Executive Summary
of
Environmental Impact Assessment
Extension of Runway, Construction of Isolation Bay, Link Taxiway and Other Allied Works at Dibrugarh Airport

Airports Authority of India
Dibrugarh Airport, Dibrugarh - 786012,
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EXECUTIVE SUMMARY

0.1 Introduction

Dibrugarh Airport is one of the major airport in NER. Dibrugarh is located 439 km east of Guwahati. Dibrugarh is well connected to the rest of India by rail, road and air transport and thus serves as a gateway to eastern Assam and also parts of Arunachal Pradesh.

Presently, Dibrugarh Airport has runway 05/23 of 1829 m x 45 m suitable for A320 operation with load penalty in all weather condition. AAI has planned the extension of runway, construction of isolation bay, link taxiway and other allied works at Dibrugarh Airport.

Total land of Dibrugarh Airport is 354.56 Acres. Indian Army and IAF have accorded working permission to AAI for 5.33 Acres and 0.71 Acres of their respective land. In addition, 32.5 Acres land has been handed over by State Govt to Airports Authority of India for proposed extension and other associated work.

Environment plays a vital role in overall development of the country. Recognizing the importance of environmental protection and sustainable development, the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India had formulated policies and procedures governing the industrial and other developmental activities to prevent indiscriminate exploitation of natural resources and promote integration of environmental concern in developmental projects. To assess and evaluate potential environmental impacts during design, construction & operation phases and to suggest mitigation measures with detailed environmental management plan, environmental impact assessment study has been conducted for the project.

The Ministry of Environment, Forest and Climate Change (MoEF&CC) has made prior environmental clearance (EC) for Airport projects mandatory through its notification issued on 14th September 2006 and as amended on 1st December 2009.

During 148th Meeting of the Expert Appraisal Committee of Ministry of Environment of Forest & Climate Change (MoEF&CC) for Building/ Construction Projects/ Township and Area Development Projects, Coastal Regulation Zone, Infrastructure Development & Miscellaneous projects held on 19th to 21st May, 2015, the project was considered and TOR was finalised vide letter dt. 18 June, 2015. EIA & EMP report has been prepared as
per TOR approved by MoEF&CC. The compliance of TOR is given in the beginning of EIA Report.

0.2  Project Description

0.2.1  Justification of Proposed Extension

Dibrugarh Airport is the operational airport belonging to Airports Authority of India. Presently, the Airport is having runway 05/23 of dimension 1829 m x 45m dimension with PCN 57/F/C/W/U, suitable for B-737-800, AB 321 and AB 310 type of aircraft with load penalty in all weather conditions. Airports Authority of India has proposed for extension of runway to 2407 m x 300 m dimension, construction of isolation bay, link taxiway and other allied works at Dibrugarh Airport to meet the demand of airlines.

0.2.2  Scope of Extension and Expansion

The proposed extension at Dibrugarah Airport at Dibrugarh will include following:

i.  Extension of Runway 05/23 towards runway 05 beginning.
ii.  Provision of runway shoulders 7.5 m wide on either side of extended portion or runway in continuation of existing shoulders.
iii.  Provision of turn pad.
iv.  Grading of runway strip of 2407m x 300m dimension. Additional land has been requested from the State Govt. for 300m runway strip.
v.  Demolition of boundary wall of IAF in north-west direction and to construct new frangible boundary wall at 150m from the center line of the runway.
vi.  Provision of storm water drain for extended portion of runway beyond the runway strip of 300m.
vii.  Provision of perimeter road, along with lighting and CISF watch tower inside the boundary as per the current norms.
viii.  Rerouting and construction of 5m wide link road to Nepalipatti, drainage system etc. outside boundary wall towards runway 05 beginning, with lightings.
ix.  Construction of box culverts of strength to withstand B 747 - 400 type of Aircraft operations.
x.  Removal of obstructions and structures in the area of extension of Runway, basic strip and approach funnel.
xi.  Provision of CAT-I precision Approach lights of 900 m length for runway 05.
xii.  Provision of simple approach lights of 420m length for runway 23.
xiii. Provision of HIRL system including the threshold lights and with standby circuit, on the extended portion of runway, integrated with existing runway lights and also integrated with remote control provided in ATC control Tower.

xiv. Installation of New PAPI on runway 05 and runway 23.

xv. Electrical works for trans-installation of glide path of runway 05.

xvi. Rerouting of electrical cables falling in area of runway extension, of any

xvii. Provision of illuminated mandatory instruction signs and information signs at appropriate points.

