

Bangladesh

Chittagong Airport Development Project

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Field Survey: February 2006

1. Project Profile and Japan's ODA Loan



Map of project area



Inside Control Tower Built through Project

1.1 Background

Chittagong is the second largest city¹ in Bangladesh next to Dhaka (Dacca). The district has Chittagong Port, which has the largest cargo volume in Bangladesh, and has succeeded in developing its economy, particularly within its Export Processing Zone (EPZ)². Chittagong Airport was opened in the first half of 1940s, and as the most important airport after Dhaka International Airport, operates domestic flights between Dhaka and Chittagong and short-range international flights to Kolkata (Calcutta) and other cities. Since its opening, however, the airport has not implemented any large-scale expansion or improvement projects apart from runway extensions. Consequently, facilities are aging, and structural problems such as obstructions in approach paths and poor visibility from the control tower have prevented safe and reliable flight operation. In addition, the pavement strength of runways and aprons cannot accommodate the large aircraft required for international flights. Furthermore, there are problems with congestion in the existing terminal during peak hours. Thus, there was a need to increase the airport's capacity to meet the expected increase in airport users and to enable it to function as an alternative airport to Dhaka International Airport during flooding or other natural disasters.

¹ The population of Chittagong (District) is 6.62 million, approximately twice the population of Yokohama City.

² Six EPZs have been established in Bangladesh. The site area of the Chittagong EPZ is 453 acres, the largest in the country next to the Dhaka EPZ. At present, 127 companies operate in this zone.

1.2 Objective

This project's objective was to meet the increase in demand for transport of airline passengers and cargo volume by improving and expanding the Chittagong International Airport in the Chittagong District and thereby contribute to the economic growth in Bangladesh.

1.3 Borrower/Executing Agency

People's Republic of Bangladesh/Civil Aviation Authority of Bangladesh (CAAB)

1.4 Outline of Loan Agreement

Loan Amount/ Disbursed Amount	10,943 million yen/10,850 million yen
Exchange of Notes Loan Agreement	June 1995 August 1996
Terms and Conditions - Interest Rate - Repayment Period (Grace Period) - Procurement	1.0%/year 30 years 10 years General Untied
Final Disbursement Date	November 2003
Main Contractors	SHIMIZU CORPORATION, Marubeni Corporation, Bangladesh Power Development Board, ITOCHU Corporation, Emergency One Inc.
Consulting Services	Pacific Consultants International, BRTC
Feasibility Study (F/S) etc.	1989: F/S JICA 1993: Chittagong Airport Development Project (E/S loan)

2. Evaluation Result

2.1 Relevance

2.1.1 Relevance at the time of appraisal

The importance for economic development in the transportation sector was recognized in the Fourth Five-Year Plan (1990-1995) and the Fifth Five-Year Plan

(1997-2002)³, and thus one of the main objectives of the plan was to promote the development of appropriate transportation infrastructure to meet the needs of the manufacturing sector. One measure adopted by CAAB upon implementation of the Fourth Five-Year Plan was to develop the Chittagong Airport to serve as the No. 2 international airport next to Dhaka International Airport, and in the Fifth Five-Year Plan, a contribution of 4,600 million taka in the Chittagong Airport Development Project was set. This project was aimed at expanding and improving the airport to meet the air transport demand along economic development of Chittagong, while developing the airport to function as an alternative airport to Dhaka International Airport. For this reason, the priority of the project was high.

2.1.2 Relevance at the time of ex-post evaluation

The National Strategy for Accelerated Poverty Reduction (2005-2007)⁴ published in October 2005 also placed emphasis on the development of transportation infrastructure as part of infrastructure maintenance to support economic development aimed at poverty reduction. Airport improvement was adopted as CAAB's strategic objective in the strategy plan (which detailed measures at the level of the various government organization) appended to the Poverty Reduction Strategy Paper (PRSP). Based on these policies and measures, this project sought to meet air transport demand while enhancing safety, and to improve and expand the Chittagong Airport to function as an alternative airport to Dhaka Airport during natural disasters and other events. Thus, because demand for flights using this airport is high, the relevancy of this project remains high.

2.2 Efficiency

2.2.1 Outputs

The scope of this project is outlined below.

