CONSTRUCTION OF NEW GREENFIELD AIRFIELD FOR BADULLA DISTRICT

PRELIMINARY REPORT ON SITE FEASIBILITY

MAY 1, 2016

CIVIL AVIATION AUTHORITY OF SRI LANKA
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Contents

Executive Summary

Aviation has a vast potential for socio economic development of any country. It connects places of diverse social and economic status and different topography with comparatively less costs of infrastructure development.

Air Transport becomes vital mode of connectivity for places where safe and expeditious means of other transport modes are not available due to variety of reasons including undulating topography. With accessibility being made available by air, an remote town boosts its power of attraction of business, tourism and investments into the area tremendously in addition to generating employment opportunities that help enhancement of quality of life and social status of its citizens.

Although Badulla district is enriched with valued religious and historically precious assets located in a diverse, exotic and translucent ambience, exploitation of the inherent value and beauty of the district by visitors, especially the time-bound tourists and time sensitive investors have been dissuaded due to absence of safe, efficient and expeditious means of transport between the city of Colombo and Badulla district. Statistics shows that out of a total of 5.2 million tourists' nights spent in the country in 2015, only around 5% of tourists nights have been spent in High Country which includes Badulla District. Consequently the full potential of the area as a tourist destination has not yet been fully tapped.

Although there are number of places in Badulla district which have vast potential for promotion as tourist destinations, absence of expeditious means of travel has been the major hurdle for the development of tourism in the regions.

Also, Badulla, Bandarawela have always been a thriving ground for ornamental flowers with its mild climate and favourable weather the year around. The area is conducive for floriculture products which includes, Ornamental Foliage Plants, Cut Decorative Foliage, Cut Flowers, Aquarium Plants, Landscaping Plants, Tissue cultured Plants and Flower Seeds etc. Though the trade has been prominent in the area for a number of years it still has opportunity to reach a vast majority of low income earners of the entire Uva Province. The floriculture has a vast potential to earn foreign exchange provided there is good means of transport system for them to reach the intended foreign markets in time.

Broadly, the climatically cool and salubrious condition in the hill country are ideal for temperate crops such as carrot, leeks, cabbage, Chinese cabbage, cauliflower, salad leaves, beet, bean, bell pepper, salad cucumber, tomatoes, cherry tomatoes, sukini, strawberries etc. Cultivation of these crops on commercial scale for export requires expeditious means of transport.

Also the climatic conditions in Badulla district is conducive for bio technical industries which uses biological systems, living organisms or derivatives thereof, to make or modify products or processes for specific use. However in order to promote such industries, in the region, there should be good transport system so that investors, manufacturers, vendors and technocrats are guaranteed with speedy connection between the city and the places where such manufacturing plants or sites would be established.

In this context, construction of an airfield for Badulla district which can handle operation of a medium size aircraft as part of infrastructure improvements needed for promotion of tourism, floriculture, economic crops, bio technical industries etc would be of great value to the district. This need has been identified by the Government and necessary provision has been made in the National Budget -2016 for construction of a domestic airport for Badulla district.

There are number of vital factors that a chosen site should satisfy for construction of an airport and therefore it is not an easy task to select a place especially in a hilly area. During the preliminary studies conducted for selecting a site, two different locations were identified for further studies and they are in Haputale and Bandarawela

Preliminary studies shows that if the area is provided with an airport which can handle 50 seater aircraft, it would satisfy the need for air travel for a considerable length of time.

Accordingly the planned airport will have only a runway of 1,200 m long and 30 m wide with an apron capable of accommodating only two aircraft at any given time. A small terminal building is planned which can accommodate around 50 passengers at any given time.

An aircraft having less than passenger 50 seats will be able to operate from the planned airport and it will be able handle around 1,000 passengers per day without a difficulty (four flights per hour for five hours per a day). The cost of airport development is not expected to be recovered from airport operations itself. It shall be considered as cost of infrastructure development for promotion of other sectors as stated earlier.

Regional Director, UDA, Badulla had done a detailed study of the area for economic development planning and during the exercise he had identified a land at Sherwood Estate, Totalagala, Haputale for construction of an airport as means of supporting all other planned economic activities for the region. Haputale is viewed central to many of other economic activities and tourism centres in the region and has therefore a great potential to be developed as a tourist destination. The portion of land identified for the purpose from Sherwood Estate has an infecund tea plantation. There is hardly any settlements in the area. The land is not level but undulant with level variation of 10 – 20 m at certain places requiring extensive earth cutting and filling. The current access road is very narrow and winding with steep elbow junctions. It is therefore necessary to develop a new road of 500 m from "Y" Junction on Haputale - Bandarawela to gain access to the site. However, during the detailed study of the site, it was pointed out that part of the identified land conforms to the Landslide prone area. Climatic conditions in the area was observed to be fluctuating rapidly. Also power line carrying high voltage was observed to be crossing the approach path of the proposed runway. Furthermore the development cost of the runway was found to somewhat prohibitive due to heavy work to be done for levelling the site. In view of the foregoing it was decided not to pursue the site at Sherwood Estate, Thotalagala, Haputale for airport construction.

The other site identified for the airport is located at Mahaulpothawatte, about 3.2 km away from the Bandarawela railway station on the Poonagala Road. Part of land contains

fecund tea plantation. There is a possibility of construction of a runway of 1,300 m in length and 30 m in width at this site. There are a very few private dwellings in the area. The difference of elevation at the two ends of the proposed runway is about 50 m (160 ft) with two hillocks being located at the middle, which can be cut to fill the troughs on either side and in the middle so that the runway could be leveled at the elevation of 1,400 m (4505 ft). There are some electricity power distribution lines going across the proposed path of the runway and they need to be relocated so that take-off and approach paths of the proposed runway would be clear of obstacles. The cost of construction is estimated to be Rs.800 million inclusive of contingencies but excluding land acquisition.

Since the National Budget -2016 has proposed establishment of the airport under a PPP arrangement, it would be prudent if additional land around the proposed runway is made available to the prospective partners facilitating commencement of projects relating to tourism, floriculture, bio technology and cultivation of fruits and vegetables on commercial scale.

1 Introduction

1.1 Badulla District

Badulla is the Capital of Uva Province. It belongs to the hill country of Sri Lanka and is rich with many religious, historical and natural scenic attractions for both local and foreign tourists. Badulla district spreads over an area of 2861 km^2 (4% of Sri Lanka land). It has a population of approximately 1 million (5% of country population) people. Badulla district has borders with six districts viz, Monaragala, Ratnapura, Ampara, Matale, Nuwara Eliya and Kandy.

The economy of the district is primarily based on agricultural farming and livestock. Tea, vegetable and paddy are main income generators of the district which is divided into two portions as the upper region and the lower region according to climatic and geographical characteristics. The upper division of the district is famous for tea plantation and vegetable cultivation whereas the lower division is famous for paddy cultivation.

Ella, Haputale, Bandarawela and Welimada areas are enriched with natural scenic beauty with potentiality to attract tourists as their tour destination. Also Badulla town is one of the oldest town in Sri Lanka with proven traces of the earlier settlements along the banks of the Badulu oya and Namunukula Mountains ranges. However absence of expeditious means of transport between the city of Colombo and Badulla district have adversely affected taping the full potential of the area as a tourist destination. Consequently a few percentage of incoming foreign tourists have visited the district.

1.2 Historical Background

Badulla is considered as one of the civilized area even before the King Vijaya's era which is considered where the written Sri Lankan history began. "Rama-Rawana legend" proves this fact and lots of tales are based on this area. Some hidden places and caves spread over the area prove that legend archeologically.

Mahiyangana Raja Maha Viharaya, which belongs to Badulla district was built with the first visit of Lord Buddha to Sri Lanka. Lord Buddha visited Mahiyangana to solve the conflict among "Yaksha tribes". Muthiyangana Raja Maha Viharaya is another landmark of the time of Buddha.

Apart from those places Bogoda temple which was constructed by the King Walagamba has its unique features which provides evidences of proud Sri Lankan history.

1.3 Population

The recorded population of Badulla District is 815,405 (2012) and there were 620,486 registered voters at the last Presidential Election (2015). The literacy rate of Badulla is over 90%.

1.4 Administration

There are 9 electorates in Badulla District including Mahiyangana, Viyaluwa, Passara, Badulla, Hali-Ela, Uva Paranagama, Welimada, Bandarawela and Haputale and the district is administered through 15 number of divisional secretariats. Badulla, Bandarawela, Ella, Haldummulla, Hali-Ela, Haputhale, Kandaketiya, Lunugala, Mahiyangana, Meegahakivula, Passara, Rideemaliyadda, Soranathota, Uva-Paranagama and Welimada are the administering divisional secretariats in Badulla. There are 1960 villages in this district and managed through 567 Grama Niladhari divisions. Eight (08) Members are representing Badulla district in the Parliament of Sri Lanka.

1.5 Climate

The climate of Badulla is considered as tropical and the rainfall in most months of the year is significant due to the varying weather conditions. The average annual temperature of Badulla is 23.2 °C and the rainfall is 1885 mm. The driest month is June and more precipitation can be expected in November. Month of May is the warmest with temperature of around 25 ºC and January is the lowest with average temperature of 21ºC. Average relative humidity of the area is 80%.

1.6 Transport Infrastructures

Since the King Ravana's age, Badulla is considered as the transport hub of Uva Province. It has many historical practices related to transportation such as Ravana's transportation via "Dandumonara" referred as an aeroplane in the ancient times. (Badulla is said to have a great civilization with rich infrastructures before the King Vijaya and Indian incursion towards Sri Lanka.)

Badulla has a well-maintained roadways and railway. A4 Colombo – Batticaloa Highway and A16 Beragala – Hali-Ela highway are connected together and that creates a proper accessibility towards Haputale. Daily bus and train services are available from Colombo and Kandy.

1.7 Economic Strength

Badulla district is highly nourished area with regards to cultivation of economic crop; tea, vegetables, paddy and fruits. It has also a vast potential of making foreign exchange to development of tourism. However, Badulla district is identified to be amongst high deficiency districts. Agriculture is the main livelihood, but there is a significant number of population who has not enough earning to fulfill their basic requirements. About 51% of the population in the area are receiving low income.

1.7.1 Tea Plantation

According to the extent of tea plantation in Sri Lanka, Badulla district is having higher density of tea plantation and processing.

It is a proven fact that Sri Lankan best quality tea leaves are from Haputale tea estates.

1.7.2 Agriculture

As mentioned above, lower division of the district is dedicated for the paddy cultivation. Approximately 30% of land use of Badulla is allocated for paddy cultivation.

1.7.3 Fresh Fruits and Vegetables

Broadly, the climatically cool and salubrious condition in the hill country are ideal for temperate crops such as carrot, leeks, cabbage, Chinese cabbage, cauliflower, salad leaves, beet, bean, bell pepper, salad cucumber, tomatoes, cherry tomatoes, sukini, strawberries etc.

The cultivation of such vegetables such as Carrot, Beet root, Leeks, Cabbage, Beans etc. contributes to the agricultural sector development. As a whole this land bears most of the economic plants since it's enriched with fertile soil and tropical climate suitable for any plantation.

1.7.4 Floriculture

Sri Lanka is a tropical paradise and nature has bestowed upon her a rich collection of natural fauna & flora. Sri Lanka is also endowed with different climatic conditions caused by terrain enabling her to develop floriculture products ranging from tropical to temperature. Sri Lanka is recognized as one of the best quality production centers for floriculture products in the world and has built up her reputation as reliable supplier of a wide range of quality floriculture products which adorn homes and offices across the world.

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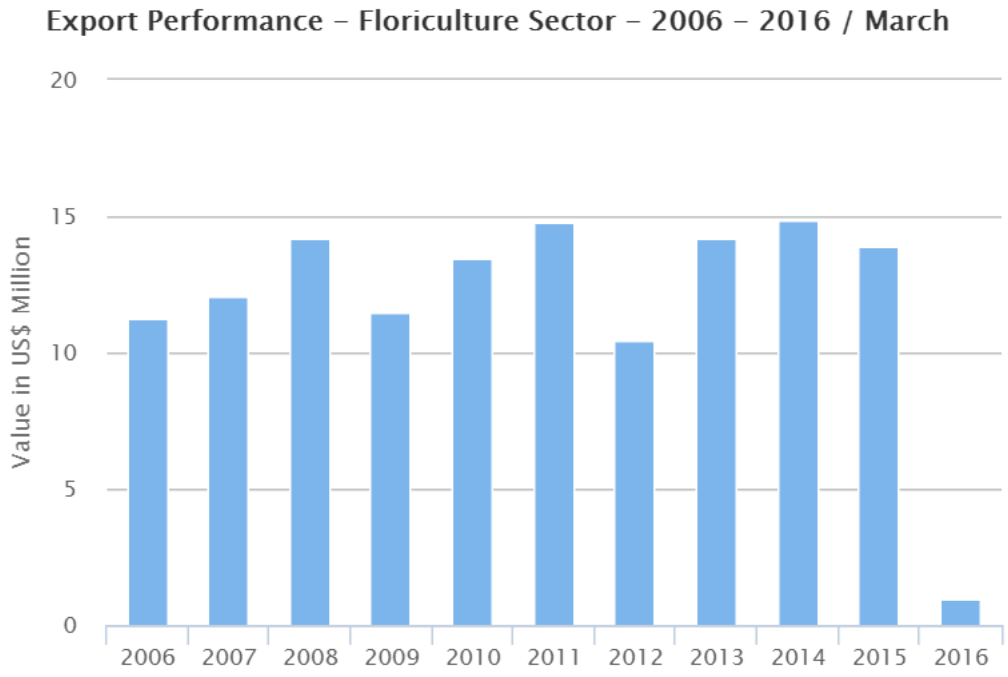
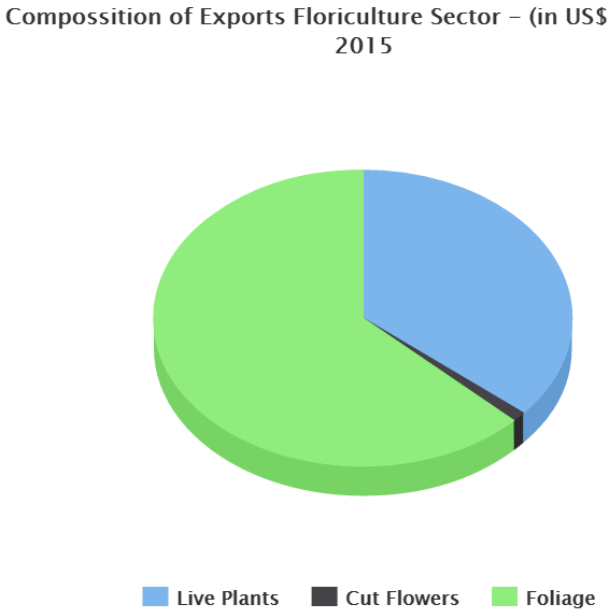
The following charts show the foreign exchange earnings from floricultural sector and composition of export floriculture which can be further promoted with dedicated efficient air transport network connecting the growing areas with two international airports viz. BIA and MRIA so that they reach needy markets well in time.