0.2.3 Land Required for Proposed Extension

For extension of runway, Indian Army and IAF have recently accorded working permission to AAI for 5.33 Acres and 0.71 Acres of their respective land. In addition, 32.5 Acres land has been handed over by State Government to Airports Authority of India for proposed extension. Airports Authority of India is not acquiring any land. Therefore, resettlement and rehabilitation action plan is not required.

0.2.4 Filling Required for Proposed Extension

The terrain at the site within the airport for proposed extension is plain with elevation varying from 107.69 m to 110.0 m above mean sea level (amsl). For proposed extension, approx. 123200 cum earth filling will be required and same will be obtained from approved sand quarries of Brahamputra River at distance of about 7 km from the airport.

0.2.5 Utilities

**Air Conditioning and Building Management System**

At the existing airport, 3 air cooled chillers of 282 TR capacity each have been installed to meet the central air conditioning requirement. Building Management System (BMS) has been adopted at the airport.

**Power Requirements**

Total power requirement is estimated as 1275 kW which is met through Assam State Electricity Board (ASEB) power supply. For the power back-up, 3 DG sets of 750 KVA capacity each have been installed at the airport, which are operated in the event of grid power failure.
Total Water Requirement

Total water requirement for Dibrugarh Airport is 30 kld which is met through existing bore well already available at the Dibrugarh Airport.

Sewage Treatment and Disposal

20 kld sewage is generated from the Dubrugarh airport, which is treated in 40 kld capacity sewage treatment plant. Treated waste water is used for greenery and landscaping development at the airport.

Rain Water Harvesting

Rainwater harvesting system has been provided at the Dibrugarh Airport at terminal building.

Parking Facilities at Airport

At the Dibrugarh Airport, parking facilities are available for 240 Cars.

0.3 Description of Environment

Topography and Physiography: Physiographically the study area is plain and located in the south of the upper Brahamputra valley which is flowing broadly east to west in upper part of the study area. A major part of study area is extensive plain formed by the Brahamputra and its south bank tributary, Dibru river. Ground elevation in the study area varies from 105m to 112 m above msl. The ground elevation at existing and proposed extension of runway of Dibrugarh Airport varies from 107.81 m to 109.36 m above mean sea level (amsl).

Geology: A fairly thick group of sedimentary rocks occurs in this area ranging in age between Eocene and Pleistocene and are exposed mainly along the foot hills bordering the southern boundary of this Dibrugarh district. The eastern part of the district and the valley of the Brahamputra river are covered by thick alluvial deposits belonging to sub-Recent and Recent periods.
Soil Characteristics: The soil of the area are composed of alluvium which may be classified as new and old. The new alluvium varies mostly from clayey to sandy loam in texture and is slightly acidic in reaction.

Water Quality: Water quality of study area meets desirable limit. Ground water resources in the study area were found fit for drinking purpose.

Micro Meteorology: January is the coldest month with the daily minimum temperature at 8.8°C and the daily maximum temperature at 31.4°C. Temperatures drop appreciably with the onset of the monsoon after the first week of July. The monsoon period is generally pleasant. With the withdrawal of the monsoon by the end of September, day temperatures rise a little in October and both day and night temperatures begin to drop rapidly by November. During the South-West monsoon the humidity is high and is about 88% in the mornings. Summer is the driest part of the year, the humidity being 71-86% in the afternoons.

At Dibrugarh IMD station, Annual average wind speed is 4.1kmph. Highest mean wind speed (6.2 kmph) is observed in April whereas lowest wind speed (2.3 kmph) is observed in November and December month.

Ambient Air Quality: Ambient air quality monitoring have been carried out at five locations during post monsoon season for PM$_{2.5}$, PM$_{10}$, SO$_2$, NO$_2$, NH$_3$, O$_3$, C$_6$H$_6$, BaP, Pb, As, Ni and CO. National ambient air quality standards for industrial, residential, rural & other areas are met for all monitored parameters at all AAQM locations during post monsoon season.

