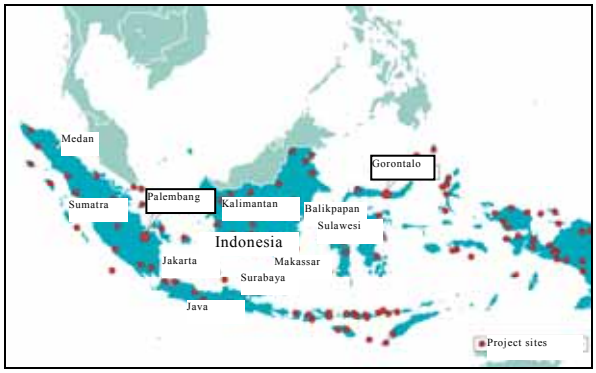
Indonesia

Airport Safety Facilities Improvement Project

External Evaluator: Takuya Okada

Field Survey: November 2004

1. Project Profile and Japan's ODA Loan



Project site location map

Gorontalo Airport in northern Sulawesi

1.1 Background

In Indonesia, an archipelagic state that spans an enormous area[1], air transportation represents an important means of intra-island movement for both people and goods, and for the transmission of information. In those regions with limited land and sea routes there were particularly strong demands to secure air routes in order to support economic growth. At this time, with the exclusion of a few international airports, air safety and traffic control equipment was in short supply at Indonesia's airports. Although measures to ensure safety at regional airports had been identified as an urgent priority[2], the government had avoided familiarizing itself with the safety issues until a specific accident occurred and had a propensity to put countermeasures on a backburner due to constraints on its fiscal budget. In short, major central airports were given priority, meaning that development of small and medium-sized regional airports had perforce to take a backseat.

1.2 Objectives

This project's objective was to improve the safety of air transportation through the development of facilities (runway extensions, procurement of maintenance equipment, etc.) at regional airports in Indonesia (38 airports including Palembang Airport and

[1] Indonesia is an archipelago comprising some 17,500 islands spread over an area of 1,905,000km^2 (approximately five times larger than Japan) that extends 5,150km east to west (equivalent to continental USA). It has the world's fourth largest population of around 200 million.

[2] The problems facing regional airports included: (1) defective pavement on runways, taxiways and aprons, (2) limitations on airload due to inadequate runway length, (3) obstacles on landing strips and in the airport vicinity, (4) insufficiently wide runways and taxiways (5) insufficiently large aprons, (6) shortages of maintenance equipment, and (7) inadequate security equipment.

Gorontalo Airport), and thereby contribute to greater efficiency in the domestic air transport industry.

1.3 Borrower/Executing Agency

Government of the Indonesian Republic/Directorate General of Air Communications under Ministry of Transport supervision

1.4 Outline of Loan Agreement

Loan Amount/Disbursed Amount	6,785 million yen/5,949 million yen
Exchange of Notes/Loan Agreement	October 1993/November 1993
Terms and Conditions Interest Rate Repayment Date (Grace Period) Procurement	 2.6% 30 years (10 years) General untied
Final Disbursement Date	December 2002
Main Contractor	PT.JAYA KONSTRUKSI (Indonesia), etc.
Consultants	Pacific Consultants International, etc
Feasibility Study (F/S), etc.	1991: Master Plan (M/P), JICA, Regional Airport Facilities Development Planning Survey

2. Results and Evaluation

2.1 Relevance

2.1.1 Relevance of project plans at appraisal

Air transportation represents an important means of intra-island movement in the Indonesian archipelago, and guaranteed air links are also crucial to rectifying intra-regional differences. REPELITA V (1989-1993), Indonesia's fifth five-year development plan, set forth the following basic policies for the air sector: "greater efficiency in air transportation", "aviation security", and "effective utilization of existing airport facilities". In connection with regional airports, poorly-surfaced runways and taxiways, and shortages of maintenance equipment, etc. had been pointed out as major problems, and further increases in demand for air transport were anticipated. This project was a high priority undertaking that was principally designed to raise safety standards through infrastructure development at regional airports.

2.1.2 Relevance of project plans at evaluation

"Efforts to improve efficiency by strengthening transport systems to facilitate maximal use of existing transportation facilities and infrastructure" is set forth as the objective of the development goal for the transport sector in Indonesia's current national development plan (PROPENAS: 2000-2004). The plan also stresses the importance of directing

initiatives towards the rehabilitation and preservation of roads, bridges, railroads, ports and airports. As demand for domestic air transport continues to expand, the development of infrastructure at regional airports remains critical in terms of ensuring safety, and the significance of this project, which was designed to improve safety and therefore operational efficiency, remains high.

2.2 Efficiency

2.2.1 Outputs

This project involved the procurement and deployment of airport safety and maintenance equipment to regional airports throughout Indonesia. Airports that the Ministry of Communication, Directorate General of Air Communication (DGAC) has identified as requiring urgent development and/or improvement of basic safety infrastructure, including runways, taxiways and so forth were selected as project development targets.

