Report on the proposal for construction of Second Parallel Runway at Bandaranaike International Airport Colombo

August 2015

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1 Introduction

1.1 Background

The growing need to construct the second runway at the Bandaranike International Airport (BIA) was discussed at the Ministerial Committee chaired by Hon. Joseph Michael Perera, Minister of Home Affairs and the recommendations of that Committee have been approved by the Cabinet of Ministers on 10th June 2015.

The need to construct second runway at BIA has been discussed at the Cabinet Sub-Committee on Economic Affairs, at two occasions on 5th May and 19th May 2015. Non obstruction to BOI premises and to the civilians and religious organizations in the BIA area was the major concerns to those forums.

In keeping with the abovementioned concerns, instructions were given by the Hon.Prime Minister at the Cabinet Sub Committee meeting held on 7th July 2015 to initiate a study for construction of a second parallel runway at BIA for expanding its capacity for growing needs and efficient handling of aircraft and in the event of such an exercise is found to be prohibitive for any socio economic reasons or any other concerns to propose for an alternate plan for construction of a complete international airport with well-spaced two parallel runways capable of handling independent simultaneous operations at a suitable location in Horana/ Padukka Area.

1.2 Committee to study for construction of a second parallel runway at BIA (CSCSPR)

Pursuant to the decision of the Government aforementioned, Secretary, Ministry of Aviation in terms of his letter No.MCA/Av/04/85 dated 20th July 2015 (Please see Annex-1) appointed a committee comprising the following and/or their designated representatives to initiate a comprehensive study on the above matter and submit a report.

1. Director General of Civil Aviation (Chairman)
2. Chairman, Airport and Aviation Services (Sri Lanka) Ltd. (member)
3. Chairman, Urban Development Authority (member)
4. Chairman, Board of Investment (member)

Accordingly, the 1st meeting of the above Committee (CSCSPR) was convened by Mr.R.M.S.P.Rathnayake, Additional Secretary (Aviation) on 7th August 2015 at the Civil Aviation Authority of Sri Lanka.

CSCSPR reviewed the work that has taken place hitherto in this respect and examined the possible options for detailed study, if such proposals are acceptable to the Government from policy point of view.

This report contains the Committee (CSCSPR) recommendations together with background information involving the construction of the proposed second runway at BIA.

2 The Runway at BIA

2.1 History

BIA has a single runway constructed in 1986 under the "Colombo International Airport Development Project Phase 1". It has been designed for code 4E critical aircraft (e.g. Boeing B-747) with a life span of 20 years. The runway is 3,350 meters long and 45 meters wide (3,350 m X 45 m). It is supported with a parallel taxiway (30 meter wide), which used to be the previous runway constructed in 1967 with the Canadian aides. The taxiway is provided with 5 perpendicular intersections.

2.2 Current Status

The runway has since been aged nearly three decades without undergoing any resurfacing or overlaying other than regular maintenance. The runways was incident free until 2001 when SriLankan Airlines London bound flight UL505 (Airbus A340) sustained substantial damage to a centre gear tire and large area near the centre-wheel-well due to a displaced cowling of a runway centerline light hitting the aircraft during take-off run on BIA runway. Following this incident, at the request of Director General of Civil Aviation (DGCA), the International Civil Aviation Organization (ICAO) mobilized an Expert Team from 19th -22nd March 2001 to review the BIA facilities and infrastructure and submit a report. ICAO Report recommended inter alia resurfacing of the runway.

The need for resurfacing of the BIA has since been re-emphasized by subsequent ICAO missions and audits conducted by the CAASL. However, the runway continues to be serving international operations without any resurfacing to date.

2.3 Present Limitations

The BIA runway (3,350 m X 45 m) is capable of accommodating most of the commonly used commercial aircraft by airlines. However it is not wide enough for unimpeded operation of New Large Aircraft such as Airbus A-380.

The width of the runway need to be expanded for unimpeded operation of New Ultra Long – Range code 4-F aircraft (e.g. Airbus A380 and the Boeing 747-400ER). Outer engines of the Airbus A380 placed 47m apart, protrudes beyond the width of the 45m standard runway at BIA.

The jet blast could cause serious soil erosions, damage runway signs and lights unless runway shoulders are widened and the runway lights and signs are relocated. A380 aircraft may experience safety implications during takeoff run with full payload at full engine thrust due to possible ingestion of foreign objects. ICAO standards requires the runway to be 60m in width for accommodation of New Large Aircraft.

2.4 Capacity

With the given infrastructure the current air traffic handling capacity of the runway is estimated to be 25 aircraft movements per hour. The handling capacity of the runway can be improved slightly (up to about 30) with the introduction of Rapid Exit Taxiway and improved ATC system.

Note: As per the data provided by the Member States to ICAO for Asia Pacific Seamless ATM Plan, the capacity expectations of Singapore and Thailand for single runway operations with advanced ATC systems and properly designed taxiway system which includes Rapid Exit Taxiways are 30 and 34 respectively.

Construction of a parallel taxiway system for enhancement of runway capacity at BIA for the current runway is not possible due to limited space between the existing taxiway and the apron.

2.5 Current Use

The runway handled approximately 57,000 aircraft movements in 2014. Presently the runway handles around a mix of 17 arriving and departing aircraft movements per hour during peak hours.

2.6 Projected growth

The traffic at BIA is observed to be growing at a rate of 7% per annum and reach 75,000 movements per annum by 2017; the landmark figure which ICAO advocates the States to start planning for a second runway. It is expected to reach 100,000 aircraft movements per annum by 2022 and achieve the status of "airport with high density traffic" in the ICAO parlance and the airport is then required to have a second runway to handle traffic as per their guidelines. The following Chart depicts the projected growth of BIA at different rate of growth.

