

4.1.8 Sea Transportation

(1) Current Development Program

For Indonesia, the biggest archipelago country with over 17,000 islands stretching 5,000 km from east to west, and 2,000 km from north to south, sea transportation plays an important role as a gateway for cargoes and passengers to and from foreign countries and other islands. On the other hand, transportation on rivers, lakes and sea crossings (ASDP) are classified as part of the land transport system. In this sense, the ports function as the connection of the sea/river/lake transportation with the road/railway transportation. In order to meet the increasing demand of cargo and passenger along the national economic growth, development and improvement of port facilities, navigation system, shipping industry and port management institutions are urgently required.

1) Current Development Program

a) Current RPJM 2004-2009

The key issues of sea transportation and river/lake/ferry transportation are mentioned in the current RPJM 2004-2009, as follows:

(Sea Transportation)

- i) Decline in the share of the national shipping fleet in the transportation cargo
- ii) High-cost of cargo handling charge
- iii) Inadequate port infrastructure and facilities
- iv) Poor quality of navigation facilitation instruments compared with the international standards
- v) Controversy on the authority for managing sea-ports between the central government and regional governments.

(River/Lake/Ferry Transportation)

- i) Inadequate and limited ferry infrastructure and facilities
- ii) Limited availability of vessels
- iii) Inadequate and limited transportation network
- iv) Indefinite role between private company and regional government

To address the above mentioned key issues, programs are enumerated below:

(Sea Transportation)

- i) Program for the Rehabilitation and Maintenance of Sea Transport Infrastructure
- ii) Program for the Construction of Sea Transport Infrastructure
- iii) Program for the Restructuring of Sea Transport Institutions and Regulations

(River/Lake/Ferry Transportation)

- i) Program for the Rehabilitation of River, Lake and Ferry Wharves

- ii) Program for the Development of River, Lake and Ferry Transportation Infrastructure and Facilities
- iii) Program for the Restructuring and Reforming of River, Lake and Ferry Transportation Institutions

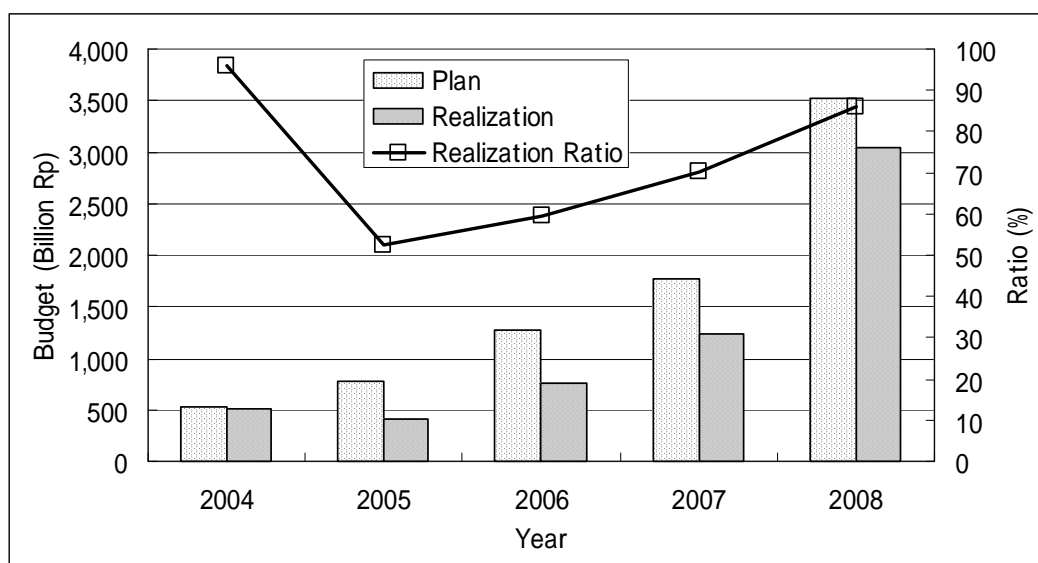
b) Current Development Blueprint for Sea Transportation

The MOT, mainly the Directorate General of Sea Transportation (DGST) has formulated the Development Blueprint for Sea Transportation based on the National Transport System (SISTRANS). The policies of the blueprint are:

- i) To increase national maritime transport services,
- ii) To increase safety and security of the national maritime transport,
- iii) To increase utilization of maritime transport development,
- iv) To increase quality of human resources, science and technology in maritime transport sector,
- v) To increase maintenance and environmental quality and energy efficiency in maritime transport sector,
- vi) To increase provision of maritime transport development fund, and
- vii) To increase the quality of the state administration of maritime transport sub-sector.

2) Budget Allocation in 2004-2008

In 2008, the national budget of transportation sector under the MOT was Rp. 12,217 billion in 2008, of which Rp.3,527 billion was allocated for sea transportation. As to the amount of budget, sea transportation is the sub-sector with most allocated budget (Sea: 29%, Railway: 26%, Air: 21%, Land: 13%, Others: 11%). Figure 4.1.33 shows the planned and realized budget for sea transportation (2004-2008). Both budget and its realization ratio have been sharply increasing since 2005.



Source: Finance Bureau, Ministry of Transportation

Figure 4.1.33 National Budget (APBN) for Sea Transportation

(2) Progress of Development

The status of achievements of the sea and ASDP (River/Lake/Ferry) transportation sector under the current RPJM 2004-2009 are shown in Table 4.1.46 and Table 4.1.47, respectively.

Table 4.1.46 Achievements of Sea Transportation Sector in RPJM

Target/Program	Indicator	Unit	Initial Condition 2004/2005	Achievement		
				2006	2007	2008
Improving the market segment of the national shipping vessels both for domestic and import export sea transport	Numbers of domestic sea transport	Million ton	114.5	135.3	148.7	192.8
		Percent	55.5	61.3	65.3	79.4
	Numbers of overseas sea transport	Million ton	24.6	29.4	31.4	38.2
		Percent	5.0	5.7	5.9	7.1
Improving the performance and efficiency of ports that managed State Owned Enterprises (BUMN)*	Cargo loading and unloading flow	Million ton	286.19	358.32	377.29	403.72
	Port container flow	Million TEU	6.68	7.27	7.64	9.39
Compliance of the shipping navigation equipments and maintenance facilities	Vessel Traffic Services (VTS)	Unit	0	5	7	7
	Pharos	Unit	247	252	274	275
	Floating light	Unit	346	346	329	351
	Light buoy	Unit	1,192	1,236	1,216	1,244
Completion of the Law No.21 Year 1992 on the Shipping and Government Regulation No.69 on the Ports	Issuance of the Law		Rough Draft of	Draft of Law	Draft of Law	Law
	Issuance of Government Regulation				Rough Draft of Gov. Regulation	Draft of Gov. Regulation

Source: RPJM Evaluation Book 2005-2008

Table 4.1.47 Achievements of River/Lake/Ferry Transportation in RPJM

Target/Program	Indicator	Unit	Initial Condition 2004/2005	Achievement		
				2006	2007	2008
Improvement of quays infrastructure to increase the number of new ferry transport which is ready to operate or increase the capacity of the dense/crowded ferry transport	Numbers of constructed quays	Unit	47	48	60	
	Construction of crossing beacon	Unit	5	6	18	15
	Numbers of lake quays	Unit	8	11	17	
	Rehabilitation of lake quays	Unit	21	8	25	22
	Rehabilitation of river quays	Unit	5	6	22	
Improvement of feasibility and numbers of ASDP facilities	Rehabilitation of Crossing Vessels	Unit	10	36	15	
Improving the ASDP safety	Crossing beacon	Unit	5	6	8	15
	Inland and River beacon	Unit	264		850	900

Source: RPJM Evaluation Book 2005-2008

(3) Remaining Issues

1) Key Remaining Issues for the Next RPJM 2010-2014

According to the draft concept of the next RPJM 2010-2014, BAPPENAS addressed the following remaining issues.

(Sea Transportation)

- i) Low portion of national flag fleet
- ii) No national port master plan and limited number of international ports
- iii) Low level of reliability/adequacy of port and navigation facilities
- iv) Limited funds and lack of investment by the private sector
- v) High cost of cargo transportation
- vi) Low performance of port activities due to the lack of port facilities
- vii) Lack of human resources in the sea transportation sector

(River/Lake/Ferry Transportation)

- i) Lack of navigation route and infrastructure to meet the demands
- ii) Lack of vessels and existence of overly aged vessels
- iii) Insufficient institutional system and indefinite role among central government, local government and state-owned company
- iv) Limited affordability in remote areas

2) Indonesia's Competitiveness in the Current Sea Transportation Sector

a) Position of Indonesian Container Throughput among Neighboring Countries

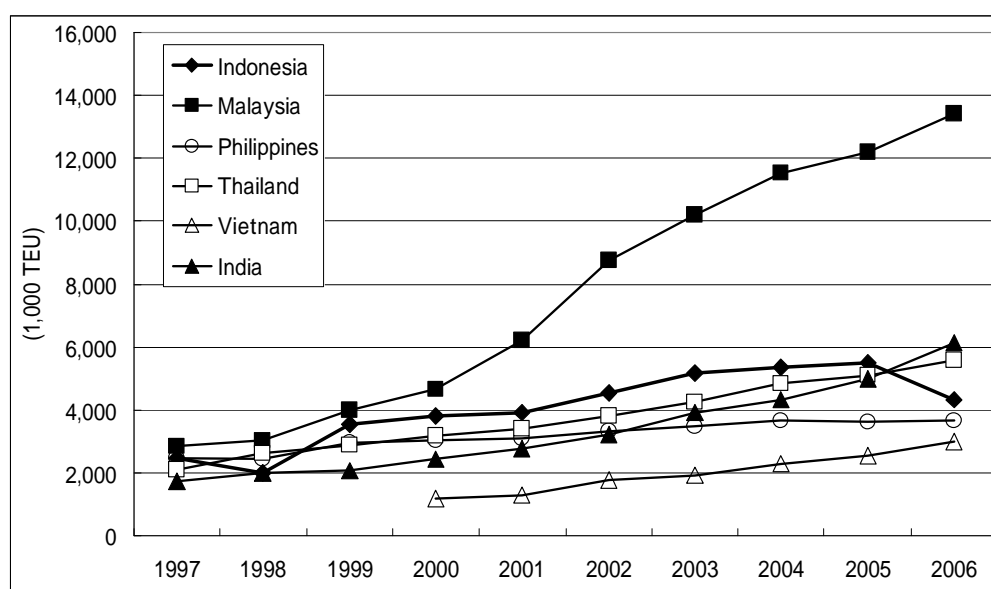
Table 4.1.48 shows the container throughput and its world ranking among the Asian countries in recent years. This was summarized from the source entitled "Containerization International Yearbook 1999 -2009". In 2007, container throughput of Indonesia was 4,481 thousand TEU, and it was 23rd in the world ranking.

Figure 4.1.34 indicates the container throughput trend of Indonesia and its neighboring countries (namely Malaysia, the Philippines, Thailand, Vietnam and India) ranked as 50th in the world,

Table 4.1.48 Container Throughput and Ranking in Asian Countries

Country	Container Throughput (1,000 TEU)										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Indonesia	1,920	2,233	2,102	3,864	3,492	4,540	4,560	5,567	5,503	3,740	4,481
	20	17	19	15	16	15	16	14	16	23	23
Malaysia	2,976	3,015	3,942	4,612	6,225	7,542	10,072	11,264	12,027	13,419	14,873
	14	14	13	14	10	9	8	8	8	7	7
Philippines	2,507	3,167	2,813	3,605	3,091	3,271	3,469	3,673	3,634	3,596	3,835
	16	13	16	16	18	20	22	21	23	25	27
Thailand	2,100	2,639	2,892	3,269	3,382	3,801	4,410	4,856	5,115	5,574	6,200
	18	15	15	18	17	17	17	17	17	18	18
Vietnam					1,291		2,196	2,139	2,694	3,000	3,937
					33		26	28	28	29	26
India	1,803	1,829	1,762	2,314	2,591	3,243	3,916	4,267	4,938	6,190	7,372
	22	21	21	24	22	21	19	18	18	16	15
China	20,365	24,729	28,215	35,483	43,970	55,717	61,621	74,540	88,548	108,225	128,558
	2	1	1	1	1	1	1	1	1	1	1
Japan	10,892	10,228	11,796	13,621	12,981	13,501	14,567	15,937	16,777	18,274	19,008
	4	4	4	4	4	4	4	4	4	4	4

Source: Containerization International Yearbook 1999-2009



Source: Containerization International Yearbook 1999-2009

Figure 4.1.34 Container Throughput Trend in Asian Countries

India and Thailand have been steadily increasing the throughput and their average growth rate (1997-2007) was 15.1% and 11.4%, respectively. The Philippines has been gradually increasing their throughput with an average growth rate of 4.4%, although its ranking has been falling.

Vietnam has been rapidly increasing their throughput along the economic growth with the Doi Moi economic reforms. Several container terminals financed by the private sector have been constructed around Ho Chi Minh to immediately meet the increasing demands. The container-handling companies, PSA Corporation Ltd., SSA (Stevedoring Services of America), and APM Terminals, which are the so-called the mega operators, have already started business in Vietnam.

Malaysia has sharply increased since Tanjung Pelepas Port started its operation as a privatized port in 1999. Now mega carrier, Maersk Line, is the largest user of the port. Said port is the most convenient and controllable container terminal for Maersk Line as its hub in Asia, replacing Singapore. Container throughput of the port in 2007 was 5,500 thousand TEU, which is 37 % of the whole of Malaysia.

Indonesia steadily increased their throughput by 2004 and has ranked 14th, but it suddenly decreased throughput to 3,740 thousand TEU in 2006, causing its rank to fall to 23rd. In 2007, Indonesia recovered their throughput to 4,481 thousand TEU which is the level in 2002. As to the average growth ratio of container throughput (1997-2007), Indonesia has 8.9%. However, its numerical value is insufficient, as compared to above mentioned neighboring countries, namely Malaysia (17.5%), Thailand (11.4%) and India (15.1%).

b) Container Handling Cost in ASEAN Countries

Terminal handling charge (THC) consists of container handling charge and surcharge. In Indonesia, container handling charge was greatly discounted on November 2005. Nevertheless, THC is comparatively high among ASEAN countries due to costly surcharge as shown in Table 4.1.49.

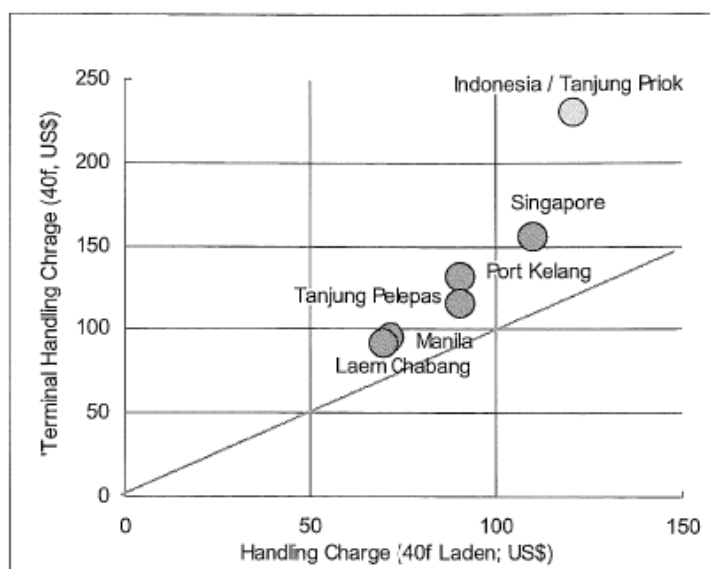
Figure 4.1.35 indicates that surcharge proportion of the Indonesian gateway Port, Tanjung Priok Port is relatively high. Container replacement and stocking in the yard or in temporary custom warehouse additionally charge shippers/consignees for surcharge, since Tanjung Priok Port yard area is inadequate.

In general, transportation cost to and from the port is generally a heavy burden to both consignees and consignors. Logistic conditions such as cost, speed and security are the most important factors for the foreign investors. In order to promote the foreign investment, which in turn result in the development of the national economy, high-performing and economical freight transportation are essential.

Table 4.1.49 Terminal Handling Charge of Asian Countries
(Unit: USD)

Country	Dry Container		Ref. Container		Document
	20'	40'	20'	40'	
Indonesia	210	280	200-210	275- 280	40
Brunei	117	174	N/A	N/A	N/A
Cambodia	77	110	100	143	17
Malaysia	170	180	121-136	185-203	25
Philippine	112	190	N/A	N/A	N/A
Singapore	150	220	150	216	35
Thailand	90	140	N/A	N/A	16
Vietnam	60	90	N/A	N/A	4

Source: ASEAN Logistic 2008



Source: OCDI Quarterly 68

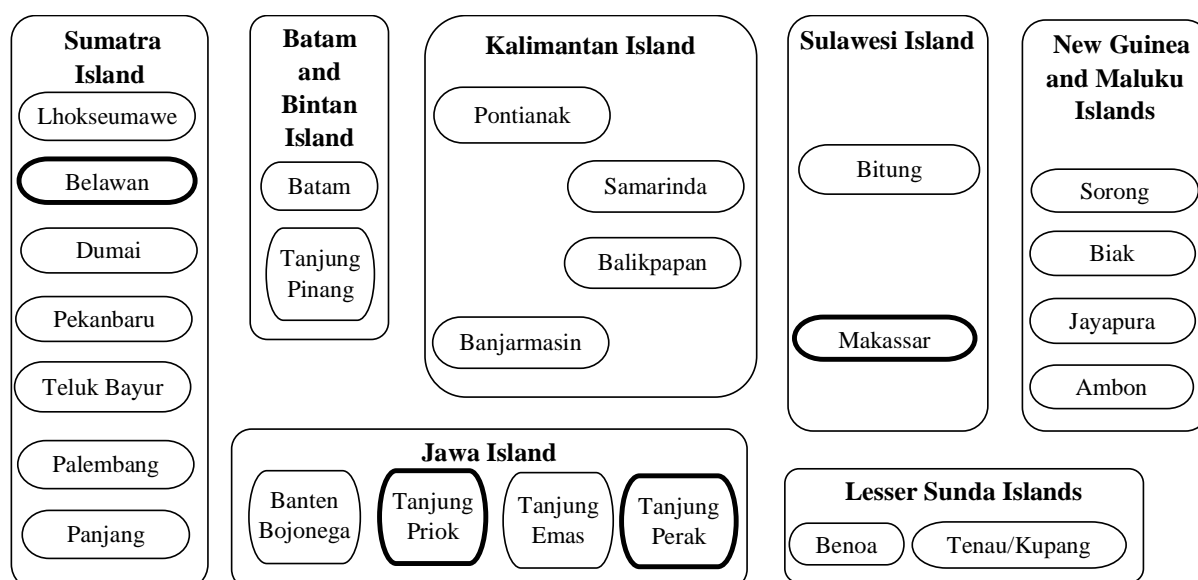
Figure 4.1.35 Interrelation between Terminal Handling Charge and Container Handling Charge of Main Ports in Asian Countries

3) Sea Transportation Sector by Island

a) Strategic Ports

There are around 2,100 ports in Indonesia which is an archipelago of over 17,000 islands stretching 5,000 km from east to west and 2,000 km from north to south. These ports are either categorized as commercial port under the control of PT Pelabuhan Indonesia, or non-commercial port under the control of Technical Operation Unit of DGST. MOT designated 25 strategic ports among the commercial ports, which support the national and regional economic activities. Furthermore, MOT designated four main ports as gateway ports for container cargoes.

Figure 4.1.36 indicates the location of strategic ports including the main ports by island, and Table 4.1.50 indicates the cargo throughput these ports. In 2008, total cargo throughput the strategic ports was 281 million tons, of which 95 million tons are for export, 32 million tons for import and 154 million tons for domestic loading and unloading.



Note) Main Port is mentioned by Bold Frame

Source: JICA Study Team

Figure 4.1.36 Location of the Strategic Ports by Island (Area)

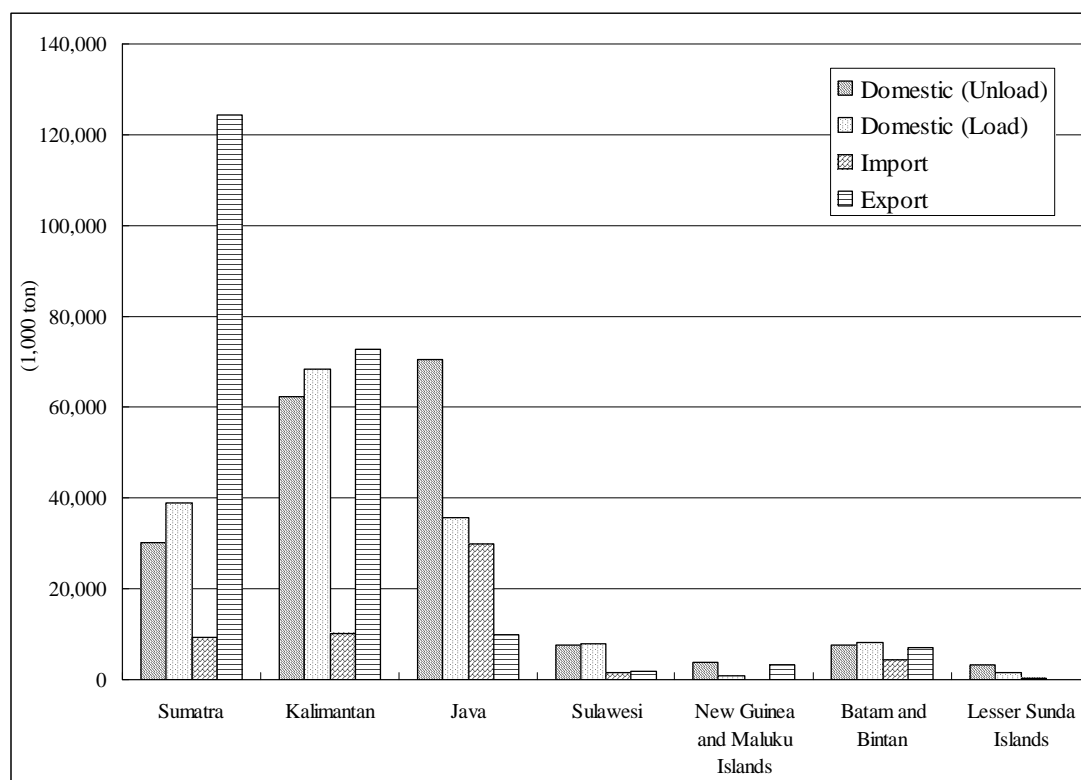
Table 4.1.50 Cargo Throughput of Strategic Ports in 2008

Island	Port (Strategic Port)	Export (Ton)	Import (Ton)	Domestic (Ton)	Total (Ton)	Container (TEU)
Sumatra	Lhokseumawe	8,291,946	147,629	328,169	8,767,744	0
	Belawan	4,789,945	1,291,582	8,586,909	14,668,436	552,907
	Dumai	12,044,060	483,822	12,306,820	24,834,702	0
	Pekanbaru	816,461	168,752	3,306,403	4,291,615	22,972
	Teluk Bayur	1,687,061	296,131	6,354,233	8,337,426	39,600
	Palembang	1,678,884	353,629	10,238,939	12,271,451	46,037
	Panjang	4,296,675	720,159	8,342,502	13,359,336	89,896
Kalimantan	Pontianak	717,570	520,755	4,162,523	5,400,849	160,163
	Samarinda	13,735,003	42,761	4,404,525	18,182,289	139,478
	Balikpapan	14,272,852	4,569,262	27,685,142	46,527,257	77,077
	Banjarmasin	19,834,249	31,085	6,195,903	26,061,237	212,848
Java	Banten	31,347	1,588,297	3,068,044	4,687,688	87,963
	Tanjung Priok	6,023,350	12,905,581	19,352,783	38,281,714	3,531,058
	Tanjung Emas	293,530	472,283	5,732,763	6,498,577	369,970
	Tanjung Perak	856,936	5,857,771	20,353,709	27,068,416	670,705
Sulawesi	Bitung	556,586	18,844	1,140,505	1,715,934	125,090
	Makassar	1,426,972	697,664	2,937,102	5,061,738	235,833
New Guinea and Maluku Islands	Sorong	76,669	5,615	612,321	694,605	15,796
	Biak	N/A				
	Jayapura	0	0	865,675	865,675	24,191
	Ambon	7,524	0	446,810	454,334	37,409
Batam and Bintan	Batam	1,134,123	2,150,028	3,980,041	7,264,192	239,977
	Tanjung Pinang	2,583,480	12,221	1,197,844	3,793,545	0
Lesser Sunda Islands	Benoa	0	0	1,002,148	1,002,148	37,508
	Kupang	385	0	874,546	874,931	19,265
(Total)		95,155,609	32,333,870	153,476,359	280,965,838	6,735,742

Source: DGST, Ministry of Transport

b) Sea-born Cargo Throughput by Island

In 2007, total cargo throughput of commercial and non-commercial ports was 620 million tons, of which 203 million tons (33%) were handled in Sumatra Island, 214 million tons (34%) in Kalimantan Island, 146 million tons (24%) in Java Island, and 58 million tons in other islands. Figure 4.1.37 shows the cargo throughput of commercial and non-commercial ports by island.

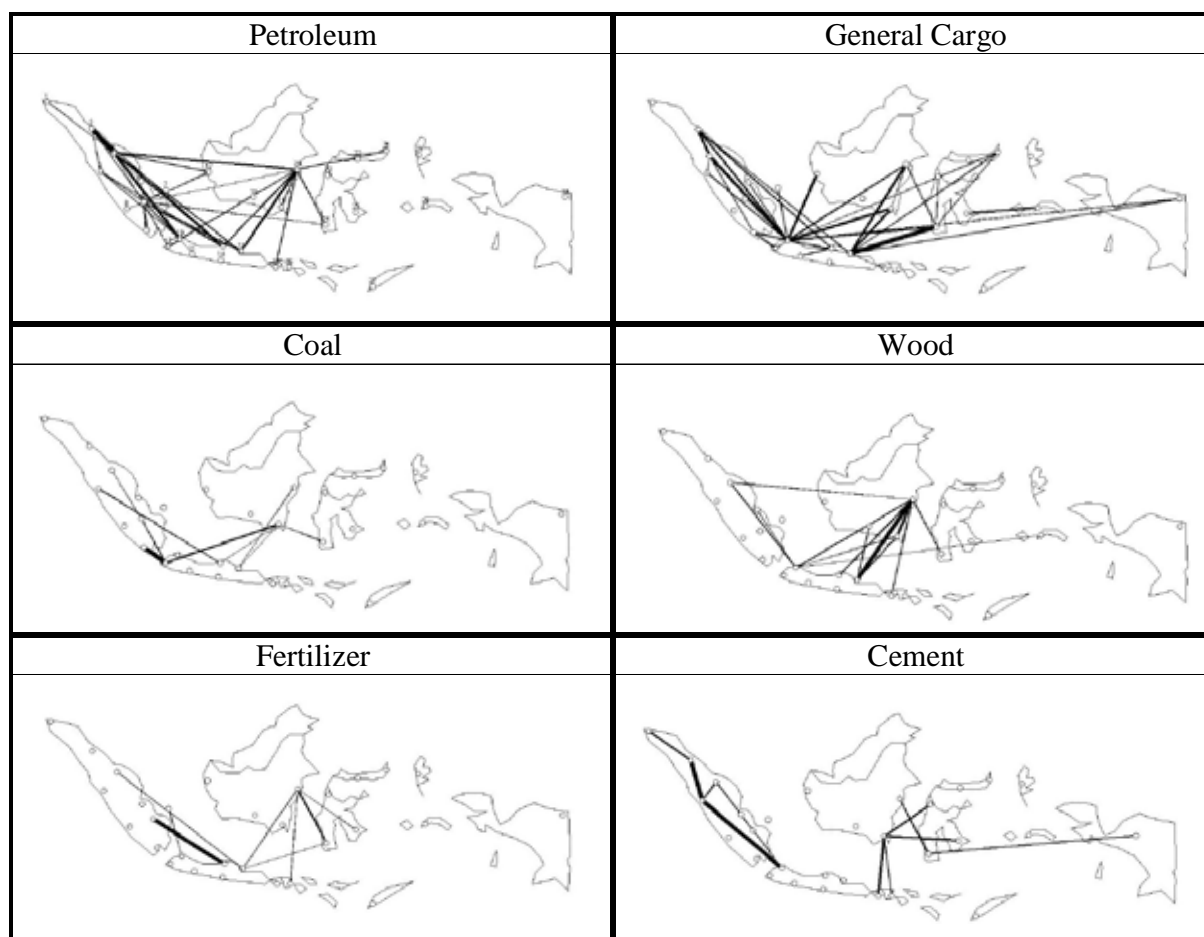


Source: Transportation and Communication Statistics 2007

Figure 4.1.37 Cargo Throughput of Commercial and Non-Commercial Ports by Island

c) Origin and Destination of Main Commodity by Sea Traffic

Domestic origin-destination flows of main commodities, namely petroleum, general cargo, coal, wood, fertilizer and cement, are shown in Figure 4.1.38. Most of the commodities, which are produced in Kalimantan and Sumatra Islands, concentrate on Java Island. Transportation between islands, excluding Java Island, is not so remarkable except for petroleum products.

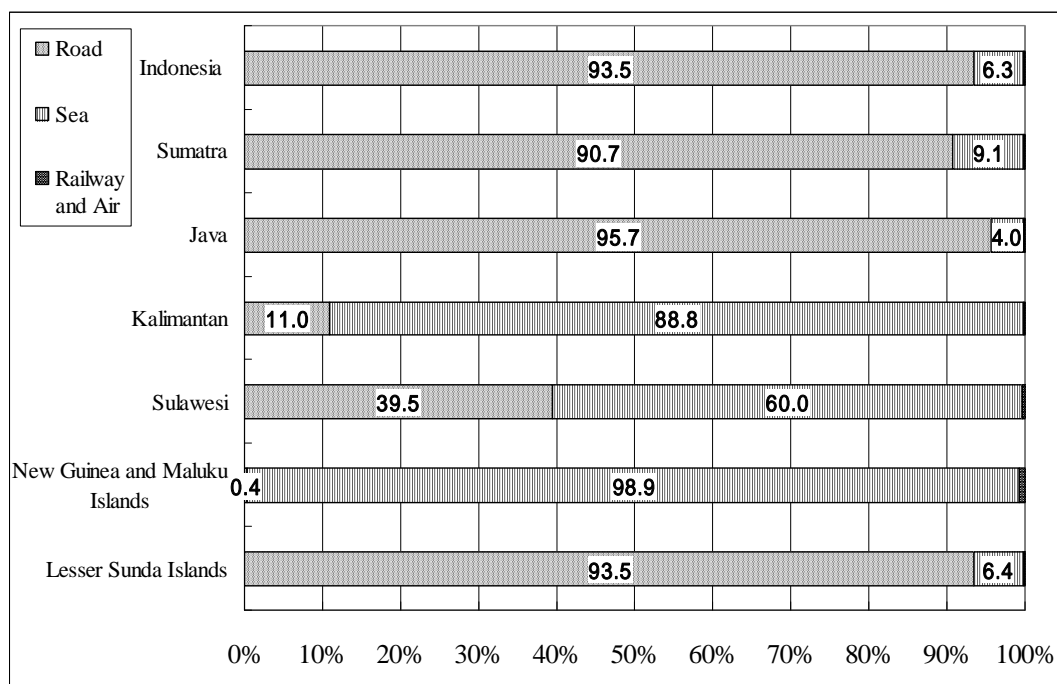


Source: STRAMINDO 2004

Figure 4.1.38 Origin and Destination Flows of Main Commodities

d) Inland Cargo Transportation Mode by Island

Cargoes have been transported by several modes, namely sea, road, railway and air. In 2006, the total inland cargo transportation was 9,176 million ton-km, of which 8,579 million ton-km (93.5%) was by road, 574 million ton-km (6.3%) by sea/river, 21 million ton-km (0.2%) by railway and 2 million ton-km (0.02%) by air. Figure 4.1.39 shows the modal share by inland transportation. In Sumatra, Java and Lesser Sunda Islands, road transportation is the major mode of transportation. On the other hand in Kalimantan, Sumatra, Papua and Maluku Islands, sea/river transportation plays an important role in place of road transportation. Sumatra and Kalimantan produce coal, which is mostly transported by river. Thus, the share of sea/river transportation is greater.



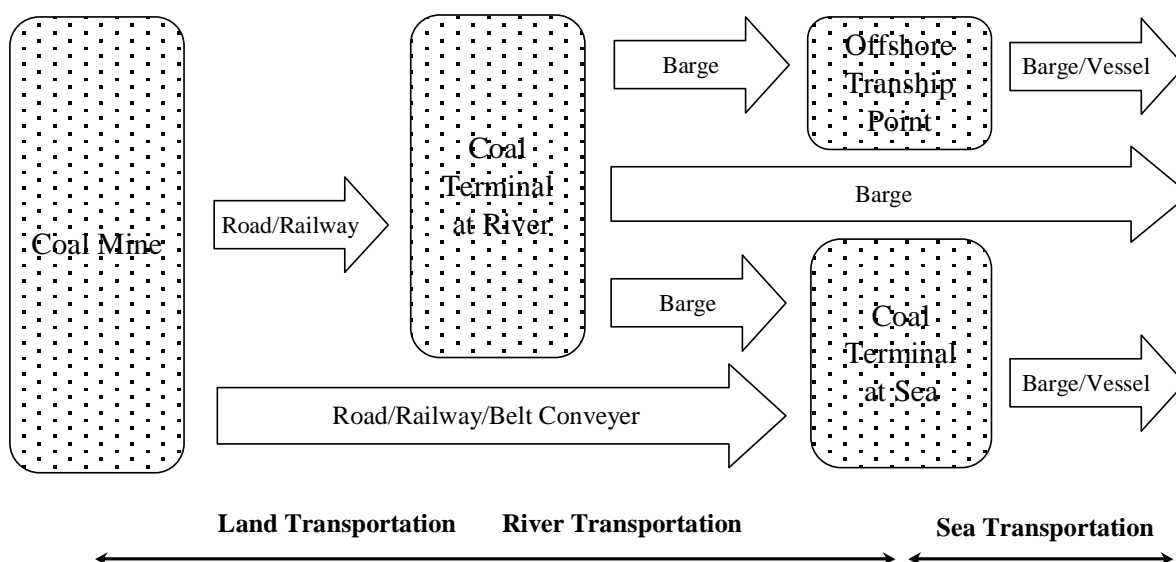
Source: BAPPENAS

Figure 4.1.39 Modal Share of Inland Cargo Transportation by Island

4) River Transportation

In 2008, coal production volume of Indonesia was 187 million tons, of which 139 million tons is for export according to the Directorate General of Geology and Mineral Resources. Mineral fuel, which is mainly composed of coal, is the vital export material in Indonesia. In 2008, it amounted to USD 10.7 billion by FOB price, and its portion in the total export amount was 7.8 %.

Most of the coal mines are located in the mountainous areas of Kalimantan and Sumatra Islands. Majority of coal companies built exclusive coal-handling terminals along the rivers, namely Barito River, Mahakam River in Kalimantan Island, and Musi River in Sumatra Island. Figure 4.1.40 indicates the coal transportation flow. Based on national conditions around the coal mines, river transportation system is the most efficient and economical transportation mode for bulk cargoes such as coal. The rivers play the most important role for coal transportation. However their width, depth and navigation system are insufficient. Improvement of the river as a canal for safety and efficient coal transportation is required to meet the increasing demand.



Source: JICA Study Team

Figure 4.1.40 Coal Transportation Flow in Kalimantan and Sumatra Islands

5) General Issues of Current Sea Transportation Sector

a) Port Development of Strategic Ports

The development strategy for the national sea transportation mentions the medium and long-term development plans for strategic ports as shown in Table 4.1.51. As to the progress of each development plan, Bitung Port, Makassar Port, Kupang Port, Dumai Port, Tanjung Priok Port, Samarinda Port and Tanjung Perak Port have completed their master plans. Batam Port and Tanjung Emas Belawan Port, meanwhile, have completed draft master plans. Other ports are in the preparation stage of their master plans.

Table 4.1.51 Medium and Long-Term Development Plan of Strategic Ports

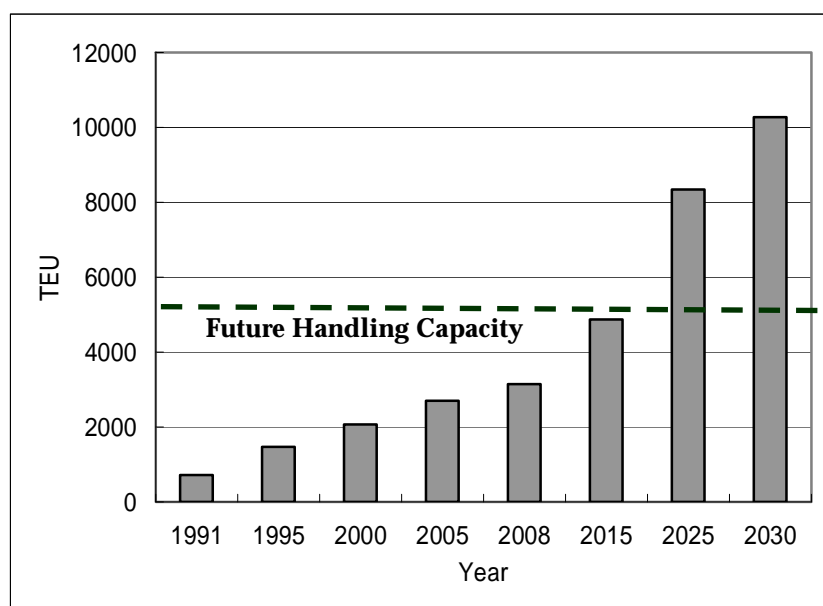
Location	Port	Medium and Long Term Development Plan	
		2005-2009	2009-2024
Sumatra	Lhokseumawe	Stay	Stay
	Belawan	Development of the berth	Development as an international hub port
	Dumai	Development after appropriate demand	Equipment of the container crane
	Pekanbaru	Development after appropriate demand	Relocation of the port
	Teluk Bayur	Development after appropriate demand	Extension of the berth up to 500m and equipment of additional crane
	Palembang	Development after appropriate demand	Development after appropriate demand
	Panjang	Equipment of crane as required and the joint use with the international terminal	Extension of the berth up to 750m
Kalimantan	Pontianak	Development after appropriate demand	Extension of the berth up to 750m
	Samarinda	Extension of the berth (837m to 2,100m)	Additional Extension of the berth up to 3,100m
	Balikpapan	Stay	Extension of container berth (590m to 750m) with a crane
	Banjarmasin	Development after appropriate demand	Development of container berth as required
Java	Banten/Bojonegar	Operation of container berth	Management by newly established body
	Tanjung Priok	Conversion of the conventional berth	Additional extension of the container berth
	Tanjung Emas	Stay	Extension of the berth up to 500m
	Tanjung Perak	Conversion of the conventional berth	Additional extension of the container berth
Sulawesi	Bitung	Preparation of an international hub port	Development as an international hub port
	Makassar	Extension of the berth (2,420m to 3,500m)	Additional Extension of the berth up to 5,300m
New Guinea and Maluku Island	Sorong	Extension of the berth (280m to 500m)	Additional Extension of the berth up to 800m
	Biak	Stay	Additional Extension of the berth up to 890m
	Jayapura	Extension of the berth (303m to 530m)	Additional extension of the berth up to 890m
	Ambon	Stay	Development of semi-container berth
Batam and Bintan	Batam	Conversion of conventional berth to container as required	Development as an international hub port (priority)
	Tanjung Pinang	Extension of the berth (540m to 800m)	Additional extension of the berth up to 1,200 m
Lesser Sunda Islands	Benoa	Stay	Stay
	Tenau/Kupang	Stay	Development as an international port

Source: Development Strategy of National Sea Transportation

b) International Gateway Port of Indonesia

Tanjung Priok Port plays an important role as the international gateway and logistics center to support economic activities, and handles container cargos of over 50% of the whole ports of Indonesia in 2008.

According to the previous JICA Study on PPP strategy for the port, container throughput capacity of Tanjung Priok Port is estimated to be around 4.1 million TEU, of which about 1.5 million TEU is for domestic cargoes under the condition that the rehabilitation project is completed. Cargo handling capacity will overflow along with the steady cargo growth in the near future as shown in Figure 4.1.41. Currently, Tanjung Priok Port has problems on the inadequacy of yard area and serious truck traffic congestion, since the port is located in an urban area. In order to meet the future cargo demands and to boost the national economy, a new container terminal development, in cooperation with the present Tanjung Priok Port, is urgently required.



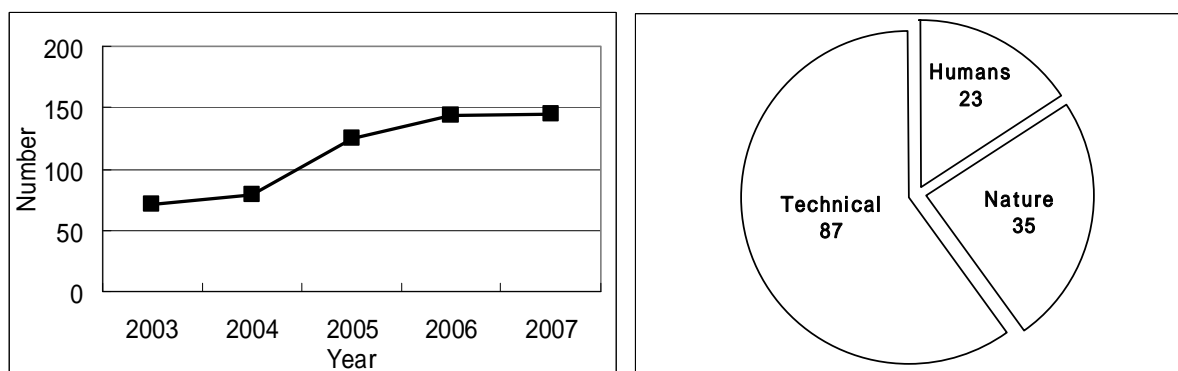
Source: JICA Study Team

Figure 4.1.41 Container Cargo Throughput Record and Forecast of Tanjung Priok Port

c) Navigation Safety and Security

The number of marine incidents has been increasing over the recent years as shown in Figure 4.1.42, with technical errors as major causes of such incidents. In order to reduce said incidents and to maintain navigational safety and security, improvement of the navigation system/facilities, technical enhancement of sailors, and maintenance of vessels are urgently required. As explained in Table 4.1.52, the navigation aids of Indonesia are insufficient as compared with Japan.

In 2006, 102 burglar incidents blamed on piracy or armed gangsters were reported in Southeast Asian waters, of which 83 occurred within Indonesian jurisdiction. Guard boats, therefore, have an important role to keep security in Indonesian waters.



Source: Ministry of Transport

Figure 4.1.42 Marine Incident (2003-2007) and Its Cause (2007)

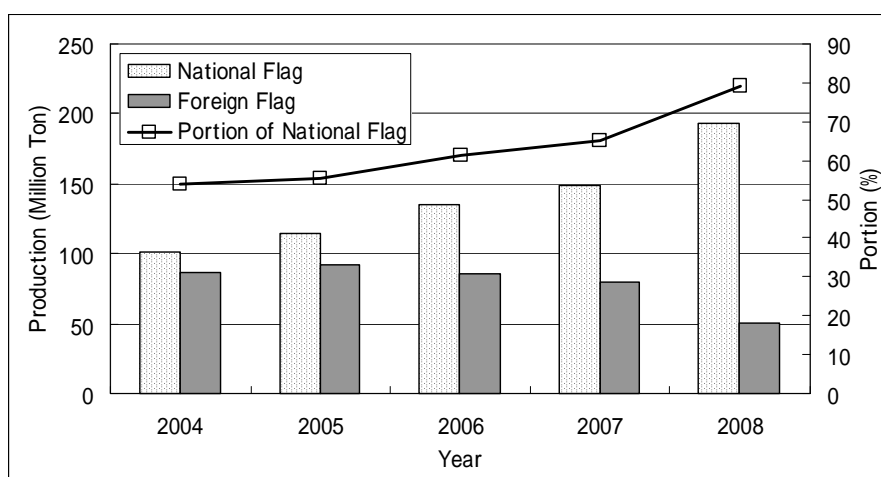
Table 4.1.52 Navigation Aids of Indonesia and Japan in 2007

Item	Indonesia	Japan
Patrol Boat	140	432
Navigation Sign	2,071	5,385
Navigation Boat	60	46
Guard Boat	565	N/A

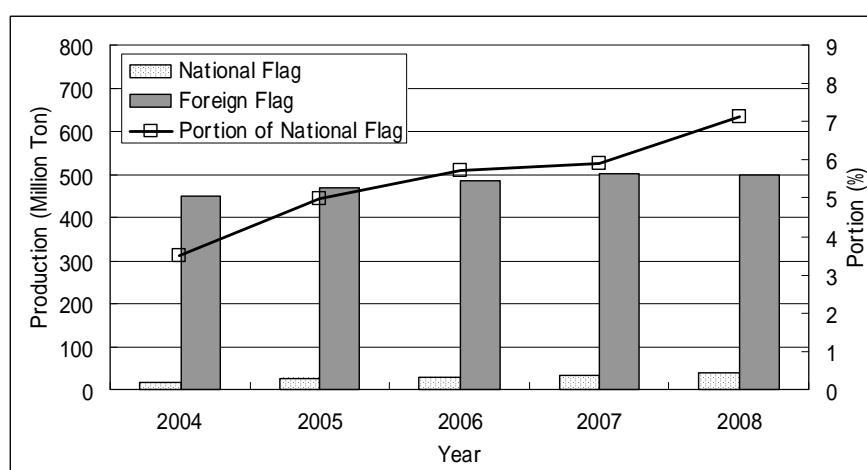
Source: Transport Sector of Indonesia (Japan Embassy)

d) National Shipping Industry

In 2008, production by national vessels in domestic transportation was 193 million ton, which is 79% of the total production. Both productions and their portions have been increasing over the recent years as shown in Figure 4.1.43. On the other hand, production by national vessels in international transportation was 38 million ton, which is 7% of the total. These have likewise been increasing over the recent years as shown in Figure 4.1.44. However, it is still considered minimal.



Source: Transportation Statistics 2008

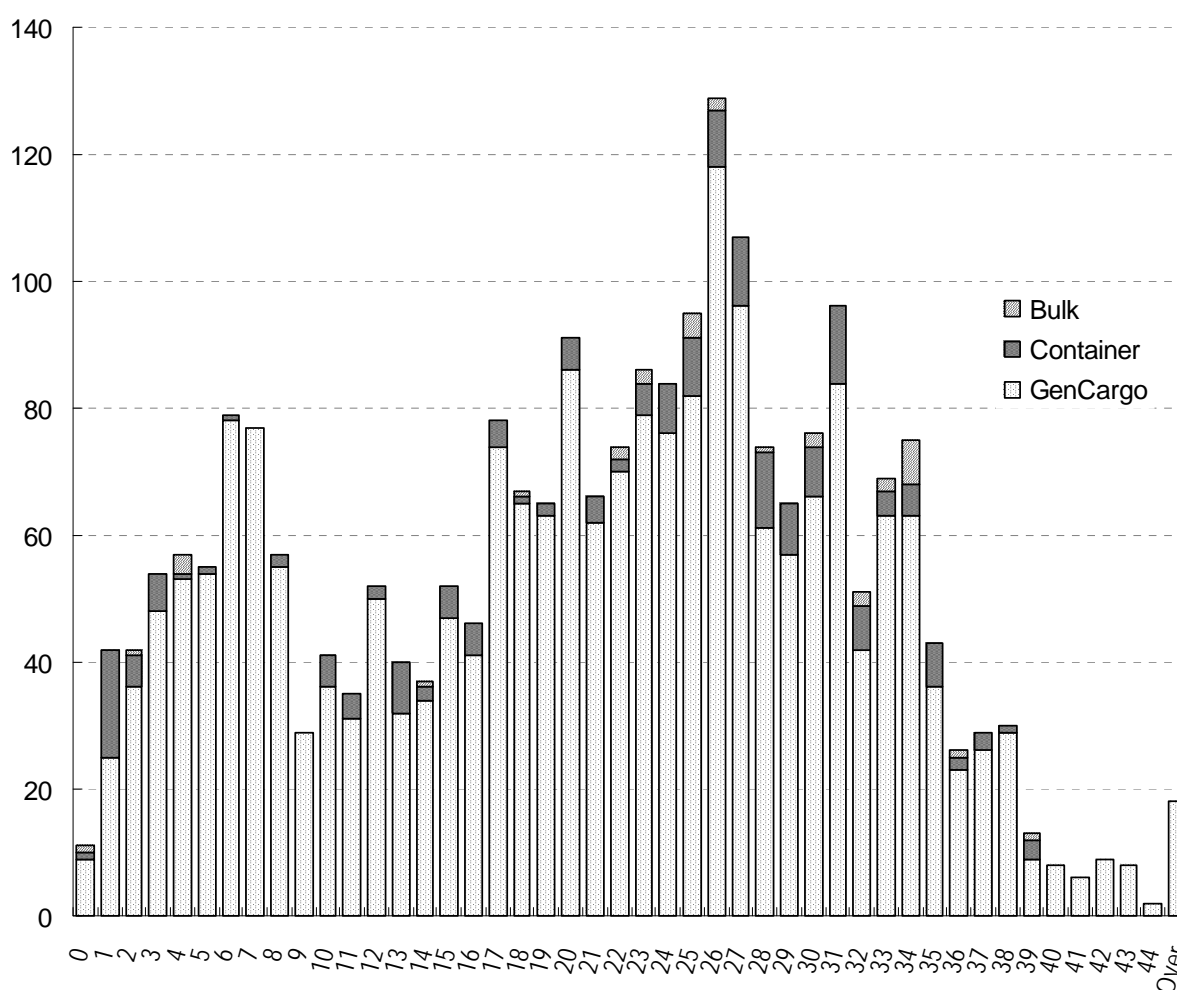
Figure 4.1.43 Production by National/Foreign Vessels in Domestic Transportation

Source: Transportation Statistics 2008

Figure 4.1.44 Production by National/Foreign Vessels in International Transportation

In 2008, the cabotage principle was implemented, which requires that all commodities such as palm oil, vegetables, and other farming products to be exclusively transported by national ships. Later in 2009, it is also expected that liquid as well as dry bulk cargos and also LNG should all be transported by national ships. Moreover, starting from 2010, coal cargos should be serviced by local ships as well. From 2011, all offshore activities are also supposed to utilize the national ships. By this gradual policy, all national commodities will be transported by national ships by 2012.

On the other hand, the number of aging Indonesian vessels is relatively high as shown in Figure 4.1.45. About 38% out of the total number of vessels already exceed the general vessel life span of 25 years, and are mostly not well-maintained. In order to reduce occurrence of marine accidents, and to meet the customer's needs, relatively newer vessels with adequate quality is required.



Source: Ministry of Transport

Figure 4.1.45 Age Distribution of Indonesian Fleet

In accordance with the President's Instruction (INPRES) No.5/2005 regarding the cabotage principle, the procurement of new vessels and used vessels which are not too old is required. To meet the demand for such requirement, domestic shipping companies, especially for small and medium scale enterprises, require available resources for financing. In this sense, the Public Ship Finance Program (PSFP) utilizing ODA funds was proposed by JICA (former JBIC) in 2007.

(4) Action Plan to Address the Issues

1) The next RPJM 2010-2014

BAPPENAS addressed the following policies and strategies to resolve the previous issues in the draft concept of the next RPJM 2010-2014:

(Sea Transportation)

- Policy

- i) Improvement of quality, service and navigation safety
- ii) Improvement of the accessibility for service in outer and remote areas.
- iii) Promoting competition and widen opportunities to private and public sectors engaged in sea transportation implementation.
- iv) Accommodating the development of multimodal carrier.
- v) Technology development and compliance with international standards.

- Strategy

- i) Building the integrated service system (single window) in ports.
- ii) Development of facilities in strategic ports.
- iii) Delegation of the management system of feeder ports under the control of local governments, in order to reduce the range of supervision and number of employees.
- iv) Development of port infrastructures under the control of province/district.

(River/Lake/Ferry Transportation)

- Policy

- i) Improvement of safety and quality of infrastructure and facilities management and transportation
- ii) Enhancement of capacity and improvement of services to keep smooth traffic
- iii) Increase in accessibility to services
- iv) Encouraging the role of the government and the private sector

2) The next RENSTRA 2010-2014

MOT addressed the following strategic program on RENSTRA 2010-2014 in consideration of said issues and current water transport conditions. Contents of the programs are:

(Sea Transportation)

- i) Development of a maritime facility in isolated areas;
- ii) Pioneer services in 19 provinces (90 lines);
- iii) Development of Belawan Medan Port and other eco ports;
- iv) Development of maritime safety facility;
- v) Improvement of maritime facility in security due to the implementation of ISPS Code;
- vi) Development of passenger ship in Central and East Indonesia;

- vii) Development of international hub port in the West and East of Indonesia;
- viii) Improvement of safety sea transportation;

(River/Lake/Ferry Transportation)

- i) Development of facility for river/lake/island crossing; and
- ii) Transportation services of pioneer crossing for 92 routes in the whole of Indonesia

3) Action Plan to Address the Issues

In order to address foregoing issues, the study team proposed the action plan based on water transportation development policy/strategy and current conditions as shown in Table 4.1.53 and Table 4.1.54.

Table 4.1.53 Action Plan on Sea Transportation Sector (including ASDP)

Issues	Action Plan
1. Strong Economic Growth	
1.1 Building Strong Backbone Infrastructure (DKI Jakarta)	
<u>Insufficient Water Transportation Service</u> 1) Insufficient port facility and equipment 2) Insufficient cargo handling capacity 3) Limited container yard 4) Insufficient service for port user	a) Improvement/expansion of port facility b) Repair/restoration of cargo handling equipment c) Development of new international gateway port d) Introduction of an effective logistic system
1.2 Upgrading Infrastructure in the Main Cities	
<u>Insufficient Water Transportation Service</u> 1) Insufficient port facility and equipment 2) Insufficient cargo handling capacity 3) Insufficient service for port user 4) Incomplete ferry network 5) Inadequate river canal facility	a) Improvement/expansion of port facility b) Renewal of cargo handling equipment c) Introduction of new or lower age vessels d) Development of ferry network e) Improvement of river canal
2. Poverty Reduction	
2.1 Provision of Basic Infrastructure Services in Depressed Areas	
<u>Regional Disparity of Water Transportation Service</u> 1) Inadequate port facility 2) Regional disparity of sea transportation network 3) Incomplete accessibility to isolated areas	a) Development/improvement of port facility b) Development of coastal shipping for isolated areas d) Plying pioneer vessels
3. General issue and Nation wide	
1) Vulnerable institution/ organization 2) Increase in maritime accident 3) Burglar incidents 4) Incomplete environment control system by port operators 5) Over-aged vessels	a) Restructuring of institutions b) Improvement of safety and security equipment c) Introduction of new safety management system d) Procurement of new or lower age vessels e) Establishment of port environment management system

Source: JICA Study Team

Table 4.1.54 Region-wise Action Plan on Sea Transportation Sector (including ASDP)

Region	1. Building Strong Backbone Infrastructure	2. Upgrading Infrastructure in the Main Cities	3. Provision of Basic Infrastructure Service in Depressed Areas
Jakarta	1) Improvement/expansion of port facility 2) Development of new international gateway port 3) Introduction of an effective logistics system	---	---
Java	---	1) Improvement/expansion of port facility 2) Development of ferry network	---
Sumatra	---	1) Improvement/expansion of port facility 2) Development of ferry network 3) Improvement of river canal	---
Kalimantan	---	1) Improvement/expansion of port facility 2) Development of ferry network 3) Improvement of river canal	---
Sulawesi	---	1) Improvement/expansion of port facility	1) Development of coastal shipping for isolated area 2) Plying pioneer vessels
Bali & Nusa Tenggara and Maluku & Papua	---	1) Improvement/expansion of port facility	1) Development of coastal shipping for isolated area 2) Plying pioneer vessels

Source: JICA Study Team

The suggested criteria for the selection of priority projects in the water transportation sub-sector are the same as that in the transportation sector. The projects should therefore focus on the following six view points:

i) To support the national economy as international gateway ports or hubs (transshipment) port

-Development of Tanjung Priok Port (Current international gateway port)

-Improvement of Tanjung Perak Port and Makassar Port (Current sub international gateway port)

-Development of Belawan Port, Batam Port and Kupang Port (Potential hub port due to strategic location)

ii) To support the regional economy as strategic ports

-Improvement of Dumai Port, Lhokseumawe Port, Pekanbaru Port, Tanjung Pinang Port, Palembang Port, Panjang Port, Pontianak Port, Teluk Bayur Port, Banten/Bojonegara

Port, Benoa Port, Tenau/Kupang Port, Tanjung Emas Port, Ambon Port, Biak, Bitung Port, Jayapura Port, Makassar Port, Samarinda Port and Sorong Port

iii) To improve the quality of ferry transportation, to keep inter-island transportation route as sea road, and to enhance the economic interchange between islands

- Improvement of Banjarmasin Port, Samarinda Port, Parepare Port, Banka Belitung Port, Pontianak Port and Banjarmasin Port

- Procurement and introduction of the pioneer vessel, and plying between main islands and isolated islands

iv) To support mining industries through transportation

- Improvement of river canal to transport mining, especially coal, products (Barito River, Mahakam River, Musi River and Other related rivers)

v) To maintain navigation safety and security

- Improvement of navigation aids and setting-up vessel

- Introduction of navigation observation and control system (Vessel traffic system, Ship reporting system)

- Procurement and retrofit of the patrol boat

- Procurement assistance for relatively newer vessels through public finance

vi) To preserve environment

- Establishment of port environment protective system

4.1.9 Evaluation of Candidate Projects in the Transportation Sector

(1) Compilation of List of the Candidate Projects for Blue Book

In the transportation sector, 138 candidate projects are identified for inclusion in the Blue Book, which are proposed projects subject to foreign assistance, as summarized in Table 4.1.55. Among them, 94 are for implementation (Project Assistance), and the rest are for technical assistance for future implementation.

Table 4.1.55 List of Candidate Projects in Transportation Sector for Blue Book

Sub-Sector	Project Assistance		Technical Assistance		Total		Share
	No.	Amount (mil. US\$)	No.	Amount (mil. US\$)	No.	Amount (mil. US\$)	
Road	45	11,666	21	114	66	11,780	42.9%
Rail	24	8,384	11	90	35	8,474	30.8%
Air	10	1,760	6	13	16	1,773	6.5%
Sea/River	15	5,404	6	39	21	5,443	19.8%
Total	94	27,214	44	256	138	27,470	100.0%

Source: JICA Study Team

Road sector shares about 43%, followed by the railway sector with about 31% in the total project cost for transportation sector. Because land transportation is still dominant for both freight and passenger transport, with more or less 90%, the investment in the transportation sector tend to be allocated to road and railway sector.

Total project cost of sea/river transportation sector shares 20% of those in the transportation sector. This is rather high if the present modal share of 8% is taken into account. This seems to reflect government policy to strengthen the relationships between islands in Indonesia.

Tables 4.1.56 through 4.1.59 show the list of candidate projects by sub-sector, namely, road, railway, air transportation and sea/river transportation.