Under initial plans, 38 airports were singled out for infrastructure development, but target airports were reshuffled and changes made to work content on the basis of findings from a subsequent in-depth study, with the end result that development work was actually undertaken at 33 airports. At two of these airports: Palembang and Gorontalo, international competitive bidding was undertaken[3] due to the planned scale of the work involved; however, the following changes were made at the execution stage. At Palembang Airport, findings from the detailed design survey revealed that the planned resurfacing of the existing runway would not bring the runway up to standard in terms of flatness, and the decision was made to construct a new runway instead[4]. In line with this decision, the extension work that was to be undertaken on the apron attached to the existing runway was cancelled. Meanwhile, at Gorontalo Airport, initial plans called for the runway to be extended by 600m (to bring the total length to 2,200m), but following a study undertaken by DGAC, a 1,800m runway[5] was deemed sufficient for current airport needs and the extension work to be executed via this project was reduced to 200m (bringing total runway length to 1,800m). In addition, initial plans to rehabilitate the passenger terminal were switched to construction (replacement), as the condition of the building – already damaged by an earthquake in 1991 – had deteriorated even further.

[3] Contracts for the remaining 31 airports were procured through domestic competitive bidding.
[4] Following on from this project, the Palembang Airport Development Project (Phase 1) (L/A 1997; 8,826 million yen) is currently in progress. The runway constructed via this project will be used as a taxiway upon completion of the project currently being executed at Palembang Airport.
[5] A runway of 1,800m in length is suitable for Boeing 737 class aircraft (passenger load: approx. 130).

Table 1. Comparison of Planned and Actual Outputs

Item	Planned	Actual
1) Airport development	The following development work is to be undertaken at 38 domestic airports: - Runway extensions; taxiway/apron extensions - Improvement works, including removal of obstacles - Runway resurfacing, building maintenance, etc. - Servicing/procurement of airport safety equipment [Location of the 33 airports targeted for improvement]  	Development work was undertaken at 33 airports (see map below), essentially in line with the plans.
2) Procurement/deployment of maintenance equipment	- Airport maintenance equipment (mowers, grass collectors, tractors, dump trucks, etc.) - Air navigation systems, airport security equipment, fire fighting equipment, airport information systems	→ As planned → Execute as part of airport development work

Meanwhile, airport maintenance equipment was procured and deployed to 101 of the 146 airports under direct DGAC jurisdiction at appraisal (1993). It should be noted that, subsequent to the signing of the loan agreement, more equipment than initially planned was procured/deployed on the basis of the DGAC policy to "prioritize the upgrading equipment at airports under direct DGAC control". Furthermore, the provision of air navigation systems, airport security equipment, fire fighting equipment and airport information systems was implemented as part of the aforementioned "airport infrastructure" program consequent upon a definitive study undertaken by DGAC.

2.2.2 Project Period

The project was scheduled to be executed during a five-and-a-half year period spanning November 1993 through April 1999; however, in fact it took approximately nine years to execute and was completed in December 2002[6]. Even excluding the additional output components, the work included in the initial plans was subject to an overrun of two years and eight months. The delays are attributed to the time taken by the executing agency (DGAC) to appoint a project director after the signing of the loan agreement (approx. 10

[6] With the exclusion of the additional output components, the project was completed in December 2001.

months), to holdups in the start of development work at the airports due to the design modifications, and to holdups in work contract procedures due to the effects of the currency crisis (major political confusion).

Table 2. Comparison of Planned and Actual Implementation Schedules

	Planned	Actual
Loan agreement	November 1993	As left
Consultant selection	Nov. 1993 – Jun. 1994	Apr. 1994 – Mar. 1995
Consulting services	Jul. 1994 – Apr. 1999	Apr. 1995 – Dec. 2002
Palembang Airport development (bidding)	Mar. 1995 – Sept. 1996	Mar. 1997 – Jul 1998
As above (construction)	Oct. 1996 – Apr. 1998	Feb. 1999 – Dec. 2001 (Additions: Jul. 2001 – Oct. 2002)
Gorontalo Airport development (bidding)	Mar. 1995 – Sept. 1996	Mar. 1997 – Jul. 1998
As above (construction)	Oct. 1996 – Apr. 1998	Feb. 1999 – Aug. 2001
Development of other regional airports (bidding)	Nov. 1993 – Dec. 1994	Unknown
As above (construction)	Dec. 1993 – Jun. 1995	Nov. 1994 – Dec. 1996
Procurement of maintenance equipment (bidding)	Nov. 1994 – Feb. 1996	Jan. 1997 – Sept. 1998
As above (procurement/deployment)	Mar. 1996 – Dec. 1996	Sept. 1998 – Dec. 2000
Project completion	April 1999	December 2002

2.2.3 Project Cost

The total cost of the project amounted to 5,949 million yen, or approximately 75 percent of the originally estimated 7,983 million yen. These savings were possible because depreciation of the local currency exceeded inflation and because competitive bidding facilitated efficient ordering.