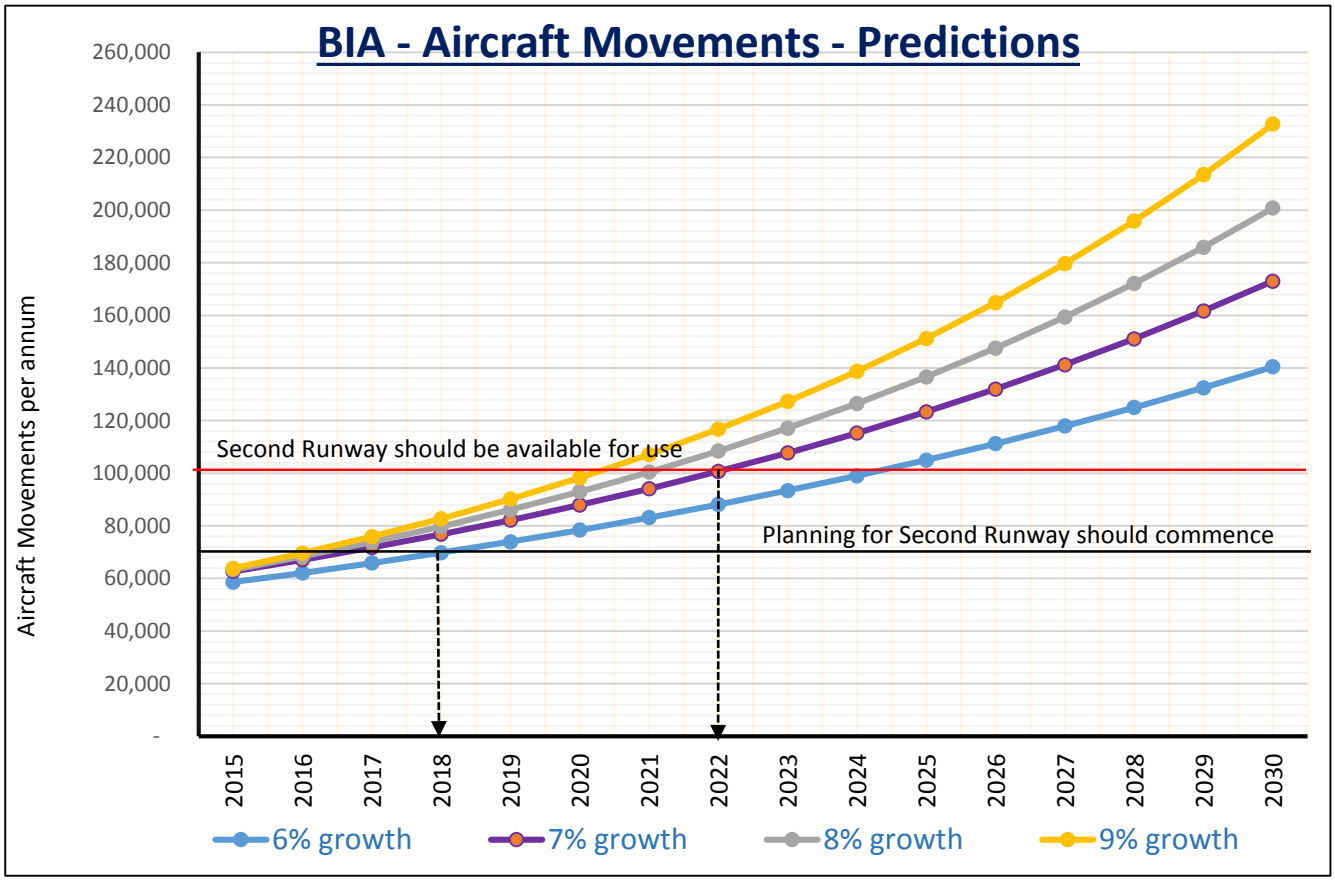


Chart 1-Projected Aircraft Movements of BIA

2.7 Government Investments on BIA

Since inaugural in 1968, the successive governments have invested huge sums of capital for capacity development of BIA. Major improvements in the airport capacity and other ancillary infrastructure took place during two different period of 1983-1988 and 2003-2004 with a total expenditure of Yen 26.4 Billion (Rs. 6.4 Billion) and Yen 12.4 Billion (Rs.11.4 Billion) respectively. The details of the development work undertaken under during those periods are given in Annex-3.

With the objective of transforming Sri Lanka to a main commercial and business hub which connects the Eastern and the Western countries, the Government has obtained a JICA loan of Yen 74 Billion (Rs.80 Billion) to improve and modernize the facilities of Bandaranaike International Airport (BIA).

The above loan financing will be utilized to construct two story passenger terminal building with two terminals for arrivals and departures, Prier No.2 with 8 gates and 14 aerobridges, aircraft parking apron and taxiway as well as to improve the utilities such as water supply, electricity and waste water disposal system. The work of this project is expected to commence soon.

3 Need for Second Runway for Airports

3.1 Advantage of a Second Runway for airlines

It is an international standard that an airline shall carry additional fuel sufficient to go to an alternate airport if landing at the planned airport cannot be made due to unforeseen reason(s).

Weight of trip fuel which includes the weight of fuel needed for the planned destination airport and for the alternate airport not only eats into the payload but also costs extra money to an airline. In a competitive environment, airlines strive to maximize the payload and for this purpose, if the weight of trip fuel can be minimized, it is considered to be the most preferred option.

Airlines have to land at an alternate airport only when landing at the planned airport cannot be made for some reason. Such situations arise in most of the cases either due to blockade of the active runway or weather going below the approved minima.

With the modern day technology, weather at the planned airport can be predicted to a good probability of accuracy and therefore airlines are in a position to handle such situations judiciously as the need arises. Hence except in bad weather conditions, airlines are assured of landing at the planned destination airport, if the airport is provided with more than one runway.

Accordingly the availability of more than one runway at an international airport provides the operating airlines with direct significant commercial benefits in terms of saving of cost of trip fuel which results in higher payload.

3.2 Global Trend

Like commercial airlines in the world, international airports are also in a strong but silent competition for establishment of their positions in the air transport market place by attracting more airlines, passengers and cargo with a view to reaching the hub status. For this purpose the airports strive to be capacity unconstrained, efficient, competitive, economical, customer oriented and environment friendly.

Due to multifold gainful reasons, airports serving international civil aviation incline more towards the establishment of well-spaced multiple parallel runways at the existing airport than establishing many airports at different locations. Dubai, London Heathrow, Singapore, Hong Kong are a few such examples which have constructed multiple runways albeit amidst pressing limitations for free space and they had an option of developing airports at different locations.

3.3 Regional Airports

Under the liberalized economic policy which entices active private sector participation for airport development, there are a number of international airports emerging rapidly in South India in strong competition with the airports in the sub-region. Most of those airports located within one hour flying time from Colombo, have strong potential of challenging and overtaking the market position of BIA. The Maldives has also planned for constructing of the second runway, adding vibrancy of the competitiveness of air transport market in the sub-region. It is important to note that all airports in the sub-region cannot take the position of the hub status but one amongst them, who is agile and fast enough to respond to the emerging challenges and market demand.