Table 4.1.56 (1/2) Candidate Projects for Blue Book for 2010-2014 (Road Sector)

No.	Activity Name	Project Category			Project Cost (million US\$)			Recommended Agency			Project Digest	Remarks
		Region	City/State	Category	Foreign (USD)	Counter Part (USD)	Total (USD)	Line Ministr	BAPPE NAS	JST		
I. PROJECT ASSISTANCE												
RD-P01	Road Rehabilitation Project	Nation-wide	Nation-wide	Upgrading	212,540		212,540					
RD-P02	Provincial-Local Road Improvement	Nation-wide	Nation-wide	Upgrading	212,540		212,540					
RD-P03	Rural Transportation	Nation-wide	Nation-wide	Poverty Reduction	212,540		212,540					
RD-P04	Bridge Material	Nation-wide	Nation-wide	Upgrading	159,405		159,405				OK	Phase-1 & Phase-2, JICA fund
RD-P05	Regional Road	Nation-wide	Nation-wide	Poverty Reduction	212,540		212,540					
RD-P06	Solo-Kertosono Toll Road	Java	East-Java	National Backbone	106,270		106,270				OK	Original: Yogja-Solo-Kertosono / PPP
RD-P07	Serangan - Tanjung Benoa Toll Road	Bali	Denpasar	Regional Develop. / Tourism Linkage	159,405		159,405				OK	China / Korea Loan & Investment / PPP
RD-P08	Cileunyi - Sumedang - Dawuan Toll Road	Java	West Java	National Backbone / Industry Linkage	318,810		318,810				OK	China Loan / PPP scheme
RD-P09	Kendari Bridge	Sulawesi	South East Sulawesi	Regional Develop. /Access to Port	63,762		63,762				OK	China Loan / PPP scheme
RD-P10	Tayan Bridge	Kalimantan	West Kalimantan	Regional Develop. /ASEAN Highway	95,643		95,643				OK	China Loan / PPP scheme
RD-P11	Musi Bridge	Sumatra	Palembang	Urban Transport. / Bridge construction	318,810		318,810				OK	Misi I, II, III bridge together
RD-P12	Gorontalo-Djalaludin Airport Access Road	Sulawesi	Central Sulawesi	Regional Develop. / Access to Airport	21,254		21,254				OK	Korea Loan / PPP scheme
RD-P13	Pekanbaru - Kandis - Dumai Freeway	Sumatra	Riau	National Backbone / Industry Linkage	318,810		318,810					High priority in JICA PPP Study
RD-P14	Gilimanuk - Denpasar Freeway	Bali	Bali	National Backbone / Tourism Develop.	132,837		132,837					
RD-P15	Trans Sulawesi Maminasata Arterial Road	Sulawesi	Maminasata	Regional Develop.	85,016		85,016				OK	Proposed in JICA M/P
RD-P16	Medan-Kualanamu Toll Road	Sumatra	Medan	Urban Transportation	140,000		140,000				OK	Chinese Loan expected / PPP scheme
RD-P17	Bandung Intra Urban Toll Road	Java	Bandung	Urban	318,810		318,810					JICA Loan expected
RD-P18	Pasir Panajam Bridge Construction	Kalimantan	Balikpapan / East Kalimantan	Regional Develop. / Access to Port	85,016		85,016					
RD-P19	Eastern National Road Improvement Program (ENRIP)	East Indonesia	East Indonesia	Upgrading	177,864		177,864				OK	Australian Loan / Candidate for
RD-P20	Western National Road Improvement Program (WNRIP)	Java / Sumatra	Western Indonesia	Upgrading	80,000		80,000				OK	IBRD Loan
RD-P21	Selat Sunda Bridge	Java-Sumatra	Sunda Strait	National Backbone / ASEAN Highway	531,350		531,350					Expected JICA fund
RD-P22	Batam - Bintan Bridge	Sumatra	Batam-Bintan	National Backbone / Industry/tourism linkage	584,485		584,485					BPN recommended to include
RD-P23	Galala-Poka Bridge	Maluku	Ambon	Poverty Reduction	42,508		42,508					BPN request activity status
RD-P24	Papua Strategic Road Development	Papua	Papua	Poverty Reduction	1,786,822		1,786,822					Why budget is so increase?
RD-P25	Balikpapan - Samarinda Freeway	Kalimantan	East Kalimantan	Regional Develop./ ASEAN Highway	531,350		531,350					Important / PPP
RD-P26	Kualanamu - Toba Lake Freeway	Sumatra	North Sumatra	Regional Develop. / Tourism Linkage	531,350		531,350					Important / PPP
RD-P27	Manado Bypass II	Sulawesi	North Sulawesi	Regional Develop.	17,003		17,003					Korean is interested to fund / PPP Scheme
RD-P28	Bridge Construction in West Nusa Tenggara, Phase-II	East Indonesia	West Nusa Tenggara	Poverty Reduction	195,000		195,000				OK	BB 2005 / JICA Grant Aid / Candidate for
RD-P29	Padan Bypass Capacity Expansion & Duku Flyover	Sumatra	West Sumatra	Regional Develop. / Access to Airport and Port	58,000		58,000				OK	BB 2008 / Korea Fund
RD-P30	Additional Loan for Suramadu Bridge Construction Project	Java	East Java	Regional Develop. / Industrial linkage	77,000		77,000				OK	BB 2008 / Chinese Loan
RD-P31	Kalimantan Boarder Road Development Project	Kalimantan	Kalimantan	Poverty Reduction	250,000		250,000					ADB loan
RD-P32	South Java Regional Road Development Project	Java	Java	Poverty Reduction	250,000		250,000					IDB Loan
RD-P33	Metropolitan Freeways and Toll Road Project	Java	DKI Jakarta	Urban Transport	213,000		213,000					JICA loan
RD-P34	Eastern Trans Sumatra and Middle Trans Sumatra Project	Sumatra	Sumatra	Regional Develop.	200,000		200,000					ADB Fund
RD-P35	Construction of Keloks 9 bridges in West Sumatra	Sumatra	West Sumatra	Regional Develop.	39,400		39,400					JICA loan
RD-P36	Construction of South Coastal Highway Phase I in Yogyakarta	Java	Central Java	National Backbone	117,989		117,989					JICA loan
RD-P37	South and Middle Java Corridor Railway Crossing Flyover Project	Java	Central Java	Upgrading	81,818		81,818					JICA loan
RD-P38	Asset Management Loan (Road) Project	Nation-wide	Nation-wide	Upgrading	1,000,000		1,000,000					JICA loan
RD-P39	Intelligent Traffic System in Jabodetabek	Java	DKI Jakarta	Upgrading management	217,853		217,853					MOT (DGLT)
RD-P40	Intelligent Traffic System for Three Cities	Java / Sumatra	Semarang, Medan, Surabaya	Upgrading management	191,286		191,286					MOT (DGLT)
RD-P41	Tanung Priok Access Road (Phase-3)	Java	DKI Jakarta	National Backbone / Industrial linkage	318,810		318,810					MOT (DGLT)
RD-P42	Road Network in Belawan Port	Sumatra	Medan	National Backbone / Industrial linkage	53,135		53,135					MOT (DGLT)
RD-P43	Jakarta Urban Road Network Flyover Construction Project	Java	DKI Jakarta	Upgrading / managemet	300,000		300,000					
RD-P44	Pandan-Malang Toll Road	Java	East Java	Regional Develop. / Industrial linkage	184,803		184,803					JICA PPP Study
RD-P45	Sukabumi - Ciranjang - Padalaran Toll Road	Java	West Java	National Backbone/ Industrial linkage	461,079		461,079					JICA PPP Study
Total					11,665,910	0	11,665,910					

Source: JICA Study Team

Table 4.1.56 (2/2) Candidate Projects for Blue Book for 2010-2014 (Road Sector)

No.	Activity Name	Project Category			Project Cost (million US\$)			Recommended Agency			Project Digest	Remarks
		Region	City/State	Category	Foreign (USD)	Counter Part (USD)	Total (USD)	Line Ministr	BAPPE NAS	JST		
II. TECHNICAL ASSISTANCE												
RD-T01	Technical Assistance for Road Preservation Financing	Nation-wide	Nation-wide	Upgrading	3,000		3,000					
RD-T02	Bridge Replacement Project for Border Community Development in West Kalimantan	Kalimantan	West Kalimantan	Poverty Reduction	8,750		8,750				OK	JICA Grant
RD-T03	Seriously Damaged by Gigantic Earthquake, Main Bridges, Urgent Reconstruction Project in Nias Island North Sumatra Provinces	Sumatra	North Sumatra	Poverty Reduction	15,380		15,380				OK	JICA Grant
RD-T04	Road Policy Advisor	Nation-wide	Nation-wide	Upgrading	1,000		1,000				OK	JICA Expert
RD-T05	Asset Management System for Road and Bridge	Nation-wide	Nation-wide	Upgrading	1,000		1,000				OK	JICA Grant
RD-T06	Construction of Bridge in South East Sulawesi Province	Sulawesi	South East Sulawesi	Poverty Reduction	8,230		8,230				OK	JICA Grant
RD-T07	Sumatra Arterial Road Network Study	Sumatra	Sumatra	Regional Develop.	3,000		3,000				OK	Korea Grant
RD-T08	Toll Road Operation PPP Operation	Java	Java	National Backbone	1,000		1,000				OK	JICA Grant
RD-T09	Bridge Reconstruction, damages by flooding in South Sulawesi	Sulawesi	South Sulawesi	Poverty Reduction	1,000		1,000				OK	JICA Grant
RD-T10	Review of Feasibility Study and DED of Padan Bypass Phase-II	Sumatra	West Sumatra	Regional Develop.	3,000		3,000				OK	KOICA Grant
RD-T11	Feasibility Study on Gorontalo - Djalaludin Airport	Sulawesi	Central Sulawesi	Regional Develop./ Access to airport	3,000		3,000				OK	KOICA Grant
RD-T12	PPTA Regional Road Development Project	Kalimantan / Java	Nothern Kalimantan / South Java	Poverty Reduction	1,300		1,300				OK	ADB Grant
RD-T13	Study on Arterial Road Network Development Plan with Multimodal Transportation for Bali and Nusa Tenggara Timur Phase-1	Bali / East Nusa Tenggara	Bali / East Nusa Tenggara	Regional Develop. / Access to airport and ferry terminal	3,000		3,000				OK	JICA Grant
RD-T14	Private Sector Participation in Road Network Improvement	Java	DKI Jakarta	Urban transportation / Industrial linkage	3,000		3,000				OK	JICA Grant
RD-T15	The Project for Bridge Construction of South Rine Road in Nusa Tenggara Timur Phase-I	East Nusa Tenggara	East Nusa Tenggara	Poverty Reduction	13,750		13,750				OK	JICA Grant
RD-T16	The Project for Urgent Reconstruction of Main Bridge in Maluku Tengah Regency in Maluku Province	Maluku	Maluku	Upgrading	18,500		18,500				OK	JICA Grant
RD-T17	Design Preparation including Detailed Engineering Design for Selected Trans National	Nation-wide	Nation-wide	National Backbone	9,300		9,300				OK	JICA Grant
RD-T18	Technical Assistance Service on Improvement of Standard Bidding Documents for Road and Bridges in Directorate General of Highways, Ministry of Public Works	Nation-wide	Nation-wide	Upgrading	2,600		2,600				OK	JICA Grant
RD-T19	Papua Arterial Road Network Study	Papua	Papua	Regional Develop. / Mineral resource development linkage	3,000		3,000					JICA Grant
RD-T20	Technical Assistance Loan Preparation of Freeways Program Development	Nation-wide	Nation-wide	Regional Develop.	1,100		1,100					IBRD Grant
RD-T21	Bridge material supply for Development area in Sumatra	Sumatra	Sumatra	Upgrading	10,000		10,000					JICA Grant
Total					113,910	0	113,910					
Total Project Assistance					11,779,820	0	11,779,820					

Source: JICA Study Team

Table 4.1.57 Candidate Projects for Blue Book for 2010-2014 (Railway Sector)

No.	Activity Name	Project Category			Project Cost (million US\$)			Recommended Agency			Project Digest	Remarks
		Region	City/State	Category	Foreign (USD)	Counter Part (USD)	Total (USD)	Line Ministr	BAPPE NAS	JST		
I. PROJECT ASSISTANCE												
RW-P01	Railway to Soekarno Hatta Airport	Java	Jakarta	Urban transportation	120,000		120,000					Possible for PPP
RW-P02	Railway to Juanda Surabaya Airport	Java	Surabaya	Urban transportation	150,000		150,000					Possible for PPP
RW-P03	Double Track Railway Project in South Sumatra	Sumatra	S-Sumatra	Upgrading	240,000		240,000				OK	
RW-P04	Urban Railway Electrification in Bandung	Java	Bangund	Urban transportation	157,000	18,000	175,000				OK	French interested
RW-P05	Urban Railway Electrification in Surabaya	Java	Surabaya	Urban transportation	500,000		500,000				OK	French interested
RW-P06	Jakarta MRT South-North Line (Duku Atas - Lubuk Bulus)	Java	Jakarta	Urban transportation	840,000		840,000				OK	Japan interested
RW-P07	Jakarta MRT South - North Line Extension (Jakarta Kota - Duku Atas)	Java	Jakarta	Urban transportation	1,000,000		1,000,000				OK	Japan interested
PW-P08	Manggarai - Cikarang Double-double Track for Java Main Line	Java	West Java	Urban transportation	468,000		468,000				OK	JICA fund, Listed in BB 2006
RW-P09	Java South Line Double Track Project (Cirebong - Kroya)	Java	Central Java	National Backbone	306,000	54,000	360,000				OK	JICA fund
RW-P10	Java South Line Double Track Project Phase-II (Kroya - Kutoarjo)	Java	Central Java	National Backbone	226,000	40,000	266,000				OK	JICA fund expected
RW-P11	Java South Line Double Tracking and Signaling Improvement Project Phase-III (Solo - Surabaya)	Java	Central Java	National Backbone	609,000	107,000	716,000				OK	JICA fund expected
RW-P12	Java North Line Double Tracking and Signaling Improvement Project (Sumaran - Surabaya)	Java	Central Java	National Backbone	695,000	122,000	817,000				OK	JICA fund expected
RW-P13	JABODETABEK Circular Railway Line Improvement Project (Stage I)	Java	Jakarta	Urban transportation	160,000		160,000				OK	
RW-P14	Improvement of Railway Level Crossing Protection System in Java and Sumatra (Phase-I)	Java / Sumatra	Java / Sumatra	Upgrading for Safety	27,200	4,080	31,280				OK	
RW-P15	Procurement of Locomotive Diesel (30 units)	Java/Sumatra	Java /	Upgrading	129,600	14,400	144,000				OK	
RW-P16	JABODETABEK Bogor Line Capacity Expansion Project	Java	West Java	Upgrading maintenance	380,000	70,000	450,000				OK	Request to JICA
RW-P17	Procurement of Tracks Material and Turnouts	Java /	Java /	Upgrading quality	102,000	15,300	117,300				OK	Listed in BB2006
RW-P18	Development of Regional Railway System of Central Java Region (Phase-I)	Java	Central Java	Regional Develop.	200,000	50,000	250,000				OK	F/S done by JICA
RW-P19	Procurement of Railway Track Construction and Maintance Machinery (Phase-II)	Java	Java	Upgrading maintenance	65,000	9,750	74,750				OK	Listed in BB2006, Requested to KfW
RW-P20	Procurement of 24 Unit (3set) Electric Railcars	Java	DKI Jakarta	Upgrading service	37,000	0	37,000				OK	Requested JICA grant
RW-P21	Procurement of 160 Unit Electric Rail Car for JABODETABEK	Java	DKI Jakarta	Upgrading service	207,000	0	207,000					
RW-P22	Railway Bridge Rehabilitation in West Sumatra	Sumatra	West	Upgrading for	80,000		80,000					
RW-P23	Jakarta MRT East-West Line	Java	DKI Jakarta	Urban transportation	1,100,000		1,100,000					Pre-F/S done by JICA
RW-P24	Central Station Development in Dukhu Atas	Java	DKI Jakarta	Urban transportation	80,765		80,765					DGLT Project
Total					7,879,565	504,530	8,384,095					
II. TECHNICAL ASSISTANCE												
RW-T01	Jakarta MRT South-North Line Extension and East-West Line Engineering Services	Java	DKI Jakarta	Urban transportation	20,000	3,000	23,000				OK	Pre-F/S done by JICA
RW-T02	Construction of Aceh Railway Line Phase-I (Urban Railway LRT Study)	Sumatra	Ache	Regional Develop.	10,000	1,000	11,000				OK	China fund comitted
RW-T03	In-house Consultant for Indonesian Railway Development	Nation-wide	Nation-wide	Upgrading technology	8,000	2,000	10,000				OK	
RW-T04	Trans Sumatra Railway : Engineering Service	Sumatra	Sumatra	National Backbone	2,000	300	2,300				OK	F/S done by SNCF
RW-T05	Underpass / Flyover on Java Railway Main Line (Engineering Services)	Java	Java	Upgrading safety	12,000	2,000	14,000				OK	
RW-T06	The Feasibility Study for Java High Speed Train	Java	Java	National Backbone	3,500	0	3,500				OK	Pre-F/S done by JETRO
RW-T07	National Railway Master Plan Study	Java/Sumatra	Java/Sumatra	Master Plan	5,000	1,000	6,000				OK	Finance by AusAID
RW-T08	Study on JABODETABEK Railway Management Reform and Service Improvement	Java	DKI Jakarta	Management Reform	12,000	2,000	14,000				OK	
RW-T09	Reliminary Existing Railway Bridge Survey on Java South Line	Java	Central Java	Upgrading safety	1,947	689	2,635				OK	Expected JICA loan (IP-518)
RW-T10	In-house Consultant for Double-Double Track Project	Java	DKI Jakarta	Upgrading technology	40	0	40					
RW-T11	Improvement of The Railway System in the East Jakarta Industrial Region	Java	DKI Jakarta	Urban transportation / Industrial linkage	2,500	1,000	3,500				OK	Possibility of PPP
Total					76,987	12,989	89,975					
Total Project Assistance					7,956,552	517,519	8,474,071					

Source: JICA Study Team

Table 4.1.58 Candidate Projects for Blue Book for 2010-2014 (Air Transport Sector)

No.	Activity Name	Project Category			Project Cost (,000)			Recommended Agency			Project Digest	Remarks
		Region	City / State	Category	Foreign (USD)	Counter Part (USD)	Total (USD)	Line Ministry	BAPPENAS	JST		
I.	PROJECT ASSISTANCE											
AR-P01	New CNS/ATM System Development for Indonesia	Nation-wide	Nation-wide	New System Development	194,000	19,400	213,400				OK	F/S done by JICA
AR-P02	Procurement of Landing Facility	Nation-wide	Nation-wide	Upgrading	22,500	2,500	25,000				OK	Continue to request from 2006-2009 Blue book list JBIC SAPROF done.
AR-P03	Enhancement of Safety for Air link to Eastern Indonesia	Nusa Tenggara, Maluku		Upgrading	42,000	8,000	50,000				OK	French interested
AR-P04	Airport Development for Disaster Measure and Border Region Development	Nation-wide	Nation-wide	Poverty Reduction	140,000	18,200	158,200				OK	Continue to request from 2006-2009 Blue book list.
AR-P05	Development of Airport in Papua	Papua	Wamena, Sorong, Manokwari, Jayapura, Merauke	Poverty Reduction	196,040	84,017	280,057				OK	
AR-P06	Procurement and Installation of Security Equipment	Nation-wide	Nation-wide	Upgrading	14,337		14,337					Continue to request from 2006-2009 Blue book list.
AR-P07	Implementation of Indonesia National Aeronautical Information System Centre (NASC) Phase II	Nation-wide	Nation-wide	Upgrading	7,200		7,200				OK	Ministry consider to budget allocation to APBN.
AR-P08	Procurement of Airport Rescue and Fire Fighting Equipment	Nation-wide	Nation-wide	Upgrading	28,700	3,000	31,700				OK	Requested in 2006-2011 Blue book list.
AR-P09	Procurement of aircraft for Pioneer Flight	Nation-wide, maily Nusa Tenggara, Maluku		Support Remote area	480,000		480,000				OK	Requested in 2006-2012 Blue book list.
AR-P10	Multiple Airport Development for Jakarta Metropolitan Area	Java	Jakarta	National Backbone	500,000		500,000					
Total					1,624,777	135,117	1,759,894					
II.	TECHNICAL ASSISTANCE											
AP-T01	Restructuring and Regulatory Reform for Civil Aviation Authority Technical Assistance	Nation-wide	Nation-wide	Management reform	341		341				OK	USTDA interested
AP-T02	Project for Improvement Aviation Safety Policy	Nation-wide	Nation-wide	Upgrading safety	3,300		3,300				OK	JICA interested and Implementation project is on process.
AP-T03	The Master Plan Study on the Multiple-Airport Development for Jakarta Metropolitan Area	Java	Jakarta	National Backbone	2,000		2,000				OK	JICA interested and Implementation project is on process.
AP-T04	Enhancement of Inspector Competencies in	Nation-wide	Nation-wide	Upgrading safety	5,000		5,000				OK	
AP-T05	Air Navigation Blue Print Development	Nation-wide	Nation-wide	Upgrading technology	400		400				OK	Australia interested
AP-T06	Project for Introduction of Environmental Friendly Airport (Eco-Airport)	Nation-wide	Nation-wide	Upgrading quality	2,400		2,400				OK	Continue to request from 2006-2009 Blue book list.
Total					13,441	0	13,441					
Total Project Assistance					1,638,218	135,117	1,773,335					

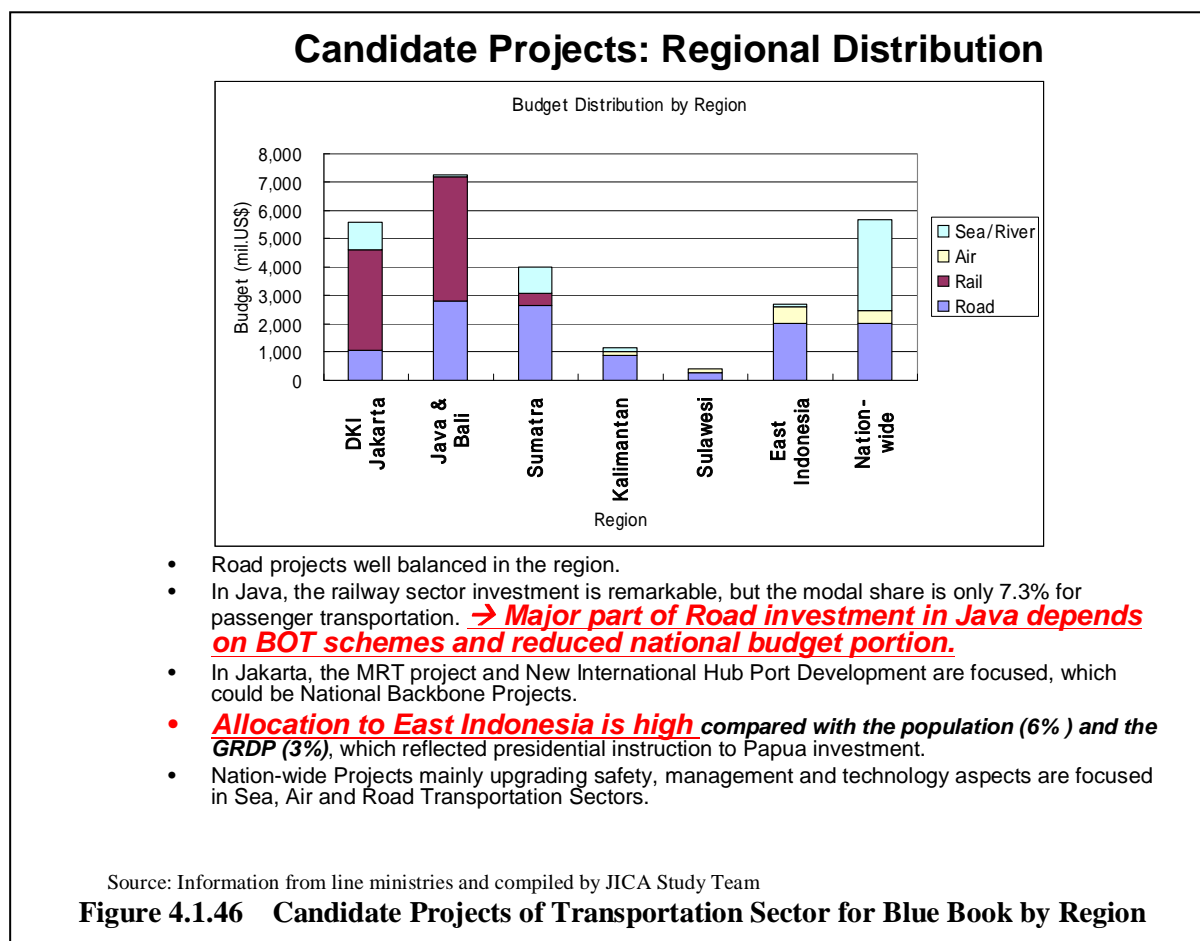
Source: JICA Study Team

Table 4.1.59 Candidate Projects for Blue Book for 2010-2014 (Sea/River Transport Sector)

No.	Activity Name	Project Category			Project Cost (,000)			Recommended Agency			Project Digest	Remarks
		Region	City / State	Category	Foreign (USD)	Counter Part (USD)	Total (USD)	Line Ministry	BAPP ENAS	JST		
I.	PROJECT ASSISTANCE											
SE-P01	Improvement and Development of Indonesia Aids to Navigation	Nation-wide	Nation-wide	Upgrading safety	22,800	8,400	31,200					
SE-P02	Indonesian Ship Reporting System	Nation-wide	Nation-wide	Upgrading management	17,504	2,891	20,395					
SE-P03	Procurement of Special Vessel for Navigation Aids	Nation-wide	Nation-wide	Upgrading safety and operation	107,317	5,973	113,290					
SE-P04	Development of Jayapura Port Facilities	Papua	Papua	Regional Develop.	14,790	2,610	17,400					
SE-P05	Vessel Traffic Services System	Nation-wide	Nation-wide	Upgrading safety	60,853	6,788	67,641					
SE-P06	Indonesia Coast Guard Patrol Boats Retrofit	Sumatra	Malacca St.	Upgrading safety	39,780	7,020	46,800					
SE-P07	Procurement of Patrol Boat to Enhance Maritime Safety (Class II)	Sumatra	Malacca St.	Upgrading safety	120,000	0	120,000					
SE-P08	Public Ship Finance for Development of Domestic Ship Industry (Phase I)	Nation-wide	Nation-wide	Upgrading technology / management	300,000	0	300,000					
SE-P09	Procurement of Passenger Vessel and Pioneer Ship	Nation-wide	Nation-wide	Poverty Reduction	1,089,267	N/A	1,089,267					
SE-P10	Development of Strategic and Local Ports (some port will be selected among 29 listed ports)	Nation-wide	Main City	Regional Develop.	1,588,735	N/A	1,588,735					
SE-P11	Improvement of River Transportation (Musi River, Ciliwung River, Kapuas River, Barito River, Mambano River)	Sumatra / Kalimantan	Sumatra / Kalimantan	Regional Develop.	170,032	N/A	170,032					
SE-P12	Development of Ferry Port (Surabaya-Banjarmasin, Samarinda-Parepare, Banka Belitung-Pontianak, Banjarmasin, Papua)	Java / Sumatra / Kalimantan /	Main City	Regional Develop.	239,107	N/A	239,107					
SE-P13	Development of International Hub Port in Greater Jakarta Metropolitan	Java	DKI Jakarta	National Backbone/ Domestic Hub Port	800,000	200,000	1,000,000					
SE-P14	Development of Batam Port	Sumatra	Batam	National Backbone / International Hub	300,000	N/A	300,000					
SE-P15	Development of Dumai Port (III)	Sumatra	Riau	Development / Upgrade	300,000	N/A	300,000					
Total					5,170,185	233,682	5,403,867					
II.	TECHNICAL ASSISTANCE											
SE-T01	Master Plan for Strategic Development of Ports at West Coast of Sumatra	Sumatra	West Sumatra	Regional Develop.	7,000	0	7,000					
SE-T02	Standardization for Development of Environment Protective System in Ports in	Nation-wide	Nation-wide	Upgrading quality	7,000	0	7,000					
SE-T03	Development Study on Upgrading Sea Trade in Greater Jakarta Metropolitan	Java	DKI Jakarta		7,000	0	7,000					
SE-T04	Study on Urgent Improvement of Surabaya Metropolitan Port				7,000	0	7,000					
SE-T05	Master Plan for Indonesian Port				5,313	0	5,313					
SE-T06	Master Plan for Ferry Port Network				5,313	0	5,313					
Total					38,627	0	38,627					
Total Project Assistance					5,208,812	233,682	5,442,494					

Source: JICA Study Team

Figure 4.1.46 shows the regional distribution of candidate projects.



For the road sector, project distribution is well balanced in the whole of Indonesia. The allocation to Sumatra is the highest, which is targeting to support industrial development by establishing direct linkage between the production areas and the port/airport, for strengthening the logistics. The remarkable allocation to East Indonesia, particularly to Papua is proposed by BAPPENAS in accordance with the presidential instruction for Papua development. Prior to the intensive investment for road networks however, the integrated regional development plan for the Papua Region should be formulated for effective and efficient infrastructure development.

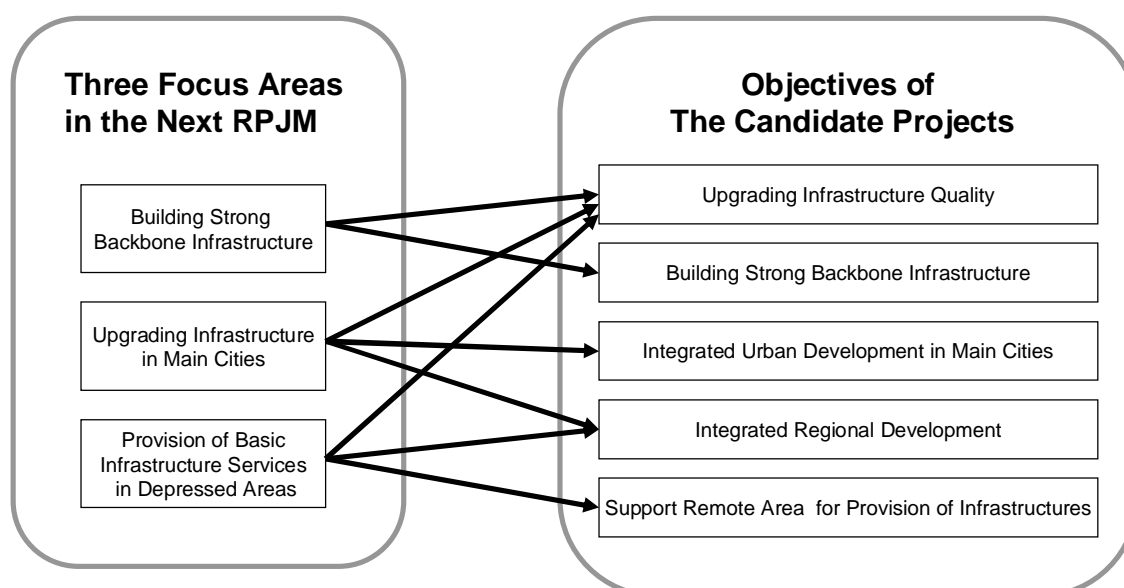
In DKI Jakarta and Java, railway investment is remarkable. Modal shift to public transportation will be accelerated in the next five years with the construction of the Mass Rapid Transit (MRT) network, airport access railway, modernization and improvement of JABODETABEK Railway, and monorail system in addition to the existing BRT system in DKI Jakarta. Said modal shift will not be limited in DKI Jakarta but will be extended to Surabaya, Bandung and Semarang in the future.

Transportation investment for Java is also the same as the characteristics of DKI Jakarta, considering that the railway sector investment is higher than that of the road investment. The main reason is that huge investment for double tracking and electrification projects for the Java South and North lines

continues to strengthen the railway capacity in the whole of Java Island. Another factor is that Trans-Java Highway Corridor mainly is expected for implementation under the BOT scheme, and that most of the project cost depends on private investment, which is not included in the figure above. On the other hand, the toll road projects under BOT schemes are generally not progressing well and seriously delayed for implementation mainly due to difficulties in land acquisition and financial arrangement. GOI is currently reviewing the BOT scheme of the toll road including further participation of the government in terms of land acquisition and financial assistance, to change from BOT to Public Private Partnership (PPP) scheme.

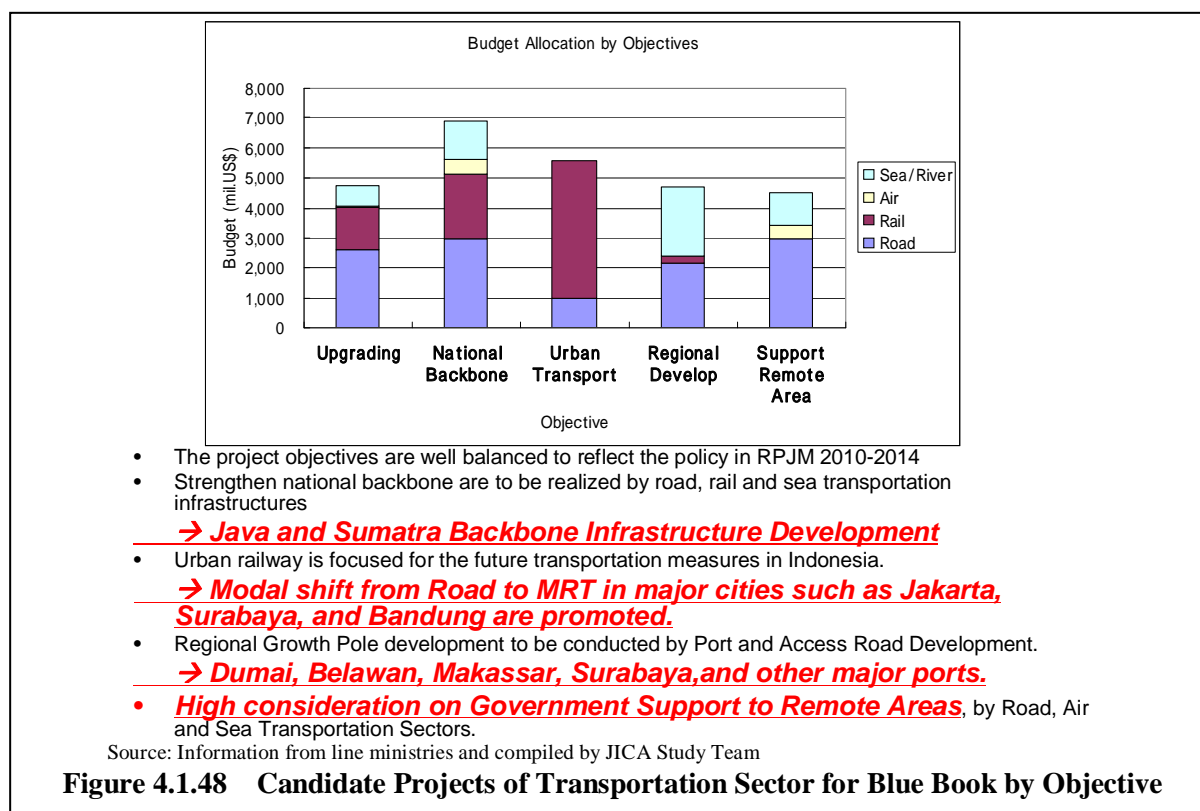
Apart from the fact that road investment in Indonesia is highly dependent on private investors, government investment on the railway sector is still remarkable in Java. This is highly related to the future vision of the Java Regional Development, that **Java could be developed with more high-tech industries, finance, business and commercial center similar to Megalopolis**. The Megalopolis is a region with two or more mega cities interconnected together, forming one big urban area, such as BOSWOSH (Boston (5.9 million) – Hartford (1.2 million)– New York (18.8 million) – Philadelphia (5.6 million) – Baltimore(2.5 million) – Washington D.C (4.8 million), Taiheiyo Belt Megalopolis of Japan. The **“Java Megalopolis”** could be realized by strong corridors of highway and high speed rail along Jakarta – Bekasi – Karawang –Cirebon – Semarang – Surabaya and forming a big urban area, which was nominated as one of the candidate projects for the next blue book as technical assistance project.

The candidate projects of the transportation sector are also categorized according to project objectives. In this chapter, the project objectives are classified into five categories, which are highly related to the three focus areas, namely, i) building strong backbone infrastructure, ii) upgrading infrastructures in the main cities, and iii) provision of basic infrastructure services in the depressed areas.



Source: JICA Study Team

Figure 4.1.47 Relationship between the Three Focus Areas and Project Objectives



For upgrading the existing infrastructures, service capacity, safety aspects, service quality, and so on, constant investment is essential. Around 20% of the budget would be allocated for the maintenance and upgrading of the existing infrastructures. Particularly, high share of road sector is observed, as the current service quality of existing infrastructure is rather poor.

For infrastructure to strengthen national backbone, road, rail and port development are mainly proposed. For the road network development, trans-Java and Sumatra Highway, double tracking and signaling of Java South Line, the new port development at Jakarta and Batam are included as components. In view of the national development corridor and the future participation to global economic corridor, the nominated projects for building strong national backbone development would be reasonable.

For the improvement of urban transportation condition, rail-based MRT system projects are the major components. In addition, improvement of road network such as flyover construction, ring-road development and intra-urban highway development are necessary and hence, nominated as candidate projects.

For regional growth poles development in each region, port development and access road network projects are mainly proposed, as pointed out in Sub section 4.1.3 of this report.

High consideration of government support to remote area development is made in the proposed candidate list. Particularly, project formulation in Papua and the accumulated high share of around 20% is vital for the road, port and airport sectors.

(2) Setting Evaluation Criteria

The collected project information was well-assessed by the JICA Study Team and evaluated for suitability of those nominated in the Blue Book, based on the following evaluation criteria:

- Consistency with the national development policy and strategy of RPJM 2010-2014
- Suitability of regional and sector development policy and strategy,
- Economic viability of the candidate projects
- Urgency of the Project,
- Possibility of project implementation
- Appropriateness for international cooperation

Among the above evaluation criteria, the first criteria, “Consistency with the national development policy and strategy described in RPJM 2010-2014” is the most important and candidate projects should be pre-evaluated in this aspect prior to performing the detailed assessment. In case the nominated projects are not in compliance with the RPJM 2010-2014, said project should not be included in the Blue Book.

(3) First Evaluation: Consistency with the National Development Plan

All the candidate projects were initially assessed based on the development policy and strategies on transportation sector under RPJM 2010-2014. The transportation development strategies and direction of development policy are as follows:

Table 4.1.60 Strategy and Development Policy of Transportation Sector in RPJM 2010-2014

No.	Strategy	Direction of Development Policy
1	Improvement of the facility and infrastructure standards comply with minimum services standards	
1		Reducing the maintenance backlog of transportation infrastructure and facilities
2		Improving the condition of road infrastructure services in accordance with minimum service standards
3		Improving safety and quality of transport services
4		Enhance the professionalism of transportation human resources
5		Support the development of sustainable transportation in the context of mitigation and adaptation to climate change
6		Improvement of urban public transport management
7		Increasing the capacity and speed of the early acts of search and rescue victims of accidents and disasters
2	Support the improvement of real sector competitiveness	
8		Improve the quality and capacity of transport services to support the smooth distribution of goods and services and to support the development of tourism areas and centers of agricultural and industrial

		production
	9	Encouraging efficient transportation of goods and passengers
	10	Improve transport services strategy more competitive in between-mode and among-mode
	11	Improve fluency, capacity and service quality in the cross and corridors that have been saturated and the continuity of the severed land transportation in the island (rivers and lakes) and inter-island with a point-to-point services
	12	Developing public transport in urban mass affordable and efficient rail-based in the metropolitan area
	13	Technological developments and meet the international conditions
3	Improve the Government and Private Partnership	
	14	Encourage private sector's role in the transportation sector through institutional reforms and legislation that enables the provision of infrastructure
	15	Encourage cooperation and capacity building of central and local governments in planning, preparing and conducting transactions of KPS projects
	16	Bundling and unbundling KPS transportation projects and provide support and feasibility facilities for more interesting projects for the private sector

Among the above three strategies of the transportation sector, “Improve the Government and Private Partnership” is focused on institutional and capacity development aspects of the government administration as well as legal set-up matters. The three development strategy sub-items 14 to 16 above are not directly related to the candidate projects. Therefore, the development policies under this strategy are not considered as the criteria for evaluation of the candidate projects, whether or not the candidate project complies with the national development policy and strategy mentioned in RPJM 2010-2014.

The evaluation results are compiled in the following tables:

Table 4.1.61 Evaluation Results for Compliance to National Development Strategies for Transportation Sector in RPJM 2010-2014 (Road Sector)

				Road Sector																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
				RD-P01	RD-P02	RD-P03	RD-P04	RD-P05	RD-P06	RD-P07	RD-P08	RD-P09	RD-P10	RD-P11	RD-P12	RD-P13	RD-P14	RD-P15	RD-P16	RD-P17	RD-P18	RD-P19	RD-P20	RD-P21	RD-P22	RD-P23	RD-P24	RD-P25	RD-P26	RD-P27	RD-P28	RD-P29	RD-P30	RD-P31	RD-P32	RD-P33	RD-P34	RD-P35	RD-P36	RD-P37	RD-P38	RD-P39	RD-P40	RD-P41	RD-P42	RD-P43	RD-P44	RD-P45																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
				Road Rehabilitation Project	Provincial Local Road Improvement	Rural Transportation	Bridge Materiel	Regional Road	Solo-Kertosono Toll Road	Serangan - Tanjung Benoa Toll Road	Oleunyi - Sumedang Dawuan Toll Road	Kendari Bridge	Tayan Bridge	Mali Bridge	Gorontalo-Djalauldin Airport Access Road	Pekanbaru - Kancis Durnal Freeway	Gilmanuk - Denpasar Freeway	Trans Sulawesi Mammasata Arterial Road	Medan-Kualananu Toll Road	Bandung Intra Urban Toll Road	Pasir Panajam Bridge Construction	Eastern National Road Improvement Program (ENRIP)	Western National Road Improvement Program (WNRIP)	Selat Sunda Bridge	Batam-Bintan Bridge	Galala-Poka Bridge	Papua Strategic Road Development	Balikpapan - Samarinda Freeway	Kualimaru - Tobu Lake Freeway	Menado Bypass II	Bridge Construction in West Nusa Tenggara, Phase-II	Padan Bypass Capacity Expansion	Additional Loan for Suramadu Bridge Construction Project	Kalimantan Boarder Road Development Project	South Java Regional Road Development Project	Metropolitan Freeways and Toll Road Project	Eastern Trans Sumatra and Middle Trans Sumatra Project	Construction of Kelola 9 bridges in West Sumatra	Construction of South Coastal Highway Phase-I in Yogyakarta	South and Middle Java Corridor Railway Crossing Flyover Project	Asset Management Loan (Road) Project	Intelligent Traffic System in Jabodetabek	Intelligent Traffic System for Three Cities	Tanjung Priok Access Road (Phase-3)	Road Network in Belawan Port	Jakarta Urban Road Network Flyover Construction Project	Pandan - Maling Toll Road	Sukabumi - Cianjur - Padalarang Toll Road																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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Remarks:

- : Fully matched with the Development
- : Partially matched with the Development Policy
- x : not pached with the development policy
- : not related to the development policy

(Railway, Air Transport, Sea/River Transport Sectors)

Remarks:

- : Fully matched with the Development
- : Partially matched with the Development Policy
- × : not pached with the development policy
- : not related to the development policy

(4) Second Evaluation: Scoring and Characteristics of Candidate Projects

After the preliminary evaluation of the candidate projects, whether it complies with the national development policy and strategy or not, the detailed assessment of the candidate projects was conducted. The assessment was made on five viewpoints mentioned in (2) above. These are 1) compliance to regional and sector development policy and strategies, 2) economic viability, 3) urgency of the project, 4) implementability, and 5) appropriateness for international cooperation.

The detailed items of evaluation, evaluation weight and scoring criteria presented as category are summarized in Table 4.1.64.

For the detailed evaluation, five major categories are defined taking into account the appropriateness of the candidate projects for inclusion in the Blue Book. These categories are similar to the five viewpoints stated above. The evaluation weight is compared for each category and determined by JICA Study team, as follows:

Table 4.1.63 Selected Category and Evaluation Weight

No.	Category	Weight	Remarks
1	Compliance to regional and sector development policy	27%	Considered as the most important criterion being the ultimate goal of the project to attain the objectives of RPJM.
2	Economic viability	25%	The national target of GDP growth for the next five years is 6-7%. The projects with high EIRR shall be prioritized for effective economic growth.
3	Urgency of the project	5%	This criterion is set rather low as the urgency of the projects is already considered in the economic viability.
4	Implementability of the Project	20%	Implementability of the project is very important to avoid the implementation delays, which might seriously affect the sustainable economic growth in the country.
5	Appropriateness for international cooperation	23%	Those projects which need foreign assistance such as those involving high technologies and transfer of technology, also considers foreign investment as essential for the implementation.

In accordance with the evaluation criteria set in the previous section, all the transportation projects were evaluated by JICA Study Team. The result is compiled in Table 4.1.65 and shown visually in Figure 4.1.50.

Table 4.1.64 Evaluation Items, Weight and Scoring Criteria for the Project Evaluation for Transportation Sector

					Point					
No.	Category		Evaluation Items	Weight	Material	1	2	3	4	5
1	Fitness of Regional and Sector Development Policy and Strategy	27%	1 Regional Development Plan	15%	RPJM2010-2014 (Book 3)	Opposite concept against RPJM 2010-2014	Between 1 and 3	Not specified in the RPJM but considered as the same concept.	Between 3 and 5	Fully Match with the General Concept
			2 Sector Development Plan	12%	RENSTRA	Opposite concept against RENSTRA	Between 1 and 3	Not specified in the RENSTRA but considered as the same concept.	Between 3 and 5	Fully Match with the General Concept of RENSTRA
			Sub-Total							
2	Economic Viability	25%	1 Indicative EIRR (*1)	7%	Views by JST	Negative New project in remote area	0% - 10% New project in semi-urban area	10%-15% New Project in urban area Rehabilitation / extension project in semi-urban area	15%-20% Rehabilitation / extension Project in urban area	More than 20% Direct linkage with New Industrial projects
			2 Number of	3%	Views by JST	Less than 100,000	100,000 - 1,000,000	Around 1 million	1 - 10 million	More than 10 million
			3 Benefit on Low Income People	5%	Views by JST	Less benefit for low income people	Target beneficially is not specified by Income level	Target beneficially is to middle - low income people	Main beneficially is low income level.	Target beneficially is to low income people
			4 Synergetic Effect with other sectors	10%	Views by JST	Not expected	Between 1 and 3	Expected but so far difficult to be list up and not sure.	Between 3 and 5	Highly expected to stimulate other sector development
			Sub-Total							
3	Urgency of the Project	5%	1 Present Demand - Supply Balance	5%	Views by JST	The difficit is not very serious and some alternative is considerable.	The difficit is not very serious within the 10 years.	Needed within 5-10 years, and the issue is very serious for the people	Needed within 3-5 years, and the issue is very serious for the people	Urgently needed within 3 years, and the issue is very serious for the people.
			Sub Total							
4	Implementability	20%	1 Number of PAP / Social Impact	7%	Views by JST	PAP is more than 1,000 and opposition by local government is expected.	PAP is more than 1,000 and opposition by local people / NGO is expected. (LG: positive)	PAP is 100 - 1,000. LG:Positive, but opposition by PAP/NGO is expected.	PAP is 100-1,000 LG: Positive, PAP/NGO: not strongly opposed.	PAP is less than 100
			2 Difficulty of EIA	3%	Views by JST	The project area is located in natural reserve / sensitive area, and Negative Impact will be	EIA is not carried out and the project area is expected within reserve/sensitive area.	EIA is not carried out but no signifiant negative effect is expected.	EIA on-going / completed	EIA completed / approved
			3 Capacity of Executing Agency	3%	Views by JST	Executing agency is primitive and not willing to take responsibility for implementation.	The agency is newly established and no experiences but strong will for implementation and responsibility	Enough experiences. But not strong will for the implementation with responsibility	Similar experiences but the first experiences to tackle the Project. Strong will for the implementation.	Well experienced to implement the similar projects, and strong will for the implementation.
			4 Maturity of the Project	7%	Views by JST	M/P should be formulated before F/S.	F/S will be needed to implement the project.	F/S ready but no EIA / RAP.	F/S and EIA ready but look for finance	F/S, EIA, Finance Ready
			Sub Total							
5	Appropriateness for International Cooperation	23%	1 Technical Difficulty	15%	Views by JST	No high technology / management capability is required.	between 1 and 3	Possible to implement locally, but better to introduce foreign technology in the view of	between 3 and 5	High Technologies / management Knowhow from the developed coutries are essential to
			2 Possibility on Private Finance	5%	Views by JST	No chance for Private investment and all the construction, O&M cost to be paid by government	Between 1 and 3	Basically Government Investment is suitable, but possible for franchise contract for O&M.	Suitable PPP scheme, with around 50% investment from government, with risk sharing.	High FIRR is expected by private investment, with minor government Investment.
			3 Accessibility by Foreign Experts	3%	Views by JST	Should be done by local expert due to cultural / social difficulties.	Foreign experts are not welcome as the site is not safe for public peace.	No problem to participate by foreing expert but JV with local entity is essential because of language and cultural issues.	No problem to participate by foreing expert in the view of safety, political & social aspects.	Positive to participate by foreign expert, in the view of safety, political & social aspects.also Transfer of technology is highly expected.
			Sub Total							

100%

Note: (*1): For the project for establishment of safety management system, EIRR is not suitable to estimate, and JST tentatively judged as point "5" in this category.

Table 4.1.65 Evaluation Results of Candidate Transportation Projects for Inclusion in Blue Book 2010-2014

No.	Activity Name	Project Cagtegory		Project Cost ('000USD)	Recommended Agency			Project Evaluation					Rank	
		Region	Category		Line Ministr y	BAPPE NAS	JST	Fit to upper plan	Economi c viability	Urgency	Implemen tability	Foreign assistance		Total
I.	PROJECT ASSISTANCE													
RW-P06	Jakarta MRT South-North Line	Java	Urban transportation	840,000				27.0	21.6	5.0	12.0	21.0	86.6	A
RD-P08	Cileunyi - Sumedang - Dawuan Toll Road	Java	National Backbone	318,810				24.6	19.4	4.0	14.2	23.0	85.2	A
RD-P41	Tanjung Priok Access Road (Phase-3)	Java	National Backbone	318,810				24.0	18.0	5.0	16.0	21.0	84.0	A
RW-P23	Jakarta MRT East-West Line	Java	Urban transportation	1,100,000				27.0	21.6	4.0	10.0	21.0	83.6	A
RD-P30	Additional Loan for Suramadu Bridge	Java	Regional Develop.	77,000				21.6	20.0	5.0	18.2	17.4	82.2	A
RD-P15	Trans Sulawesi Maminasata Arterial Road	Sulawesi	Regional Develop.	85,016				24.6	23.4	3.0	13.2	17.4	81.6	A
RW-P07	Jakarta MRT South - North Line Extension	Java	Urban transportation	1,000,000				27.0	18.2	3.0	11.4	21.0	80.6	A
RW-P05	Urban Railway Electrification in Surabaya	Java	Urban transportation	500,000				21.6	21.0	4.0	14.8	19.0	80.4	A
SE-P13	International Hub Port in Greater Jakarta	Java	National Backbone	1,000,000				27.0	18.6	4.0	13.2	17.4	80.2	A
AR-P01	New CNS/ATM System	Nation-wide	Upgrading	213,400				24.0	15.0	5.0	18.0	17.4	79.4	A
SE-P08	Public Ship Finance for Domestic Ship Industry	Nation-wide	Upgrading	300,000				24.0	14.0	4.0	18.2	19.0	79.2	A
RD-P43	Jakarta Urban Road Network Flyover	Java	Upgrading	300,000				24.0	19.6	5.0	14.6	16.0	79.2	A
AR-P06	Procurement / Installation of Security Equipment	Nation-wide	Upgrading	14,337				24.0	13.6	3.0	18.0	20.4	79.0	A
AR-P10	Multiple Airport for Jakarta Metropolitan Area	Java	National Backbone	500,000				27.0	18.2	3.0	8.6	22.0	78.8	A
RW-P16	JABODETABEK Bogor Line Capacity	Java	Upgrading	450,000				24.6	18.2	4.0	14.8	17.0	78.6	A
RD-P16	Medan-Kualanamu Toll Road	Sumatra	Urban Transportation	140,000				24.6	18.4	5.0	12.0	18.4	78.4	A
RD-P22	Batam - Bintan Bridge	Sumatra	National Backbone	584,485				19.2	17.0	4.0	16.0	22.0	78.2	A
RD-P44	Pandan-Malang Toll Road	Java	Regional Develop.	184,803				21.6	18.0	3.0	15.4	20.0	78.0	A
RD-P06	Solo-Kertosono Toll Road	Java	National Backbone	106,270				24.0	18.6	5.0	12.8	17.4	77.8	A
RW-P01	Railway to Soekarno Hatta Airport	Java	Urban transportation	120,000				19.2	17.6	5.0	12.8	23.0	77.6	A
PW-P08	Manggarai-Cikarang Double-double Track	Java	Urban transportation	468,000				27.0	19.6	4.0	9.4	17.4	77.4	A
RW-P13	JABODETABEK Circular Rail Line	Java	Urban transportation	160,000				24.6	21.6	3.0	8.0	19.8	77.0	A
RW-P04	Urban Railway Electrification in Bandung	Java	Urban transportation	175,000				18.6	19.6	3.0	17.6	18.0	76.8	A
RD-P13	Pekanbaru - Kandis - Dumai Freeway	Sumatra	National Backbone	318,810				27.0	16.6	4.0	11.4	17.8	76.8	A
RD-P17	Bandung Intra Urban Toll Road	Java	Urban Transportation	318,810				21.6	18.0	5.0	12.6	19.0	76.2	A
RW-P09	Java South Line D-Track (Cirebong - Kroya)	Java	National Backbone	360,000				21.6	16.8	3.0	18.2	16.4	76.0	A
RW-P24	Central Station Development in Dukhu Atas	Java	Urban transportation	80,765				21.6	20.4	3.0	12.0	19.0	76.0	A
RW-P10	Java South Line D-Track (Kroya - Kutoarjo)	Java	National Backbone	266,000				21.6	19.6	3.0	15.4	16.4	76.0	A
AR-P04	Airport for Disaster Measure and Border Region	Nation-wide	Poverty Reduction	158,200				27.0	15.0	5.0	18.0	10.8	75.8	A
RD-P38	Asset Management Loan (Road) Project	Nation-wide	Upgrading	1,000,000				21.0	15.6	4.0	16.8	18.4	75.8	A
SE-P10	Strategic and Local Ports Project (29 listed	Nation-wide	Regional Develop.	1,588,735				27.0	16.6	3.0	15.4	13.4	75.4	A
AR-P05	Development of Airport in Papua	Papua	Poverty Reduction	280,057				27.0	15.0	5.0	14.0	13.8	74.8	B
SE-P02	Indonesian Ship Reporting System	Nation-wide	Upgrading	20,395				21.0	11.2	4.0	19.4	19.0	74.6	B
SE-P05	Vessel Traffic Services System	Nation-wide	Upgrading safety	67,641				21.0	11.2	4.0	19.4	19.0	74.6	B
RD-P39	Intelligent Traffic System in Jabodetabek	Java	Upgrading	217,853				16.2	15.0	3.0	18.2	22.0	74.4	B
SE-P04	Development of Jayapura Port Facilities	Papua	Regional Develop.	17,400				27.0	14.0	4.0	16.0	13.4	74.4	B
RW-P20	Procurement of 24 Unit (3set) Electric Railcars	Java	Upgrading service	37,000				18.6	17.0	4.0	16.8	17.4	73.8	B
RW-P21	Procurement of 160 Unit Electric Rail Car	Java	Upgrading service	207,000				18.6	17.0	4.0	16.8	17.4	73.8	B
RD-P45	Sukabumi - Cijanjang - Padalalan Toll Road	Java	National Backbone	461,079				21.6	20.0	4.0	10.6	17.4	73.6	B
RD-P10	Tayan Bridge	Kalimantan	Regional Develop.	95,643				24.6	16.6	3.0	12.8	16.2	73.2	B
RD-P29	Padan Bypass Capacity Expansion & Duku	Sumatra	Regional Develop.	58,000				24.6	18.4	4.0	12.0	13.4	72.4	B
RD-P27	Manado Bypass II	Sulawesi	Regional Develop.	17,003				21.6	16.0	3.0	14.8	16.8	72.2	B
SE-P15	Development of Dumai Port (III)	Sumatra	Upgrading	300,000				21.6	18.0	3.0	12.6	16.8	72.0	B
SE-P11	Improvement of River Transportation	Suna / Kali	Regional Develop.	170,032				19.2	15.4	3.0	14.8	19.0	71.4	B
SE-P12	Development of Ferry Port	Nationwide	Regional Develop.	239,107				21.0	18.6	3.0	15.4	13.4	71.4	B
RD-P34	Eastern and Middle Trans Sumatra Project	Sumatra	Regional Develop.	200,000				24.0	18.2	4.0	14.8	9.8	70.8	B
RD-P05	Regional Road	Nation-wide	Poverty Reduction	212,540				21.6	20.0	3.0	12.0	13.8	70.4	B
RW-P19	Track Construction and Maintenance Machinery	Java	Upgrading	74,750				18.6	14.2	4.0	17.4	16.0	70.2	B
RD-P21	Selat Sunda Bridge	Java-Sumatra	National Backbone	531,350				24.6	19.6	2.0	4.0	19.4	69.6	B
RD-P18	Pasir Panajam Bridge Construction	Kalimantan	Regional Devellop.	85,016				21.6	14.0	3.0	10.6	19.8	69.0	B
RW-P15	Procurement of Locomotive Diesel (30 units)	Java/Sumatra	Upgrading	144,000				18.6	14.2	4.0	14.2	18.0	69.0	B
AR-P03	Safety for Air link to Eastern Indonesia	East	Upgrading	50,000				24.6	11.6	4.0	18.0	10.8	69.0	B
RW-P18	Regional Railway System of Central Java Region	Java	Regional Develop.	250,000				22.2	16.2	3.0	10.0	17.4	68.8	B
SE-P01	Development of Indonesia Aids to Navigation	Nation-wide	Upgrading safety	31,200				21.0	11.2	4.0	20.0	12.4	68.6	B
SE-P09	Passenger Vessel and Pioneer Ship	Nation-wide	Poverty Reduction	1,089,267				21.6	14.2	3.0	18.0	11.8	68.6	B
RD-P11	Musi Bridge	Sumatra	Urban Transport.	318,810				19.2	16.4	4.0	12.8	15.8	68.2	B
AR-P02	Procurement of Landing Facility	Nation-wide	Upgrading	25,000				21.6	10.6	5.0	18.0	10.8	66.0	B
RW-P14	Railway Level Crossing System	Java /	Upgrading for Safety	31,280				18.6	17.0	3.0	15.6	11.8	66.0	B
RD-P35	Construction of Keloks 9 bridges in West	Sumatra	Regional Develop.	39,400				18.6	16.6	4.0	14.2	12.2	65.6	B
RD-P40	Intelligent Traffic System for Three Cities	Java /	Upgrading	191,286				13.8	13.0	2.0	15.4	21.4	65.6	B
RD-P23	Galala-Poka Bridge	Maluku	Poverty Reduction	42,508				22.2	14.0	3.0	11.4	14.6	65.2	B
SE-P07	Patrol Boat to Enhance Maritime Safety	Sumatra	Upgrading safety	120,000				21.0	11.2	4.0	20.0	8.8	65.0	B
AR-P09	Procurement of aircraft for Pioneer Flight	East	Support Remote area	480,000				21.6	13.0	3.0	14.0	13.2	64.8	C
RD-P07	Serangan - Tanjung Benoa Toll Road	Bali	Regional Develop.	159,405				16.2	13.6	4.0	12.8	18.0	64.6	C
SE-P03	Special Vessel for Navigation Aids	Nation-wide	Upgrading safety	113,290				21.0	11.2	4.0	19.4	8.8	64.4	C
SE-P06	Indonesia Coast Guard Patrol Boats Retrofit	Sumatra	Upgrading safety	46,800				21.0	11.2	4.0	19.4	8.8	64.4	C
RW-P02	Railway to Juanda Surabaya Airport	Java	Urban transportation	150,000				13.8	15.0	2.0	11.4	22.0	64.2	C
RW-P17	Tracks Material and Turnouts	Java /	Upgrading quality	117,300				18.6	17.0	3.0	16.8	8.8	64.2	C
RW-P03	Double Track Railway in South Sumatra	Sumatra	Upgrading	240,000				19.8	17.6	2.0	10.8	13.8	64.0	C
RD-P12	Gorontalo-Djalaludin Airport Access Road	Sulawesi	Regional Develop.	21,254				22.2	15.0	3.0	11.4	12.2	63.8	C
RD-P01	Road Rehabilitation Project	Nation-wide	Upgrading	212,540				21.0	15.0					

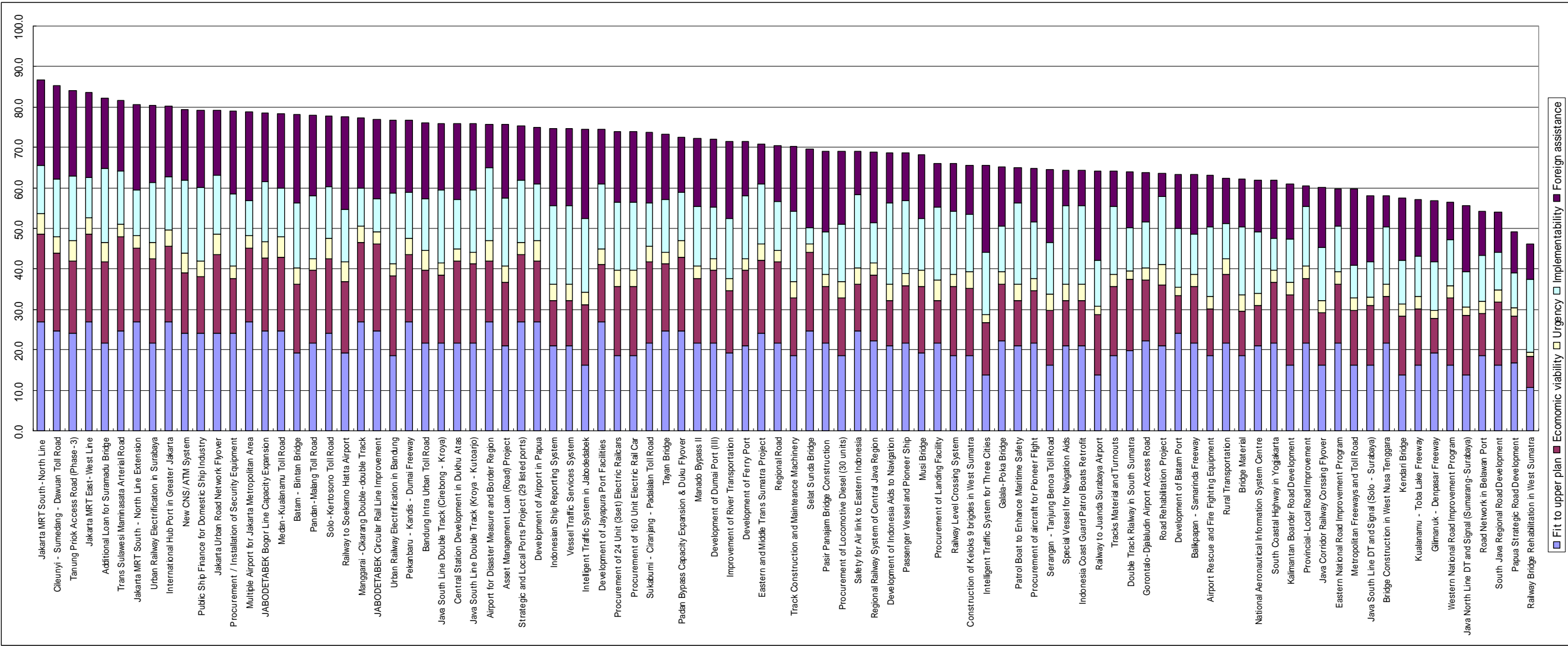


Figure 4.1.49 Ranking Results of Overall Evaluation for Blue Book Inclusion of Candidate Projects (Transportation Sector)

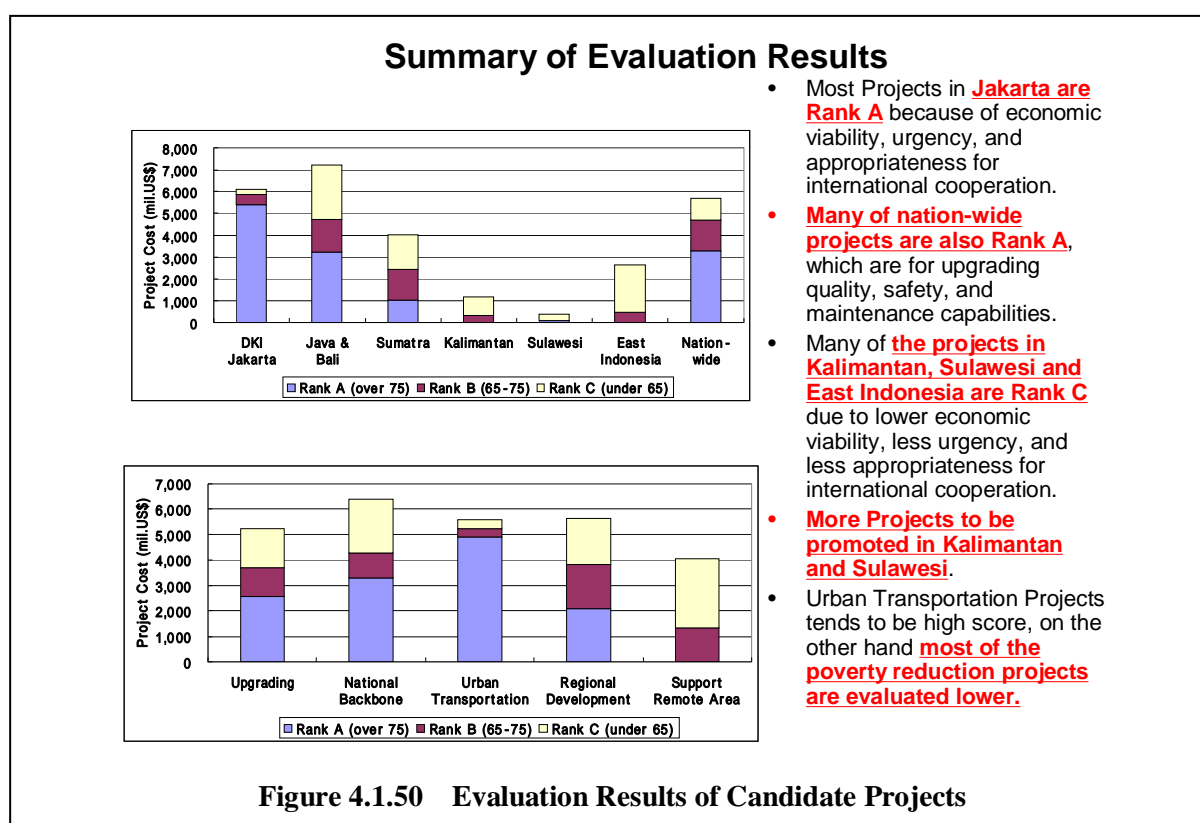
(5) Detailed Analysis on the Evaluation Results and Solution Alternatives

The average score of all the projects is calculated to be around 70%. Based on the evaluation, the projects are classified into three categories based on the scoring system shown as follows:

- Rank A Project: Score of more than 75 points
- Rank B Project: Score between 65 to 75 points
- Rank C Project: Score of less than 65 points

The number of projects in Rank A is 31, also 31 in Rank B and 32 in Rank C.