Table 3. Comparison of Planned and Actual Project Costs

Item	Planned	Actual
Foreign currency	2,767 million yen	1,235 million yen
Local currency	5,216 million yen (Rp. 88,393 million)	4,714 million yen (Rp. 142,849 million)
Total	7,983 million yen	5,949 million yen
ODA loan portion	6,785 million yen	5,949 million yen
Exchange rate	Rp. 1 = 0.059 yen (April 1993)	Rp. 1 = 0.033 yen (1993-2002 average)

2.3 Efficiency

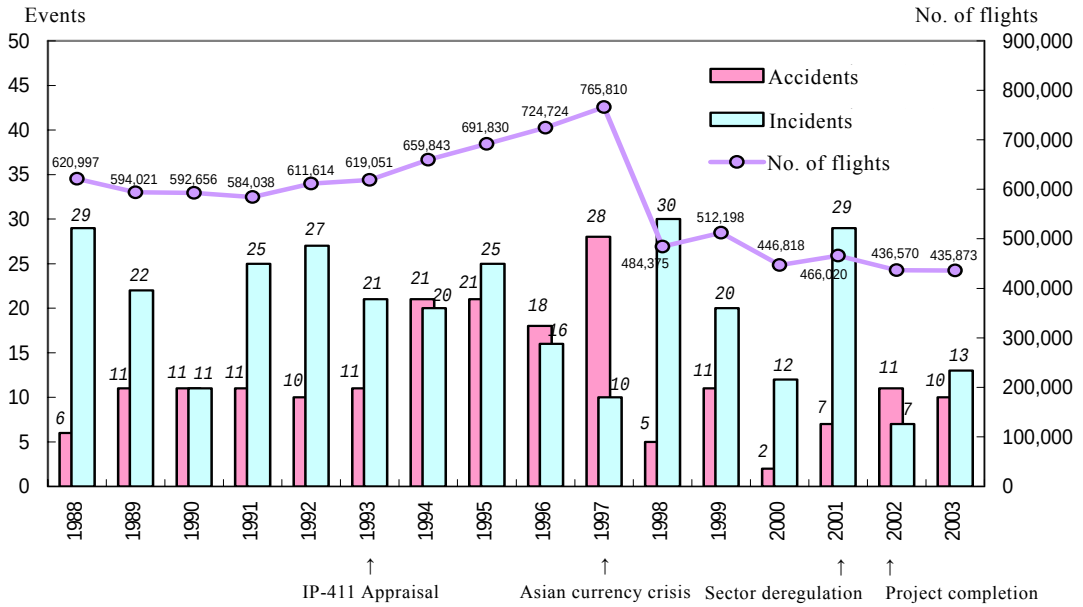
2.3.1 Aviation sector safety (nationwide)

Figure 1 illustrates annual trends in the numbers of commercial flights and aviation accidents (accidents and incidents[7]) in Indonesia. Despite ongoing growth in flight

[7] The International Civil Aviation Organization (ICAO) defines an aviation accident as "any of the events detailed in 1-3 below which occurs during the operation of an aircraft between the time any person boards the aircraft with the intention of flight and all such persons have disembarked". Namely: 1) An event in which either a passenger or a member of the cabin crew suffers death (including deaths occurring within 30 days of the accident) or serious injury (injures requiring treatment for at least 48 hours, and injuries that

numbers from 1990 onwards, the Asian currency crisis of 1997 produced a dramatic decline in commercial traffic between 1997 and 1998. Thereafter, the easing of regulations on participation in the air transport services industry in 2001 led to increasingly intense competition between old and new airlines, resulting in a shakeout of inefficient routes and the use of larger aircraft, and in the past few years, flight numbers have stabilized in the region of 450,000 per year.

Figure 1. Aviation Accidents in Indonesia (accidents and incidents)



Source: National Transportation Safety Committee (NTSC)

Meanwhile, despite the absence of any clear trend in the number of aviation accidents, fewer accidents occurred in 2002 and 2003, following the deregulation of the aviation sector, although the need for caution is emphasized as these data only cover a two-year period. By way of substantiation, the following table compares the number of flights against the accident rate. Table 4 compares the average number of accidents per million flights in the five years prior to appraisal against the two years following completion of the project. It proves that aviation safety has improved since the project was completed and that Indonesia's safety record is now on a par with Japan's ten years ago.

manifest within 7 days of the accident) either whilst on board or as the result of contact with equipment that is attached to the aircraft; 2) an event involving damage to an aircraft and/or structural defects necessitating rapid repair or replacement, where there is a risk that the strength and/or navigation of the aircraft could be adversely affected; 3) an event where an aircraft goes missing or becomes inaccessible. Meanwhile, ICAO defines aviation incidents as "any events other than aviation accidents that may adversely affect the safe navigation of the air craft". Generally speaking, the definition refers to both accidents and incidents.