3.4 ICAO recommendations

ICAO recommends (ref.paragraph 7.12, Asia/Pacific Seamless ATM Plan – 2013) all high density aerodromes should provide the following infrastructure and facilities to optimize runway capacity.

a. Additional runway(s) with adequate separation between runway centrelines for parallel independent operations;

b. Parallel taxyways, rapid exit taxyways at optimal locations to minimize runway occupancy times and entry/exit taxiways;

c. Rapid exit taxiway indicator lights (distance to go information to the nearest rapid exit taxiway on the runway);

d. Twin parallel taxiways to separate arrivals and departures;

e. Perimeter taxiways to avoid runway crossings;

f. Taxiway centreline lighting systems;

g. Adequate maneuvering area signage (to expedite aircraft movements);

h. Holding bays;

i. Additional apron space in contact stands for quick turnarounds;

j.

k.

3.5 Benefits of the BIA Second Runway

In the context given above, BIA need to identify evolving manifold challenges and adjust itself to compete with the emergent airports in the region. BIA has to remove its capacity constraints and become viable, efficient, cost-effective, customer focused and environmentally friendly airport.

For this purpose it is imperative that BIA should be equipped inter-alia with appropriate runway system capable of handling independent simultaneous parallel aircraft operations including New Large Aircraft ensuring that the runway system would no longer be the factor limiting the airport capacity not only in near term and mid-term but also a few decades ahead.

The following table lists some of the obvious accompanying benefits to both airlines and the airport if BIA is equipped with well-spaced two parallel runways.

Nature of Benefits	Benefits to Airlines	Benefits to Airports
Increased Efficiency	• Less Turn Around time due efficient handling of movements. • Least disturbances due possible blockade of active runway. • Assurance of slots for preferred arrival times and departure times. • Enhanced aircraft utilization for revenue purposes. • Minimizing ground time of flight crew making more use of their regularized flight time.	• Segregation of arriving and departing aircraft minimizing ground delays or holding times in air. • Least disturbances in the event of blockade of active runway. • Ability to conduct regular maintenance of runways without airport closure. • Ability to make optimum use of terminal capacity without limitations / constraints. • Ability to accommodate more aircraft at any given moment • Winning the goodwill, image and reputation of customers.

Nature of Benefits	Benefits to Airlines	Benefits to Airports
	• On time arrivals and departures winning the goodwill, image and reputation of customers as efficient airlines.	
Higher Productivity	• Enhanced certainty of landing at the planned destination • Higher payload due to high assurances of landing at the planned destination (due to less alternate fuel requirement) • Avoidance of duplication of costs (staff, fuel, handling equipment, maintenance, rentals etc.) • Ease of management • Reduced administrative and operational costs ,savings on aircraft maintenance costs due reduction of diversions • Savings on possible diversions a.	• Less operational staff • Less maintenance costs (electricity, water, security, janitorial services, telephones etc.) • Less infrastructure development costs (land, road, rail, fuel farms, ground navigational aids etc.) • Increased revenue • Optimization of use of fixed assets • Environment pollution confined to a selected location and less emission due to higher efficiency. • Easy land use planning and zoning • Better preparedness for emergencies • Central management of staff and resources • Less security costs
Passenger convenience	• Least possibility and probability of flight cancellations due airport closures • On time departures and arrivals • Easy transfers / Transits • Better connectivity with wider options • Better customer care and passenger handling • Less chance for missing a connection flight	• Least possibility and probability of airport closure • Easy transfers / Transit • Easy access to the city • Better connectivity • Wider choice of airlines • One stop centre for recreational and shopping facilities • Avoidance of the hassle of shuttling between airports

3.6 Time Scale for Availability of the Second Runway

Aircraft movements at BIA has shown a steady year on year growth of over 7% in the last few years and it is predicted that it will reach 100,000 movements per annum by 2022. Airports having over 100,000 movements per annum are categorized as "High Density Airports".

As per the ICAO recommendations High Density Airports should have a second runway to handle traffic without undue delays due runway congestions. Sri Lanka cannot work in isolation in this regard but fall in line with the regional and global planning criteria as the delay of aircraft at BIA due limitations of the runway will have negative chain effect on the whole route network.

Moreover, with the recent change of government policy on the grant of commercial traffic rights to airlines from "Protective" to "Liberalized" approach, and also other policy drives for intensive promotion of trade, commerce, investments and tourism in the country the rate of growth of traffic may be even more than 7%. In such a scenario, need for the second runway would come sooner than 2022. This situation has been predicted by the Hon. Minister of Finance in his note to the Cabinet of Ministers.

Hence it will be prudent if planning is commenced with a view to completing the second runway for BIA by 2020.

3.7 Scale of the Second Runway needed

The global air transport industry is moving towards construction of New Large Aircraft which require code 4-F runway for unimpeded operation with Maximum Take-Off Weight.

Also BIA experiences a temperature in the range of 25º C - 35º C. With the increase of ground temperature, aircraft with full load requires a longer take-off distance.

In this context, the second runway at BIA should be 4,000 metres in length and 60 metres in width (4,000 m X 60 m) and well-spaced with the existing runway facilitating independent simultaneous parallel operations of aircraft so as to derive the optimum capacity benefits of the airport.

4 Work of the Previous Committees for the Second Runway

Various committees appointed at different times to study a possible area for the location of the second runway at BIA have recommended different sites as enumerated below.

4.1 Report of IATA – April, 2004

In its report, IATA recommended construction of a new parallel 4,000 m long and 60 m wide runway with a separation of 2,500 m north of the existing runway. The proposed runway excluded the area occupied by Sri Lanka Air Force. IATA also stated in its report that the construction of a closely spaced second runway at BIA would be an expensive mistake as it would require in the long term, a third Runway adequately separated from the second Runway to cater to the capacity needs. Therefore, acquisition of land once again would be unavoidable.

4.2 Report of the Sub Committee Appointed by the Chairman AASL – August 2005

A Committee appointed by the Chairman, AASL comprising of six senior officials of the AASL recommended two possible locations for the second runway as follows.

a. Option 1 – Construction of a new parallel displaced Runway 2,000 m north of the existing Runway.

b. Option 2 - Construction of a new parallel displaced Runway 2,000 m south of the existing Runway.

4.3 Report of the Japan Airport Consultant – October, 2006

JICA Report recommended to construct a new parallel runway with a separation of a 230m north from the existing Runway.

4.4 Report of the US Trade and development agency (USTDA) – January, 2009

USTDA after an assessment of possible sites recommended three options viz;

a. Construction of a new Runway 215m North-West of the existing runway.

b. Construction of a new Runway 2,100m South-West of the existing runway.

c. Construction of a new Runway 2,100m South-East of the existing runway.

4.5 Review of the CSCSPR on the Recommendations made by the Previous Committees

According to ICAO recommendations contained in the Airport Planning Manual (Doc.9184) the minimum separation between two parallel runways should be 1,525 m, for independent simultaneous parallel operations. Such separation of two runways would provide the airport with optimum capacity. Construction of parallel runways with lesser separation than what is recommended by ICAO will not increase the airport capacity substantially but also pose safety hazards.

