

EXECUTIVE SUMMARY

Draft Environment Impact Assessment

Airport Expansion Project at Belgaum, Belgaum District, Karnataka

Project Proponent	:	Airports Authority of India, Hubli , Karnataka
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INTRODUCTION

Belgaum Airport is an operational airport (Aerodrome Reference Code 3C) having total land area 360.34 Acres. Regular flights started operations since 2003. At present, Spice Jet Airlines is operating one scheduled flight (ATR-72) daily in Belgaum-Bangalore-Chennai and Chennai-Bangalore-Belgaum sector. Non-scheduled charters operate their flights for business, ceremonies and other important occasions.

A MOU has signed between AAI and Karnataka Govt. for modernization/development of Belgaum Airport. AAI will upgrade the Belgaum Airport and make it operational for all Code-C type of aircraft meeting the licensing criteria. At present one flight per day of ATR-72 aircraft operates from Belgaum Airport. After expansion it will operate A-321 aircrafts with minimum seating capacity of 169 passengers and four flights per day.

PROJECT DESCRIPTION

Belgaum Airport is located 8 km east of Belgaum city, near State Highway 20. Belgaum is the commercial hub and divisional headquarters of north Karnataka, ranking second to Bangalore in the state in terms of overall exports (mainly related to the automotive industry). There are also many tourist spots in and around Belgaum, which has high influx of tourists. Thus the proposed expansion of the domestic airport will provide better connectivity to the region and attract the tourist and entrepreneur population.

The expansion phase will involve extension of runway with facilities such as terminal building, apron, apron shoulder, taxi track, runway shoulder, boundary wall, perimeter roads and parking facilities. All the existing facilities will be modernized during expansion. An additional land of about 370 acres will be required for the expansion. The estimated cost of the project is 293.35 crores.

BASELINE ENVIRONMENT STATUS

Baseline environmental studies have been carried during post-monsoon season from October 2013 to December 2013. Studies have been carried out in 10-km radius from project area for soil quality, ambient air quality, water quality, noise level monitoring studies, flora and fauna studies and demography.

Land-use

The land use pattern indicates the manner in which different parts of land in the study area is being utilized. The land use pattern of the study area consists of the following land types.

- **Agricultural Land:** The land-use of the project area is dominated by agricultural land with about 67.5% of total land being occupied by agriculture. In most of the areas, both kharif and rabi crops are grown.
- **Settlements:** About 9.8% of the study area are occupied by settlements. The town of Belgaum, located about 8-km west makes up most of this category followed by the settlement of Samba.
- **Forest:** The 10km radius map shows presence of 2 reserved forests, one in North direction (3-3.8km) and other one in North East direction (4 - 4.7km).

- **Water bodies:** The area have two major water bodies viz., Killa Lake (7km towards West) and Kangrali Lake (9km towards NW).
- **Roads:** The area is well connected by SH-20 (State Highway Road connecting various cities and villages) at a distance of 2 Km.

The land use pattern of the project site includes existing airport, barren/scrub land, agriculture land, settlements, roads and plantations.

Topography

Proposed project site is almost flat agriculture land with elevation ranging from 771.45 m to 748.28 m above MSL. The project site is flat with gentle slope only. The general slope is towards South West to North East.

Seismicity

The project site falls under Seismic Zone II which is a low damage risk zone (MSK VI or less).

Soil Quality

Soil samples were collected and analyzed from six locations in the study area as per approved methods of CPCB.

- The texture of the soil in the area is dominantly sandy clay loam in nature.
- The moisture content of the soil samples is found to be low. This is due to the dry weather and moderate water holding capacity of the soil. Moisture content ranges from 2.8% to 5.6%.
- Organic carbon, a major nutrient for soil fertility, was found to be moderate in most of the sampling locations.
- The soil samples showed presence of good nitrogen content. Available phosphorous is on an average sufficient and potassium content is low.

Meteorological Data

The meteorological parameters were recorded on hourly basis during the study period near proposed site and comprises of parameters like wind speed, wind direction, ambient temperature, relative humidity, atmospheric pressure, rainfall and cloud cover. The onsite data for the study period is given below:

- Ambient Temperature: The maximum Ambient Temperature during the study period was recorded as 32.2°C in the month of October and the minimum temperature recorded was 12.4°C in the month of December.
- Relative Humidity: The mean relative humidity of the area varied from 75% to 39.8% during the study period.
- Wind Speed: The wind speed on an average was recorded 1.4 meter/second.
- Wind Direction: The recorded predominant wind direction was from east followed by north-east, south east and west.
- Rainfall: The rainfall of the area was 60.3 mm in the study season.