The regional distribution of each category is summarized as follows:



Based on the above, it can be said that most of the projects in DKI Jakarta marked high score points and classified as Rank A Project. This is realized as many projects in DKI Jakarta are expected to be of high economic viability, urgently needed, and required high technologies seeking international cooperation. The projects in major cities also marked with generally high score.

Table 4.1.66 Rank A Projects in DKI Jakarta

Rank	Activity Name	Region	Cost (1000 US\$)	Project Evaluation					Total
				Fit to upper Plan	Economic Viability	Urgency	Implement ability	International Cooperaton	
1	Jakarta MRT South-North Line	Jakarta	840,000	27.0	21.6	5.0	12.0	21.0	86.6
3	Tanung Priok Access Road (Phase-3)	Jakarta	318,810	24.0	18.0	5.0	16.0	21.0	84.0
4	Jakarta MRT East-West Line	Jakarta	1,100,000	27.0	21.6	4.0	10.0	21.0	83.6
9	Jakarta MRT South - North Line Extension	Jakarta	1,000,000	27.0	18.2	3.0	11.4	21.0	80.6
10	International Hub Port in Greater Jakarta	Jakarta	1,000,000	27.0	18.6	4.0	13.2	17.4	80.2
12	Jakarta Urban Road Network Flyover	Jakarta	300,000	24.0	19.6	5.0	14.6	16.0	79.2
20	Railway to Soekarno Hatta Airport	Jakarta	120,000	19.2	17.6	5.0	12.8	23.0	77.6
22	JABODETABEK Circular Railway Line	Jakarta	160,000	24.6	21.6	3.0	8.0	19.8	77.0
27	Central Station Development in Dukhu Atas	Jakarta	80,765	21.6	20.4	3.0	12.0	19.0	76.0

The nationwide projects are also generally marked with high score, and many are classified as Rank A projects. The objectives of nation-wide projects are mainly to upgrade safety, improve service level, and strengthen security and maintenance capability and so on. These are raised as the top priorities for the transportation sector development plan as shown below:

Table 4.1.67 Rank A Nationwide Projects

Rank	Activity Name	Region	Cost (1000 US\$)	Fit to upper Plan	Economic Viability	Urgency	Implement ability	International Cooperaton	Total
10	New CNS/ATM System Development for	Nation-wide	213,400	24.0	15.0	5.0	18.0	17.4	79.4
11	Public Ship Finance for Domestic Ship Industry	Nation-wide	300,000	24.0	14.0	4.0	18.2	19.0	79.2
13	Procurement and Installation of Security	Nation-wide	14,337	24.0	13.6	3.0	18.0	20.4	79.0
29	Airport Development for Disaster Measure	Nation-wide	158,200	27.0	15.0	5.0	18.0	10.8	75.8
30	Asset Management Loan (Road) Project	Nation-wide	1,000,000	21.0	15.6	4.0	16.8	18.4	75.8
31	Strategic and Local Ports	Nation-wide	1,588,735	27.0	16.6	3.0	15.4	13.4	75.4

Many projects in Kalimantan, Sulawesi and East Indonesia have rather low score, and are mostly classified as Rank C project. These are those with mainly lower economic viability, and unconfirmed urgent needs. However, the following one project in Sulawesi is evaluated as Rank A:

Table 4.1.68 Rank A Projects in Kalimantan and Sulawesi

Rank	Activity Name	Region	Cost (1000 US\$)	Project Evaluation					Total
				Fit to upper Plan	Economic Viability	Urgency	Implement ability	International Cooperaton	
6	Trans Sulawesi Maminasata Arterial Road	Sulawesi	85,016	24.6	23.4	3.0	13.2	17.4	81.6

The project is highly related to the regional development plan. Trans Sulawesi Arterial Road was identified in the Master Plan for Regional Development, which is directly linked with the industrial development projects. Since the river transportation project is also directly linked with coal transportation, high economic viability particularly for energy generation is expected as well as necessity for exports.

From the facts mentioned above, the regional development plan formulation is quite important to promote the projects in East Indonesia for the betterment of the peoples' living condition, with high economic viability.

(6) Conclusions and Recommendations

Based on the assessment of the candidate projects in the transportation sector, the following four aspects should be taken into account for selecting the nominated projects for inclusion in the Blue Book:

- Strengthening Java-Sumatra development corridor,
- Infrastructure development in major cities and regional growth poles
- Integrated development approach for East Indonesia
- Gateway for global market access

1) Strengthening Java-Sumatra Development Corridor

Strengthening of Java-Sumatra development corridor is the most important issue, and the following measures should be taken into account to promote the infrastructure development activities:

a) Acceleration of toll road projects in Java under PPP scheme

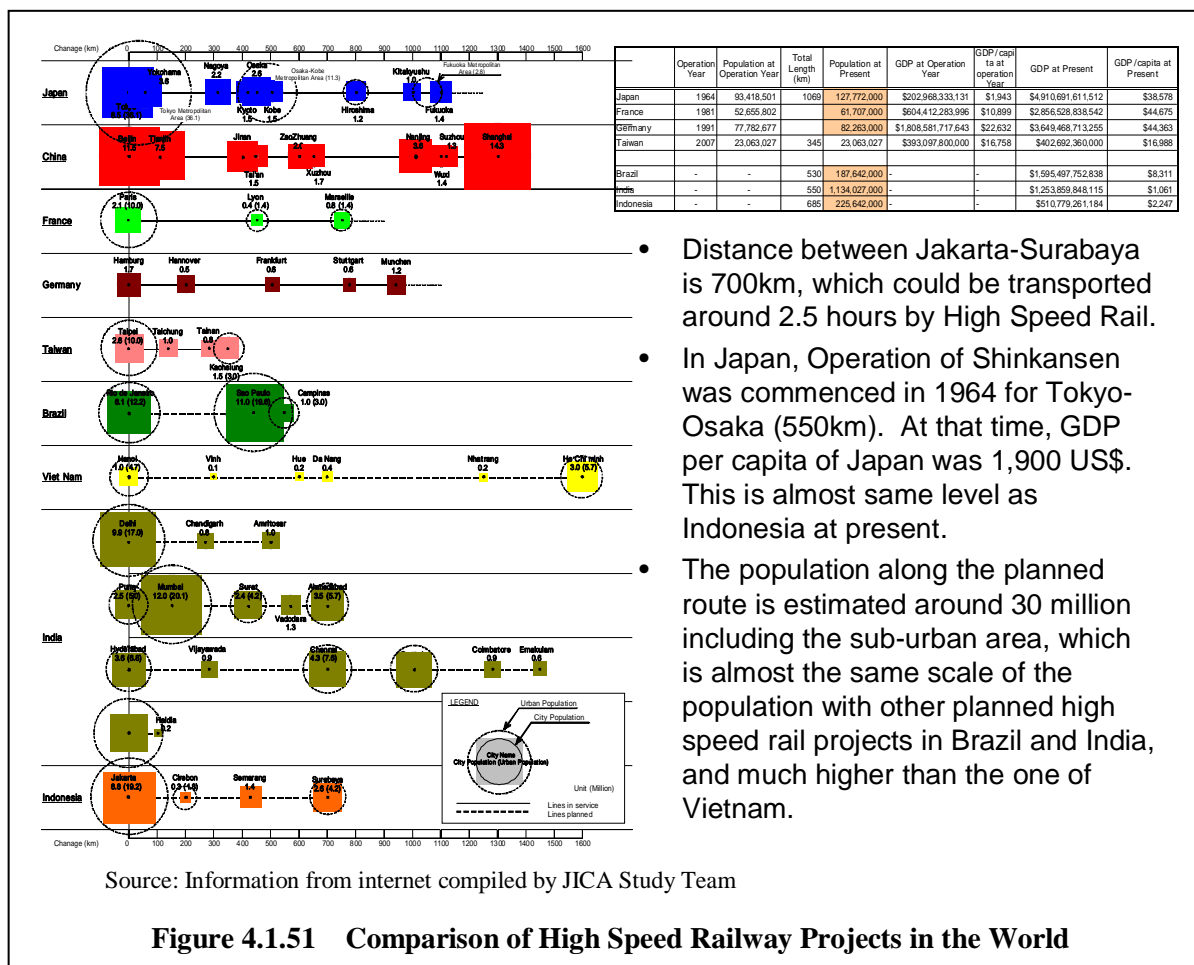
Many of the toll road projects in the Trans-Java corridor are ongoing under BOT scheme, but the progress is very slow due to difficulties in land acquisition. Review of financial schemes as well as risk sharing plan should be carried out by the government to facilitate the implementation of the toll road projects. Encouraging of further government involvement through PPP scheme would be effective.

b) Promotion of High Speed Rail corridor to formulate the Java Megalopolis

Java Island has still high potential for leading the development of Indonesian Economy despite its highly dense population and existence of various industries. Several mega cities are scattered in Java with each city having own leading industries. Strengthening of the connection between the mega cities will accumulate more economic activities and produce synergetic effects in economics and social activities. Together with trans Java highway corridor, the High Speed Dedicated Passenger Railway connecting Jakarta and Surabaya would be expected to develop the Java Megalopolis.

c) Selat Sunda Bridge

The bridge/tunnel connection between Java and Sumatra should be well-assessed for future implementation, which is expected to contribute to the economic integration of both islands. Java is the center of economic activities in Indonesia with its huge source of manpower, while Sumatra has rich natural resources for initiating economic activities with potential land resources. It is also located at the front side of the global market. The direct connection with the Trans Sumatra highway would expand the economic effect of the Selat Sunda Bridge to the whole Sumatra Island.



2) Infrastructures in Major Cities and Regional Growth Poles

The development of major cities and regional growth poles shall be identified in the next five-year plan, to expand the development activities in the whole of Indonesia. This is realized as it would be difficult to extend the economic impact of the infrastructure projects in Java and Sumatra to the other areas. The following cities could be identified as the development centers with the identified transportation projects:

DKI Jakarta

- MRT Network Development (North-South Line, East-West Line)
- JABODETABEK Circular Railway Line
- Soekarno-Hatta International Airport Access Railway
- City Monorail Network Development
- New Hub Port Development
- New International Airport Development
- Tanjung Priok Access Road Development
- Flyover Construction for Highway Network

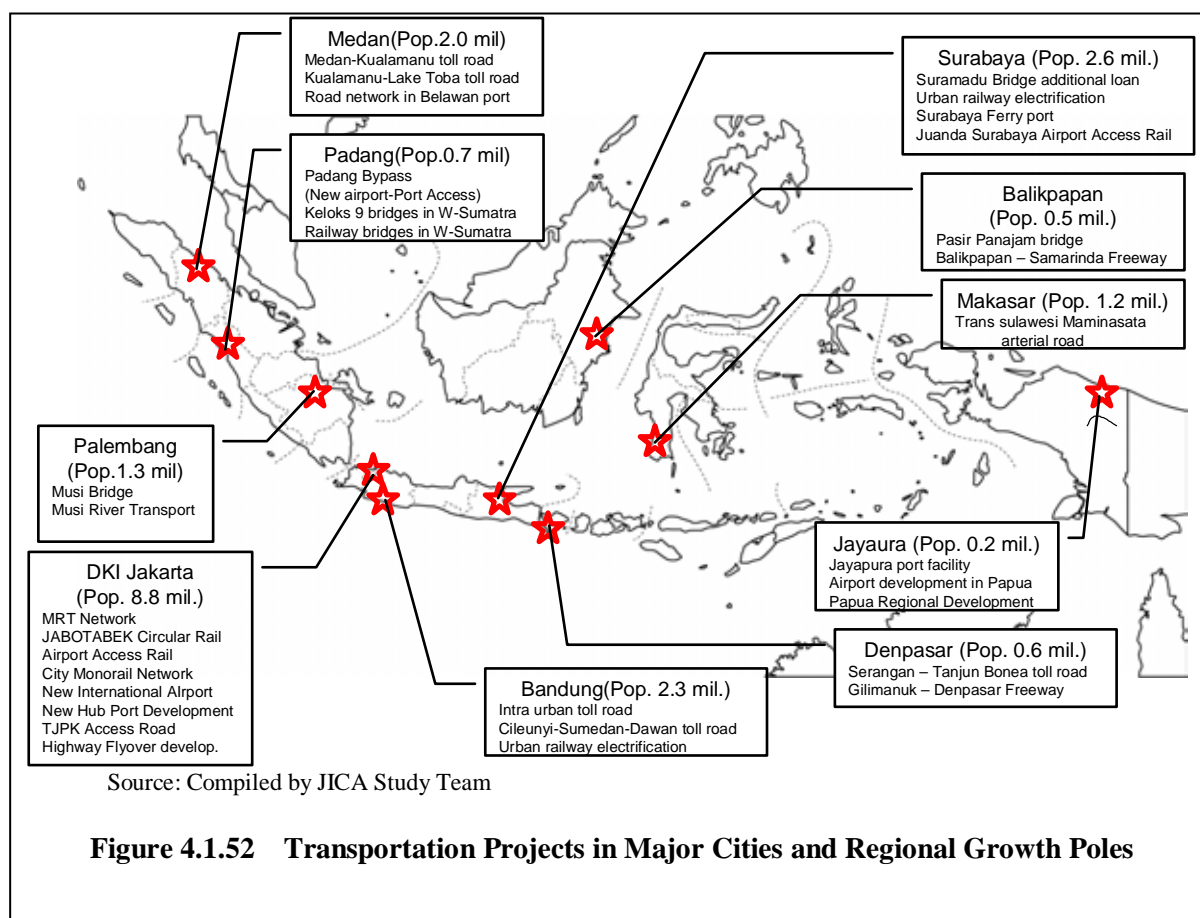
Bandung

- Intra-Urban Toll Road
- Urban Railway Electrification
- Cileunyi – Sumedang – Dawuan Toll Road

Surabaya

- Additional loan for Suramadu Bridge
- Urban Railway Electrification in Surabaya

- Development of Surabaya Ferry Port
- Railway to Juanda Surabaya Airport
- Medan
 - Medan-Kualamanu Toll Road
 - Kualamanu – Lake Toba Toll Road
 - Road network in Belawan Port
- Makassar
 - Trans Sulawesi Maminasata Arterial Road
- Palembang
 - Musi Bridge
 - Improvement of River Transport (Musi River)
- Denpasar
 - Serangan- Tanjung Bonea toll road
 - Gilimanuk – Denpasar Freeway
- Padang
 - Padan Bypass Capacity Expansion
- Balikpapan
 - Pasir Panajam Bridge
 - Balikpapan – Samarinda Freeway
- Jayapura
 - Development of Jayapura Port Facility
 - Development of Airport in Papua



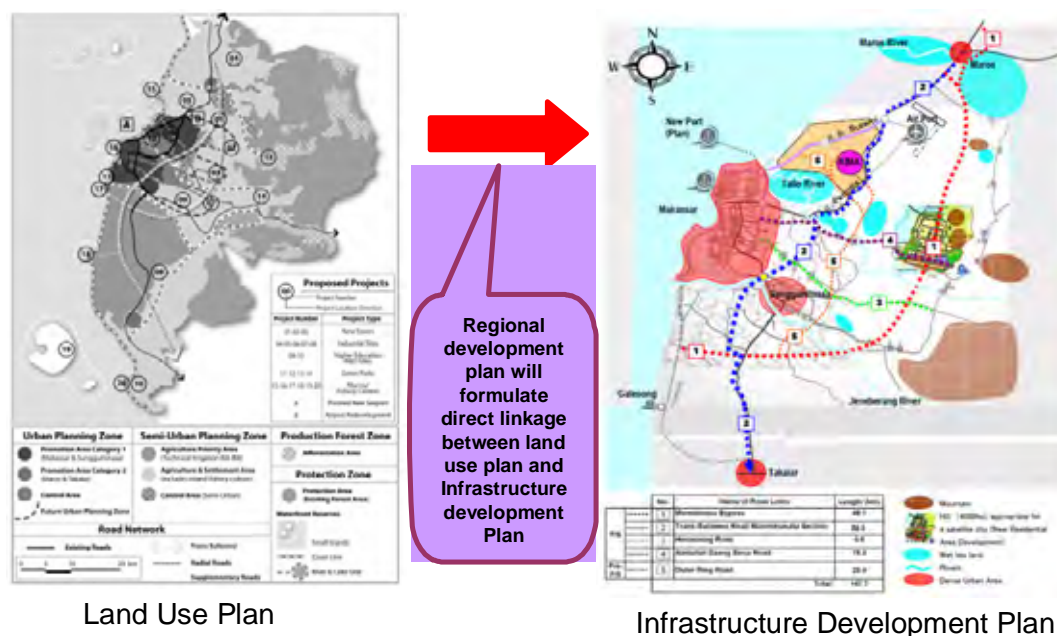
3) Integrated Development Approach for Eastern Indonesia

Most of the nominated transportation projects in East Indonesia, including in Kalimantan, Sulawesi, Maluku, Nusa Tenggara, Timor, and Papua, are evaluated with rather low ranks because of low economic viability and less urgency for the implementation of infrastructure development projects.

In these areas, the integrated regional development approach should be taken into account for the promotion of transportation infrastructure. It is recommended that the regional development master plan be formulated to identify future production centers, industrial development areas, center of economic activities and so on. Based on these regional development strategies, the transportation infrastructure development should be formulated.

A good example is the “Trans Sulawesi Manimassata Arterial Road Project”. The Project is evaluated as the highest in rank among the projects located in East Indonesia. The project was identified in the “Integrated Spatial Plan for Mamminasata Metropolitan Area”, July 2006 by JICA, and was well assessed considering the importance of the road network for regional economic development. As a result, the identified transportation project is expected to have high synergetic effects with agro-industrial development, and tourism development. Consequently, high economic viability is expected as the final result.

Integrated Regional Development Approach
(Integrated Spatial Plan for Mamminasata Metropolitan Area, Sulawesi)



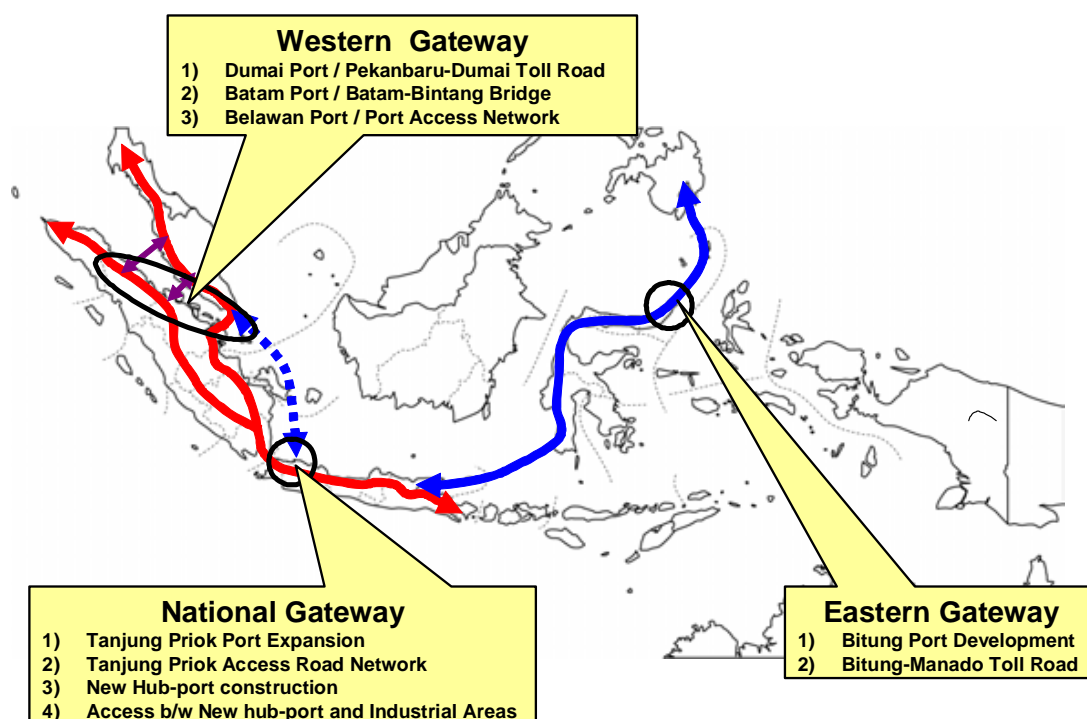
Integrated Spatial Plan for Mamminasata Metropolitan Area, JICA 2006

4) Gateway for Global Market Access

Although there is a huge development potential in the domestic market of Indonesia, strengthening the linkage with the global market such as GMS Region, India, China, and East Asia would be necessary for Indonesia in the future to sustain its economic development alongside the leading countries initiating the global economic activities.

There are three gateways identified based on the existing global economic corridors, namely, Jakarta Port, North Sumatra and Riau (Batam, Dumai, Belawan), and Bitung in Sulawesi. It is recommended that the three port areas be developed with an integrated approach, which should be executed together with the access road, land development and industrial development.

Gateway to Global Economic Corridors



Source: JICA Study Team

Figure 4.1.54 Indonesian Gateways to Global Economic Corridors

4.2 Power Sector

In the early 1990s, a good number of Independent Power Producers (IPPs) were introduced in Indonesia to cope up with the rapid growth of electricity demand in the country. At that time, about 30 IPP projects with a total installed capacity of 11,000 MW were initiated. Due to slowdown in the power demand growth from 13% in 1997 to 1.5% in 1998¹ caused by the 1997 Asian financial crisis and a significant drop in the value of the rupiah, Indonesia's state-owned electric utility company, PLN, had to renegotiate the Power Purchase Agreement (PPA) with the IPP developers in June 1998. After renegotiation with these IPP developers, the government assessed these projects and classified them into three categories, i.e., "continue", "postpone" and "re-examine". As a result of the classification, projects classified as "continue" were only ten projects with total installed capacity of 4,755 MW, which is less than half of the capacity which was initially agreed². Under these conditions, power development projects after the 1997 crisis were not fully implemented, due to lack of confidence of power development investors influenced by the result of renegotiation mentioned above and less attractive investment climate.

Electrification rate of the country

Table 4.2.1 below shows the growth of household electrification rate³ before and after the 1997 crisis. Despite the severe economic conditions, several countries like Vietnam and Mongolia achieved sharp increase of electrification ratio from less than 20% level to more than 70% level. The reasons for the electrification rate increase in Vietnam seem to be due to: (i) strong power development initiatives through the establishment of the Electricity of Vietnam (EVN, a corporative state-owned company), and (ii) steady progress of power development projects using ODA loan. However, it is noted that island nations like Indonesia and the Philippines need more cost to further increase the electrification rate compared with continental countries.

Table 4.2.1 Growth of Electrification Rate before and after 1997 Financial Crisis
Electrification Rate (%)

Country	1994	2000
Singapore	100	100
China	92	98.6
Malaysia	90	96
Mongolia	15	90
Thailand	87	82
Vietnam	15	75
Philippines	58	68
Indonesia	39	53
Cambodia	10	15
Myanmar	10	5

Source: INDONESIA, Averting an Infrastructure Crisis

¹ PLN Annual Report

² IEEJ November 1999

³ Electrified household/Total number of household

4.2.1 Current Development Program

Background

At the time of RPJM 2004-2009 formulation, one of the key policy directions of the power sector was to reform the power supply industry. This policy was initiated considering issues such as:

- (1) Unbalanced supply and demand;
- (2) Low level of rural electrification;
- (3) Decrease of investment in the power sector; and
- (4) Uneconomical tariff structure.

Programs in RPJM 2004-2009

To overcome the issues mentioned above, the GOI formulated the demand forecast and investment plan for RPJM 2004-2009 which is summarized as follows:

- Assumption for power demand growth rate: 8.3% per year (average economic growth: 6.6%)
- Total power demand to increase from 97.91 TWh in 2004 to 145.72 TWh in 2009
- Household electrification ratio will increase from 56.1% in 2004 to 67.9% in 2009
- Potential 10 million new customers in five years 2004-2009

For Java-Madura-Bali (Jamali) system:

- Assumption for power demand growth rate: 7.8% per year
- Additional installation of :
 - generating capacity of 6,100 MW
 - transmission line: 3,720 km
 - substation capacity of 14,276 MVA

For Outer Islands:

- Assumption for power demand growth rate: 10.2% per year
- Additional installation of:
 - generating capacity of 4,400 MW
 - transmission line of 3,720 km
 - substation capacity of 4,120 MVA

For rural electrification program:

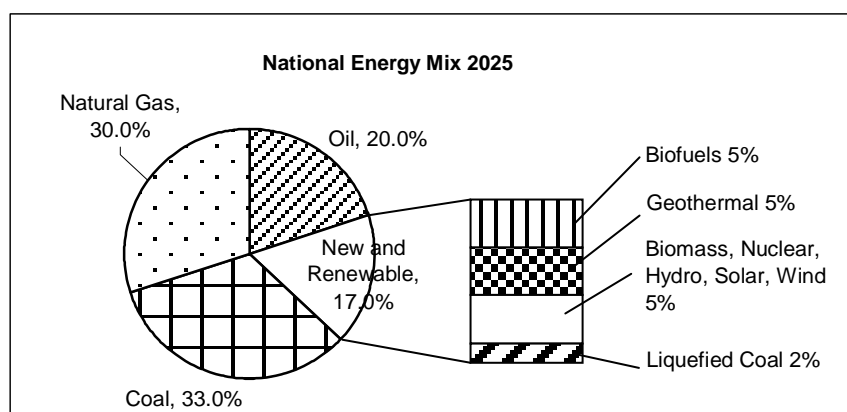
- Village electrification rate: 97% in 2009

National Energy Policy and Energy Blueprint

In 2004, the GOI formulated the National Energy Policy which focused on the following three major policies: 1) Reinforcement of energy supply, 2) Variation of energy sources, and 3) Promotion of energy saving.

With the declaration of the National Energy Policy, the government has changed its view on energy from “abundant” to “limited.”

In 2005, the national energy blue print was announced based on the National Energy Policy stipulating the target indicators for energy mix and aiming at reducing oil dependency and promoting the development of coal and other renewable energy. The following figure shows the energy mix target presented in Presidential Decree No. 5/2006. It is mandated in the decree that an optimum energy mix should be achieved in 2025 consisting of: (i) less than 20% of oil; (ii) more than 30% of natural gas; (iii) more than 33% of coal; (iv) more than 5% of bio fuels; (v) more than 5% of geothermal; (vi) more than 5% of other new and renewable energy, especially biomass, nuclear, hydro, solar and wind; and (vii) more than 2% of liquefied coal.



Source: Presentation Material from MEMR

Figure 4.2.1 Energy Mix Target in 2025

Additional Programs (Fast Track Programs)

Apart from RPJM 2004-2009, the GOI announced the non-oil-based power development promotion project called “Fast Track Program”⁴ (FTP-1) in 2006 to avert the deficit of power supply in the country. This program was aimed at developing additional power supply capacity of 10,000 MW through the construction of coal-fired power plant during the period from 2006 to 2009. Some financial and administrative problems caused substantial delays in implementing some of these projects. In addition to FTP-1, another 10,000 MW will be developed under FTP-2 using renewable energy sources such as hydro and geothermal, among others. FTP-2 was announced by Presidential

⁴ It is occasionally called as “Crash Program” mainly by mass media.

Decree No. 5/2010 on January 08, 2010 while the detailed project list was prescribed by Ministerial Decree No. 2/2010 on January 27, 2010. FTP-2 also includes coal and natural gas as sources for power generation. In view of environmental friendliness, FTP-2 stipulates that the coal power generation project should apply clean coal technologies (CCTs)⁵.

4.2.2 Progress of Development

The progress of development of the power sector during the RPJM 2004-2009 period can be summarized as follows:

(1) Generating capacity

According to the material provided by BAPPENAS, it was scheduled to add more than 10,000 MW of power supply capacity to meet the growing demands during the period of RPJM 2004-2009. The actual supply capacity installed was less than 4,000 MW, which is less than half of the target capacity. According to the Planning and Technology Directorate of PLN, the poor project performance was attributed mainly to stalled project financing, especially for those projects funded by foreign investment or loans that were badly affected by the global recession.

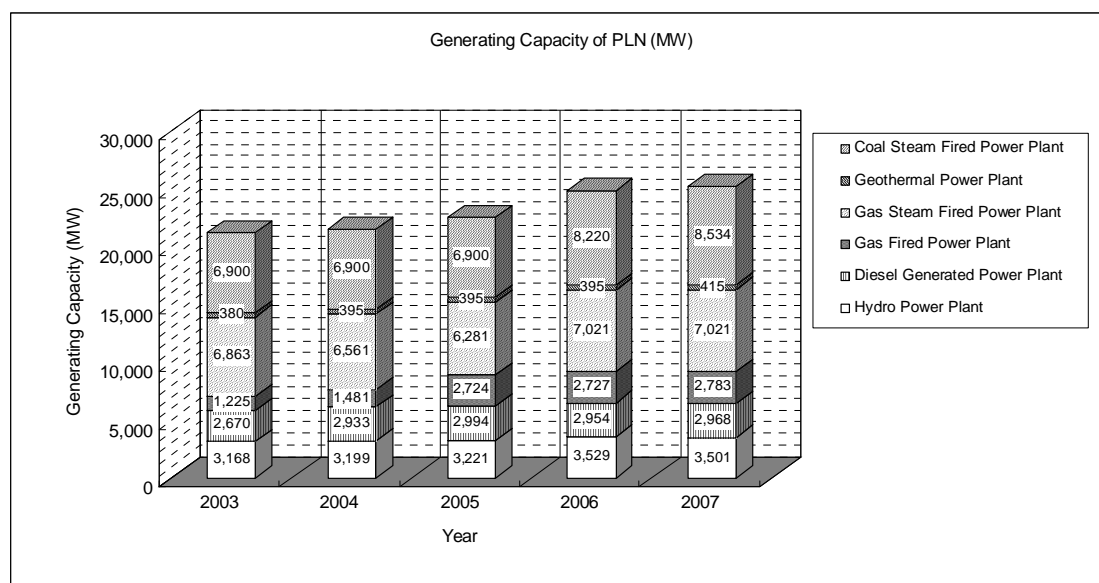
The PLN Annual Report 2007 indicated that about 4,000 MW of additional generating capacity was placed into the PLN grid during 2003 to 2007. This means that the average of only 1,000 MW (4-5% growth) per year was added into the national grid while the projected electricity demand growth rate was 7.8% per year in Jamali and 10.2% per year in the outer islands (refer to Table 4.2.2 and Figure 4.2.2 below).

Table 4.2.2 Generating Capacity of PLN by Sources and its Growth Rate

	Year				
	2003	2004	2005	2006	2007
Hydro Power Plant	3,168	3,199	3,221	3,529	3,501
Diesel Generated Power Plant	2,670	2,933	2,994	2,954	2,968
Gas Fired Power Plant	1,225	1,481	2,724	2,727	2,783
Gas Steam Fired Power Plant	6,863	6,561	6,281	7,021	7,021
Geothermal Power Plant	380	395	395	395	415
Coal Steam Fired Power Plant	6,900	6,900	6,900	8,220	8,534
Total (MW)	21,206	21,469	22,515	24,846	25,222
Growth rate (%)		1.2	4.9	10.4	1.5

Source: PLN Annual Report 2007

⁵ Explanation on CCTs are given in Sub-section 4.2.2 Progress of Development, (2) Energy Mix, Coal.

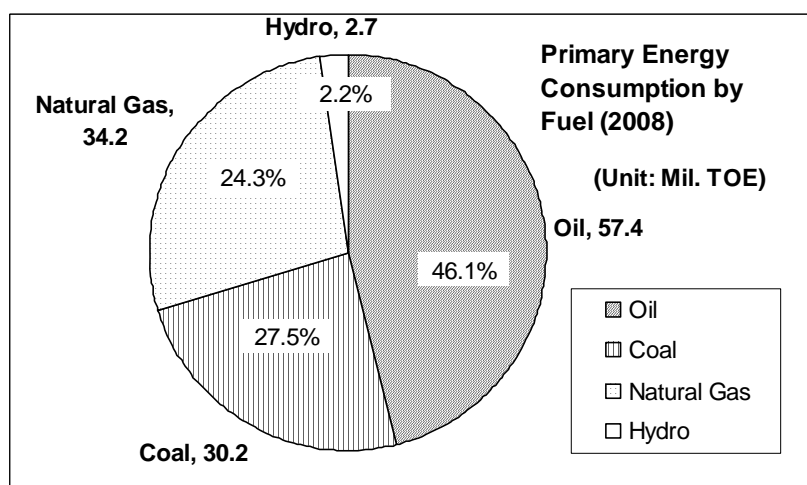


Source: PLN Annual Report 2007

Figure 4.2.2 Generating Capacity of PLN by Sources

(2) Energy Mix

The current energy mix (as of 2008) is shown in Figure 4.2.3.



Source: BP Statistical Review of World Energy June 2009

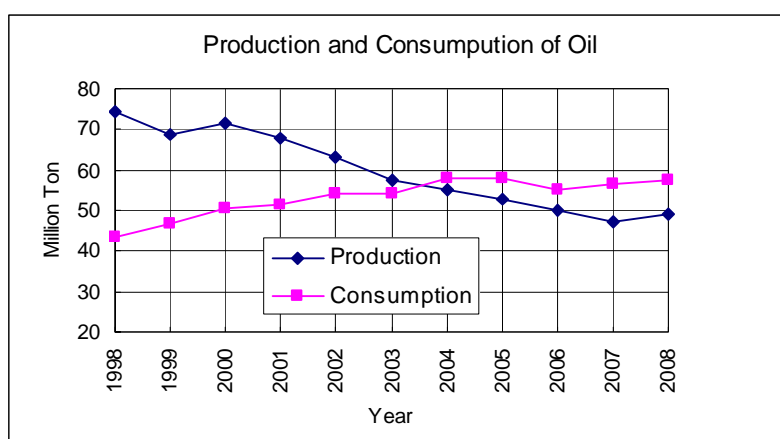
(TOE: Tonnes of Oil Equivalent)

Figure 4.2.3 Primary Energy Consumption by Fuel (2008)

To achieve the energy mix target in 2025, further reduction of oil usage and strong promotion of renewable energy sources are of great importance in the power sector.

The following three graphs show the energy production and consumption during the last decade by the type of energy presented in Figure 4.2.3.

Oil

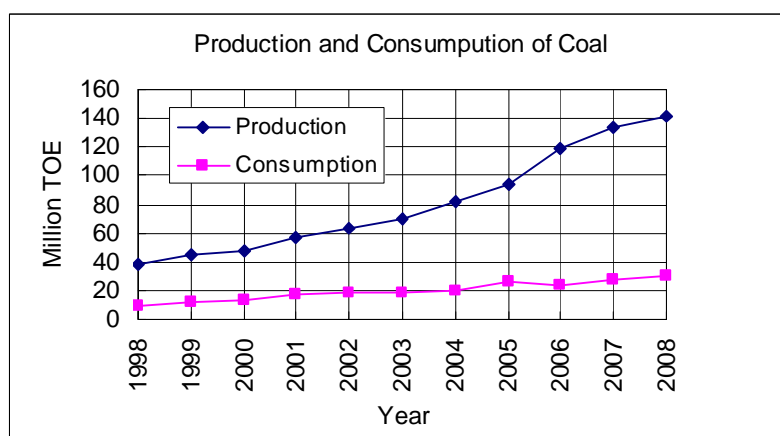


Source: BP Statistical Review of World Energy June 2009

Figure 4.2.4 Production and Consumption of Oil (1998-2008)

In the 1990s, Indonesia's oil production exceeded its consumption supported by its daily production rate of 1.5 million barrels per day. However, since the late 1990s, many of the country's largest oil fields have continued to decline in output while the domestic oil consumption has been growing steadily. As a result, Indonesia became a net oil importing country in 2004. Under such conditions, it is necessary to make serious efforts to decrease the country's oil dependency.

Coal



Source: BP Statistical Review of World Energy June 2009

Figure 4.2.5 Production and Consumption of Coal (1998-2008)

On the other hand, the development of coal has been progressing very well in the last decade. The production amount almost tripled in the last ten years. As of 2005, Indonesia was the second largest net exporter of coal in the world. Such huge surplus of coal production will contribute to the energy mix target to increase the share of coal. The increased production of coal will be a strong driving force for the 10,000 MW coal-fired power development plan (Fast Track Program-1). To make full

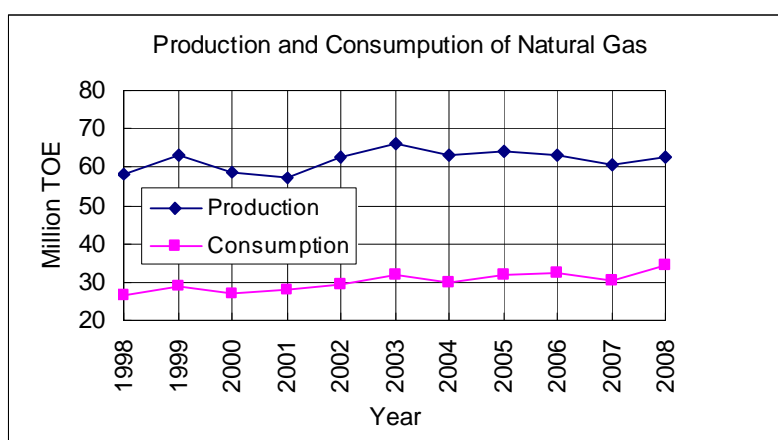
use of the country's coal reserves, it is necessary to develop transportation infrastructures to carry coal to demand centers.

The development and usage of coal have environmental concerns, and one of the solutions to prevent the negative impact is the application of Clean Coal Technologies (CCTs). In the World Energy Outlook 2008, CCTs are described as follows:

“Clean coal technologies (CCTs) are designed to enhance the efficiency and the environmental acceptability of coal extraction, preparation and use.”

CCTs can be applied to achieve a good balance between economic development and environment conservation, i.e., to keep the target growth of GDP on the one hand while reducing the CO₂ emission on the other hand. For example, “high efficiency pulverized coal-fired power generation technology (ultra super critical steam condition)” is one of the CCTs in the coal utilization category. Other examples are “NO_x/SO_x reduction technologies” that can be applied to new/existing coal-fired power plants as environmental countermeasures. In this regard, CCTs should be applied to achieve sound development of coal resources.

Natural Gas



Source: BP Statistical Review of World Energy June 2009

Figure 4.2.6 Production and Consumption of Natural Gas (1998-2008)

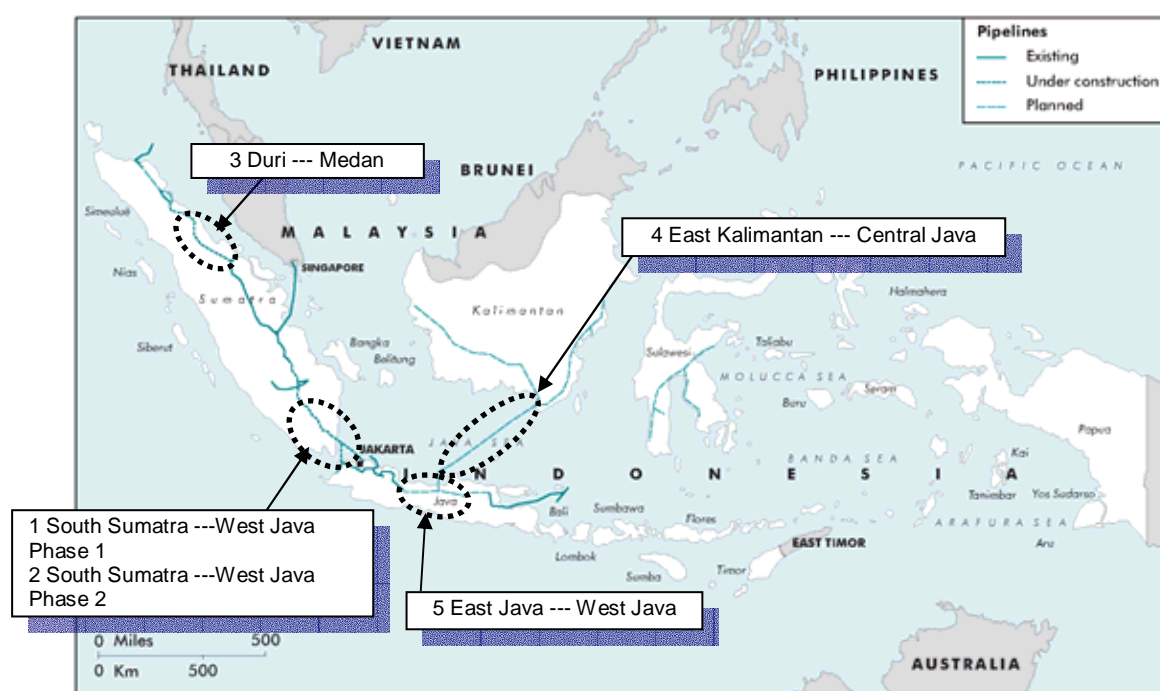
Indonesia is the tenth largest holder of proven natural gas reserves in the world and the single largest in the Asia-Pacific region. More than 70% of the country's natural gas reserves are located offshore, with the largest reserves found in Natuna Island, East Kalimantan, South Sumatra, and West Papua. Nearly half of the produced natural gas is mainly for export and the rest is for domestic use. The major countries for export are Japan, Singapore, South Korea, and Taiwan. Considering the target energy mix in 2025, further promotion of natural gas development should be initiated since natural gas emits less green house gas compared with coal.

In spite of abundant reserves in Indonesia, domestic use of natural gas is limited due to lack of gas pipeline networks. To address this issue, the PGN (Government Gas Company) has prepared five gas transmission projects and is currently implementing them.

Table 4.2.3 Domestic Natural Gas Pipeline Development Plan

No.	Location	Length	Capacity (MMCFD)	Construction Cost (Mil. US\$)	Target Year of Operation
1	South Sumatra ---West Java Phase 1	445km	250-550	424	2006
2	South Sumatra ---West Java Phase 2	649km	400-600	542	2007
3	Duri---Medan	521km	250-350	574	2008
4	East Kalimantan ---Central Java	619km	700-1100	1220	2011
5	East Java --- West Java	700km	500-700	n.a.	2011

Source: IEEJ Report August 2006



Source: MEMR

Figure 4.2.7 Locations of Existing Domestic Gas Pipelines and Major Development Plans

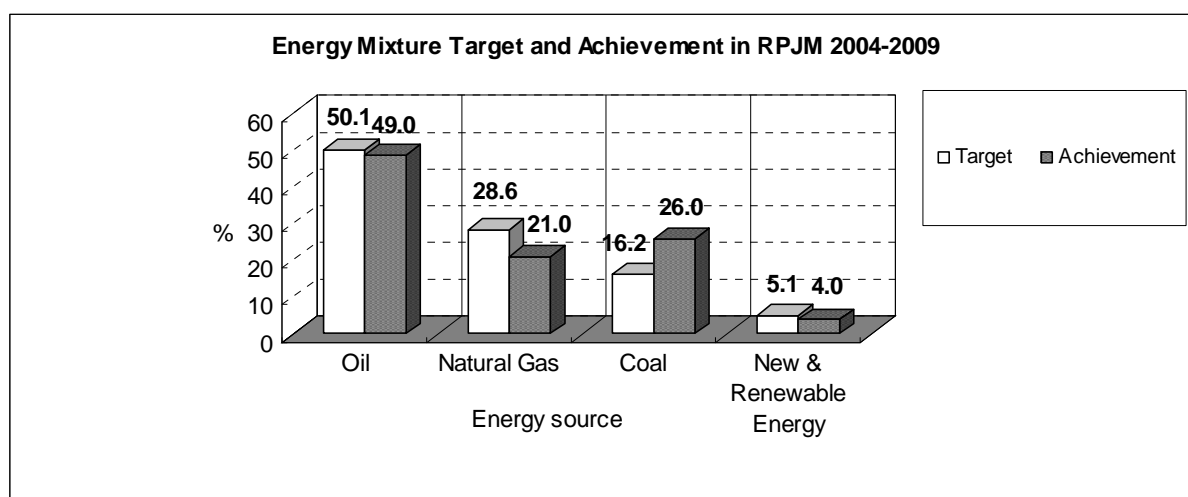
The target energy mix and its achievement

The graph below shows the target ratio and its achievements on energy mix as sources for power generation during the RPJM 2004-2009 period. Based on the graph, the ratio of oil usage is still high in spite of its price hike, which was not expected during the planning stage of RPJM 2004-2009. The oil usage is much encouraged by the government subsidy policy, which enables PLN to procure oil at a price below the actual production cost. To reduce its dependency on oil, the government abolished the subsidy on oil products in 2005 which was triggered by the hike of oil prices. This abolishment of fuel oil subsidy has made PLN to consider the fuel switch from oil to coal and renewable energy sources.

The use of natural gas remains low because of insufficient existing gas pipeline networks and delay in pipeline network development. Due to lack of gas supply, some combined cycle power plants are obliged to burn high speed diesel (HSD) oil, which is far more expensive than natural gas. Based on rough estimates, the unit generation cost (Rp/kWh) by burning HSD will be 1.5 times to 2 times more expensive than using natural gas. According to information from PLN, the following power plants are using HSD in lieu of natural gas, which worsens the efficiency and financial balance of the power plant:

- Muara Tawar 920 MW (Jamali system)
- Grati 462 MW (Jamali system)
- Gresik 1,579 MW (Jamali system), and
- Belawan 817 MW (North Sumatra system).

(* Jamali: Java-Madura-Bali)



Source: BAPPENAS

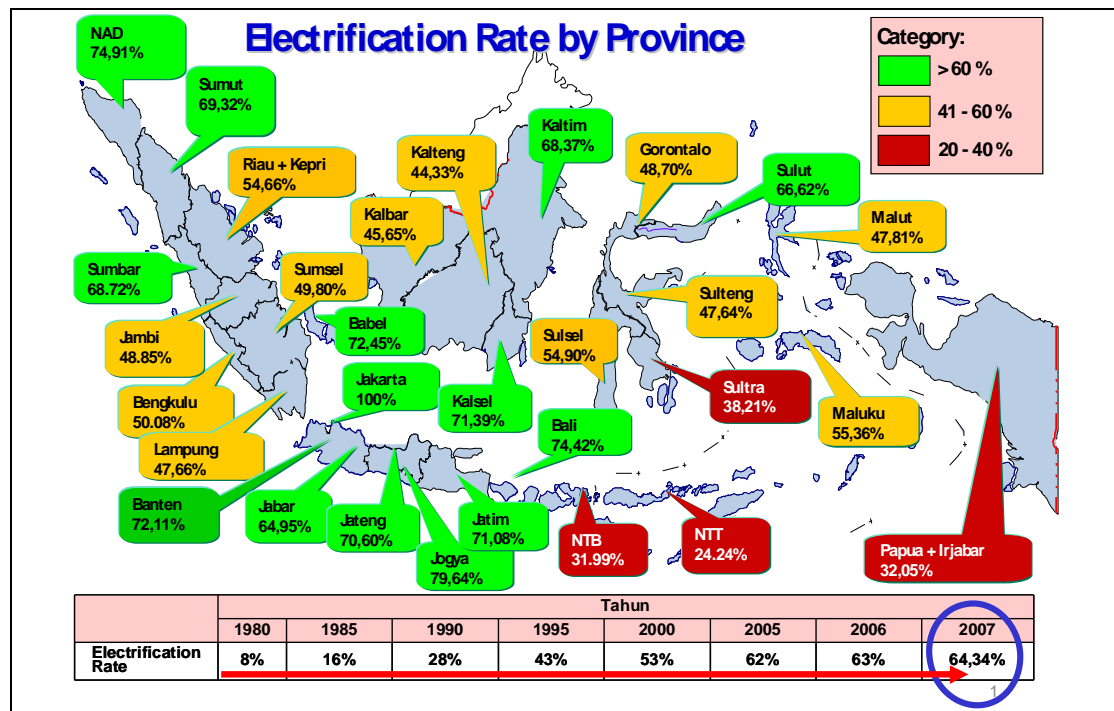
Figure 4.2.8 Target and Achievement of Energy Mixture in RPJM 2004-2009

To fill the shortage of natural gas, coal was developed and used as an alternative energy source. The ratio of new and renewable energy is still low with less than 5% of total energy use. Hence, further acceleration of new and renewable energy development is needed.

(3) Electrification rate

1) Household electrification rate

By 2007, the household electrification rate has increased to 64.3 % for the whole Indonesia. Figure 4.2.9 shows the household electrification rate by province. The household electrification rate of more than 60% has already been achieved in Java Island and the north-western part of Sumatra Island. But in the rest of the provinces, especially in Nusa Tenggara Islands and Papua, the rate is still low at about 30%.

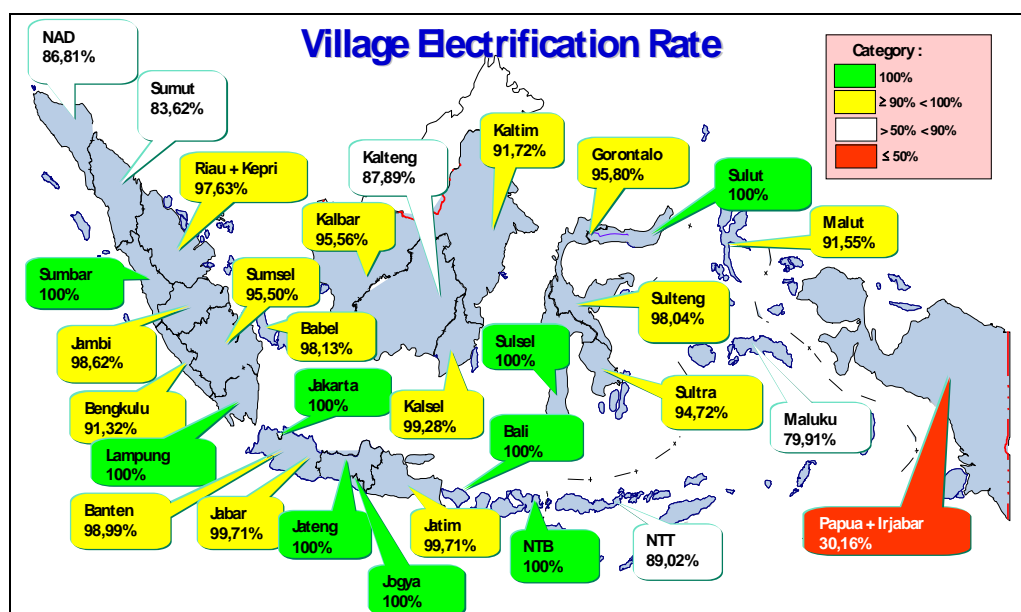


Source: Presentation Material of MEMR

Figure 4.2.9 Household Electrification Rate by Province

2) Village electrification rate

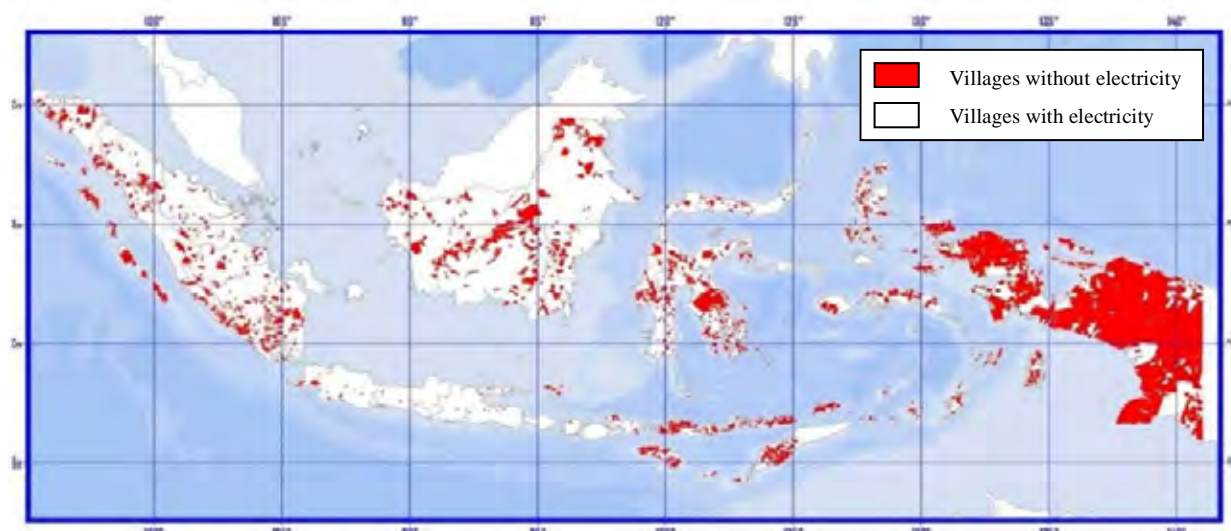
Indonesia has achieved 91.9% of village electrification rate in 2007. Most provinces in Java Island have achieved more than 98% of village electrification. In Sumatra Island, except for North Sumatra and Nanggroe Aceh Darussalam (NAD) provinces, village electrification of more than 90% has already been achieved.



Source: Presentation Material of MEMR

Figure 4.2.10 Village Electrification Rate by Province

On the other hand, village electrification rate is still low at 30% in the eastern part of Indonesia, especially in Papua provinces,. Figure 4.2.11 shows the location of villages in Indonesia without electricity. Of the 71,555 villages in Indonesia, 65,776 villages (92%) have already been electrified by 2007. There are still 5,779 villages without electricity.



Source: Presentation Material by MEMR

Figure 4.2.11 Location of Villages without Electricity

According to the Ministry of Energy and Mineral Resources (MEMR), village electrification will be done by PLN for its grid extension area. Those areas out of PLN grid will be electrified through government assistance. Possible energy sources are either by micro hydro mini-grid, solar mini-grid, solar home systems, or wind power. If none of these energy sources are available, diesel will be utilized.

During the RPJM 2004-2009 period, a total budget of Rp 1.5 trillion was allocated for rural electrification in the off-grid areas. The selection and/or determination of suitable energy sources for electrification should be prioritized to estimate the required cost in order to achieve the target of rural electrification.

(4) Transmission line and substations

Development progress of transmission lines and substations is also one of the key indicators to measure achievements of the power supply infrastructure in the national target. Table 4.2.4 shows the accomplishments in the development of transmission lines and substations during the period from 2003 to 2007. Compared with the target transmission line development of 7,440 kmc during the RPJM 2004-2009 period, only about 5,000 kmc was achieved during the period from 2003 to 2007 or about 2,500 kmc less than the development target. This delay of transmission line development was to some extent affected by the less development of installed generation capacity as discussed in the preceding section. The tsunami disaster in 2004 destroyed several transmission and substation

facilities, which resulted to the decrease of substation transformer capacity in 2005 as shown in the table below.

Table 4.2.4 Development of Transmission Line and Substations

	2003	2004	2005	2006	2007	2003-2007
Transmission Line (kmc)						
25 - 30 kV	12	260	260	12	12	
70 kV	5,035	4,726	4,726	4,619	4,619	
150 kV	19,519	22,229	22,381	23,238	22,702	
275 kV					781	
500 kV	3,608	3,578	3,578	5,048	5,048	
Total Length (kmc)	28,174	30,793	30,945	32,917	33,162	
Increase from prev. year		2,619	152	1,972	245	4,988
(Increase ratio %)		9.3%	0.5%	6.4%	0.7%	17.7%
Substation Transformer Capacity (MVA)	53,399	54,128	53,976	54,527	58,713	
Increase from prev. year		729	-152	551	4,186	5,314
(Increase ratio %)		1.4%	-0.3%	1.0%	7.7%	10.0%

Source: PLN Annual Report 2007, Statistics PLN 2003-2007

*Decrease in Substation Transformer Capacity in 2005 is caused by the tsunami disaster in Nanggroe Aceh Darussalam province.

(5) New Electricity Law

In September 2009, the Parliament passed a new law called “Law No. 30/2009 on Electricity” to replace the existing Law No. 15/1985. The major characteristics of “Law No. 30/2009” are as follows:

Item	Previous Electricity Law (No.15/1985)	New Electricity Law (No.30/2009)
Power Development Plan	Central government formulates RUKN (National electricity general plan)	Central government formulates RUKN (National comprehensive power development plan). Local governments formulate regional electricity general plan (RUKD) based on RUKN.
Responsibility of Electricity Business Implementation	By PLN, under control of the central government	Central and local governments will jointly implement electricity business under control of the central government
Implementation of Electricity Business	Basically by PLN. Exceptionally, by cooperatives and other entities.	PLN, Public enterprise, Private enterprise, Cooperatives, community-based organization
Rural Electrification	By PLN in principle, under the responsibility of the central government	Obligation of PLN in case of Public enterprise, Private enterprise, Cooperatives, etc. are not able to electrify.
Electricity Tariff	Uniform all over the nation Need approval by the President	Tariff is determined through approval of the Parliament. Regional tariff can be set independently through approval of local assembly (regional tariff)

Before the new law, the formulation of the national power development plan (RUKN) was under the authority of the MEMR and the change of electricity tariff was under the authority of the President. However, with the new law, such formulation and revision need approval of the Parliament.

(6) National Climate Change Action Plan

In September 2009, the President, Mr. Susilo Bambang Yudhoyono, declared that Indonesia had decided on a national climate change action plan that will reduce greenhouse gas emissions by 26% by 2020 from BAU (Business As Usual). Further, he declared that Indonesia could reduce emissions by as much as 41% with international support. This announcement was made during the G20 leaders' meeting on September 25, 2009. Such target percentage was based on 2005 emission levels. Indonesia is the first developing country who announced an emissions reduction target.

4.2.3 Remaining Issues

From the review of the development program and progress presented in the preceding sub-sections, the remaining issues on the power sector can be highlighted as follows:

- (1) Shortage of power supply capacity in some regions
- (2) Waiting users and captive power
- (3) Tariff Issues
- (4) Lack of policies for rural electrification
- (5) Lack of coordination between central and local governments in handling development permissions related to power development projects
- (6) Less development of energy mix
- (7) Regulatory issues
- (8) Challenges as the first developing country that declared a "National Climate Change Action Plan"

Detailed descriptions of above eight items are given hereunder.

(1) Shortage of power supply capacity in some regions

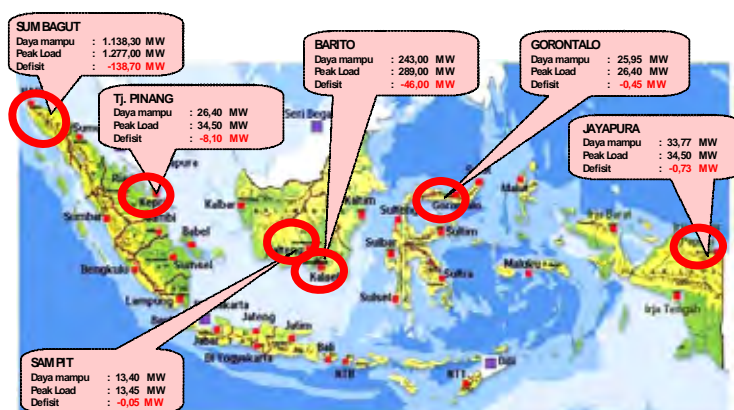
There are 26 electricity systems in Indonesia as shown in Table 4.2.5. However, several regions experience power interruptions during peak hours due to insufficient power supply capacity. These areas with critical conditions are: (1) NAD and North Sumatra, (2) Tanjung Pinang in Riau, (3) Barito in South Kalimantan, (4) Sampit in Central Kalimantan, (5) Gorontalo, and (6) Jayapura in Papua. In

these regions, low voltage or sudden power interruptions are being experienced which affect the development of their economy and industry.