In view of the foregoing, the recommendations made by all of the above committees merit detailed consideration other than the recommendations made by JICA (Ref. 4.3) and USTDA (Ref.4.4. a) which have to be discarded due to close proximity of the proposed runways to the existing runway.

5 Government Policy Considerations on Second Runway at BIA

The Committee examined carefully the following recommendations, decisions and directions of the Government Ministerial Committees and Sub Committees in regard to location of the second parallel runway at BIA. It was also guided by the instructions of the Hon. Prime Minister and observations made by the Hon. Minister of Finance.

5.1 Ministerial Committee appointed by Cabinet of Ministers

(Ref. Cabinet Paper No. 15/0303/603/010 and the decision dated 01st April 2015)

Ministerial Committee consisting of the following Ministers had made the recommendations as under.

Hon.Joseph Michael Perera, Minister of Home Affairs (Chairman)
Hon.Reginald Cooray, Minister of Aviation
Hon.Arjuna Ranatunga, Minister of Ports and Shipping
Hon.Ruwan Wijewardena, State Minister of Defence

Quote

"Cabinet Committee decides that International Airport, Katunayake should be functioned as a competitive airport among the regional airports, that the airport should be operated effectively, that a second runway should be constructed for the international airport, Katunayake that the prevailing extent of land is not sufficient for the purpose and therefore new land acquisitions should be taken place. However, the Cabinet Committee decided that the most appropriate remedy should be applied subject to Government approval after a proper study on the substitute land acquisitions proposed, since the construction of the second runway is not urgent and attention should be drawn as far as possible to circumvent any possible damages to the civilians as well as religious places of worship".

Unquote

The Ministerial Committee has also stated that;

Quote

"The Cabinet Committee agreed that decisions should be taken without disturbing the smooth functioning and requirement of the Air Force Camp considering all facts since the Air Force is the stakeholder of the defence of the country"

Unquote

5.2 Cabinet Sub Committee on Economic Affairs 5th May 2015

Quote

"The Committee was briefed of the need of BIA to have well-spaced parallel runways for efficient and economic handling of growing traffic in competition with the emerging hubs in the region. In this respect two sides (north and south of present runway) for the sitting of the second parallel runways are proposed. Locating the second runway north of existing runway would entail a number of challenges. Hence instruction was given in detail the proposal for locating the runway on the south existing runway so that it would be a staggered parallel towards Minuwangoda side without disturbance to BOI land in the free trade zone.

Advice was given prepare the detailed Master Plan on the land requirement and identify the required lands for runway. The owners of the identified land should be notified well in advance."

Unquote

5.3 Cabinet Sub Committee on Economic Affairs 19th May 2015

Quote

"The alternate locations suggested for runway was not approved by the Committee. Instructions were given not to consider any option which will affect the BOI zone and to re-look at the possibility of constructing it in the proximity of Air Force land".

Unquote

5.4 Observations of the Minister of Finance – Note to the Cabinet dated 10th June 2015

In regard to the Report of the Ministerial (Cabinet) Committee at paragraph 5.1 above, the Hon. Minister of Finance had submitted a note to the Cabinet giving the following observation.

Quote

"It is observed that the prevailing extent of land for the construction of the second runway of Bandaranaike International Airport is not sufficient in view of the development of the airport activities and potential competitions in adjacent countries.

I agree with the Committee recommendation to acquire land for airport expansion / development after a proper assessment, as this would affect other sections of the society. I am also of the view that the need for land for the development airport activities including second runway would arise soon than twenty years from now

considering the increasing volume of air traffic and cargo and also the number of passengers."

Unquote

5.5 Cabinet Sub-committee headed by the Hon. Prime Minister on 7th July 2015

Quote

Instructions were given by the Hon.Prime Minister at the Cabinet Sub Committee meeting held on 07th July 2015 to initiate a study for construction of a second parallel runway at BIA for expanding its capacity for growing needs and efficient handling of aircraft and in the event of such an exercise is found to be prohibitive for any socio economic reasons or any other concerns to propose for an alternate plan for construction of a complete international airport with well-spaced two parallel runways capable of handling independent simultaneous parallel operations at a suitable location in Horana/ Padukka Area.

Unquote

6 Technical and Operational Considerations for Second Runway

There are number of vital factors that need to be considered carefully in selecting a site for construction of an airport with a single runway or multiple runways for airport to be technically sound, operationally safe, efficient, customer focused and ecofriendly.

6.1 Primary considerations

Out of all the applicable technical factors, the climatic conditions, directions of the predominant wind, terrain surrounding the site and soil condition are the primary considerations in selecting a site for the location of an airport or runway.

Howevermuch all other factors may merit favorably for a proposed site for construction of an airport, if (1) the climatic conditions are not conducive for aircraft operations or (2) the proposed runway cannot be oriented along the direction of predominant wind or (3) the proposed site is surround by hilly environment, or (4) if the soil is not stable and tend to slip, such a site cannot be considered for construction of an airport as it would seriously compromise flight safety.

If the climatic conditions are misty, the visibility conditions of the airport goes down requiring very advanced Instrument Landing System for landing aircraft. Aircraft operations under visual conditions are to be suspended until weather improves.

If the wind directions varies frequently, determination of alignment of runways would be difficult. Consequently, even a basic airport will require at least two runways perpendicular to each other for uninterrupted operations thought the day. (e.g. Katukurunda airport was initially provided with two runways perpendicular to each other).

If the airport is surrounded by undulating terrain, approach and taking off aircraft will face additional operational restrictions. Installations of ground Navigational Aids will be difficult. Controlling of aircraft in the circuit area will be a challenging task involving higher safety considerations. Aircraft operating in such areas will frequently experience wind shear or turbulence which is safety hazard.

Area which has tendency of landslips poses number of safety risks and such areas should therefore be avoided when designing sites for location of airports.

6.2 Secondary considerations

If a site satisfies the primary considerations, then the following main factors should also be considered when selecting a site for location of an airport/runway.

a. Availability of land for the present and future needs
b. Airspace planning and management
c. Present use of land and future land use planning of the area
d. Accessibility by road and rail to the proposed site
e. Ability to integrate with existing airport facilities if any
f. Impact of Noise and Emission on the community
g. Impact of the proposed project on the Environment
h. Socio Economic and Political impact
i. Costs of development

6.3 Special considerations when placing parallel second runway

In addition to the above, the following factors need special attention when constructing the second runway at an airport

Cost of Construction: Runway is an expensive crucial infrastructure of an airport which has direct bearing on the success or failure of the airport. It should be technically sound and long lasting and operationally safe and cost effective. (Cost of construction of runway alone at Mattala Rajapaksa International Airport is Rs. (---- USD)).