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

Natural Hazards and Disaster Risk:

Earthquakes are one of the most destructive of natural hazards. Assam falls within an earthquake Zone V. The project area comes under zone V in the seismic zoning map of India

Terrestrial Ecology: There is no forest in the area. Tropical Wet Evergreen Vegetation is found in region. Species association and frequency of their occurrence vary from area to area, but the ones commonly found species are Actinodaphne obovata (Petarichawa),
**Aesculus species** (Ramanbih), **Artocarpus chama** (Sam), **Albizia species** (Siris, Sau, Koroi), **Anthocephalus chinensis** (Kadam), **Duabanga grandiflora** (Khakan), **Castanopsis species** (Hingori, Dohabahingori, Kanchan), **Dillenia indica** (Ou-tenga), **Bauhinia purpurea** (Kanchan), **Lagerstroemia species** (Jarul, Ajar, Sidha), **Magnolia species** (Phulsopa, Gahorisopa, Pansopa, Kharikasopa, Kathalsopa, Duleesopa), **Michelia champaca** (Teeta campa), **Syzygium species** (Paharijam, Mokrajam, Berjamu, Kolajamu, Bogijamu, golapjamu), **Schima wallichii** (Bolem, Ghugra), **Terminalia species**, (Hilikha, Bohera, Bhomora), **Trewia nudiflora** (Bhelkor), etc.

Within 10 km radius area, no species of flora and fauna has been categorized as rare, endangered and threatened (RET) species. There is no wildlife sanctuary or national park within 10 km radius study area.

**Socio-Economic Environment of Study Area:** As per 2011 Census, the population of the Dibrugarh In the settlements located in the study area, there are total 276867 households as per census records 2011. The population of settlements in the study area is 209513. The male population constituted nearly 50.83% persons while the female population is 49.17% of the total population. sex ratio in settlements located in the study area are 967. Scheduled Castes population account for 4.36%, 4.41% amongst males and 4.30% amongst females. In the study area 58.36% is literate, 65.64% amongst males and 50.83% amongst females.

In the study area, total main workers account for 29.53% (40.53% males and 18.16% females) whereas non-workers account for 59.45% (47.89% males and 71.40% females). Marginal workers are 11.02% (11.58% males and 10.44% females). Out of total main workers in the study area, Cultivators workers at 10.40% (11.95% males and 6.83% females) followed by Other workers at 83.03% (82.74% males and 83.70% females), Agricultural labourers account for 6.57% (5.31% males and 9.47% females).

**4.0 Anticipated Environmental Impacts & Mitigation Measures**

**Topography & Physiography:** Topography of the area is almost plain. Terrain at the site within airport and proposed extension is plain with elevation varying from 107.69 m to 110.0 m above mean sea level (amsl). For proposed extension, approx. 123200 cum earth filling will be required and same will be obtained from approved sand quarries of Brahmaputra River at distance of about 7 km from the airport. It is evident that the impact on the topography will be confined to limited to the project site for extension of
runway by 2407 m x 300 m dimension, which is very small as compared to the total study area.

Mitigation Measures

- Land clearing at the site will be kept to the absolute minimum practicable; and
- Construction site would be designed to minimize filling of the earths.
- Borrowing of earth will be ensured only from approved borrow area on Brahmaputra River.
- Borrow area will be rehabilitated after borrowing of necessary earth.

Land Use Pattern: Dibrugarh Airport is the operational airport belonging to Airports Authority of India. For extension of runway, Indian Army and IAF have recently accorded working permission to AAI for 5.33 Acres and 0.71 Acres of their respective land. In addition, 32.5 Acres land has been handed over by State Govt to Airports Authority of India for proposed extension. Airport Authority of India is not acquiring any land.

Mitigation Measures

- Land clearing for construction site will be kept to the absolutely minimum practicable;
- The filling of soil at the proposed site for extension of runway would be kept minimum; and
- Construction debris and waste generated during construction activities will be collected and disposed in environmental sound manner as per applicable rules depending upon type of wastes.

Water Resources: Total water requirement is 30 kld, which is met through existing bore well at the airport. Water requirement is met through bore well already available at the Dibrugarh Airport. From the airport 20 kld sewage is generated from the Dubragarh airport, which is treated in 40 kld capacity sewage treatment plant. Treated waste water is used for greenery and landscaping development at the airport. After extension of runway water requirement will be almost same.

Mitigation Measures
Continuous efforts will be made to reduce water consumption using less water required cisterns;
Efforts will be made to stop wastage and leakage of water;
Reused treated waste water in HVAC, greenery and landscaping at the existing airport.
Provision of rain water harvesting through rain water collection tanks.

**Water Quality:** Total estimated wastewater generation during the operation phase is 20 kld, which is treated in Sewage Treatment Plant (STP). After treatment, treated wastewater is reused for horticulture purposes. No wastewater will be discharged outside the airport premises.