Table 4. No. of accidents per takeoff/landing

5 years prior to appraisal	2 years following completion
53 accidents/million flights *1989-1993 average	47 accidents/million flights *2002-2003 average
(Reference) Japanese figures for the same periods	
47 accidents/million flights	*34 accidents/million flights *2002 data*

Source: Compiled from data obtained from NTSC

The mowers, runway sweepers and other maintenance equipment that was procured and deployed to regional airports under this project continues to be used, and is contributing to the visibility of runway lighting and to the safety of aircraft operation[8]. Added to which, the rehabilitation/construction of airport infrastructure and the installation of power generators has made it possible for the regional airports targeted to provide security and comfort to passengers.

2.3.2 Aviation Sector Safety (individual case examples)

At Palembang Airport, which was visited during the field survey, although there were considerable declines in both flight and passenger numbers following the currency crisis of 1997 (which are consistent with nationwide trends), there have been signs of a recovery since 2001 and passenger traffic is increasing significantly. The construction of a new runway with guaranteed flatness has increased the safety of takeoffs and landings. Added to which, the former runway has been converted into a parallel taxiway, and this is contributing to smoother aircraft turnarounds.

Table 5. Annual flight traffic/passenger numbers for Palembang Airport

Year	Annual flight traffic	Passenger numbers
1994	13,350	527,202
1995	14,612	610,479
1996	14,614	646,259
1997	15,027	577,280
1998	10,122	372,319
1999	7,822	339,166
2000	8,278	383,702
2001	8,594	466,584
2002	9,112	551,330
2003	10,994	814,692[9]

Source: Palembang Airport

One of the major reasons for the recent increases in passenger traffic is the competition between airlines that followed deregulation, which is pushing airfares down. For example, in 2000, prior to the price war, a one-way ticket between Jakarta and Palembang cost Rp.

[8] Based on comments made by the director of the Aviation Technology Agency of the Directorate General of Air Communications during interview.

[9] A figure of 800,000 passengers per year is equivalent to the passenger traffic through Izumo Airport in Japan.

600,000; by 2004 the price had dropped to Rp. 150,000-175,000[10]. This explains why many passengers who formerly used a bus-ferry combination to travel the route, having weighed the fares and journey times involved[11], have shifted to air transport.

2.4 Impact

2.4.1 Greater Efficiency in Domestic Air Transportation

As detailed above, although the currency crisis of 1997 marked the beginning of a falloff in flight number, there have been considerable increases in passenger traffic since 2001, though this is partially attributable to the decrease in airfares induced by deregulation. In 2003 Indonesia chalked up its highest passenger traffic on record, with numbers exceeding 15 million, or approximately 1.6 times higher than at appraisal. The number of passengers per flight is also on the increase as airlines strive to improve their operational efficiency, employ larger aircraft and so forth.

Table 6. Passenger Numbers on Domestic Routes and per Flight

Year	Passenger numbers (per year)	Passenger numbers per flight
1993	9,319,472	15
1994	10,581,817	16
1995	12,220,809	18
1996	13,494,810	19
1997	12,813,548	17
1998	7,585,853	16
1999	6,350,481	12
2000	7,622,570	17
2001	9,168,059	20
2002	12,253,173	28
2003	15,316,466	35

Source: “Air Transport Blue Book”, DGAC (May 2004)

The basic airport infrastructure (runways, taxiways, etc.), lighting equipment and navigation systems that were improved via this project are considered to be reinforcing the safety of air transport services in Indonesia. Nevertheless, with passenger traffic increasing and the average number of passengers per flight also on the rise, in order to reduce the human and economic losses that would result in the unlikely event of an aviation accident, Indonesia’s aviation sector needs to continue with its efforts to improve the safety of domestic air transport services.

2.5 Sustainability

2.5.1 Executing Agency

As of 2004, Indonesia’s twenty three major airports are operated by PT Angkasa Pura, a

[10] These figures were obtained from the “Air Transport Blue Book” (May 2004), published by the Directorate General of Air Communications.

[11] In 2004, the combined fare for the bus and ferry ride was Rp. 175,000 and the journey took 12 hours.

wholly government owned subsidiary, while DGAC has direct control over 164 small and medium-sized airports. PT Angkasa Pura has divided the country down the middle with PT Angkasa Pura I (PT. AP I) supervising the airports in eastern regions of the country and PT Angkasa Pura II (PT. AP II) supervising those located in the western regions. Table 7 shows the airport supervisory systems of PT. AP I, PT. AP II and DGAC.