- (1) Civil Engineering works
- (2) Construction and expansion of passenger & cargo terminal
- (3) Maintenance of air transport support facilities
- (4) Construction of utilities
- (5) Consulting Services

³ There is two years gap between the Fourth Five-Year Plan and the Fifth Five-Year Plan (FY1995/96 and FY1996/97) , and during this period a national development plan was not enacted. (An outline of past development plans appears on page 1 of Chapter 1 of the Fifth Five-Year Plan 1997-2002)

⁴ Under the guidance of the World Bank and the IMF, Bangladesh announced "National Strategy for Economic Growth, Poverty Reduction and Social Development," in March 2003, which was approved as the Interim Poverty Reduction Strategy Paper (I-PRSP). Based on this document, work was begun on establishing a Poverty Reduction Strategy Paper, and in October 2005, this was announced as the National Strategy for Accelerated Poverty Reduction.

All of the outputs have been implemented as planned. Construction of the aircraft fueling station, which was not the scope of this project, was delayed by Padma Oil Company (government-owned), which was provided with the site. At the time of the ex-post evaluation, the station was under construction, and its completion was scheduled for March 2006, but construction of a cargo apron in front of the cargo terminal had not begun.

Fig. 1 Map of Vicinity of Chittagong Airport



Fig. 2 Passenger Terminal



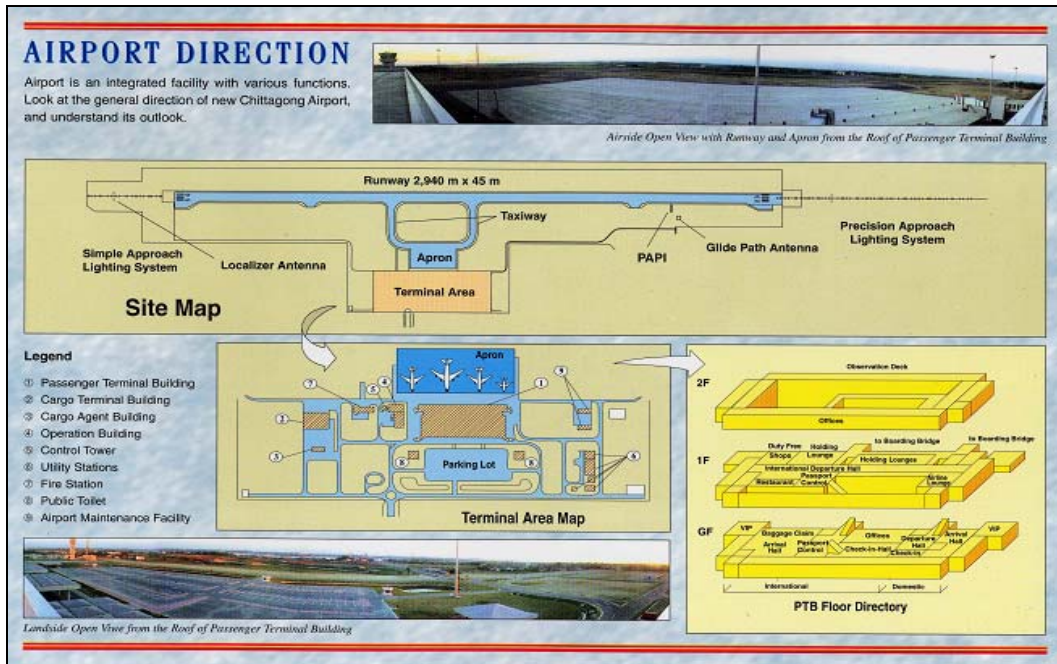
2.2.2 Project period

This project was scheduled for completion in July 2001, but after a 28-month delay, was finally completed in November 2003. Civil engineering works and construction of the passenger and cargo terminal and facilities were completed within the planned construction period at the time of the appraisal (March 1998-December 2000), and use of new facilities commenced in March 2001. However, procurement of equipment necessary for provision of fire engines, ambulances and facilities, which was scheduled to be completed by March 2001, was delayed because bidding was not concluded in the two rounds initially set in the bidding terms, necessitating a third round. In addition, there were delays in customs procedures concerning this equipment, and ultimately this project was completed in November 2003.

2.2.3 Project cost

Although consulting costs increased by 35 million yen as a result of an extension of the service period due to procurement delays and the provision of additional services for public announcements, the total actual project cost was 10,850 million yen compared with the planned amount of 10,943 million yen, and thus the amount was within the plan.