Table 4.2.5 Status of Installed Capacity and Peak Loads in each Electricity System in Indonesia (as of September 2008)

NO.	ELECTRICITY SYSTEMS	PROVINCE	POWER SUPPLY CAPACITY (MW)	PEAK LOADS (MW)	BALANCE (MW)	STATUS
1	Sumbagut	NAD & North Sumatra	1,138.30	1,277.00	-138.70	Deficit
2	Nias (Isolated)		14.22	11.00	3.22	Standby
3	Tg Pinang	Kep. Riau	26.40	34.50	-8.10	Deficit
4	Batam		280.50	204.60	75.90	Normal
5	Sumbagsel	Riau, West Sumatra, South Sumatra, Jambi, Bengkulu,	1,571.20	1,549.10	22.10	Standby
6	Kerinci (Isolated)		2.24	1.78	0.46	Normal
7	Bangka	Bangka Belitung	49.51	49.41	0.10	Standby
8	Belitung		20.95	17.27	3.68	Normal
9	Pontianak	West Kalimantan	122.00	121.40	0.60	Standby
10	Singkawang		41.57	38.50	3.07	Normal
11	Barito	South Kalimantan	243.00	289.00	-46.00	Deficit
12	Sampit	Central Kalimantan	13.40	13.45	-0.05	Deficit
13	Mahakam	East Kalimantan	181.00	180.00	1.00	Standby
14	Bontang		13.80	12.95	0.85	Standby
15	Minahasa	North Sulawesi	139.30	136.02	3.28	Standby
16	Palu	Central Sulawesi	48.55	42.17	6.38	Standby
17	Gorontalo	Gorontalo	25.95	26.40	-0.45	Deficit
18	Poso	Central Sulawesi	4.65	4.25	0.40	Standby
19	Sulsel	South Sulawesi	477.00	473.00	4.00	Standby
20	Kendari	South-Eastern Sulawesi	26.40	26.10	0.30	Standby
21	Ambon	Maluku	34.10	28.40	5.70	Standby
22	Ternate	North Maluku	15.80	13.72	2.08	Standby
23	Jayapura	Papua	33.77	34.50	-0.73	Deficit
24	Lombok	West Nusa Tenggara	97.65	94.95	2.70	Standby
25	Kupang	East Nusa Tenggara	47.74	34.85	12.89	Normal
26	Jamali	Banten, West Java, DKI Jakarta, Central Java, DIY, East Java, Bali	16,316.00	15,961.00	355.00	Standby

Source: Presentation Material by MEMR



Source: Presentation Material by MEMR

Figure 4.2.12 Areas with Critical Electricity Conditions (as of September 2008)

Apart from these critical regions, there are nine regions with reserved capacity of less than 5%. These regions may possibly become critical as well since the regional industry and economy demands are growing.

(2) Waiting users and captive power

Table 4.2.6 shows the number of applicants for new connections to PLN with their connecting capacity in megawatt (MW). Nearly one million customers all over the nation, equivalent to 3,500 MW capacity, are still waiting for new connections. In Java, the ratio of connected users is more than 75%, but outside Java, about 60% of customers are still waiting for connections. The quantity

of waiting users should be counted as deficit from the current supply balance, and thus it is urgently needed to develop additional power supply to satisfy the required demands.

Table 4.2.6 Waiting Users for PLN Connections in Capacity (MW)

		Applicants	Connected	Cancelled	Waiting Users
Java	Capacity (MW)	4,728	2,379	41	2,308
	(% against Applicants)		50.3%	0.9%	48.8%
	Customer (Nos.)	1,434,592	1,087,628	452	346,512
	(% against Applicants)		75.8%	0.03%	24.2%
Outside Java	Capacity (MW)	2,006	790	7	1,209
	(% against Applicants)		39.4%	0.4%	60.3%
	Customer (Nos.)	1,143,492	480,091	18,711	644,690
	(% against Applicants)		39.4%	0.3%	60.3%
Whole Indonesia	Capacity (MW)	6,734	3,169	48	3,517
	(% against Applicants)		42.0%	1.6%	56.4%
(% against Applicants)	Customer (Nos.)	2,578,084	1,567,719	19,163	991,202
	(% against Applicants)		47.1%	0.7%	52.2%

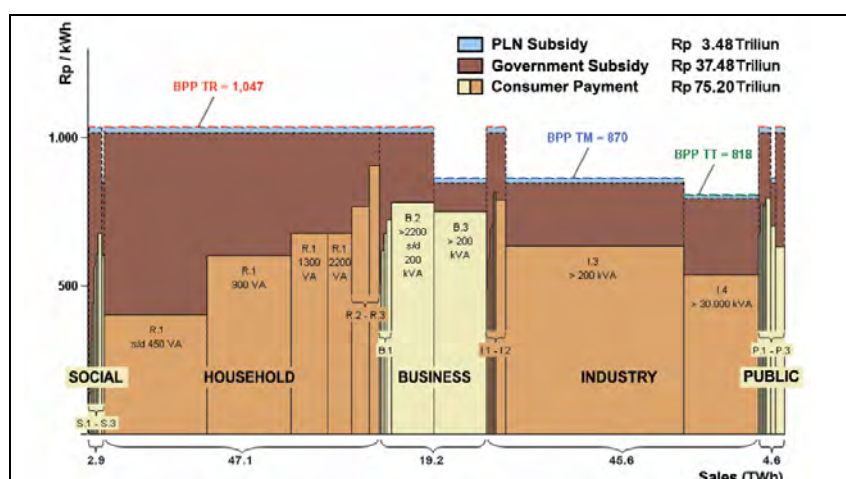
Source: Statistics PLN 2007

According to PLN Statistics 2007, there are about 7,500 MW of captive power to complement the power supply deficit. Most of these captive power users such as factory owners have suffered from high oil prices since 2005. Significant increases in power capacity with less costly, non-oil-based energy sources will be necessary. Furthermore, new transmission and distribution networks should be developed accordingly.

(3) Tariff issues

Electricity tariff does not cover the production cost.

Figure 4.2.13 shows the schematic diagram of electricity tariff and subsidy by type of PLN users. The dark brown shade in the figure below indicates the amount of subsidy. It is noted that all types of users rely on subsidies.



Source: PLN Annual Report 2007

Figure 4.2.13 Electricity Subsidy in 2007

In 2007, the total subsidy from the government amounted to Rp 37.48 trillion, equivalent to more than 30% of the total production cost. The subsidy is not exclusive for low-income household users but also for other types of users, including business and industrial users. According to the MOF, the electricity subsidy was only 0.3 % of GDP in 2005. In 2008, however, the ratio of subsidy was estimated to have reached 1.9 % of GDP.

According to data from PLN, the current average sales price of electricity is about Rp 600~700 per kWh while the average cost of generation is around Rp 1,000 per kWh. The negative discrepancy between the electricity tariff and the production cost causes the following problems to the power sector:

- 1) The amount of subsidy put pressure on the national budget. If such amount could be utilized as development fund, additional power supply can be provided and the power shortage can be mitigated.
- 2) The IPPs are having difficulties in the recovery of their investment cost because of the restricted tariff rate set by the authorities. Therefore, IPPs are hesitant to invest in the power sector.
- 3) With the current tariff rate schedule wherein all types of users are subsidized, the concept of subsidizing users in higher generation cost areas such as rural and remote villages, which is practiced in other countries, would not be possible.
- 4) Low tariff rates encourage excessive use of electricity.

Furthermore, the current system for electricity subsidy is regarded as an order of the government to PLN as a public service obligation (PSO) executor. Such government order system makes PLN execute the obligation without any regard that it is an electricity business enterprise. Therefore, there seems to be no incentives for PLN to increase new customers to expand their business opportunities.

(4) Lack of policies for rural electrification

Although the government set the target of 100% village electrification by 2015 and 67.2% of household electrification by 2020, there seems to be no roadmap showing how to achieve the target. Without such roadmap, it is difficult to rationalize the need of electrification, the target area, the sources of electricity, and the necessary funds for development. The initial investment costs for the development of rural electrification would be higher than the current supply area since the target areas are located in more remote areas. In addition, there is a government policy that rural areas should utilize renewable energy wherever possible⁶ despite the fact that the initial investment costs for renewable energy sources are higher than conventional energy sources. As discussed in the previous section, there is no space for squeezing development funds for rural electrification .

⁶ National Electricity General Plan (RUKN) 2008-2027, November 13, 2008

To achieve the targets of rural electrification, it is necessary to prepare a comprehensive roadmap which includes arrangement of development funds for rural electrification.

(5) Lack of coordination between central and local governments in handling development permissions related to power development projects

It is evident that the local government is extensively involved in handling several important power development projects which contradicts with the national priority and importance and causes substantial delay and, in some cases, suspension of the project. This is because of lack of coordination between the central and local governments. For example, there are several cases whereby permissions for power development projects are not issued by the prefectural or provincial governor, although these projects are ready for construction.

It is, of course, necessary to respect and obey the laws related to autonomy, however, close coordination between central and local governments are essential for the smooth implementation of power projects of national importance.

(6) Less development of energy mix

An energy mix policy was formulated in 2004 as part of the National Energy Policy mentioned in Section 4.2.1 to decrease the nation's dependency on oil. Figure 4.2.3 shows the expected achievement of energy mix in RPJM 2004-2009. The target value of 50% was successfully achieved for oil dependency. However, the target mix for natural gas failed to reach the target level and the deficit was covered by coal energy. It appears that the shortage of mix ratio for natural gas is due mainly to lack of development of gas pipeline networks, which was affected by the ambiguous government policy on natural gas development. The government's policy on the development of natural gas for domestic or export uses is unclear which may have held back investments on natural gas pipeline networks during the RPJM 2004-2009 period.

The ratio of new and renewable energy for the current energy mix (as of 2009) compared with the energy mix target in 2025 is still low as shown in Figure 4.2.14. By looking at Figure 4.2.14, efforts should be made to further decrease oil dependency and to further accelerate the development of new and renewable energy.

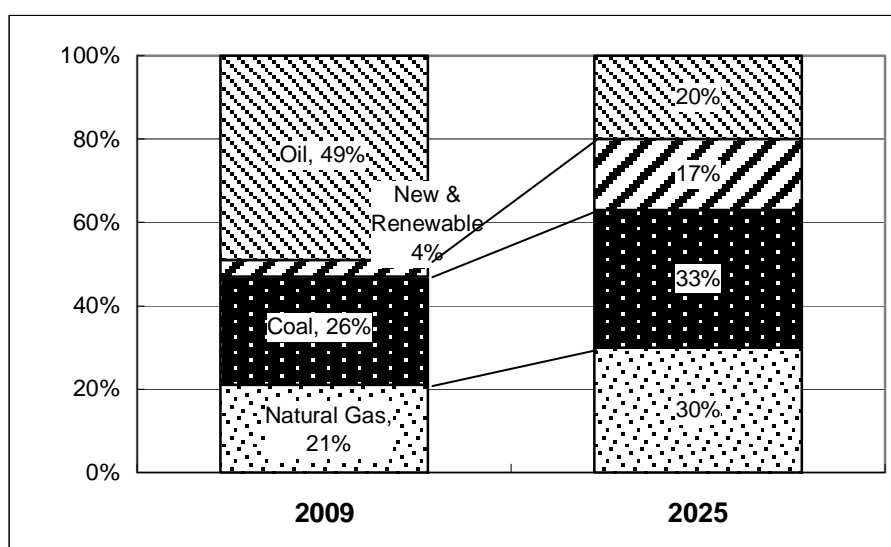


Figure 4.2.14 Current Energy Mix and 2025 Target

Although there are some barriers in the development of new and renewable energy, it is necessary for Indonesia to accelerate the development of such energy sources to achieve the 2025 energy mix target.

(7) Regulatory issues

There used to be several issues related to regulations, especially on the abandoned Law No. 20/2002 on Electricity. However, with the new law, “Law No. 30/2009 on Electricity”, in place, some of the issues are being solved. For example, revision of the tariff table is underway.

Another regulatory issue is the one related to geothermal power development wherein the survey and development rights are awarded through tendering procedures. Tenderers are then required to submit the cost of development of steam and selling price of electricity at the time of tendering prior to their actual survey and development and any cost which cannot be recovered by the selling price will be the developer’s risk. This situation makes developers hesitant in investing for development. Likewise, the current regulation inhibits the possibility of investigating geothermal potential under public financing. Thus, it is necessary to revise related laws and regulations to enable investigations by public fund in order to mitigate the risks of private developers.

(8) Challenges as the first developing country who declared “National Climate Change Action Plan”

As discussed in the preceding sub-section, Indonesia had declared its 2020 target to reduce greenhouse gas emission by 26% to 41% compared with 2005 level. Indonesia should tackle the issues of implementing this action plan while achieving strong economic growth on the other hand.

These remaining issues described in this sub-section can be summarized as follows:

Remaining Issues (RIs)

◆ **(RI-1) Critical Power Supply Regions**

Regions with "Supply Capacity < Peak Load"

1) Sumbagut (NAD & North Sumatra)	: -138.70 MW
2) Tg. Pinang (Kep. Riau)	: -8.10 MW
3) Barito (South Kalimantan)	: -46.00 MW
4) Sampit (Central Kalimantan)	: -0.05 MW
5) Gorontalo (Gorontalo)	: -0.45 MW
6) Jayapura (Papua)	: -0.73 MW

(as of Sept. 2008)

◆ **(RI-2) Waiting Users**

1 million waiting users with 3,500 MW in capacity

◆ **(RI-3) Tariff and Subsidy Issues**

Electricity tariff is too low.

- 1) Electricity tariff does not cover the production cost
- 2) IPP developers hesitant to invest
- 3) Difficult to recover the investment
- 4) Low tariff may encourage overuse of electricity.

Large Amount of Subsidy from the Government

- 1) Rp 37.5 trillion (in 2007)
- 2) More than 30% of production cost subsidized.
- 3) Average production cost: Rp 1,000/kWh
- 4) Average tariff: Rp 600~700/kWh
- 5) All type of users subsidized.
- 6) Amount of subsidy is nearly 2% of GDP in 2008.
- 7) Puts pressure on national budget

◆ **(RI-4) Lack of Policies for Rural Electrification**

No roadmap prepared to determine/estimate:

- 1) Areas to electrify
- 2) Type of energy sources for electrification
- 3) Necessary fund for electrification

◆ **(RI-5) Lack of coordination between central and local governments**

Issuance of development permission takes time to coordinate between central and local governments

→ Delay in implementation

◆ **(RI-6) Less Development of Energy Mix**

- 1) Delay in development of natural gas
- 2) Less development of renewable energy
Less than 5% of primary energy use.

◆ **(RI-7) Regulatory Issues**

Preparation of detailed regulations of the new electricity law (Law No.30/2009) and their application

◆ **(RI-8) Challenges as the first developing country that declared a "National Climate Change Action Plan"**

4.2.4 Action Plan to Address the Issues

From the preceding sub-sections, relationship between issues of the power sector can be summarized as follows:

Remaining Issues

- ◆ (RI-1) Critical Power Supply Regions
- ◆ (RI-2) Waiting Users



Action Plans

- ◆ (AP-1) Enhancement of Power Supply Capacity
 - Acceleration of Power Development
 - With due consideration to Energy Mix
 - Acceleration of Development for
 - Backbone Transmission Line Networks
 - Substations
 - Distribution Line Networks
- ◆ (AP-2) Application of Demand-Side Management
 - Use of less energy-consuming electronic appliances (LED etc.)
 - Management for Energy Efficiency and Conservation (EE&C)

Remaining Issues

- ◆ (RI-3) Tariff and Subsidy Issues



Action Plans

- ◆ (AP-3) Revision of Tariff Table that can cover the generation cost
 - To increase revenue for:
 - Sound operation of PLN and other electricity suppliers
 - Attractive investment environment for investors
- ◆ (AP-4) Reduction of Subsidy
 - Subsidize only low-income customers
 - Cross subsidize development cost for remote areas electrification, if fund sources are available
- ◆ (AP-5) Acceleration of Power Development that contributes to:
 - Reduction of the power generation cost
 - For example, coal-fired, geothermal, and hydropower development

Remaining Issues

- ◆ (RI-4) Lack of Policies for Rural Electrification

**Action Plans**

- ◆ (AP-6a) Preparation of Roadmap for Rural Electrification
 - To determine/estimate:
 - Regions to electrify
 - Energy source for electrification
 - Cost for electrification
 - Organization for Operation and Maintenance
- ◆ (AP-6b) Implementation of the development programs presented in the Roadmap

Remaining Issues

- ◆ (RI-5) Lack of coordination between central and local governments

**Action Plans**

- ◆ (AP-7a) Close coordination between central and local government
- ◆ (AP-7b) Clarification of roles between central and local governments in terms of development projects related to the power sector
- ◆ (AP-7c) To fill gaps of understanding between central and local government
 - Development Coordination Meeting etc.

Remaining Issues

- ◆ (RI-6) Less Development of Energy Mix

**Action Plans**

- ◆ (AP-8) Promotion of renewable energy and natural gas infrastructure development
 - Hydropower, Geothermal
 - Need for timely implementation of F/S, D/D and related studies to confirm the potential
 - to be ready for construction
 - Application of “ Feed-in-tariff ” for geothermal
 - Natural gas supply infrastructure development

Remaining Issues

- ◆ (RI-7) Regulatory/Institutional Issues

**Action Plans**

- ◆ (AP-9) Regulations in revision/transformation
 - New electricity law
 - Preparation of detailed regulations
 - Acceleration of renewable energy development
 - Application of “ Feed-in-tariff ” system for geothermal

Remaining Issues

- ◆ (RI-8) Challenges as the first developing country that declared a “National Climate Change Action Plan”

**Action Plans**

- ◆ (AP-8) Promotion of renewable energy and natural gas supply infrastructure development

Detailed descriptions of the above ten major action plans (APs) are given hereunder.

- ◆ (AP-1) Enhancement of Power Supply Capacity
- ◆ (AP-2) Application of Demand-Side Management
- ◆ (AP-3) Revision of Tariff Table that can cover the generation cost
- ◆ (AP-4) Reduction of Subsidy
- ◆ (AP-5) Acceleration of Power Development that contributes to reduction of power generation cost
- ◆ (AP-6) Preparation and Implementation of Roadmap for Rural Electrification
- ◆ (AP-7) Close coordination between central and local government
- ◆ (AP-8) Promotion of renewable energy and natural gas supply infrastructure development
- ◆ (AP-9) Regulations in revision/transformation

(AP-1) Enhancement of Power Supply Capacity

Enhancement of power supply capacity is one of the most important objectives of the power sector. To achieve this objective, the following concrete actions should be taken:

(1) Acceleration of power development with due consideration to energy mix target

PLN formulated the national general electricity plan called RUPTL 2009-2018 in 2008. Power development should be implemented based on RUPTL. In addition to RUPTL, it is recommended to consider the national target of energy mix when selecting the type of energy for power development. The accelerated development of new and renewable energy sources should be considered, such as hydropower and geothermal power which are indigenous and less developed against their potential, to fill the targets of both power deficit and energy mix.

Hydropower development acceleration

To accelerate hydropower development, the following approaches are recommended:

- 1) Deeper considerations should be taken on both natural and social environment issues caused by the project as well as the project's technical feasibility in the formulation of a ready-to-implement hydropower development plan .
- 2) The following measures should be considered for more effective use of the existing hydropower stations:
 - a) Rehabilitation/improvement of mechanical equipment of the hydropower plant; and
 - b) Countermeasures for sedimentation in the reservoir of the hydropower stations.

Geothermal power development acceleration

The government has its policy that development of geothermal power should be carried out mainly by IPPs. It is desirable for the government to bear the cost of related investigative studies to reduce the risk of private developers and to create attractive investment climate.

For instance, there is a scheme to support geothermal development in Europe and Central Asia called Geothermal Energy Development Fund (GeoFund) prepared by the World Bank and GEF. The major functions of the GeoFund are: (1) to mitigate the risk of geothermal energy exploitation by preparing geothermal database or atlas to support identification of geothermal projects; and (2) to provide contingent grants or low cost loans to cover the project cost.

From the institutional point of view, the introduction of (1) geothermal specific fixed tariff structure such as "Feed-in-tariff," or (2) tax exemption scheme for renewable energy related equipment, should be considered to promote aggressive participation of private investors in power development. These are being considered by BAPPENAS and the Ministry of Energy and Mineral Resources.

Implementation of FTP-2

The Fast Track Program-2 (FTP-2) will be a strong driving force to achieve the power development and energy mix targets. Careful monitoring and implementation of FTP-2 is equally important as FTP-1.

(2) Acceleration of development for transmission line, substations, distribution lines

Complementary to power development, the development of transmission and distribution systems should also be timely implemented based on the RUPTL. The 60 to 70% of the budget for transmission line, substations, and distribution lines is borne by the national/regional budget (APBN/APBD) or PLN's budget (APLN). The remaining 30 to 40% of development budget comes from multi-/bi-lateral foreign assistance, like JICA, ADB, World Bank, etc. Securing of the annual budget for development should be the first priority of the transmission and distribution sector. The cause/s of the fire disaster of substations in Jakarta in November 2009 which seriously affected the electricity supply in the city should also be considered which points to either deterioration of transmission/distribution facilities or overload to the facilities to some extent. The collection of information such as: (i) data of distribution loss, (ii) records of accident, (iii) load factors to the facilities, and (iv) degradation level of the facilities (year of installation/rehabilitation) is required in the study for further enhancement of the facilities.

(AP-2) Application of Demand Side Management (DSM)

The application of demand side management is another tool for the stable supply and use of electricity which contributes to the efficient use of energy. For this, JICA facilitated a study called "The Study on Energy Conservation and Efficiency Improvement in the Republic of Indonesia⁷" in 2007. The study focuses on the analysis of present energy consumption structure and proposes effective measures for energy conservation and electricity demand-side management (DSM). The study also proposes action plans and the roadmap to effectively promote energy conservation.

Energy efficiency (EE) is a cost-effective approach to invest in energy conservation and efficiency improvements, particularly on the end-use or demand side, where the growing demand for energy services cannot be immediately met through increasing energy supply. EE contributes to energy security, economic growth, and environmental sustainability through emissions reduction and mitigation of global GHGs. Recent changes in methodologies and approaches by the CDM Executive Board made the programmatic CDM approach suitable for EE. There is possibility of developing an EE project in Indonesia targeting different end-uses such as replacement of incandescent bulbs in office buildings and hotels in Jakarta and major cities, establishing financial facility for industry and commercial sectors, and setting performance standards for equipment and appliances. A simplified small-scale methodology could apply to such an EE project if the project achieves an annual energy savings of 60 GWh. The generated carbon credits by the project would

⁷ PDF files are available in JICA Library (<http://lvzopac.jica.go.jp/library/indexeng.html>).

add supplemental revenues to the project owner while it reduces the stress on the energy supply systems and on the local and global environment.

(AP-3) Revision of Tariff Table that can cover the generation cost

The electricity tariff of PLN has not been revised since 2003. The revision of tariff table is one of the most important regulatory issues considering the issue of low tariff that cannot cover the generation cost:

- a) for sound operation of electricity supply business, which is mainly executed by PLN at the moment; and
- b) for formulation of attractive investment environment for private investors to the power sector.

In Japan, for instance, electricity tariff is periodically evaluated by an independent third party. The total cost for power generation is periodically reviewed taking into account the necessary costs of generation, electrification and maintenance for the remote users. With such a system, a balanced tariff scheme is determined to satisfy (i) sound management of the power supply company, (ii) reasonable tariff for users, and (iii) power supply for all users (universal service).

Therefore, it is recommended for Indonesia to introduce a similar third party evaluation scheme for appropriate determination of electricity tariff. The current tariff does not reflect the cost of electricity. It is necessary to explain to users the need for tariff increase in order to alleviate the critical financial status of PLN and to sustain sound development of Indonesia's power sector.

(AP-4) Reduction of Subsidy

As presented in Figure 4.2.13, all types of electricity users profit from subsidy which exert pressure on the national budget (about 2% of GDP in 2008). PLN can not operate its business without subsidy. The reduction of subsidy should be tackled through combination with other action plans such as “(AP-5) Acceleration of Power Development that contributes to reduction of power generation cost” and “(AP-9) Regulations in revision/transformation.”

(AP-5) Acceleration of Power Development that contributes to reduction of power generation cost

The reduction of power generation cost is one of effective measures to contribute to tariff and subsidy issues. The current average cost of PLN to generate 1 kWh of electricity is Rp. 1,271 (2008). Through the development of energy sources with low production cost, such as coal-fired steam power plant, hydropower plant or geothermal power plant, the government can possibly lower the generation cost.

(AP-6) Preparation and Implementation of Roadmap for Rural Electrification

The determination of the regions/areas to electrify, selection of optimum energy source for electrification, estimation of cost for electrification, and decision who to operate and maintain the power plant are the basic tasks for the smooth implementation of rural electrification. For this

purpose, technical assistance for both central and local governments will be crucial in the preparation of a roadmap for rural electrification. Electrification of each target area should be implemented based on this roadmap. It was mandated by the government that rural electrification will be under the responsibility of the local government from the year 2011. Under this situation, capacity building of the local government will be necessary for the smooth implementation of rural electrification to achieve the target of both household electrification ratio and village electrification ratio.

A least cost option will be adopted for the selection of energy sources. The possible candidates for energy sources are either (i) to extend the grid from PLN's supply area, or (ii) to establish isolated mini-grids from PLN's supply system (off-grid supply system).

In case of off-grid supply system, there are several options such as: (i) mini-grid by micro-hydropower station, (ii) mini-grid by biomass gasification power station, (iii) mini-grid by diesel power station, (iv) installation of solar power battery charging station, and (v) individual household electrification by solar home system.

As per government's policy, the application of renewable energy is the recommended source for rural electrification. However, this type of energy source requires higher initial cost for installation as compared with diesel power generation or grid extension. Therefore, financial support schemes for initial investment costs including connection are necessary to accelerate the development and promotion of rural electrification by renewable energy.

The options for the operation and maintenance of power stations and distribution systems are: (i) by PLN, (ii) by rural electrification enterprise, or (iii) by village electrification cooperatives, etc.

Specific pre-feasibility studies and pilot projects in some representative locations should be conducted once the rural electrification roadmap is formulated. Such pilot projects will give chances for business people to exploit their opportunities, for institutions to learn how to sustain and expand electrification services, and for those people in un-electrified villages to observe the benefits of rural electrification and help them obtain ideas and ways toward the electrification of their villages.

The MEMR should take the lead in formulating the roadmap with close coordination to the relevant ministries, agencies, local governments, and NGOs.

(AP-7) Close coordination between central and local government

It is always the case that the development permission for the development of power sector projects in the local areas is under control of the local government despite the project's national importance. Close coordination between central and local government is prerequisite for the smooth implementation of the project. Clarification of the roles of central and local governments in developing the power sector projects and holding of coordination meetings before and during the project implementation are necessary for smooth and efficient coordination. For this, BAPPENAS should play a vital role especially during the start up period of the project.

(AP-8) Promotion of renewable energy and natural gas supply infrastructure development

The promotion of renewable energy development is important to: (i) achieve the target of energy mix, and (ii) to promote rural electrification by applying renewable energy sources. These are already discussed in “(AP-1) Enhancement of Power Supply Capacity” and “(AP-6) Preparation and Implementation of Roadmap for Rural Electrification.”

Further increase of share for natural gas should be accelerated from the current 21% level toward the target of 30% in 2025 to achieve the national energy mix target. The fast-track development of natural gas supply infrastructures is urgently required considering the backlog during the last RPJM period (2004-2009).

(AP-9) Regulations in revision/transformation

After the approval of the new electricity law “Law No. 30/2009 on Electricity” in the parliament, the implementing rules and regulations are being prepared by the Directorate General of Electricity and Energy Utilization (DGEEU) of the MEMR.

With the new law, a considerable part of electricity development will be under the responsibility of local governments and entities other than PLN. Technical guidance from the central government will be essential to reinforce the capability of the local governments and other entities in handling electricity business. Foreign technical assistance can be considered as well when applying cutting-edge technologies to further assist such activities.

4.2.5 Priority projects for the next five years (2010-2014)

The following indicators should be set as the power sector development targets for the next five years (RPJM 2010-2014) in the implementation of the action plans to address the issues in the preceding sub-section :

Target Indicators for 2010-2014⁸

- 1) Additional Power Development: 30,000 MW
- 2) Additional Transmission Line Development: 28,000 kmc
- 3) Transmission Loss: Less than 10%
- 4) Rural Electrification: 80.4% of household electrification ratio and 98% of village electrification ratio by 2014
- 5) Energy Efficiency and Conservation: Energy elasticity less than 1.44 by 2014

⁸ Based on information and discussions provided by BAPPENAS during the study period.

Preliminary examinations on candidate projects were made in this sub-section using available reference materials to achieve the above targets.

The followings reference materials were used in the examination:

- 1) RUPTL 2009-2018 (Power Development Program prepared by PLN)
- 2) Plan of Required Investment for Power Development, Transmission Line and Substation Development of PT PLN 2010-2014 (Rencana Kebutuhan Investasi Proyek Transmisi/GI dan Pembangkit PT PLN (Persero) 2009-2014 Revisi 1), hereinafter called as “PLN investment plan 2010-2014”
(This document was prepared in November 2009 to estimate the required cost and to decide possible donors for the power development, transmission line and substation development for the next five years.)
- 3) Status of projects in Blue Book 2006-2009 submitted from PLN to BAPPENAS
- 4) Candidate project list to be put into Blue Book 2010-2014 submitted from PLN to BAPPENAS

Using the above materials, candidate project lists were examined for each category consisting of:

- 1) Power Development
- 2) Transmission Line, Substation, Distribution Line Development
- 3) Rural Electrification

(1) Power Development

The prospective power development projects were examined for Java-Bali system and outside Java-Bali system (Sumatra, Kalimantan, Sulawesi, Maluku&Papua, and NTB&NTT) using the RUPTL 2009-2018 as reference material.

a) All power development projects including IPPs in Java-Bali system

The power development projects including the ongoing projects in Java-Bali system shown in Table 4.2.8 are scheduled for the period from 2010 to 2014, according to RUPTL 2009-2018.

According to the schedule on Table 4.2.8, additional 19,003 MW will be newly added to Java-Bali system during the next five years of 2010 to 2014. Of these, 11,318 MW (60%) will be developed by PLN while the rest of 7,685 MW (40%) will be by IPPs.

Table 4.2.8 Power Development Projects for 2010-2014 for Java-Bali System

Table 4.2.3 Power Development Projects for 2010-2014 for Java-Bali System																			
	Additional Installation	Type of Development	Installed Capacity	Expected Scheme /Fund source															
							Year of Installation and Capacity (MW)												
			MW			2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018			
	(1) PLN Project																		
	(a) Ongoing Project		6,118 (2010-2014)				2,890	5,218	900										
PO-01	Muara Karang	PLTGU	694	JBIC			500	194											
PO-02	Muara Tawar	PLTGU	241	JBIC				241											
PO-03	Priok Extension	PLTGU	743	JBIC			500	243											
PO-04	Suralaya #	PLTU	625	FTP-1				625											
PO-05	Labuan	PLTU	600	FTP-1			600												
PO-06	TelukNaga/Lontar	PLTU	945	FTP-1				945											
PO-07	Pelabuhan Ratu	PLTU	1,050	FTP-1				1,050											
PO-08	Indramayu	PLTU	990	FTP-1			660	330											
PO-09	Rembang	PLTU	630	FTP-1			630												
PO-10	Pacitan	PLTU	630	FTP-1				630											
PO-11	Paiton Baru	PLTU	660	FTP-1				660											
PO-12	Tj. Awar-awar	PLTU	600	FTP-1				300	300										
PO-13	Tj Jati Baru Cilacap Baru	PLTU	600	FTP-1				600											
	(b) Planned Projects		5,200 (2010-2014)					150	2050	2000	1,000								
PP-01	Upper Cisokan PS	PS	1,000	IBRD	-	-	-	-	-	-	1,000	-	-	-	-	-			
PP-02	Muara Tawar Add-On 2,3,4	PLTGU	1,200	JBIC	-	-	-	150	1,050	-	-	-	-	-	-	-			
PP-03	Bojanegara (LNG Terminal)	PLTGU	2,250	Unallocated	-	-	-	-	-	-	-	-	750	750	750	-			
PP-04	PLTGU Baru	PLTGU	3,000	Unallocated	-	-	-	-	-	-	-	-	-	1,500	-	1,500			
PP-05	PLTG Baru	PLTG	2,600	Unallocated	-	-	-	-	-	-	-	-	1,400	-	1,200	-			
PP-06	Indramayu Baru	PLTU	1,000	JICA	-	-	-	-	-	-	-	-	1,000	-	-	-			
PP-07	PLTU Baru	PLTU	5,000	Unallocated	-	-	-	-	1,000	2,000	-	-	-	-	-	2,000			
PP-08	Kesamben	PLTA	37	Unallocated	-	-	-	-	-	-	-	-	-	-	37	-			
PP-09	Kalikonto-2	PLTA	62	Unallocated	-	-	-	-	-	-	-	-	-	62	-	-			
PP-10	Matenggeng PS	PS	885	Unallocated	-	-	-	-	-	-	-	-	-	-	885	-			
PP-11	Grindulu PS	PS	1,000	Unallocated	-	-	-	-	-	-	-	-	-	-	-	1,000			
	(2) IPP Project																		
	(a) Ongoing Project		1,040 (2010-2014)			60	260	130	910										
IO-01	Kamojang #4-Operasi	PLTP	60	-	60														
IO-02	Wayang Windu	PLTP	110	-			110												
IO-03	Cikarang Listrindo	PLTG	150	-			150												
IO-04	Cirebon	PLTU	660	-				660											
IO-05	Bali Utara/Celukan Bawang	PLTU	380	-				130	250										
	(b) Planned Projects		6,645 (2010-2014)					660	1785	1375	2825	1040	1970	1950	945				
IP-01	Banten	PLTU	660	-	-	-	-	-	-	-	660	-	-	-	-	-			
IP-02	Madura	PLTU	200	-	-	-	-	-	-	100	100	-	-	-	-	-			
IP-03	Bali Timur (Infrastruktur)	PLTU	200	-	-	-	-	-	-	-	200	-	-	-	-	-			
IP-04	Sumatera Mulut Tambang	PLTU	3,000	-	-	-	-	-	-	-	-	-	-	1,800	1,200	-			
IP-05	PLTU Jawa Tengah (Infrastruktur)	PLTU	2,000	-	-	-	-	-	-	-	-	1,000	1,000	-	-	-			
IP-06	Paiton #3-4 Exp (IPP)	PLTU	800	-	-	-	-	-	800	-	-	-	-	-	-	-			
IP-07	Tanjung Jati B Exp (IPP)	PLTU	1,320	-	-	-	-	660	660	-	-	-	-	-	-	-			
IP-08	PLTU Jabar (Ex. Tj Jati A)	PLTU	1,320	-	-	-	-	-	-	660	660	-	-	-	-	-			
IP-09	Panas Bumi	PLTP	2,910	-	-	-	-	-	225	415	505	40	140	640	945	-			
IP-10	Rajamandala	PLTA	30	-	-	-	-	-	-	-	-	-	30	-	-	-			
IP-11	Jatigede	PLTA	110	-	-	-	-	-	-	-	-	-	-	-	110	-			
	Total Installation					60	3,150	5,348	2,620	3,835	3,375	3,825	1,040	1,970	1,950	945			
	Total Installation 2010-2014									19,003									
	by PLN									11,318									
	by IPP									7,685									

Note: PLTU: Coal fired steam power plant, PLTP: Geothermal power plant, PLTA: Hydropower plant, PLTG: Gas fired power plant, PLTGU: Gas combined cycle power plant, PS: Pumped storage power plant

Source: Prepared by the JICA Study Team based on RUPTL 2009-2018 (PLN)

Of the 11,318 MW by PLN, 7,330 MW (64%) will be developed under the Fast Track Program-1 (FTP-1) whose development is ongoing. According to the original schedule, three power stations with total capacity of 1,890 MW will be put into the system by 2009 under the FTP-1. The rest of the seven power stations with total capacity of 5,440 MW will be completed during the period from 2010 to 2014.

There are four gas combined cycle power stations scheduled, namely Muara Karang (694 MW), Muara Tawar (241 MW), Priok Extension (743 MW) and Muara Tawar Add-On 2, 3, 4 (1,200 MW) with total capacity of 2,878 MW. Of these, 1,878 MW will be put into the system during the period from 2010 to 2014. These projects are under/scheduled for construction with financial assistance from Japan Bank for International Cooperation (JBIC). The Upper Cisokan pumped storage power plant is schedule to be funded by the World Bank. The project is in the preparation stage of consultant procurement for design review and construction supervision.

Project No. PP-07 PLTU Baru (new development of coal fired steam power plant, 3,000 MW) is scheduled to be put into the system during 2010-2014 without expected financial resources. It is

urgently required to scout for possible donors to fund this project, or to find possible investors who will develop the project as an IPP scheme.

As for geothermal power development, in addition to the scheduled PLN projects in Table 4.2.8, the following five projects are scheduled to be implemented by PLN instead of IPPs.

- 1) Gunung Tangkuban Perahu 110 MW
- 2) Kamojang 100 MW
- 3) Ijen 30 MW
- 4) Wilis/Ngebel 110 MW
- 5) Iyang Argopuro 275 MW

b) Candidate project list for external loan in Java-Bali system

Excluding FTP-1 and IPP projects among those described in the preceding section, the following projects shown in Table 4.2.9 will be the candidates for external loans with their possible disbursement schedule and expected donors.

The data in Table 4.2.9 are derived from “PLN investment program 2010-2014” which is mostly based on RUPTL 2009-2018 with minor adjustment made based on coordination result with donors. There are still several projects without possible donors. Further discussions between donors and government officers (ex. PLN) will be required, such as discussion during fact finding or appraisal missions.

Table 4.2.9 Candidate Project List for External Loans (Java-Bali system)

No.	Project Name	Type of Power Plant	Installed Capacity	Possible Donors	Expected year of operation	Disbursement Schedule (Mil. USD)							Disbursement (Mil. USD)	Total Investment (Mil. USD)
						2009	2010	2011	2012	2013	2014	after 2014		
JB-11	Indramayu Baru	Coal fired	2,000	JICA	2015		83	354	688	709	479	187	2,313	2,500
JB-13	Muara Karang Repowering	Gas combined cycle	694	JBIC	2009, 2010	321	102						423	619
JB-14	Priok Extension	Gas combined cycle	743	JBIC	2009, 2010	228	173	44	22				467	652
JB-15	Muara Tawar Blok #5	Gas combined cycle	241	JBIC	2010	145	21	6					172	202
JB-16	Muara Tawar Add-On 2,3,4	Gas combined cycle	1,200	Credit Export	2011, 2012	33	274	347	366				1,020	1,020
JB-17	LNG Bojonegara	Gas combined cycle	2,250		2015-2017								0	1,913
JB-18	PLTGU Baru	Gas combined cycle	3,750		2016, 2018							3,188	0	3,188
JB-19	PLTG Baru	Gss fired	3,600		2015, 2017						166	1,994	166	2,160
JB-20	Kesamben	Hydro	37		2017						15	59	15	74
JB-21	Kalikonto	Hydro	62		2016					25	37	62	62	124
JB-22	Upper Cisokan Pumped Storage	Pumped Storage	1,000	IBRD	2014	33	83	139	166	142	83	16	646	662
JB-23	Matenggeng PS	Pumped Storage	885		2017				29	73	123	361	225	586
JB-24	Grindulu PS	Pumped Storage	1,000		2018					33	83	546	116	662
JB-26	Ijen	Geothermal	110	Multi/bilateral	2014					50	73	53	123	176
JB-27	Iyang Argopuro	Geothermal	275	Multi/bilateral	2017, 2018				25	37	77	301	139	440
JB-28	Kamojang	Geothermal	100	JICA	2013			27	40	47	27	19	141	160
JB-29	Wilis/Ngebel	Geothermal	165	Multi/bilateral	2014					25	87	152	112	264
						760	736	917	1,336	1,141	1,250		6,140	15,402

Source: PLN

c) All the power development projects including IPPs outside Java-Bali system

The total number of projects outside the Java-Bali system consisting of Sumatra, Kalimantan, Sulawesi, Maluku&Papua, and NTT&NTB are too many to list up which include many isolated systems mainly supplied by diesel power generation. Therefore, only summary of development projects by PLN and IPPs are shown in the following table by regions.

Table 4.2.10 Power Development Projects Summary (outside Java-Bali system)

<i>Region</i>	<i>by PLN (MW)</i>	<i>by IPP (MW)</i>	<i>Total (MW)</i>
Sumatra	3,350	2,102	5,452
Kalimantan	1,380	567	1,947
Sulawesi	1,112	723	1,835
Maluku & Papua	268	49	317
NTB & NTT	340	148	488
Total	6,450	3,589	10,039

Source: Prepared by using RUPTL 2009-2018

d) Candidate project list for external loan outside the Java-Bali system

The power development projects outside the Java-Bali system which will be candidates for external loan for the period 2010-2014 are shown in Table 4.2.11 below. The required fund, disbursement schedule and expected donors are shown in the table.

The data are derived from “PLN investment program 2010-2014” which is mostly based on RUPTL 2009-2018 but with minor adjustment based on coordination result with donors. The criteria for selecting the above projects are:

- (1) projects whose donors have already been decided; and
- (2) projects with required investment cost of more than USD 10 million.

There are still several projects without possible donors. Further discussion between donors and government officers (ex. PLN) will be required, such as discussion during fact finding or appraisal missions.

Table 4.2.11 Candidate Project List for External Loans (outside Java-Bali system)

No.	Project Name	Region	Type of Power Plant	Installed Capacity	Possible Donors	Expected year of operation	Disbursement Schedule (Mil. USD)								Disbursement (Mil. USD)	Total Investment (Mil. USD)
							2009	2010	2011	2012	2013	2014	after 2014	2009-2014		Total
OJB-000	Genyem	Maluku & Papua	Hydro	20	ADB	2011, 2012			10.0	10.0					20.0	
OJB-001	Asahan III	Sumatra	Hydro	174	JICA	2012	7.1	55.0	147.0	98.0					307.1	
OJB-002	Peusangan	Sumatra	Hydro	86	JICA	2012	7.2	37.6	146.5	97.7					289.0	
OJB-003	Bakaru II	Sulawesi	Hydro	126	JICA indication	2015, 2016					25.2	88.2	139		252.0	
OJB-004	Bone I	Sulawesi	Hydro	11		2013?				10.5	10.5				21.0	
OJB-005	Bone II	Sulawesi	Hydro	6		2013?				5.5	5.5				11.0	
OJB-006	Bonto Batu	Sulawesi	Hydro	100		2016					40.0	160			200.0	
OJB-007	Isal II	Maluku & Papua	Hydro	20		2014				8.0	20.0	12			40.0	
OJB-008	Kusan	Kalimantan	Hydro	65		2015				26.0	65.0	39			130.0	
OJB-009	Poko	Sulawesi	Hydro	234		2017					93.6	374			468.0	
OJB-012	Bacan	Maluku & Papua	Diesel	1	Belgian Loan	2009	1.2								1.2	
OJB-013	Kuala Enok	Sumatra	Diesel	2	Belgian Loan	2009		2.3							2.3	
OJB-014	Sanggeng (Manokwari)	Maluku & Papua	Diesel	3	Belgian Loan	2009	3.1								3.1	
OJB-015	Sofifi	Maluku & Papua	Diesel	2	Belgian Loan	2009	1.5								1.5	
OJB-016	Timika	Maluku & Papua	Diesel	3	Belgian Loan	2009	3.1								3.1	
OJB-017	Tobello	Maluku & Papua	Diesel	3	Belgian Loan	2009	3.1								3.1	
OJB-074	Luwuk Turbine Gas	Sulawesi	Gas fired	30		2011-13, 2016			3.0	3.0	6.0				18.0	
OJB-075	New PLTG Kalbar	Kalimantan	Gas fired	105		2017, 2018									63.0	
OJB-076	New PLTG Kaltim	Kalimantan	Gas fired	100		2010, 2016	12.9	17.1							60.0	
OJB-077	New Sumut	Sumatra	Gas fired	70		?		9.0	12.0						42.0	
OJB-079	Keramasan	Sumatra	Gas combined cycle	86	JICA	2011	59.3	27.1							87.4	
OJB-081	Lhokseumawe	Sumatra	Gas combined cycle	120		2010, 2011				120.0					120.0	
OJB-082	Muara Teweh	Kalimantan	Gas combined cycle	120		2010, 2011				40.0	80.0				120.0	
OJB-083	Lobong	Sulawesi	Micro Hydro	2	ADB	2009	2.4	2.4							4.8	
OJB-084	Mangango	?	Micro Hydro	1	ADB	?	1.8	1.8							3.6	
OJB-085	Merasap	Kalimantan	Micro Hydro	2	ADB	2010?	2.3	2.3							4.6	
OJB-086	Ndungga	NTB & NTT	Micro Hydro	2	ADB	2010	2.9	2.9							5.8	
OJB-087	Prafi (Manokwari)	Maluku & Papua	Micro Hydro	3	ADB	2009	3.8	3.8							7.6	
OJB-088	Santong	NTB & NTT	Micro Hydro	1	ADB	2009	1.4	1.4							2.8	
OJB-106	Kombemur (Fak-Fak)	Maluku & Papua	Micro Hydro	7		2013, 2014				5	9.9	5			19.9	
OJB-129	Hululais #1,2	Sumatra	Geothermal	110	ADB	2012, 2013			51.8	80.2					132.0	
OJB-130	Lahendong IV	Sulawesi	Geothermal	20	ADB	2011		9.4	14.6						24.0	
OJB-131	Tulehu	Maluku & Papua	Geothermal	20	ADB	2012			9.4	14.6					24.0	
OJB-132	Ulumbu	NTB & NTT	Geothermal	5	ADB	2010	2.4	3.6							6.0	
OJB-134	Lahendong III	Sulawesi	Geothermal	20	JICA	2009	10.2	0.2							10.4	
OJB-135	Lumut Balai	Sumatra	Geothermal	220	JICA (?)	2011-14									0.0	
OJB-136	Sungai Penuh	Sumatra	Geothermal	110	ADB indication	2011		51.8	80.2						132.0	
OJB-137	Ulubelu #3,4	Sumatra	Geothermal	110	ADB indication	2013, 2014				25.9	66	40.1			132.0	
OJB-138	Mataloko	NTB & NTT	Geothermal	10	JICA indication	2013-15				5.0	5.0				10.0	
OJB-139	Sembalun	NTB & NTT	Geothermal	20	KfW indication	2013				9.4	14.6				24.0	
OJB-140	Ulubelu #1,2	Sumatra	Geothermal	110	JBIC	2011, 2012	102.6	42.8							146.3	
OJB-142	Bora	Sulawesi	Geothermal	10		2012			4.7	7.3					12.0	
OJB-143	Hululais #3	Sumatra	Geothermal	55		?			25.9	40.1					66.0	
OJB-144	Huu	NTB & NTT	Geothermal	10		2015						4.7			12.0	
OJB-145	Jaboi	Sumatra	Geothermal	10		2015		2.4	3.6		2.4	3.6			12.0	
OJB-146	Kotamobagu	Sulawesi	Geothermal	40		2013, 2014				9.4	24.0	14.6			48.0	
OJB-147	Lahendong Optimasi	Sulawesi	Geothermal	25		2011		11.8	18.2						30.0	
OJB-148	Lahendong V	Sulawesi	Geothermal	20		2012			9.4	14.6					24.0	
OJB-149	Lainea	Sulawesi	Geothermal	20		2014					9.4	14.6			24.0	
OJB-151	Merana	Sulawesi	Geothermal	50		2014					23.6	36.5			60.0	
OJB-152	Seulawah	Sumatra	Geothermal	40		2012			18.8	29.2					48.0	
OJB-154	Wai Sano	NTB & NTT	Geothermal	10		2017									12.0	
OJB-155	Lombok	NTB & NTT	Geothermal	100	Korean Loan	?				23.5	41.5				65.0	
OJB-166	New PLTU (Sumbagut)	Sumatra	Coal Steam	400	China Loan Indicat	2012, 2013			107.9	208.0	204.1				520.0	
OJB-209	Takalar	Sulawesi	Coal Steam	200	Spanish Loan indic	2013, 2014			86	100.0	74.0				260.0	
								228.3	324.7	928.1	777.2	590.8	431.4		3,280.5	
															4,145.2	

Source: PLN

Based on the above data, about 29,000 MW of power development projects will be executed in the next five years with about 18,000 MW to be developed by PLN and about 11,000 MW by IPPs. Out of the PLN 18,000 MW development, 10,000 MW will be developed by FTP-1 while the remaining 8,000 MW will be developed using external loan.

(2) Transmission Line, Substations, and Distribution Line Development

Based on the “PLN investment program 2010-2014, the necessary development projects were examined for both Java-Bali system and outside Java-Bali system (Sumatra, Kalimantan, Sulawesi, Maluku&Papua, and NTB&NTT). The succeeding three figures below show fund arrangements for projects in the Java-Bali system.

Table 4.2.12 Required Investment on Transmission Line in Java-Bali system
Mil. USD

Fund source	2010	2011	2012	2013	2014	Total	%
ADB	67.5	33.5	4.6	32.1	70.4	208.1	11.2%
APBN	50.7	96.9	109.8	159.3	177.6	594.3	32.0%
APLN	174.7	100.1	78.2	89.9	97.9	540.8	29.1%
IBRD			2.9	6.4	1.0	10.3	0.6%
JICA			19.0	41.6	18.9	79.5	4.3%
JBIC						0.0	0.0%
Credit Export	66.9	57.5	17.9	7.4	14.2	163.9	8.8%
Acceleration	143.9	80.6	19.5	5.7	12.0	261.7	14.1%
Unallocated						0.0	0.0%
Total	503.7	368.6	251.9	342.4	392.0	1,858.6	100.0%

Table 4.2.13 Required Investment on Substation in Java-Bali system
Mil. USD

Fund source	2010	2011	2012	2013	2014	Total	%
ADB	97.2	58.7	27.5	35.8	53.5	272.7	9.5%
APBN	94.9	196.3	218.2	260.7	335.1	1,105.2	38.4%
APLN	168.4	184.5	130.7	125.0	184.7	793.3	27.5%
IBRD	43.6	44.1	11.2	1.0	4.5	104.4	3.6%
JICA					151.5	151.5	5.3%
Credit Export	76.8	83.7	63.3	14.7		238.5	8.3%
Acceleration	83.9	81.4	30.4	14.3	4.8	214.8	7.5%
Unallocated						0.0	0.0%
Total	564.8	648.7	481.3	451.5	734.1	2,880.4	100.0%

Table 4.2.14 Required Investment on Distribution Line in Java-Bali system
Mil. USD

Fund source	2010	2011	2012	2013	2014	Total	%
APLN	582.2	595.4	665.9	719.2	778.1	3,340.8	97.1%
ADB	60.0	40.0				100.0	2.9%
Total	642.2	635.4	665.9	719.2	778.1	3,440.8	100.0%

As indicated in the above tables, the construction cost for transmission lines, substations and distribution lines are mostly allocated from the national budget (APBN) or PLN budget (APLN). Funds allocated from ADB, IBRD, JICA and JBIC are also counted. However, these schemes are mostly by prepared as supplementary component for the power development schemes with less than USD 500 million in budget. Large scale projects, such as the Java-Sumatra submarine transmission line, will need separate discussions between government officers and donors for formulation of individual sub-projects.

The same idea is applied for projects outside the Java-Bali system as shown in Tables 4.2.15 to 17.

Table 4.2.15 Required Investment on Transmission Line outside Java-Bali system

Mil. USD							
Fund source	2010	2011	2012	2013	2014	Total	%
APBN	433.7	427.1	333.1	161.2	108.4	1,463.5	55.0%
APLN	244.8	244.8	134.2	202.9	294.0	1,120.7	42.1%
Credit Export indication						0.0	0.0%
IBRD indication						0.0	0.0%
ADB indication	34.3	24.3	19.3			77.9	2.9%
Unallocated						0.0	0.0%
Total	712.8	696.2	486.6	364.1	402.4	2,662.1	100.0%

Table 4.2.16 Required Investment on Substations outside Java-Bali system

Mil. USD							
Fund source	2010	2011	2012	2013	2014	Total	%
APBN	183.7	185.7	120.8	66.8	65.2	622.2	53.1%
APLN	121.5	74.1	60.3	81.1	104.5	441.5	37.7%
Credit Export indication						0.0	0.0%
IBRD indication	50.1	50.1				100.2	8.5%
ADB indication	1.6	4.3	2.7			8.6	0.7%
Unallocated						0.0	0.0%
Total	356.9	314.2	183.8	147.9	169.7	1,172.5	100.0%

Table 4.2.17 Required Investment on Distribution Line outside Java-Bali system

Mil. USD							
Fund source	2010	2011	2012	2013	2014	Total	%
APLN	144.3	221.6	275.8	346.9	364.4	1,353.0	82.4%
APBN						0.0	0.0%
ADB						0.0	0.0%
IBRD	127.5	76.5	51.0			255.0	15.5%
Loan from Korea	23.8	10.2				34.0	2.1%
Total	295.6	308.3	326.8	346.9	364.4	1,642.0	100.0%

(3) Rural Electrification

In RPJM 2010-2014, the rural electrification target is set as follows:

- 80.4% of household electrification ratio by 2014
- 98% of village electrification by 2014

About Rp. 1.5 trillion were allocated for rural electrification program, mainly for off-grid areas, during the last five years. The same amount will be allocated for the next five years. Such fund allocation will be borne by the national budget (APBN).

From the latest information from BAPPENAS (as of January 2010), the rural electrification programs will be under the responsibility of local governments. Fund sources for rural electrification programs will come from the special allocation fund (DAK) with a total amount of Rp. 10 trillion in five years.

4.2.6 Candidate projects for Blue Book

The current status of candidate project list and selection criteria are presented in this subsection.

(1) The past Blue Book candidate list

Two Blue Books were prepared during the last RPJM period, i.e., Blue Book 2006-2009 (original) and Blue Book 2006-2009 (2008 revision). Of the two Blue Books, the power sector related schemes and their status are summarized below:

Table 4.2.18 Blue Book 2006-2009 (original and 2008 revision)

No	Project Title	Investment Required (Million USD)		Fund Source Indication	Status
		Loan	Counterpart Funding		
1	E/S for Java-Sumatra Interconnection 500 kV Line HVDC	40	-	JICA	Procurement Stage
2	Construction for Java-Sumatra Interconnection 500 kV Line (HVDC) Phase-1	2,191	201	JICA	Appraisal stage
3	Muara Tawar Add on Block 2,3,4,CCPP (825-1200 MW)	850	150	KE	Procurement EPC
4	Java-Bali Submarine Cable 150 kV Circuit 3&4	55.56	6.17	KE	Waiting for Ministry of Finance Approval
5	Rehabilitation and Modernization of Paiton SPP 1&2 (2x400 MW)	41.1	7.25	JBIC	o Contract signed o Waiting for approval
6	Rehabilitation and Modernization of Saguling HEPP (4x178 MW)	13.38	2.36	JBIC	o Contract signed o Contract is waiting for L/A
7	Enterprise Resource Planning (ERP) Outside Java-Bali	30		IBRD	Procurement stage
8	Lahendong IV GEOPP (1x20 MW)	32.73	5.78	ADB	EPC stage, waiting for ex-HEPP Poigar fund
9	Lombok Steam Coal Power Plant (2x25 MW)	75	7.5	Korea	Waiting for appraisal
10	Parit Baru Steam Coal Power Plant (2x50 MW)	132.86	23.45	Cina	Retender
11	Takalar Steam Coal Power Plant (2x115 MW) in South Sulawesi	357.58	39.8		o Bargained price is higher than HPS o Need decision for other fund source instead of Spanish loan
12	Java-Bali Distribution Performance Improvement	100	15	ADB	o Has been appraised o Waiting for L/A
13	Scattered Transmission and Substation in Indonesia. Funding source is divided into 2 : 1. KE Fund : For strengthening Jakarta 2. IBRD Fund : For InterBus Transformer (IBT) Java and Sumatera	500		IBRD/KE	KE Fund Status o Recommendation from BAPPENAS o Waiting for Ministry of Finance Approval IBRD fund status o Arranging tender document o Waiting for appraisal
14	Java-Bali Crossing Interconnection 500kV	286.4	41.7	ADB	FS arrangement and document tender by ADB (in progress)
15	Upper Cisokan Pumped Storage HEPP (1000 MW)	774	73	IBRD	o LARAP in progress o Procurement for consultant
16	Sembalun GEOPP, Lombok (2x10 MW)	40.46	7.14	JICA	o Waiting for WKP tender o F/S is in progress
17	Bakaru II Hydro Electric Power Plant (HEPP) (2x63 MW)	133.23	36.74	JICA	JICA has intention to conduct SAPROF II
18	Kusan Hydro Electric Power Plant (HEPP) 65 MW	95.5	16.9	JICA	o LARAP arrangement is on progress o Waiting for JICA appraisal
TOTAL		5,748.80	633.8		

KE: Kredit Expor (Credit Export), WKP: Wilayah Kerja Pertambangan (Mining Working Area), LARAP (Land Acquisition and Resettlement Action Plan)
Source: PLN

(2) Blue Book Candidate List for 2010-2014

At the beginning of December 2009, PLN sent a letter to BAPPENAS showing the power sector candidate project list for Blue Book. There are 11 projects for Project Assistance and seven projects for Technical Assistance in the list as shown below.

Table 4.2.19 Candidate Project List for Blue Book 2010-2014 (Project Assistance)

No	Project Title	Capacity	Investment Required			Potential Lender
		(MW)	Total (Mil. US\$)	Loan (Mil. US\$)	Counterpart Funding (Mil. US\$)	
1	Steam Coal Fired Power Plant Indramayu Baru	2,000	2,890	2,457	434	JICA
2	Hydro Electric Power Plant Merangin	350	529	476	53	JICA
3	Geothermal Power Plant Hululais 1&2	110	154	139	15	JICA/ADB
4	Geothermal Power Plant Kotamubagu 1, 2, 3 &4	80	120	108	12	JICA/ADB
5	Geothermal Power Plant Sungai Penuh 1 & 2	110	154	139	15	JICA/ADB
6	Geothermal Power Plant Tulehu	20	50	45	5	JICA
7	Geothermal Power Plant Mataloko	5	12.5	11.25	1.25	JICA
8	HVDC Java – Sumatra		2,392	2,191	201	JICA
9	Interconnection of West Kalimantan-Serawak		110	99	11	ADB
10	Scattered Transmission Lines & Substations in Indonesia		1,000	900	100	ADB
11	Electrification Development Program in Sumatra		40	36	4	Korea
TOTAL		2,675	7,452	6,601	851	

Source: PLN, BAPPENAS

Table 4.2.20 Candidate Project List for Blue Book 2010-2014 (Technical Assistance)

No	Project Title	Province	Capacity (MW)	Remarks
1	Geothermal Power Plant Hulu lais	Bengkulu	110	WKP Pertamina
2	Geothermal Power Plant Kotamubagu	Sulawesi Utara	80	WKP Pertamina
3	Geothermal Power Plant Sungai Penuh	Jambi	110	WKP Pertamina
4	Geothermal Power Plant Sembalun	NTB	20	WKP PLN
5	Geothermal Power Plant Ulumbu	NTT		WKP PLN, additional
6	Master Plan Study for Scattered Geothermal in Indonesia			
7	Detailed Master Plan Study for Greater Jakarta	DKI Jakarta		

Source: PLN, BAPPENAS WKP: Wilayah Kerja Pertambangan (Mining Work Area)

(3) Evaluation of Candidate Project List for Blue Book

Below are the speculations and recommendations based on the proposed list submitted by PLN:

(a) Contributions to power deficit solutions and lowering of generation cost

About 30,000 MW of power development projects will be executed during the next five years from 2010 to 2014. About 75% of these projects will utilize coal fired steam power plant. The accelerated development of coal-fired steam power plant is expected to resolve the chronic power deficit in the country, especially in the Java-Bali system. In addition, coal fired power plants can generate electricity at lower cost compared with diesel power plants, which may contribute to the lowering of power generation cost.

(b) Need of Renewable Energy development acceleration

On the other hand, the accelerated coal fired power plant installation will make its share to be around 60% of the total installed capacity in Indonesia, which is contrary to the energy mix policy to promote more renewable energy. Therefore, the accelerated development of renewable energy sources such as hydropower and geothermal will be prerequisite to achieve the target of energy mix in 2025 stipulated as a national policy.

Steady implementation of feasibility studies and detailed designs for geothermal and hydropower projects should be prioritized to confirm the viability and promote the accelerated development of these projects. In addition, sufficient coordination of development concessions on potential geothermal and hydro power projects is the key issue for smooth implementation of the power

potential. The central government should duly coordinate with the local governments during the investigation, study, design and construction stages of the projects. It is recommended to implement those projects with sufficient maturity even before their original implementation schedule to further accelerate the renewable energy development.

(c) Need of application of clean coal technologies (CCTs)

The development of coal-fired power plant is in full swing by the Fast Track Program-1. However, coal fired power plants have the nature of emitting more greenhouse gases compared with other power sources. Thus, consideration should be carefully made on the application of clean coal technology for the development and diffusion of coal fired power plant to reduce the environmental burden. As mentioned in the preceding subsection, the application of CCTs is a must for the projects under Fast Track Program-2 (FTP-2). Likewise, the application of CCTs in the rehabilitation/improvement of the existing coal fired power plants should also be considered and implemented.

Considering the above points and from the view point of “(b) Need of Renewable Energy development acceleration” above, the following projects should be added into the candidate list for Blue Book and should be listed up for timely implementation.

Study and construction of:

- (i) Merangin Hydropower Project in Sumatra (Jambi)
- (ii) Bonto Batu Hydropower Project in Sulawesi
- (iii) Malea Hydropower project in Sulawesi
- (iv) Bakaru Rehabilitation and Bakaru II Hydropower project in Sulawesi
- (v) Isal-2 Hydropower project in Maluku (Seram)
- (vi) Peusangan-4 Hydropower project in NAD
- (vii) Grindulu Pumped Storage Power Project
- (viii) Matenggeng Pumped Storage Power Project
- (ix) Upper Cisokan Pumped Storage Power Project
- (x) Pugar Sea Water Pumped Storage Power Project
- (xi) Karaha Geothermal Project
- (xii) Ulubelu 3,4 Geothermal Project
- (xiii) Lahendong 5,6 Geothermal Project
- (xiv) Lumut Balai 3,4 Geothermal Project
- (xv) Kamojang 5 Geothermal Project

From the view point of “(c) Need of application of clean coal technology” above, the followings should be implemented.