Interdependence: A runway cannot function in isolation without its full integration with such other ancillary facilities as taxiways, apron, ground aids etc. Therefore sitting of a runway should be carefully planned and designed ensuring its optimum use by airlines productively without compromising safety and efficiency at all times.

Operational Expenses: Consideration should be given not only for the initial cost of construction of the runway but also for its operation and regular maintenance after construction. In this respect the most optimum means of placing a new runway is the direct opposite parallel to the existing runway with adequate separation. Such a measure will maximize the effective use of land space abutting either sides of the two runways which is of prime value for aviation related activities.

Runway Placement: In a situation where placement of a new parallel runway right opposite of an existing runway becomes impossible due to some reason, the sitting of the new parallel runway may be shifted longitudinally so that two runways would be "displaced parallel" instead of "opposite parallel". However, the amount of displacement of the new runway should be carefully worked out and made to the bare minimum as it would otherwise not only increase the initial cost of construction but also entail adverse manifold implications on airport operations and maintenance. Excessively displaced parallel runways should be avoided as it would increase the taxing time of aircraft, countering the desired increase of efficiency of the runway/airport.

7 Other Options

CSCSPR examined another option for sitting of the second runway and also a few other off-BIA locations for construction of a completely new international airport with well-spaced two parallel runways, in the event that the land space required for the construction of the second runway at BIA would not be available.

However, CSCSPR is of the strong view that construction of a completely new airport at a new location should be considered only as the very last option, as construction of completely new airport would be exorbitantly cost prohibitive, resource intensive and time consuming exercise. The fraction of the total cost of such a project would be sufficient to pay compensation to inhabitants and property owners of land that need to be acquired for the location of the second runway.

Also such an exercise would totally nullify the continuous capacity improvements made by the Government to BIA since inception at enormous costs and efforts and also other associated infrastructure improvements such as Expressway etc.

7.1 Second runway Off-BOI area

CSCSPR considered a proposal for the location of the second parallel runway with 2,500 m separation south of the existing runway in off-BOI land, without disturbing the BOI activities. Feasibility of this proposal is given under paragraph 8.4

7.2 Airport in Muturajawela Area

CSCSPR observed that there is large area of vacant land at Muturajawela which can be considered for possible airport development. Feasibility of this proposal is given under paragraph 8.5.

7.3 Airport over the Negombo lagoon

CSCSPR observed that there is sufficient space of land for construction of an airport with well-spaced parallel runways in southern end of Negombo Lagoon. Feasibility of this proposal is given under paragraph 8.6.

7.4 Off shore airport

CSCSPR observed that there is a possibility of constructing off-shore airport like in Japan (Kansai Airport). Feasibility of this proposal is given under paragraph 8.7

7.5 International Airport at Horana / Padukka Area

CSCSPR examined the proposal for construction of a complete international airport at Horana / Padukka Area. Feasibility of this proposal is given under paragraph 8.8.

8 Detailed Analysis of the Proposals

8.1 IATA Report (Ref. 4.1)

If a second runway is constructed north of the present runway with 2,500 metres separation north of existing runway off-SLAF land (421 hectares) (see picture 1) as proposed in the IATA Report, it will have the following advantages and disadvantages.

Picture 1-IATA Proposed Runway

Advantages	Disadvantages
Cost of runway construction would be comparatively low due to availability of flat land	a. Seamless integration of the existing Terminal building and other land-side infrastructure with the new runway is difficult. b. New Terminal building has to be constructed between the two runways to make optimum use of both runways c. Until new Terminal building is constructed, I. Effective use of both runways will be curtailed due to the reasons of aircraft landing/take off on the new runway having to cross the existing runway. II. Aircraft using the new runway has to taxi a long distance for takeoff and after landing. III. New and imminent safety hazard is created for aircraft having to cross active runway.

Advantages	Disadvantages
	d. Free use of land on north of the new runway would be curtailed as it would encroach more into densely populated area. e. SLAF (421 hectares)would be trapped between the two runways. It will be on one hand a threat to SLAF security and on the other, enormous hassle to civil operations. f. The airport will shift more towards the Negombo Township imposing restrictions under the Zoning Regulations on high rise construction in the vicinity of the airport. g. Land to be acquired is densely populated and more families need to be resettled. h. Three main roads connecting Negombo and inland towns have to be diverted. i. Effective use of the existing Expressway E-3 and railway for both runways would be difficult without realignment with an extension. Such an exercise is not practical as it has to go through the SLAF base. j. Cost of resettlement would be high k. Conflicts with the recommendations of the Ministerial Committee (Ref.5.1)

Since the above option does not help improve the runway capacity, CSCSPR does not recommend pursuing this option.

8.2 Report of AASL officials (Ref.4.2)

In their Report, AASL had proposed two options for construction of displaced second parallel runway with 2,000m separation either south or north of the existing runway.

Construction of a displaced parallel runway with 2,000 m separation south of the existing runway would adversely affect the BOI land and would be contradictory to the Government Policy directives, stated under paragraph 5.3. Hence the CSCSPR decided to drop this proposal.

Construction of a displaced parallel runway with 2,000 m separation north of the existing runway would adversely affect the SLAF and would be contradictory to the Government Policy directives, stated under paragraph 5.1. Hence the CSCSPR decided to drop this proposal.