Air Quality

The ambient air quality with respect to the study zone of 10-km radius around the proposed site forms the baseline information. The various sources of air pollution in the region are

industrial, vehicular traffic related and rural activities. This will also be useful for assessing the conformity to standards of the ambient air quality during operation. The study area represents mostly rural environment with a little portion of Belgaum city.

- The maximum and minimum concentrations for PM10 were recorded as 108.7 $\mu\text{g}/\text{m}^3$ and 44.4 $\mu\text{g}/\text{m}^3$ respectively. The maximum concentration was recorded at the road-side area of Belgaum City near intersection of NH4 and SH20. The minimum concentration was recorded near the project site. The PM10 value is more in some locations due to heavy vehicular traffic.
- The maximum and minimum concentrations for PM2.5 were recorded as 42.4 $\mu\text{g}/\text{m}^3$ at NH4-SH20 intersection at Belgaum and 16.9 $\mu\text{g}/\text{m}^3$ at project site
- The maximum and minimum SO₂ concentrations were recorded as 13.2 $\mu\text{g}/\text{m}^3$ at NH4-SH20 intersection at Belgaum, and 9.7 $\mu\text{g}/\text{m}^3$ at project site respectively
- The minimum concentration of 18.6 $\mu\text{g}/\text{m}^3$ for NOx was recorded at Modage and maximum concentration of 25.2 $\mu\text{g}/\text{m}^3$ was observed at NH4-SH20 intersection at Belgaum.
- The maximum concentration of 1.13 $\mu\text{g}/\text{m}^3$ for CO was recorded at NH4-SH20 intersection at Belgaum with minimum of 0.88 $\mu\text{g}/\text{m}^3$ observed at Sulebhavi.

Noise Level Survey

The monitoring for noise levels were done in 10 locations keeping considering the population and traffic of the area. The L_{eq} were recorded in the range of 47.6 to 59.1 dB(A) during daytime and 33.8 to 37.4 dB (A) during night time. The highest level was recorded at the intersection of NH4 and SH20 at Belgaum and the lowest was in a rural area near to the site. The noise levels in general were found mostly within the acceptable levels as per standards for various zones as prescribed by Central Pollution Control Board (CPCB).

Traffic Survey

It was found that there is a high traffic density for LMVs. The traffic destination is either towards Belgaum city or nearby areas as the SH-20 connects various towns of Karnataka. The movement of heavy vehicle in this area comprises of mainly buses and good carriers on long distance haul.

Water Quality

Five surface water and four ground water sources were examined for physico-chemical characteristics, heavy metals and bacteriological parameters in order to assess the effect of industrial and other activities on surface and ground water. The samples were analyzed as per the procedures specified in 'Standard Methods for the Examination of Water and Wastewater' published by American Public Health Association (APHA).

Surface Water:

- The analysis results indicate that the pH value of the samples are in the range of 7.2 to 7.8;
- The TDS was observed in the range of 251 mg/l to 312 mg/l, indicating that the surface water bodies are not polluted. The maximum value was found at Balekundri and minimum value at Nilji village.

- DO was found to be in the range of 2.6 to 4.1 mg/l. It indicates that water is suitable for irrigation etc (Ref :IS-2296, Class-E)
- The BOD levels in the water samples are very high compared to the specified standard with 6.4mg/l as the minimum value observed at Balekundri and 15.3mg/l as the maximum value observed at pond near Sinddoli). This was mainly due to discharge of sewage, bathing of human and cattle in these water bodies.

As per IS: 2296, the surface water quality meets the criteria for Class C and therefore can be used for drinking purpose after conventional treatment and disinfection. The surface water can be used for drinking and irrigation purpose after conventional treatment as per Class C of CPCB standards.

Ground Water:

Most of the villages in the project area have hand pumps and wells, as most of the residents of these villages make use of this water for drinking and other domestic uses. Four bore well samples have been considered for sampling.

- The analysis results indicate that the pH of the samples ranges in between 6.9 to 7.5 which are well within the specified standard of 6.5 to 8.5;
- Total hardness was observed to be ranging from 102.6 to 125.8 mg/l. The maximum hardness was recorded at Marihal and the minimum at Sambra. The hardness was found to be within the acceptable limit of 300 mg/l as per IS 10500:2012.
- Chlorides were found to be in the range of 38.1 mg/l to 48.3 mg/l which is well within the specified standard of 250 mg/l as per IS 10500:2012.
- Sulphate was found to be in the range of 19.6 mg/l to 23.4 mg/l which is well within the specified standard of 200 mg/l, as per IS 10500:2012

It can be concluded that the ground water quality meets the standards of IS 10050:2012 and therefore can be used for drinking purposes.