- (xvi) Study and Construction of Indramayu Coal-fired Steam Power Plant in Java
- (xvii) Technical assistance for rehabilitation/improvement of existing coal fired steam power plant by applying Clean Coal Technologies (CCTs)

To further accelerate transmission line development:

Study and Construction of

- (xviii) Upgrading Transmission Capacity of 500 kV Line in West Java
- (xix) Java-Sumatra Interconnection Transmission Line Project II & III
- (xx) Malay-Sumatra Interconnection Transmission Line Project

To further accelerate environment friendliness and efficient energy use,

- (xxi) Technical assistance related to energy efficiency and conservation

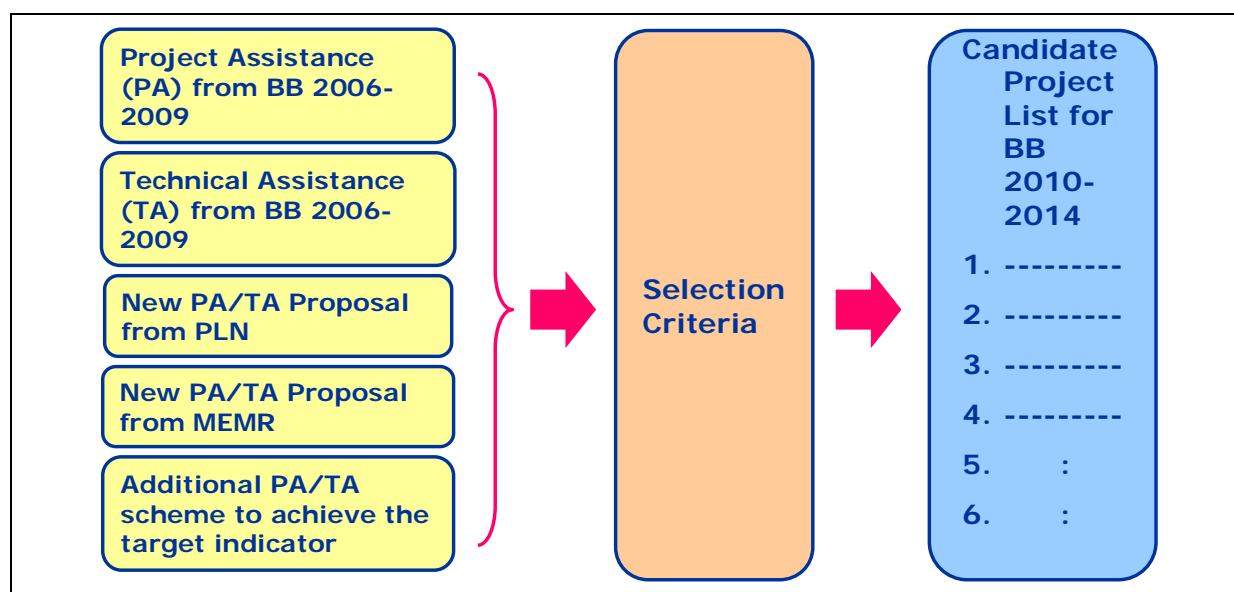
To further accelerate achievement of target electrification ratio,

- (xxii) Technical assistance for rural electrification master plan

(4) Selection criteria for candidate Blue Book projects

The following procedures will be taken for the selection of candidate project list in the Blue Book 2010-2014.

Figure 4.2.15 Flow of Selection of Candidate Projects for Blue Book 2010-2014



Candidate projects will be selected using the above flow, and the selection criteria will be as follows:

- ◆ Consistent with national development plan (RPJMN, Renstra, RUKN, RUPTL)
- ◆ Project Cost > 10 million USD
(Suitable size for external loan)
- ◆ Readiness/Maturity of the project (feasibility study or detailed design completed)
- ◆ Committed by possible donors
- ◆ Project EIRR > 12%
- ◆ To Further Accelerate:
 - Energy mix target
 - Renewable Energy Development (Hydro and Geothermal)
 - Lowering of generation cost
 - Achievement of key performance indicators of the sector
 - Energy efficiency and conservation
- ◆ Application of:
 - Environmental friendly technologies
 - Cutting-edge technologies
- ◆ Technical Assistance to support above objectives

Though the detailed information on the candidate projects are not fully available at the moment, a preliminary evaluation of the candidate projects for Blue Book are given in Table 4.2.21 in the next page. Further evaluation should be made after obtaining sufficient project information to screen the candidate projects by criteria.

Table 4.2.21 Candidate Project List for Blue Book and their preliminary evaluation

No.	TA/PA	Criteria Candidate Project	Consistent with national development plan (RPJMN, Renstra, RUKN, RUPTL)	Project Cost > 10 million USD	Readiness/Maturity of the project (feasibility study or detailed design completed)	Committed by possible donors	Project EIRR > 12%	To Further Accelerate:				Application of:		Supportive Technical Assistance	Status
								Energy mix target	Renewable Energy Development (Hydro and Geothermal)	Lowering of generation cost	Achievement of key performance indicators of the sector	Energy efficiency and conservation	Environmental friendly technologies	Cutting-edge technologies	
1	PA	Steam Coal Fired Power Plant Indramayu Baru	O	O	O	O	O	O	O	O	O	O	O	O	Proposed from PLN to BAPEPNAS (Dec. 2009)
2	PA	Merangin Hydropower Project in Sumatra (Jambi)	O	O	O	O	O	O	O	O	O	O	O	O	Proposed from PLN to BAPEPNAS (Dec. 2009)
3	PA	Geothermal Power Plant Hululais 1&2	O	O		O		O	O	O	O		O		Proposed from PLN to BAPEPNAS (Dec. 2009)
4	PA	Geothermal Power Plant Kotamubagu 1, 2, 3 & 4	O	O		O		O	O	O	O		O		Proposed from PLN to BAPEPNAS (Dec. 2009)
5	PA	Geothermal Power Plant Sungai Penuh 1 & 2	O	O		O		O	O	O	O		O		Proposed from PLN to BAPEPNAS (Dec. 2009)
6	PA	Geothermal Power Plant Tulehu	O	O		O		O	O	O	O		O		Proposed from PLN to BAPEPNAS (Dec. 2009)
7	PA	Geothermal Power Plant Mataloko	O	O		O		O	O	O	O		O		Proposed from PLN to BAPEPNAS (Dec. 2009)
8	PA	HVDC Java – Sumatra		O		O					O			O	Proposed from PLN to BAPEPNAS (Dec. 2009)
9	PA	Interconnection of West Kalimantan-Serawak		O		O					O				Proposed from PLN to BAPEPNAS (Dec. 2009)
10	PA	Scattered Transmission Lines & Substations in Indonesia		O		O					O				Proposed from PLN to BAPEPNAS (Dec. 2009)
11	PA	Electrification Development Program in Sumatra		O		O					O				Proposed from PLN to BAPEPNAS (Dec. 2009)
13	TA	Geothermal Power Plant Hulu lais	O					O	O	O	O		O	O	Proposed from PLN to BAPEPNAS (Dec. 2009)
14	TA	Geothermal Power Plant Kotamubagu	O					O	O	O	O		O	O	Proposed from PLN to BAPEPNAS (Dec. 2009)
15	TA	Geothermal Power Plant Sungai Penuh	O					O	O	O	O		O	O	Proposed from PLN to BAPEPNAS (Dec. 2009)
16	TA	Geothermal Power Plant Sembalun	O					O	O	O	O		O	O	Proposed from PLN to BAPEPNAS (Dec. 2009)
17	TA	Geothermal Power Plant Ulumbu	O					O	O	O	O		O	O	Proposed from PLN to BAPEPNAS (Dec. 2009)
18	TA	Master Plan Study for Scattered Geothermal in Indonesia	O					O	O	O	O		O	O	Proposed from PLN to BAPEPNAS (Dec. 2009)
19	TA	Detailed Master Plan Study for Greater Jakarta												O	Proposed from PLN to BAPEPNAS (Dec. 2009)
20	TA/PA	Malea Hydropower project in Sulawesi		O				O		O	O		O	O	
21	TA/PA	Peusangan-4 Hydropower project in NAD		O				O		O	O		O	O	
22	TA/PA	Bonto Batu Hydropower Project in Sulawesi		O				O		O	O		O	O	
23	TA/PA	Bakaru Rehabilitation and Bakaru II Hydropower project in Sulawesi		O				O		O	O		O	O	
24	TA/PA	Isal-2 Hydropower project in Maluku (Seram)	O					O		O	O		O	O	
25	TA/PA	Grindulu Pumped Storage Power Project		O					O		O		O	O	
26	TA/PA	Matenggeng Pumped Storage Power Project		O					O		O		O	O	
27	TA/PA	Pugar Sea Water Pumped Storage Power Project		O					O		O		O	O	
28	TA/PA	Karaha Geothermal Project						O	O	O	O		O	O	
29	TA/PA	Ulubelu 3,4 Geothermal Project						O	O	O	O		O	O	
30	TA/PA	Lahendong 5,6 Geothermal Project						O	O	O	O		O	O	
31	TA/PA	Lumut Balai 3,4 Geothermal Project						O	O	O	O		O	O	
32	TA/PA	Kamojang 5 Geothermal Project						O	O	O	O		O	O	
33	TA	Technical assistance for rehabilitation/improvement of existing coal fired steam power plant by applying Clean Coal Technologies (CCTs)										O	O	O	
34	PA	Upgrading Transmission Capacity of 500 kV Line in West Java		O						O	O				
35	PA	Java-Sumatra Interconnection Transmission Line Project II & III		O						O	O			O	
36	PA	Malay-Sumatra Interconnection Transmission Line Project		O						O	O			O	
37	TA	Technical assistance related to energy efficiency and conservation									O	O		O	
38	TA	Technical assistance for rural electrification master plan									O			O	

☒ : Candidate project which may satisfy the criteria

☐ : Information not available / Candidate project which may not satisfy the criteria
(Blank)

Source: Prepared by JICA Study Team

4.3 Water Supply and Sewerage Sector

4.3.1 Current Development Program

(1) Water Supply and Sewerage

The following three programs consisting of: a) program for promoting community empowerment; b) program for developing institutions; and c) program for improving management of drinking water and waste water are being implemented in RPJMN 2004-2009.

1) Community Empowerment

The community empowerment program aims to enhance the community awareness on the importance of clean drinking water and proper management of waste water. This is initiated through improvement of the quality of life and productivity of human resources considering the following targets: a) increased awareness of communities on the importance of behavioral pattern that is consistent with clean and healthy living; and b) increased participation of communities in the development and management of drinking water and waste water.

Consequently, the following activities are being carried out:

1. Execution of public campaigns, mediations and facilitation with the general public on the importance of clean and healthy ways of living;
2. Increasing the role of schools in supporting clean and healthy ways of living;
3. Presentation of proper examples and promoting the role of the communities in the conservation of raw water sources;
4. Promotion of community participation in improving the quality of the environment;
5. Conservation of local cultures and knowledge that support conservation and maintenance of raw water quality;
6. Promotion reward and punishment culture in community participation for enhancing the quality of the environment;
7. Promotion of charity funds and NGOs;
8. Increasing of community capacity on the basis of the demand driven approach, that is participatory, based on informed choice, pro-poor, gender equality, education and self-financing; and
9. Involvement of local communities during the initial design, construction and operation and maintenance (O&M) of the facilities, as well as in the rehabilitation of areas that have been affected by natural disasters.

2) Institutional Development

Institutional development is aimed at reforming the laws and regulations and promoting institutions that are related to the development of drinking water and waste water in the context

of realizing an effective institutional framework and administration system. The following main objectives will be pursued accordingly:

1. To promote coordination and cooperation among activities and among regions in the development of drinking water and waste water;
2. To promulgate law and regulations on public-private partnership in the development of drinking water and waste water;
3. To enhance the role of private enterprises in the development and management of drinking water and waste water;
4. To avail of inexpensive and sustainable sources of financing;
5. To complete the revision of law and regulations on Regional Government Owned Enterprises (BUMD) engaged in the development and management of drinking water and sewerage; and
6. To restore the performance of institutions that manage drinking water and waste water services in the regions affected by natural disaster.

In order to attain the above targets, the following activities are being carried out:

1. Formulation of presidential regulation on inter-regional cooperation (regionalization) in the development and management of drinking water and sewerage;
2. Formulation of presidential regulation on cooperation between the BUMN/BUMD and private enterprises;
3. Improvement of cooperation between the BUMDs and private enterprises that is mutually beneficial, accountable and transparent;
4. Promotion of water supply and sewerage fund;
5. Formulation of presidential regulation on the issuance of bonds by the BUMDs; and
6. Provision of technical assistance to institutions that manage drinking water and sewerage services in regions affected by natural disaster.

3) Improvement in Management Drinking Water and Sewerage Services

The program for improving the management of drinking water and sewerage services is aimed at: a) expanding the coverage of drinking water and waste water services that are undertaken by the BUMDs; b) enhancing the performance of the BUMDs that manage drinking water and sewerage services to achieve unqualified audit opinions; and c) expanding of coverage of drinking water and sewerage services directly managed by the local communities. These shall be performed in an optimal, efficient and continuous manner.

Thus, the following activities are being carried out, accordingly.

1. Restructuring the management of state-owned water supply and wastewater treatment firms, PDAM and PDAL, respectively;
2. Increasing the total number of PDAMs and PDALs with good performance in metropolitan and large cities;
3. Enhancement of the capacity of PDAMs and PDALs through competence tests,

- education and training and optimizing the ratio of personnel serving the total number of customers;
4. Revision of regulations on structure and determination of tariffs;
 5. Reduction of leakage by replacing defective pipelines, enforcement of law against illegal connections, and enhancement of efficiency of bill collections;
 6. Increasing operation and maintenance (O&M) activities;
 7. Improvement of O&M activities;
 8. Rehabilitation of the existing drinking water supply and sewerage systems;
 9. Promotion of involvement of communities in the construction and management of drinking water and sewerage facilities;
 10. Expansion of community-based drinking water and sewerage services;
 11. Development of centralized sewerage system at metropolitan and large cities;
 12. Provision of drinking water and sewerage infrastructures for low income housing areas;
 13. Development of sludge and drinking water processing technology;
 14. Restructuring of the debts of PDAMs and PDALs, specifically those obtained from foreign loans through Subsidiary Loan Agreements (SLA); and
 15. Repair of drinking water and sewerage infrastructure and facilities that have been destroyed and construction of such infrastructure in new housing areas in regions affected by natural disaster.

(2) Solid Waste and Drainage Management

The activities for achieving the targets and pursuing policy directions for solid waste management and drainage are classified into three programs; namely, 1) program for community empowerment; 2) program for developing institutions; and 3) program for enhancing the performance of personnel managing waste and drainage facilities.

1) Community Empowerment

The program for community empowerment is aimed at enhancing the community awareness in resolving solid waste and drainage problems especially on the reduction of dumping solid wastes that contaminate rivers and obstruct canals and drainage outlets. It also intends to promote involvement of communities in dealing with waste and drainage issues.

The activities that will be carried out to realize the above objectives include:

1. Execution of public awareness campaigns on the 3Rs principle (Reduce, Reuse, and Recycle);
2. Development of community-based recycling centers in metropolitan and large cities;
3. Socialization of the structure for financing solutions to solve solid waste and drainage problems;
4. Expansion of the capacity of individual garbage collectors in metropolitan and large cities;

5. Development of community-based vermin compost and promotion of composting activities in large and medium-sized cities;
6. Preparation and execution of models for the development of small-scale organic agricultural products as an effort to improve the compost market;
7. Execution of public awareness campaigns on the importance of drainage outlets in order to reduce the occurrence of inundations in metropolitan, large and medium-sized cities;
8. Initiation of community-based activities for the maintenance and normalization of drainage outlets in slum areas of metropolitan, large and medium-sized cities;
9. Involvement of communities in the initial planning, design, construction as well as in the O&M activities, particularly in regions affected by natural disaster in the context of rehabilitation activities.

2) Institutional Development

Institutional development program is aimed at realizing an institutional system that is effective, accountable and transparent. It necessitates the existence of a regulatory framework on the relationship between government and private enterprises involving in the management of solid wastes and drainage matters; creation of new funding sources for resolving wastes and drainage concerns, improvement of the quality of coordination; and promoting cooperation among regions in dealing with solid wastes and drainage issues.

The main activities that will be carried out for realizing such aims include the following:

1. Review and revision of laws and regulations that pertain to wastes and drainage matters;
2. Formulation of the academic concepts for drafting laws related to solid wastes;
3. Formulation of policies, strategies, and action plans to address solid waste problems on a national scale;
4. Execution of projects to serve as models of regional institutions taken to handle wastes and drainage services;
5. Enhancement of the quality of human resources through education and training;
6. Preparation and execution of the model project related to management of solid wastes through cooperation of the government and private enterprises; and
7. Provision of technical assistance to institutions managing the waste and drainage services in the disaster affected region.

3) Improvement of Performance in Management of Solid Waste and Drainage

The program for improving the performance management of wastes and drainage is aimed at realizing the aforementioned targets in an efficient, effective, beneficial and environment friendly manner. This will consequently result in increasing the coverage of waste services, reducing the extent of inundated areas, promoting use of appropriate technology and enhancing the performance of those managing wastes and drainage services.

The main activities include the following:

1. Restructuring and enhancement of business professionalism of the regional government owned enterprise engaged in sanitation (PD Kebersihan) and the regional government office responsible for sanitary matters (Dinas Kebersihan);
2. Enhancement of human resources through education and training of personnel in the use and operation of necessary apparatus and equipment at institutions that deal with solid waste and drainage;
3. Increasing the quantity of solid waste to be transported to final disposal site and improvement of management for solid waste disposal site;
4. Promotion of separation of organic and non-organic wastes;
5. Application of advanced technology to reduce solid waste volume in metropolitan cities;
6. Enhancement of the quality of management of final disposal sites based on the standards on sanitary landfill system for large cities;
7. Application of recommendations from the feasibility study for the utilization of the Waste to Energy (WTE) incinerator in waste processing;
8. Enhancement of capacity building of institutions that handle the construction and maintenance of drainage facilities;
9. Enforcement of laws against illegal housing settlements that occupy lands intended for drainage networks;
10. Increase and normalization of drainage outlets;
11. Construction of primary and secondary drainage networks for large cities;
12. Enhancement of O&M activities to primary and secondary drainage networks;
13. Promotion of cooperation between the government and private enterprises, through contract management, leasing, BOT and BOO, for the management of wastes and drainage matters;
14. Development of appropriate technology on waste and drainage; and
15. Rehabilitation of the infrastructure and facilities of waste handling and the drainage systems that have been destroyed and construction of additional facilities in various new settlement areas affected by natural disaster.

4.3.2 Progress of Development

(1) Water Supply

The access rate to drinking water source including household water connection, public standpipe, borehole, dug well, spring, rainwater collection, and bottled, are summarized as follows:

Tabel 4.3.1 Access Rate to Water Supply Service

Type of WS	Year 2001 (%)			Year 2004 (%)			Year 2007 (%)		
	Rural	Urban	Nation	Rural	Urban	Nation	Rural	Urban	Nation
Piped WS	6.51	33.59	18.25	6.95	32.84	17.45	7.28	27.91	16.18
Target of RPJMN in 2009							30.0	66.0	40.0
Safe Non-Piped WS *1	55.97	52.55	54.19	61.78	53.84	58.39	59.58	50.24	55.55
Unsafe Non-Piped WS *2	36.99	10.39	25.46	30.25	7.88	20.73	31.11	6.96	20.68
Others	0.52	3.42	1.80	1.03	5.43	2.91	2.03	14.89	7.58

Source : Susenas, BPS, various years

Note : *1/Safe non-piped drinking water sources consisting of protected dug wells, springs, and rain water

*2/Unsafe non-piped drinking water sources consisting of pump, unprotected dug wells, springs, rain water and so on

The targeted access rate to the piped system in the RPJMN 2004-2009 was 30% in rural areas and 66% in urban areas. However, the achieved rates remain lower than target rates due to insufficient funds for expansion of water supply facilities in urban areas and problems on identifying the proper rural areas by the local governments. The improvement of PDAM is a key issue for raising the access rates especially in urban areas. Moreover, those for the non-piped system with protection of water source were reduced during this 5-year plan, in spite of the Indonesian government's efforts in increasing the water supply capacity and served population as shown in Table 4.3.2.

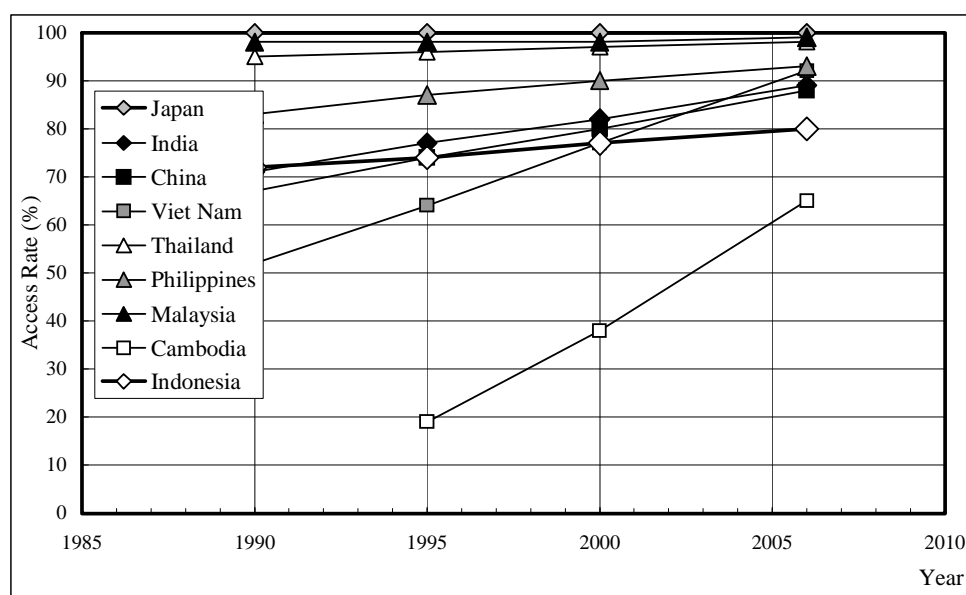
Table 4.3.2 Development of Piped Water Supply Facilities

Description	Piped Drinking Water Supply (litter/s)	Population Served (Million Person)
RPJMN/RENSTRA 2004 - 2009	39,880	26.80
Achievement 2005	5,518	3.23
2006	5,596	3.33
2007	10,443	2.31
2008	8,130	2.20
Achievement by 2008	29,687	11.07
Difference to Target	10,193	15.73
Plan in 2009	5,154	4.57

Source: 4th Evaluation Report for RPJM 2004-2009, 2009

The incremental increase of population served with piped drinking water supply during the 4-year period of 2005-2008 is about 11 million. However, the access rate to water supply has been lower than the population growth rate during this period.

Comparing with other developing countries in Asia in terms of access rate, Figure 4.3.1 shows that Indonesia's progress rate in the provision of water supply facilities for the past 16 years (1990-2006) is only 10%. Piped system has decreased the share of access rate year by year, due to poor management capacity.



Source: United Nations Millennium Development Goals Indicators (online database, accessed on 8 August 2008).
 ESCAP Statistical Yearbook for Asia and the Pacific 2008; <http://www.unescap.org/stat/data/syb2008/>

Figure 4.3.1 Low Development Progress in Water Supply Sector

The soundness of management of PDAMs is evaluated by BPP-SPAM, a consultative body for water supply at the national level which was established under the law of PP 16/2005 on the Development of Water Supply System. BPP-SPAM is a ministerial body established by and responsible to the Minister of Public Works.

In 2007, the evaluation result shown in Table 4.3.3 indicates Sound (“Sehat”) at 24% (80/335), Unsound (“Kurang Sehat”) at 35% (116/335), and Poor (“Sakit”) at 41% (139/335). The 255 PDAMs with “Kurang Sehat” and “Sakit” evaluation ratings are assessed as having insufficient O&M functions.

Table 4.3.3 Soundness of Management of PDAMs

Soundness of Management	2004	2005	2006	2007	2008*	2009*
Sound (Sehat)	38	44	50	80	104	140
Unsound (Kurang Sehat)	73	110	113	116	134	145
Poor (Sakit)	224	181	172	139	97	50

Note: Figures with symbol of “*” means target.

Source: The water dialogues, Indonesia

On the other hand, National Audit Agency (BPKP) evaluated PDAM in 2006 and 2007, and reported the number of “Sound PDAM” is 53 in 2006 and 49 in 2007 out of checked PDAM of 205.

During the current RPJMN, PDAMs evaluated as “Sehat” increased from 38 (11%) in 2004 to 80 (24%) bodies in 2007. However, the remaining 76% of PDAMs needs improvement of management capacity.

There are several indicators set to measure the performance of PDAM in “Direktri Kinerja PDAM Tahun 2007” issued by BPP-SPAM. The applied indicators are as follows:

- A. Financial
 - 1. Operating ratio (cost per income)
 - 2. Debt to total assets
 - 3. Income against total debt
 - 4. Number of days for collection of revenue after issuing invoice to customer
- B. Management
 - 1. Consumed water m³/pel/bln
 - 2. Customer Structure
 - Industrial and commercial use
 - Household
 - Public use
 - 3. Employee per 1000 connections
- C. Engineering
 - 1. Water loss
 - 2. Production Efficiency
 - 3. Supplied hours per day
 - 4. Distribution Efficiency

Table 4.3.4 summarizes the performance of PDAMs in 2007.

Table 4.3.4 Summary of Performance of PDAMs in 2007

Tariff	Average Tariff	Rp/m3	1,301
	Production Cost	Rp/m3	1,459
Population	Province	Pearson	228,523,300
	Total in Service Area	Pearson	121,052,871
	Served	Pearson	34,203,992
Population Ratio	Served/Service Area	%	28%
	Service Area/Province	%	53%
Financial Management	Debt	Rp. Mil.	4,813,119
	Sales	Rp. Mil./Year	1,700,902
Production Capacity	Installed	lit/s	117,440
	Produced	lit/s	98,618
Staff	per 1000 connection	Mean	12
		Min	3
		Max	54

Source: Direktri Kinerja PDAM Tahun 2007

Based on these figures, the performance of PDAMs is evaluated to be less efficient in tariff and production cost and poorly performing by serving only of 28% of population in their service areas. It also accumulated large amount of debts, and has poor management capability in terms of the number of staff.

Figure 4.3.2 shows the summary of connection rate to the water supply system of PDAMs in each island.

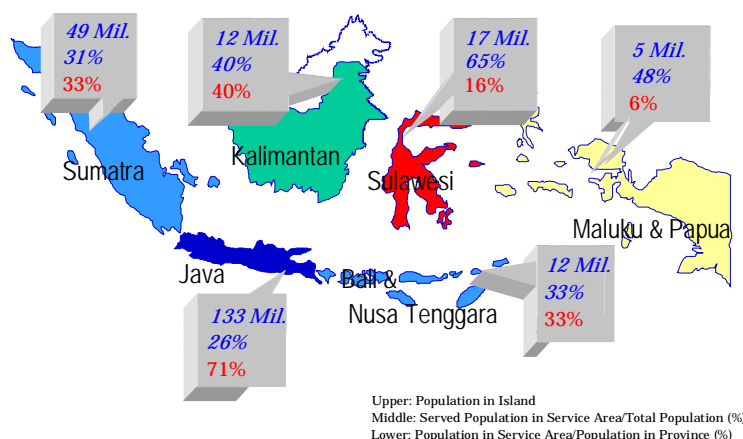


Figure 4.3.2 House Connection Rate to Water Supply System of PDAMs

In Java Island, the total population is 133 million and 94 million, corresponding to 71% of the total population in Java Island, is living in the service area of PDAMs. However, PDAM is able to supply drinking water to only 26% of the 94 million population in their designated service areas. PDAMs in other islands distribute water to 30% to 65% of population in their respective service areas. However, its limited capacity lead to lower service rate to consumers.

The principal legal basis for water supply in Indonesia is Law 7/2004 on Water Resources and its implementing regulation. During the current RPJMN, several decrees and regulations have been issued to secure the healthy PDAM and/or to restructure the debt of PDAM such as PDAM Rescue Program under MOF Decree PP16/2005 and Pre-53/PB/2006, MoHA Decree No. 23 /2006 which regulates water tariff for full cost recovery, and PDAM debt restructuring under 120/PMK.05/2008, etc. These institutional arrangements provide the conditions to PDAM for debt restructuring or setting of water tariff such as increase of customers, UFW reduction, and so on. However, the capacity improvement of most of PDAMs is insufficient to apply these governmental arrangements and they have insufficient funds for expansion of the water supply facilities in order to increase the revenue of PDAM.

Pursuant to these laws and regulations, responsibilities for serving water supply are in the hands of the central and local governments, through the State Owned Enterprises (BUMNs) and local government owned enterprises (BUMDs). The law also allows private entities to participate in the water supply services. The BUMDs mandate is to have a function of “Public Service + Profit Oriented” which are different from PDAM (Semi Autonomous Corporation). It is possible that PDAM can function as BUMD under this law and be privatized. However, this is still in draft and is expected to be issued in the next RPJMN.

The development of the rural water supply during the current RPJMN has been implemented mainly through support of donors such as the “Project for Water Supply and Sanitation for Low Income Communities” (PAMSIMAS) under the World Bank, the “Community Water Services and Health Project” (CWSHP) under ADB, and so on. However, it is reported that the creation of ownership of communities and leadership of operator are the key issues for the success of the project.

(2) Sewerage Sector

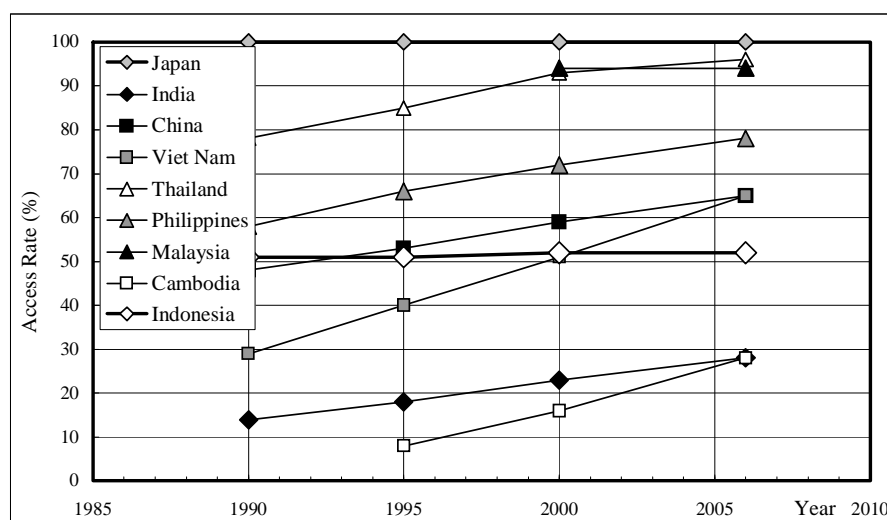
Improved sanitation facility includes flush/pour flush toilet or latrine connected to piped sewerage, septic tank or pit; a ventilated improved pit latrine; a pit latrine with slab or a composting toilet/latrine. These systems are being promoted by the government. As a result, the access rate reached to about 77% in Indonesia according to the BPS statistics 2008, which comprised of private, shared and public toilets or pits in 2007. On the other hand, toilet and latrine with cesspit or septic tanks are provided only to 49 % of the national population as shown in Table 4.3.5. However, there is no definite target in RPJMN 2004-2009 for the sewerage sector in terms of type of sanitation facilities.

Table 4.3.5 Type of Treatment of Human Waste in %

Types	2001			2004			2007		
	Urban	Rural	Nation	Urban	Rural	Nation	Urban	Rural	Nation
Toilet and latrine with cesspit / septic tank	62.95	19.80	38.51	65.99	25.47	42.70	71.06	32.47	49.13
Ponds / rice fields, river / lake / sea, ground holes, beach / gardens, or others	37.07	80.19	61.99	34.01	74.53	57.30	28.93	67.54	50.86

Source : Sensus, BPS

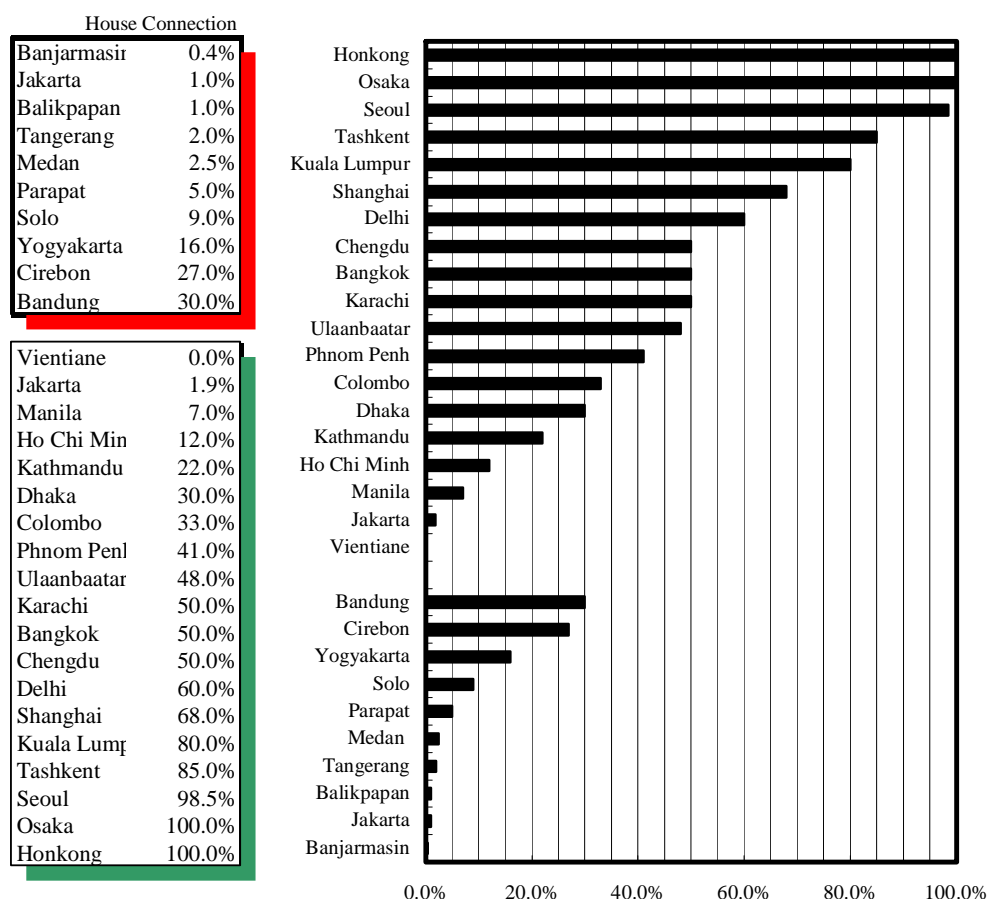
Figure 4.3.3 shows the access rate of the other developing countries in Asia. The progress of provision of sewerage facility in Indonesia is the lowest during the past 16 years (1990-2006) among the countries listed.



Source: United Nations Millennium Development Goals Indicators (online database, accessed on 8 August 2008).
 ESCAP Statistical Yearbook for Asia and the Pacific 2008; <http://www.unescap.org/stat/data/syb2008/>

Figure 4.3.3 Low Development Progress in Sewerage Sector

Centralized sewerage systems were constructed at Banjarmasin, Jakarta, Balikpapan, Tangerang, Medan, Parapat, Surakarta, Yogyakarta, Cirebon, and Bandung. A sewerage system with wastewater treatment plant was constructed in Denpasar on February 2007. Figure 4.3.4 shows the house connection rate in each city. Sewerage systems in these cities are operated by PDAMs, department of local government or BUMD, in accordance with the revision to PP25/2000.



Data Source:

Upper: Centralized Wastewater Treatment Plants in Indonesia/USAID

Lower: Water in Asian Cities/ADB

Figure 4.3.4 Service Ratio of Major Cities in Indonesia and Asian Countries

This regulation is an implementing guideline to the Law on Regional Autonomy in which the local governments are responsible for the provision of sanitation services, except for piped sewerage services in large and metropolitan cities which is a central government responsibility.

The existing treatment plants apply the preliminary and/or the secondary treatment processes. However, the water quality of effluent in some of these systems does not meet the quality standards in Indonesia. The BOD of effluents in Jakarta, Bandung and Medan exceeds 50 mg/l, which corresponds to those in polluted river water, according to the Asian Water Development Outlook, 2007 (ADB).

The figure also shows the house connection rate of major cities in other Asian countries. The access rate in Indonesia appears low, with that in Jakarta being the lowest among other capital cities in Asian countries. The low progress of sewerage system has induced water pollution of the rivers and drainage canals, especially in the urban areas such as Jakarta and Surabaya.

On the other hand, model schemes applying community based sanitation (SANIMAS) have been implemented in medium and small cities under the finance of Indonesian Government, NGO/NPO and BORDA South East Asia. The model with small scale sewerage system and low cost provides

facilities for public latrine and sewerage with distinguished user options for their activities. This scheme is being implemented in the entire Indonesia since 2006.

(3) Solid Waste

The following table shows the type of solid waste disposal and their share prior to the current RPJMN 2004-2009.

Table 4.3.6 Type of Solid Waste Disposal

Type of Disposal	2001			2004		
	Urban	Rural	Nation	Urban	Rural	Nation
Transported by Pubic Service	40.1	1.0	18.0	41.3	1.5	18.4
Dumping	7.5	12.7	10.5	8.0	12.6	10.7
Creating Compost	1.6	5.0	3.5	1.2	3.2	2.31
Burned	35.5	50.1	43.8	35.6	55.3	46.9
Dispose to Rivers/lakes	5.8	8.3	7.2	6.9	8.5	7.8
Dispose w/o Consciousness	3.4	13.7	9.3	0.7	11.3	7.7
Others	5.9	9.1	7.7	4.4	7.6	6.2

Source: BPS

The public services such as transportation of solid waste, controlled/sanitary landfill is available only for 18% of the population.

At the end of 2007, there are final disposal sites at 378 locations. Nevertheless, the method of open-dumping is mainly applied on 80.6% of the disposal sites, while sanitary landfill is only applied at 2.8%. In general, open dumping tends to induce adverse effects on groundwater and the surrounding environment of the sites.

Number of Final Disposal Sites	:	378 locations		
Area (Ha)	:	1.886,99 ha		
Method of processing	:	Controlled landfill	:	15.5%
		Open dumping	:	80.6%
		Burned or thrown to the forest	:	1.1%
		Sanitary landfill	:	2.8%

Source: <http://www.pu.go.id/infostatistik>, tanggal 25 maret 2008

The Indonesian Government has issued Law No. 18/2008 which obliges the local governments to prepare an action plan to close the final disposal sites with open-dumping method within one year and to implement the closure within five years. This law also describes the necessity of regional cooperation on solid waste management including reduction of solid waste.

(4) Storm Water Drainage

The drainage situation in Indonesia is reported as follows:

Table 4.3.7 Classification of Drainage around House (%)

Flow Condition	2001			2004			2007		
	Rural	Urban	Nation	Rural	Urban	Nation	Rural	Urban	Nation
Smooth drainage flow	44.16	68.04	54.56	48.32	69.16	57.18	42.76	66.09	52.83
Very slow flow velocity	8.66	11.02	10.04	8.63	10.94	9.61	9.30	12.37	10.63
Stagnant drainage	3.65	3.34	3.52	3.15	2.97	3.08	3.98	3.69	3.86
No significant problem	43.52	16.80	31.89	39.9	16.93	30.13	43.96	17.84	32.68

Source: Housing and Settlement Statistics, BPS

About 14% of residents in Indonesia are facing drainage problems. Complaints concerning “very slow flow velocity” or “stagnant drainage” had been increasing. Moreover, drainage problems were caused by: a) restricted O&M activities for drainage system in the usual inundation areas; b) expansion of inundation areas due to lack of consideration for natural drainage flow from new housing developments; or c) obstruction of drainage flow due to illegal settlement.

(5) Budget for Implementation of RPJMN 2004-2009

The Cipta Karya has invested a budget of Rp. 5,390 billion in 2005; Rp. 3,757 billion in 2006; and Rp. 5,775 billion in 2007 as follows:

Table 4.3.8 Budget in Renstra and Actual Disbursement of Cipta Karya

2005			2006			2007		
Renstra	Actual	Difference	Renstra	Actual	Difference	Renstra	Actual	Difference
3,340	5,390	2,050	4,510	3,757	-753	5,050	5,775	725

Source: Page-18 of PU Strategic Plan Review

Of the budget in 2006 and 2007, Rp. 805 billion in 2006 and Rp. 1,135 billion in 2007, which correspond to 21.5 % and 18.9 % of the total budget of Cipta Karya, respectively, is allocated to the improvement programs in the water supply and sanitation sectors. However, these investments are not enough to reach the target of the current RPJMN and Renstra. On the other hand, 90% of these budgets are actually disbursed, while the remaining 10 % is undisbursed in both 2006 and 2007.

(6) Public and-Private-Partnership (PPP) Scheme

The PPP scheme is expected to be one of the measures for securing funds for the development of infrastructure, especially in the water and sanitation sectors. Since 1990's, water supply schemes in Indonesia have been financed by private sectors particularly in the major cities.

Table 4.3.9 Water Supply Projects under Operation by PPP Scheme

No	Projects	Capacity (lps)	Project Cost (Million US \$)	Developer	Remarks
1	Medan (BOT)	500	5	Lyonnaise Des Eaux	Urban water supply
2	Batam (Concession)	3,000	100	Cascal By & Bangun Cipta Sarana	Urban water supply
3	Jambi (BOT)	200	2	PT. Noviantama	Urban water supply
4	Palembang (Concession)	80	5	PT. Bangun Cipta Sarana	Urban water supply
5	Pekanbaru (BOT)	600	10	PT DAPENMA	Urban water supply
6	North Serang (BOO)	150	5	PT Sauh Bahtera Samudra	Urban water supply
7	West Jakarta (Concession)	6,200	255	PT. Palyja	Urban water supply
8	East Jakarta (Concession)	6,500	255	PT Thames PAM Jaya	Urban water supply
9	Cisadane (JO)	3,000	N.A	Tirta Cisadane	Urban water supply
10	Serpong (BOT)	50	5	Bintang Jaya	Housing develop. area
11	Lippo Karawaci (BOT)	120	10	Lippo Karawaci (full private)	Housing develop. area
12	Bintaro Jaya (BOO)	100	10	Pembangunan Jaya	Housing develop. area
13	Cikampek (BOT)	60	0.5	N.A.	Urban water supply
14	Bekasi - Kemang Pratama (BOO)	50	10	PT Kemang Pratama	Housing develop. area
15	Hunday Industrial Estate (BOO)	50	5	PT. Hunday	Industrial estate

No	Projects	Capacity (lps)	Project Cost (Million US \$)	Developer	Remarks
16	Kota Legenda (BOO)	25	2.5	PT Cikarang Permai	Housing develop. area
17	Bukit Indah Cikarang (BOO)	150	10	PT Bukit Indah (full private)	Housing/industrial ara
18	Subang (BOT)	50	2.5	PT MILD	Urban water supply
19	Gajah Mungkur	600	2	PT Tirta Gajah Mungkur.	Urban water supply
20	Bawen (BOT)	250	10	APAC INTI	Urban water supply
21	Sidoarjo Regency(BOT)	200 450	2.5 3	PT Vivendi PT Hanarida	Urban water supply
22	Denpasar (BOT)	300	10	PT Tirta Artha Buana	Urban water supply
23	Samarinda (BOT)	400	55	WATTS	Urban water supply
24	Banjarmasin (BOT)	400	5	PT Adi Karya	Urban water supply
25	Tangerang City (BOT)	30	0.86	Gadang Berhad	Urban water supply

Source: Progress Reports, Infrastructure Projects, Public Private Partnership, 2009, Public Private Partnership Central Unit, BAPPENAS

There are 25 on-going projects applying for PPP scheme in the water sector of Indonesia. The investment cost for these projects is about USD 781 million. These are water supply projects for medium or small cities, or for housing development areas or industrial estates.

The major problems in the PPP scheme are related to performance of PDAMs, who are the main buyer of the PPP scheme. Among these are: 1) financial deficits and debt due to high non-revenue water ratio and low tariff against production cost, and 2) poor performance of PDAM management. These problems prevent the introduction of private investment to water supply projects in large municipalities and cities.

The followings are summary of PPP book 2009:

Table 4.3.10 Candidates of PPP Scheme in PPP Book 2009

Water Supply Projects in PPP BOOK	Modalities of PPP Scheme	Expected Commencement of Operation	Water Source Availability	Land Acquisition
Municipality of Bandung	Concession	2013	Unclear	Pemkot/PDAM
Municipality of Medan	BOT	2011	Unclear	Unclear
Municipality of Bandar Lampung	BOT	2013	Unclear	Unclear
DKI Jakarta -Bekasi-Karawang	BOT	2014	Unclear	Unclear
West Cikarang & Cibitung Bekasi Regency	Concession	2013	Unclear	Unclear
Bandung Regency	Concession	2014	Unclear	Unclear
Regency of Sumedang	Concession	2012	Unclear	Unclear
Indramayu Regency	Concession	2013	Unclear	Unclear
Municipality of Cirebon	Concession	2012	Unclear	Unclear
Pondok Gede, Bekasi Municipality	-	2014	Unclear	Unclear
Surakarta -Sukoharjo		2013	Unclear	Unclear
Klungkulung Regency		2014	Unclear	Unclear
Maros Regency		2012	Unclear	Unclear
West Bandung Water Conveyance: Alternative 1		2013	Unclear	Unclear
West Bandung Water Conveyance: Alternative 2		2013	Unclear	Unclear
East Bandung Water Conveyance: Alternative 1		2013	Unclear	Unclear
East Bandung Water Conveyance: Alternative 2		2013	Unclear	Unclear
Semarang Water Conveyance: Alternative 1		2013	Unclear	Unclear
Integrated Solid Waste Final Disposal/Treat. for Greater Bandung	Concession	2011	Unclear	Done by Gov.
Integrated Solid Waste Final Disposal/Treat. for Bogor and Depok	Concession	2011	Unclear	Partly Done by Gov.

Source: PPP Book, 2009

The PPP book includes 18 water supply projects and 2 integrated solid waste final disposal and

treatment for Bandung and Depok. There has been no sewerage project identified to be executed by PPP scheme.

As given in the table, these PPP projects have unclear risks such as allocation of water and land acquisition due to lack of studies which shall not only clarify these risks but also suggest the framework of PPP scheme including the roles and benefits of public and private investors and other stakeholders.

The mentioned study, especially for the sewerage and solid waste management sectors, also includes a study on the feasibility for entrusting the operation of solid waste management system, including clean development mechanism (CDM), methane fuel, and so on. This is required to identify a way for introduction of private investments to these sectors.

4.3.3 Issues to be followed up by the RPJMN 2010-2014

(1) Water Supply

1) Institutions and legislation

1. Poor institutional capacity and human resources;
2. Low level of approach and insufficient function of organizations, task forces, and authorities;
3. Insufficient activities of SPAM (PDAM), including recruitment and training of staff; and
4. Strengthening of SPAM management for local governments, especially PDAM.

2) Lack of Funds

1. Lack of funds for development and O&M due to low water tariff and accumulated large debts;
2. Investment for the development of SPAM, which shall depend on foreign loans rather than on developing domestic alternative funding sources; and
3. Low commitment and priority of funding source by the local government in the development of SPAM.

3) Decreased quantity and quality of water

1. Deterioration of river basins due to limited watershed management and to increased community activities and industry without any environmental protection;
2. Deterioration of water quality due to water pollution by waste water without proper treatment;
3. Water use licensing which is inconsistent with the regulations, causing conflicts among water users; and
4. Lack of stringent rules or regulations of water allocation to water users.

4) Minimum coverage and low quality of services

1. Large water losses in the piped system ranging from 10% to 50% with an average loss of around 37% in 2004;
2. Low pressure on the water distribution network; and
3. Production cost higher than water tariffs.

- 5) Lack of ownership/commitment of the community in the development and O&M of the water supply system.

(2) Sewerage

- 1) Strengthening of institution and legislation for the development of sewerage facilities and O&M performance stated in Article 21, paragraph (2) of Law No. 7 of 2004 on Water Resources, which states that the protection and preservation of water resources-one of them-done by means of setting and sanitation infrastructure;
- 2) Limited sources of investment funds for the sewerage sector due to low priority in development;
- 3) Improvement of worsened quality of water sources, especially in large urban areas, which shall tackle on the lack of master plan for waste water management, defining the goal of development of facilities and water quality;
- 4) Low levels of management organizations for O&M of sewerage facilities without proper treatment for waste water and full cost recovery for services;
- 5) Low awareness in the national level on the importance of sanitation; and
- 6) Cooperation of private sector on funding for wastewater development, management and O&M of the facilities.

(3) Solid Waste Management

- 1) Strengthening of regulation that supports the implementation of the Law No. 18/2008 on solid waste management, including norms, standards, guidelines, manuals and operational procedures;
- 2) Development of funds for solid waste management apart from the government budget, including public funds, private cooperation, and both private investment and CSR funds;
- 3) Reduction of volume of solid waste due to:
 1. Rapidly increasing volume of solid waste due to population growth in metropolitan and large cities;
 2. Weak implementation of 3R principles (Reduce, Reuse, Recycle) on reduction of solid waste volume; and
 3. Poor transportation services provided by the local government;
- 4) Lack of skills of human resources in solid waste management
 1. Development of personnel of local governments and related stakeholders in solid waste management;
 2. Adverse effects to environment in the surrounding area caused by open dumping of solid waste without proper treatment (controlled or sanitary landfill); and
 3. Lack of management including technology for final disposal sites;

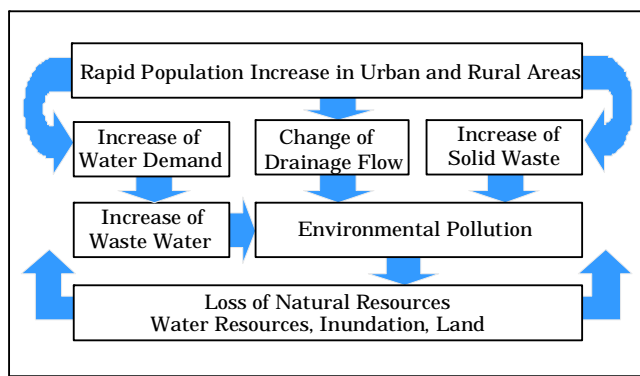
- 5) Difficulties on acquiring land for new TPA and lack of funds for the construction of new TPA.
- (4) Drainage
 - 1) Restricted O&M of drainage systems in the usual inundation areas due to insufficient funds;
 - 2) Scarcity of solid waste disposal system and low public awareness on the negative effects of dumping garbage into drainage channels;
 - 3) Expansion of inundation area due to lack of consideration for natural drainage flow from new housing development;
 - 4) Lack of a master plan for integration of the existing drainage networks, considering global climate change; and
 - 5) Obstruction of drainage flow by illegal settlements and restricted control by the local governments.
- (5) Acceleration of PPP scheme in water and sanitation sector in order to secure the funds for infrastructure development
 - 1) Review and implementation of the model projects in water and sanitation sectors, especially those related to improvement of PDAM;
 - 2) Execution of feasibility studies on the PPP candidate projects in PPP Book 2009 aiming to identify the most effective framework of each project for public and private investors including minimizing risks of the projects;
 - 3) Enhancement of risk sharing procedure between the Government and investor, and other stakeholders; and
 - 4) Capacity development of personnel through involvement in the planning and execution of PPP schemes.

4.3.4 Action Plan to Address the Issues

The main issues to be addressed in RPJM 2010-2014 are: 1) necessity of integrated approach for development and management; 2) development of human resources through management involvement in planning, implementation, and O&M of infrastructures; and 3) acceleration of PPP scheme for securing funds for development of infrastructure to cope with the national budget for water and sanitation sectors.

- (1) Integrated Approach for Development of Infrastructure in Water Supply, Sewerage, Solid Waste and Drainage

In water and sanitation sector, the identified issues are related to the deterioration of environment in urban and rural areas as shown in Figure 4.3.5.



Source: JICA Study Team

Figure 4.3.5 Current Problems in Water and Sanitation Sector

In order to solve these issues and to cope with the rapid increase of population, an integrated approach from the view point of basin management for development of infrastructures including formulation of plan, implementation and asset management needs to be initiated.

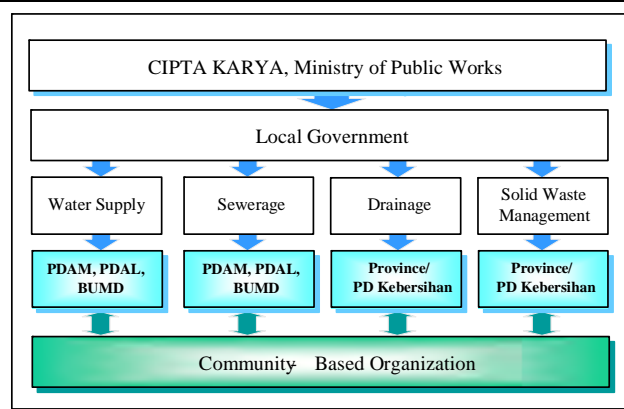
In this approach, the following considerations are further required:

- 1) Watershed management for conservation of water storage function in the river basin,
- 2) Appropriate spatial planning and implementation of the plan in the river basin, and
- 3) Integrated infrastructure development in order to harmonize the balanced social, economic, and environmental development in the river basin.

To realize the mentioned approaches, all related agencies and/or organizations should be requested to coordinate well with the central and local governments. These agencies may include the Ministry of Forestry for watershed management, the Ministry of Mining and Energy for groundwater management, the Ministry of Public Works, and the local governments. BAPPENAS should allocate the budget for each agency.

(2) Human Resources Development in Management of Infrastructure Development

PDAM and the agencies at provincial or district levels are the major players responsible for the water and sanitation sector under the integrated coordination of Cipta Karya, as shown in Figure 4.3.6.



Source: JICA Study Team

Figure 4.3.6 Related Agencies in Water and Sanitation Sector

It is therefore essential to develop the capacity of staff of the concerned agencies.

1) Water Supply

PDAMs cover 54% of the total population in Indonesia. Hence, an essential issue is the improvement of capacity development, especially on matters related to piped water supply system.

The issues and suggestions on the improvement of PDAM are summarized as follows:

Issues	Suggestions
a. Restructuring of PDAM	Establishing autonomous body to Create business consciousness to all staff of PDAM
b. Change of management	Employment of top management from private sector to create business strategies and plans on the basis of benefit-oriented
c. Restructuring of debt	Preparation of restructuring plan including business plan and repayment schedule to SLA and other loans
d. Minimizing water loss	Reducing water loss by establishing flow/customer metering, repair of pipeline, and so on to increase production efficiency
e. Expansion of water supply system	Urgent needs for PDAM Java integrated development of water source and its quality improvement
f. Training for staff	Change business consciousness of staff of PDAM both in technology and logistics such as inspection and repair of facilities, reading of bulk flow and water meters, invoicing and collection of revenue, budget allocation, and so on
g. Water tariff	Cover production costs and acquire benefits from O&M, then initiate re-investment by introduction of appropriate water tariff setting system under management of the local government

In order to improve the situation of PDAM, the GOI has executed reform programs which include debt restructuring and institutional strengthening in collaboration with national and international institutions during the current RPJM.

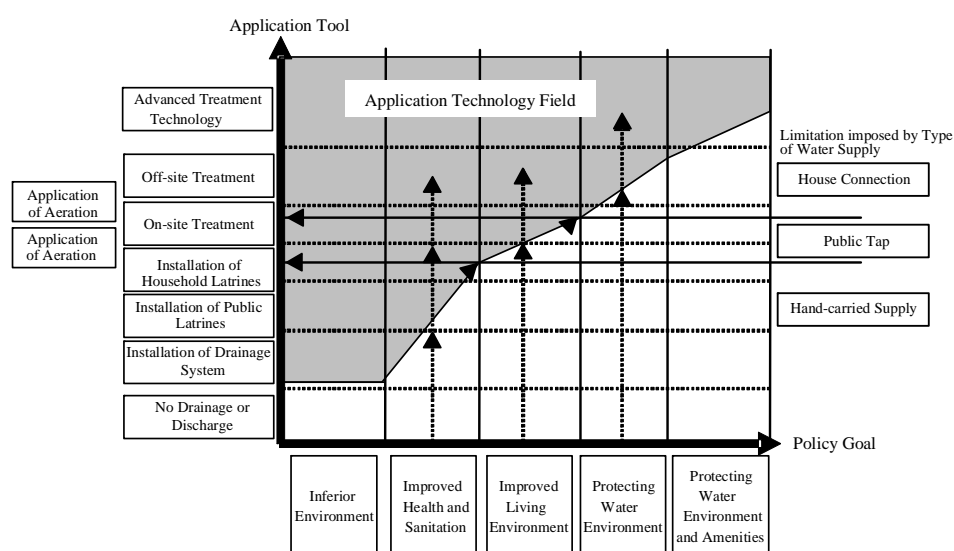
Reduction of non-revenue water (NRW) such as leakage through pipeline, illegal water connection and delay of revenue collection, is one of the important issues in the current RPJMN. However, NRW is estimated to be as high as 50% in the maximum and 37% in average in 2007. As an example, if water leakage in NRW is reduced by 1% (production capacity of 98,618 lit/s x 86,400 seconds x 1 % / 100 lit/day/capita = 852,060 persons), PDAMs will be able to distribute clean water to incremental population of about 852,000. It also increases the income of PDAMs by converting the water loss to revenue water, considering the current costs.

To reduce of the amount of NRW, it is essential to train the staff of PDAMs in terms of identification of leakage and illegal use in line with the establishment of flow and customer metering system and procurement of necessary apparatus for finding the exact location of leakage from pipelines.

Moreover, training of administration staff on the establishment of administration system for the business and financial planning is necessary. These include pricing on water tariff, marketing for increasing customers, proper reading of flow and customer meters, invoicing to customers, collection of tariff, and so on.

2) Sewerage

The planning and policy making capacity for deciding goals or targets for the development of sewerage infrastructure is essential in this sector. This was induced since the current RPJM does not describe goal and applicable tools like as shown in the following matrix in Figure 4.3.7:



Source: Guidelines for Management of Sewerage Facilities in Developing Countries

Figure 4.3.7 Goal and Tool Matrix

The current situation of sewerage system varies in the rural areas, cities, and in the metropolitan in accordance with the area's water supply situation. Therefore, the appropriate goals of RPJMN 2010-2014 shall be established according to specific local conditions in line with the preparation of respective special plans.

3) Solid Waste

One of the serious issues in solid waste management is the application of open dumping which have serious adverse effects to surrounding environment such as pollution of groundwater and air contamination with methane gas. This method without management for sanitary conservation is applied to more than 80% of the existing disposal sites, according to the presentation material of Cipta Karya in the workshop on May 26, 2009. To mitigate the situation, the GOI issued an act No. 18/2008 ordering the closure of open dumping sites within five years. Therefore, priority shall be given to closure of open dumping sites in order to minimize their adverse effects. Normally,

covering the disposal sites with earth fill and/or provision of pipe facility to extract gas is implemented at the sites. In case of groundwater pollution at some sites, a measure for leachate is necessary to be considered in the planning stage. Moreover, the application of sanitary landfill is expected to be facilitated in RPJM 2010-2014 in order to minimize impact on the environment surrounding the disposal sites.

Also, land acquisition for new final disposal sites to replace the open dumping sites should be prioritized. In order to execute land acquisition smoothly, it is recommended to establish the followings:

1. Communication system and procedures between the related governments/agencies and residents in the land to be acquired for the new final disposal sites;
2. Plans which shall be prepared by the local governments or responsible bodies under the aforesaid law for the replacement of the existing open dumping; and
3. Approval procedures for the plans for land acquisition, including acceptance procedures from the residents.

Under the above situation, it is suggested that training of the local government staff, focusing on engineering application methods and planning as well as O&M of disposal sites shall be conducted as soon as possible.

On the other hand, the rapid increase of solid wastes is one of the serious concerns. To cope with such issue, the 3R principle, including the application of compost, has been implemented in the current RPJMN. Continuing education of residents in the communities should to be strengthened for further development of this measure.

4) Drainage

Spatial planning in cities and provision of necessary drainage facilities are some of the issues to be managed and regulated by the local governments in the drainage sector. Furthermore, O&M shall be performed with the cooperation of communities under the management of the local government.

(3) Introduction of PPP Scheme for Infrastructure Development in Water and Sanitation Sector

There are many potential risks on the PPP scheme for water supply, which include:

1. Macro-economic risks such as inflation and interest rate fluctuation;
2. Risks on production such as limited supply of raw water, pipeline leakage, electricity power failure, unreliable meter reading, and poor quality of raw water;
3. Force majeure risks such as natural disaster, riots, terrorism, and labor strikes;
4. Risks on construction of facilities such as construction cost escalation, land price, and time overrun of construction period; and
5. Business risks on lower tariff, breach of contract by operator, premature termination by operator, demand uncertainty, and unpaid bills of consumers.

Among the above-mentioned risks, the significant issues for private investors are: 1) delay of water source development by public sector; 2) natural fluctuation of water source and change of water

allocation during the concession period for which the private investor may need an agreement of the minimum revenue guarantee to investor; 3) payment risk from end user such as PDAM; and 4) delay of the implementation of the project due to land acquisition for construction works. These risks are the key risks for pricing a project by the investors.

It is, therefore, essential to identify the government and stakeholders' responsibilities related to the reduction of these risks through the establishment of institutional arrangement and support in order to facilitate the PPP scheme.

Currently, the GOI made efforts on guarantee funds to fill the gap between the investors' requirement and the client's condition. This fund is expected promote the PPP schemes in infrastructure development in Indonesia. Also, the sustainable fund is a key issue for success of this measure.