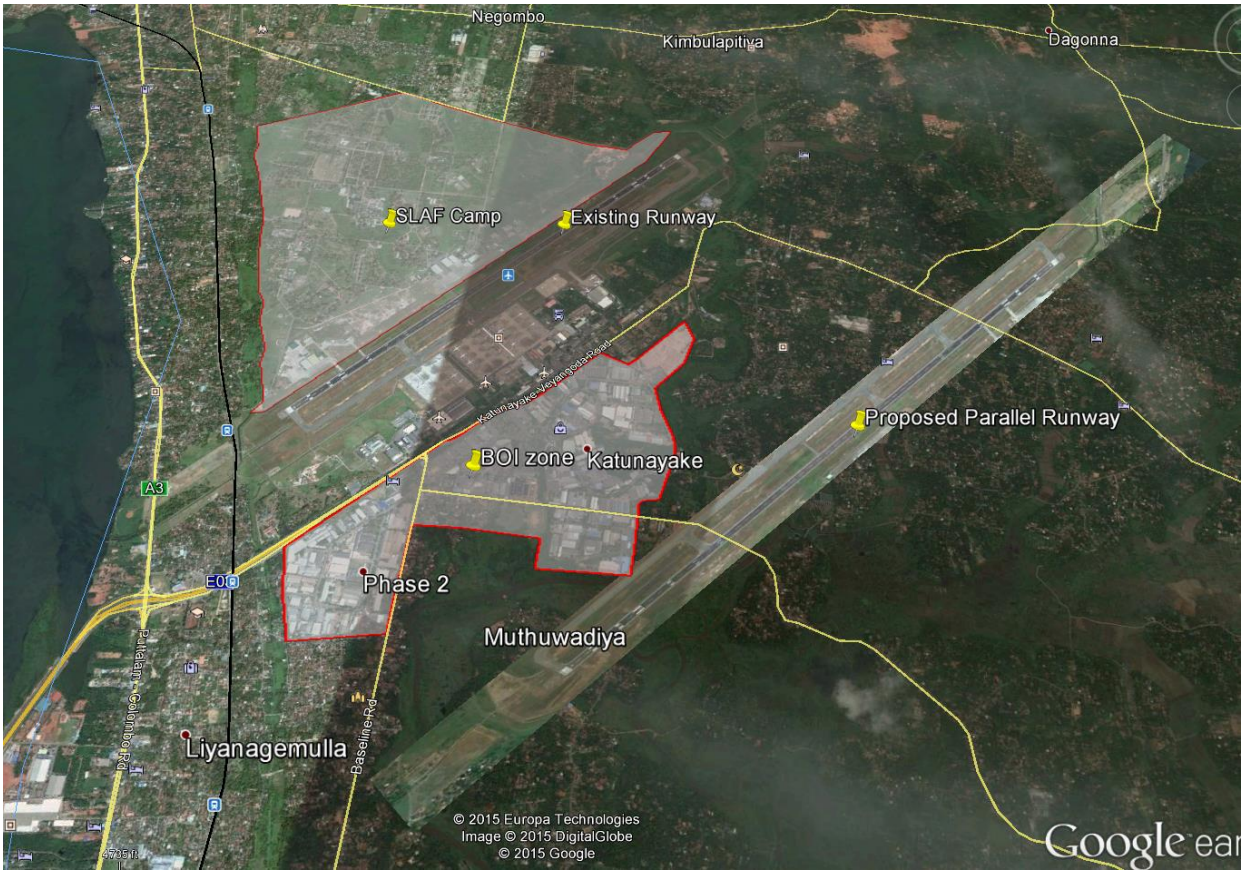
8.3 USTDA Report (Ref.4.4)

In their report USTDA had proposed three options. CSCSPR decided to drop the first option for construction of a close parallel runway with 215 m separation, for reasons stated under paragraph 4.5.

One of the other two options was to construct a parallel runway with 2100 m separation South West of the current runway. The proposed runway would affect the BOI land and portion of the present Expressway E-03. CSCSPR decided to drop this proposal as it is contradictory to the Government Policy directives, stated under paragraph 5.3.

The other proposal of the USTDA was to construct a parallel runway with 2,100 m separation South East of the current runway. The proposed runway, if constructed would impose height restrictions on the building the BOI land as the take-off /approach path of the proposed runway would be over the BOI land. Hence CSCSPR decided to drop this proposal as it is contradictory to the Government Policy directives, stated under paragraph 5.3.

8.4 Off-BOI land



Picture 2-Proposed parallel runway south of BOI land

In view of number of disadvantages associated with the location of the second parallel runway north of the existing runway as explained in paragraph 8.1, the CSCSPR considered a proposal for constructing a parallel runway south of the existing runway avoiding the BOI area. The BOI occupies an area of 531 acres and the proposed runway would be south of BOI as shown is the picture 2. Advantages and disadvantages associated with such an exercise, is given below.

Disadvantages	Advantages
• Cost of runway construction would be comparatively high due to uneven land. • Diversion of a water stream is required. • Although there is less number of houses in the area, there	a. BOI area would be avoided and BOI can continue to function without disturbance b. Seamless integration of the existing Terminal building and other land-side infrastructure with the new runway becomes easier.

Disadvantages	Advantages
may be more number of boarders who are working in BOI factories living in the area.	c. There is no need for construction of a new Terminal building immediately to make optimum use of both runways. d. Effective use of both runways simultaneously is assured as there will not be crossing traffic e. Aircraft using the new runway will be taxing a comparatively short distance for takeoff or after landing. f. Free use of land on south of the new runway would not be curtailed as the area is comparatively less populated. g. Zoning Requirements of the new runway will not affect the Negombo Township. h. Land to be acquired is comparatively less developed. i. Closure of main roads connecting Negombo and inland towns can be avoided. j. Effective use of the existing Expressway E-3 and railway for both runways would be assured. k. Due to close proximity of BOI land, foreign investments on aviation related activities can be better facilitated.

If this proposal is acceptable to the Government, the land area to be acquired is shown in Picture-3. During the preliminary study of the area, the following data has been gathered.

i. Extent of land area to be acquired – 776 hectares
ii. Number of Buildings located within the area – 3200
iii. Number of Religious Places – 01
iv. Main Roads affected – 03 (Katunayake– wegda Rd, Connecting Rd to Katunayake – wegda Rd, Averiwatta Rd)
v. Waterways effected – 01 (tributary to Dadugamoya)

Picture 3-Area of land required for acquisition for second runway

8.5 Airport at Muturajawela area

The attention of CSCSPR was drawn to a large area of vacant land in Muthurajawela area for possible construction of a completely new airport. Muturajawela is the island's largest peat bog, and is notable for its unique and highly diverse ecosystem. The marsh is believed to have originated about 7000 years ago.

Muthurajawela was declared as a sanctuary by the Sri Lankan government in 1996 in recognition of its vast bio-diversity, with 192 distinct species of flora and 209 distinct species of fauna, as well as another 102 species of birds. Some of the identified species have been shown to be indigenous to the marsh. The marsh is a major local and tourist attraction, primarily for sightseeing and boating tours, and the area also supports local agriculture and forestry.

Whilst noting the availability of landscape, the CSCSPR underscored of the need to respect the ecological value and its present status as a protected zone as a sanctuary.

Since the site is located about 13 NM away from BIA, development of the land to be an airport or construction of runway there would not lead to any enhancement of BIA capacity. It was also observed that present the Expressway and Dutch canal would be other major concerns that need to be addressed, in the event of the land is used for airport development.

CSCSPR does not recommend pursuing this option as it would not help achieve intended capacity enhancement of BIA.