1.7.5 Livestock and Animal Husbandry

Higher amount of dairy products and significant volume of animal husbandries are located in Badulla district and up country economy is basically carried by this sector after the tea plantation.

1.7.6 Tourism

Laced curtains of water cascade down steep precipices throwing a fine mist of water to the surrounding and the incessant crash of water on the rock below is a symphony that is repeated from time immemorial in Badulla District. The central highlands of Sri Lanka are home to 350 waterfalls with Bambarakanda Falls plummeting a height of 263 meters (83 feet) to rank as Sri Lanka's tallest fall. Saint Clair water fall, Diyaluma falls, Horton Plains, Bogoda Bridge and beautiful Nuwaraeliya are the popular destinations of tourists. Wedda culture which is still present has a higher potential of tourism attraction.



Although the Badulla district has a vast potential of tourist attraction, the following charts of tourists' occupation (source – Tourism Development Authority) in the country show that High Country which includes Badulla district has not been able to attract significant number of tourists to the area over the last five years.

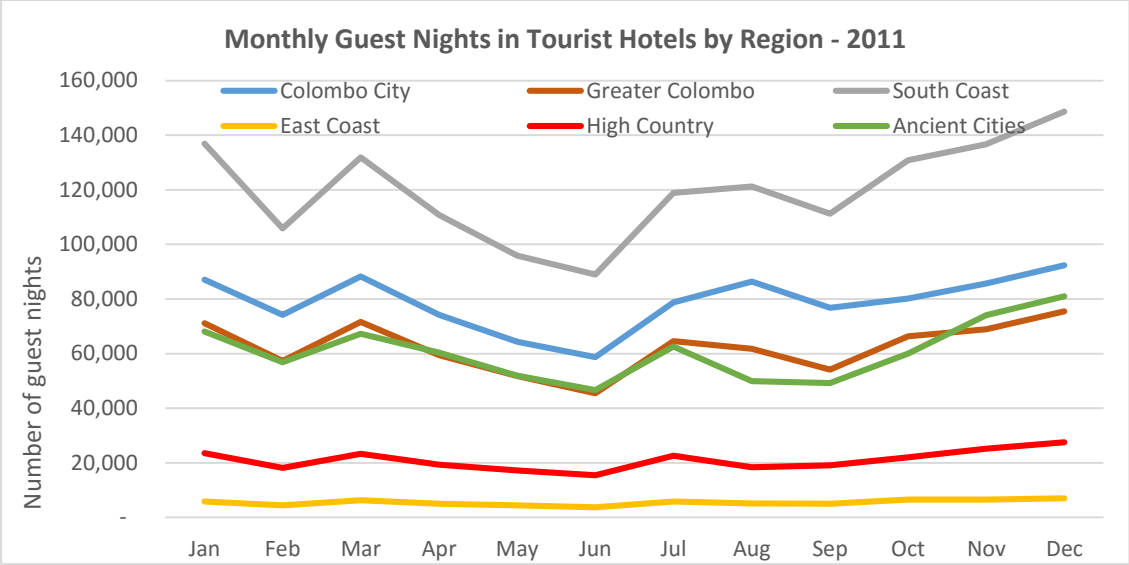
Although the region is seen to be improving its tourists' night occupation, the rate of growth is comparatively low. One of the main reasons is the constraints in expeditious access. Out of the total number of guest nights spent in the country it is only 5% of guest nights that has been spent in High Country.

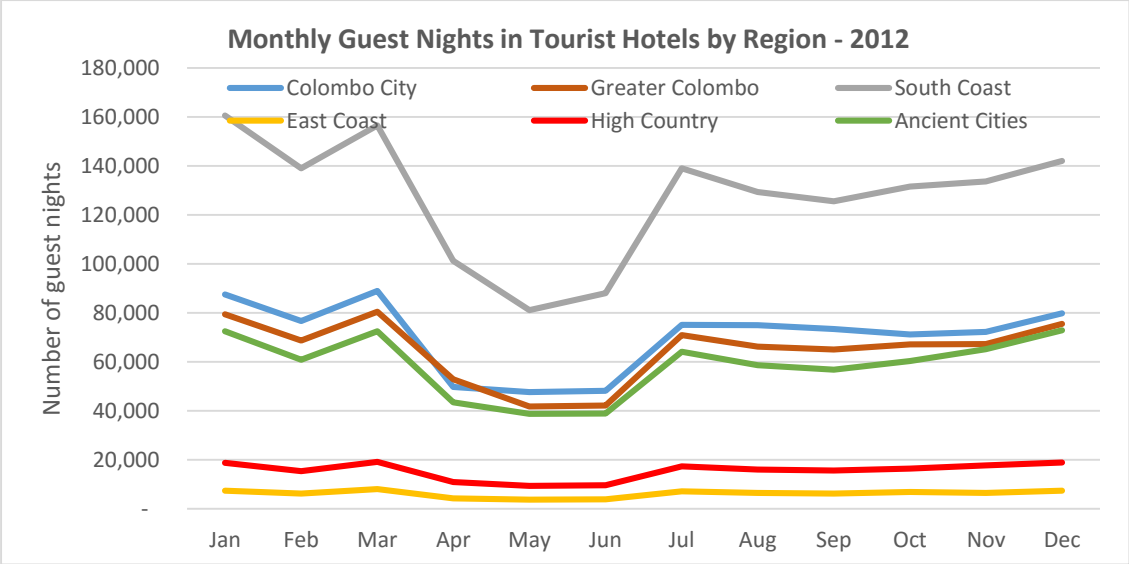
Average travel time between Colombo and Badulla is nearly 6 hours by road and it could even be more during rush hours. Providing accessibility to the region by air could be a viable solution to overcome the present situation and increase the number of tourist nights spent in the region. Such a measure is needed, for the promotion of upmarket tourism in the area.

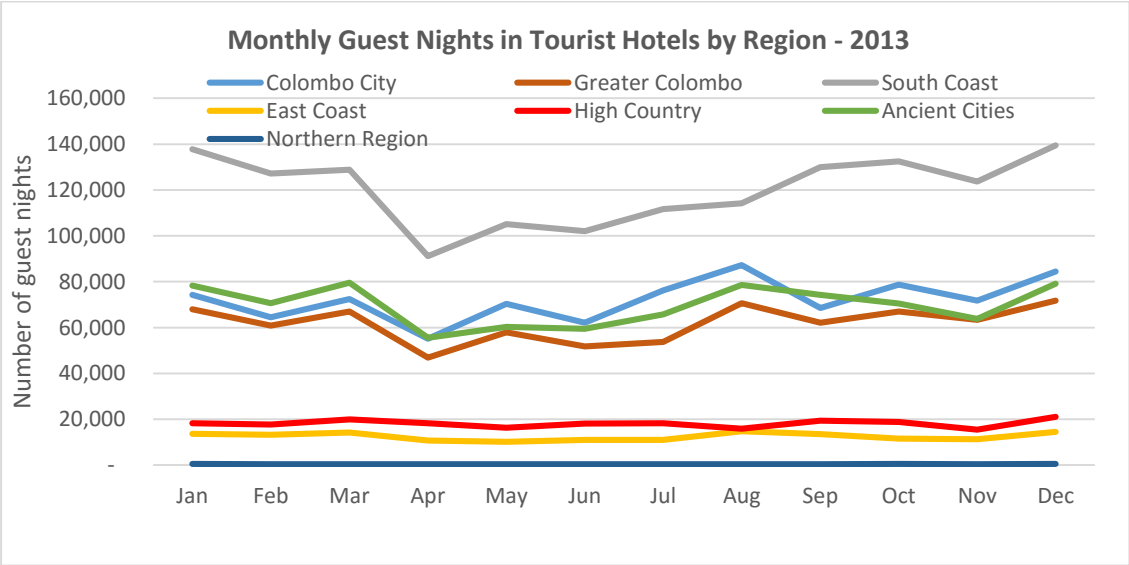
The following charts show as to the level of tourists' night occupation of hotels in the entire country over the last five years. It is observed that highest number of guests' night occupations had been in south coast, Colombo, Greater Colombo and ancient city areas and numbers have been growing progressively over the past five years. However, the guests' night occupation in hotels in High Country and East coast has been lying at around 5% and there has not been any significant growth over the past five years. Although both High Country and East Coast have a lot to offer to tourists, the main reason for tourists not have visited these area is believed to be the absence of expeditious and efficient mans of access, especially for group travelers.

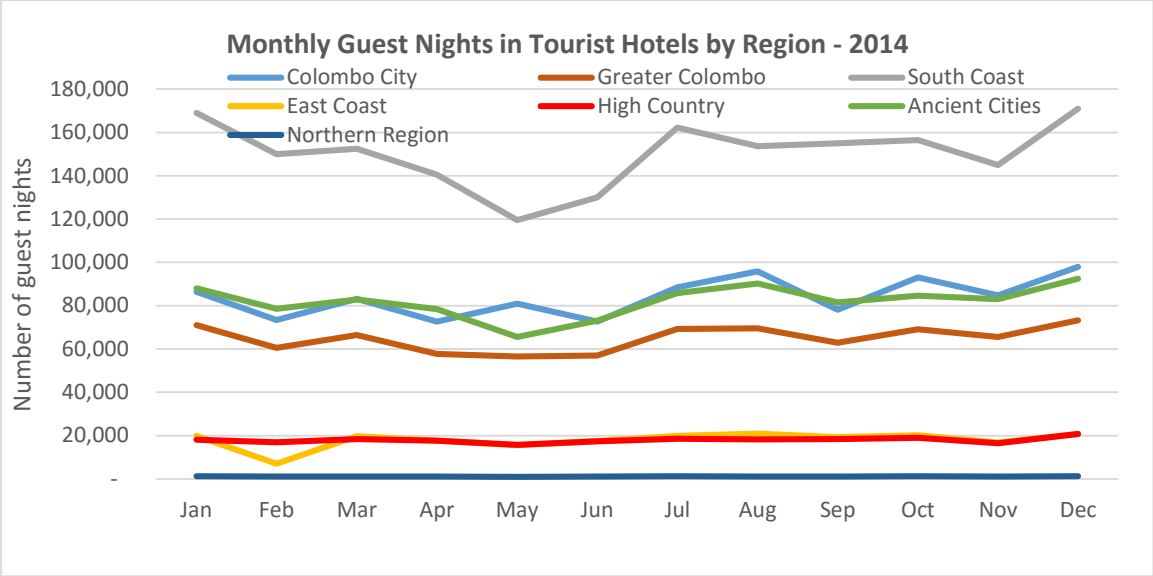
Although a significant number of tourists are seen to be in Ella Area, majority of them are viewed to be budget tourists who spend less and make more use of subsidized public conveyance such as train for touring within the country. If Sri Lanka needs to attract high spending tourists, they needs to be provided with safe, efficient and expeditious means of transport so that they are assured of connectivity at any time and scheduled air services

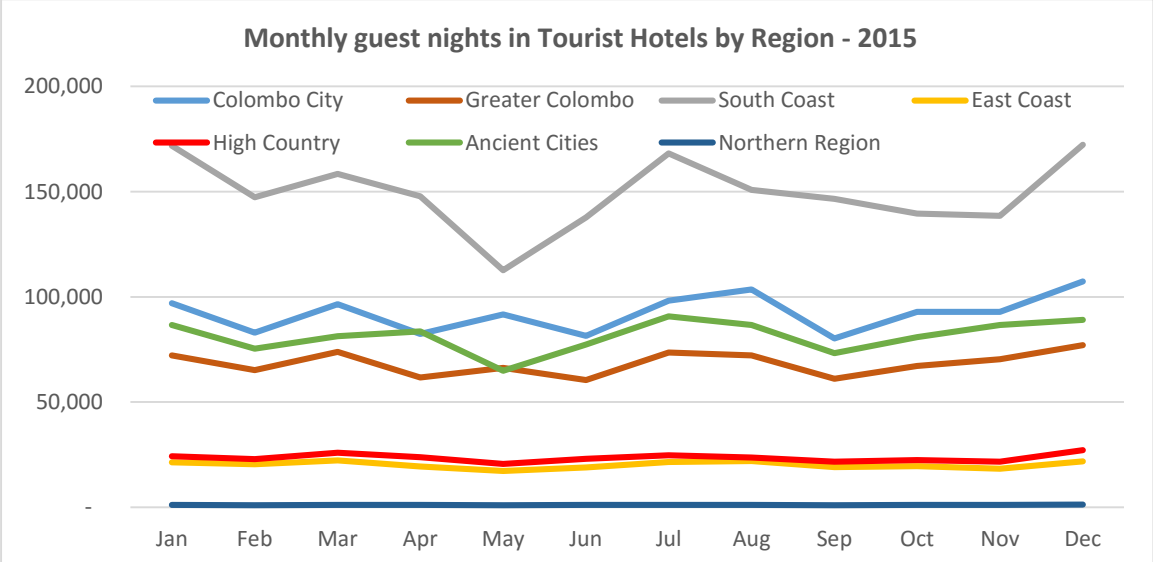
between the international airport and up-country would be an ideal means of satisfying this requirements.