(4) Suggestions on Performance Indicators

The following performance indicators are suggested to be applied in the water and sanitation sectors in RPJMN and RENSTRA for 2010 to 2014, taking into account the strategies and target and the stability, safety and sustainability of projects or activities in the sector:

Indicators	Water Supply
Impact	<ul style="list-style-type: none"> ☞ Persons with disability have equal access to Water and Sanitation Services as other people in their communities, which result in improved quality of life and improved state of health ☞ The reduced number of persons infected by water and hygiene related diseases
Outcome	Satisfaction of people <ul style="list-style-type: none"> ☞ Stable <ul style="list-style-type: none"> • Served population • Supplied amount • Service hours ☞ Safe <ul style="list-style-type: none"> • Served water quality without any treatment at customers' end ☞ Sustainable <ul style="list-style-type: none"> • Affordable and reliable water tariff invoiced • No. of person claiming to management bodies • No. of local governments with proper number of engineers or technicians with certificates
Output	<ul style="list-style-type: none"> ☞ Stable: Facilities <ul style="list-style-type: none"> • Water source capacity installed • No. of facilities constructed, rehabilitated and extended • No. of connections to the facilities • Length of pipeline extended for distribution of water • Number or length of repaired pipeline for reduction of UFW or NRW ☞ Safe: Standardization <ul style="list-style-type: none"> • Quality of treated water ☞ Sustainable: Management <ul style="list-style-type: none"> • No. of O&M bodies with evaluation of assets and management procedures • No. of communities with active operation bodies • No. of water meters installed or correctly operated and read • Service hours: 24 hours operation • No. and type of capacity building on financial and engineering aspects for bodies responsible for O&M • No. and type of capacity building for communities • Law and GR for accelerating infrastructure in water supply
Indicators	Sewerage
Impact	<ul style="list-style-type: none"> ☞ Persons with disability have equal access to Water and Sanitation Services as other people in their communities, which result in improved quality of life and improved state of health ☞ The reduced number of persons infected by water and hygiene related diseases.
Outcome	Satisfaction of people <ul style="list-style-type: none"> ☞ Stable <ul style="list-style-type: none"> • Served population • Treated waste water amount

	<ul style="list-style-type: none"> ☞ Safe <ul style="list-style-type: none"> • Treated waste water quality • Water quality of rivers, ponds, and lakes ☞ Sustainable <ul style="list-style-type: none"> • Affordable and reliable fees for treatment • No. of person claiming to management bodies ☞ No. of O&M bodies with proper number of engineers or technicians with certificates
Output	<ul style="list-style-type: none"> ☞ Stable: Facilities <ul style="list-style-type: none"> • Provision of toilet or latrine with cesspit or septic tank • No. of facilities constructed, rehabilitated and extended • No. connection to sewerage system • Length of pipeline extended for collecting waste water ☞ Safe: Standardization <ul style="list-style-type: none"> • Quality of treated water • Quality of rivers, lakes and ponds with outlet of sewerage facilities ☞ Sustainable: Management <ul style="list-style-type: none"> • No. of O&M bodies with evaluation of assets and management procedures • No. of communities with active operation bodies • No. and type of capacity building on financial and engineering aspects for bodies responsible for O&M • Law and GR for accelerating infrastructure in sewerage
Indicators	Solid Waste Management
Impact	<ul style="list-style-type: none"> ☞ Persons with disability have equal access to Water and Sanitation Services as other people in their communities, which result in improved quality of life and improved state of health ☞ The reduced number of persons infected by water and hygiene related diseases
Outcome	<p>Satisfaction of people</p> <ul style="list-style-type: none"> ☞ Stable <ul style="list-style-type: none"> • Served population • Transported amount of solid waste • Treated amount of solid waste ☞ Safe <ul style="list-style-type: none"> • No. of local governments with proper number of engineers or technicians with certificates ☞ Sustainable <ul style="list-style-type: none"> • No. of person claiming to management bodies • No. of local governments who prepared replacement plan of open dumping and implemented/monitored based on the plan ☞ No. of local governments with proper number of engineers or technicians with certificates
Output	<ul style="list-style-type: none"> ☞ Stable: Facilities <ul style="list-style-type: none"> • No. of Final Disposal Sites with sanitary landfill • No. of Regional Final Disposal Sites • No. of transportation ☞ Safe: Standardization <ul style="list-style-type: none"> • Preparation of Technical Guidelines for FDS with sanitary landfill • No. of local governments with technical assistance and annual evaluation ☞ Sustainable: Management <ul style="list-style-type: none"> • No. of O&M bodies with evaluation of assets and management procedures • No. of communities with active operation bodies • No. and type of capacity building on financial and engineering aspects for bodies responsible for O&M • Law and GR for accelerating infrastructure in sewerage
Indicators	Drainage
Impact	<ul style="list-style-type: none"> ☞ Persons with disability have equal access to Water and Sanitation Services as other people in their communities, which result in improved quality of life and improved state of health ☞ The reduced number of persons infected by water and hygiene related diseases
Outcome	<p>Satisfaction of people</p> <ul style="list-style-type: none"> ☞ Stable <ul style="list-style-type: none"> • Area and duration of inundation by heavy rainfall in identified areas ☞ Safe <ul style="list-style-type: none"> • Preparation of Technical Guidelines for drainage improvement • No. of local governments with technical assistance and annual evaluation ☞ Sustainable <ul style="list-style-type: none"> • No. of person claiming to management bodies • No. of local governments with drainage plans and execution of their plans ☞ No. of local governments with proper number of engineers or technicians with certificates
Output	<ul style="list-style-type: none"> ☞ Stable: Facilities <ul style="list-style-type: none"> • Length of drainage facilities improved or newly constructed ☞ Safe: Standardization <ul style="list-style-type: none"> • Preparation of Technical Guidelines for drainage facilities • No. of local governments with technical assistance and annual evaluation ☞ Sustainable: Management <ul style="list-style-type: none"> • No. of O&M bodies with evaluation of assets and management procedures • No. of communities with active operation bodies

	<ul style="list-style-type: none"> No. and type of capacity building on financial and engineering aspects for bodies responsible for O&M Law and GR for accelerating infrastructure in drainage improvement
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Application of some of the suggested indicators needs the improvement of measuring or monitoring system of related agencies in order to obtain the accurate figures of outcome of the infrastructures development. Especially, in order to monitor improvement of PDAM performance and management of other public services, the monitoring plan for these indicators shall be included into the development plan of the infrastructure.

4.3.5 Candidate Projects for New Blue Book 2010-2014 and the Next Version of PPP Book

(1) Status of the Projects in Blue Book 2006-2009 and PPP book

According to information from BAPPENAS, the status of projects on the Blue Book 2006-2009 including revisions (BB) and the PPP Candidate Projects are listed in Table 4.3.11 and Table 4.3.12, respectively.

Table 4.3.11 Blue Book Projects 2006-2009 as of Sept. 2009

No.	Project Title	PA/TA	Source of Fund	Loan / Grant (USD Thous.)	Counterpart Fund (USD Thous.)	Total (USD Thous.)	Description
	Bappenas			11,760	570	12,330	
1	Water and Environmental Sanitation (WES)-UNICEF	PA		23,232		23,232	On-going.
2	WASPOLA 2	TA	Grant of AusAid	1,260		1,260	On-going. Will expire in 2009. There are still activities that must be resolved but a lot of consultant contracts have expired.
3	ISSDP (Indonesia Sanitation Sector Development Project)	TA	Grant of Netherlands	8,000		8,000	On-going.
4	Indonesia Slum Alleviation Policy and Action Plan (SAPOLA)	TA	Cities Alliance	1,000	420	1,420	Project is listed in the Blue Book revisions I 2006-2009 and listed in the Green Book 2008. SLA scheme is planned and ready for appraisal. Awaiting follow-up of the proposals that have been sent to the World Bank.
5	Indonesia Water and Sanitation Policy and Action Planning Facility (Phase III)	PA		1,500	150	1,650	It is signed to Revisions Blue Book 2006-2009 and listed in the Green Book 2007.
	Department of Health			110,510	9,410	119,920	
1	WSLIC2 (Water and Sanitation for Low Income Community - Phase 2)	PA		94,100	9,410	103,510	On-going
2	Community-Led Total Sanitation (CLTS) Bill Gates	TA		600		600	On-going
3	CWSH (Community Water Services and Health)	PA	ADB	14,670		14,670	On-going
4	ProAir (Rural Water Supply and Sanitation in NTT Province)	PA	Gtz, Kfw	1,140		1,140	On-going
	Cipta Karya			674,310	95,667	787,774	
1	National Program for Community Water Supply and Sanitation Services (PAMSIMAS)	PA	World Bank	94,100	9,410	103,510	Listed in Blue Book 2006-2009. On-going.
2	Urban Water Supply and Sanitation Project	PA	World Bank	32,000	5,150	37,150	Listed in 2006-2009. Project is already in the green book of 2007 and 2008, and negotiated in May 2009.
3	Southern Bali Water Supply Project	TA	JICA	5,000	500	5,500	Based on coordination meetings with the Directorate General of Cipta Karya, Dep. Public Works dated December 12, 2008, recommended the project is changed from a Technical Assistance to Project Assistance. It is in the revision process of FS. Indications Donor: JICA
4	Water Supply and Sanitation Project	PA		50,000	6,000	56,000	There are difficulties on local governments to follow the SLA scheme, particularly relating to PDAM debt arrears. Therefore, it is in the process for looking for interest kab / the city.
5	Implementation of Western Java Environmental Management Project APL-2	PA		20,000	4,000	24,000	No progress. Waiting for change the terms of APL-2 (trigger). Therefore, it is in the process for looking for interest kab / the city.

No.	Project Title	PA/TA	Source of Fund	Loan / Grant (USD Thous.)	Counterpart Fund (USD Thous.)	Total (USD Thous.)	Description
6	Metropolitan Sanitation Management and Health Project	PA	ADB	35,000	20,000	55,000	Ready for appraisal. It is proposed in the Green Book 2009-2010. Also it is entered into the list of ADB's loan pipeline in 2009 and listed in GB 2009.
7	Greater Surabaya-Umbulan Water Supply Project	PA	World Bank				Proposed by the Minister of Public Works Letter No.. HL.02.02-Mn/724 November 21, 2008. Given the constraints of coordination and agreement among local governments has not been completed until the project is estimated this will not begin until the year 2009 that proposed to cancel the Bluebook from 2006 to 2009 and directed to be funded through the PPP scheme. Indications Donor: World Bank / JICA
8	Implementation of Batam Sewerage Project	PA	Korea, Batam	40,000	10,000	50,000	Feasibility study was conducted in 2005 by the Millennium Science and Engineering Inc. (MSE) of funding from the U.S. Trade and Development Agency working together with Batam Industrial Authority. However, it is required to review the Feasibility Study document. Therefore, it is proposed to receive technical assistance from the Korean government in the form of grants that is required for the preparation of planning documents including the review of Feasibility Study and the DED. In the process of updating the readiness criteria by the ororita Batam.
9	Small Scale Water Treatment Plants for Emergency Relief	PA	Spain/Hangary	50,000	14,270	64,270	Aims to anticipate natural disasters. Already listed in the Blue Book 2006-2009. No FS. Is in talks with the donor phase Spain / Hungary. Spain waiting for a letter from Bappenas.
10	IKK Water Supply Program and Small Water Treatment Plant for Water Scarcity Area	PA	JICA/Spain/Netherlands	150,000	15,000	165,000	BB was listed in 2006-2009 with the allocation of USD 30 million and proposed again through the Minister of Public Works No.. HL.02.02-Mn/724 November 21, 2008 with the allocation of USD 365 million. For the initial phase is recommended for its allocation reduced to \$ 150 million. This project can proceed to Phase II, if satisfied to be developed. Interest in the search process kab / the city through RPIJM. Proposed returning to the Netherlands financed through a letter No. Minister of Public Works. HL 02.01-Mn/249 dated May 6, 2009. Not possible in 2009. JICA willing to finance a record review conducted prior to the minimum project value of USD 50 million.
11	Water Supply Project in Central Lombok Regency	PA	JICA	5,400	100	5,500	In the preparation of readiness criteria.
12	Urban Renewal for Better Settlement on The Slums Area	PA	JICA	9,310	200	9,510	In the preparation of readiness criteria. Project needs confirmation whether it will put into the BB 2010-2014.
13	Regional Solid Waste for Maminasata, South Sulawesi	PA	JICA	40,470	4,047	44,517	Waiting for the signing of the Loan Agreement. Expect from the provincial co-funding for access roads. JICA want this project managed the administration but the administration wants this project is managed by the govt. Gowa. There was a team from JICA to assist GOI to strengthen the institutional arrangement. Position: Waiting for the results of the study until August 2009. No way was carried out in 2009-2010. DED (detailed engineering design) for the Regional Landfill was done with grant funds from Indii (AusAid) began in March 2009. Already listed in GB 2009. Consists of a loan of USD 39.47 million and a grant of USD 1 million.
14	Construction for Sewerage System Project in the City of Surabaya	PA	JICA	20,530	900	21,430	In the preparation of readiness criteria.
15	Community Based Sanitation (SANIMAS)	PA	Belanda			4,284	BB was proposed in 2006-2009 by letter No. Minister of Public Works. HL 02.01 - Mn/294 dated May 25, 2009. Focus CK RPJMN 2010-2014. Need to return to the Blue Book is proposed next.
16	Water Supply and Sanitation for Low Income	PA	Belanda			13,513	BB was proposed in 2006-2009 by letter No. Minister of Public Works. HL 02.01 -

No.	Project Title	PA/TA	Source of Fund	Loan / Grant (USD Thous.)	Counterpart Fund (USD Thous.)	Total (USD Thous.)	Description
	Communities (WSLIC)/PAMSIMAS						Mn/294 dated May 25, 2009. TOR is required to be adjusted. It is not to be recommended for inclusion in the proposed 2010-2014 BB, yet.
17	Climate Friendly and Sustainable City Development (Eco City) untuk Solid Waste Management Phase I: Solid Waste Improvement Management	PA	KfW, Germany	75,600	-	75,600	Proposed again to put into DRPHLN-JM 2006-2009 by Ministry of Public Works No.. HL 02.02-Mn/450 dated July 31, 2009. Then it is listed in the 2006-2009 Revision III BB and GB 2009. Consists of a loan of USD 68.6 million and a grant of USD 7 million.
18	Surabaya Sanitary Center and Environmental Education Park (Berubah menjadi TA)	PA	JICA	7,800	500	8,300	MOD has made signing Preliminary Survey dated 15 January 2009. It is changed from PA to TA based on the number of the Secretary-General of Public Works dated HL 02.02-Sj/410.1 about August 18, 2009 to Surabaya Change Scheme Activities Sanitary and Environmental Education Center Park Project (BB ID: P-03-03300-0603-066232)
19	Surabaya Sanitary Center and Environmental Education Park	TA	JICA	800	-	800	MOD has made signing Preliminary Survey date 15 January 2009. Changed from PA to TA based on the number of the Secretary-General of Public Works dated HL 02.02-Sj/410.1 about August 18, 2009 Surabaya Change Scheme Activities Sanitary and Environmental Education Center Park Project (BB ID: P-03-03300-0603-066232)
20	Review of All Standars, Manuals, and Regulations Related to Building Code	TA	JICA	8,600	1,720	10,320	TA is completed in March 2009 and it is proposed a new name for the period 2010-2014. The Project on Building Administration and Enforcement Capacity Development for Seismic Resilience.
21	Technical Assistance for Batam Sewerage Project	TA	World Bank	1,000	100	1,100	Feasibility study is conducted in 2005 by the Millennium Science and Engineering Inc. (MSE) of funding from the U.S. Trade and Development Agency to work together with the Batam Industrial Authority. In the preparation of readiness criteria.
22	Metropolitan Sanitation Management and Health Project (MSMHP)	TA	ADB	1,200	300	1,500	Fact finding mission visited on 18-28 May 2009, and followed by the signing of the MoU of Fact Finding Mission.
23	Sector Survey on the PDAM Asset Management dan Capacity Building of Drinking Water System Provision Management (SPAM) Project.	TA	JICA	4,000	600	4,600	In the preparation of readiness criteria. JICA wanted a change of name to "Assistance to PDAM on Asset Management Services". If possible combined with other similar activities such as the Capacity Building of Drinking Water Provision System Management (SPAM) Project. It is proposed to be processed in order to be funded by using the grant of JICA through the Secretary-General letter No. PU. HL 02.02-Sj/410-2 dated August 18, 2009. It also proposed to enter into the "East Asia Climate Change Partnership" funding from the KOICA by mail Kabiro PKLN No. HL 02.01-Sr/703 dated 17 September 2009
24	Revitalization of Solid Waste Final Disposal System and Its Operation in The Municipalities of Banjarmasin, Palembang, and Medan	TA		2,100	420	2,520	In the preparation of readiness criteria. JICA is not willing to finance. If allowed to enter into the project Maminasata or EcoCity. It requires revision of location. This will be proposed again in 2010.
25	Master Plan and DED for Drainage in Mebidang Metropolitan Area	TA	IndII	1,000	100	1,100	In the preparation of readiness criteria. JICA is not willing to pay for having a bad experience related to land acquisition in Deli Serdang. Submitted to Indii. Da Beluma Indii response.
26	The Preparation of Umbulan Spring/Greater Surabaya Water Supply	TA	IndII	2,000	400	2,400	Already listed in the Blue Book 2006-2009. In the preparation of readiness criteria. JICA not willing to finance. Proposed by Indii.
27	Implementation Stage of Regional Water Supply Project	TA	JICA	900	200	1,100	On-going.
28	Review Feasibility Study and DED Jakarta Wastewater Development Project (sama dengan Sewerage System Development Establishment of Jakarta Flood Management Network System)	TA	JICA	7,000	700	7,700	In the preparation of readiness criteria. JICA target of this project could begin late 2009. Jakarta has sent a letter. Proposed re-thorough of the Minister of Public Works Tax HL 02.02-Mn/450 July 31, 2009 with the name of sewerage System Development Establishment of Jakarta Flood Management Network System

No.	Project Title	PA/TA	Source of Fund	Loan / Grant (USD Thous.)	Counterpart Fund (USD Thous.)	Total (USD Thous.)	Description
29	Collection Data for Sewerage System Project in The City of Surabaya	TA	World Bank	500	50	550	Grants are administered by the World Bank.
30	Sewerage System Development for Semarang	TA	ADB	5,000	500	5,500	This project in 2009 is proposed only a Technical Assistance. In the preparation of readiness criteria. Indications Donor: ADB
31	Sewerage System Development for Cirebon	TA	ADB	5,000	500	5,500	It was proposed as Project Assistance, but based on the coordination meeting with the DG. Cipta Karya - Dep. PU on December 12, 2008, this project in 2009 proposed only a Technical Assistance. waiting DED. Indications Donor: ADB
32	Preparation Plan for Metropolitan Bandung and Capacity Upgrade for Bojong Soang WWTP	TA	Korea	2,900	300	3,200	Enter into the proposed revision of the Blue Book II, 2006-2009, based on meeting Cipta Karya - Dep. Public Works dated December 12, 2009. In the preparation of readiness criteria. Indications Donor: KOICA. Proposed re-through the Minister of Public Works No.. HL 02.01 - SJ/745 December 31, 2008. Proposed to enter into the "East Asia Climate Change Partnership" funding from the KOICA by mail Kabiro PKLN No. HL 02.01-Sr/703 dated 17 September 2009
33	Regional Solid Waste for Mebidang Area, North Sumatera	TA	ADB	5,000	500	5,500	No. of Minister of Public Works. HL.02.02-Mn/724 November 21, 2008, proposed as Project Assistance, but based on the coordination meeting with the DG. Cipta Karya - Dep. PU on December 12, 2008, this project in 2009 is proposed only a Technical Assistance. In the preparation of readiness criteria. Indikasi Donor: ADB
34	Regional Solid Waste for Palembang Metropolitan Area	TA	ADB	5,000	500	5,500	Minister of Public Works. HL.02.02-Mn/724 November 21, 2008, proposed as Project Assistance, but based on the coordination meeting with the DG. Cipta Karya - Dep. PU on December 12, 2008, this project in 2009 is proposed as a Technical Assistance. In the preparation of readiness criteria. Indikasi Donor: ADB
35	Sewerage System Development for Palembang City	TA	ADB	5,000	500	5,500	Minister of Public Works. HL.02.02-Mn/724 November 21, 2008, proposed as Project Assistance, but based on the coordination meeting with the DG. Cipta Karya - Dep. PU on December 12, 2008, this project in 2009 is proposed as a Technical Assistance. In the preparation of readiness criteria. Indikasi Donor: ADB
36	Banyumas Water Supply Project	TA	Netherland	7,000		7,000	Match No. of Minister of Public Works. HL.02.02-Mn/724 November 21, 2008, proposed as Project Assistance, but based on the coordination meeting with the DG. Cipta Karya - Dep. PU on December 12, 2008, this project in 2009 proposed only a Technical Assistance. In the preparation of readiness criteria. Indications Donor: ADB
37	Jakarta Solid Waste Management Project	TA	JICA	1,000		1,000	Proposed new addition is a foreign loan project for Revision DRPHLN - JM on the basis of the Minister of Public Works No.. HL 02.01 - SJ/745 December 31, 2008. Not recommended for re-proposed in 2010-2014.
38	Master Plan and DED Preparation on Waste Water Sector Project	TA	IndII			5,000	Proposed new addition is for a foreign loan project for Revision DRPHLN - JM on the basis of the Minister of Public Works No.. HL 02.01 - SJ/745 December 31, 2008.
39	Preparation of Master Plan, Feasibility Study and DED for Drainage in Several Cities	TA	IndII			5,000	It was proposed in 2006-2009 by letter No. Minister of Public Works. HL 02.01 - Mn/294 dated May 25, 2009. Indii proposed to be funded in 2010.
40	Gas Emission Reduction for Solid Waste Sector in Indonesia	TA	KfW, Jerman	7,033		7,033	It was proposed in 2006-2009 by letter No. Minister of Public Works. HL 02.01 - Mn/294 dated May 25, 2009. Indii proposed to be funded in 2010.
41	Analytical Survey for Review of Master Plan and Development of Feasibility Study for Surabaya Sewerage System Development Project	TA	JICA	3,000	200	3,200	It is proposed to enter into DRPHLN-JM 2006-2009 by Ministry of Public Works No.. HL 02.02-Mn/450 dated July 31, 2009.
42	Sewerage System Development Project Establishment of Jakarta Flood Management Network System	TA	JICA				It is proposed to enter into DRPHLN-JM 2006-2009 by Ministry of Public Works No.. HL 02.02-Mn/450 dated July 31, 2009.

No.	Project Title	PA/TA	Source of Fund	Loan / Grant (USD Thous.)	Counterpart Fund (USD Thous.)	Total (USD Thous.)	Description
43	Capacity Development of 3R and Domestic Solid Waste Management System	TA	JICA			8,520	It is proposed to enter into DRPHLN-JM 2006-2009 by Ministry of Public Works No.. HL 02.02-Mn/450 dated July 31, 2009.
44	Regional Solid Waste Management Project in Surabaya Metropolitan Area	TA	JICA	3,000	200	3,200	It is proposed to enter into DRPHLN-JM 2006-2009 by Ministry of Public Works No.. HL 02.02-Mn/450 dated July 31, 2009. Already listed in GB 2009.
45	Integrated Regional Solid Waste Planning and Management Project in Maminasata Metropolitan Area	TA	JICA	1,550	150	1,700	It is proposed to enter into DRPHLN-JM 2006-2009 by Ministry of Public Works No.. HL 02.02-Mn/450 dated July 31, 2009.
46	Human Settlements Information Center Development	TA	JICA	500		500	It is proposed to enter into DRPHLN-JM 2006-2009 by Ministry of Public Works No.. HL 02.02-Mn/450 dated July 31, 2009.
47	The Project on Building Administration and Enforcement Capacity Development for Seismic Resilience	TA	JICA	3,000	50	3,050	It is proposed to enter into DRPHLN-JM 2006-2009 by Ministry of Public Works No.. HL 02.02-Mn/450 dated July 31, 2009.
48	Global Partnership on Output Based-Aid Expanding Piped Water Supply to Surabaya's Urban Poor	TA	World Bank	11,250		11,250	It is proposed to enter into DRPHLN-JM 2006-2009 by Ministry of Public Works No.. HL 02.02-Mn/450 dated July 31, 2009.
Ministry of Public Housing				246,259	72,105	318,364	
1	Development of Low Cost Multi Storey Rental Housing in Big and Metro Cities	PA		100,000	20,000	120,000	listed in the Blue Book 2006-2009
2	Large-scale Housing Development Project	PA		121,000	49,000	170,000	It is proposed for inclusion in the Blue Book through a letter the Minister of Housing Tax KU.01.01-SM/XI/534 dated 26 November 2008.
3	TA for Development of Low Cost Multi Storey Rental Housing in Big and Metro Cities	TA		1,000	100	1,100	Listed in the Blue Book 2006-2009
4	Integrated Housing Microcredit Shelter Project	TA		5,750	1,500	7,250	New proposals are submitted through the Secretary Ministry of Public Housing No. KU.01.01-SM/XI/534. On 26 November 2008. This project aims to develop micro-credit housing and strengthen the capacity of financial institutions to non-bank micro-credit finance housing development for low-income communities. Activities being revised proposal to be submitted to Indii. No indication donors.
5	Accelerating Affordable Apartment Development for Owning and Rental Purposes	TA		5,050	460	5,510	New proposals are submitted through the Letter of the Minister of Public Housing No. KU.01.01-SM/XI/534. On 26 November 2008. This project aims to develop a policy of modest apartment building owned (Rusunami) and increase private sector participation in financing. No indication donors
6	Lease-Purchase of Affordable Apartment Program	TA		4,400		4,400	New proposals are submitted through the Letter of the Minister of Public Housing No. KU.01.01-SM/XI/534. On 26 November 2008. This project aims to develop a policy of modest apartment building owned (Rusunami) and increase private sector participation in financing. Activities being revised proposal to be submitted to the donors, there are indications IndII.Belum
7	Development on Housing Data	TA	JICA	1,500	150	1,650	New proposals are submitted through the Letter of the Minister of Public Housing No. KU.01.01-SM/XI/534. On 26 November 2008. This project aims to develop a policy of modest apartment building owned (Rusunami) and increase private sector participation in financing. No indication donors
8	Technical Assistance for Improvement of Self-help Housing Quality in Disaster-Prone Areas	TA	JICA	2,448	52	2,500	Already listed in the Revision II Blue Book 2006-2009. New proposals are submitted through the Letter of the Minister of Public Housing No. KU.01.01-SM/XI/534. On 26 November 2008. This project aims to develop a policy of modest apartment building owned (Rusunami) and increase private sector participation in financing. No indication donors
9	Integrated Low Cost Self-	PA		5,111	843	5,954	It is a major new initiative proposal by

No.	Project Title	PA/ TA	Source of Fund	Loan / Grant (USD Thous.)	Counterpart Fund (USD Thous.)	Total (USD Thous.)	Description
	Help Housing Development Project						Minister of Housing letter No. KS.02.03.SM/VII/303 dated July 27, 2009 regarding Proposed Activities Technical Assistance (TA) grants for funding (grants) from JICA overseas financial year 2009-2011
	Local Government			28,907	6,000	34,907	
1	Expanding Piped Water Supply to Surabaya's Urban Poor	TA	World Bank	2,500		2,500	Proposed new addition is for a foreign loan project for Revision DRPHLN - JM on the basis of the Minister of Public Works No.. HL 02.01 - SJ/745
2	Expanding Piped Water Supply to Surabaya's Urban Poor	PA	World Bank	2,407		2,407	Grants are administered the World Bank. In the process of grant agreement.
3	South Pekanbaru Water Supply Development Project	PA		24,000	6,000	30,000	SLA scheme planned and ready for appraisal

Table 4.3.12 Status/Progress of PPP Candidate Projects as of Sept. 2009

No.	Project	Status
1	Bandar Lampung	<ul style="list-style-type: none"> Location: Bandar Lampung Capacity: 500 l/s Estimated Investment: Rp. 160 billion Pre-FS
2	Banjarmasin Bulk Treated Water Supply	<ul style="list-style-type: none"> Location: Banjarmasin Estimated Investment: U.S. \$ 5 million Winner is determined
3	Cikarang Water Supply	<ul style="list-style-type: none"> Location: Cikarang, Bekasi regency, West Java Capacity: 330 l/s Estimated Investment: Rp 179.4 billion Pre-FS
4	Ciledug Water Supply	<ul style="list-style-type: none"> Location: Ciledug, Tangerang City Section South Capacity: 400 l/s Estimated Investment: U.S. \$ 13 million Still in the planning stage
5	Cimenteng Drinking Water Treatment, Bandung	<ul style="list-style-type: none"> Capacity: 1100 l/s Estimated Cost of Investment: U.S. \$ 18 million Technical discussion was conducted on August 3, 2007 at Bandung Letter of request for technical assistance received from the Mayor of Bandung on August 30, 2007 Review of Pre-Feasibility Study has been conducted by Team SID Letter technical assistance agreement was submitted to the Mayor Bandung on 21 September 2007 Provision of technical assistance consultants for project preparation was done Preparation of short list by the auction committee Bappenas As of June 17, 2008 at 16:00 as the deadline for revenue proposal, only 2 companies that includes a proposal namely Poyry Environment GmbH, Germany and PT. Waseco Tirta, Indonesia Some companies claimed back 4 from the revenue proposals namely: Egis BCEOM, France; C. Lotti & Association, Italy; SMEC International, Australia and MinConsult, Malaysia. This person months expected because the allocation for foreign experts that is too small 3 person months. Evaluation of technical proposals was held on 4-6 July 2008 Preparation of feasibility study is planned to begin to do in September 2008.

No.	Project	Status
6	Kab. Bandung Water Supply	<ul style="list-style-type: none"> • Location: West Java • Capacity: 300 l/s • Estimated Investment: U.S. \$ 17 million • Bandung Regency has Eastern been established as a location project development. • The scope of the project include the development of science and networking distribution (satellite concession) • Pre-FS review Who's done • Repair project scope resulting from the expansion • West Bandung regency, find solutions to problems • Raw water sources and improve the project design to make it more interesting for investors. Including Studies on demand, studies of willingness to connect and willingness to pay has been completed. • Based on the study of technical and financial analysis, necessary government support in the form of scale dam construction Citarik small river to make this project feasible. • Need to coordinate among stakeholders (central and local) to decide whether the project will be continued. • Presentation of study results was done to local governments. • Need to discuss more information among the stakeholders in the center and local government for formulating government support required.
7	Dumai City Water Supply	<ul style="list-style-type: none"> • Location: Riau Province • Capacity: 500 l/s • Estimated Investment: U.S. \$ 44 million • Preparation of Pre-FS is performed by Dumai City Government. • Dumai City Government is considering the implementation of the project scheme by EPC turn-key, and financed by the budget itself. • Rokan Hilir Government does not give permission to the utilization of water resources under the raw. • Due to the lack of progress of this project, internal meeting is required. • The National Secretariat decided to issue the proposed project. • A list of 10 models of PPP project is prepared. Proposal expenditure from the list of models to project meetings.
9	Water Kab. Tangerang	<ul style="list-style-type: none"> • Location: West Java • Capacity: 900 l/s • Estimated Investment: U.S. \$ 37 million • PQ has been completed, and 4 participants are qualified. • The bidding has been completed and documents are without indication of support. • Government invited offers in terms of revenue proposals in July 2007 • Pemasukaan bid proposals on November 5, 2007 • Training evaluation techniques and negotiation proposal to offer • Tangerang District Procurement Committee held on 29-31 October 2007 • 2 bidders bid includes proposals • Minister of Public Works decided to continue the bidding process • Accuatco is selected as the winner. • Contract Pemkab. Tangerang and PT Accuatco as the winner of the tender is signed on August 4, 2008. This cooperation is conducted with the pattern during the 25-year concession.
10	Cirebon Water Supply	<ul style="list-style-type: none"> • Capacity: 300 l/s • Estimated Investment: US 90.6 million • Preparation of Pre-FS
11	Karian Water Supply	<ul style="list-style-type: none"> • Stage planning
12	Duri Water Supply	<ul style="list-style-type: none"> • Capacity: 250 l/s • Estimated Investment: U.S. \$ 15 million • Stage planning
13	Jatinangor Water Supply	<ul style="list-style-type: none"> • Location: Jatinangor, Sumedang, Java West • Capacity: 221 l/s • Estimated Investment: U.S. \$ 3.5 million • Pre-FS review is required.
14	Uprating WTP Kali Garang	<ul style="list-style-type: none"> • Location: Kota Semarang • Capacity: 600 l/s • Estimated investment: U.S. \$ 5 million • Developer: PT. Degremon • Construction underway and expected to be completed in 2009
15	Coral Pilang IV	<ul style="list-style-type: none"> • Location: City of Surabaya • Capacity: 2000 l/s • Estimated Investment: U.S. \$ 25 million • Feasibility Study (FS) and Amdal been completed.
16	Menado Bulk Water	<ul style="list-style-type: none"> • Location: Kota Manado

No.	Project	Status
		<ul style="list-style-type: none"> Capacity: 400 l/s Estimated Investment: U.S. \$ 5 million Feasibility study (FS) was completed
17	Kota Jambi	<ul style="list-style-type: none"> Location: Jambi Capacity: 250 l/s Estimated Investment: US 19.95 Million Capacity Building to the PPP team held on 24-25 August 2007 Determination of winner on 8th September 2008: Tirta Siskem jambi Consortium Negotiation contracts
18	Pontianak	<ul style="list-style-type: none"> Location Pontianak Capacity: 1:21 l/s Estimated investment: USD 2.62 million Feasibility study (FS) was completed
19	Menganti Water Supply (District Gresik)	<ul style="list-style-type: none"> Location: Menganti District, District Gresik, East Java Capacity: 160 l / d (intake) & 150 l / d (WTP) Estimated investment: USD 49.3 billion Review and Pre-FS
20	<ul style="list-style-type: none"> Raw Water Supply Project for Tukad Unda, Klungkung 	<ul style="list-style-type: none"> Scheme Socialization Application letter from the Regent of Klungkung KPS has accepted on June 8, 2007 Conducted on Socialization 21-22 June 2007 Letter of request technical assistance from the Regent of Klungkung has accepted on July 17, 2007 Approval of technical assistance to the Regent of Klungkung has delivered on August 20, 2007 Capacity Building to the KPS team has held on 2-3 Nov. 2007 As of the date of June 9, 2008, as many as 10 companies have submitted EOI. Evaluation of EOI was held on 4-6 July 2008 Follow-up Issues ADB Request: acceleration of approval procedure and draft procurement document consultant
21	Provision of Drinking Water Zone Prima Kab. Sleman	<ul style="list-style-type: none"> Estimated Project Value: U.S. \$ 4 million Letter of request technical assistance from the Regent of Sleman has received On July 21, 2007 Initial project data has been obtained from the Regional Government Retrieved information that the Regent of Sleman is dealing with cases corruption Follow-up Issues Research and assistance Delayed the project to cases of corruption resolved
22	Drinking Water Supply for Kab. Maros	<ul style="list-style-type: none"> The letter requests assistance from Regent Maros has received January 17, 2008. Dit. PKPS has conducted field visits Bappenas to approve a letter of assistance have been sent on May 6, 2008. Regent Maros convey its commitment to follow the appropriate procedure through the Presidential Regulation 67/2005 letter dated June 2, 2008. Follow-up Issues Finalization by the consultant KAK-TA INO 4872 Request approval for KAK to ADB for funding through the PDF. Procurement plan for consultant
23	Regency of Karawang	<ul style="list-style-type: none"> Estimated Investment: U.S. \$ 9.18 million Planning phase
24	Regency of Pematang	<ul style="list-style-type: none"> Capacity: 250 l/s Estimated Investment: Rp. 96, Billion Pre-FS
25	Regency of Subang	<ul style="list-style-type: none"> Capacity: 75 l/s Estimated Investment: Rp. 52 billion Planning phase
26	Municipality of Bekasi (Pondok Gede and Jati Asih)	<ul style="list-style-type: none"> Capacity: 330 l/s (intake) and 300 l/s (WTP) Estimated Investment : Rp 159.2 billion Pre-FS
27	Umbulan Water Supply	<ul style="list-style-type: none"> Capacity: 4000 lpd Estimated Investment: USD 90 million Stage planning
28	Balik Papan	<ul style="list-style-type: none"> Capacity: 450 l/s Estimated Investment: Rp. 109.2 Billion Capacity Building to the PPP team held on 24-25 Aug. 2007 Auction ads in the daily Republika pp. 21 PQ Registration and refund documents on 2-9 Jan. 2007 Public illustrate PQ 16 April 2007

No.	Project	Status
		<ul style="list-style-type: none"> • The deadline for entries revenue PQ documents 17-23 April 2007 • Draft contract already exists. • Determination winners, waiting for the results of consultations with Parliament
29	Cilacap	<ul style="list-style-type: none"> • Capacity: 50.4 l/s • Estimated Investment: Rp. 50.4 Billion • Medium Pre-FS and review conducted
30	Regency of Kebumen	<ul style="list-style-type: none"> • Capacity: l/s • Estimated investment: USD 27.1 billion • Pre-FS formulated

Source: PPP HP, BAPPENAS

Project Assistance

1) Water Supply Sector

Most of the projects in BB are initiated in recent years. The nationwide projects on urban water and sanitation which is expected to contribute to improvement of PDAM performance are still in the preparation stage. Also, IKK water supply programs have been implemented. But the number of IKKs, where improvement, rehabilitation or expansion works are executed, does not meet the required number of IKKs. On the other hand, the water supply projects for the metropolitans and/or major large cities are planned to be implemented by the PPP scheme, but most of the candidate projects in PPP are still at study stage and completed projects are none during the current RPJM period, excluding small scale projects.

The National Program for Community Water Supply and Sanitation Services (PAMSIMAS) is currently being implemented and is desired to be continued in the next RPJM in order to improve the water supply condition in the rural areas of Indonesia.

2) Sewerage Sector

The lone completed BB Project in the sewerage sector during the current RPJM is for Denpasar City in which the construction work was completed in 2007 and the 2nd Phase of the Project is being executed. Projects for Jakarta, Surabaya and Batam Island are expected to be executed during the current RPJM, but not yet realized. The Metropolitan Sanitation Management and Health Project involving sewerage and solid waste management for five cities in Indonesia is expected to be implemented under PA of ADB.

The community-based sewerage projects for the urban poor and rural areas are being implemented under the aforesaid PAMSIMAS and the Department of Health.

3) Solid Waste Management

The current BB includes Solid Waste Management for Maminasata, which is under appraisal of JICA for providing Japanese Yen Loan.

4) Drainage Improvement

There is no definite project in BB. However, drainage work is expected to be included into the sewerage projects or sanitation improvement projects.

Technical Assistance

There are 42 projects in the technical assistance of BB. Of these 42 projects, Cipta Karya occupies 30 projects covering water supply, sewerage, solid management and drainage. Considering the large increase from 13 projects in the original version of BB, the need for development and improvement of infrastructures in these sectors will increase in the coming years. Therefore, candidate projects for

the next BB are expected to be formulated.

(2) Necessity and Priority of Projects in the Blue Book 2010-214

1) Status of Preparation of Candidate Projects for Blue Book 2010-2014

There is no clear information and data on the candidate projects for the next version of the Blue Book, although these are scheduled to be provided officially by BAPPENAS to the Study Team. Therefore, the Study Team assumed the candidate projects required for solving the issues and problems on the basis of the data and information collected through hearings to Cipta Karya and BAPPENAS.

Table 4.3.13 shows the major activities or projects considered by Cipta Karya in the formulation of plans. Also, this table indicates the expected donors for fund sources by Cipta Karya. However, the project components, cost, present situation for each project or city are still under preparation into application form of BB by Cipta Karya.

On the other hand, Cipta Karya has prepared the budget allocation plan for 2010-2014 with a total budget of Rp. 226,000 billion, of which Rp. 109,956 billion and Rp. 57,090 billion are expected to be allocated to water supply, and sanitation and environmental improvement, respectively, according to the Final Report of LEMTEK. In preparation of the budget, the following policies are applied:

Table 4.3.13 Expected Budget of Cipta Karya for Water Supply and Sanitation Sector in RPJM 2010-2014

Policy	Strategy	Activity	Amount of Budget (Rp. Billion)
I. Improvement of Social Welfare	1. Improvement of Infrastructure and settlement facilities with priority of poor areas	Water supply	25,470
		Restructuring of environmental settlement	-
	2. Community-based infrastructure development	Water supply	2,000
		Restructuring of environmental settlement	23,431
	3. Improvement of Inter Agency Cooperation	Water supply	265
		Restructuring of environmental settlement	-
II. Improvement of Environmental Quality	1. Development of infrastructure	Water supply	12
		Restructuring of environmental settlement	-
	2. Development of infrastructure against climate change	Water supply	-
		Restructuring of environmental settlement	-
	3. Promotion of public campaigns	Water supply	264
		Restructuring of environmental settlement	-
III. Boosting of Economic Growth	1. Development of infrastructure for enhancing competitiveness	Water supply	500
		Restructuring of environmental settlement	9,675
	2. Increase of participation and cooperation of state enterprises and other enterprises/private sector	Water supply	7,900
		Restructuring of environmental settlement	-
	3. Improvement and development of infrastructure for economic development	Water supply	72,400
		Restructuring of environmental settlement	12,470
	4. Strengthening and development of linkage between region, urban and rural areas	Water supply	-
		Restructuring of environmental settlement	-

Policy	Strategy	Activity	Amount of Budget (Rp. Billion)
IV. Capacity Building of Regional Government	1. Revision of laws and regulations related to the minimum service standard	Water supply	233
		Restructuring of environmental settlement	100
	2. Encourage cooperation between institutions to strengthen the financial and technical capacity of local government to achieve the development goal	Water supply	192
		Restructuring of environmental settlement	877
	3. Establishment of coordination and control mechanisms to realize the national policies and strategies in urban areas	Water supply	450
		Restructuring of environmental settlement	-
	4. Increase of the role of government and provinces in improvement of performance of infrastructure and settlement facilities	Water supply	720
		Restructuring of environmental settlement	85
Grand Total of Required Budget for RPJM		Water supply	109,956
		Restructuring of environmental settlement	57,090

Source: Final Report, Dec. 2009, LEMTEK

From the above table, it is recognized that the following issues are focused in the next RPJM:

- a) Community-based infrastructure development;
- b) Infrastructure development and improvement for building strong economic growth;
- c) Revision and addition of laws and regulations to support the above activities; and
- d) Capacity development of local government and related agencies.

2) Priorities for BB Project

In order to realize the above strategies, the projects or studies in Blue Book shall have the following objectives:

- a) Water supply projects shall improve the performance of PDAM in urban areas, especially on UFW reduction and increase of connections to support restructuring of PDAM, and development of community-based water supply facilities with sustainable operation and maintenance capacity of communities for realizing the MDG.
- b) Sewerage projects shall strengthen the existing sewerage facilities and quality of service in the metropolitan or large urban areas on served population in order to create better water environment and shall maintain water sources for drinking water supply in terms of water quality. On-site facilities shall be further developed in the rural areas for realizing the MDG.
- c) Solid management projects shall develop final disposal sites for fulfilling the requirements of Law No. 18/2008.
- d) Drainage projects shall include the public awareness campaign for environment and sanitation as well as improvement of drainage networks.
- e) The candidate projects in RPJM 2006-2009 shall have high priority excluding projects which have not been realized for three years.
- f) All the projects shall contribute to the target outcome indicators set in the Draft RPJM 2010-2014:
 - Access rate to drinking water for 70 % of the population at the end of 2014, with 32% access to piped drinking water supply and 38% access to non-piped water;
 - Availability of access to waste water management system centered (off-site) to 10%

of the total population through a system of centralized waste water management for urban areas by 5% and communal system of 5%, and providing access and improving the quality of waste water management systems of local (on-site) to 90% of the total population;

- Availability of access to solid waste management for 80% of households in urban areas; and
- Reduction of habitual inundation area of 22,500 ha in 100 strategic urban areas.

From the above conditions, high priority shall be given to the candidate projects in Table 4.3.14

Table 4.3.14 Preliminary Information on Activities of Cipta Karya by Using Foreign Loan/Grant

No.	Description	Expected Funding Source					High Priority	Required Cost (USD m)	RPJM 06-09	Remarks
		ADB	KfW	WB	JICA	Others				
	Water Supply									
1	Water Supply System IKK				P			165		
2	Rural Water Supply System (PAMSIMAS)			P				14		Preparing business plan for 20 PDAM using grant from IndII (Ausaid)
3	Water Supply System Improvement							NA		
4	Water Supply System - Incentive for PDAM (Grant)							15		
5	Global Partnership on Output Based-Aid Expanding Piped Water Supply to Surabaya' Urban Poor							11		
6	Banyumas Water Supply Project							7		
7	Water Supply System - SLA							NA		
	- UWSSP (Kota Bogor, Kab. Muara Enim, Kab. Kapuas)			P				37		
	- Jakarta, Bekasi, Karawang Water Supply				P			5		TA is required.
	- Master Plan for West Semarang Water Supply				P					On going project
	- Umbulan Water Supply				P			5		TA is required.
	- Southern Bali Water Supply			P	P			50		
	- Southern Pekanbaru Water Supply					P		30		funded by loan from DANIDA (Denmark)
	Solid Waste Management									
1	Regional Final Disposal Site Mebidang (CDM)	P						6		
2	Regional Final Disposal Site Bandung Raya (CDM)			P	P			NA		Indication donor: World Bank/JICA
3	Regional Final Disposal Site Semarang (CDM)							NA		Master Plan has been already prepared
4	Regional Final Disposal Site Denpasar							NA		Master Plan has been already prepared
5	Regional Final Disposal Site Mamminasata				P			44		DED is still being prepared, funded by grant of IndII (AusAid)
6	Regional Final Disposal Site Surabaya Metropolitan (CDM)		P		P			3		TA to JICA 2009
7	Regional Final Disposal Site Jakarta Metropolitan							1		
8	Regional Final Disposal Site Palembang (CDM)							1		
9	West Java (Jabodetabek, Serang, Cirebon, Kota Bandung, Kota Cimahi, Kab. Bandung, Kab. Sumedang)			P				24		WJEMP (West Java Environmental Management Project), Master Plan should be reviewed.
10	Gas Emission Reduction for Solid Waste Sector in Indonesia					P		7		
11	Capacity Development of 3R							5		

No.	Description	Expected Funding Source					High Priority	Required Cost (USD m)	RPJM 06-09	Remarks
		ADB	KfW	WB	JICA	Others				
	and Domestic Solid Waste Management System									
12	Name of cities which is being prepared for CDM Concept application									
	- Surakarta		P					76	Green	These cities are included in activity namely "Climate Friendly and Sustainable City Development (Eco City) Phase I : Solid Waste Improvement Management"
	- Malang		P							
	- Pekalongan		P							
	- Mataram		P							
	- Bukittinggi		P							
	- Kab. Serdang Bedagai		P							
	- Bitung		P							
	- Amuntai		P							
	- Cilegon		P							
	- Sidoarjo		P							
	- Jombang		P							
	- Jambi		P							
	- Solok		P							
	- Bontang		P							
	- Padang	P						NA		
	- Pekanbaru	P						NA		
	- Banda Aceh	P						NA		
	- Bandar Lampung	P						NA		
	- Batam	P						NA		
	- Yogyakarta	P						NA		
	- Cirebon			P				NA		
	- Balikpapan			P				NA		
	- Bogor			P				NA		
	- Banjarmasin			P				NA		
	- Samarinda			P				NA		
	- Pontianak			P				NA		
	- Palangkaraya			P				NA		
	- Manado			P				NA		
	- Ambon			P				NA		
	- Jayapura			P				NA		
	Sewerage									
1	Development on existing network of WWTP in:									
	Medan	P						3		Master Plan is still under review
	Jakarta (new WWTP)							8		Master Plan should be reviewed
	Bandung							3		Master Plan should be reviewed
	Cirebon							3		Master Plan should be reviewed
	Yogyakarta	P						3		Master Plan is still under review
	Surakarta							21		
	Denpasar								Brown	
	Banjarmasin							3		
	Tangerang							3		
	Batam							50		
	Samarinda							3		
	Balikpapan							3		
2	New WWTP construction in:									
	Semarang							5		
	Surabaya							50		
	Makassar	P						30		Environmental Impact Assessment is still being prepared, funded by grant of IndII
	Palembang							6		
	Mataram							3		
	Drainage									
1	Preparation of Master Plan, Feasibility Study and DED for Drainage in Several Cities							7		
2	Batam							NA		
3	Palembang							NA		
4	Pekanbaru							NA		

No.	Description	Expected Funding Source					High Priority	Required Cost (USD m)	RPJM 06-09	Remarks
		ADB	KfW	WB	JICA	Others				
5	Cilegon							NA		
6	Bekasi							NA		
7	Tangerang							NA		
8	Bandung							NA		
9	Surabaya				P			NA		
10	Pontianak							NA		
11	Banjarmasin							NA		
12	Samarinda							NA		
13	Balikpapan							NA		
14	Makassar				P			NA		
15	Denpasar							NA		
16	Mataram							NA		
17	Ambon							NA		
18	Jayapura							NA		
19	North Coast of Central Java (Kendal, Pekalongan, etc)							NA		
20	Semarang				P					On-going
21	Jakarta			P	P					included into Jakarta Sewerage Project

Regarding to the project proposal information for Blue Book 2010-2014, it is noted that the projects in the Table 4.3.14 are still tentative and subject to change as of September 2009. The candidate projects are scheduled to be decided in March 2010.

(3) Preliminary Selection Criteria for Evaluation of Candidate Projects

According to the Technical Guidelines on Submission of Proposals for Projects Financing by Foreign Loans and/or Grants Book I: General Guidelines published by BAPPENAS in 2006, foreign sources of funding are required for accelerating the achievement of national development targets with priorities indicated in RPJM, which is to be mentioned in the Foreign Loan Requirement Plan (RKPLN) prepared by BAPPENAS and the Ministry of Finance.

It is proposed that the selection of candidate projects to be based on the following issues for respective development strategy and activities, although no project digests of new candidate projects are available at the time of the preparation of this report:

- (1) Suitability for Regional and Sector Development Policy/Strategy;
- (2) Urgency and Necessity;
- (3) Financial Issues;
- (4) Economic Issues;
- (5) Issues on Implementation; and
- (6) Appropriateness for international cooperation in technical difficulty.

These issues are further defined as shown in Table 4.3.15. The issues and weights in the table are tentative values, which shall be finalized between BAPPENAS and the line ministries.

Table 4.3.15 Evaluation Model for Candidate Projects of Blue Book in Water and Sanitation Sector

Table 4.13: Evaluation Model for Candidate Projects of Blue Book in Water and Sanitation Sector									
Categories		Evaluation Items	Weight	Point: 1	2	3	4	5	Score
1. Fitness for Regional and Sector Development Policy/Strategy	25%	Regional Development Plan in RPJMN 2010-2014	15%	Not strategically developing area in RPJM	between items 1 and 3	Not strategically developing area in RPJM but the concept is applicable	between items 3 and 5	Strategically developing area in RPJM	
		Sector Development Plan in RENSTRA 2010-2014	10%	Not strategically developing area in RENSTRA	between items 1 and 3	Not strategically developing area in RENSTRA but the concept is applicable	between items 3 and 5	Strategically developing area in RENSTRA	
		Sub-total	-	-	-	-	-	-	
2. Urgency and Necessity	25%	Gap of Present Status and National or MDG Target of Outcome Indicator	15%	< 5%	5% to 10%	10% to 20 %	20% to 30%	> 30%	
		Contribution to poverty alleviation and equitable growth mechanism	10%	Not included into Project Components	between items 1 and 3	One of Project Components	between items 3 and 5	Main Purpose of the Project	
		Sub-total	-	-	-	-	-	-	
3. Financial Issues	20%	Financial IRR	5%	< 5 %	5% to 8 %	> 8%	8% to 12%	> 12 %	
		Availability of financial or business plan	5%	No preparation activity	under preparation	Prepared	Reasonable plan	Realistic Plan	
		Possibility of full cost recovery by revenue	5%	Revenue/Cost <50%	50% to 80%	80% to 100%	100% to 120%	> 120%	
		Application of Sub-Loan of Foreign Loan to Project	5%	Applied	-	-	-	Not Applied	
		Sub-total	-	-	-	-	-	-	
4. Economic Issues	10%	Number of beneficiaries	5%	< 10,000	10,000 to 50,000	50,000 to 100,000	100,000 to 200,000	>200,000	
		Economic IRR	5%	< 5 %	5% to 8 %	> 8%	8% to 12%	>12 %	
		Sub-total	-	-	-	-	-	-	
5. Issues on Implementation	10%	Maturity	3%	Master plan	Preliminary feasibility study	Feasibility study	Basic design	Detailed design	
		Capacity of responsible agencies for implementation and O&M	5%	Bad	between items 1 and 3	Fair	between items 3 and 5	Excellent	
		Social and environmental issues	2%	EIA is planned to be executed.	between items 1 and 3	EIA is being executed.	between items 3 and 5	EIA is completed.	
		Sub-total	-	-	-	-	-	-	
6. Appropriateness for international cooperation in technical difficulty.	10%	Technical Difficulty	7%	Conventional technology in Indonesia	between items 1 and 3	Necessity of foreign support in safety and reliability of applied technology	between items 3 and 5	Application of new/ high technology in Indonesia	
		Difficulty of Private Finance	3%	High FIRR	between items 1 and 3	Reasonable FIRR but need of government finance to part of the Project	between items 3 and 5	Low possibility of private investment	
		Accessibility of Foreign Experts to the Project Site from the view points of culture, security, and so on	2%	Bad	between items 1 and 3	Fair	between items 3 and 5	Excellent	
		Sub-total	-	-	-	-	-	-	
Total Score			100%						

4.4 Water Resources Sector

The water resources sector consists mainly of four sub-sectors, namely: i) water resources development and management, ii) irrigation development and management; iii) raw water supply and management; and iv) flood control and coastal protection. The irrigation sub-sector is one of the important water resources infrastructures needed to support the sustainable growth of Indonesia. Moreover, it is recognized as the dominant sector in terms of water use (utilizing 86% of the total water use in the whole country). Hence, irrigation infrastructure is separately discussed in some parts of this section.

4.4.1 Current Development Program

(1) Current Medium-Term Development Plan (RPJM) 2004-2009

The following five programs for water resources development were set out in the current RPJM 2004-2009:

- i) Program for the development, management, and conservation of rivers, lakes, and other water sources;
- ii) Program for the development and management of irrigation networks, swamp irrigation networks and other forms of irrigation networks;
- iii) Program for supplying and managing raw water;
- iv) Program for controlling floods and safeguarding coastal areas; and
- v) Program for reforming institutions and administrative aspects.

Specific activities under each program mentioned above are proposed in Chapter 33 - “Accelerating Infrastructure Development” of the current RPJM 2004-2009. The key issues addressed in the current RPJM 2004-2009 for formulating the above programs are as follows:

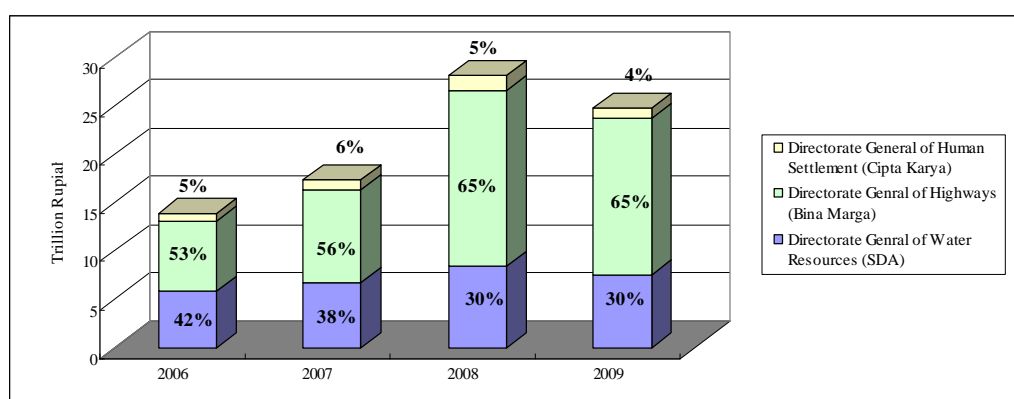
- i) Imbalance between supply and demand of water both in the spatial and temporal perspectives;
- ii) Increasing threat to the sustained carrying capacity of water resources in terms of surface as well as ground water;
- iii) Decline in the capacity to supply water;
- iv) Increasing potential of water conflicts;
- v) Not optimal utilization of irrigation networks;
- vi) Widening extent of coastal abrasion;
- vii) Weakness of coordination institutions and administration;
- viii) Low quality of data management and information system; and
- ix) Damaged water resource infrastructures due to natural disasters, specifically in Aceh and North Sumatra.

(2) Current Renstra 2005-2009

Among the several ministries involved in executing the programs for water resources sector, the Ministry of Public Works (MPW) governs in terms of the allocated government budget for implementation of the programs. The MPW formulated the national strategic development plan for Renstra 2005-2009 to implement the programs in line with the current RPJM 2004-2009. The contents of the Renstra include challenges, vision, mission, aim, strategies, policies, programs, targets, activities and outcome performance indicators.

(3) Government Budget Allocation in 2005-2009

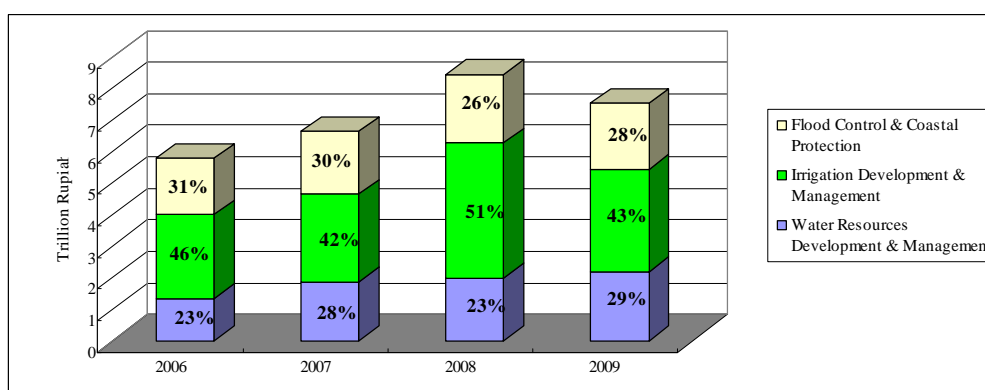
The Directorate General of Water Resources (DGWR) is responsible for the implementation of water resources infrastructure development projects for MPW. The allocated annual budgets were Rp 28.1 trillion in 2008 and Rp 24.8 trillion in 2009. Around 30% of the total annual budget to MPW has been allocated to DGWR in 2008 and 2009 as shown in Figure 4.4.1.



Source: Director of Development Finance Allocation, BAPPENAS

Figure 4.4.1 Comparison of Budget Allocation in Ministry of Public Works in 2006-2009

Figure 4.4.2 shows the distribution of allocated budget to DGWR in the 2006-2009 period. More than 40% of the budget has been allotted to irrigation development and management, followed by flood control and coastal protection (26-31%), and water resources development and management (23-29%).



Source: Director of Development Finance Allocation, BAPPENAS

Figure 4.4.2 Comparison of Budget Allocation in Directorate General of Water Resources, Ministry of Public Works in 2006-2009

4.4.2 Progress of Development

(1) Progress of Major Activities under the Current RPJM 2004-2009

Various efforts for water resources infrastructure development have been undertaken to support the national and regional economic growth. Table 4.4.1 presents the progress of major activities achieved as of May 2008 under the current RPJM 2005-2009 as well as the expected achievement until 2009.

Table 4.4.1 Progress of Major Activities and Expected Achievements under the Current RPJM

Category	Activity / Indicator		Target for 2005-2009	Achieved as of 2008	Estimated Achievement by 2009
1. Water resources development, management, and conservation	Construction of reservoir and pond		11 reservoirs	9 reservoirs	11 reservoirs (100%)
			350 ponds	431 ponds	443 ponds (127%)
	O&M of reservoir		121 reservoirs	119 reservoirs	121 reservoirs (100%)
2. Irrigation development, and management	Surface irrigation system	Development/improvement	560,000 ha	453,979 ha	521,619 ha (93%)
		Rehabilitation	1,516,748 ha	1,321,901 ha	1,495,396 ha (99%)
		O&M	2,100,000 ha	2,039,336 ha	2,091,528 ha (100%)
	Ground water irrigation system	Development/improvement	6,000 ha	5,373 ha	7,921 ha (132%)
		Rehabilitation	5,350 ha	5,916 ha	8,949 ha (167%)
		O&M	8,000 ha	2,780 ha	3,000 ha (38%)
	Swamp development	Rehabilitation improvement	800,000 ha	820,598 ha	1,015,206 ha (127%)
		O&M	1,100,000 ha	451,291 ha	637,954 ha (58%)
3. Raw water supply and management	Construction of water supply channel		7 m ³ /s	8.52 m ³ /s	12.66 m ³ /s (181%)
	Rehabilitation of water supply channel		241 units	153 units	163 units (67%)
	Construction of weir and pond		441 units	66 units	100 units (23%)
	Rehabilitation of weir and pond		449 units	58 units	68 units (15%)
4. Flood control and coastal protection	Installation of FFWS		10 systems	9 systems	10 systems (100%)
	10-year flood protection		10,000 ha	9,306 ha	12,806 ha (128%)
			1,250 km	940.2 km	1,013 km (81%)
	O&M of river		1,500 km	225 km	225 km (15%)
	Coastal protection		250 km	117.47 km	148.7 km (60%)
5. Institutional reform	Improvement of coordination among institution		<ul style="list-style-type: none"> - Government Regulation No.20/2006 regarding Irrigation - Government Regulation No.42/2008 regarding Water Resources Management - Government Regulation No.43/2008 regarding Groundwater - Presidential Decree No.12/2008 regarding Water Resources Council - Ministerial Regulations No.30/2007 regarding Participatory Irrigation - Ministerial Regulations No.31/2007 regarding Irrigation Commission Guideline 		

Source: Concept Strategic Plan Water Resources 2010-2015, DGWR, MPW, May 2009

(2) Institutional Strengthening and Policy Reform in Water Resources Sector

The new Water Resources Law No.7/2004 introduced major changes to the legal and institutional framework for water resources management, e.g., new paradigms such as regional autonomy, decentralization and state revenue sharing, establishment of a National Water Resources Council (NWRC), an inter-governmental coordination framework headed by the NWRC, stakeholder participation in policy-making, private sector involvement in water resources management, and management and empowerment of beneficiaries (especially farmers). From this new law, some 35 government regulations concerning water resources management (WRM) are required to be promulgated. To date, several government regulations listed in Table 4.4.1 were completed under the new law. This revision was included in the program for the reform of institutions and administrative aspects in the current RPJM 2004-2009.