Picture 4-Vacant land space at Muturajawela Area

8.6 Airport at South of Negombo Lagoon

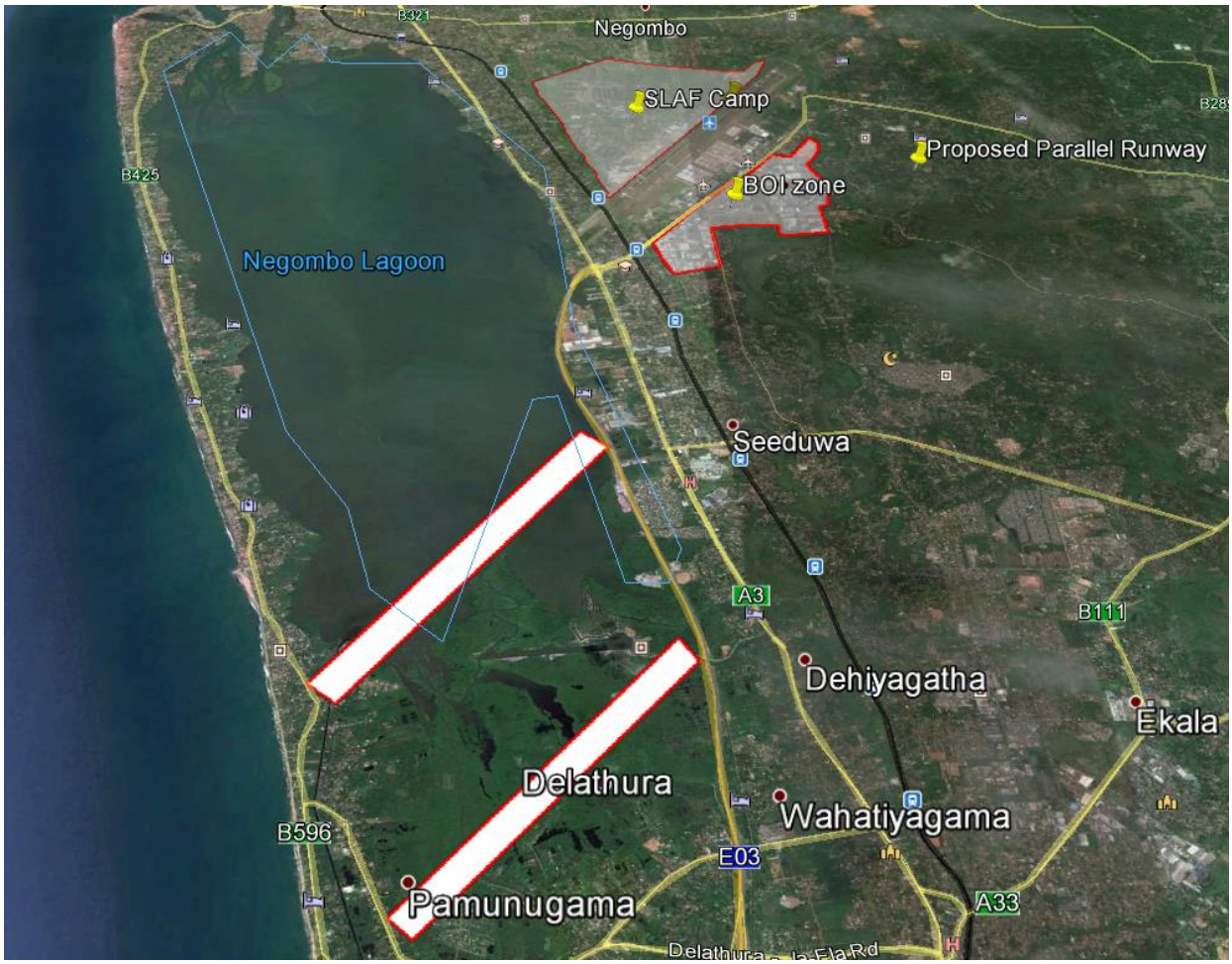
There is a sizable vacant space south of Negombo Lagoon which may be considered for construction of two well-spaced runway as shown in picture-5. Also it will not help improve the present capacity of the BIA, as the site is distantly located.

There may be environment concerns involving **Negombo Lagoon** is a large estuarine lagoon in Negombo, south-west Sri Lanka. The lagoon is fed by a number of small rivers and a canal. It is linked to the sea by a narrow channel to the north, near Negombo city.

The main area of the lagoon is surrounded by a densely populated region containing rice paddies, coconut plantations and grassland. The land is used for fishing and agriculture and has extensive mangrove swamps and attracts a wide variety of water birds including cormorants, herons, egrets, gulls, terns and other shorebirds.

However, as it would be considerable distance away from the current airport premises, constriction of single parallel or two parallel runways there would not help improve the handling capacity of BIA as integration would not bring the desired efficiency or productivity. Also it will require a huge sums of money to be spent for development to be an international airport.

CSCSPR does not recommend pursuing this option, as it would not help achieve the intended capacity enhancement of BIA.



Picture 5- Vacant space South of Negombo Lagoo

8.7 Off-shore Airport

CSCSPR also considered another option of establishing a complete off-shore airport. Such airports are functioning in Japan and Hong Kong, where availability land for construction of a complete airport infrastructure had been the main reason for such development.

Development of such airports are costly due to reclamation of sea. Once developed they are number distinct advantages such as less cost for perimeter security infrastructure, effective land use planning, easy establishment of obstacle free approach/take off areas etc.

However, CSCSPR is of the view that in relation to the huge national investments already made for BIA development, going for such option would not be prudent at this stage.

8.8 Airport at Horana/Padukka Area

The CSCSPR examined this proposal in the context that the entire BIA will be shifted to some other area in the country in the event that the land required for its expansion cannot be acquired due to non-cooperation of the inhabitants in the area.

The CSCSPR found that there is large areas of rubber land located in Horana/Padukka Area, which is easily accessible through the Expressway E-2.

However, when the possible sites are evaluated against the Primary Technical Considerations as stated at paragraph 6.1 for construction of airports, not only this area but also the entire area between the coast and west of the central hill of country traversing from Ratmalana to Matara is found to be not suitable for construction of airports mainly due to instability of wind and other reasons explained under paragraph 6.1. Direction of the wind traversing the country over this area from North East and South West directions, is distorted due to midland high terrain hence veers in different directions during different times.

Picture 6-Terrain of Sri Lanka off the Western coastal belt.

9 Summary of the Detailed Analysis of the most preferred option

The CSCSPR is of the view that the most preferred option out of all, which have been discussed in this report is construction of the 2nd parallel runway south of the existing airport off-BOI land. Summary of its assessment most vital factors is given in Annex-2

10 Resettlement Plan

The success of getting the required land released from the current property owners for development of facilities for the common good to the nation such as the expansion of the international airport depends mainly on the means of communication with the community to be affected and the compensation package being offered.