Table 7. Indonesia's Airport Supervisory System

PT. Angkasa Pura I (Major airports in eastern regions of Indonesia)	PT. Angkasa Pura II (Major airports in western regions of Indonesia)	DGAC
Following 13 airports: Bali, Surabaya, Makassar, Balikpapan, Biak, Manado, Yogyakarta, Solo, Banjarmasin, Semarang, Ambon, Mataram, Kupang	Following 10 airports Jakarta (Soekarno Hatta Intl.), Jakarta (Halim PK), Palembang, Pontianak, Medan, Padang, Pekanbaru, Bandung, Banda Aceh, Tanjung Pinang	164 small- to midsize regional airports nationwide (including Gorontalo)
(Airports covered by the project)	(Airports covered by the project)	(Airports covered by the project)
Yogyakarta	Palembang, Bandung, Banda Aceh, Tanjung Pinang	Gorontalo, Sintang, Putussibau, Pangkalan Bun, Sambit, Tarakan, Tanjung Selor, Merauke, Datadawai, Longbawan, Longapung, Labuhan Bajo (Komodo), Bajawa, Alor, Ampenan, Bima, Palu, Luwuk, Ternate, Kuabang (Kau), Meulaboh, Gunungsitoli, Sibolga, Aek Godang, Tanjung Karang, Curug, Cirebon, Cilacap

Source: "Air Transport Blue Book", DGAC (May 2004)

The following sections provide an outline of the technical capacity, operation and maintenance systems and financial status of each of the executing agencies.

2.5.1.1 PT. Angkasa Pura I (PT. AP I)

1) Technical Capacity: Training related to facilities maintenance is being appropriately undertaken.
2) Operation and Maintenance System: The offices responsible for individual airports are adequately staffed and there is a sound system in place for airport facilities' maintenance.
3) Financial Status: Generally speaking, the finances of PT. AP I are in a favorable

condition. The company is dependent on international routes for more than 90% of its revenues, but as Table 8 shows, profit performance has taken a turn for the better in the last few years. Further, PT. AP I has a high capital adequacy ratio of approximately 70% (69.3% as of the end of 2001), indicating that its financial base is stable.

Figure 8. Profit and Loss Statement for PT. AP I

(Unit: billion Rp.)

	2000	2001	2002
Income	575	767	923
Expenditure	415	532	659
Gross operating profit (GOP)	160	235	264
Post-tax profit	324	418	197

Source: PT. AP I

2.5.1.2 PT. Angkasa Pura II (PT. AP II)

1) Technical Capacity: Training related to facilities maintenance is being appropriately undertaken.

2) Operation and Maintenance System: The offices responsible for individual airports are adequately staffed and there is a sound system in place for airport facilities' maintenance.

3) Financial Status: Generally speaking, the finances of PT. AP II are in a favorable condition. At around 65%, its capital adequacy ratio is high and stable (65.9% in fiscal 2001, 64.7% in fiscal 2002, 63.8% in fiscal 2003).

Table 9. Profit and Loss Statement for PT. AP II

(Unit: billion Rp.)

	2001	2002	2003
Income	1,090	1,236	1,253
Expenditure	689	768	870
Gross operating profit (GOP)	401	468	383
Post-tax profit	482	372	284

Source: PT. AP II

2.5.1.3 Directorate General of Air Communications (DGAC)

1) Technical Capacity: Training related to facilities maintenance is being appropriately undertaken.

2) Operation and Maintenance System: Each of the airports is operated and managed by DGAC branch offices (UPT: technical management units).

3) Financial Status: Airport taxes and apron parking fees (tax) levied at individual airports are recorded as DGAC revenue, with the expenditure needs of individual airports being covered by the DGAC budget. Since these are government facilities, any taxes levied are subject to the national tax system and are considerably lower than the charges levies at

airports operated by PT. Angkasa Pura. Accordingly, operating expenses at regional airports operated by DGAC exceed revenues (see Table 10).

Table 10. Balance Sheet for Gorontalo Airport
– A regional airport under DGAC supervision (Reference) –
(Unit: million Rp.)

	2001	2002	2003
Income	44	152	352
Expenditure	1,501	1,569	1,881
Balance	-1,457	-1,417	-1,529

Source: Gorontalo Airport Technical Management Unit (UPT)

2.5.2 Current Operation and Maintenance Status

The situation at the two airports visited during the field survey is detailed hereunder.

2.5.2.1 Palembang Airport

Airport facilities are currently being expanded under a separate project (Palembang Airport Development Project (1) (IP-491), L/A: 1997). The runway that was constructed via this project is to be converted into a taxiway upon completion of the current project.

Figure 2. Palembang Airport

Construction of a new passenger terminal being funded by a separate project (completion scheduled for September 2005)

2.5.2.2 Gorontalo Airport

Follow-up work (repaving, etc.) using funds from the Gorontalo provincial government budget has been undertaken since this project was completed, as the airport authority strives to make further improvements to its infrastructure.