Some important stipulations of the new Water Resources Law No.7/2004 are:

- i) Control of water resources shall be carried out by the central government and/or regional government while recognizing the rights possessed by local traditional communities and similar rights, as long as such rights are not conflicting with national interests and the laws and regulations (Article 6, Clause 2).
- ii) No license is needed for water utilized for private or irrigation needs (Article 8, Clause 1).
- iii) Surface and groundwater resources management shall be based on river basins, with integration between surface and groundwater (Articles 11 and 12).
- iv) Statement of WRM responsibilities of central, provincial, district and village government for river basins within and across their boundaries (Articles 14 to 17).
- v) Financing WRM activities and sources of finance (Articles 77 to 80).
- vi) Cross-sectoral and cross-regional coordination of WRM shall be made by water resources councils at national, provincial, district and river basin level (Articles 85 to 87).
- vii) Criminal penalties up to Rp 1.5 billion and nine years imprisonment are specified for infringement of this law (Articles 94 to 96).

The main points of some implementing regulations at the back of the new Water Resources Law No.7/2004 are discussed briefly below.

1) Establishment of New River Basin Management Organization

Under the national institutional reform framework above, the MPW established a technical implementation unit (UPT) as its new river basin management organization at the state level. This UPT is called Balai Besar and Balai Wilayah Sungai (Water Resources Management Office), instituted under the Ministerial Regulation No.11A/PRT/M/2006. This regulation specified a total of 133 river basin groups (Wilayah Sungai) all over Indonesia. These are classified into 5 international groups, 27 inter-provincial groups, 37 national strategic river groups, 51 river groups crossing local government jurisdictions, and 13 river groups within the city boundaries. Out of these, 69 river basin groups are directly controlled and managed by UPT. These comprise five

river basins that include those within the international border, 27 inter-province river basins, and 37 national strategic river basins. Along this line, a total of 30 UPTs have been established, comprising 11 offices of Balai Besar and 19 offices of Balai all over the country. The remaining river basins are being managed by regional governments. The new Balai Besar and Balai undertake the works related to both water resources development and management, and operation and maintenance (O&M). The necessary budget to operate the Balai Besar and Balai is obtained from the national budget (APBN).

2) Establishment of the National Water Resources Council (NWRC)

WRM requires for coordination regarding water use, control and conservation among various stakeholders. As a legal ground of the coordination entity for WRM, the Presidential Decree No.12/2008 establishing the NWRC was issued in February 2008. The NWRC have the tasks of: i) preparing and formulating national policy and strategy on WRM; ii) deciding and providing options for classification of groundwater basins and river areas; iii) monitoring and evaluating groundwater basins and river areas; and iv) preparing and formulating hydro-geological, and hydro-meteorological information system management policies in consultation with the related institutions for each issue. This Presidential Decree No.12/2008 stipulates the organizational structure and membership of the NWRC. The chairman of the NWRC shall be the Coordinating Minister for Economic Affairs, and the executive chairman shall be the Minister of Public Works. The membership shall come not only from governments, consisting of 14 ministers, two agencies and local governments, but also 11 NGOs.

3) Government Regulation No.42/2008 regarding Water Resources Management

This government regulation stipulates the manner of planning, implementing, monitoring and evaluating water resources conservation, water resources development and water allocation in a comprehensive manner. The regulation covers four major policy directions: i) definition of WRM; ii) policy and guideline for WRM; iii) provision of river areas, watersheds, water quality management, water sources use zones, water allocation, water resources facility, water resources development, climate change and water resources business; and iv) function of central government, regional governments, and other agencies, and function of coordination forums.

(3) Formulation of Regulations in Relation to Irrigation Sector

1) Government Regulation No.20/2006 regarding Irrigation

For full implementation of the new Water Resources Law No.7/2004 in the irrigation sector, Government Regulation No.20/2006 was enacted with the main contents summarized hereunder:

- (a) Responsibilities of the central, provincial and district/city government and water users association (WUA) for the development and management of irrigation system are clearly defined based on the size of irrigation system and its facility level as follows:

Table 4.4.2 Responsibility of Development and Management of Irrigation System

Work	Category of Irrigation System	Main and secondary irrigation system	Tertiary system
Development of irrigation system	Inter-state, inter provinces and national strategic irrigation system	Central government	WUA
	Inter district irrigation system	Provincial government	WUA
	District/city region	District / city	WUA
Management of irrigation system	More than 3,000 ha, inter provinces and national strategic irrigation system	Central government	WUA
	1,000 ha to 3,000 ha or inter district irrigation system	Provincial government	WUA
	District/city region	District/city	WUA

Source: Government Regulation No.20/2006 regarding Irrigation

- (b) Irrigation commission shall be established to realize the integrity of management of the irrigation system in district/city, province or inter-province.
- (c) Farmers participation in irrigation system development and management is more emphasized in all stages such as drawing up of initial ideas/plan, involvement in decision making and implementation of construction, improvement, rehabilitation, and O&M of irrigation systems.
- (d) Necessity of empowerment of district/city government and WUA is raised, and the roles of each stakeholder are defined.
- (e) The process management of irrigation assets and the roles of each stakeholder are defined.

2) Ministerial Regulations

To implement the Government Regulation No.20/2006 in the operation level, the following guidelines were also formulated:

- (a) Ministerial Regulation of Public Works No.38/2006 regarding de-concentration and co-administration;
- (b) Ministerial Regulation of Public Works No.30/2007 regarding Guidelines for Participatory Irrigation System Management and Development; defining farmer society participation in the development and management of irrigation systems, rules and participation procedure, and monitoring and evaluation;
- (c) Ministerial Regulation of Public Works No.31/2007 regarding Guidelines for Irrigation Commission; defining the general rules of the commission, scope of arrangement, positions/works/tasks and functions, organization composition/membership and administration, election procedure, work connection, and financing;
- (d) Ministerial Regulation of Public Works No.32/2007 regarding Guidelines for O&M of Irrigation Systems; defining the general rules with operation and maintenance manuals for irrigation system; and
- (e) Ministerial Regulation of Public Works No.33/2007 regarding Guidelines for Empowerment of Water Users Associations (P3A), Federation of Water Users Association (GP3A), and Central of Water Users Association (IP3A); defining the formation of water users association, membership and structure of the organization,

working area, work and functional relationships, improvement, financing, and monitoring and evaluation.

4.4.3 Remaining Issues

(1) Key Remaining Issues for Next RPJM 2010-2014

According to the draft concept of the next RPJM 2010-2014, BAPPENAS addressed the following remaining issues based on the evaluation on performance of the current RPJM 2005-2009:

- i) Decreasing function and sustainability of water resources capacity;
- ii) Decreasing capacity of water supply sources;
- iii) Non-optimal level of irrigation service networks;
- iv) Increasing potential of water conflicts;
- v) Increasing threat of flooding and droughts;
- vi) Spreading coastal abrasion; and
- vii) Weakness of coordination and function of institutional management of water resources.

Furthermore, the draft Renstra 2010-2014 prepared by DGWR addressed the strategic issues on water resources management in detail through the evaluation of the current Renstra 2005-2009:

- i) The level of watershed damage becomes more severe, threatening the preservation of reservoirs, lakes, and other sources of water, and increasing the risks on hydro power.
- ii) The irrigation and swamp network services, which are less optimized for irrigation water requirement, and the limited available quantity and quality of raw water to serve as drinking water in border areas and small islands have to be developed.
- iii) Irrigation network function has to be developed and improved due to the increasing irrigation water demand and the swamps, in order to support the national food security and provide adequate domestic water supply.
- iv) Problems on O&M of water resources infrastructure require attention.
- v) Paddy land conversion in Java has increased significantly.
- vi) Weak coordination among institutions and the autonomous regions resulted in inefficient management of water resources.
- vii) Data and information system management is still limited.
- viii) Global climate change impact is more intensive.
- ix) Abrasion on the coastal zone becomes a threat to the small islands and affects the boundary of the country and Exclusive Economic Zone (EEZ).

In addition to the above issues, DGWR emphasized the following problems in the implementation of the current Renstra 2005-2009:

- i) Increased extra "burden" other than the activities of the current Renstra targets due to the impact of natural disasters that occurred in 2005-2009. (Natural disaster occurred in December 2004 in Aceh and North Sumatra.)
- ii) The development of institutional management of water resources has not yet been completed.

- iii) The implementing institutions have weak capacity in executing water resources management and coordinative management.
- iv) Budget-based performance management has not been implemented effectively due to limited allocation of national budget.

As mentioned in Sub-section 4.4.2 (2), under the new Water Resources Law No.7/2004, some 35 government regulations were called for to expand, clarify and help in the implementation of the new law. At least 9 regulations were planned to be revised under the ongoing Renstra 2005-2009 as the program of development of institutional management, aiming at realizing effective institutional management so that potential water conflicts can be controlled. The target regulations for revision are on irrigation, rivers, water resources management, financial management of water resources, water quality management, groundwater, corporatization of water resources management, PJT I and PJT II. Several regulations are still in various stages of preparation.

The draft RPJM 2010-2014 emphasizes that the new paradigms under the new Water Resources Law No.7/2004 requires some adjustment of the roles of respective government, private and community for the management of water resources infrastructures. There is still weakness in the coordination between institutions under the regional autonomy. The policy and commitment are not in harmony with each other and thus needed to be synchronized to manage the water resources. Community participation and awareness, which are basic requirements for the new paradigms, are still in the limited level. In this connection, increasing the institutional capacity in water resources management and community participation and empowerment (especially in the district/city level) should become key challenges for the next RPJM 2010-2014.

Together with the strategic issues discussed above, regional water-related issues by island, complicated flood control and coastal protection issues need to be addressed in the forthcoming Renstra 2010-2014 and these are discussed in the succeeding items from (2) to (5) in this subsection. The remaining issues in the irrigation sector are also discussed in detail in Item (6).

(2) Outstanding Regional Water-related Issues by Island

The remaining issues mentioned above are not necessarily common to all the islands in Indonesia, including its locality. Due to unequal distribution of population (e.g. about 83% of Indonesia's population live in the two main islands of Java (57%) and Sumatra (26%)), varying topographical, geographical and climatic conditions, and different levels of economic development, associated water-related issues are different according to island. Table 4.4.3 below summarizes the outstanding regional water-related issues of the main islands.

Table 4.4.3 Outstanding Regional Water-related Issues by Island

Island	No. of River Basin (WS)	Major Issues
Sumatra	48	<ul style="list-style-type: none"> Illegal (uncontrolled) logging and deforestation, critical catchment (all provinces) Deteriorated irrigation infrastructure (all provinces) Water conflict between irrigation and DMI (Medan, Padang) Flooding (all provinces)
Java	22	<ul style="list-style-type: none"> Illegal (uncontrolled) logging and deforestation, critical catchment (all provinces) Degraded water environment (all provinces) Severe water stress condition, increasing water conflicts (all provinces) Deteriorated irrigation infrastructure (all provinces) Flooding (all provinces) Insufficient coordination/management of water resources (all provinces)
Kalimantan	18	<ul style="list-style-type: none"> Illegal (uncontrolled) logging and deforestation, critical catchment (all provinces) Inter-community conflicts (indigenous people and recent incomers) Deteriorated irrigation and swamp schemes due to poor maintenance (all provinces) Poor water supply and sanitation coverage (well behind the MDG targets)
Sulawesi	23	<ul style="list-style-type: none"> Deteriorated irrigation and drainage infrastructure (all provinces) Severe water stress condition, increasing water conflicts (South Sulawesi) Flooding (all provinces)
Nusa Tenggara and Bali	9	<ul style="list-style-type: none"> Deforestation of catchment (all provinces) Deteriorated irrigation and swamp infrastructure (all provinces) Severe water stress condition, increasing water conflicts (West Nusa Tenggara, Bali) Poor water supply and sanitation coverage (well behind the MDG targets)
Maluku and Papua	12	<ul style="list-style-type: none"> Deteriorated irrigation infrastructure (all provinces)

Source: Indonesia's Water Sector Profile (Draft), BAPPENAS, 2008

(3) Complicated Issues to be highlighted

It should be emphasized that solutions for the following serious issues of the current RPJM 2005-2009 should be highlighted to formulate the next RPJM:

- i) Worsening watershed (water resources) deterioration mainly in Java, Sumatra, Kalimantan, Sulawesi, and Nusa Tenggara
- ii) Progressing environmental degradation (seriously polluted rivers in Java)
- iii) Serious dilapidation of existing water resources infrastructure (mainly irrigation facilities all over Indonesia)

Watershed degradation is progressing due to illegal and uncontrolled loggings, attributed to poverty and subsistence agriculture. This resulted in increased occurrences of soil erosions and decreased water holding capacity of the upper catchment area. As a consequence, the following issues are highlighted: i) increase of reservoir sedimentation, ii) decrease of water supply capacity, iii) increase of flood peak, iv) decrease of drought discharge and its prolonged duration, etc. Watershed deterioration is a complicated issue that requires inter-sectoral and inter-regional approach to determine solutions. This issue could not be resolved by MPW alone, the leading agency on water resources infrastructure development. It is, therefore, recommended to emphasize in the "Policy Direction" and "Strategy" that a socially-complicated issue such as watershed deterioration shall be resolved through the coordinated implementation of related ministries and regional governments, with the provision of top-level coordination of policies and strategies in the water resources sector.

In many urban areas in Java, the aquatic environment has deteriorated due to over-exploitation of water resources and their contamination. This is due to domestic, municipal, agricultural and industrial

wastes, which are often discharged without proper treatment. This is also due to the exceeding capacity of self-purification of rivers which also occur frequently. All these are effects of population growth and concentration, urbanization and industrialization. As a result, many urban rivers and aquifers have lost their potentials as sources of water with adequate quality for various uses, consequently causing water conflicts on water stress situation. Besides more strict water quality management and pollution control, education and empowerment of inhabitants is necessary to make them understand that care and attention to the water environment is everyone's responsibility. The solution for the environmental degradation issue also requires the same coordinated implementation approaches applied to watershed deterioration issue.

Serious dilapidation of existing water resources infrastructure (mainly irrigation facilities) is a national concern due mainly to poor budget for O&M. Damaged facilities exist and have not been rehabilitated, repaired or replaced. This is likely to cause significant adverse effects in view of water resources management, namely: i) shortened lifetime of facilities, ii) reduction of water supply capacity, iii) insufficient (non-optimal) water use, and iv) water conflicts among water users. All the existing water resources infrastructures, as public utilities, are supposed to support human lives and economic activities. Thus, continuous management for these facilities is indispensable to serve their function as important water source/water distribution facilities as well as flood mitigation for a wide range of beneficiaries.

(4) Flood Control and Mitigation

Flooding event occurs regularly throughout Indonesia. Figure 4.4.3 shows the distribution of events of natural disasters in 2002-2004 in the country. As highlighted in Figure 4.4.3, a flood event has the largest and greatest impact on life and property amongst natural disasters. Out of 1,155 events in total, the number of flood events was 408 in three years from 2002 to 2004. Flooding damages are particularly serious in major urban cities.

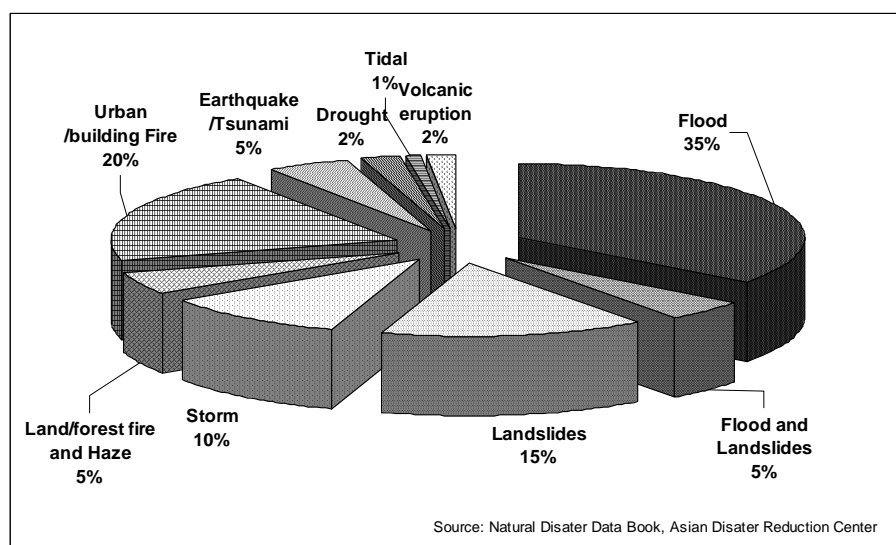
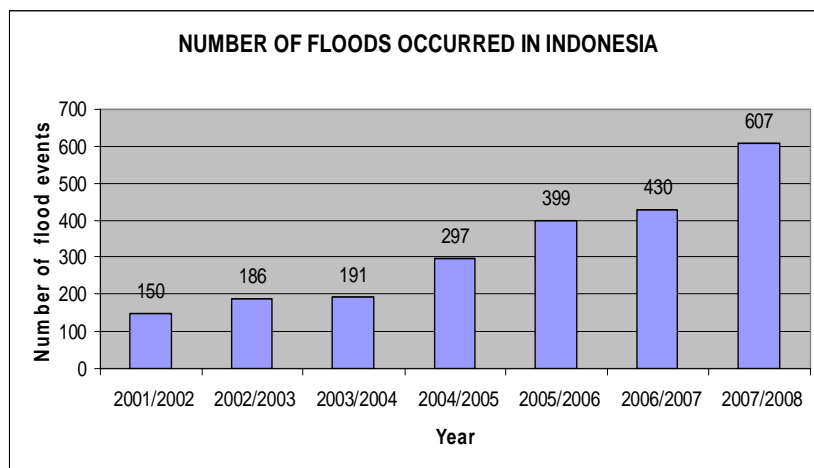


Figure 4.4.3 Distribution of Natural Disaster Events in Indonesia in 2002-2004

As shown in Figure 4.4.4 below, the number of flood events in Indonesia has been increasing every year. Flooding events might be increasing as a result of climate change but these are also due to urbanization in major cities. Particularly, serious flooding was experienced in Jakarta continuously in both January and February 2002 within living memory, where more than 300,000 people had to be evacuated from deeply submerged low-lying areas of Jakarta. Furthermore, similar serious widespread flooding occurred over Central Java in December 2007. These serious flooding events highlighted the slowness of progress on the planned flood control measures.



Source: Water Resources Policy and Strategy on Adaptation to Climate Change, DGWR, MPW, January 2009

Figure 4.4.4 Number of Flood Events in Recent Years in Indonesia

Flood control works have been implemented in the current RPJM 2004-2009 showing some progress; e.g. installation of 10 FFWS systems and a 978-km long river improvement for protecting 15,650 ha of flood prone areas from 10-year floods. In Java and Sumatra, large areas of floodplains have been protected by dikes. However, they are prone to occasional overtopping and breaching as a consequence of unpredictable extraordinary floods. It might be concluded that the current flood control and mitigation measures being implemented are still below satisfactory level, requiring flood management approach with combined use of structural (flood control infrastructure) and non-structural flood prevention measures. The flood management approach aims at reducing/minimizing economic and social losses from floods. Conceivable non-structural measures are:

- i) Early alert system such as FFWS with provision of improved communication and dissemination system and community awareness programs;
- ii) Emergency flood shelters and evacuation buildings;
- iii) Flood hazard mapping and risk mapping with evacuation system;
- iv) Conservation of water resources by increasing the water holding capacity in upper basin (soil and water conservation by watershed conservation); and
- v) Conservation of wetlands and low-lying areas as temporary flood storage areas (flood retarding areas).

The following conventional flood and disaster control works (structural measures) shall also be continued and further strengthened:

- i) Development of flood and sediment/mud control facilities;
- ii) Rehabilitation of flood and sediment/mud control facilities; and
- iii) O&M of flood and sediment/mud control facilities.

(5) Coastal Protection

Indonesia is the largest archipelagic country in the world, covering 8 million km² of the earth's surface with a total land area of around 2 million km². The coastline runs 81,000 km with around 17,508 islands within the archipelago. It was reported¹ that in 1997, about 2 million people live in coastal areas with elevation of between 0 and 2 m above sea level. Many industries also operate in these coastal areas such as oil and gas exploration, transportation, fisheries (approximately 400,000 ha ponds), settlements, agriculture and tourism. These economic activities contribute to about 25% of GDP and absorb about 15% of employment.

Coastal abrasion has threatened the productive lands and tourist areas. Coastal abrasion in various border regions might result in the shifting of territorial border lines. The government recognizes that safeguarding of coastal lines has strategic importance to guard the territorial integrity of NKRI (Unity State of the Republic of Indonesia) and EEZ (Exclusive Economic Zone, totally 1.9 million km²) of Indonesia. More than 30,000 km of coastline has been damaged due to abrasion. This corresponds to around 37% of the national coastline. Although no precise data and information are available at this moment, progressing degradation of coastal areas is evident in the form of:

- i) Loss of mangrove forests;
- ii) Destruction of coral reefs;
- iii) Depletion of fish stocks; and
- iv) Shoreline erosion and regression of seashore.

The target length for coastal protection works in the current RPJM 2005-2009 was 250 km. However, the estimated achievement by 2009 would only be 156 km. The allocated budget thereof was only around 5% of the total budget of DGWR in 2006-2009. It was reported that the total assets of the existing coastal protection facilities in Indonesia as of 2002 were 8,000 m long jetties, 15,000 m long coastal protections and 24,000m long wave breakers².

The rapid loss of mangrove cover and coral reefs would result to accelerated shoreline erosion, more saline-water intrusion into freshwater aquifers, and loss of key fish and prawn nursery sites. Furthermore, due to climate changes, an increase in sea level would result in devastating impact to the coastal areas on socio-economic activities and sustainable development. In this respect, increasing the

¹ Summary for Policymakers, Climate Variability and Climate Changes, and Their Implication in Indonesia (2007), Ministry of Environment and Ministry of Public Works

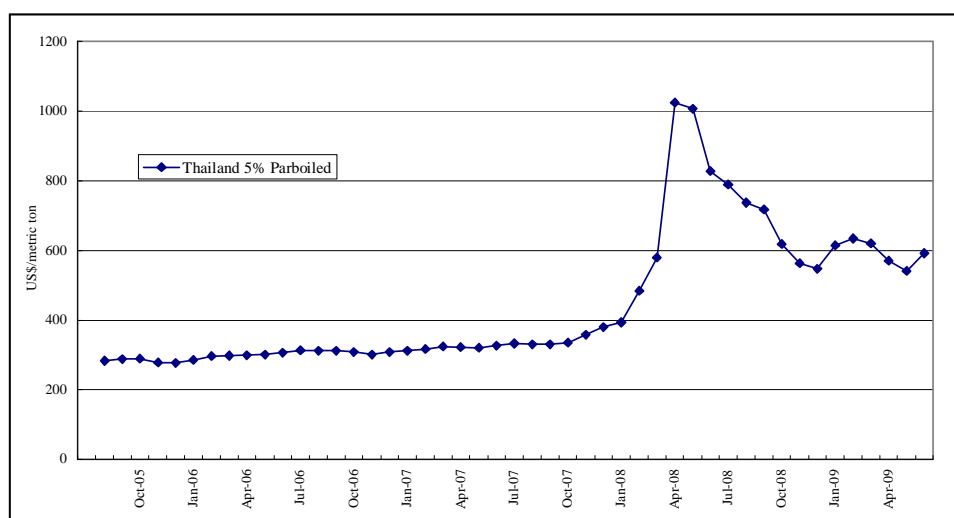
² Proceeding of Workshop on Asset Management for Hydraulic Infrastructure, 2002, DPU and BAPPENAS

budget for coastal protection and rehabilitation works should be addressed as one of the key remaining issues for the next RPJM 2010-2014.

(6) Remaining Issues in the Irrigation Sector

1) Trend of International Rice Price and Realization of Food Security in Indonesia

In 2008, due to the increased production of bio-ethanol using food grain (e.g. maize) in the world and the tremendous forward buying of rice in the international market, the price of rice rapidly increased. The following graph presents the price fluctuation of rice at the Thailand international market, which reached to US\$1,000/t in April 2008 from US\$300 /t in 2007. At present, although the price slightly declined, it is still considered to be at a high level (US\$600/t).



Source: Rice Outlook Report, 2009, United States Department of Agriculture (USDA)

Figure 4.4.5 International Price of Rice

Consequently, it was reported that in the Philippines, the largest rice importing country, its government encountered difficulties in acquiring the required amount of rice. It was also reported that some of the Middle Eastern and developed countries, which rely on imported food from abroad, started to acquire land outside their boundaries for their production in order to secure future food supply. Indonesia had also imported a large amount of rice from 1995 to 2003 as shown in the following figure. However, in these several years, it was observed that the imported amount has decreased as a result of great efforts to increase paddy production.

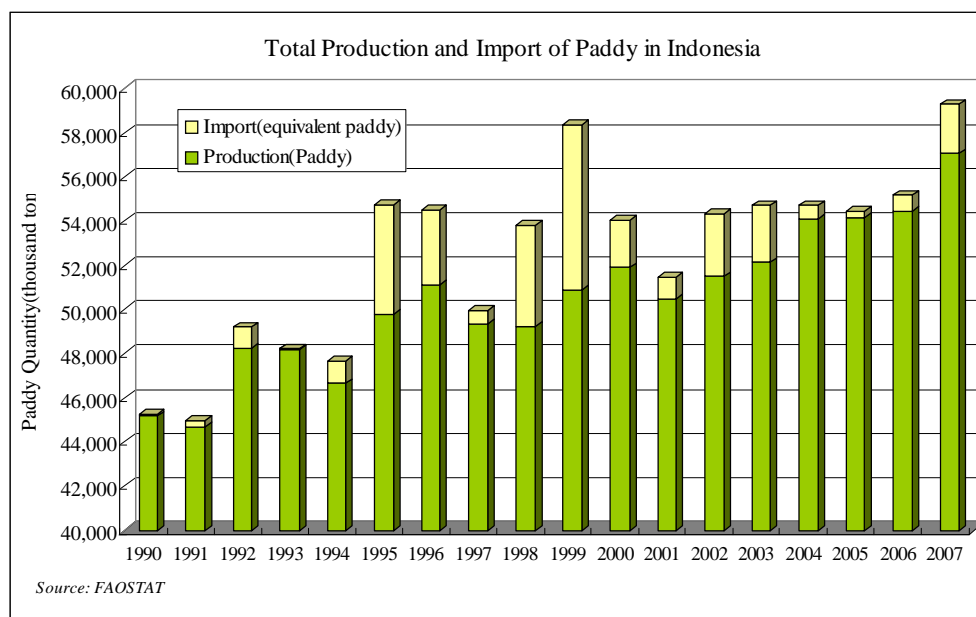


Figure 4.4.6 Paddy Production and Import Volume of Indonesia

As it is forecasted that there will be a risk of food shortage all over the world in the future, increase and stabilization of paddy production as a main food crop should be given high priority to ensure safety, security and peace in the country. Under this circumstance, irrigation infrastructure development is required to be planned based on the projection of the future food balance in Indonesia, in cooperation with its related ministries.

2) Reduction of Irrigation Paddy Fields due to Conversion of Lands into Urban and Industrial Areas

One of the highlighted issues to be given high priority is the reduction of irrigation paddy fields, especially in Java, due to conversion of lands into urban and industrial areas. Although it was also noted as a key issue in the current RPJM 2004-2009, reduction of irrigable lands is continuing, according to the statistical data of BPS as shown in the following table.

Table 4.4.4 Area of Irrigation Paddy Field and Non Irrigation Paddy Field by Island

(Unit : 1,000 ha)

Island	Category	Unit	2000	2001	2002	2003	2005	2007	Change since 2000	Average per year
Java-Bali	Irrigation	1,000 ha	2,668	2,659	2,616	2,624	2,544	2,543	-125	-18
	Non-Irrigation	1,000 ha	762	765	783	792	771	769	7	1
	Paddy production	1,000 ton	29,947	29,102	29,417	28,961	30,551	31,306	1,359	194
Sumatra	Irrigation	1,000 ha	1,060	1,054	1,034	1,289	1,127	1,041	-19	-3
	Non-Irrigation	1,000 ha	1,052	1,044	1,070	1,182	1,213	1,165	113	16
	Paddy production	1,000 ton	11,819	11,287	11,542	12,136	12,675	13,371	1,552	222
Kalimantan	Irrigation	1,000 ha	228	245	248	253	194	186	-41	-6
	Non-Irrigation	1,000 ha	740	747	761	822	802	833	93	13
	Paddy production	1,000 ton	3,000	3,074	3,169	3,358	3,614	4,309	1,309	187
Nusa Tenggara	Irrigation	1,000 ha	252	263	269	281	273	283	31	4
	Non-Irrigation	1,000 ha	61	65	68	70	68	70	9	1
	Paddy production	1,000 ton	1,950	1,907	1,838	1,932	1,829	2,032	82	12
Sulawesi	Irrigation	1,000 ha	661	645	618	793	614	645	-17	-2
	Non-Irrigation	1,000 ha	303	292	282	294	278	275	-28	-4
	Paddy production	1,000 ton	5,065	4,983	5,438	5,602	5,301	5,924	859	123
Outer Java total ^{*1)}	Irrigation	1,000 ha	2,201	2,207	2,169	2,616	2,208	2,155	-46	-7
	Non-Irrigation	1,000 ha	2,157	2,148	2,181	2,368	2,362	2,344	187	27
	Paddy production	1,000 ton	21,834	21,251	21,987	23,028	23,419	25,636	3,802	543
Indonesia Total ^{*1)}	Irrigation	1,000 ha	4,869	4,867	4,785	5,240	4,753	4,698	-171	-24
	Non-Irrigation	1,000 ha	2,919	2,913	2,964	3,160	3,133	3,113	194	28
	Paddy production	1,000 ton	51,781	50,353	51,404	51,989	53,970	56,942	5,161	737

Note: ^{*1)} Maluku and Papua are not included due to insufficient data

Source: Area of Irrigation and Non Irrigation Paddy Field: Agricultural Survey, Land Area by Utilization in Indonesia, BPS

Paddy production: Statistical year book, BPS

The productivity of paddy in Java-Bali is higher than those in outer Java. The proportion of irrigated paddy fields is 77%, which is higher than those in outer Java (48%). The yield of paddy and cropping intensity are also at high levels, considering that farmers have extensive experience in paddy cultivation. Hence, Java is the main area for paddy production in the country. This means that reducing the paddy fields in Java will cause considerable impact in paddy production at the national level. The following table summarizes the paddy production, harvested area, yield, cropping intensity, and annual production per wetland, by island. Based on the difference of the production per wetland area, reduction of 1 ha of paddy field in Java will require an increase of around 1.7 ha (9.45/5.66) of paddy field in outer Java, to maintain the same amount of production.

Table 4.4.5 Paddy Production and Yield by Island of 2007

Island	Paddy production	Harvested area	Average yield	Wetland area	Average cropping intensity	Production per area of wetland
	(1,000 ton)	(1,000 ha)	(ton/ha)	(ha)	(%)	(ton/ha)
	a	b	a/b	c	b/c x 100	a/c
Java & Bali	31,306	5,816	5.38	3,312	176%	9.45
Outer Java total	25,851	6,332	4.08	4,570	139%	5.66
Sumatra	13,371	3,181	4.20	2,206	144%	6.06
Kalimantan	4,309	1,291	3.34	1,020	127%	4.23
Nusa Tenggara	2,032	499	4.07	353	141%	5.75
Sulawesi	5,924	1,300	4.56	920	141%	6.44
Maluku & Papua	216	61	3.52	71	86%	3.02
Indonesia Total	57,157	12,148	4.71	7,883	154%	7.25

Source: Statistical Year Book 2007, BPS

In case that decrease of paddy field in Java-Bali will continue at the rate of 18,000 ha (irrigated and non-irrigated paddy field) every year as presented in Table 4.4.4, production of

170 thousand ton of paddy will consequently decrease every year. This implies that an increase of around 30,000 ha of paddy field in outer Java might be required annually in order to supplement the corresponding decrease of paddy production in Java-Bali. In terms of national food security, it is vital to increase paddy production and harvested area to meet the demands of population growth. However, considering the accelerated national economic growth, expansion of urban and industrial areas in Java which cannot be restricted, the following measures are recommended:

- i) It is essential to specify highly productive areas and strategically important agricultural areas in the spatial plan. Formulation of law or regulation is also necessary to avoid uncontrolled development of urban and industrial areas. Hence, the government plays the role of regulating the conversion of productive agricultural lands.
- ii) To meet the increase in future food demands, required irrigation system for increasing the harvested area will have to be developed and extended outside of Java.
- iii) It is evident that land conversion has occurred since the land value became higher than that of agricultural production. Therefore, cultivation of high-value crops in suburban areas should be promoted.

3) Non-optimal use of existing irrigation facilities

The issue related to non-optimization of irrigation facilities was also raised in the current RPJM 2004-2009. However, it remains unresolved and should still be considered in the next RPJM. According to the data and reports from DGWR, MPW, out of the scheduled irrigation area (7.47 million ha), 0.24 million ha (3%) of irrigation scheme has not been completed, while 1.8 million ha (24%) is not functioning well. However, these estimated areas were not based on detailed survey, and are still unclear at present. Thus, MPW plans to initiate an inventory survey in 2009 to obtain more realistic figures.

As one of the methods in measuring the functionality of the existing irrigation schemes, the following table presents the comparison of scheduled irrigation areas from MPW, and irrigation areas from the BPS data.

Table 4.4.6 Comparison of Planned Irrigation Area and Irrigation Area from BPS Statistical Data (2007)

Island	Irrigation Area (Planned) (1,000ha)	Irrigation Area (from BPS data) (1,000ha)	Projected Ratio of Functionality of Irrigation Scheme
Java & Bali	3,300	2,543	77%
Outer Java total	4,169	2,218	53%
Sumatra	1,989	1,041	52%
Kalimantan	480	186	39%
Nusa Tenggara	486	283	58%
Sulawesi	1,022	645	63%
Maluku & Papua	192	62	32%
Indonesia Total	7,470	4,760	64%

Source: 1) Planned irrigation area: Ministry of Public Works, DGWR (2007)

2): Irrigation Area: Statistical Year Book (2007), BPS

According to the above information, about 36% of the area is not functioning well. The following are the main reasons for the reduced irrigation functionalities:

- i) Insufficient and improper O&M
 - Reduction of canal flow capacity due to sedimentation and erosion of canal slope, especially main canal
 - Difficulty of proper water management due to deterioration of gates and structures
- ii) Improper water management
 - Shortage of water in downstream area due to water overuse in the upstream area, caused by improper water management
- iii) Deterioration of facilities due to aging
 - Deterioration of facilities exceeding the durability period resulting in extensive maintenance works
- iv) Limited water source for irrigation in river
 - Shortage of water resource for irrigation due to the deterioration of upstream watershed and increase of domestic, municipal, and industry (DMI) water demand

Since the reasons for lowering the facilities' functionalities and the degree of deterioration vary for each irrigation system, it is urgently required to collect actual information from the field and to establish a relevant database. Based on the collected actual information, it becomes possible to formulate a more effective and efficient rehabilitation program through the application of asset management, in terms of reducing life cycle costs.

As described above, the recommended actions for the improvement of utilization of the existing irrigation systems are summarized below:

- i) Implementation of inventory survey of irrigation facilities and performance.
 - Type and quantity of facilities
 - Functionality of facilities and performance of irrigation system
 - Identification of main reasons for decreased functionality
 - Establishment of database
- ii) Formulation of rehabilitation program and prioritization of system to be rehabilitated, reflecting the asset management concept
- iii) Implementation of rehabilitation of irrigation system.

4) Strengthening of institutions for O&M

As described in Item (3) of Sub-section 4.4.2, the government regulation on irrigation defines the demarcations of roles of each stakeholder, as summarized below:

Table 4.4.7 Responsibility of Management of Irrigation System

Category	No. of Irrigation System in 2008	Total Irrigation Area (1,000ha)	Main & secondary canal and facilities		Tertiary canal and facilities	
			Fund	Responsible office	Fund	Responsible
More than 3,000 ha or crossing provincial boundary	241 (1%)	2,851 (38%)	Central government	Balai / Balai Besar	WUA	WUA
1,000ha to 3,000 ha or crossing district boundary	1,109 (3%)	1,423 (19%)	Provincial government	Dinas Province	WUA	WUA
Less than 1,000 ha	31,860 (96%)	3,196 (43%)	Kabupaten	Dinas Kabupaten	WUA	WUA
Total	33,210 (100%)	7,470 (100%)				

Source: Government Regulation of the Republic of Indonesia No.20/2006 regarding irrigation

No. of irrigation system and irrigation area: Ministry of Public Works, DGWR, 2008

A series of guidelines was also prepared in 2007 to fully implement the government regulation,. However, it is still observed that there are problems to be addressed, as listed below:

- 1) Weak capacity of government staff both in provincial government and Kabupaten and WUAs on O&M for irrigation facilities;
- 2) The roles and responsibilities under the new regulations are not fully understood by the O&M staff of government, O&M institutions, and WUAs staff; and
- 3) Monitoring and evaluation system on O&M performance is not established.

Since the institutional framework on the management of irrigation schemes is new, the actual implementation at the operational level seems to still be in the transition stage. For instance, an irrigation system serving more than 3,000 ha area should be managed by Balai office. However, regular O&M works in some systems were designated to either Dinas Province or Dinas Kabupaten, since the areas of responsibility of Balai office related to all irrigation systems are too large to manage, considering its limited staff. In addition, with a restricted budget, it seems the office had difficulties in implementing proper O&M. Participatory works by WUA have also met many challenges. According to the regulation, development of tertiary canals became the WUA's responsibilities. However, in some cases, the construction and management of tertiary canals were not completely implemented due to lack of funds and capacity. Hence, irrigation performance was not achieved as expected. As it is still in the transition period, a new institutional framework consisting of new laws, regulations, and guidelines should be transferred to local government staff through seminars or workshops. An appropriate O&M organization should be established at the operations level. Continuous capacity-building for local government staff and WUAs following the guidelines is also necessary to be executed. After implementation at the operational level, review of such guidelines and obtaining feedback are also required in order to further improve the institutional framework.

It is also recommended that the relevant office on O&M issues at the central government should monitor and evaluate the annual O&M performance of every irrigation scheme, using performance indicators such as actual irrigated area against planned irrigation area or cropping intensity. Regular site inspection on evaluation of O&M performance is also effective to observe site condition and collect reliable information.

5) Reduction of Economic Gap and Increase Farmer's Income

The following figure shows the comparison of GRDP per capita by island. It reveals that the GRDPs of Eastern Indonesia regions such as Nusa Tenggara and Sulawesi are relatively lower than the others.

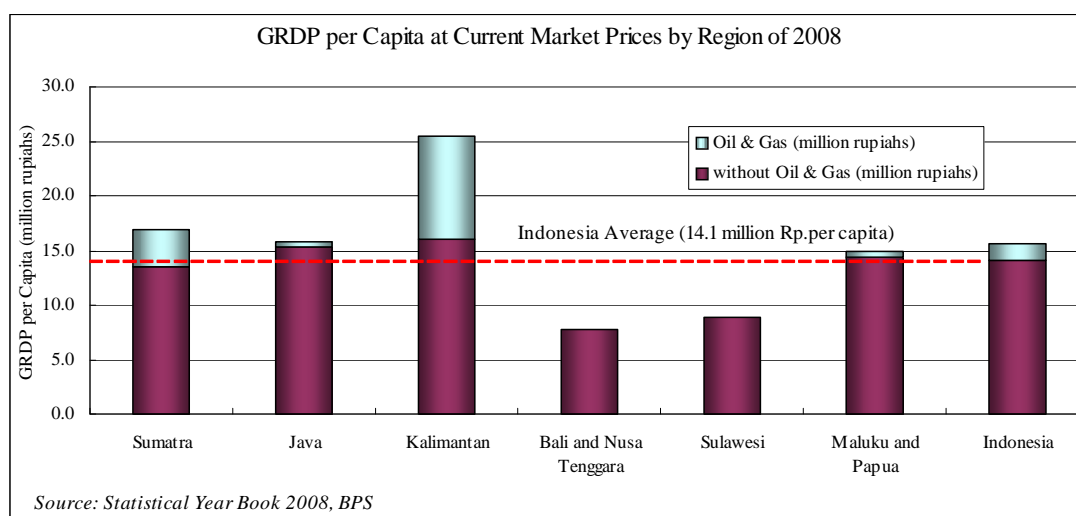
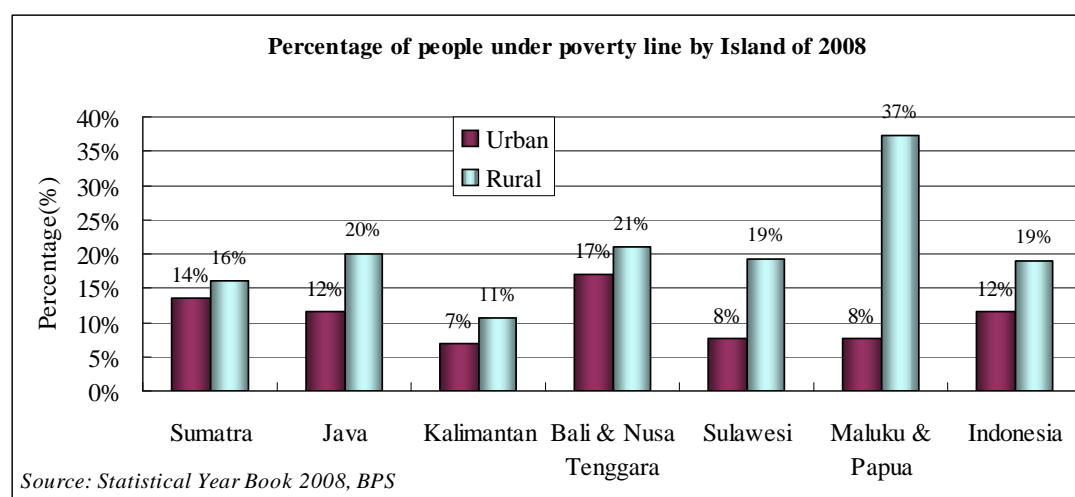


Figure 4.4.7 GRDP per Capita at Current Market Prices by Island (2008)

The economic gap between urban and rural areas is also determined. The following figure shows the percentage of people under poverty line by island (2008).



Note: Poverty line in urban area is set at 204,896 rupiahs and the one in rural area is set at 161,831 rupiahs.

Figure 4.4.8 Percentage of People under Poverty Line by Island (2008)

Figure 4.4.8 shows that in Java and Sulawesi, the percentage in the rural area is almost double that in the urban areas. A high priority issue in Indonesia is the achievement of sustainable economic growth, driven by private investment. However, rapid development sustained by private sector is concentrated only in the urban areas. This has increased the economic gap between the urban and the rural areas. This situation could cause unstable livelihood, concentration of population in the urban areas, and expansion of slum areas as revealed from the experience of BRICs countries. Agriculture is the main economic activity in most rural areas. Hence, provision or rehabilitation of irrigation infrastructures to increase paddy production will contribute to regional economic development. According to the JICA Study Report “The Study on Comprehensive Recovery Program of Irrigation Agriculture (2004)”, incremental net profit was estimated at US\$350/ha in average through increase of paddy production as a result of the rehabilitation of the existing irrigation scheme. Therefore, the immediate implementation of irrigation development is highly required to increase farmer’s income and contribute to poverty reduction.

6) Countermeasure for Water Conflict and Adaptation to Climate Change

(a) Countermeasure for Water Conflict

The agriculture sector is the dominant user of water (86% of the total demand). In Indonesia, there is an imbalance between demand and supply in terms of place and time. According to the analysis of availability and demand balance in the dry season, Java-Bali and Nusa Tenggara experience deficiency due to high demand and limited water resources, as shown in the following table:

Table 4.4.8 Water Balance During Dry Season Year 2003 and 2020

Island	Availability (x10 ⁹ m ³)	Demand (x10 ⁹ m ³)			
		2003	Balance	2020	Balance
Sumatra	96.2	11.6	Surplus	13.3	Surplus
Java-Bali	25.3	38.4	Deficit	44.1	Deficit
Kalimantan	167	2.9	Surplus	3.5	Surplus
Nusa Tenggara	4.2	4.3	Deficit	4.7	Deficit
Sulawesi	14.4	9	Surplus	9.7	Surplus
Maluku	12.4	0.1	Surplus	0.1	Surplus
Papua	163.6	0.1	Surplus	0.2	Surplus

Source: Sub-Directorate of Hydrology, Ministry of Public Work (2003).

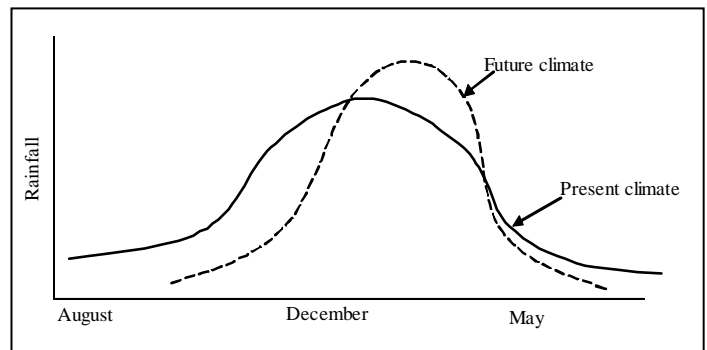
It is expected that water demand for DMI in Java and Bali will continue to increase, thus, the following countermeasures are recommended:

- i) Modernization of irrigation facility to conserve water
 - Extension of concrete lining and improvement of irrigation facility to reduce conveyance loss
 - Installation of remote gate control system for integrated water management to minimize water management loss

- ii) Application of monitoring and evaluation system of water management to reduce water conveyance losses in the canal system
- iii) Construction and rehabilitation of reservoir (embung) to increase water storage capacity.

(b) Adaptation to Climate Change

The increase in temperature and change of rainfall pattern are observed to be the effects of climate change. Reports estimated that the rainfall pattern would change in terms of shifting of the rainy periods and more intense rainfall intensity, as shown in Figure 4.4.9. This phenomenon is expected to cause serious drought in the future. For agriculture production, the following scenarios may consequently occur:



Source: Climate Variability and Climate Change, and their Implication in Indonesia, Ministry of Environment and Ministry of Public Works, 2007

Figure 4.4.9 Projected Rainfall Pattern in Indonesia

- i) Decrease of yield in rainfed paddy field during rainy season;
- ii) Decrease of yield and harvested area in surface irrigation system during dry season; and
- iii) Decrease of yield in swampy area due to frequent flood during rainy season.

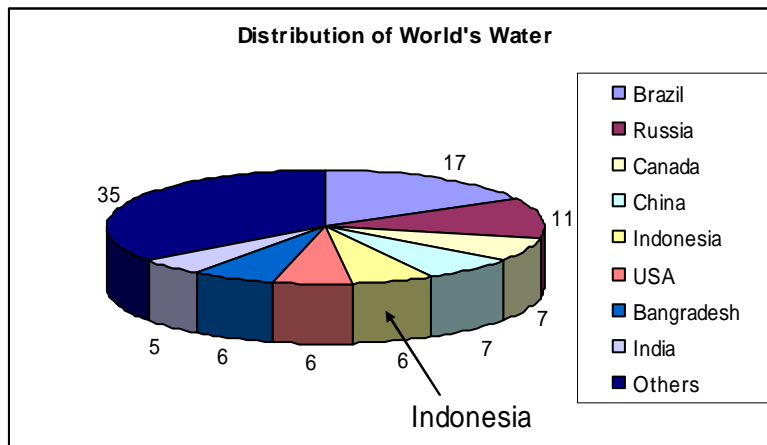
Further detailed research and study are recommended to determine the change in rainfall pattern and its effects to agriculture production. At present, the following countermeasures are recommended.

- i) Extension of irrigation facilities to rainfed paddy field;
- ii) Construction of water storage facilities to be utilized for dry season irrigation; and
- iii) Construction of drainage canals, installation of drain pumps and construction of banks as protection from flooding.

4.4.4 Action Plan to Address the Issues

(1) Competitiveness of Indonesia's Water Resources Infrastructure

Figure 4.4.10 shows the distribution of the world's fresh water resources, with Indonesia ranking 5th in the distribution. Indonesia is thus rich in water resources in terms of availability. However, the water resources infrastructure development in Indonesia is still below satisfactory level due to uneven distribution of precipitation and water resources, and its monsoon climate wherein the wet season brings severe floods while the dry season causes water shortage. This has caused various water-related problems as discussed in Sub-section 4.4.3 above.



Source: Dams and Development, World Commission on Dams, 2000

Figure 4.4.10 Distribution of the World's Water

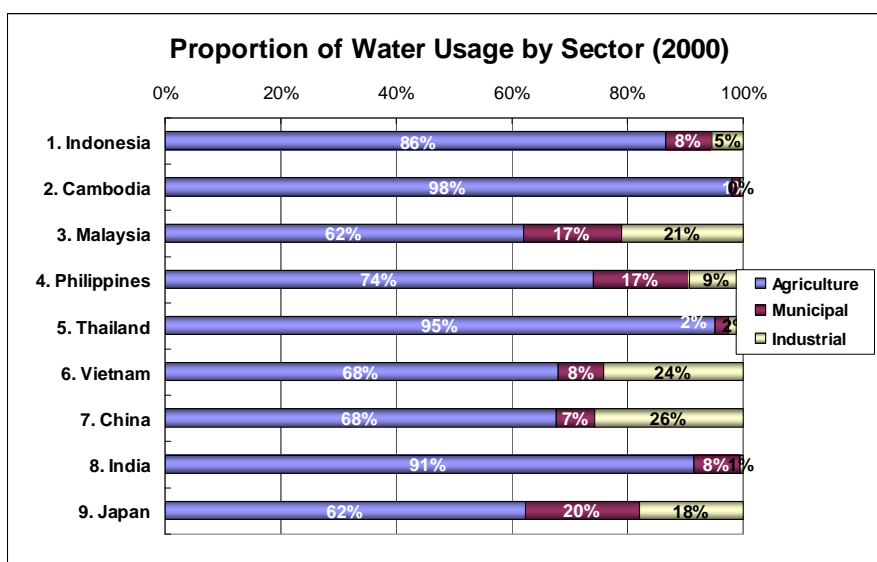
The objective of this sub-section is to evaluate the current status of water resources infrastructure development in Indonesia. Several relevant indicators are compared to those with other countries in order to evaluate the country's performance on water resources infrastructure development. The countries considered are the ASEAN members including Cambodia, Malaysia, the Philippines, Thailand and Viet Nam, and BRICs members such as China and India. The adopted performance indicators are as follows:

- i) Proportion of water usage by sector as of 2000;
- ii) Available annual water resources per capita as of 2007;
- iii) Freshwater withdrawal ratio as of 2002;
- iv) Dam storage capacity per capita as of 1995;
- v) No. of large dams (higher than 15 m as of 1998;
- vi) Large dam density (No. of large dams per 1,000 km²) as of 1998; and
- vii) Large dam density (No. of large dams per million persons) as of 1998

In this performance comparison, it should be noted that:

- The proportion of water usage by sector is only for comparison purposes without any ranking sequence;
- Available annual water resource is defined as the internal renewable water resources, comprising long-term average annual flow of rivers and recharge of aquifers generated from precipitation; and
- Freshwater withdrawal is the sum of surface water withdrawal and groundwater withdrawal. Freshwater withdrawal ratio is determined from the freshwater withdrawal divided by the internal renewable water resource.

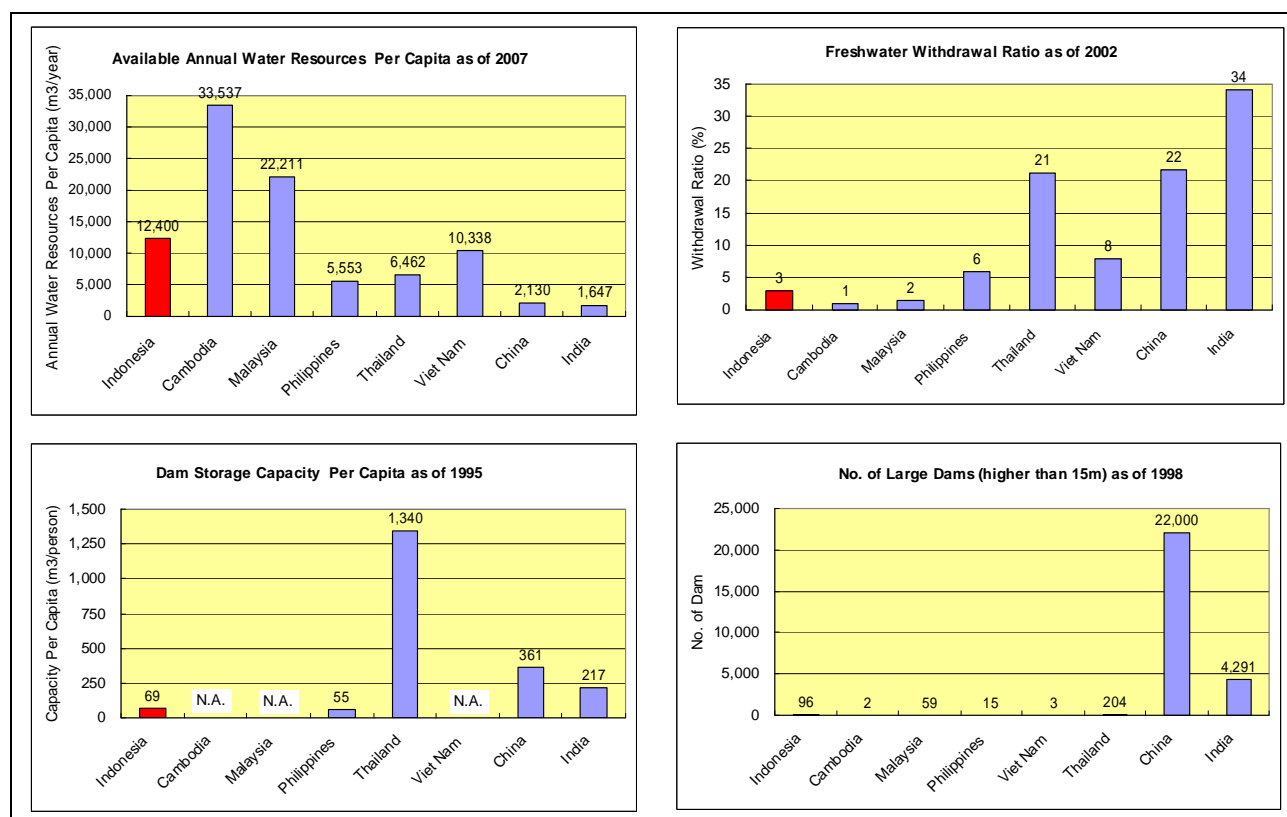
Figure 4.4.11 presents the comparison of water use ratios by sector. Agriculture is the dominant sector in all the selected countries. It should be noted that the water use ratio of agricultural sector in Indonesia is 86%.

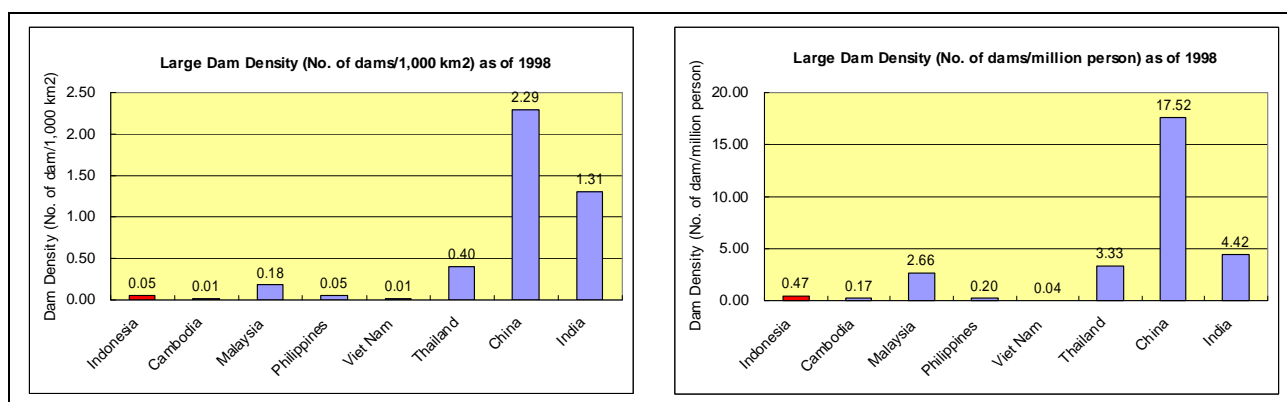


Source: AQUASTAT, FAO

Figure 4.4.11 Comparison of Proportion of Water Usage by Sector

The results of the analysis of competitiveness of Indonesia are graphically shown in Figure 4.4.12 and summarized in Table 4.4.9.





Source: AQUASTAT, FAO and ICOLD

Figure 4.4.12 Comparison of Competitiveness of Indonesia by Several Indicators

Table 4.4.9 Summary of Indonesia's Performance on Water Resources Sector

Indicator	Indonesia	Ranking
i) Available annual water resources per capita	12,400 m ³ /year	3 out of 8
ii) Freshwater withdrawal ratio	3 %	6 out of 8
iii) Dam storage capacity per capita	69 m ³ /person	4 out of 5
iv) No. of large dams (higher than 15 m)	96 dams	4 out of 8
v) Large dam density (No. of large dams per 1,000 km ²)	0.05 dams/1,000 km ²	5 out of 8
vi) Large dam density (No. of large dams per million persons)	0.47 dams/million person	5 out of 8

Source: AQUASTAT, FAO and ICOLD

The major findings and comments of the Study Team are as follows:

- As a whole, Indonesia is abundant in water resources. Since Indonesia has the largest population among ASEAN countries, its available annual water resources per capita is only around 12,400 m³/year as of 2002. This is lower if compared with those of Cambodia and Malaysia, with 33,537 m³/year and 22,211 m³/year, respectively. Furthermore, the water resources potential per capita varies from island to island due to uneven population distribution and climate conditions. It becomes less than 2,000 m³/year in Java Island, while it is more than 282,000 m³/year in Papua. It is readily conceivable that the highly populated Java Island is likely to become critical from the viewpoint of water demand and supply balance due to industrialization and urbanization.
- The freshwater withdrawal ratio in Indonesia is as small as 3%. The ratio in Thailand, which is ahead of Indonesia in terms of upper middle income population, is as large as 21%. This low ratio comes from the fact that the developed dam storage capacity per capita in Thailand of 1,340 m³/person is considerably higher than the 69 m³/person in Indonesia.
- Large dams have played a key role in water resources development and management for the people. Although there are 117 large dams (more than 15m high) in Indonesia as of 2004, indicators of dam densities in terms of area and population are 0.05 dams/1,000 km² and 0.47 dams/million persons. These values are far smaller compared

with those in Malaysia (0.18 dams/1,000 km² and 2.66 dams/million persons) and Thailand (0.40 dams/1,000 km² and 3.33 dams/million persons). It should be noted that both indicators in Indonesia are almost seven to eight times less than those in Thailand.

- iv) It is said that water resources infrastructure is considered as a platform for economic growth. Considering that Indonesia is still below satisfactory level in terms of current status of infrastructure among ASEAN countries, accelerated water resources infrastructure development should be done immediately in many areas of the country.

(2) Regional Policy Direction for Water Resources Infrastructure Development

Water-related issues differ for every locality because of uneven distribution of population, varying climate conditions and different land and water uses as discussed in Sub-section 4.4.3. The current RPJM 2005-2009 does not state regional policy directions and strategies for water resources infrastructure development for a particular island or regency. Therefore, setting the policy direction and strategies for water resources infrastructure development and management based on particular regional issues is recommended for consideration in the subsequent RPJM 2010-2014. Table 4.4.10 presents the recommended regional policy direction by island.

Table 4.4.10 Proposed Regional Policy Direction

Island	Regional Policy Direction for Infrastructure Development
Sumatra	<ul style="list-style-type: none"> Water resources protection (watershed management) Rehabilitation of deteriorated irrigation facilities (Efficient irrigation O&M program) Water allocation and conflict resolution in urban areas Flood management in view of adaptation of climate change
Java	<ul style="list-style-type: none"> Water resources protection (watershed management) Wastewater control and water quality management Strengthening of integrated water resources management (IWRM) by Balai Besar Rehabilitation of deteriorated irrigation facilities as well as other water resources infrastructure Flood management in view of adaptation of climate change Institutional strengthening of river basin management organizations
Kalimantan	<ul style="list-style-type: none"> Water resources protection (watershed management) Rehabilitation of deteriorated irrigation facilities (Efficient irrigation O&M program) Provision of affordable access to water in remote areas (MDG targets)
Sulawesi	<ul style="list-style-type: none"> Rehabilitation of deteriorated irrigation facilities (Efficient irrigation O&M program) Strengthening of integrated water resources management (IWRM) for water stress basins Flood management in view of adaptation of climate change
Nusa Tenggara and Bali	<ul style="list-style-type: none"> Water resources protection (watershed management) Rehabilitation of deteriorated irrigation facilities (Efficient irrigation O&M program) Water resources development with the focus on increasing of water storage Raw water supply to remote areas
Maluku and Papua	<ul style="list-style-type: none"> Rehabilitation of deteriorated irrigation facilities (Efficient irrigation O&M program)

Source: JICA Study Team

(3) Budget Allocation for More Sufficient O&M

Table 4.4.11 presents the actual allocated budget for O&M activities in 2007 for DGWR of MPW. As shown, the total allocated budget for all the activities of DGWR in 2007 was around Rp 7.86 trillion, while the allocated budget for O&M activities was around Rp 0.96 trillion, representing only 12.2% of the total budget. Considering the fact that serious deterioration of the existing water resources

infrastructures is a nationwide issue, the allocated budget for O&M activities seems insufficient. This can be attributed mainly to limited potential of human resources or budgetary constraints.

Table 4.4.11 Allocated O&M Budget of DGWR, MPW in 2007

No.	Program	Activities	Target			Actual	Budget ('000Rp)
1	Development and management of	O&M of irrigation network		1,895,253	ha	1,954,802	242,930,047
2	irrigation network, swamp and others	O&M of swamp irrigation network		403,940	ha	459,541	57,939,843
3	Development, conservation and management of rivers and other water sources	Optimum functioning of lake, reservoir, situ, and embung	Lake	12	nos	47	5,759,615
			Reservoir	29	nos		11,409,308
			Situ	19	nos	179	14,310,560
			Embung	54	nos		11,819,735
			Pos AWLR	200	nos	43	99,131,333
4	Flood control and coastal security	O&M of river		439	km	138	518,144,627
Total							961,445,068

Source: Director of Development Finance Allocation, BAPPENAS

All river and irrigation infrastructures are indispensable to ensure sustainable water supply for specific water users such as PDAM, DMI and farmers. Thus, higher priority of O&M should be given to these facilities. Generally, maintenance aims at rehabilitating the function of water-related facilities due to detected fatigue, deteriorated components and mechanical problems. In general, O&M cost consists of: i) operating costs, ii) maintenance costs, and iii) direct personnel costs.

