile value of $PM_{2.5}$ concentration was found 25 $\mu g/m^3$.

The 24-hourly PM_{10} concentrations during study period vary in the range of 34 $\mu g/m^3$ to 55 $\mu g/m^3$. The mean PM_{10} concentration was 42 $\mu g/m^3$ and 98%tile value of PM_{10} concentration was 52 $\mu g/m^3$.

The 24-hourly SO_2 concentrations during study period vary in the range of 4.9 to 7.8 $\mu g/m^3$. The mean SO_2 concentration was 6.1 $\mu g/m^3$ and 98%tile value of SO_2 concentration was 7.5 $\mu g/m^3$.

The 24-hourly NO_2 concentrations during study period vary in the range of 9.6 to 16.9 $\mu g/m^3$. The mean NO_2 concentration was 13.0 $\mu g/m^3$ and 98%tile value of NO_2 concentration was 16.4 $\mu g/m^3$.

The CO concentrations during study period vary in the range of 0.1 to 0.2 mg/m^3. The mean CO concentration was 0.10 mg/m^3 and 98%tile value of CO concentration was 0.2 mg/m^3.

The O_3 concentrations during study period vary in the range of 8.1 to 14.7 mg/m^3. The mean O_3 concentration was 11.0 mg/m^3 and 98%tile value of O_3 concentration was 13.9 mg/m^3.

Concentration of Ammonia (NH_3), Lead (Pb), Benzene (C_6H_6), Benzo (a) Pyrene (BaP), Arsenic (As) and Nickel (Ni) in ambient air were found below detectable limit (BDL) during the study period.

Noise Level: Noise measurements were carried out at 8 locations. Measured day and time Leq noise levels are within the limit stipulated for ambient noise standards.

Natural Hazards and Disaster Risk - The project site is located in seismic zone V and has most earthquake-prone zone, classified as having the highest severity and intensity of seismic activity.

Biological Environment - There is no wildlife sanctuary, national park or other protected area within 10 km distance from the Barapani (Shillong) Airport. No forest land is involved in the project. Within 10 km radius area, 8 species of mammals, 1 specie of avifauna and 3 species reptiles are Schedule 1 as per Wildlife Protection Act, 2022.

11.4 Anticipated Environmental Impacts & Mitigation Measures

Topography & Physiography:-Topography at the site is almost plain. The construction for the proposed expansion of Barapani (Shillong) Airport will be confined within existing 416.16 Acres land and encumbrance free 22 Acres land by Government of Meghalaya. For expansion and construction of runway, 1273976 cum cutting and 197136 cum filling will be required, which will be utilized at the site. Impact related to excavations and transportation of excavated materials will not appear from the project. Hence, the anticipated impact on the topography during construction phase.

Mitigation Measures

- Land clearing at the site will be kept to the absolute minimum practicable;
- Construction site would be designed to minimize filling of the earth, and
- Borrowing of earth if required will be ensured only from approved borrow area having valid environmental from District Level Environmental Impact Assessment Authority (DEIAA).

Drainage Pattern: The storm water management has been designed by providing storm water drains including both sides of runway and culverts. Drains and culverts will meet the requirement of DGCA -CAR requirement. Storm water management/drainage plan for the airport has been prepared to ensure that no rain water accumulation at the airport.

Mitigation Measures

- Slope and storm water management shall be provided to maintain drainage and flow of runoff in the drain.
- At the airport site, storm water drains including both sides of runway and culverts have been provided.
- Drainage at the site will be maintained as per drainage counter at the site, therefore, no flooding will be occurred at and around the Barapani airport during the construction phase.

Water Resources and Water Quality

During the construction phase of the proposed expansion of Barapani (Shillong) Airport, approx 40-50 kl/day water will be required depending upon the type of construction activities. Water requirement will be met through water supply by borewells/ Greater Shillong Water Supply Scheme.

During operation phase, total fresh water requirement is estimated as 371 kld. Fresh water requirement will be for domestic (306 kld), fire testing (5 kld) and HVAC (60 kld) purposes. 257 kld waste water will be generated from the expansion of Barapani (Shillong) Airport, which will be treated in 275 kld capacity sewage treatment plant (STP).