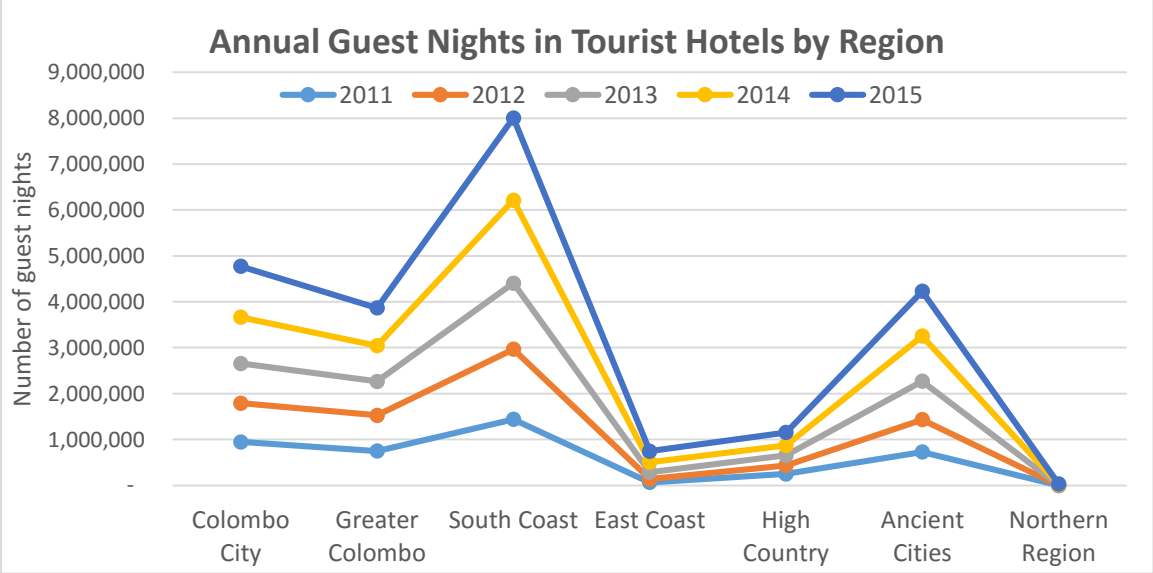







Monthly Guest Nights in Tourist Hotels by Region - 2014
Colombo City
Greater Colombo
South Coast
East Coast
High Country
Ancient Cities
Northern Region
Number of guest nights
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
-
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


Monthly guest nights in Tourist Hotels by Region - 2015
Colombo City
Greater Colombo
South Coast
East Coast
High Country
Ancient Cities
Northern Region
200,000
150,000
100,000
50,000
-
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

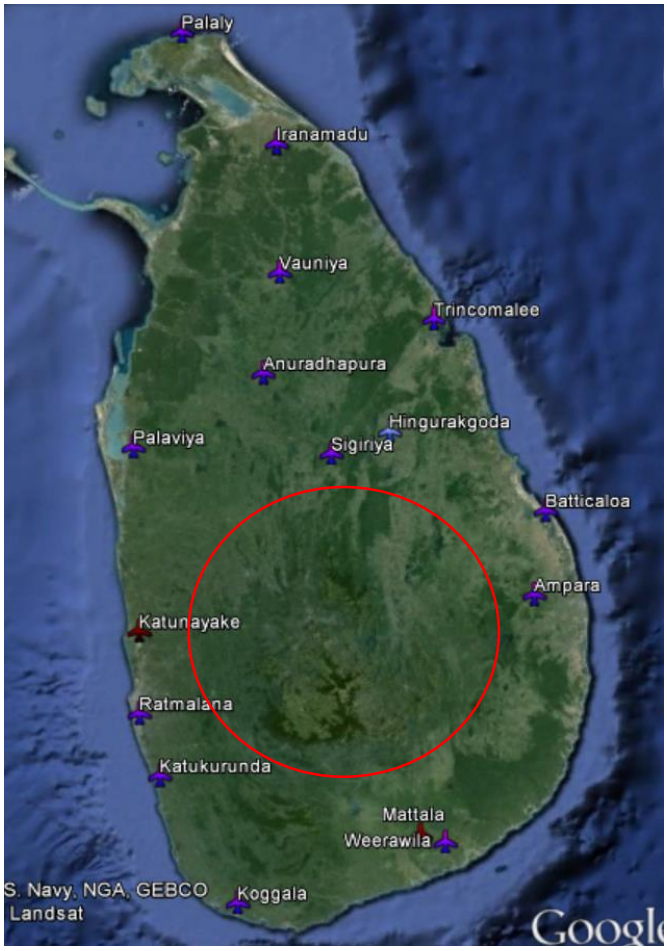

Annual Guest Nights in Tourist Hotels by Region
2011
2012
2013
2014
2015
Number of guest nights
9,000,000
8,000,000
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
-
Colombo City
Greater Colombo
South Coast
East Coast
High Country
Ancient Cities
Northern Region

1.7.7 Bio Technology

The climatic conditions in Badulla district is conducive for bio technical industries which uses biological systems, living organisms or derivatives thereof, to make or modify products or processes for specific use. However in order to promote establishment of such industries, in the region, there should be good transport system so that investors, manufacturers, vendors and technocrats are guaranteed with speedy connection between the city and the places where such manufacturing plants or sites would be established.

1.8 Advantage of an airfield for the Uva Province

Out of nine administrative provinces in Sri Lanka, seven provinces have at least one airport. Some provinces such as Western Province and Southern Province have three airports each. Although Central Province is having an airport at Sigirya, it is also lying in the plain grounds. The following picture show the location of sixteen aerodromes in the country.



Unlike the other provinces, which can be provided with highways or expressway in time to come, the Central Province and Uva Province will continue to face the problem of having expeditious means of connectivity due to difficult terrain conditions. These provinces which have vast potentials from economic point of

Although Badulla District has centuries' long proud history gifted with winsome ambience, not having expeditious means of access for time sensitive travelers, is a negative factor for the development of tourism in the area, especially for tourists who spend a few days in the country.

Presence of an airport which can accommodate at least aircraft carrying less than 50 passengers at a time would help promotion of tourism in the area.

Although the airport itself would not be able to generate sufficient traffic to cover cost of its construction, the airport would be a valued infrastructure which would enable development of tourism potential in the area generating wider benefits to the area. With an airport in the area, Badulla district would be accessible to any other part of the country within less than 45 minutes by air and that would enable promotion of trade and commerce and also investment of the area.

Furthermore general aviation activities such as ballooning, gliding, parasailing, parachuting and other adventure activities related to aviation could be done around the proposed airfield opening up the full potential of general aviation.

1.9 Proposal in the National Budget 2016

The need for an airport for Badulla district has been identified in the National Budget 2016 approved by the Parliament of Sri Lanka. The budget proposal states "To improve the domestic air transportation, three new domestic airports will be established at Digana, Badulla and Puttalam through a PPP arrangement".

It was under aforementioned government policy, a study is undertaken to explore the feasibility of constructing an airfield for Badulla district (Haputale or Bandarawela) depending on the suitability from both aviation point of view and other cultural, religious and environmental points of view.

1.10 Proposed sites

In the search of a place of construction of an airport in Badulla, the sites which merited further consideration were found in the secretarial divisions of Bandarawela and Haputale. These towns have the following general characteristics.

1.10.1 Bandarawela

Bandarawela is the second largest city in the Badulla district and is a popular resting place for travellers who are visiting Hill Country due to its perfect location. The climate in Bandarawela is mild but yet slightly warmer than some of the higher altitude towns like Haputale.

The city is located 200 kilometres from the capital, Colombo, and 125 kilometres from Sri Lanka's second most important city, Kandy. Distance to Badulla is 28 km, Nuwara Eliya: 50 km, Haputale: 13 km, Ella: 8 km and Welimada is 29 km. From either direction Bandarawela can be reached both by bus and by train, the journey to and from the city a magical experience past tea plantations and rolling hills.

The main economy in the area relies on vegetable and tea production, although tourism is becoming more and more an important part of life in Hill Country. One of the main tourist attractions in Bandarawela is the Dowa Temple which is located just a few kilometres east from Bandarawela, on the road towards Badulla. The temple is a cave shrine also carved into the solid rock and decorated with Sri Lankan Buddhist murals. The temple dates back for more than two millennia. It is one of the heritage sites of Sri Lanka. The 38ft. tall, fast decaying Buddha statue and the carvings on the gateway of the temple are the ones to watch out for. The paintings on the canopy and the likes depict various Jathaka stories. Rawana Ella (131ft. in height) and Diyaluma (628ft. in height) are the most beautiful waterfalls in this region. Rawana Ella is situated on the Ella, Wellawaya main road and Diyaluma is situated near the Koslanda village. If one visits the place during the New Year season, then missing the bike race at Diwathalawa military academy would be a great loss. Adisham Bungalow,Bandarawela Hotel and Lipton's Seats are the other historic places in Bandarawela area. This place is the education- seat of the country. The best time to visit the place is from March to May and from September-December.

1.10.2 Haputale

Haputale is one of the Electoral Divisions in this District which is situated at 175 km from Colombo on the Colombo - Kandy - Nanu Oya - Badulla road. Presence of Railway station at Haputale also help promotion of the concept of multi modal transport system.

Laying along a mountain ridge of the southern edge of the Central Highlands of Sri Lanka, Haputale is one of the most spectacularly situated towns of Sri Lanka. The high elevation vantage location of Haputale allows a bird's eye view to the north as well as to the south. To the south are plains that run into the coast. To the north are hills after hills, hills next to hills, hills over the hills of the highlands which creates a dreamlike scenery.

The area has a rich bio-diversity dense with numerous varieties of flora and fauna. Haputale is surrounded by hills covered with cloud forests and tea estates. Due to its elevation, the town has a cooler climate than its surroundings. Haputale pass allows views across the Southern plains of Sri Lanka. The South-West boundary of Uva basin is marked by the Haputale mountain ridges, which continue up to Horton Plains and Adam's Peak to the west. Due to its unique features, CNN (Cable News Network- USA) named Haputale as one of Asia's most overlooked destinations.

2 Considerations in Airfield Development

2.1 Overall Considerations

The following factors shall be taken into overall consideration in the planning and design of an airport.

- Potential use after construction (frequency of usage)
- Availability of adequate land stretch in the direction of predominant wind
- Terrain in the vicinity
- Visibility conditions (Usability factor)
- Soil condition
- Accessibility by road
- Current pattern of land use
- Resettlements, if any
- Ability of integration with other modes of transport
- Archeological concerns of the site
- Conformity of the land with other regional development
- Environmental factors
- Cost of development

2.2 General Factors affecting the design of runway

Factors affecting the determination of sitting of runway and its minimum length depend largely on the following:

- Performance characteristics and operating masses of the Design aircraft;
- Weather, particularly surface wind speed and direction, temperature, humidity and visibility;
- Runway characteristics such as slope and surface condition; and
- Aerodrome location factors, for example, aerodrome elevation which affects the barometric pressure and topographical constraints.
- Soil condition of the site and effect of natural disasters such as landslides.

2.3 Runway Length Corrections for Elevation, Temperature and Slope

When the appropriate flight manual for critical aircraft is not available the runway length must be determined by applying general correction factors.

a) The basic length should be selected for the runway adequate to meet the operational requirements of the aircrafts for which the runway is intended. This basic length is a runway length selected for aerodrome planning purposes which is required for take-off or landing under standard atmospheric conditions for zero elevation, zero wind and zero runway slope.
b) The basic length selected for the runway should be increased at the rate of 7 per cent per 300 m elevation. However, certain corrections to be done to the selected airfield with the environmental factors such as elevation and availability of resources.

c) The length of runway determined under (b) above should be further increased at the rate of 1 percent for every 1°C by which the aerodrome reference temperature exceeds the temperature in the Standard Atmosphere for the aerodrome elevation. Since Haputale / Bandarawela average temperate is 10 °C higher than the Standards Atmosphere, 10 % increase of the runway length required under standard temperature is required.
d) Where the basic length determined by take-off requirements is 900 m or over, that length should be further increased at the rate of 10 per cent for each 1 per cent of the runway slope
e) At aerodromes where temperature and humidity are both high, some addition to the runway length determined under (d) may be necessary, even though it is not possible to give exact.

2.4 Design aircraft (Critical aircraft)

The critical aircraft is a conceptual aircraft whose characteristics are a composite of the most critical elements of all the aircrafts that each aerodrome facility is intended to service. For example, in the design of a runway the critical characteristic determining runway width may derive from a different actual aircraft than the critical characteristic determining clearance to the parallel taxiway. As movement area design is directly related to the operating characteristics of the aircrafts for which the facilities cater, it is important that the critical aircraft be separately determined for each facility.

2.5 Aerodrome Facility Reference Code (Aerodrome Reference Code)

It is a two-element, alpha-numeric notation (for example 1B, 3C) derived from the critical aircraft for that aerodrome facility. The code number is based on the aircraft reference field length and the code letter is based on the aircraft wing span and the outer main gear wheel span.

The aerodrome reference code provides a method of grouping aircrafts with different characteristics (e.g. wing span, outer main gear wheel span, approach speed and all-up mass) which behave similarly when landing, taking-off or taxying. This, in turn, enables standards for aerodrome facilities such as runways to be set in terms of a small number of aircraft groups, rather than individually for a large number of separate aircrafts.