Fig. 3 Airport Facilities Arrangement Plan (from an airport opening ceremony pamphlet)



2.3 Effectiveness

2.3.1 Number of passengers, cargo volume and number of take-offs and landings by origin and destination

All new facilities of the Chittagong Airport renewed in March 2001. Table 1 compares the planned number of passengers, cargo volume, and number of take offs and landings in the fourth year after renewing of the airport as estimated at the time of appraisal with the actual figures of 2004 which is the fourth year after opening (for reference, the table also lists the actual figures in 1996 (time of loan agreement) and in 2001(at the start of service)). The estimated figures for the number of passengers, cargo volume, and number of take offs and landings at the time of the appraisal and the actual figures are as given in Table 1.

Table 1. Number of Passengers, Cargo Volume and Number of take offs and landings at Chittagong Airport

Item	Actual			Projected
	1996 (loan agreement)	2001 (Time of start of service)	2004 (Fourth year after actual start of service)	Fourth year after opening
No. of Passengers	International flights 39,461	International flights 36,013	International flights 236,283	International flights 199,500
	Domestic flights 154,462	Domestic flights 140,912	Domestic flights 199,248	Domestic flights 288,100

	Total 193,923	Total 276,925	Total 435,534	Total 487,600
Cargo Volume	International flights 255 tons	International flights 232 tons	International flights 2,701 tons	International flights 4,600 tons
	Domestic flights 0 tons	Domestic flights 526 tons	Domestic flights 512 tons	Domestic flights 450 tons
	Total 255 tons	Total 758 tons	Total 3,213 tons	Total 5,050 tons
Number of take offs and landings	International flights n.a.	International flights 671	International flights 2,092	International flights 1,190
	Domestic flights n.a	Domestic flights 5,439	Domestic flights 7,780	Domestic flights 3,900
	Other n.a	Other 7,878	Other 9,088	Other n.a.
	Total 10,490	Total 13,988	Total 18,960	Total n.a

Source: Actual figures are from CAAB; estimates were calculated based on Review of Master Plan and Basic Design, December 1994.

Note: "Other" includes arrivals and departures of general aircraft for cropdusting, etc., and other aircraft. A total of 15 international flights are currently operating weekly from the airport: flights to Bangkok by Thai Airlines (3/wk.), to Kolkata by GMG and Biman (5/wk.), and to the Middle East by Biman (7/wk).

The number of take offs and landings (international and domestic flights), number of passengers (international flights), and cargo volume (domestic flights) have exceeded estimates. However, number of passengers and cargo volume are not growing in comparison with the increase in the number of take offs and landings probably because the size of aircraft operating is smaller than expected. Table 2 shows the comparison of the types of aircraft used in estimates of weekly take offs and landings and the types of aircraft scheduled for use in current weekly schedules.

Table 2. Comparison of Aircraft Expected to be Used with Aircraft Actually Used

	Types of aircraft used in estimates of weekly arrivals and departures (2005)	Types of aircraft used in weekly schedules (as of Feb. 2006)
International flights	Of 28 take offs/landings: J (2, 7%) WB (14, 50%) NB (12, 43%)	Of 31 take offs/landings WB (6, 19%) NB (16, 52%) SJ/TP(9, 29%)
Domestic flights	Of 74 take offs/landings WB (8, 11%) NB (28, 38%) SJ/TP (38, 51%)	Of 124 take offs/landings WB (6, 5%) NB (10, 8%) SJ/TP (108, 87%)

Source: Data as of February 2006 are from materials furnished by the Chittagong Airport Office; estimates were calculated based on Review of Master Plan and Basic Design, December 1994.

Note: Table abbreviations indicate the size of aircraft: J=Jumbo, WB=Wide Body, NB=Narrow Body, SJ=Small Jet, and TP=Turbo Prop.

2.3.2 Safety

The Karnaphuli River runs across the aircraft approach path on the east side of the Chittagong Airport. Prior to implementation of this project, it was pointed out that masts of large ships navigating the river could be obstructions to takeoffs and landings. Thanks to the project, however, the runway was moved 250 meters to the southwest, which solved the problem.

2.3.3 Function as an alternative airport for Dhaka International Airport

Between the opening of renewed airport in March 2001 to the present, the Dhaka International Airport has not closed due to flooding or other natural disasters. However, as a result of improving the runway and other facilities of the Chittagong Airport, there have been instances where aircraft scheduled to land at Dhaka International Airport landed instead at the Chittagong Airport, since landing in Dhaka was not possible due to thick fog, demonstrating the Chittagong Airport's ability to function as an alternative airport. However, because there are no lodging facilities near the airport, responding to increased use of the airport and improving its functions as an alternative airport in times of emergency will require construction of hotels near the airport and development of roads into Chittagong City.