Mitigation Measures

- Continuous efforts will be made to reduce water consumption using less water required cisterns;
- Water efficient urinal and toilets will be provided in proposed terminal building.
- Efforts will be made to stop wastage and leakage of water;
- Sewage and domestic waste water will be treated in Sewage Treatment Plant
- Treated waste water will be used for greenery & landscaping at the proposed civil enclave.

Soil

Approx 1240 kg per day solid wastes will be generated during operation of the Barapani Airport, which will be collected, segregated and managed by external agency for disposal as per Solid Waste Management Rule, 2016. Hence, the impact on the soil will be insignificant as an organized solid waste collection and disposal practices will be followed at the Barapani Airport.

Mitigation Measures

- Municipal solid waste collection bins will be placed at strategic locations in the proposed civil enclave;
- External agency will be hired for disposal of solid wastes as per the provisions of the Solid Waste Management Rule, 2016;
- Solid waste generated from the Barapani Airport will be transported in close containers;
- Used lubricating waste oil and oil contaminated clothes etc will be collected separately in containers and will be sold to authorized recyclers as per CPCB/MSPCB guidelines.

Ambient Air Quality

During the operational phase of the Barapani Airport, sources of emissions will be from Aircraft during taxing and at apron, vehicular emissions from vehicles engaged in ground operations, vehicular emissions from vehicles coming for drop and pick up of passengers and stack emission from DG sets operations during grid power failure.

Mitigation Measures

- Compliance of all standards prescribed by the ICAO during operation of aircrafts by preventive maintenance and monitoring;
- Stack heights of DG sets will be as per the CPCB guidelines;
- Proper traffic management plan will be prepared to ensure that there is no traffic congestion in front of proposed terminal building. It will help in reduction of vehicular emissions from the proposed civil enclave.
- Ground vehicles at the proposed civil enclave will be maintained and will have a "Pollution Under Control" certificate;
- Development of greenery and landscaping at the Barapani Airport for improving ambient air quality.
- Monitoring of ambient air quality/ source emissions will be carried out as per monitoring plan.

Noise Levels

During operation phase of the Barapani Airport, landing, take-off and taxing of various types of aircrafts are major sources of air emissions. Aircraft noise modelling has been carried out using AEDT model for Barapani Airport.

The noise levels from 70-90 dB(A) will be confined within the boundary of the Barapani Airport. Boundary ball around the Barapani Airport and green belt development will significant attenuate noise levels from the Barapani Airport. The impact of noise levels due to the operation of the Barapani Airport will be within permissible levels. Further, noise mitigation measures to be implemented at and around the Barapani Airport will further reduce the noise levels in nearby settlements.

Mitigation Measures

- The compliance of all standards prescribed by the ICAO during operation of aircrafts by preventive maintenance and monitoring,
- Proper traffic management will be prepared to ensue that there is no traffic congestion at the proposed civil enclave. It will help in reduction of vehicular noise emissions from the proposed civil enclave,
- DG sets will be provided with acoustic enclosure as per CPCB guidelines,
- Terminal building will be sound proof,
- Ground staff will wear earplug while attending the aircraft,

- Green belt, landscaping and boundary at the proposed civil enclave will act as barrier for noise;
- Monitoring of ambient air quality/source emission will be carried out as per monitoring plan.

Terrestrial Ecology

At the Barapani Airport, green area and landscaping will be developed on 8250 sqm area city side. 103 trees will be planted at the Barapani (Shillong) Airport after expansion (@80 sqm for 1 tree). Treated waste water from STP will be used for irrigation of green belt. This has positive and long-term beneficial impact on terrestrial ecology of the area. For irrigation of green belt, treated waste water from STP will be available and used. This will be positive and long term beneficial impact on terrestrial ecology of the area.

Mitigation Measures

- Landscaping/ plantation/ greenery will be developed.
- Indigenous species of trees will be planted for green belt and landscaping.

Socio-Economic Environment: The proposed expansion of Barapani Airport will open direct and indirect job opportunities in the area and region. Further, it will attract more and more pilgrims, tourist, trade, commercial and developmental activities in the area. Therefore, positive impacts are anticipated on socio-economic environment during construction and operation phase of the proposed Barapani Airport.