As the aerodrome reference code notation is derived from aircraft and not aerodrome characteristics, it applies to the individual aerodrome facilities (e.g. runways and taxiways) and indicate their suitability for use by specific groups of aircrafts. Thus at the same aerodrome there may exist, for example, a code 4E runway, a code 1A runway, a code C taxiway and a code 2 runway strip.

In many cases to determine the appropriate design standard for an aerodrome facility, it is necessary first to identify the aircrafts for which the facility is intended, and then to determine the aerodrome reference code notation for the most critical of these aircrafts. The particular standard for the facility is then related to the more demanding of the two criteria (the number or the letter) or to an appropriate combination of both.

The following table gives Numeric Code for some aircraft.

Code	Aeroplane reference field length	Typical aeroplane
1	< 800 m	DE HAVILLAND CANADA DHC-6/PIPER PA-31
2	800 m but < 1200 m	ATR42/BOMBARDIER Dash 8 Q300

3	1200 m but < 1800 m	SAAB 340/BOMBARDIER Regional Jet CRJ- 200
4	1800 m and above	BOEING 737-700/AIRBUS A-320

The following table gives the Alphabetic code for the runway.

Code	**Wingspan**	**Outer main gear**	**Typical aeroplane**
A	< 15 m	< 4.5 m	PIPER PA-31/CESSNA 404 Titan
B	15 m but < 24 m	4.5 m but < 6 m	BOMBARDIER Regional Jet CRJ-200/DE HAVILLAND CANADA
C	24 m but < 36 m	6 m but < 9 m	BOEING 737-700/AIRBUS A-320
D	36 m but < 52 m	9 m but < 14 m	B767/AIRBUS A-310
E	52 m but < 65 m	9 m but < 14 m	B777/B787 Series/A330
F	65 m but < 80 m	14 m but < 16 m	BOEING 747-8/AIRBUS A-380-800

3 Construction of an Airfield for Uva Province

As stated at paragraph 1.9, the Government in its National Budget -2016 has proposed construction of a new airport in Badulla district. Connectivity by air to central part of the hills is vital for tapping the full potential of tourism of the area in view of long hours of journey by road or rail to reach such places.

The air distance between Haputale and Bandaranaike International Airport (BIA) / Bandarawela and Bandaranaike International Airport (BIA) is 127 km and 132 km respectively which can be flown within approximately 30 minutes by a medium size aircraft like ATR-42. Such means of speedy accessibility between Badulla District (Haputale / Bandarawela) and Colombo District (RMA/BIA) will really help attraction of tourists to the area.

3.1 Design Aircraft

Preliminary studies shows that if the area is provided with an airport which can handle 50 seater aircraft, it would satisfy the need for air travel for a considerable length of time.

An aircraft having less than passenger 50 seats will be able to operate from the planned airport and it will be able to handle around 1,000 passengers per day without a difficulty (four flights per hour for five hours per a day).

It is proposed that the airfield in Haputale / Bandarawela area is designed to handle ATR-42 aircraft (less than 50 seater aircraft) which has the following basic characteristics. The ATR 42 is a twin-turboprop, short-haul regional airliner built in France and Italy by ATR. ATR models have their final assembly in Toulouse, and share resources and technology with Airbus. Unit cost of ATR is USD 12,–19 million (2012). Some of its vital performance data of ATR is as follows.

- Maximum Take-Off Weight (MTOW) - 18,600 kg (41,005 lb.)
- Max payload (at typical in-service OEW) - 5,300 kg (11,684 lb.)
- Take Off Distance Required – at Basic (MTOW - ISA - SL) - 1,165 m (3,822 ft.)
- Passengers - 48 (30” pitch)
- Runway Reference code - 2C

3.2 Justification for ATR 42 aircraft

The traffic between Badulla and rest of the domestic airport would be mainly comprised of tourists. The demand for seats may initially be satisfied with a medium size aircraft carrying less than 50 passengers. Since the distance between the proposed airport and any part of the country is less than 350 km, which can be served within 45 minutes of flight time, if the demand increases, it could be satisfied by increasing the number of flights.

Since commencement of production in 1981, as at 31 December 2014, ATR had delivered 1190 aircraft (436 ATR 42s and 754 ATR 72s) and it has become most popular aircraft in South Asia Region. Technical crew and maintenance support is readily available on competitive pricing.

ATR aircraft are equipped with the most advanced technological innovations so that they always remain at the cutting edge of modernity, performance and reliability. It is so

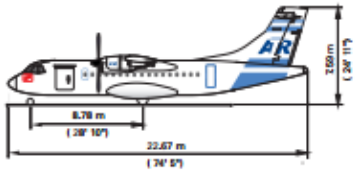
versatile that within a very short period, the operator can change configuration of aircraft from all passengers to all cargo and vice versa. Such an aircraft or similar aircraft will facilitate transport of cargo including perishables (Vegetables, Fruits and Dairy products etc.) that are produced in Badulla District.

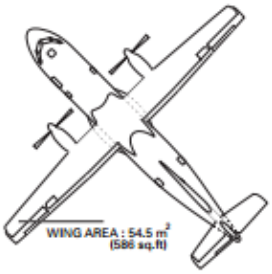
A new engine - the PW127N - has been certified, bringing with it 4.5% additional take-off power and thereby increasing aircraft performance in hot weather and at altitude. The aircraft is in production and technical support is readily available to the user.

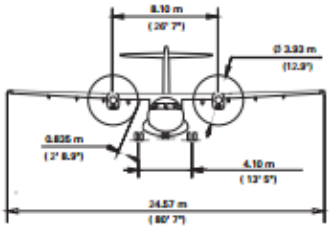
3.2.1 ATR Characteristics

ATR 42-500

THE REFERENCE IN REGIONAL AIR TRANSPORT

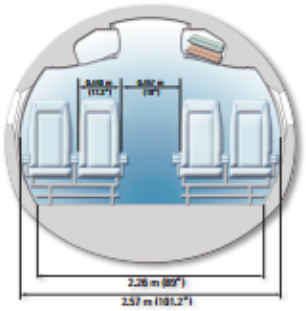






STANDARD CONFIGURATION

48 seats at 30" pitch



ENGINES	
PRATT & WHITNEY CANADA	PW127E/M
Take-off power	2,160 SHP
Take-off power - One engine	2,400 SHP
Max continuous	2,400 SHP
Max climb	2,160 SHP
Max cruise	2,132 SHP
PROPELLERS	
Hamilton Standard	568F
Blades: 6; Diameter: 3.93 m - 12.9 ft	
WEIGHTS	
Max take-off weight (basic)	18,600 kg - 41,005 lb
Max landing weight (basic)	18,300 kg - 40,344 lb
Max zero fuel weight (basic)*	16,700 kg - 36,817 lb
Operational empty weight (Tech. Spec.)	11,250 kg - 24,802 lb
Operational empty weight (Typical in-service)	11,700 kg - 25,794 lb
Max payload (at typical in-service OEW)	5,300 kg - 11,684 lb
Max fuel load	4,500 kg - 9,921 lb

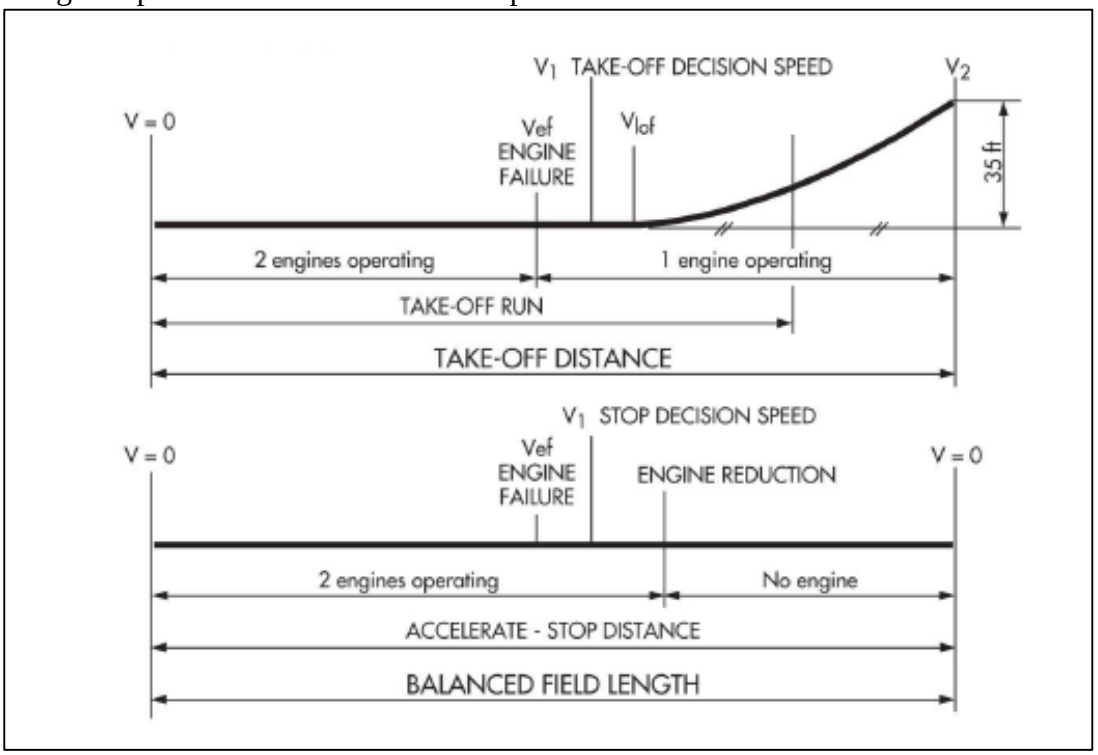
* *Optional MZFW@17,000 Kg available on demand.*

AIRFIELD PERFORMANCE	
TAKE-OFF DISTANCE:	
• Basic (MTOW - ISA - SL)	1,165 m - 3,822 ft
• At TOW for 300 Nm - Max pax - SL - ISA	1,025 m - 3,363 ft
• At TOW for 300 Nm - Max pax - 3,000 ft - ISA +10	1,215 m - 3,986 ft
TAKE-OFF SPEED (V2 min @ MTOW)	112 KCAS
LANDING FIELD LENGTH (JAR 25)	
• Basic (MLW - SL)	964 m - 3,163 ft
• At LW (max pax + reserves) - SL	904 m - 2,967 ft
• Reference speed at landing	104 KIAS
EN-ROUTE PERFORMANCE	
Optimum climb speed	160 KCAS
Rate of climb (ISA, SL, MTOW)	1,851 ft/min
Max Cruise speed (95% MTOW - ISA - Optimum FL)	300 KTAS - 556 km/h
Fuel flow at cruise speed	811 kg/h - 1,788 lb/h
Range with max pax	716 Nm
200 Nm Block Fuel	565 kg - 1,246 lb
CO2 Emission	1,780 kg - 3,925 lb
300 Nm Block Fuel	783 kg - 1,727 lb
CO2 Emission	2,467 kg - 5,439 lb

NB: En-route performance computed assuming Max Optional TOW, Typical in-service OEW, 48 PAX@95 Kg, JAR fuel reserves, taxi time allowance: 4 min.

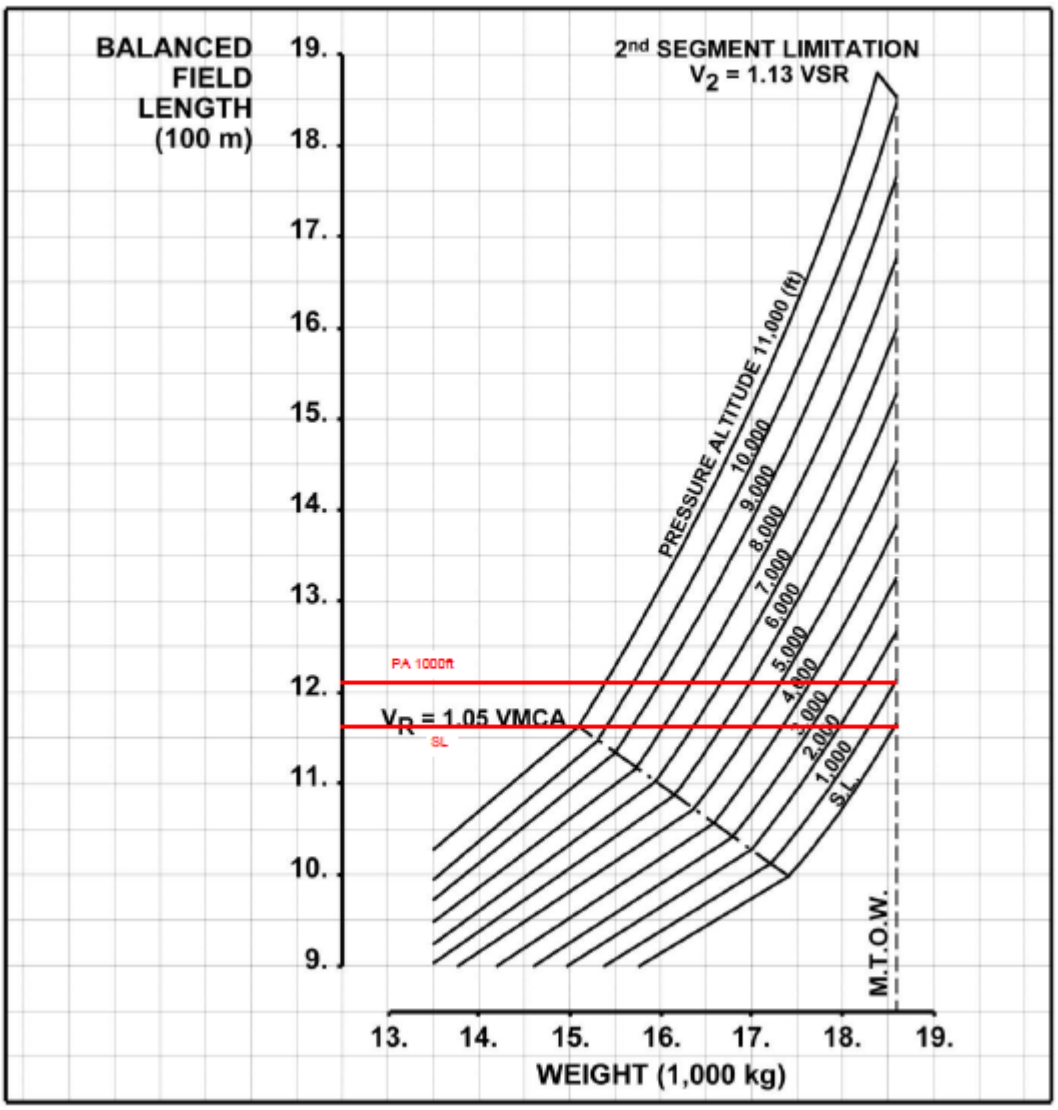
3.3 Take Off Runway Length Requirement

The following chart shows the runway length requirement for takeoff with one engine being inoperative and accelerate-stop distance in case of an aborted takeoff.