2.3.4 Internal rate of return

By re-calculating internal rate of return based on the data obtained through this

ex-post evaluation survey, the fact was found that while the financial rate of return is negative (as opposed to a plus 7.6% calculated at the time of the detailed design review), the economic rate of return is 12% (calculated to be 13.92% at the time of the appraisal). The financial rate of return has declined substantially mainly because airport tax, aviation fuel tax and other items assumed to be airport income in the plan were not actually posted as airport income (rather, these items were posted as National Treasury receipts).

2.4 Impacts

2.4.1 Trends in Chittagong's Gross Regional Domestic Product

Thanks to economic growth primarily in the garment industry, the Gross Regional Domestic Product (GRDP) of Chittagong now accounts for 8% of Gross Domestic Product (GDP), elevating the district to Bangladesh's second economic and commercial base next to Dhaka, which accounts for 15%. Since 2001, after this project's completion, round-trip flights to Dhaka and international flights to the Middle East from the Chittagong Airport have increased, and it appears that the airport is significantly contributing to the Chittagong economy.

Table 3. Real GRDP (1995/96 prices) and Substantial Growth Rate of Chittagong

Fiscal year	1996	1997	1998	1999	2000	2001	2002	2003	2004
Item	/1997	/1998	/1999	/2000	/2001	/2002	/2003	/2004	/2005
GRDP (100 millions of taka)	138	147	155	165	171	179	188	200	211
Growth rate (%)	4.89	6.48	5.45	5.03	3.64	4.68	5.03	6.38	5.50

Source: 2004 Statistical Yearbook of Bangladesh and Monthly Statistical Bulletin –Bangladesh, July 2005

2.4.2 Economic Activity in the Chittagong Export Processing Zone (EPZ)

The Chittagong Export Processing Zone (EPZ) is located 7.2km north of Chittagong Airport, and as of February 2006, 127 companies (including 14 Japanese companies) were in operation. The number of employees for the entire EPZ is between 96,000 and 97,000⁵, with the garment industry accounting for approximately half, followed by towels, electronic parts, leather products, metal processing, and plastics. With the start of operation by Thai Airways of flights to Bangkok in December 2002 (these flights initially operated via Chiang Mai, but now are non-stop) the Chittagong Airport has become more convenient for

⁵ Figures for number of companies and number of employees are as of January 31, 2006.

foreigners from Japan, Korea, and China, contributing to the expansion of economic activity in the Chittagong EPZ. On the other hand, cargo flights were not in operation at the time of the ex-post evaluation, and transport was limited to small volumes of urgent cargo using passenger flights. For this reason, operation of cargo flights and construction of an apron for cargo is desired by companies in the EPZ.

Table 4. Number of Companies Operating in the Chittagong Export Processing Zone (CEPZ)

	Foreign Companies	JV	Bangladesh Companies	Total	No. of Employees
1983-1990	19	9	7	35	92,279
1991-1995	20	4	7	31	
1996-2000	26	3	11	40	
2001	4	0	2	6	371
2002	2	1	1	4	2,008
2003	2	1	3	6	1,274
2004	4	0	1	5	808
Total	77	18	32	127	96,740

2.4.3 Increase in the number of foreign passengers

At the time of ex-post evaluation, international flights are mainly medium-range flights carrying mainly laborers to Middle Eastern countries such as Saudi Arabia and Oman operated by government-run Biman Airlines. As a result of the start of service to Bangkok by Thai Airways and to Kolkata by the private-sector GMG Airlines, however, the number of foreign passengers using Chittagong Airport increased between 2004 and 2005.

Table 5. Increase in Foreign Passengers

	2004	2005	Yearly Rate of Increase
Arrivals	9,529	10,811	13.5%
Departures	9,333	10,331	10.7%

Source: Chittagong Airport Office

2.4.4 Impact on society and the environment

Purchase of a land for airport construction and relocation of residents were

completed prior to the start of airport renewing, and no particular problems have arisen apart from complaints by relocated residents due to major delays in road and waterworks construction in the relocation sites, the expense of which being borne by the executing agency.

Wastewater from the airport is processed by the wastewater processing facility completed through this project, and no problems with pollution from wastewater have developed.

Noise from airplane takeoffs and landings at the airport has not caused any particular problems since the airplane approach path crosses industrial and other areas where residents do not live.