It is observed that the concentrations of all the parameters are in consonance with IS: 10500-2012 and does not indicate any industrial contamination.

Floral & Faunal Studies

The major crops grown in the state are rice, ragi, jowar, maize and pulses besides oilseeds and number of cash crops. Cashew, coconut, areca nut, cardamom, chillies, cotton, sugarcane and tobacco are among other crops produced in the state.

Flora: The vegetation of Belgaum district is of two types. The moist occurs in the south-western portion where the district touches the crest line of the Western Ghats. The second, found towards the east of Belgaum city stretches from the northern areas around Athani, Chikodi and Gokak right down to Sampagaon and Saundatti in the south. It is of the dry type. Natural moist forests in Belgaum district have felt the pressure of over exploitation especially in recent years. The natural vegetation has been replaced by forest plantations.

Fauna: Among the faunal groups, birds are most conspicuous, which are commonly seen in all the habitat types of terrestrial origin. The project site is surrounded with Reserved Forest. There is no wildlife sanctuary in the study area. Although the Forest Department has recorded

the presence of a few Schedule I species in the District, however, presence of such species in the study area could not be established during field study due to development of settlements.

Demography & Socio-Economic Condition

There are 55 villages in the Study Area. The total population of the villages as per 2011 Census of India data is 6,61,303 with 1,46,727 households.. The literacy rate of the Study Area is good and stands at 85.9% (2011) which was 81.1% in 2001 and is greater than the National literacy rate of 74.1%. Also there has been a marked increase in the female literacy rate of the area. It has increased from 73.43% in 2001 to 80.62% in 2011.

The Study Area is dominated by General castes. About 7.32 percent of the population belongs to Scheduled Castes while only 5.10 percent tribal population is present in the area.

ANTICIPATED IMPACTS & MITIGATION MEASURES

Topography & Drainage

As the project site is almost flat with little undulation at a point, therefore leveling activities will be required which is not going to affect the topography of the project site.

Air Environment

Sources of air pollutant emission during operation phase include emission from aircrafts, DG sets and road traffic. The rate of NOx emission from aircrafts is maximum during climb-out stage while emission of HC and CO will be maximum during idling stage. The incremental emission from DG sets will comply with prescribed standards of MoEF/CPCB. The vehicles plying inside the airport will be maintained for effective combustion in order to reduce emission and regular pollution check shall be done.

Water Resources & Quality

The project will utilize water from Belgaum City Corporation. The daily consumption of water during operation phase will be about 87.1 KLD of which 61 KLD will be fresh water and 26.1 KLD will be recycled water. Wastewater will be suitably treated in SBT based STP and utilized for make-up water in cooling system, floor washing, flushing, gardening and dust suppression etc. Rain water harvesting structures are proposed to recharge ground water thereby reducing the impact on water resource.

Noise Environment

The main noise generating sources will be aircraft operation and vehicular traffic which will be properly mitigated by installation of noise barriers and complying with the International Code on noise levels during landing and take-off of aircraft so that the incremental noise levels do not go beyond the prescribed limits. Also as the air traffic will be very low and limited to four aircrafts, the impact on the areas outside the airport will be almost negligible. Personnel working near the aircraft will be provided with ear-muffs and other PPEs as required.

Solid Waste Generation

During the operational phase, two types of waste would be generated namely the solid waste and the hazardous waste. The municipal waste has been estimated to be about 602kg/day, which will be collected by Belgaum Municipal Corporation as per established laws and procedures. The disposal of the solid wastes will be done after proper arrangements with

authorized transporters & disposers. The hazardous wastes will be handled as per Hazardous Waste (Management & Handling) Rules, 2008.

Biological Environment

Impact during operation phase shall mainly result due to increase in ecological footprint and due to emission of air pollutants. However, since the project site is almost free of any forest, no major wildlife has been encountered in the area. To compensate for any impact on flora and fauna, greenbelt development will be taken up in specified plots leaving space required to be kept vacant for safety reasons.

Socio-Economic Environment

The flow of men, money and material will affect the socio-economic status of the people in the area. Change in land-use, disruption of residences and tension among communities will be some of the impacts on social environment. The positive impact may be the increase of employment opportunities for un-skilled and semi-skilled workers.