3.4 Balance Field Length – ATR 42

The following chart indicates the effect of weight of the aircraft and elevation of the aerodrome on runway length requirement. With the elevation becomes higher, the distance of the runway required for takeoff also increases unless the payload of the aircraft is reduced.

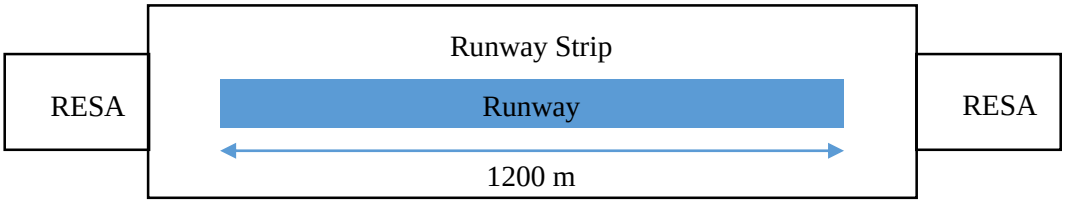


3.5 Runway

In order to accommodate the Design aircraft (2C aircraft – i.e. ATR-42), a runway with following characteristics is required. However, the runway length requirement would be more if either the elevation of the runway or operating temperature is higher. For more details refer to the Balance Field Requirement chart given at paragraph 3.4.

- Length - 1,200 m (at an elevation of 1,000 ft)
- Width - 30 m

A Runway Strip and a Runway End Safety Area (RESA) should be established as per ICAO requirements as below;



3.6 Runway End Safety Area (RESA)

In accordance with the ICAO Standards there should be a Runway End Safety Area of 90 m long and 60 m wide for a 30 m wide runway. This area should be an obstacle free area.

3.7 Total Length required for the Runway (at an elevation of 1,000 ft)

As stated above, the total length of land area required for a runway will be 1500 m as specified below;

- Length of the runway = 1,200 m
- Length required for the Runway Strip for two ends of the Runway = 60 m x 2 = 120 m
- RESA for both Runway ends = 90 x 2 = 180 m
- Total length required = 1,500 m

However in the current RESA cannot be provided due to limitations of land space, it is proposed that two ends of this runway are made to have up-hill which a slope not exceeding 2%.

3.8 Taxiway

A 23 m wide taxiway connecting the runway to an appropriate apron needs to be constructed.

3.9 Apron

An apron has to be constructed initially to handle a low capacity of traffic but with adequate area for expansion.

3.10 Runway lighting

Taking into account the predominant poor visibility conditions in the area, it is proposed that the lighting be installed using solar power lighting system that would bring the maintenance cost down.

3.11 PBN approaches

It would be expedient to provide the air field with PBN approach procedures so that aircraft equipped with required navigation equipment can use the airfield even under low visibility conditions.

3.12 Total Land Area

In order to develop an airfield to accommodate the basic facilities as explained above an area of 50 hectares (125 acres) would be required.

3.13 Utilities

3.13.1 Water

Water facility needs to be provided.

3.13.2 Electricity

Electricity facility needs to be provided

3.13.3 Telecommunication

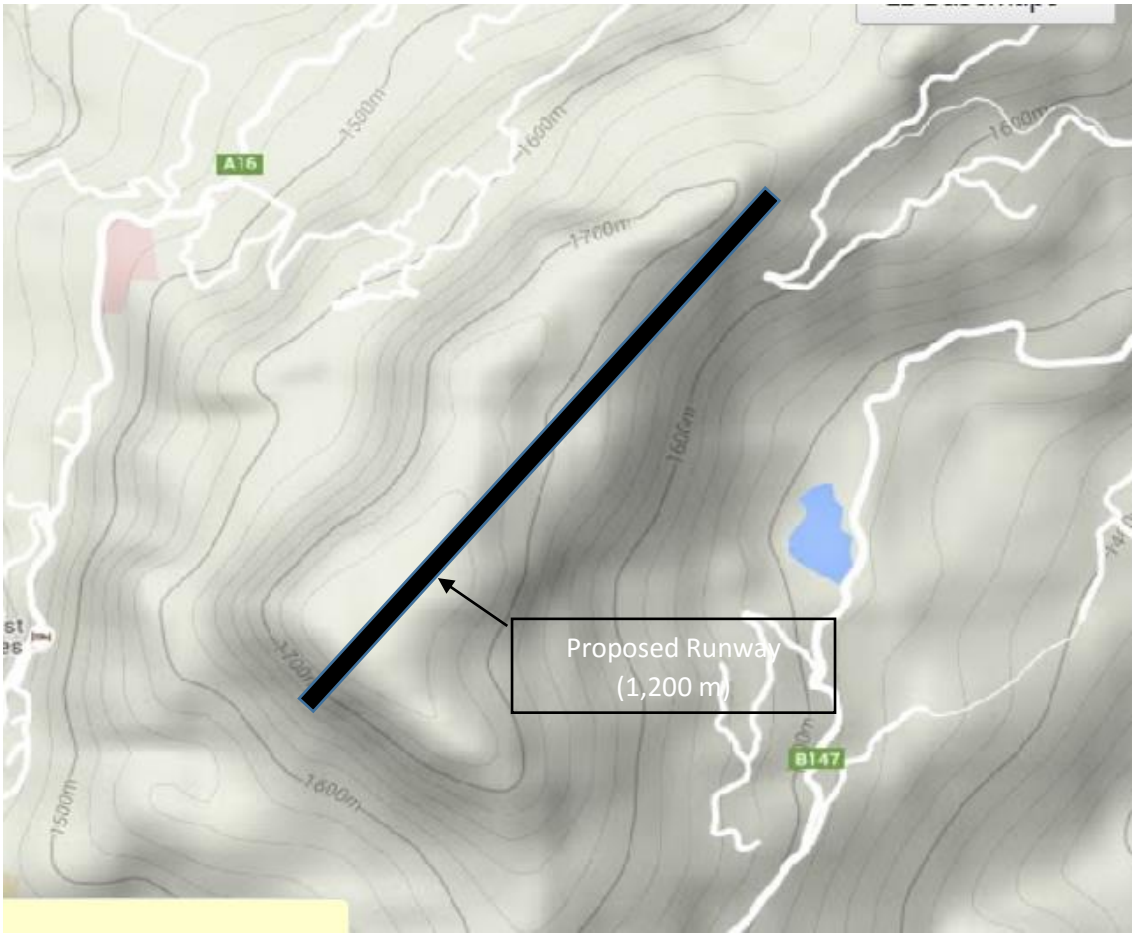
Telecommunication facility needs to be provided

4 Proposed Site at Haputale

4.1 Location

In the process of conducting a preliminary survey for the identification of suitable location for construction of domestic airport in Badulla district, a proposal was received to consider a land at Sherwood Estate, Thotalagala in Haputale. During the initial site inspection it was found that the location merits further study, if the preliminary clearances and support from all the government agencies concerned are received for the site from the view point of the respective organizations.

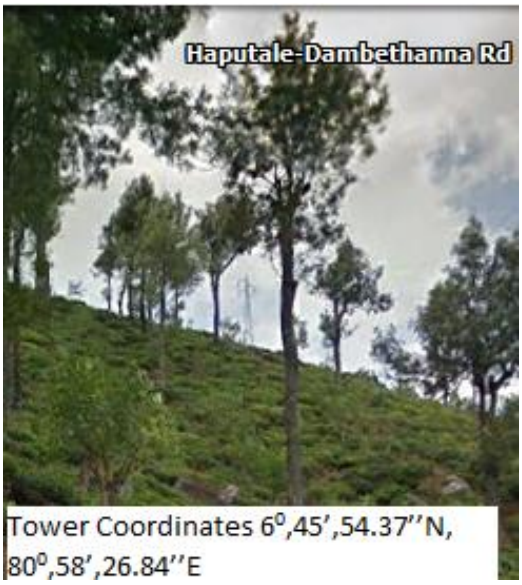
Sherwoood Estate, is located about 1700 m above the Mean Sea Level. The site is located 4 km away from Haputale city and 171 km from Colombo by air. The contour map of the area is as shown below.



However, detailed scrutiny of the 1:10,000 contour maps printed by Surveyor General indicates traversing of a High Voltage Power line through the identified area. Physical inspection of the site from the main road indicates presence of Electrical Masts in the area as shown below although they are not located as shown in the contour map. Details of a layout of High Voltage Power line network in the area has been requested from the Ceylon Electricity Board and reply is awaited. If the High Voltage Power line crosses the proposed runway or its extended centreline within a distance of less than 5 km from its threshold, the selected place cannot be used for construction of the airport due to the impending risk for flight safety.

Furthermore, at the meeting held at the Central Environmental Authority on 19th April 2016 for scoping of the proposed runway construction project, the representative of the NBRO stated that they do not recommend construction of a runway at the proposed site as part of the area has been identified to be located in a Landslide prone area. NBRO has already invested some money to mitigate the risk of landslide and it was his view that the area should not be disturbed further.

Tower Coordinates 6^0,46',02.69''N, 80^0,58',34.24''E



Tower Coordinates 6^0,45',54.37''N, 80^0,58',26.84''E


Tower Coordinates 6^0,45',52.90''N, 80^0,58',25.99''E

4.2 Land Requirements

As per the design criteria mentioned at another place in this document, the total land area to be acquired for the purpose would be in the range of 40 - 50 hectares.

4.3 Distance to other airfields by air

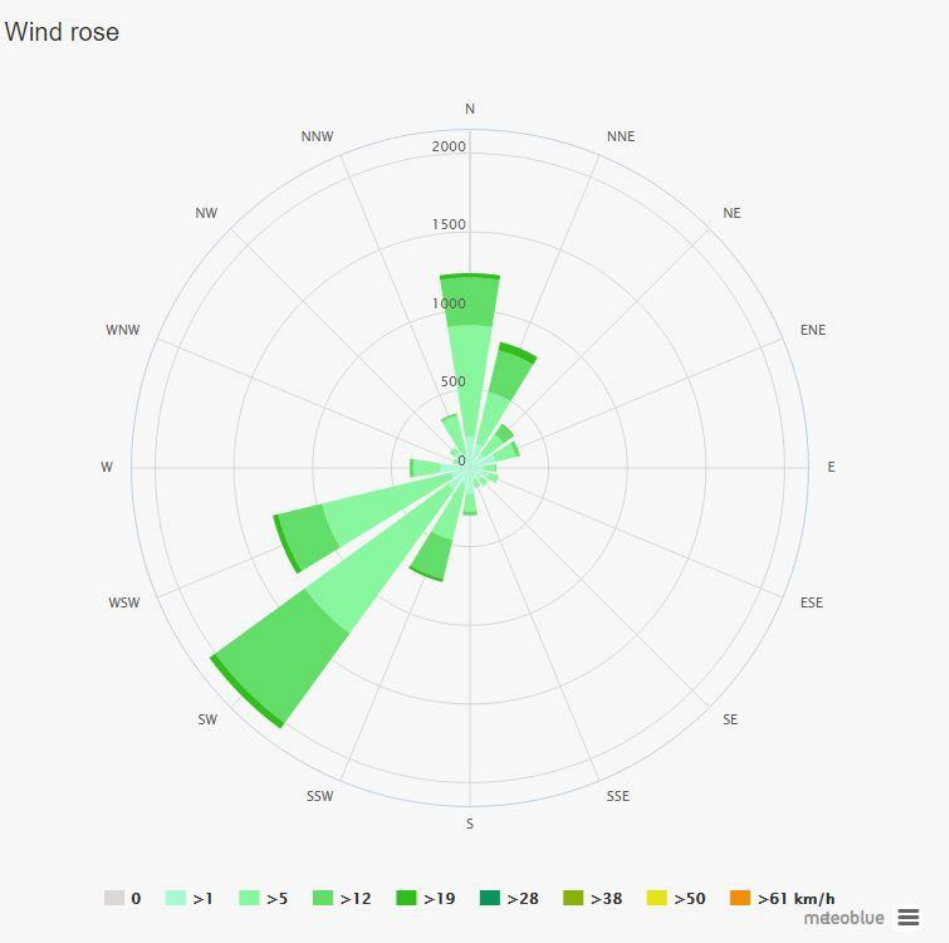
Proposed Haputale airfield will be the only airfield located in the up country region and Uva Province. The distance between proposed Haputale airfield and the rest of the airfields in Sri Lanka is as shown in the Table below.