**Mitigation Measures**

- Collection of waste water and treatment of waste water in Sewage Treatment Plant (STP);
- Avoid spillage of fuel and lube oil and storing them on concrete floor.
- Solid waste collection and disposal as per Municipal Solid Waste (Management & Handling) Rule 2000.
- Regular testing and analysis of treated waste water from STP to ensure effectiveness of STP and compliance of discharge standards.

**Soils:** Approx 80 kg per day solid waste is generated during operation of the Dibrugarh airport, which is collected, segregated and managed by external agency for disposal as per Municipal Waste (Management & Handling) Rule, 2000. Hence, the impact on the soil will be insignificant as an organized solid waste collection and disposal practices exist at the Dibrugarh airport.

**Mitigation Measures**

- Municipal waste collection bins have been placed at strategic locations in the airport;
- Agency has been hired for disposal of solid wastes as per the provisions of the Municipal Waste (Management & Handling) Rule, 2000;
- Solid waste generated from the airport is transported in close containers;
- Used lubricating waste oil and oil contaminated clothes etc is collected separately in containers and is sold to authorized recyclers as per CPCB/APCB guidelines.
**Ambient Air Quality:** During the operational phase of the Dibrugarh airport after extension of runway and apron, the intermittent air emissions are generated from aircraft engines during approach, landing, taxiing, take-off and initial climb, which is termed as reference Landing and Take-off Cycle (LTO cycle). The air pollutants of concern from the aircrafts emissions are un-burnt Sulphur Dioxide, Hydrocarbons (HC), Carbon Monoxide (CO) and Oxides of Nitrogen (NO$_x$) as per ICAO guidelines.

For the power back-up, 3 DG sets of 750 KVA capacity each have been installed at the Dibrugarh Airport, which will be sufficient after extension of runway. Exhaust emissions comprising NO$_2$ and SO$_2$ are generated from the operation of DG sets, which are operated only to meet the power requirement during grid power failure.

Vehicular emissions are also generated at the Dibrugarh airport from the operation of vehicular traffic at the airport as ground support vehicles, passengers pickup and dropping vehicles. These vehicles are mainly diesel and petrol driven and are source of mainly CO, HC and NOx emissions.

For prediction of anticipated impact of emissions from the existing airport, estimation of emissions load from Aircraft LTO, DG sets and vehicles is essential. The emissions load estimation from various emission sources has been carried out in following subsection:

<table>
<thead>
<tr>
<th>Sources</th>
<th>SO$_2$</th>
<th>NO$_x$</th>
<th>CO</th>
<th>HC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft</td>
<td>2.03</td>
<td>26.29</td>
<td>16.67</td>
<td>1.43</td>
</tr>
<tr>
<td>DG set</td>
<td>0.17</td>
<td>0.19</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Vehicular</td>
<td>--</td>
<td>2.1</td>
<td>1.1</td>
<td>0.9</td>
</tr>
<tr>
<td>Total</td>
<td>2.2</td>
<td>28.58</td>
<td>17.77</td>
<td>2.33</td>
</tr>
</tbody>
</table>

There is no continuous emissions source at the Dibrugarh Airport. Air Flights and vehicular movement remain intermittent at the airport. DG sets are also operated intermittently in the event of 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 are as per the CPCB guidelines;
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- Proper traffic management plan are prepared to ensure that there is no traffic congestion at airport. It will help in reduction of vehicular emissions from the airport.
- Ground vehicles at the airport are maintained and have a “Pollution Under Control” certificate;
- Development of greenery and landscaping at the 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 proposed extension of existing Dibrugarh airport, landing, take-off and taxing of various types of aircrafts will be major sources of noise emissions.

The noise levels from 65-85 dB(A) will be confined within the existing Dibrugarh airport boundary. The noise levels of 55 dB(A) cross the boundary and affect 1.6 km² of area outside the airport. The noise levels of 50 dB(A) cross the boundary and affect 3.3 km² of area outside the airport. The background noise levels range from 41.2-62.1 dB(A) at nearby villages which are located 0.94 km to 3.71 km from Dibrugarh airport. As Dibrugarh airport is already in operation, therefore, impact of noise levels due to the operation of existing Dibrugarh airport is included in monitored background noise levels. However, noise mitigation measures to be implemented at and around the existing Dibrugarh airport will further reduce the noise levels in nearby settlements.