ENVIRONMENT MONITORING

The environmental monitoring programme will be required to manage the effectiveness of the mitigation measures and to report to the regulatory authorities. Most if not all avoidable adverse impacts from the construction and operation of airport development can be prevented through sound environmental management. An environmental monitoring plan has been developed for managing environmental as well as health and safety issues associated to the project.

The scope of the environmental monitoring program will be to:

- Assist in detecting the development of any unwanted environmental situation, and thus, provide opportunities for adopting appropriate control measures, and define the responsibilities of all stake-holders;
- Define monitoring mechanism and identify monitoring parameters;
- Evaluate the performance and effectiveness of mitigation measures proposed in the Environment Management Plan and suggest improvements in management plan; and
- Identify training requirement at various levels.

Capital cost for installing pollution control equipments, development of green belt and setting up of laboratory for sample testing will be approximately ₹19.1 crores. Other than the above the annual recurring cost for monitoring and green belt maintenance has been estimated about INR 55 lacs without manpower cost.

RISK ASSESSMENT & DISASTER MANAGEMENT

Risks likely to pose a threat to humans, environment or property associated with various activities of the airport are addressed in this report. Such activities include fire in oil storage tanks, dispensers, natural disaster, aircraft accident related disaster, terror attack, plane hijack, sabotage, etc. Specific precautions shall be taken with respect to hazardous chemicals and regular mock drills will be carried out to enact accident scenarios with reports sent to the top management.

Suitable fire protection system comprising hydrants and foam spray systems will be provided for fire protection. Fire extinguishers will be tested periodically and will always be kept in operational mode. On-site disaster management and offsite emergency plans, commands communication and controls will be established and maintained. Adequate provisions like emergency response, response organization, response plan, material safety data sheet, command & control, capabilities, transportation, medical facilities, mitigation measures, training, education, public awareness emergency plan review etc. to control any disaster situation will be made available.

ENVIRONMENT MANAGEMENT PLAN

During operation phase, the impacts on the various environmental attributes shall be mitigated using appropriate pollution control equipments. The Environment Management Plan prepared for the proposed project aims at minimizing the pollution at source.

Air Pollution Management

Air pollutant emission from aircrafts, vehicles and DG sets will lead to increase in air pollutants in nearby areas. The mitigation measures proposed to mitigate such impacts are:

- Single/reduced engine taxiing;
- Reduced engine idling time;
- Usage of battery operated vehicles for transferring passengers from one terminal to another.

Water Pollution Management

The effluents generated from the project during operations will be collected for various treatments. The wastewater recovery, as practiced, will considerably reduce the impact on the water quality. The recovered wastewaters will be reused within project premises for greenbelt development and irrigation purposes. The measures proposed to minimize the impacts are:

- Installation of water meter as per ISO standards at the inlet point of the water uptake and the discharge point to monitor daily consumption.
- To manage ground water resource, rainwater harvesting structures will be constructed.
- The wastewater generated will be treated in Soil Bio-filter Technology (SBT) based Sewage Treatment Plant.

Noise Pollution Management

During operation of the airport, various noise generating sources include aircraft noise, traffic links to airport etc. The proposed means to mitigate higher noise levels are:

- Providing noise barriers in and around the Airport.
- Providing appropriate traffic infrastructure.
- Provision of earplugs to the workers working in high noise level area.

Solid Waste Management

The airport authority shall work exclusively with waste management companies which employ the highest environmental standards to handle different kind of waste streams. Municipal waste will be collected by the municipality. Hazardous waste shall be treated in accordance with Hazardous Waste (Management, Handling & Trans-boundary Movement) Rules, 2008;

batteries waste shall be handled in accordance with Batteries Management Rules, 2010 and E-wastes as per E waste Guidelines, 2008. The redundant machinery if any shall be stored separately and will be sold to approved recyclers, which is followed presently.

Energy Conservation

Use of energy conservation measures as part of airport design and operations, will be part of the Master Planning and the specifications as part of awarding development work of this airport to a private contractor.

Green Belt Development

Although in an airport project a wide landscaped area cannot be proposed due to security reasons, a green belt will be developed. The green belt will be expanded between terminal building and parking area. The area will be planted and landscaped with local species of plants.

Socio-economic Development

Airport Authority of India will be having its own CSR activities which will encompass developmental and social activities. The CSR activities will aim to help in overall development of the area around the proposed airport project.

The thematic/ programme focus of the AAI's CSR work will include:

- Environment conservation
- Integrated community development
- Education, including formal and informal education and vocational training
- Health as an integral component of better quality of life with special focus on women and girls.
- Disaster Management including preparedness and capacity building.