Ampara	Ampara																
Anuradhapura	170	Anuradhapura															
Batticaloa	41	153	Batticaloa														
Hindurakgoda	107	67	86	Hindurakgoda													
Iranative	266	120	235	162	Iranative												
Kankasanturai	323	171	292	218	57	Kankasanturai											
Katukurunda	202	201	227	200	317	361	Katukurunda										
Katunayake	193	138	206	155	251	292	71	Katunayake									
Koggala	209	257	242	241	377	424	73	141	Koggala								
Mattala	130	237	169	197	354	407	129	169	94	Mattala							
Puttalam	212	72	206	126	161	196	166	95	234	241	Puttalam						
Ratmalana	200	175	220	182	290	331	32	40	104	148	135	Ratmalana					
Sigiriya	118	53	105	27	164	218	179	130	224	190	102	159	Sigiriya				
Trincomalee	143	87	108	59	129	185	258	208	299	251	159	239	80	Trincomalee			
Vavunia	199	49	173	93	73	127	250	186	306	281	107	224	92	78	Vavunia		
Weerawila	128	245	168	202	360	414	143	181	105	14	251	162	196	254	288	Weerawila	
Haputale	**95**	**180**	**130**	**140**	**280**	**350**	**113**	**125**	**115**	**58**	**180**	**120**	**130**	**196**	**223**	**65**	**Haputale**

Table 1 - Air Distance between domestic airports

4.4 Wind Pattern Analysis

It is vital that predominant surface wind pattern of the area is studied for a period of at least two years in order to determine the sitting (orientation) of the runway. However, the Director General of Meteorology confirmed that there is no data regarding the surface wind pattern of Haputale Area. Accordingly necessary weather information had to be derived from the internet (https://www.meteoblue.com)



4.5 Further considerations and limitations

According to the study of the area which was done together with Urban Development Authority, Badulla Region, it is the only available government owned land which has satisfied major part of the vital considerations for location of an airport. Some of the important factors that came to light are as follows.

- There is no present infrastructure or any construction and the land area is totally unoccupied and a green field. Although the land is used for tea cultivation, the plantation is infecund in the area selected for the purpose.
- Haputale area experience misty conditions on most part of the year. The usability factor of the airfield may be affected during such occasions.
- Access road to proposed aerodrome should be constructed from available roads which are closer to the field.
- High Voltage Power line is observed to be situated closer to the site.

- Part of the identified area conforms to Landslide Prone area as per the reports of the NBRO

4.6 Development of an access road

According to the above mentioned facts, the available land appears to be suitable for the construction of the airfield. There are no obstacles to be cleared and the main disadvantage is terrain of the area which is undulating which requires earth cutting and filling at different positions. Also absence of well-developed road to the airport site would require development of a new access road of approximately 500 m in length, preferably from "Y" junction on Haputale – Bandarawela Road.

4.7 Site Analysis against common concerns

The following table summarizes the advantages and disadvantages of site for construction of the airport against common concerns. However when the fact that there is no flat land without high terrain in the surrounding, the identified land seems to be suitable for construction of the airport, if the necessary approvals / clearances are available.

Advantages	Disadvantages / Limitations
Reasonable flat land compared to surrounding terrain area	Limited land space/ expansion not possible
No effect on wild life	Airport is located on high ground
No effect on Flora and Fauna	Access Road has to be constructed
No visible archeological sites	Cost of construction is comparatively high
No displacement of families observed	Distant from Badulla City
Accessibility to main highway by less than 1 Km road construction	If the High Voltage Power line cut across the proposed flight path closer to the threshold, either the power line needs to be removed or site should be given up
No diversion of major roads or waterways	NBRO states it is not advisable to select the proposed site as part of the land falls within the Kahagalla landslide prone area
Approach paths clear of obstacles	
Central to number of tourist destination in the district	

No height restrictions on the constructions in the surrounding	

4.8 Conclusion about Haputale site

In view of the following points which are enumerated in the foregoing, the Haputale site is considered not feasible for development as a domestic airport

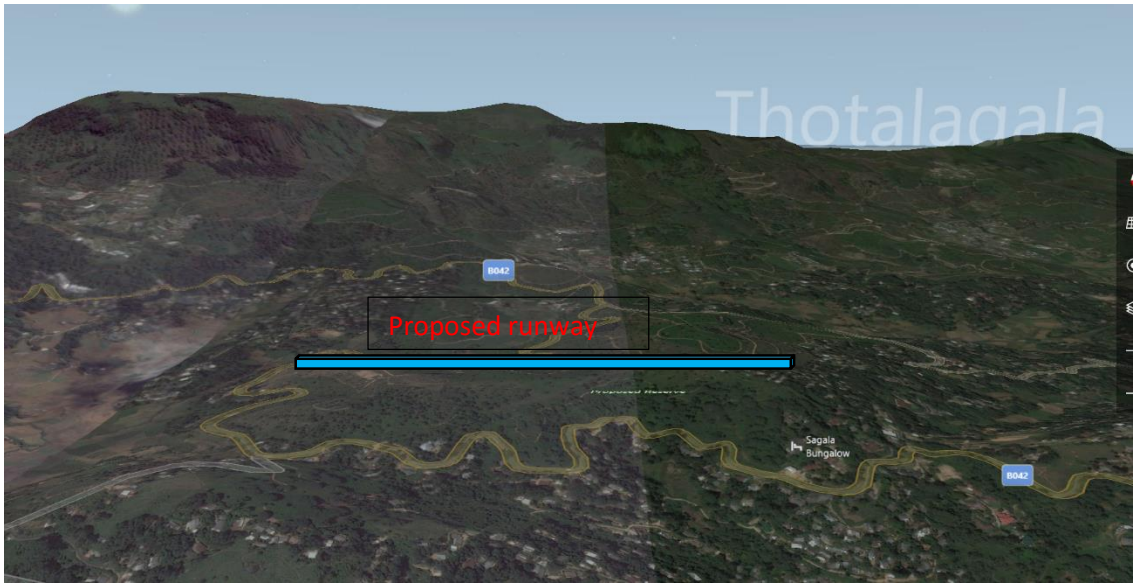
a. Part of the site conforms to the Landslide Prone Area
b. High Voltage Powerline traverse across the selected site
c. Climatic conditions are fluctuating frequently
d. High cost of land preparations

5 Proposed site at Bandarawela

5.1 Location

In the search of place for construction of an airport for Badulla district, a site has been located at Bandarawela electorate. It is situated about 3.2 km away from Bandarawela Railway Station at Mahaulpothawatta on Bandarawela – Poonagala- Koslanda (B042) Road. The part of the land is a fecund tea estate named Mahaulpotha. The land is observed to be within the ambit of Mahaulpotha and Kebillewela South Grama Seva Divisions.

There is also a private land which is adjoining Mahaulpotha Estate, which will also be required for the establishment of the airport.



5.2 Climatic Conditions

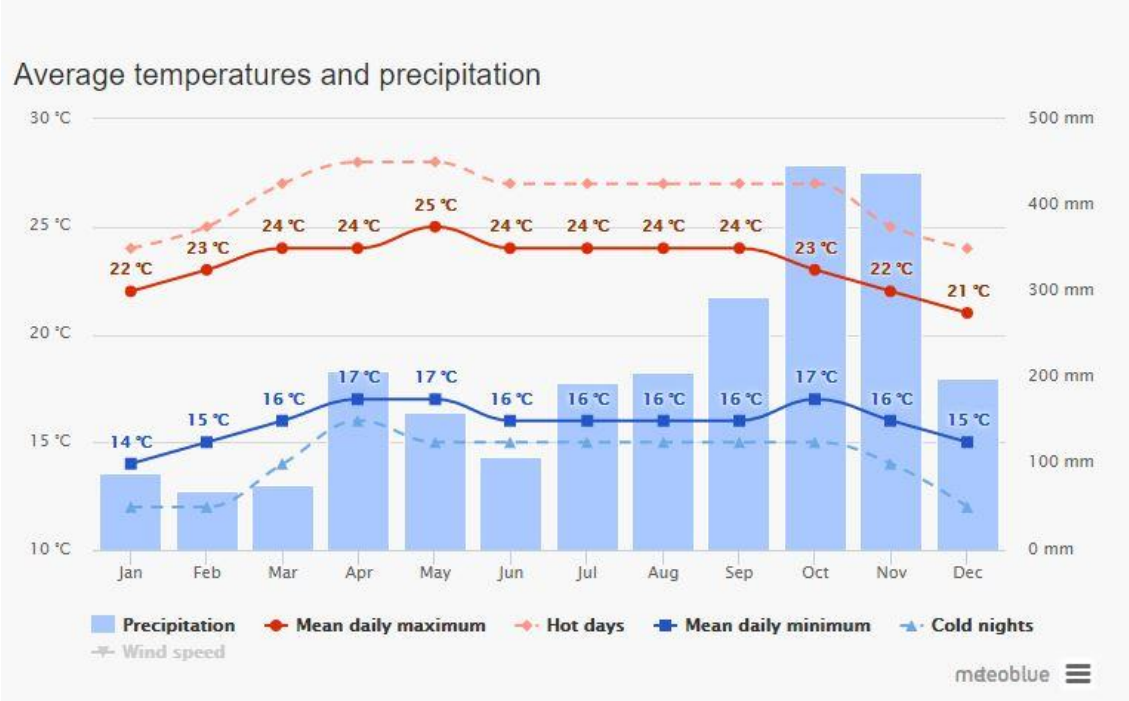
The general historic climatic conditions of Bandarawela is as follows (Source : www.meteoblue.com)

5.2.1 General Conditions

The mean daily minimum and maximum temperature of Bandarawela throughout the year has been 14^0 C and 24^0 C and in the months of December, January, and February the minimum temperature had gone down to 12^0 C whilst the highest temperature in the months of April and May had gone above 30^0 C.

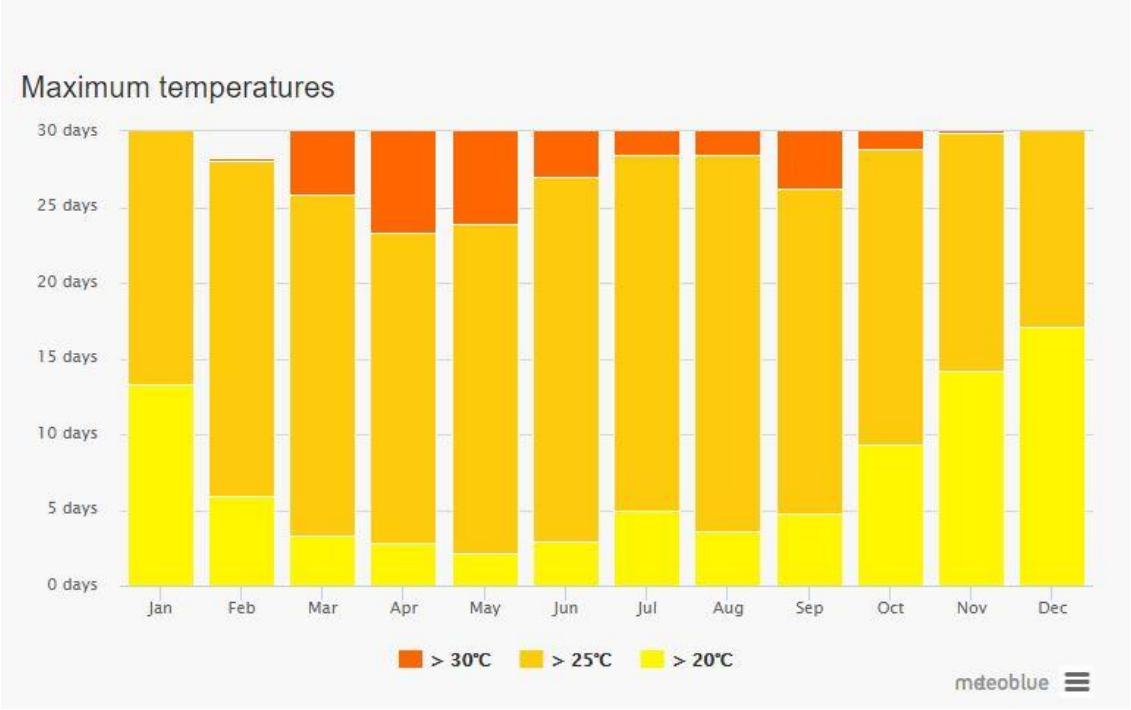
January, February and March had been fairly dry months compared to the rest of months in the year with October and November getting highest rain fall in Bandarawela.

It is observed that there is no significant adverse impact of the prevailing climate on the airport.