Mitigation Measures

- It is ensured the compliance of all standards prescribed by the ICAO during operation of aircrafts by preventive maintenance and monitoring,
- Proper traffic management has been prepared to ensure that there is no traffic congestion at the airport. It helps in reduction of vehicular noise emissions from the airport,
- DG sets have been provided with acoustic enclosure as per CPCB guidelines,
- Terminal building is sound proof,
- Ground staff wears earplug while attending the aircraft,
- Landscaping and boundary at the airport act as barrier for noise;
- Green belt/plantation in the nearby settlements
- Monitoring of ambient air quality/source emission will be carried out as per monitoring plan.
Traffic Management: The Dibrugarh Airport is located about 15 km away (by road) from Dibrugarh City. The Dibrugarh airport is approached from by NH 37 the 3.5 km approach road. At Dibrugarh Airport traffic management has been provided in such a way no traffic jam during passenger drop and pick up.

At the arrival and departure, there is proper traffic management. Therefore, there is no possibility of traffic congestion on the Dibrugarh airport due to extension of Runway.

Mitigation Measures

• All vehicles are parked in designated parking area only;
• Road crossings are well marked and signalled.
• Informatory and warning signages are retro reflective type provided, clearly visible in the night.
• Marshals have been deployed to guide the vehicles and stop vehicles to avoid traffic jam at arrival and departure of Dibrugarh Airport.

Terrestrial Ecology: Greenery and landscaping have been developed at the Dibrugarh Airport. For irrigation of green belt, treated waste water from STP and accumulated rainwater are available and used. This has positive and long term beneficial impact on terrestrial ecology of the area. After extension of Runway area under Greenery and landscaping will be increased.

Mitigation Measures

• Landscaping/ plantation/ greenery will be increased after extension of runway.
• Indigenous species of trees will be planted after extension of runway at the airport.

Heritage Structures: There is no heritage, historical or archaeological structure in the area around the airport. Therefore, no impact is anticipated due to extension of runway at existing Dibrugarh Airport. Hence, no mitigation measure is required.

Socio-Economic Environment: During operation phase after extension of runway, construction of isolation bay, link taxiway and other allied works, Dibrugarh Airport will open additional direct and indirect job opportunities in the area and region. Further, it will attract more and more tourist, commercial and developmental activities in the area as international flights will land at Dibrugarh Airport after extension of Runway. Therefore,
positive impacts are anticipated on socio-economic environment during operation phase after extension.

**Employment and Economic Growth** - The extension of runway, construction of isolation bay, link taxiway and other allied works at Dibrugarh Airport will result in a boost in tourism, commercial activities in the region as international flight will be operated. This will improve direct and indirect employment opportunities, revenue generation, commercial and industrial activities; therefore, resulting in positive impact on the employment and economic growth of the region.

0.5 **Analysis of Alternatives**

The Dibrugarh Airport is existing operational airport. Therefore, extension of runway is best alternative. 5.33 Acres and 0.71 Acres land required close to airport for extension of runway have been provided by Indian Army and IAF, respectively. Further, 32.5 Acres land has been handed over by State Govt to Airports Authority of India for proposed extension and other associated work.

0.6 **Environmental Monitoring Plan**

To ensure the effective implementation of the mitigation measures and environmental management plan during extension of runway, construction of isolation bay, link Taxiway and Other Allied Works and operation phases of the Dibrugarah Airport, 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.

0.7 **Risk Assessment & Disaster Management Plan**

Hazard occurrence at the Dibrugarh airport may result in on-site implications, like, fire at the storage of ATF, filling of ATF in aircraft, leakage of ATF and 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 Dibrugarh 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 existing Dibrugarh Airport.

0.8 Project Benefits

The direct and indirect benefits of the Extension of Runway, Construction of Isolation Bay, Link Taxiway and Other Allied Works at Dibrugarh Airport are as follows:

Direct Benefits

- Operation of B-737-800, AB 321 and AB 310 Type of Aircraft without load penalty.
- Increase in regional economy as it will boost tourism and commercial activities in the region and flights will be operated without load penalty.
- Generation of more revenue to the state, hence more development of the region.

Macro Level Benefits

- Employment opportunity to people.
- More business and industrial opportunities

0.9 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 Dibrugarh airport. There will be Environmental Management Cell (EMC) at the Dibrugarh 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
Establishment. The cell will be responsible to obtain Consent for Operate under Water Act and Air Act from APCB.

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 project 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).

Budget for Environmental Management and Monitoring Plan

At Dibrugarh Airport, budget for implementation of mitigation measures and environmental management plan during the construction and post construction phase of proposed works at existing Dibrugarh airport will be Rs. 0.75 Crores. The estimated budget of Rs 0.11 Crores has been kept for environmental monitoring during construction and operation phases of the proposed works at the Dibrugarh Airport.