Figure 3. Gorontalo Airport

The passenger terminal and apron constructed via this project

3. Feedback

3.1 Lessons learned: None

3.2 Recommendations: None

Comparison of Original and Actual Scope

Item	Planned	Actual
(1) Outputs		
1) Airport development	The following development work is to be undertaken at 38 domestic airports: - Runway extensions; taxiway/apron extensions - Improvement works, incl. removal of obstacles - Runway resurfacing, building maintenance, etc. - Servicing/procurement of airport safety equipment	Essentially as planned. * The following changes were made for Palembang Airport and Gorontalo Airport. <Palembang Airport> The planned repaving of the existing runway was cancelled and a new runway constructed instead. Apron extension work was cancelled. <Gorontalo Airport> Runway extensions were reduced from 600m (total length: 2,200m) to 200m (total length: 1,800m). Instead of rehabilitating the existing terminal building, a new passenger terminal was constructed.
2) Procurement/deployment of maintenance equipment	- Mowers : 44 units - Tractors : 70 units - Sweepers : 10 units - Dump trucks : 25 units - Pick-up trucks : 25 units - Handy mowers : 10 units - Grass collectors : 31 units - Workshop equipment : 25 sets	82 units 80 units 8 units 25 units 50 units 165 units 36 units 30 sets
3) Consulting services	Bidding assistance, work supervision, etc.[12]	As planned
(2) Project period		
- Loan agreement	November 1993	As left
- Consultant selection	Nov. 1993 – Jun. 1994	Apr. 1994 – Mar. 1995
- Consulting services	Jul. 1994 – Apr. 1999	Apr. 1995 – Dec. 2002
-Palembang Airport development (bidding)	Mar. 1995 – Sept. 1996	Oct. 1996 – Apr. 1998
- As above (construction)	Oct. 1996 – Apr. 1998	Feb. 1999 – Dec. 2001 (Additions: Jul. 2001 – Oct. 2002)
-Gorontalo Airport development (bidding)	Mar. 1995 – Sept. 1996	Mar. 1997 – Jul. 1998
- As above (construction)	Oct. 1996 – Apr. 1998	Feb. 1999 – Aug. 2001
- Development of other regional airports (bidding)	Nov. 1993 – Dec. 1994	Unknown
- As above (construction)	Dec. 1993 – Jun. 1995	Nov. 1994 – Dec. 1996
- Procurement of maintenance equipment (bidding)	Nov. 1993 – Feb. 1996	Jan. 1997 – Sept. 1998
- As above (procurement/ deployment)	Mar. 1996 – Dec. 1996	Sept. 1998 – Dec. 2000
- Project completion	April 1999	December 2002
(3) Project costs		
Foreign currency	2,767 million yen	1,235 million yen
Local currency	5,216 million yen (Rp. 88,393 million)	4,714 million yen (Rp. 142,849 million)
Total	7,983 million yen	5,949 million yen
ODA loan portion	6,785 million yen	5,949 million yen
Exchange rate	Rp. 1 = 0.059 yen (April 1993)	Rp. 1 = 0.033 yen (1993-2002 average)

[12] Consulting services: (1) development of Palembang Airport/Gorontalo Airport and procurement of maintenance equipment → detailed design, bidding assistance, work supervision, technology transfer; (2) development of other regional airports → monitoring, technology transfer.

Appendix 1: Comparison of Planned and Actual Airport Development Work and Target Airports

Airport Name	**Planned (38 airports)**						**Actual (33 airports)**					
	Civil engineering works (extensions, improvements, etc.)	Building construction	Installations, runway lights, etc.	Power facilities	Telecom facilities	Other equipment procurements	Civil engineering works (extensions, improvements, etc.)	Construction of airport buildings	Installations, runway lights, etc.	Power facilities	Telecom facilities	Other equipment procurements
Banda Aceh			■	■					■	■		
Meulaboh			■	■					■	■		
Gunungsitoli	■						■					
Sibolga				■	■					■	*Not executed*	
Aek Godang				■						■		
Tanjung Pinang	■						■					
Tabing (Padang)		■	■	■			*Cancelled*					
Palembang	■		■				■		■			
Tanjung Karang	■			■	■		■			*Not executed*	*Not executed*	
Curug	■						■					
Bandung	■						■					
Cirebon	■						■	*Additional*				
Yogyakarta	■		■				■		■		*Additional*	
Cilacap	■			■			■			*Not executed*		
4 airports in W. Kalimantan*	■	■					■	■				
Pangkalanbun	■						■					
Sambit	■						■					
Tarakan	■						■					
6 airports in E. Kalimantan**	■						■					
Labuhan Bajo (Komodo)	■						■					
Roti	■						*Cancelled*					
Bajawa	■						■					
Alor	*Unplanned*						■					
Ampenan	■	■					■	■				
Bima	■						■					
Palu	■						■					
Luwuk	■						■					
Gorontalo	■	■	■				■	■	■			
Masamba	■	■					*Cancelled*					
Ternate	■						■					
Kuapang (Kau)	■						■					

(*) Of the four airports originally targeted for development (Ketapang, Nangapinoh, Sintang and Putussibau), Ketapang and Nangapinoh were cancelled.