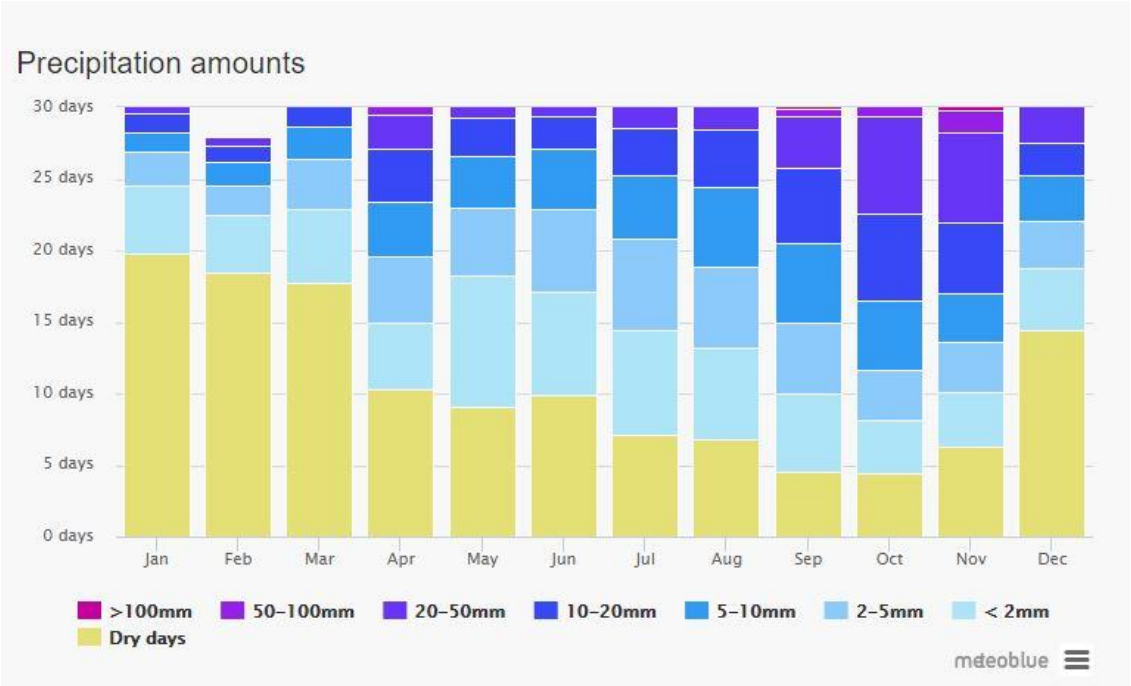
5.2.2 Average Temperature

Temperature variation of Bandarawela during the year is shown in the following chart. For a few days in the months from March to October, there have been occasions when temperature of the area had gone above 30^0 C

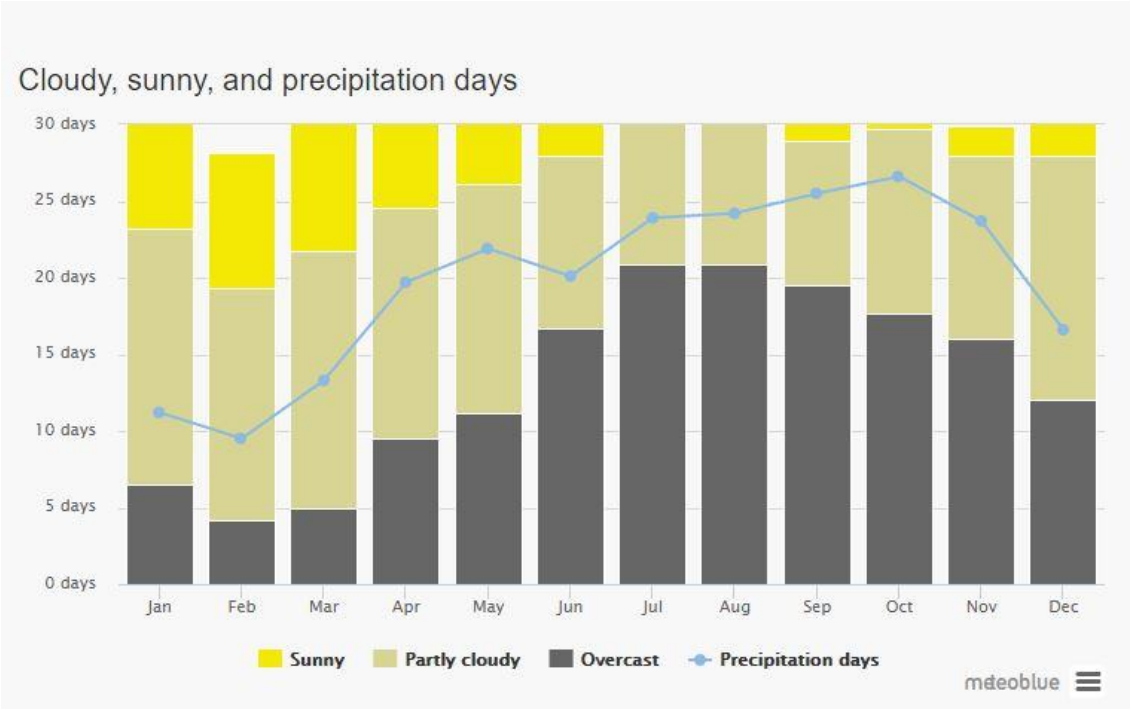


5.2.3 Average Rainfall (Precipitation)

Bandarawela gets rain almost all the year with heavy rain fall in the month of April to November.



5.2.4 General Visibility



Visibility in Bandarawela is somewhat affected due to clouds in major parts of the year. Sunny days are very limited.

5.2.5 Predominant Wind

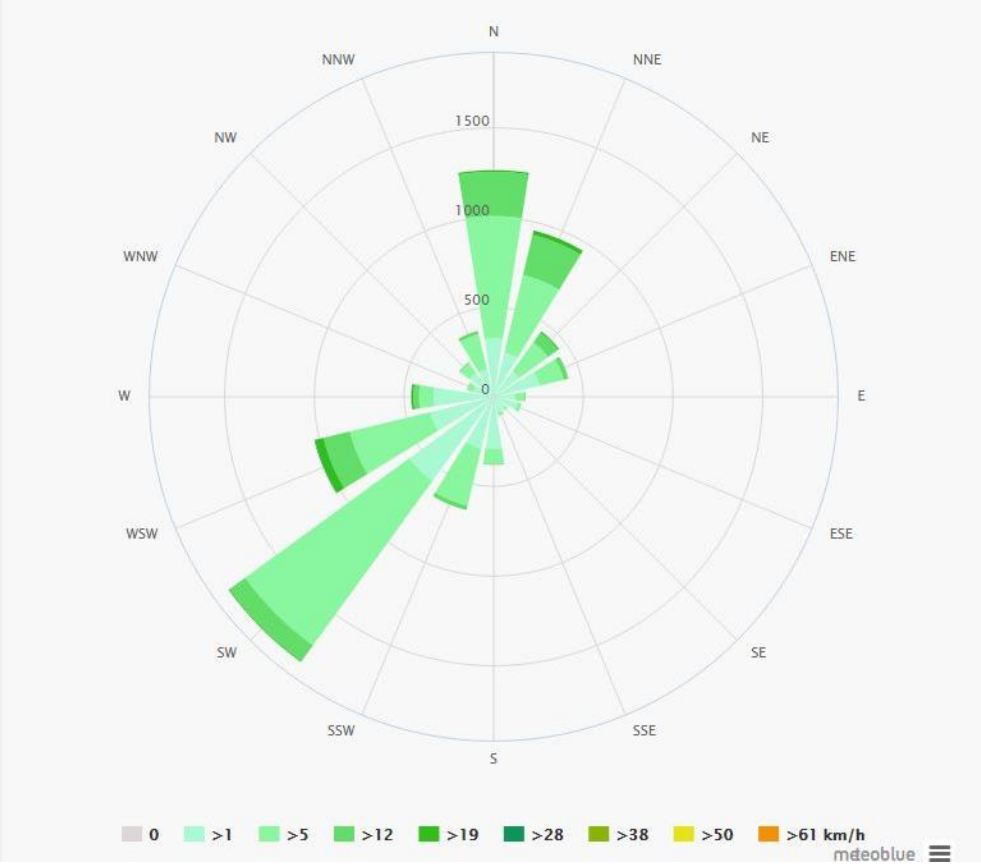
Direction of the wind and speed is very important for airport constructions. Wind speeds and directions in Bandarawela area are as shown in the diagramme.

5.2.5.1 Wind Speed

Wind speeds in Bandarawela Area has been below 28 km/h for most of days in the year.

5.2.5.2 Wind Direction

Bandarawela gets south westerly wind in major part of the year in addition to northerly wind for a few months. The following wind rose indicates the wind patterns that prevailed over the year.



5.3 Terrain

There is high terrain of Nayabeddha hills on the East of the selected site. The topmost point is about 1700 m above MSL. There is no close obstacles in the direction of North East or South West where winds blow for a major part of the year.

5.4 Accessibility

The site is accessible by two existing roads viz. Bandarawela – Koslanda road from one side, which is carpeted and from the road leading to the Nayabeddha tea estate from the other side, which needs renovation. The distance to the site from both roads to Bandarawela site is less than 3.5 km.

5.5 Land Requirements

As per the preliminary assessment, a runway of 1300 m in length could be constructed at an elevation of 1350 m above the MSL in the North East and South West direction with an angle of 53^0 from the North so that the runway would be parallel to Nayabedha hill range. Accordingly a minimum land area of 37 hectares, as shown in the following chart would be required for the construction of an airport to suit the operation of the Design aircraft.

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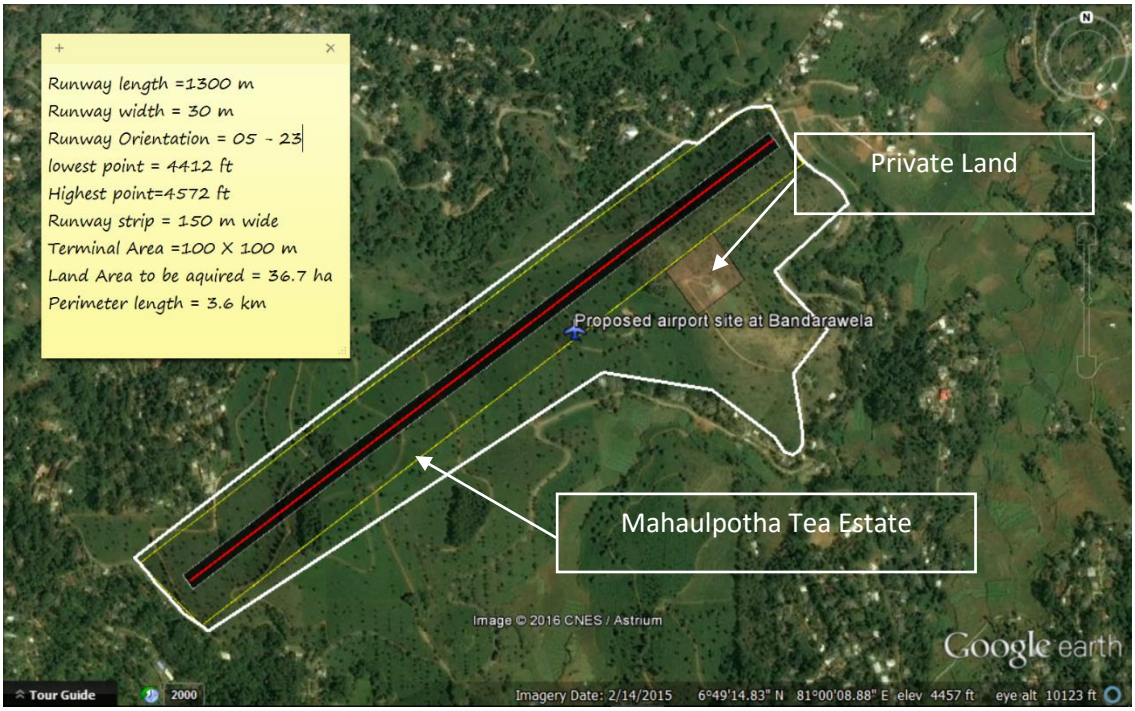
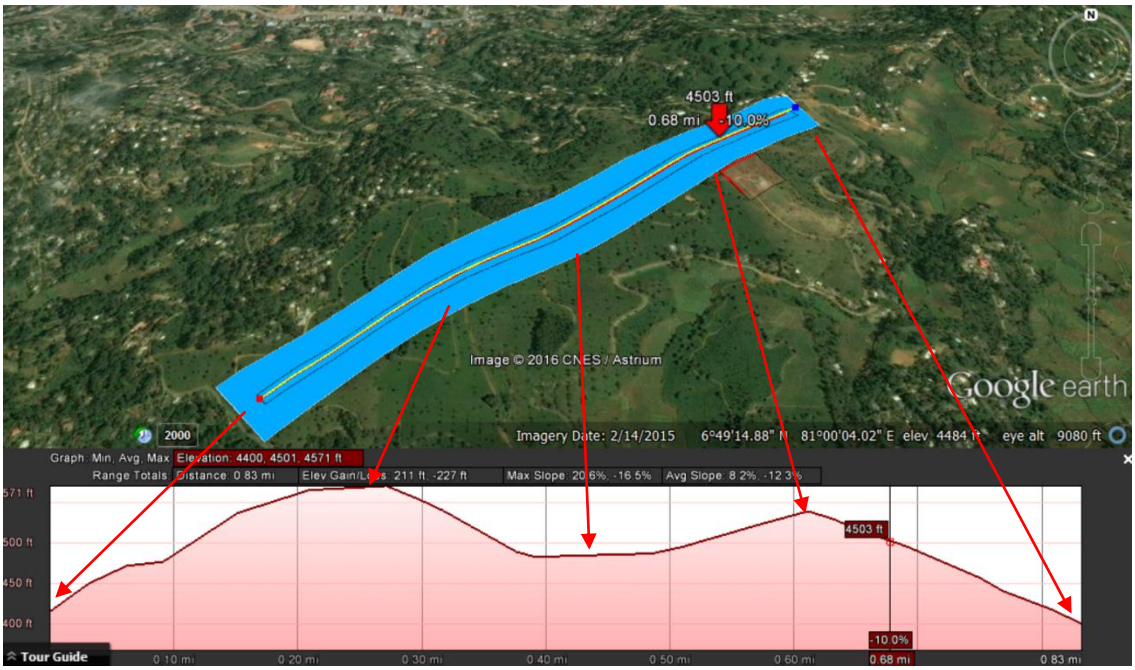


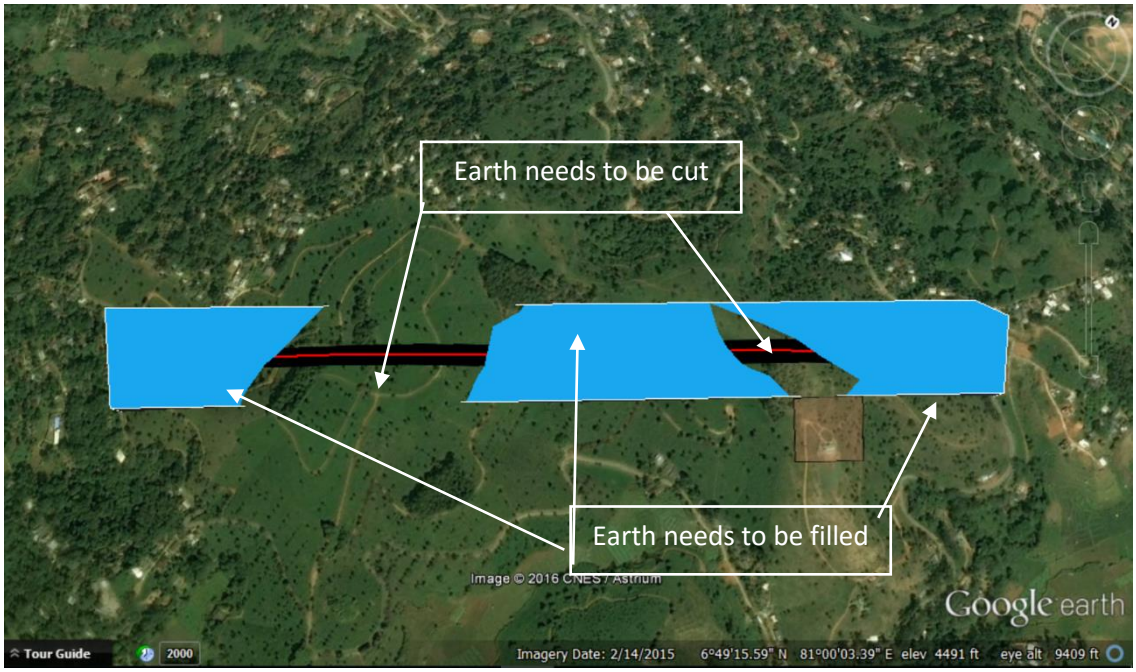
5.6 Topography of the site

In view of the fact that Bandarawela is situated in a hilly area, it is not rationale to expect a flat land which satisfies all the civil aviation requirements for construction of an airport. In that context, the site selected seems to be suitable for an airport although it contains crests and troughs of different heights and depths. The height variation along the chosen direction for the runway is depicted in the chart below.