11.5 Analysis of Alternatives

During design and construction of the proposed expansion of Barapani Airport, alternatives for energy conservation, GRIHA Rating 5 star terminal building, energy efficient materials for terminal building, reuse of treated waste water from STP, green belt and landscaping have been analyzed and adopted in design.

11.6 Environmental Monitoring Plan

Environmental monitoring plan have been prepared for ambient air quality, water quality, soil characteristics and noise monitoring to ensure the effective implementation of the mitigation measures and environmental management plan for the Barapani Airport.

Suitable mitigation measures will be taken in case of monitored parameters are exceeding the stipulated limits. Total budget of Rs 0.031 Crores and Rs 0.025 Crores has been kept for environmental monitoring during construction and operation phases.

11.7 Risk Assessment & Disaster Management Plan

Hazard occurrence at the Barapani Airport may result in on-site implications, like, fire at the HSD day tank for DG sets followed by fire, bomb threat at terminal building & aircraft and natural calamities like, earthquake, flood, etc. Other incidents, which can also result in a disaster at the proposed Barapani 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 the Barapani Airport, other supporting organizations/agencies/services for response during emergency at the Barapani Airport.

11.8 Project Benefits

The proposed expansion of Barapani (Shillong) Airport, is likely to open domestic /export markets. There is export possibility in the region through Barapani (Shillong) Airport. Shillong exports a variety of goods, including ginger, oranges, handicrafts, betel leaves, raw hides, bay leaves, fresh tomatoes, and various other agricultural produces.

Direct and Indirect Benefits

The direct and indirect benefits of the Barapani (Shillong) Airport are as follows:

Direct Benefits

- Batter infrastructure facilities for passenger
- For safe landing and takeoff of aircrafts at Barapani (Shillong) Airport
- 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.

Macro Level Benefits

- Boost in trade and commerce and more people to travel in the state.
- Employment opportunity to people.
- More business and industrial opportunities

11.9 Environmental Management Plan

The Airports Authority of India will be responsible for the implementation of mitigation measures identified in Environmental Management Plan (EMP) for construction and operation phases of the proposed development of Barapani Airport.

AAI has planned for to install 150kWp grid tied ground mounted solar photovoltaic power plant at Barapani Airport. At the Barapani Airport. Suitable mitigation measures and management will be taken to control bird's hazards at the Barapani Airport. Green belt/plantation in the nearby area will also be carried with the help of local community involvement. Large canopy trees and fast-growing small trees of indigenous species will be selected for plantation. It is proposed to plant 383 trees saplings at Barapani Airport as part of green area and landscaping.

Environmental Management Cell (EMC) is proposed at Barapani Airport to look after day to day basis implementation of mitigation measures for construction and operation phases. An Environmental Management Cell (EMC) will be headed by Assistant General Manager 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.

Environmental Management cell will implement and review the compliance of the stipulated conditions specified in Environmental Clearance and Consent for Establish. The cell will be responsible to obtain Consent for Operate under Water Act and Air Act from MSPCB.

In order to ensure that grievances and complaints by local people on any aspect of the environmental and social impacts during construction and operation phases of the proposed civil enclave will be addressed in a timely and satisfactory manner and that all possible avenues will be available to resolve their grievances (if any), mechanisms for Grievances Redressal will be setup. Environmental Management Cell will also work as Grievances Redressal Cell (GRC).

Corporate Environmental Responsibility Initiatives

AAI has proposed to allocate Rs 3.67 Crores towards Corporate Environmental Responsibility (CER) within the study area for a period of 5 years (2027-2032). The Corporate Environmental Responsibility (CER) will comprise, infrastructure creation for sanitation, health, education, skill development, electrification including solar power, solid waste management facilities and plantation in community areas of nearby villages.

11.9.1Budget for Environmental Management and Monitoring Plan

Total budget of Rs 0.68 Crores and Rs 1.24 Crores has been kept for implementation of environmental management plan during construction and operation phases of the proposed expansion of Barapani Airport. Recurring Cost of Rs 0.35 Crores and Rs 0.69 Crores per annum has been kept for EMP implementation during construction and operation phases. Total budget of Rs 0.031 Crores and Rs 0.025 Crores has been kept for environmental monitoring during construction and operation phases.