(**) Under the plans, six airports were targeted for development, but the number was altered and the work carried out at the following five airports: Tangung Selor, Merauke, Datadawai, Longawan and Longapun.

Appendix 2: List of Maintenance Equipment Procured/Deployed

Airport Location	Wheeled tractors (units)	Mowers (units)	Handy mowers (units)	Grass collectors (units)	Dump trucks (units)	Pickup trucks (units)	Pushback/to wing tractors (units)	Sweepers (units)	Workshop equipment (sets)
1. Region 1 Airports: Daerah Istimewa Aceh	**2**	**2**	**5**	**0**	**0**	**2**	**0**	**0**	**1**
1. Lasking – Sinabang	1	1	1			1			
2. CUT Nyak Dien – Meulaboh			2						
3. T. CUT Ali – Tapaktuan	1	1	2			1			1
2. Region 2 Airports: Sumatra Utara	**3**	**3**	**6**	**3**	**1**	**3**	**0**	**0**	**2**
1. Binaka – Gunungsitoli	1	1	1	1		1			
2. Pina Sore – Sibolga	1	1	2	1		1			1
3. Aek Godang - P. Sidenpuan	1	1	2	1	1	1			1
4. Pulau Batu - Gunungsitoli			1						
3. Region 3 Airports: Sumatra Barat	**1**	**1**	**2**	**0**	**0**	**1**	**0**	**0**	**0**
1. Rokot – Sipora	1	1	2			1			
4. Region 4 Airports: Riau	**4**	**5**	**7**	**3**	**2**	**2**	**0**	**0**	**1**
1. Jayapura – Rengat	1	1	2	1	1				
2. Kijang - TG. Pinang	1	2	2	1		1			
3. Dabo – Singkep	1	1	2	1	1				
4. Sei Bati - TG. Balaikarangan	1	1	1			1			1
5. Region 5 Airports: Jambi	**2**	**2**	**2**	**1**	**0**	**1**	**1**	**1**	**0**
1. Sultan Thaha- Jambi	2	2	2	1		1	1	1	
6. Region 6 Airports: Bengkulu	**2**	**2**	**2**	**1**	**1**	**0**	**0**	**0**	**0**
1. Padangkem – Bengkulu	2	2	2	1	1				
7. Region 7 Airports: Sumatra Selatan	**3**	**3**	**5**	**2**	**2**	**0**	**0**	**1**	**0**
1. Ber Tunbang - TG. Pandang	2	2	2	1	1				
2. Pangkalinang – Bangka	1	1	1	1	1			1	
3. Sumatra Selatan Transport Bureau			2						
8. Region 8 Airports: Lampung	**2**	**2**	**2**	**2**	**1**	**0**	**0**	**0**	**0**
1. Branti – Bandar Lampung	2	2	2	2	1				
9. Region 10 Airports: Jawa Barat	**3**	**3**	**3**	**3**	**0**	**3**	**2**	**1**	**1**
1. PFBU Jakarta Headquarters						1			
2. Budiarto – Curug	2	2	2	2		1		1	
3. Barai kari berasi - Curug							2		1
4. Penggung – Cirebon	1	1	1	1		1			
10. Region 11 Airports: Jawa Tengah	**2**	**2**	**2**	**0**	**1**	**1**	**0**	**0**	**1**
1. Tunggul Wulung – Cilacap	1	1	2		1	1			
2. Dewandar – Karimunjawa	1	1							1
11. Region 15 Airports: Nusatenggara Barat	**2**	**2**	**6**	**2**	**2**	**0**	**0**	**0**	**1**
1. Muhammad Salahuddin – Bima	1	1	2	1	1				
2. Branbisi – Sumbawa	1	1	2	1	1				1
3. Nusatenggara Barat Transport Bureau			2						
12. Region 16 Airports: Nusatenggara Timur	**10**	**10**	**19**	**2**	**3**	**5**	**0**	**0**	**4**
1. Haji Albusman – Ende	1	1	2		1	1			1
2. Gewanyana – Larantuka	1	1	2			1			1
3. Waiote – Maumere	1	1	2	1	1				
4. Wanopito – Lewoleba			2						
5. Satar Tacik – Ruteng	1	1	1						
6. Soa – Bajawa	1	1	1						
7. Komodo – Labuan Bajo	1	1	1			1			
8. Tardam – Sab	1	1	2						
9. Leknik – Roti	1	1	2			1			1
10. Tambolaka – Waikabubak	1	1	2			1			1
11. Mau Hau – Waingapu	1	1	2	1	1				
13. Region 17 Airports: Kalimantan Barat	**3**	**3**	**6**	**1**	**0**	**3**	**0**	**0**	**2**
1. Nangapinoh - Nangapinoh	1	1	2			1			1
2. Rahadi Usman – Ketapang	1	1	2	1		1			
3. Pangsuma – Putussibau	1	1	2			1			1
14. Region 18 Airports: Kalimantan Tengah	**8**	**8**	**9**	**4**	**3**	**4**	**0**	**1**	**4**
1. Jirik Laut – Palangkaraya	2	2	2	1	1			1	
2. Beringin – Murateweh	1	1	2		1	1			1
3. Haji Asan – Sampit	1	1		1		1			
4. Sanggau – Buntok	1	1	2			1			1
5. Iskandar – Pangkalanbun	1	1	1	1	1				
6. Kuala Kerun	1	1	1						1
7. Kuala Pembuang	1	1	1	1		1			1
15. Region 19 Airports: Kalimantan Selatan	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**0**
1. Stagen– Kotabaru			2	1					