2.5 Sustainability

2.5.1 Executing agencies

The Civil Aviation Authority of Bangladesh, the executing agency of this project, concluded an airport management and operation entrustment agreement with Thai Airways International Public Company Limited in December 2005. (This agreement was scheduled to be implemented from February 2006, but at the time of the ex-post evaluation, it had not been concluded due to opposition by the government-run Biman Airlines and others. The discussion that follows evaluates this project's sustainability assuming that this agreement will be implemented.). This agreement completely entrusts the management and operation of Chittagong Airport (excluding air-traffic control and major repairs) for 10 years, and CAAB will receive a total entrustment fee of US\$9 million. Thai Airways was scheduled to begin airport operation from February 2006, but due to strong joint opposition by management and labor of the government-run Biman Airlines, the government has postponed the agreement⁶. By entrusting the management and operation of Chittagong Airport to a foreign company with the know-how and experience in the management and operation of an international airport, this agreement seeks to improve airport service to the level of such international airports as Hong Kong, Kuala Lumpur and Singapore. Although during the term of the agreement the income of CAAB from Chittagong Airport will be reduced by air-traffic control guidance fees, a reduction in management costs is expected.

2.5.1.1 Technical capacity

When the airport management and operation entrustment agreement is

⁶ Thai Airways has accepted two postponements of implementation of the agreement, but in response to the Bangladesh Government's third request for postponement, operation has, at the present time, been scheduled for September 1, 2006.

implemented, Thai Airways will perform the airport management and operation. Approximately half of 350 current airport employees have been transferred to the company which support management and operation of Thai Airways, and these employees will perform management and operation under the technical guidance of the company. The major improvement work on runways and aprons will continue to be implemented by the technology division of CAAB.

2.5.1.2 Structure

When the airport management and operation entrustment agreement is implemented, Thai Airlines will manage and operate such airport facilities as the passenger terminal building and the cargo terminal building, and collect landing fees, boarding fees, ground cargo handling fees, etc. associated with aircraft arrivals and departures. Meanwhile, CAAB, an agency under the Ministry of Civil Aviation and Tourism (MOCAT), will assist in Thai Airline's management and operations. It will also assume responsibility for maintenance at reconciliation has not been successful. If deregulation measures can be adopted through introduction of these policies, they would be expected to promote participation of foreign airlines.

2.5.1.3 Financial status

As of the end of June 2005, CAAB had retained earnings of approximately 10,000 million taka, and thus its current financial status is sound. CAAB's balance sheet and profit and loss statement are as given in Table 6 and Table 7, respectively.

Table 6. Balance Sheet of CAAB (balances as of June 30 of each year) (millions of taka)

	2001	2002	2003	2004	2005
Cash deposits	5,203	5,797	7,510	6,548	6,821
Accounts receivable	1,496	1,719	671	2,100	2,200
Other current assets	175	335	220	228	204
Total current assets	6,874	7,851	8,401	8,876	9,225
Total fixed assets	9,710	10,211	10,112	10,411	10,939
Total assets	16,584	18,062	18,513	19,287	20,164
Reserves	286	286	290	290	290
Other current liabilities	46	48	46	46	46
Total current liabilities	332	334	336	336	336
Borrowings	4,080	4,803	4,930	4,950	5,119
Other fixed liabilities	89	70	69	62	62
Total fixed liabilities	4,169	4,873	4,999	5,012	5,181
Capital, government equity	3,726	3,796	3,908	4,080	4,165
Reserves	658	793	430	548	664
Retained earnings	7,699	8,266	8,840	9,311	9,818
Total capital	12,083	12,855	13,178	13,939	14,647
Total capital, liabilities	16,584	18,062	18,513	19,287	20,164

Table 7. Profit and Loss Statement of CAAB (millions of taka)

	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004	2004/ 2005
Boarding fees	314	350	363	414	389
Landing fees	972	763	780	798	826
Air-traffic control guidance fees	352	388	250	249	361
Other	710	476	617	777	546
Total revenues	2,348	1,977	2,010	2,238	2,122
Personnel expenses	216	203	197	231	215
Administrative expenses	444	377	398	589	547
Repair costs	193	295	304	415	346
Depreciation	216	200	200	233	226
Total expense	1,069	1,075	1,099	1,468	1,334
Net income	1,279	902	911	770	788
Charges to government	150	200	200	200	200
Profit carried forward	1,129	702	711	570	588

Source: Balance sheet and profit and loss statement were obtained from the Financial Affairs Department of CAAB.