Due to presence of BOI in close proximity to the airport and a large crowed of employees are either living or boarded in dwellings close by, the question of possible land acquisition should be handled very delicately. In this respect community in the area need to be enlightened properly at the very outset, so as to get their support for the intended development.

There observed to be large area of coconut land around Katana area which may be considered for resettlement of displaced families with better facilities with attractive compensation package. However, such matters were not dealt with in detail in this report as they stand well outside the ambit of the Terms of Reference issued to the CSCSPR.

11 Environmental Impact Assessment

Pursuant to the current legislative and regulatory framework relating to environment, an Environmental Impact Assessment (EIA) needs to be done prior to commencement of construction of a runway or expansion of airport capacity by more than 50%.

12 Recommendations

In view of the foregoing, particularly the technical and operational considerations given at paragraph 6, the government policy considerations stated at paragraph 5, and the huge capital investments already made as stated at paragraph 2.7 for BIA developments, the CSCSPR recommends that ;

a. 4,000m long and 60m wide second parallel runway be located south of the existing runway avoiding the BOI area with a lateral separation of 2,500m as stated under paragraph 8.4, satisfying the growing runway capacity requirements at BIA.

b. the exact sitting of the runway be determined after detailed survey with due regard to the need to minimizing the longitudinal separation between the lagoon side's thresholds of two runways (i.e. Runway Zero Four).

c. a technical team be mobilized for preparation of the development modalities, engineering design, aeronautical study, cost estimate and time scale of development of second runway and other associated infrastructure.

d. an attractive compensation package be developed enticing the parties affected to give consent for acquisition of their lands needed for the 2nd runway development.

e. an EIA is undertaken at the appropriate stage, when all information about the proposed activities is available to obtain Environmental Clearance.

Ministry of Civil Aviation

R.M.S.P.Rathnayake
Additional Secretary (Aviation)

Civil Aviation Authority of Sri Lanka

H.M.C.Nimalsiri
Director General of Civil Aviation & Chief Executive Officer

Atula Jayawickrama

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Ananda Wimalasena
Chairman

Ruvini Dias Bandaranaike
Executive Director

S.M.R.Rafeek
Head of Projects

Ghanasiri Withanage
Head of Civil Engineering

Board of Investments

U.Sirigampala
Executive Director /Zones

S.B.F.De Silva,
Executive Director / Technical Services

Urban Development Authority

R.Fernando
Chairman

H.A.Dayananda
Director / Lands

Annex-1

Annex-2

Summary of Detailed Analysis of the most preferred option

Vital Factors considered	Assessment
a. Flight safety;	Assured
b. Aircraft handing capacity of the airport including independent simultaneous parallel operations;	Assured
c. Economy of ground operations of aircraft;	Assured
d. Ability of integration of existing airport infrastructure with the proposed runway;	Assured
e. Usability of land abutting the proposed runway for aviation related activities such as setting up of MRO, airline hangars, cargo villages etc.	Assured
f. Possibility of establishment of ground aids for the proposed runway.	Assured
g. Ability of establishment of Obstacle Limiting Areas and Surfaces needed for the proposed runway.	Assured
h. Availability of land for the proposed construction and/or possible implications associated with land acquisitions;	Undetermined
i. Ability of integration of expressway, main road and railway to serve traffic generated by both runways;	Assured
j. Expandability of airport for future demand;	Assured
k. Cost of construction;	Undermined

Details of JICA Funding on BIA Development Projects

Name of the Ministry : Ministry of Aviation

Institution : Airport & Aviation Services (SL) Ltd.

1. **PROJECT NAME**

Phase I Development of Colombo International Airport (CIA)
(Loan Agreement SL-P6)

PROJECT DESCRIPTIONS

Construction of the Departure Terminal Building
Construction of Apron A & B
Construction of Runway, parallel taxiway and connecting taxiways
Conduction of NSC , Cargo and Maintenance buildings

IMPLEMENT PERIOD : *1983 - 1988*

LOAN AMOUNT :

(OECF)	**- ¥ 10.2 Bn + 2.4 Bn**
GEC Electricals (grant)	**- £ 5.2 Mn**
Hanover Trust Loan	**- £ 15.676 Mn + $ 8. 54 Mn**
Supplier Credit	**- ¥ 2.9 Bn**
C-ITOH	**- ¥ 2.1 Bn**
GOSL	**- Rs 269 mn**

PRESENT STATUS : *Completed.*

2. PROJECT NAME

Stage 1 of Phase II Development Project of Bandaranaike International Airport (Loan Agreement No. SL-P62)

PROJECT DESCRIPTIONS

- Construction of Pier No. 1
- Improvement to Parallel Taxiway
- Improvement to Existing Aircraft Parking Apron
- Construction of New Apron 'C'
- Construction of Departure Public concourse and Arrival Public Concourse
- Second Cargo Terminal
- Modernization of Air Navigation Facilities
- Improvement to Public Utilities (STP, Incinerator, WTP)

IMPLEMENTION PERIOD : *2003– 2006*

LOAN AMOUNT : ***JPY 12.384 Bn***

PRESENT STATUS : *Completed*

3. PROJECT NAME

Bandaranaike International Airport Development Project Phase II Stage 2 **{ SLP 104 and (SLP 114 to be signed) }**

LOAN AMOUNT : ***JPY 74.397 Bn (SLP 104 for JPY 28.969 signed in 2012)***

IMPLEMENTATION PERIOD : ***2015 – 2019***

i) PACKAGE 'A'

Project Descriptions

- Main Terminal Building, Pier No. 2 and the link to Terminal 1

- Elevated Roadway
- Utilities

PRESENT STATUS :

- Detailed design in progress
- Bidding document to be issued in November 2015
- Construction of the Main Terminal Building and Pier No 2 to be completed early 2019

ii) PACKAGE 'B'

Project Descriptions

- Apron and connecting taxiways
- Sewerage Treatment Plant
- Water Treatment Plant
- Power Supply System

PRESENT STATUS :

- Detailed design in progress
- Bidding document to be issued in October 2015
- Construction of the Apron to be completed in 2018

iii) PACKAGE 'C'

Project Descriptions

- Pier No. 3 with the link to Terminal 1
- Incinerator
- Multi Storied Car Park and the Railway Station with a link

PRESENT STATUS

- Detailed design in progress
- Bidding document to be issued in November 2015

- Construction of the Pier No 3 to be completed early 2018