If the land is levelled at 1,400 m (4505 ft) the amount of earth cut and fill can be balanced so that cost of construction could be minimized.



The Earth to be cut and filled to establish the airport is shown in the following picture. Earth in the area of natural colours needs to be cut whilst area shaded in blue needs to be filled.



5.7 Distance to other airfields by air

Due to close proximity of two sites Bandarawela and Haputale, the air distance from Bandarawela site to other airfields in the country would be much closer to the distances that are given from Haputale site above.

5.8 Land ownership and settlements

The major portion of land required for the airport conforms to Mahaulpotha Tea Estate and another significant portion is a private land. Exact extent of land and ownership is yet to be identified. It is observed that there are three normal dwellings and one large house located in the area identified for the construction of the airport.

5.9 Site Analysis against common concerns and approvals relevant authorities

The analysis of the site in regard to common concerns are as follows.

5.9.1 Effect on Wildlife

There is no wildlife on the selected site

5.9.2 Effect on flora and fauna (forests)

There are a few planted turpentine trees at the site and they need to be uprooted. Tea plantation in the area identified for the runway and runway strip which should be free from obstacles should be removed.

5.9.3 Archeological Impact Assessment

An application has been sent to the Department of Archeology requesting for approval for the site from Archeological point of view and response is awaited.

5.9.4 Site Analysis against Landslide

An application has been sent to the National Building Research Organization requesting for approval for the site from vulnerability of Landslide point of view and response is awaited.

5.9.5 Environmental Impact Assessment

An application has been sent to the Central Environmental Authority for approval for the site from environmental authority point of view and response is awaited.

5.9.6 Approval of the District Development Committee– Badulla

Badulla District Development Committee which met on 25th April 2016 under the chairmanship of Hon. Nimal Siripala de Silva, Minister of Transport and Civil Aviation approved use of the proposed site at Bandarawela subject to requisite clearances from the NBRO, Archeological Department and Central Environmental Authority in relation to matters coming the purview of respective organizations.

5.9.7 Approval from the National Planning Department

The proposal for establishment of the airport for Badulla District at the proposed site in Bandarawela is forwarded to the National Planning Department for approval.

5.9.8 Approval from the Ministry of Plantation Industries

The part of the land selected for the purpose belongs to Mahaulpotha Estate, ownership of which comes under the purview of the Ministry of Plantation Industries hence the approval of that Ministry is sought for the acquisition of land.

5.9.9 Powerlines over the site

Power lines carrying 230 volts erected on posts which are crossing the intended flight path needs to be shifted so that they would not cross the flight path or they could be relocated at lower elevation so that those line would not be an obstacle. Liaison with Ceylon Electricity Board is required in this regard.

5.10 Utilities

5.10.1 Power

Electricity is available to the site

5.10.2 Water

Water facilities available to the site

5.10.3 Telecommunication

Telecommunication is available

5.11 Public Transport Facilities

Public bus service is available. Railway station is only 3.5 km away from the site

6 Estimated Cost of Development

Cost of construction of the runway was estimated based on the following assumptions.

- The Design Aircraft will be ATR 42 which requires 2C runway
- Runway length will be not more than 1,300 m with a width of 30 m.
- A terminal capable of accommodating 50 passengers would be constructed
- An apron capable of accommodating only two ATR-42 aircraft would be constructed.
- Airport would be used only during day time under Visual Flight Rules and no standard navigational aids will be provided other than PAPI.
- In view of poor visibility conditions which is predominant, it is proposed that runway should be lighted using LED lights.
- There would not be any cost for land acquisition or payment of compensation to any party.
- Security equipment would be provided as per the National Civil Aviation Security Programmed.

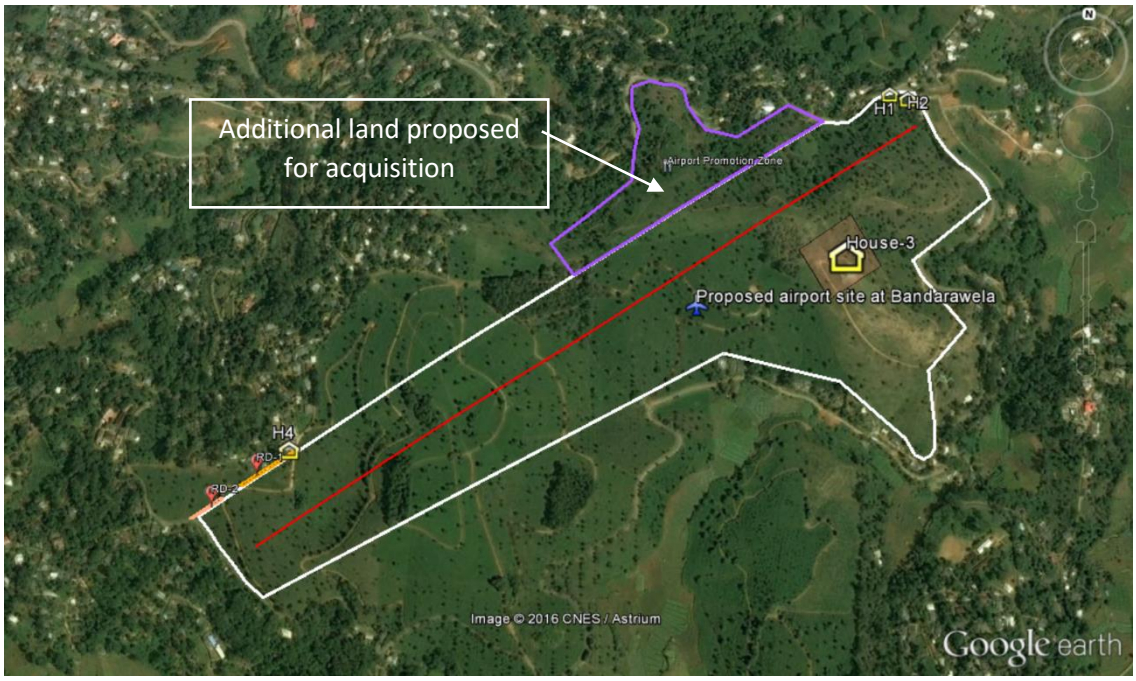
6.1 Estimates of Cost components

Index	Description	Quantity	Unit	Cost (Rs)
a.	Geo Investigation / Surveying		Item	6,000,000
b.	Preparation of ground for construction of the airport as per published Standards including retaining wall on either side		item	200,000,000
c.	Runway (1,300 m X 30 m)	39,000	m^2	350,000,000
d.	Taxiway (100 m X 30 m)	3,000	m^2	21,000,000
e.	Apron (100 m X 75 m)	7,500	m^2	53,000,000
f.	Terminal Building	400	m^2	20,000,000
g.	Perimeter Roads	-	item	80,000,000
h.	Utilities	-	item	50,000,000
	Total			780,000,000

7 Arrangements for Public Private Partnership

In the event a decision is made to call Request for Proposal for establishment, operation and maintenance of the aerodrome under PPP arrangement, it would be desirable to acquire additional land as shown below to enable the prospective investor to make optimum use of the site and facility for conversion of the airport for airport garden or airport city with additional commercial and recreational facilities around it.

After selecting a prospective candidate for a PPP arrangement under the accepted Procurement Guidelines, the candidate is required to be appointed by the Minister in charge of the subject of civil aviation under Section 6 of the Civil Aviation Act No.10 of 2014 as the Aerodrome Service Provider and he shall enter into agreement with the Statutory Service Provider (AASL) for effective coordination of provision of air navigation services as defined in the Civil Aviation Act.



8 Establishment of Aerodromes in Sri Lanka

8.1 Legal Requirements

There are a number of requirements specified in the Civil Aviation Act No.14 of 2010 in relation to establishment and operation of aerodromes in Sri Lanka and mentioned below are a few of such requirements that shall be complied with in the establishment of aerodromes in Sri Lanka.

8.1.1 Need for an Airport Master Plan

Pursuant to Section 14 (2) of the he establishment or expansion, of an Aerodrome, shall not commence until the Master Plan in respect of the same has been approved by the Civil Aviation Authority of Sri Lanka. The Authority shall before it approves a Master Plan, consult any other statutory authority where it considers such consultation appropriate or necessary and whose views and observations on the proposed establishment or expansion and its effect on environment and any other factor, needs to be considered before such Master Plan is approved.

An approval granted by the Civil Aviation Authority of Sri Lanka under subsection (2), shall be subject to such terms and conditions and to the payment of a fee as determined by the Authority.

The Authority shall cause a Notice relating to any approval granted, to be published in the *Gazette.* A copy of the approved Master Plan, other than the information referred to in paragraph (e) of subsection (1), shall be kept in the office of the Authority and be made available to the public for inspection, on payment of a fee as may be determined by the Authority.

The Authority may from time to time where it considers necessary or on the request of the person to whom approval was granted under Section 14 (2) of the Civil Aviation Act, require a Master Plan to be reviewed or evaluated and appropriate modifications or adjustments made thereto, to address any changes that may have taken place since the approval of such Master Plan.

Pursuant to Section 15 of the Civil Aviation Act**,** notwithstanding anything to the contrary contained in any other written law, a Master Plan once approved under section 14 of this Act, shall not be subject to or be required to be further approved or accepted under any other written law.

8.1.2 Need for an Aerodrome Licence

Pursuant to Section 16 of the Civil Aviation Act No. 14 of 2010, no Aerodrome other than the Aerodromes used exclusively by the Sri Lanka Air Force, whether owned by the Government or privately owned, shall be maintained, operated or improved, except in conformity with a licence issued under subsection (1) of section 11 of the Act by the Director General and subject to the terms and conditions of such licence.

For the purpose of issuing a licence referred to above the operation of an Aerodrome shall include those activities that secure:—

(*a*) the take-off and landing of an aircraft and the related movements of the aircraft on ground;

(*b*) the protection and care for the aircraft; and

(*c*) maintenance and improvement of the Aerodrome.

8.1.3 Establishment of Protected Area

Under Section (23) of the Civil Aviation Act, the Minister may by Order published in the Gazette, declare any land which is adjacent or contiguous to any area in respect of which a Master Plan for the establishment of an Aerodrome has been approved to be a protected area (in this Act referred to as the "Protected Area") for the purposes of the Act.

The Order under subsection (1) may define the area of land by setting out the extent, the assessment number or the metes and bounds of the land or each of the lands which comprises of such area of land.

8.1.4 Zoning Instructions

Pursuant to Section 23(d) of the Civil Aviation Act, Director-General of Civil Aviation shall issue instructions, directives and procedures setting out the requirements to be complied with in regard to the construction of any buildings or other structures or the making of alterations to any existing buildings or other structures within the Protected Area declared by the Minister and in respect of distinct lighting and markings in the neighborhood of an Aerodrome or air route.

8.2 Land Ownership

After following the due process, the land will be acquired and vested with the Civil Aviation Authority of Sri Lanka and it will be made available to the aerodrome operator on lease.

8.3 Aerodrome Operator

By order published in the gazette, the Minister may appoint an Aerodrome Operator for establishment, operation and maintenance of the aerodrome. The aerodrome so appointed shall obtain an Aerodrome Licence from the Director General of Civil Aviation. The Budget Proposal – 2016 states that the development of Badulla Aerodrome may be undertaken under Public Private Partnership (PPP).

9 References

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XIII. Weather Online. (n.d.). Retrieved from Badulla: http://www.weatheronline.co.uk/weather/maps/city?WMO=43479&CONT=asie& LAND=SB&LEVEL=50
XIV. Urban Development Authority, Uva Province
XV. Internet (https://www.meteoblue.com)

10 Attachment A

Land Use – 2012 – Badulla District		
Category	**Extent-acres**	**Percentage**
Residential	164.16	35.5%
Agricultural	134.31	29.08%
Roads/Railway roads	55.265	11.96%
Scrub	26.168	5.66%
Forests	25.498	5.52%
Institutional	17.42	3.76%
Commercial	12.069	2.6%
Religious	11.68	2.52%
Transport/Utilities (water resources, railway station)	4.84	1.05%
Tourism	4.818	1.04%
Crematorium	2.656	0.60%
Stadium	0.566	0.12%
Industrial	0.566	0.12%
Total	462.25	100%

Measure distance

Total area: 750,859.01 m² (8,082,179.12 ft²)

Total distance: 4.52 km (2.81 mi)