Note: The fiscal year of CAAB starts on July 1 of each years and ends on June 30 of the following year.

The estimated cash flow of Chittagong Airport from 2006 to 2016 assuming that management and operations by Thai Airways begins from July 2006 is as given in Table 8 (The internal rate of return given in the “Effectiveness” section was calculated based on this estimated cash flow). If the principal income connected with Chittagong Airport is regarded as income from air-traffic control guidance fees and entrustment fees from Thai Airlines, there will be a substantial shortage of funds for payment of principal and interest on the yen loan, and unless CAAB recovers the 4,000 million taka in long-term uncollected debt from Biman Airlines, it will have to use retained earnings to make repayment. As stated above, CAAB has approximately 10,000 million taka in retained earnings and thus repayment will not be problematic, but there may be a shortage of funds for new projects planned by policy.

Table 8. Estimated Cash Flow of Chittagong Airport Project (millions of taka)

Item	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
Flight guidance fees	18	18	19	20	21	22	22	23	23	24
Entrustment fees from Thai Airlines	40	41	40	43	48	55	66	79	91	105
(1)Total income	58	59	59	63	69	77	88	102	114	129
Personnel expenses	16	17	18	19	20	21	23	24	25	27
Administrative expenses	12	13	13	14	15	16	17	18	19	20
Repair costs	11	11	11	11	311	11	11	11	11	11
(2) Total expenditures	39	41	42	44	346	48	51	53	55	58
Cash flow from sales activities ((1) – (2))	19	18	17	19	-277	29	37	49	59	71
Repayment of principal	305	305	305	305	305	305	305	305	305	305
Payment of interest	56	59	56	53	49	46	43	40	37	34
Net cash reduction	-342	-346	-344	-339	-631	-322	-311	-296	-283	-268

Note: Estimated cash flow figures were prepared based on the assumption that management and operation by Thai Airlines will be implemented from July 2006 to June 2016. These figures also assume that runway overlay work will be implemented in 2010/2011, the tenth year of operation of the new airport, and that after expiration of the agreement, expanded airport income realized through improved service due to management by Thai Airlines and increased flights will be transferred as is to CAAB.

2.5.2 Operation and maintenance Status

Day-to-day maintenance and operation of the airport will be performed by Thai Airlines after initiation of the agreement. It is believed that Thai Airlines, with its experience and know-how in operating the Bangkok Airport, etc., will have no difficulties with day-to-day maintenance and operation. Since 2002, maintenance and operation of facilities and equipment has been inadequate due to the replacement of experienced technicians, and some facilities and equipment have been left in disrepair. However, this situation is expected to rapidly improve as a result of initiation of the agreement. Important tasks such as maintenance of runways will continue to be performed by the headquarters of CAAB even after

initiation of the agreement. The cash flow figures given in Table 8 include the planned expenditures for runway overlay scheduled for FY2010/2011, the tenth year after commencement of service.

3. Feedback

3.1 Lessons Learned

None.

3.2 Recommendations

None.

Comparison of Original and Actual Scope

Item	Plan	Actual
(1) Outputs		
Civil engineering works:		
Passenger terminal building	1 building (20,414m ²)	As planned
Cargo terminal building	1 building (2,842m ²)	As planned
Management, operation and control building	1 building (2,149m ²)	As planned
Strengthening of runways, shoulders	167,600m ²	As planned
Extension of runways	22,200m ²	As planned
Flight safety facilities	Instrument landing system	As planned
Other facilities	(ILS) 1 unit	As planned
Consulting services:	Fire engines, ambulances, maintenance equipment, etc.	
Bid assistance, construction supervision	390MM	527MM
(2) Project Period	From August 1996-July 2001 (59 months): Construction: March 1998-December 2000 (33 months) Procurement of fire engines, ambulances and maintenance equipment: August 1999 to March 2001 (19 months)	From August 1996-November 2003 (87 months): Construction: March 1998-December 2000 (33 months) Procurement of fire engines, ambulances and maintenance equipment: July 2000-November 2003 (40 months)
(3) Project Cost		
Foreign currency	7,394 million yen	7,917 million yen
Local currency	5,914 million yen (in local currency, 2,404 million taka)	5,658 million yen (in local currency, 2,443 million taka)
Total	13,308 million yen	13,575 million yen
ODA Loan Portion	10,943 million yen	10,850 million yen
Exchange rate	1 taka=2.46 yen (as of July 1996)	1 taka=2.31 yen (Ave. 1997 to 2003)