16.	**Region 20 Airports: Kalimantan Timur**	**4**	**4**	**7**	**1**	**1**	**3**	**0**	**0**	**3**
	1. Jawata – Tarakan	1	1	2	1	1				
	2. TG. Harapan - TG. Serol	1	1	2			1			1
	3. Nunukan	1	1	2			1			1
	4. Kalimaru – Berau TJ. Redip	1	1	1			1			1
17.	**Region 21 Airports: Sulawesi Utara**	**3**	**3**	**5**	**1**	**1**	**2**	**0**	**0**	**0**
	1. Melanguane – Sangir Talaud	1	1	2			1			
	2. Jalauddin – Golontaro	1	1	2	1	1				
	3. Naha – Tahuna	1	1	1			1			
18.	**Region 22 Airports: Sulawesi Tengah**	**5**	**5**	**7**	**2**	**1**	**2**	**1**	**1**	**2**
	1. Mutiara – Palu	2	2	2	1	1	1	1	1	
	2. Laros – Tolitoli	1	1	2						1
	3. Kasiguncu – Poso	1	1	1						
	4. Bubung – Luwuk	1	1	2	1		1			1
19.	**Region 23 Airports: Sulawesi Selatan**	**1**	**1**	**6**	**0**	**0**	**3**	**0**	**0**	**1**
	1. Adi Jemma – Masamba	1	1	2			1			1
	2. Pontianak – Tanatoraja			1			1			
	3. Tampapadan – Mamuju			2			1			
	4. Malili			1						
20.	**Region 24 Airports: Sulawesi Tenggara**	**1**	**1**	**2**	**1**	**1**	**0**	**0**	**1**	**0**
	1. Wolter Monginsidi – Kendari	1	1	2	1	1			1	
21.	**Region 25 Airports: Maluku**	**6**	**6**	**10**	**1**	**1**	**5**	**0**	**0**	**5**
	1. Kuabang – Kau	1	1	2			1			1
	2. Gamar Maramo – Galela	1	1	2			1			1
	3. Bubular – Ternate	1	1	2	1	1				
	4. Dumatusun – Langgur	1	1	2			1			1
	5. Usmansidi – Labuha	1	1	1			1			1
	6. Bandanaira – Pulau Banda	1	1	1			1			1
22.	**Region 26 Airports: Irian Jaya**	**13**	**14**	**50**	**5**	**4**	**10**	**1**	**2**	**2**
	1. Mopah – Merauke	1	1	2	1	1	1		1	
	2. Mindiptana - Merauke	1	1	1						
	3. Kokonao			1						
	4. Ijya Habura – Sorong			1						
	5. Rendani – Manokwari	1	1	2	1	1				
	6. Moanamani			2						
	7. Sentani – Jayapura	1	2	2	1	1		1	1	
	8. Tanahmerah – Merauke	1	1	2			1			1
	9. Wasior – Manokwari	1	1	1			1			
	10. Karubaga			1						
	11. Teminabuan – Sorong			1			1			
	12. Numfoor – Kemili			1						
	13. Bokondini - Sorong			1			1			
	14. Oksibil – Jayawijaya			2						
	15. Soron Dalatan - Sorong	1	1	1			1			
	16. Bintuni – Sorong	1	1	1						
	17. Babo			2						
	18. Wamena - Jayawijaya	1	1	2	1		1			
	19. Enarotali - Enarotali			2						
	20. Ewer – Agat			2						
	21. Nabire – Paniai	1	1	2	1		1			
	22. Sejarwo – Serui	1	1	2			1			1
	23. Trea – Fak-Fak	1	1	2		1				
	24. Senggeh			2						
	25. Wagethe – Paniai			2						
	26. Batom			2						
	27. Yurup			2						
	28. Waris			2						
	29. Dabra			2						
	30. Utarom – Kaimana	1	1	2			1			
	Totals	**80**	**82**	**165**	**36**	**25**	**50**	**5**	**8**	**30**
	Planned totals	*70*	*44*	*10*	*31*	*25*	*25*	*0*	*10*	*25*