Although the available data on actual O&M funding is very limited, Table 4.4.12 shows an experience of O&M funding of several projects in Canada. It is however unknown whether the percentage of O&M includes direct personnel cost or not. It is reasonably assumed that the required cost for O&M varies in the type of structure.

Table 4.4.12 O&M Funding in Canada

Agency	Percentage of Current Assets
Department of Regional Economic Expansion, Saskatchewan PFRA Canada	O&M Percentages *
	Roads 3%
	Bridges 1%
	Embankments 0.5%
	Outlet Works 1.0%
	Spillway 0.5%
	Canals 1.5%
	Pump Houses 1.0%
	Pumps 2.0%
Publication "Water Resources Development-Planning, Engineering, and Economics" By Professor Edward Kuiper 1965-Canada	O&M Percentages
	Dam & Reservoir 0.1%
	Intakes and Outlets 1.0%
	Hydro Plants 1.0%
	Undeveloped Canals 2.0%
	Lineal Canals 1.0%
	Irrigation Works 3.0%
	Bridges (Steel & Con) 3.0%
	Bridges (Wooden) 8.0%
Some Aspects of Maintenance in Canadian Industry by Dr. George Petes, Canada	Gates 1.5%
	O&M 3.0%

Saskatchewan Water Corporation – Canada	0.01% for very large multipurpose river infrastructure (reservoir) 2.0% for moderate-sized facilities (not asset renewal)
Tennessee Valley Authority, 1993 (2 Billion US Dollars of Current Asset Value)	O&M 0.38% Asset Renewal 0.24%

Note: *) These percentages are based on the asset value at the time of construction.

Source: Canadian International Development Agency/ Republic of Indonesia, Ministry of Public Works (An Integrated Program for the Development of Operation and Maintenance for Rivers in Indonesia), Final Report, July 1993

The comparison of direct O&M cost and current asset value of PJT1 is shown below. The actual O&M cost varies from 0.20% to 0.42% of the asset value.

Table 4.4.13 Direct O&M Cost and Current Asset Value of PJT1

(Unit: Rp. million)

Year	1997	1998	1999
O&M Cost	8,665	13,782	16,056
Book Value of Total Assets of Dams and Weirs (a)	971,810	936,868	904,802
Book Value of River Facilities	1,107,265	1,076,993	1,046,722
Total Assets Value	2,079,075	2,013,861	1,951,524
Asset Value in Current Price (b)	2,079,075	6,931,325	5,268,994
Ratio (%) (=a)/(b)x100	0.42	0.20	0.30

Note: Current price of assets was derived from the asset value in 1997 minus depreciation and then adjusted by the yearly average of the Rupiah to US\$ reported by IMF: these values are Rp. 2,904.4 in 1997, Rp. 10,013.6 in 1998 and Rp. 7,855.2 in 1999.

Source: Comprehensive Development and Management Study for Bengawan Solo River Basin under Lower Solo River Improvement Project, Final Report, 2001

The required amount of O&M cost is conceived as one of the life cycle cost (LCC) of the related facilities, as shown in the equation:

$$\text{LCC} = \text{initial investment cost} + \text{O\&M cost} + \text{replacement cost and scrap value.}$$

The cost required for O&M work includes the improvement/repair cost and routine operation and maintenance work cost. Therefore, the O&M cost depends on the soundness of the facilities and/or damage conditions. As seen in the above table, the ratio of O&M cost to asset value ranges between 0.3 and 0.4. Since the economic crisis in Indonesia in 1997/8, sufficient O&M cost has not been arranged and it is supposed that damages of the facilities have been accelerated. Considering the facts above, it is recommendable that the necessary annual O&M direct costs (excluding direct personnel cost) will be twice or three times the normal ratio, or at least 1% of the current value of the assets.

The current asset value of the whole water resources infrastructure in Indonesia, estimated to be Rp. 346.5 trillion by DGWR at 2002 price level, is summarized below.

Table 4.4.14 Estimated Asset Value of Water Resources Infrastructure in Indonesia as of 2002

No.	Infrastructure Component	Asset Value (Rp. million)
1	Irrigation	273, 460,330
2	Dam, Rubber Dam, Embung	63,481,721
3	Flood Control and Coastal Erosion	9,209,425
4	Raw Water Supply	340,000
	Total	346,491,476

Source: Proceeding of Workshop on Asset Management for Hydraulic Infrastructure, 2002, MPW and BAPPENAS

Assuming the total asset value as of 2002 above is unchanged, the required annual budget for O&M activities in 2007 is estimated to be Rp. 3.465 trillion, applying 1% ratio. However, the allocated budget in 2007 was only about Rp. 0.96 trillion, which is equivalent to around 0.28% of the total asset value in 2002. The strengthening of the O&M framework with provision of significant increase in budget and the capacity building of human resources for O&M is recommended in the next RPJM 2010-2014.

The table below presents the total assets of the existing water resources infrastructure and facilities all over the country as of 2002:

Table 4.4.15 Assets of Water Resources Facilities in Indonesia as of 2002

No.	Structure	Total Nos. / Length	No.	Structure	Total Nos. / Length
I. IRRIGATION			III. FLOOD CONTROL & COASTAL PROTECTION		
1	Headworks and Pump	16,329 nos.	1	Dike	2,806 km
	Fixed-type weir	12,408 nos.		Earth dike (more than 5m high)	541 km
	Gate-type weir	1,604 nos.		Earth dike (less than 5m high)	2,130 km
	Pump	1,380 nos.		Masonry dike (more than 5m high)	25 km
	Free intake	1,380 nos.		Masonry dike (less than 5m high)	110 km
2	Irrigation Canal (Main and Secondary)	37,388 km	2	Flood Control Valve	25 nos.
	Discharge more than 10 m ³ /s	5,608 km		Discharge control more than 100 m ³ /s	15 nos.
	Discharge less than 10 m ³ /s	31,780 km		Discharge control less than 100 m ³ /s	10 nos.
3	Drainage Canal and other Canal	23,301 km	3	Flood Canal and River Normalization	1,801 km
4	Canal Structures	213,337 nos.		Flood canal (more than 100 m ³ /sec)	65 km
	Diversion Structure	75,840 nos.		Flood canal (less than 100 m ³ /sec)	76 km
	Settling Basin	2,450 nos.		River normalization (more than 100 m ³ /s)	560 km
	Siphon and Aqueduct	8,890 nos.		River normalization (less than 100 m ³ /s)	1,100 km
	Bridge and Culvert	51,000 nos.	4	Drainage Pumping Station	25 nos.
	Other Structures	75,157 nos.		Capacity (more than 5 m ³ /s)	5 nos.
5	Tertiary Canal System	5,299,351 ha		Capacity (less than 5 m ³ /s)	20 nos.
	Technical System	3,408,400 ha	5	Flood Retarding Basin	10 nos.
	Semi-Technical System	1,120,882 ha		Capacity (more than 100,000 m ³)	10 nos.
	Non-Technical System	770,069 ha		Capacity (more than 100,000 m ³)	0 nos.
II. DAM, RUBBER DAM, and EMBUNG			6	Volcanic Mudflow and Sediment Control	402 nos.
1	Large Dam (height > 15m)	101 nos.		Check dam	377 nos.
	Multi-purpose Rockfill and Earthfill Dam	15 nos.		Mudflow pocket	25 nos.
	Single-purpose Rockfill and Earthfill Dam	64 nos.	7	Other River Facilities	21.6 km
	Concrete Gravity Dam	3 nos.		Concrete groin	2.5 km
	Arch Dam	3 nos.		Masonry groin	5.6 km
	Special Large Dam	16 nos.		Strengthening of dike	13.5 km
2	Medium Size Dam (height < 15m, Storage volume >500 km³)	135 nos.	8	Coastal Area / Estuary Area	47 km
	Multi-purpose Rockfill and Earthfill Dam	1 nos.		Jetty	8 km
	Single-purpose Rockfill and Earthfill Dam	133 nos.		Coastal groin	15 km
	Concrete Gravity Dam	1 nos.		Wave dissipation	24 km
3	Rubber Dam	34 nos.	IV. RAW WATER SUPPLY		
4	Embung	699 nos.	1	Intake	45 nos.
	Storage volume > 100,000 m ³	140 nos.		Capacity (more than 5 m ³ /s)	25 nos.
	Storage volume < 100,000 m ³	559 nos.		Capacity (less than 5 m ³ /s)	20 nos.
			2	Open Channel	167 km
				Capacity (more than 5 m ³ /s)	110 km
				Capacity (less than 5 m ³ /s)	57 km
			3	Closed Channel	21 km
				Capacity (more than 5 m ³ /s)	0 km
				Capacity (less than 5 m ³ /s)	21 km

Source: Proceedings of Workshop on Asset Management for Hydraulic Infrastructure, 2002, MPW and BAPPENAS

(4) Suggested Performance Indicators in Water Resources Sector

BAPPENAS instructed each ministry/agency to formulate performance indicators to measure the achievements of various activities under RPJM and Renstra for 2010 to 2014³. The performance indicators consist of the output, outcomes and impact indicators. The following performance indicators are suggested to be adopted in the water resources sector:

Table 4.4.16 Suggested Performance Indicators in Water Resources Sector

Major Programs	Output	Outcomes	Impact
Water resources development	No. of dams/embung	Newly developed storage volume (million m ³)	Benefit area for water supply (ha) or number of beneficiary (persons)
Rehabilitation/O&M of water resources facilities	No. of facilities subject to rehabilitation/O&M	Storage volume subject to rehabilitation/O&M (million m ³)	Benefit area for rehabilitation (ha) or number of beneficiary (persons)
Raw water supply for DMI	Increased raw water supply capacity (m ³ /sec)	Increased water volume on daily basis (m ³ /day)	Number of beneficiary (persons)
Flood control (river improvement)	River improvement length (km)	Protected area (ha) or mitigated flood damage (billion Rupiah)	Number of beneficiary (persons) or number of protected houses (houses)
Flood control (reservoir, retarding basin)	No. of dam and retarding basin	Protected area by reservoir (ha) and flood control volume in retarding basin (million m ³)	Number of beneficiary (persons) or number of protected houses (houses)
Coastal protection	Length of coastal protection (km)	Protected area (ha)	Number of beneficiary (persons) or number of protected houses (houses)
Rehabilitation/O&M of river facilities	River length subject to rehabilitation/O&M (km)	Protected area subject to rehabilitation/O&M (ha)	Number of beneficiary (persons) or number of protected houses (houses)
Rehabilitation/O&M of coastal protection facilities	Coastal length subject to rehabilitation/O&M (km)	Protected area subject to rehabilitation/O&M (ha)	Number of beneficiary (persons) or number of protected houses (houses)

Source: JICA Study Team

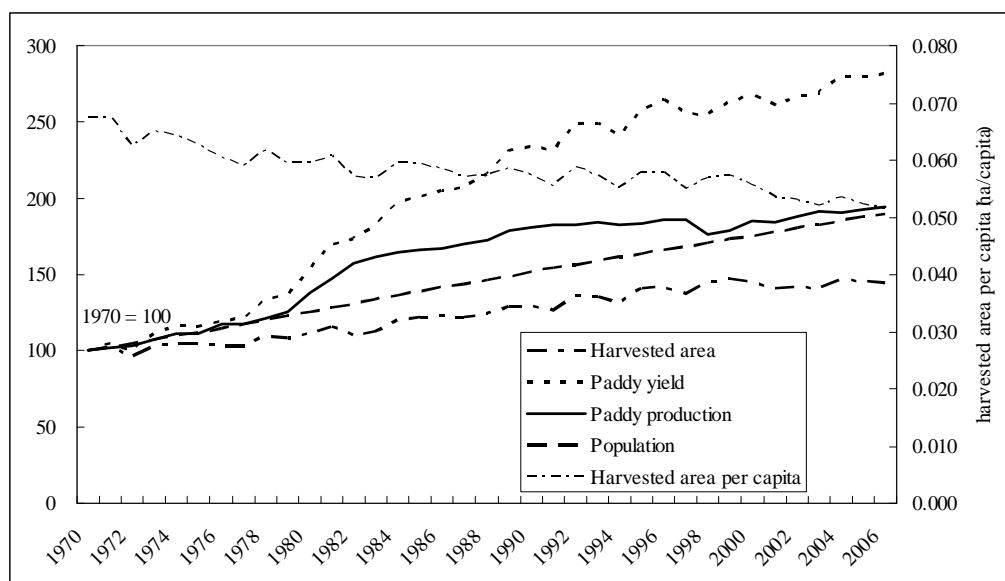
(5) Action Plan in Irrigation Sector

1) Main roles of irrigation infrastructure development

The main roles of irrigation infrastructure development are to: i) achieve food security, and ii) reduce the economic gap, including poverty alleviation. The acceleration of irrigation infrastructure development corresponds to the mission statements of the national long-term development plan, to wit: "To realize a safe, peaceful, and united Indonesia" and "To realize an even and fair distribution of development".

Since its independence in 1945, the Indonesian government has been making great efforts in irrigation infrastructure development in order to attain food security and self-sufficiency. Irrigation infrastructure is the most important agricultural infrastructure to sustain stable food supply. Consequently, irrigable areas have increased steadily since the 1970s. Figure 4.4.13 shows the increase of paddy production, paddy harvested area, yield and population since 1970 (1970=100).

³ Preparation Guidelines, National Mid-Term Development Plan (RPJM) 2010-2014, 2009, BAPPENAS

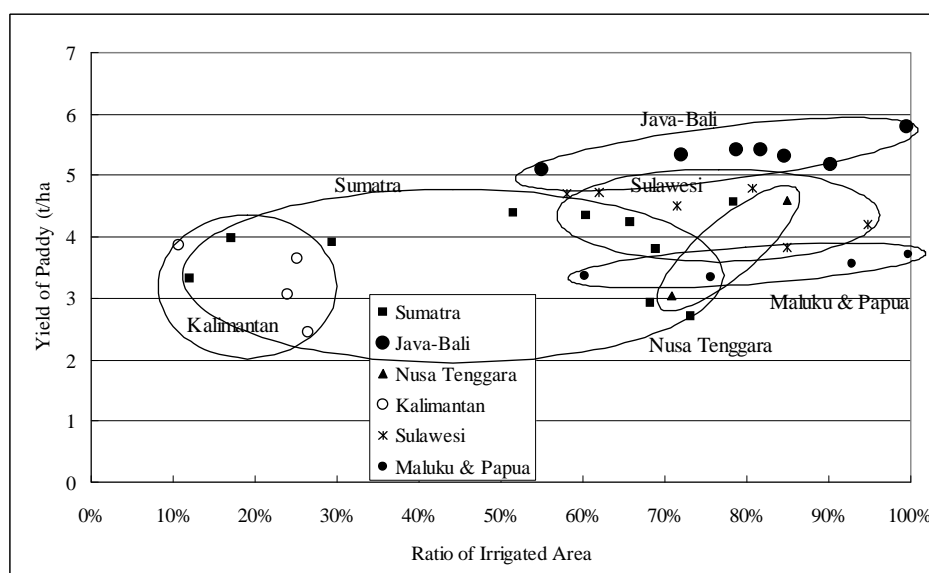


Source: FAOSTAT

Figure 4.4.13 Paddy Production, Harvested Area, Yield and Population

Based the above figure, the total production doubled since 1970, to catch up with the population growth. Increase of yield is a major factor which contributed to the increase in production which is 2.8 times from 1970. However, the harvested area has increased only to about 1.5 times. Irrigation infrastructure is the contributory factor to the increase of yield and harvested area.

Figure 4.4.14 presents the relationship of the ratio of irrigated area and average yield by province.



Source: Statistical Yearbook 2008, BPS

Figure 4.4.14 Relation of the Ratio of Irrigated Area and Average Paddy Yield by Province

Although there are some differences by island, it can be concluded that the trend of high ratio of irrigated area resulted in high yield.

Paddy yield was low (less than 3.0 t/ha) in some provinces in Kalimantan and Sumatra (West Kalimantan, Central Kalimantan, Bangka Belitung, Riau Island). The reasons of low yield in these provinces are presumed to be as follows:

- 1) Low paddy cultivation skill;
- 2) Low application of fertilizer; and
- 3) Low application of high yield variety.

2) Priority Issues for the Next Five Years

The recommended priority issues for the next five years in the irrigation sector, taking into consideration the remaining issues mentioned in item (6) in sub-section 4.4.3, are as follows:

(a) Rehabilitation of existing irrigation scheme and establishment of institutions for O&M

Rehabilitation of existing facilities is the highest priority issue since around 24% of the existing irrigation facilities is not functioning well as described in Item 3) of (6) of this sub-section. Likewise, capacity development for the local government staff and WUA on O&M for irrigation facilities should be implemented in line with the rehabilitation works. The demarcation in implementation level of the central government, local government and beneficiaries should be well-defined. The inventory survey on existing facilities and establishment of database should be prioritized in order to formulate an effective rehabilitation program and evaluation outcome of the activities.

(b) Extension and development of irrigation scheme in outer Java and formulation of regulations to control land conversion to industrial and urban area in Java

In Java, productive agricultural land (1.7 times against outer Java) has been reduced due to conversion of land use to industrial and urban area. The extension and development of irrigation scheme should be implemented immediately in order to secure the required paddy production in national level. In parallel, formulation of zoning ordinance (spatial plan) or others regulations to secure agriculture land against urbanization and industrialization should be done.

(c) Modernization of existing irrigation schemes in Java for saving water and water management

Java experiences deficiency of water balance due to high demand and limited water resources. Water use ratio for agriculture (86% of total use at present) should be reduced and shifted to DMI because it is difficult to find suitable location to develop new water resource (such as large dam) to match the increase in water demand for domestic, municipal and industry (DMI) in the future. Promotion of water saving irrigation project such as reducing conveyance loss, efficient water management should be implemented.

In addition, more high value crops should be promoted to increase the farmers' income around main cities. Moreover, improvement of farm land condition (drainage facilities, farm road, etc.) should be constructed in order to realize crop diversification.

(d) Adaptation to climate change

Although a more detailed research is required to assess the impact of climate change on agriculture productivity, extension of irrigation infrastructure in rainfed paddy fields and increase in water storage should be executed as a countermeasure for adaptation to climate change.

3) Logframe on Irrigation Sector for Next RPJM

A preliminary logframe and the proposed performance indicators are prepared by the Study team as the action plan for the next RPJM.

Table 4.4.17 Logframe and Proposed Performance Indicators on Irrigation Sector

Narrative Summary	Proposed Performance Indicator
<u>Overall Goal</u> 1. Realizing and sustaining food sufficiency 2. Reduction of economical disparity between urban and rural, as well as among regions	<u>Impact Indicator</u> 1-1 Food sufficiency ratio (%) 1-2 Stock amount of rice in Indonesia (ton) 2. GRDP per capita by province (Rupias per capita)
<u>Objective</u> 1. Increase and stabilization of paddy production 2. Poverty reduction in rural area	<u>Impact Indicator</u> 1-1 Incremental paddy production (ton) 1-2 Incremental cropping intensity of paddy (%) 1-3 Incremental harvested area (ha) 2. Ratio of people under poverty line in rural area (%)
<u>Sector Priority Issue</u> 1. Rehabilitation of existing irrigation scheme 2. Expansion of irrigation area and an increase in paddy productivity in outer Java taking population growth and reducing of paddy field in Java into consideration 3. Establishment and strengthening of institutions for O&M of irrigation system 4. Increase in farmers' income and reduction of economic gap 5. Alleviation of water conflict and adaptation of climate change	<u>Outcome Indicator</u> 1-1 Incremental actual irrigated area in the existing irrigation scheme (ha) 1-2 Functionality ratio of irrigation scheme (%) 2-1 Incremental actual irrigated area newly developed (ha) 3-1 Coverage ratio of tertiary block area managed by established WUA (%) 3-2 Functionality ratio of irrigation scheme (%) 3-3 Program performance of government O&M staff training and WUA empowerment 4-1 Increase in average farmers' income 4-2 Ratio of GDP per worker in agriculture sector vs. that in other sectors (%) 5-1 Ratio of water utilization amount for agriculture (%) 5-2 Incremental water storage volume (m ³)

Priority Activities

1. Rehabilitation of existing irrigation system
 - 1-1 Conduct of inventory survey for existing irrigation schemes and establishment of database
 - 1-2 Formulation of rehabilitation program, including preparation of criteria for selection of priority projects
 - 1-3 Establishment of asset management for reduction of life cycle cost
 - 1-4 Implementation of rehabilitation works
 - 1-5 Modernization of existing irrigation schemes in Java to increase crop productivity and water productivity
2. Expansion of irrigation area and increase in paddy productivity in the outer Java taking into consideration population growth and reducing of paddy fields in Java
 - 2-1 Formulation of law or regulation to control conversion of productive paddy fields to urban and industrial areas in Java
 - 2-2 Projection of future food balance and estimation of required irrigation development
 - 2-3 Extension and development of new irrigation areas in outer Java
 - 2-4 Support of agriculture extension service in outer Java
3. Establishment and strengthening of institutions for O&M
 - 3-1 Establishment of institution for O&M under new framework at the operations level
 - 3-2 Making clear demarcation of each institution at the operational level
 - 3-3 Awareness in the creation of WUAs and capacity-building
 - 3-4 Empowerment of provincial and district government staff on O&M activities
 - 3-5 Optimization of O&M budget
 - 3-6 Establishment of O&M performance monitoring and evaluation system
4. Increase in farmers' income and reduction of economic gap
 - 4-1 Prioritization of irrigation development in poverty areas
 - 4-2 Infrastructure development, including post-harvest and marketing facility
 - 4-3 Modernization of infrastructure to help mechanized farming practices to increase productivity
5. Alleviation of water conflict and adaptation of climate change
 - 5-1 Modernization and improvement of existing infrastructure to save water conveyance losses (e.g. extension of canal lining) and water management losses (e.g. remote control gate operation system), especially in Java
 - 5-2 Application and extension of on-farm level water management to save water at the field level
 - 5-3 Construction and rehabilitation of water storage infrastructure
 - 5-4 Extension of irrigation facility in rainfed paddy fields

Source: JICA Study Team

3) Regional Development Strategy

Rice is the staple food in Indonesia. However, the country's production has been fluctuating annually, and rice was imported constantly in the past. The demand for rice increases with the population increase. The prediction on the balance of rice consumption and supply of Indonesia for the plan period of RPJM 2, 2020 and 2025 is shown below.

Table 4.4.18 Prediction of Rice Consumption and Supply

Item	Unit	RPJM 1 2009	RPJM 2		2020	2025
			2012	2014		
Population	('000 persons)	231,370	239,688	245,022	257,791	266,988
Per Capita Rice Consumption	(kg/person/year)	140.80	139.15	139.15	139.15	139.15
Emergency Rice Stock in BULOG	('000 tons/year)	1,500	1,500	1,500	1,500	1,500
Total Rice Supply Requirement	('000 tons/year)	34,077	34,853	35,595	37,372	38,651
Supply by Imported Rice	('000 tons/year)	0	0	0	0	0
Conversion Factor (Milling rate + Post-harvest losses)		0.566	0.566	0.566	0.566	0.566
Total Paddy Supply Requirement	('000 tons/year)	60,207	61,577	62,888	66,028	68,289
Upland Paddy Supply	('000 tons/year)	3,191	3,264	3,333	3,499	3,619
Seeds for Self-stocked	('000 tons/year)	903	924	943	990	1,024
Wetland Paddy Production Requirement	('000 tons/year)	57,919	59,237	60,499	63,519	65,694

Sources:

- Population: PBS up to 2014 and FAO for 2020 & 2025 with adjustments based on BPS 2015 projection.
- Per Capita rice consumption = 139.15 kg/person/year: Recommended figure by Department of Agriculture.
- Emergency rice stock of 1,500 tons/year: Presidential Instruction
- Conversion factor: Data from Department of Agriculture and BULOG

Assumptions

- Total paddy supply in 2009; forecast.
- Upland paddy supply: assuming quantity equivalent to 5.3% of total paddy supply requirement.
- Seeds for self stocked: assumed on the basis of Department of Agriculture statistics.

The paddy field area consists of irrigation service area, rainfed area and swampy area. The total paddy field area in 2009 is estimated to be 8.05 million ha, and the annual total harvested area of paddy is 11,552 thousand ha with a total production of 57,919 thousand tons in 2009, along with the estimated figures of the respective regions as shown below.

Table 4.4.19 Existing Irrigation Service Area, Rainfed Area and Swamp in 2009

Description	2009						
	Existing Irrigation Service Area				Rain-fed	Swamp & others	Total
	Good (‘000 ha)	Better (‘000 ha)	Supple- ment (‘000 ha)	Not irrigated (‘000 ha)			
Indonesia							
Physical area	2,297	1,712	804	489	1,670	1,080	8,052
Harvested area	4,594	2,915	804	489	1,670	1,080	11,552
Cropping intensity	200	170	100	100	100	100	143
Paddy yield (ton/ha)	5.54	5.46	4.96	3.95	4.19	3.39	5.01
Production (‘000 ton)	25,434	15,908	3,990	1,933	6,992	3,662	57,919
Sumatra							
Physical area	371	375	449	155	443	633	2,426
Harvested area	742	600	449	155	443	633	3,022
Cropping intensity	200	160	100	100	100	100	125
Paddy yield (ton/ha)	4.90	4.90	4.90	3.90	3.90	3.46	4.40
Production (‘000 ton)	3,636	2,940	2,200	605	1,728	2,189	13,297
Java							
Physical area	1,466	891	66	73	711	7	3,214
Harvested area	2,932	1,604	66	73	711	7	5,393
Cropping intensity	200	180	100	100	100	100	168
Paddy yield (ton/ha)	5.86	5.86	5.86	4.78	4.78	3.71	5.70
Production (‘000 ton)	17,182	9,398	387	349	3,399	26	30,740

Description	2009						
	Existing Irrigation Service Area				Rain-fed	Swamp & others	Total
	Good (‘000 ha)	Better (‘000 ha)	Supplement (‘000 ha)	Not irrigated (‘000 ha)			
Bali & N. Tenggara							
Physical area	91	189	60	44	17	0	401
Harvested area	182	302	60	44	17	0	605
Cropping intensity	200	160	100	100	100	-	151
Paddy yield (ton/ha)	5.00	5.00	5.00	3.97	3.97		4.90
Production (‘000 ton)	910	1,512	300	175	67	0	2,964
Kalimantan							
Physical area	56	30	115	58	318	416	993
Harvested area	112	48	115	58	318	416	1,067
Cropping intensity	200	160	100	100	100	100	107
Paddy yield (ton/ha)	4.60	4.60	4.60	3.50	3.50	3.29	3.70
Production (‘000 ton)	515	221	529	203	1,113	1,367	3,948
Sulawesi							
Physical area	312	220	100	152	174	1	959
Harvested area	312	220	100	152	174	1	959
Cropping intensity	624	352	100	152	174	1	1,403
Paddy yield (ton/ha)	200	160	100	100	100	100	146
Paddy yield (ton/ha)	5.10	5.10	5.10	3.81	3.81	3.50	4.80
Production (‘000 ton)	3,182	1,795	510	579	663	4	6,733
Maluku & Papua							
Physical area	1	7	14	7	7	23	59
Harvested area	2	9	14	7	7	23	62
Cropping intensity	200	129	100	100	100	100	105
Paddy yield (ton/ha)	4.60	4.60	4.60	3.20	3.20	3.00	3.80
Production (‘000 ton)	9	41	64	22	22	76	236

Note: Estimated by the JICA Study Team on the basis of the data in 2005 of Department of Public Works and Department of Agriculture/BPS

Modernization and rehabilitation of existing infrastructures will be required for the area classified as supplemental irrigation and/or non-irrigated area, and development will be carried out for the rain-fed area. It is difficult to achieve self-sufficiency without adequate rehabilitation and improvement of existing irrigation schemes, and development of irrigation area. Regional development strategy for irrigation development in each region is briefly described below.

Sumatra Region

The rice production in the Sumatra Island is surplus. This region serves as the supplier of rice to rice deficit regions such as Java and Bali. There are some uncompleted irrigation systems in this region wherein the headworks have not been completed, or existing irrigation systems requiring urgent rehabilitation/modernization. The development strategy in this region is as follows:

- Promotion of the rehabilitation/upgrading of irrigation systems to effectively utilize the remaining irrigation development potential and to maintain/increase the productivity in the existing irrigation systems; and
- Promotion of the dam irrigation project by use of available water and land resources in the rain-fed area.

Java Region

Java occupies 3.21 million ha of paddy fields of irrigation service area and rain-fed area equivalent to 46.0% of the whole Indonesia paddy fields. The estimated paddy production for 2009 is 30.71

million ton corresponding to 56.6% of the total production of 54.26 million ton of the country. While the majority of rice production of Indonesia rests upon Java Island, the available water in the dry season is insufficient for the demand of domestic-industry-irrigation as shown in the preliminary water balance. Furthermore, the irrigation area is being reduced continuously with an average annual rate of 18,000 ha due to the urbanization. The development strategy in this region is as follows:

- Prioritization of the rehabilitation and upgrading of the existing irrigation system and management/improvement to maintain the present high productivity and to improve the water use efficiency; and
- Promotion of the improvement and modernization of the large scale irrigation projects served from the dam reservoirs - Water resources are limited in Java during the dry season. Effective utilization of the reservoir water is most important to increase the rice production sufficiency rate in Java under severe water balance situation.

Bali & Nusa Tenggara Region

Rice production in this area is insufficient to meet the consumption mainly because the irrigation area is not extensively developed although the unit yield of rice is relatively high. The per capita income in this region is lowest in Indonesia, thus the percentage of people under the poverty line both in the rural and urban areas are highest in this region. Special attention should be given to this region for creating job opportunities in a sustainable way to improve poverty and regional gaps. Irrigated agriculture is one of the most suitable measures in this region. The strategy in this region is as follows:

- Upgrading/modernization of existing irrigation systems to increase the self sufficiency rate of rice should be promoted; and
- Promotion of dam irrigation project to utilize the limited water resources in the rainy season.

Kalimantan Region

The irrigation area in this region has not been widely developed, although the water resources and land resources (in the form of rain-fed paddy field) are abundant. The development and improvement of irrigation system is required to increase the self sufficiency rate of rice. The development strategy in this region is as follows:

- Promotion of small- to medium-scale irrigation development; and
- Upgrading/modernization of the existing system.

Sulawesi Region

This region is playing an important part in supplying rice to the rice-deficit area like Java region. The available water is surplus in the dry season and the paddy fields under rain-fed condition are still left extensively. The development strategy in this region is as follows:

- Promotion of remaining irrigation development potential by means of dam irrigation projects; and

- Rehabilitation/upgrading of the existing irrigation systems to keep its position as the rice-supplying region.

Maluku and Papua Region

Rice produced in this region is less than the amount needed for consumption because irrigation system has not been well developed so far and, thus, productivity is very low. Furthermore, the percentage of people under the poverty line in the rural area is highest in Indonesia. From these situations, the implementation of irrigation development should be prioritized to increase the self-sufficiency rate of rice and the farmers' income. The development strategy in this region is as follows:

- Promotion of small- to middle-scale development to improve self-sufficiency condition and the rural economic development.

4.4.5 Priority Focus Areas of Water Resources Infrastructure Development for Next RPJM 2010-2014

(1) Policy Direction and Strategies in Water Resources Sector for RPJM 2010-2014

The goals of water resources infrastructure development was set out for the next RPJM 2010-2014 based on the remaining issues of RPJM 2004-2009 as discussed in Sub-section 4.4.3, as follows:

- i) Increasing of the capacity of water storage supported by sustainable management of water resources;
- ii) Optimization of water allocation with the fulfillment of basic needs of society and productive activities, and effective and efficient utilization of water;
- iii) Disaster prevention for water resources infrastructure, reduction of the impacts of disaster due to damaged water resources and restoration of the environment and water resources infrastructure systems in the post-disaster period;
- iv) Increasing the capacity of institutions in water resources management and empowerment of stakeholder to improve the performance management of water resources; and
- v) Increasing of availability and transparency of data and information of water resources.

The following table presents the draft policy direction and strategies to achieve the goals mentioned above for the next 5 years in 2010-2014:

Table 4.4.20 Policy Direction and Strategies of Water Resources Infrastructure Development for Next PRJM 2010-2014

Policy Direction	Strategies
1. Improvement and preservation of function and sustainability of water resources utilization to ensure adequate availability of water in both quantity and quality	<ul style="list-style-type: none"> i) Development of upstream-downstream relations ii) Control the system's conjunctive use of surface water utilization and ground water iii) Acceleration of development of small and medium scale water reservoir, especially in the area south of the equator and the strategic area iv) Control of water pollution by increasing the monitoring of water quality to control domestic and industry waste disposal
2. Utilization of water in a sustainable manner (Optimal utilization and development of irrigation networks)	<ul style="list-style-type: none"> i) Development of new irrigation areas with priority outside Java ii) Optimization of the irrigation system infrastructure iii) The increased function of the irrigation network has been built but not yet functioning, and done only in the area of guaranteed availability of water and farmers, with priority irrigation areas outside Java iv) The rehabilitation of the irrigation area that has been damaged, but functioning, especially in the reliability areas of rice v) The implementation of eco-efficient system, with the reduction of non-revenue water, water rationalization charge, implementation of the system of agriculture water efficiently, encourage re-use (reuse) and recycling water drainage, and increasing the reliability of irrigation services vi) Policies that encourage farmers to maintain the agricultural function of land
3. Utilization of water resources to ensure raw water requirement for households, urban areas and industries	<ul style="list-style-type: none"> i) The fulfillment of basic household needs, especially in areas prone to water deficit, less developing areas, and strategic areas ii) The use of groundwater will be controlled and managed in line with the increased effort to use surface water iii) Development of water storages as basic source of water and optimizing existing raw water sources by increasing operation and maintenance iv) To develop the processing technology of water quality and implement the principles of recycle, reuse and reduce v) To encourage the role of the private sector in financing infrastructure development, especially in raw water distribution through water conveyance infrastructures
4. Control and mitigation of impacts to infrastructure due to floods, volcanic eruption and coastal abrasion, and climate change	<ul style="list-style-type: none"> i) Approach to flood management (prevention, response and handling) flood hazard ii) Improve the performance of flood control infrastructure to optimize operations, maintenance and rehabilitation iii) Encourage the policy to develop retention / retarding basin areas as water parking areas iv) Encourage and develop policy incentives - disincentive between regions upstream - downstream in flood prevention

Policy Direction	Strategies
5. Increasing of performance of water resources management through establishment of institutions related to the management of water resources and human resources capacity	<ul style="list-style-type: none"> i) Encourage the acceleration of the government regulation with the implementation of Law No. 7 of 2004 as a guide of the technical implementation of water resources ii) Improve communication skills, cooperation, and coordination between and among the existing institutions, and coordination of water resource management iii) Increased institutional capacity of water resources and increased community participation and empowerment, especially in the district / city level iv) Initiate and increase community participation in the management efforts for water resources through guidance, counseling and guidance v) Organizing efforts management of water resources with a system of partnership between the government and the community
6. Increasing the provision and accessibility of data and information on water resources	<ul style="list-style-type: none"> i) Encourage the network of information in water resources involving all stakeholders ii) Facilitate the provision of data which includes data on hydrology, hydrogeology, hydrometeorology, water resources infrastructures, and other supporting data such as: water resources policy and technology iii) Build and optimize the network database between all stakeholders and setting standards, modification, classification, process and methods / procedures of collecting data and information iv) Update the data regularly, collect data from the institutions and synchronize all related data v) Prepare and implement standard operating procedures of transparency and information of data to the community, and to improve information services to the communities

Source: Draft RPJM 2010-2014, Water Resources, August, 2009

(2) Program, Activity and Target of Water Resources Sector for RPJM 2010-2014

According to BAPPENAS, finalization of the draft RPJM 2010-2014 is scheduled on 16-20 December 2009, through discussions with line ministries, provincial governments, regional governments, institutions, universities and NGOs (called MUSRENBANGNAS held on 11-13 December 2009 according to Law No.25/2005 regarding National Development Planning System). After the finalization, the Presidential Regulation on RPJM 2010-2014 will be enacted in January 2010. In parallel with the finalization process of RPJM 2010-2014, the next Renstra 2010-2014 is also scheduled to be finalized. At the MUSRENBANGNAS, four priority programs and targets for water resources infrastructure development in the next five years were addressed as summarized below:

Table 4.4.21 Priority Programs and Targets of Water Resources Infrastructure Development for Next RPJM 2010-2014

No.	Program	Target
1	Development, management and conservation of river, lake and other water resources	Construction of 19 dams and 160 embung/situ with a volume of 1.1 billion m ³ . Preserve the availability of water with a volume of 12.5 billion m ³
2	Development and management of irrigation networks, swamp irrigation networks and other water resources networks	Increase and maintenance of the services of 2.8 million hectares of irrigation networks, 1.75 million hectares of swamp irrigation networks and 46.8 thousand hectares of groundwater irrigation networks to support the national food security
3	Flood control, mudflow/sediment control and coastal conservation	Undertaking of flood control in the Jakarta East Flood Canal and integrated Bengawan Solo River basin, which are national priority targets. Protecting the area of 120.4 thousand hectares from flood hazards, 100 km coastal protection, and control 34 million m ³ of volcano mudflow/sediment
4	Supply and management of raw water	Increase the availability of raw water with a capacity of 54.8 m ³ /sec, and maintain the availability of water with a capacity of 44.8 m ³ /sec to support the achievement of MDG's goals

Source: Material of MUSRENBANGNAS, BAPPENAS, December 2009

The program, activities and output indicators were drafted by DGWR in terms of Renstra 2010-2014 based on the priority programs and targets above, as summarized below.

Table 4.4.22 Activities and Output Indicators of Water Resources Infrastructure Development for Next RPJM 2010-2014

Program	Activity	Output Indicator
1. Development, management and conservation of rivers, lakes and other water resources	a. Development of reservoir/small reservoir/ other water storage	19 reservoirs, 160 small reservoirs/ other water storage, 1.1 billion m ³
	b. Rehabilitation of reservoir/small reservoir/ other water storage	34 reservoirs/small reservoirs/other water storage, 4.5 billion m ³
	c. O&M of reservoir/small reservoir/ other water storage	199 reservoirs/small reservoirs/other water storage, 12.5 billion m ³
	d. Conservation of lakes and reservoirs and improvement of the greenbelt areas of watersheds	16 watersheds (river basins)
2. Development and management of irrigation networks, swamp irrigation networks and other water resources networks	<i>1. Irrigation:</i>	
	a. Development/Improvement of irrigation network	500,000 ha
	b. Rehabilitation of irrigation network	1,340,000 ha
	c. O&M of irrigation network	2,315,000 ha
	<i>2. Groundwater Irrigation:</i>	
	a. Development/Improvement of groundwater irrigation network	6,000 ha
	b. Rehabilitation of groundwater irrigation network	37,500 ha
	c. O&M of groundwater irrigation network	43,840 ha
	<i>3. Swamp Irrigation:</i>	
	a. Development/Improvement of swamp reclamation network	550,000 ha
3. Flood control, mudflow/sediment control, and coastal conservation	<i>1. Flood Control:</i>	
	a. Development of flood control facilities	1,000 km long, protected area 60,000 ha
	b. Rehabilitation of flood control facilities	750 km long , protected area 24,700 ha
	c. O&M of flood control facilities	2,000 km long , protected area 37,700 ha
	<i>2. Mudflow/Sediment Control:</i>	

	a. Development of sediment/mud control facilities	100 facilities, control volume of 16 million m ³
	b. Rehabilitation of sediment/mud control facilities	85 facilities, control volume of 6 million m ³
	d. O&M of sediment/mud control facilities	150 facilities, control volume of 12 million m ³
	<i>3. Coastal Protection:</i>	
	a. Development of coastal protection facilities	100 km
	b. Rehabilitation of coastal protection facilities	50 km
	c. Maintenance of coastal protection facilities	50 km
4. Supply and management of raw water	<i>1. Raw Water Supply:</i>	
	a. Development/Improvement of raw water unit	54.8 m ³ /s
	b. Rehabilitation of raw water unit	12.4 m ³ /s
	c. O&M of raw water unit	44.8 m ³ /s
	<i>2. Groundwater water supply:</i>	
	a. Development/Improvement of raw groundwater unit for drinking water	0.25 m ³ /s
	b. Rehabilitation of raw groundwater unit for drinking water	0.60 m ³ /s
	c. O&M of raw groundwater unit for drinking water	0.55 m ³ /s

Source: 6th version Renstra, MPW, October 2009

(3) Priority Focus Areas for Water Resources Infrastructure Development for RPJM 2010-2014

As discussed in Sub-section 2.3.5, three focus areas of infrastructure investment are proposed for the next five years of infrastructure development. These are: i) building strong backbone infrastructure, ii) upgrading infrastructure in the main cities, and iii) provision of basic infrastructure services in depressed areas for improved economic opportunities. The main objective of the development of water resources infrastructure is to contribute to nationwide social welfare and support to both regional and national economic developments. In this sense, water resources infrastructure is one of the lifelines of national infrastructure. These focus areas under Renstra 2010-2014 would be addressed based on the aspect of water resources infrastructure sector, as follows:

- a. Building strong backbone infrastructure mainly in Java, Sumatra and Sulawesi
 - Sustainable water resources development and management
 - Development and improvement of raw water supply capacity
 - Flood control and disaster management
- b. Upgrading infrastructure in the main cities, namely Java, Sumatra and Sulawesi
 - Upgrading of flood protection level of urban rivers as climate change adaptation measure
 - Promotion of drainage improvement in urban cities
 - Upgrading of urban river environment
- c. Provision of basic infrastructure services in depressed areas for improved economic opportunities in the whole Indonesia especially in Nusa Tenggara
 - Development of small scale reservoir and water storage facilities for irrigation and domestic water supply in the dry Nusa Tenggara area

- Rehabilitation of deteriorated river and water supply facilities with priorities for implementation in the whole of Indonesia

Recent analysis for the Southeast Asia region suggests that Indonesia is highly vulnerable to various aspects of a warming climate⁴. The eastern and western portions of densely-populated Java, the coastal regions of much of Sumatra, parts of western and northern Sulawesi, and southeastern Papua islands all rank highly subject to the multiple climate hazards. These areas are susceptible to all major climate change risks such as drought, floods, landslides and sea-level rise. Moreover, food security in Indonesia would be threatened by climate change. The major concern for Indonesia with regards to the impacts of climate change is the risk of decreased food security. Climate change will alter precipitation, evaporation, river discharge and soil moisture. Hence, it will have effects on agriculture and, ultimately, on food security. Climate change will also increase the average sea level due to increased volume of the sea water caused by the melting of polar ice caps. Around 41 million people live within ten meters of the average sea level. They are the most vulnerable to sea level changes. Sea level rise will inundate productive coastal zones; and thereby, will reduce farming and coastal livelihoods. MPW has established a National Action Plan for Climate Change Mitigation and Adaptation in Public Works Infrastructure.

Projects from the viewpoints of climate change adaptation should be addressed in line with the three focus areas above. Promising activities are:

- Upgrading of flood protection level of urban rivers in Java and Sumatra;
- Flood control and disaster management for disaster vulnerable areas; and
- Coastal management by means of coastal protection and beach conservation in Java, Sumatra, Sulawesi, Bali and Nusa Tenggara.

Many mitigation and adaptation measures should be contemplated and implemented for the next RPJM 2010-2014 to reduce the country's vulnerability to climate change which will need to be phased and prioritized according to the magnitude of investments, benefits and risks.

(4) Priority Focus Areas for Irrigation Sector Development for RPJM 2010-2014

In the RPJM (draft), the development of the irrigation sector is aimed to support national food security with activities focused on the development and management of irrigation system for the target area of 2.80 million ha and improvement and maintenance of the irrigation services. The output indicators for the irrigation program are described below.

- Development/increase of irrigation network to irrigate the area of 500 thousand ha;
- Rehabilitation of irrigation network in the area of 1.34 million ha; and
- Improvement of O&M of irrigation network for the area of 2.32 million ha.

The following irrigation development and management projects are prepared with reference to the regional development strategies, in order to attain the target outputs of the irrigation program

⁴ Country Environmental Assessment, Chapter 6: Adapting to a Changing Climate, 2009, World Bank

mentioned above:

(a) Project Assistance

(i) Modernization and Upgrading for Sustainable Irrigation Development and Management Project consisting of sub-projects such as:

- Urgent rehabilitation and/or modernization of existing irrigation systems for which headworks and canal systems have been completed, but the facilities are functioning less due to damages, superannuation, insufficient O&M, etc.; and
- Urgent rounding-up of existing irrigation systems for which the headworks and main canal system are completed, but the extension work remains uncompleted

(ii) Modernization and Improvement of Existing Strategic Large-Scale Irrigation Projects in Java

- Rentang Irrigation Modernization Project with an area of 87, 000 ha

The Rentang Irrigation Project is facing the lack of irrigation water source. The Jatigede Dam, which is the water source of Rentang Irrigation Project, is being implemented, and scheduled to be completed in the near future.

- Jatilhul Irrigation Project with an area of 240,000 ha

(iii) Dam Irrigation Development Project

- Komerling-3 with dam construction for extension area of 9,000 ha
- Small dam irrigation development projects in Bali and Nusa Tenggara Region
- Small dam irrigation development projects in Sulawesi Region
- Dam irrigation development projects in Kalimantan Region

(b) Technical Assistance

(i) Formulation of Irrigation Development and Management Program for Food Security

Increase of rice production to attain self-sufficiency relies upon the irrigation development especially in Java, Sumatra and Sulawesi as well as on agricultural intensification programs. The JICA Study for Formulation of Irrigation Development Program (FIDEP) in the Republic of Indonesia was carried out in 1993, providing the irrigation development frameworks and strategies. Subsequently, natural, social and institutional conditions have changed; and hence, there is a need to prepare the new irrigation development frameworks and strategies.

4.4.6 Recommendation of Projects to be Listed in the Next Blue Book 2010-2014

(1) Listed Projects in the Blue Book 2006-2009

A total of 39 projects were listed up as candidate projects for the water resources sector in the past Blue Book 2006-2009 as well as in the 2008 Revisions (3 times) to achieve the priority targets set out in the RPJM 2004-2009 as summarized below:

Table 4.4.23 Number of Projects of Water Resources Sector Listed in Blue Book (2006-2009)

Water Resources Sub-sector	Project Assistance (PA)			Technical Assistance (TA)		
	Blue Book 2006-2009	2008 Revisions	Total	Blue Book 2006-2009	2008 Revisions	Total
Water Resources Development and Management	7	6	13	8	2	10
Flood Control and Disaster Management	2	2	4	2	3	5
Irrigation Development	2	0	2	1	2	3
Coastal Protection	0	0	0	2	0	2
Total	11	8	19	13	7	20

Source: Project and Technical Assistance Proposals 2006-2009, Volume I Project Assistance Proposals, Volume II Technical Assistance Proposals. List of Medium-Term Planned External Loans and Grants 2006-2009, 2008 Revision, BAPPENAS

Out of 39 projects above, 19 project for project assistance (PA) and 20 projects for technical assistance (TA) were selected for the projects to be funded by foreign loans and foreign grants. The expected fund requirement is US\$1,512 million.

(2) Requirements for Project Proposal for Blue Book

According to the Technical Guidelines on Submission of Proposals for Project Financing by Foreign Loans and/or Grants Book I: General Guidelines published by BAPPENAS in 2006, the following documents are generally required in the project proposal for PA:

- Project Digest in terms of a simple sheet format
- Terms of Reference
- Feasibility Study Documents of the Project
- Project Implementation Plan
- Special Documents (if required)

(3) Candidate Project List for the next Blue Book 2010-2014

As of December 2009, candidate projects for the next Blue Book 2010-2014 are still under preparation by DGWR. According to DGWR, the candidate projects list would be finalized around the end of January 2010. The following tables present the nominated candidate lists for project assistance (PA) and technical assistance (TA), which are identified by the Study Team based on the collected information from DGWR. It should be noted that these candidate projects are still at the preliminary level for evaluation by DGWR and are subject to further confirmation. Other candidate projects not listed below are likely to be added to the draft candidate projects list.

Table 4.4.24 Draft of Candidate List of Project Assistance for Next Blue Book 2010-2014 as of December 2009

No.	Project Title	Location	Loan (US\$ 000)	Counterpart Funding (US\$ 000)
1	Countermeasure for Sediment in Wonogiri Multipurpose Dam Reservoir Slice II	Central Java	51,133	?
2	Lau Simeme Multipurpose Dam Development Project	North Sumatra	11,200	?
3	Urban Flood Control System Improvement in Selected Cities Phase II	Nationwide	100,000	?

No.	Project Title	Location	Loan (US\$ 000)	Counterpart Funding (US\$ 000)
4	Bali Beach Conservation Project Phase II	Bali	?	?
5	Urgent Rehabilitation of Strategic Irrigation System in Indonesia	Nationwide	?	?
6	Paselloreng Dam of Gilirang Irrigation Project	South Sulawesi	?	?
7	Construction of Karalloe and Associate Structures	South Sulawesi	53,261	27,174
8	Padang Flood Control Phase III	Padang	79,512	-
9	Cisadane River Urgent Improvement Project, Stage I	West Java	?	?
10	Upper Citarum River Basin Tributaries Flood Management	West Java	40,000	4,000
11	Construction of Cipanas Multipurpose Dam	West Java	115,640	?
12	Urgent Construction on Jambi City Flood Control Mitigation	Jambi	7,092	1,064
13	Urgent Construction and Rehabilitation of Water Supply for Ambon City in Maluku Province	Maluku	11,600	1,740
14	Lower Solo River Improvement Project Phase II Stage 2	East Java	100,000	10,000
15	Integrated Pamukulu River Basin Development Project Phase I	South Sulawesi	63,000	?
16	Construction of Raknamo and Temef Dams for Water Resources Development in NTT Province	NTT	86,000	?
17	Pandanduri Dam Irrigation Project	NTB	?	?
18	Rationalization and Modernization of Strategic Irrigation Schemes for Enhancing Food Security in Java (RAMSIS)	Central Java, East Java, West Java,	?	?
19	Urgent Rehabilitation of Strategic Irrigation Schemes in Western Indonesia (URSI)	South Sumatra, West Sumatra, North Sumatra, Lampung, Bengkulu, Riau, South Kalimantan	?	?
20	Rentang Irrigation Modernization Project	West Java	?	?
21	Project for the Urgent Re-construction of East Pump Station of Pluit in Jakarta in the Republic of Indonesia	Jakarta	?	?

Source: JICA Study Team, based on collected information from DGWR

Table 4.4.25 Draft of Candidate List of Technical Assistance for Next Blue Book 2010-2014 as of December 2009

No.	Project Title	Location	Grant (US\$ 000)	Counterpart Funding (US\$ 000)
1	Integrated Regional Water Resources Development and Disaster Management Sector Project in West Timor	West Timor	1,100	150
2	Integrated Water Resources Management in JABODETABEK and its Surrounding Area	Jakarta, Banten, West Java	5,000	750
3	Cisadane River Improvement Project	West Java	?	?
4	Nationwide Study on New Multipurpose Dams in the Republic of Indonesia	Nationwide	?	?
5	Coastal Management Project in Indonesia	Nationwide	5,000	?
6	Establishment of O&M Manual of Strategic Irrigation Schemes in Indonesia	Nationwide	?	?
7	The Influences of Climate Change on Coastal Protection Planning and Policies in Indonesia	Nationwide	?	?

No.	Project Title	Location	Grant (US\$ 000)	Counterpart Funding (US\$ 000)
8	Feasibility Study, Detailed Design and Construction of Pelosika Dam	Southeast Sulawesi	2,750	85
9	Study on Adaptation Strategies for Climate Change Impact for 2 River Basins (Brantas and Bengawan Solo)	Central and East Java	5,000	?
10	Beach Conservation Project	Nationwide	5,000	?
11	Integrated Water Resources Management in Bali	Bali	4,375	660
12	Comprehensive River Water Management of the Batang Hari in Jambi Province	Jambi	3,200	480
13	Comprehensive Study on Tondano-Lemebeam-Lekpang Water Resources Management in North Sulawesi	North Sulawesi	4,750	713
14	Technical Assistance for Curug Irrigation Pumping Station and Jatiluhur Hydroelectric Power Plan	West Java	4,158	-
15	Feasibility Study and Detailed Design of Tukad Ayung Multipurpose Dam	Bali	1,000	130
16	Study on Project of Integrated Water Resources and Flood Management for River Basins of Pemali-Juana and Others in Northern Central Java	Central Java	?	?
17	Urban Flood Control in Cirebon City	West Java	3,650	?
18	Water Quality Management and Water Resources of the Upper Citarum River Basin	West Java	3,600	540
19	Preparation of a Databank for Coastal Protection and Management	Nationwide	3,000	450
20	Preparation of National Lowland Management Strategy	Nationwide	34,000	5,100
21	Formulation of Irrigation Development and Management Program for Food Security in the Republic of Indonesia	Nationwide	?	?

Source: JICA Study Team, based on collected information from DGWR

(4) Preliminary Selection Criteria for Evaluation of Candidate Projects

Along with the finalization of Renstra 2010-2014, DGWR will officially submit the candidate project list for the next Blue Book 2010-2014 in line with the finalized policy direction, strategies and activities designated in the next Renstra 2010-2014. In this sense, it is assumed that all of the selected candidate projects for the Blue Book are fully in compliance with the national development policy and strategies of the next RPJM 2010-2014, as well as with various sector development programs to be implemented under the next Renstra 2010-2014.

According to the Technical Guidelines on Submission of Proposals for Projects Financing by Foreign Loans and/or Grants Book I: General Guidelines published by BAPPENAS in 2006, foreign sources of funding are required for accelerating the achievement of national development targets with priorities indicated in RPJM. This is mentioned in the Foreign Loan Requirement Plan (RKPLN) prepared by BAPPENAS and the Ministry of Finance. Although no project digests of candidate projects are available at this moment, it is proposed that the selection of candidate projects be made based on the following priorities for respective development programs.

- Urgency of project
- Number of people to be benefited
- Economic viability
 - for building strong backbone infrastructure and upgrading infrastructure in the main cities; EIRR higher than 12%
 - for provision of basic infrastructure services in depressed areas for improved economic opportunities; preferably EIRR higher than 12%
- Maturity of project (F/S or D/D have been finished or not)
- Social issues due to project implementation (Number of affected people, EIA has been completed or not, LARAP has been finished or not)
- Aspects of contribution to:
 - Effective and efficient utilization of water
 - Poverty alleviation and equitable growth mechanism (for provision of basic infrastructure services in depressed areas for improved economic opportunities)
 - Climate change adaptation
- Appropriateness for international cooperation from the aspect of technical difficulty

The table below shows a sample of evaluation criteria in terms of weighting of categories.

Table 4.4.26 Sample of Evaluation Criteria on Categories, Weight and Scoring

Category		Weight	Point:1	2	3	4	5
1	Urgency of project	30%	Low	Between items 1 and 3	Medium	Between items 3 and 5	High
2	Number of people to be benefited	20%	< 1,000	1,000 to 10,000	10,000 to 50,000	50,000 to 100,000	> 100,000
3	Economic viability	10%	< 5%	5% to 8%	8% to 10%	10% to 12%	> 12%
4	Maturity of project	10%	Master plan	Preliminary feasibility study	Feasibility study	Basic design	Detailed design
5	Social issues	10%	EIA is planned to be executed	Between items 1 and 3	EIA is being executed	Between items 3 and 5	EIA is completed
6	Aspects of poverty alleviation, effective utilization of water and climate change adaptation	10%	Not included	Between items 1 and 3	Sub purpose	Between items 3 and 5	Main purpose
7	Appropriateness for international cooperation	10%	Conventional technology in Indonesia	Between items 1 and 3	Foreign support in reliability of applied technology	Between items 3 and 5	Application of new/high technology

Source: JICA Study Team

Appendix-1

Procedures of Formulation of National Medium Term Development Plan 2010-2014 (RPJM 2010-2014)

A1.1 Relevant Laws, Regulations, and Development Plans

A1.1.1 Position of Medium-term Development Plan (RPJM) in the National Development Planning System

The National Medium-Term Development Plan (RPJM) is defined by Law Number 25 of 2004 regarding National Development Planning System. The National Development Planning System, which covers the whole picture of national development planning consisting of Long-term, Medium-term and Short-term (Annual) plans at both national and regional levels, was enacted in October 2004. The following table shows the list of each plan stipulated in the National Development Planning System.

Table A1.1.1 List of National Development Plans defined in the National Development Planning System

National level	Regional level	Period
National Long-term Development Plan (RPJPN)	Regional Long-term Development Plan (RPJPD)	20 years
National Medium-term Development Plan (RPJMN)	Regional Medium-term Development Plan (RPJMD)	5 years
Strategic Plan of Ministries and Agencies (Renstra-KL)	Strategic Plan of Work Unit of the Regional Government (Renstra-SKPD)	5 years
Government Work Plan (RKP)	Regional Government Work Plan (RKPD)	1 year
Work Plan of Ministries and Agencies (Renja-KL)	Work Plan of Work Unit of the Regional Government (Renja-SKPD)	1 year

Source: JICA Study Team

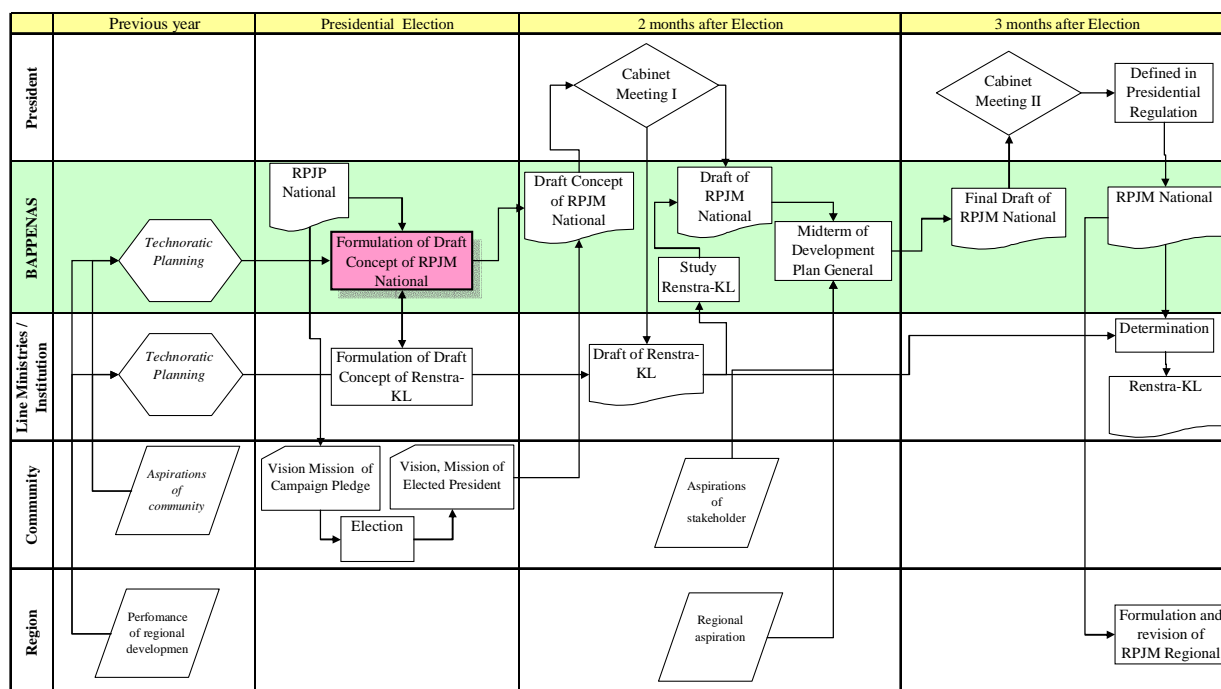
A1.1.2 How to Prepare Medium-term Development Plan (RPJM)

There are descriptions in the National Development Planning System on how to prepare the Medium-term development plan (RPJM). Summary of descriptions are as follows:

- Minister of BAPPENAS prepares the initial draft of the national RPJM.
- Chiefs of ministries/agencies prepare drafts of the Renstra-KL (Strategic Plan of Ministries/Agencies) based on the initial draft of the national RPJM.
- The draft of RPJM is used for the Development Plan Consultation Meeting (*Musrenbang*).
- The *Musrenbang* should be held not later than two months after the President's inauguration.
- Minister of BAPPENAS submits the final draft of RPJM to the cabinet based on the discussion result of *Musrenbang*.
- RPJM is enacted by means of a Presidential Regulation not later than three months after the inauguration of the President.

The above procedures are as shown in the diagram in Figure A1.1.1.

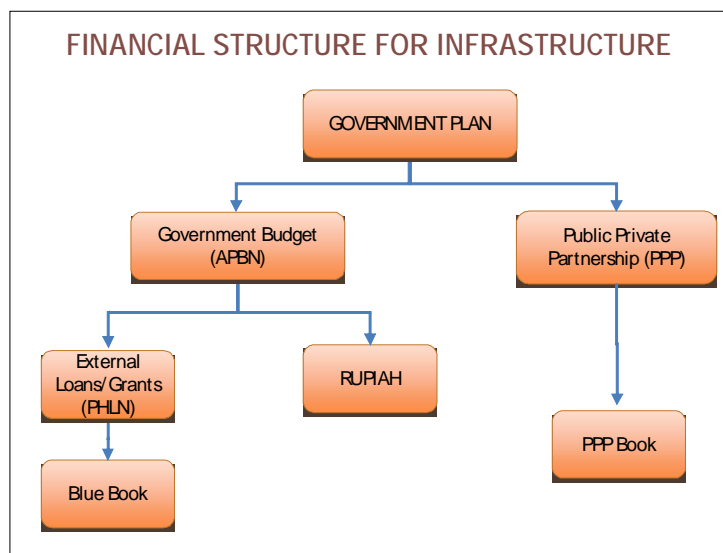
Diagram of Formulation RPJM National



Source: BAPPENAS

Figure A1.1.1 Diagram for Formulation of RPJM**A1.2 Relations of RPJM, Blue Book, PPP Book, etc.**

Figure A1.2.1 shows the financial structure for infrastructure development.



Source: BAPPENAS

Figure A1.2.1 Financial Structure for Infrastructure Development

In the government financial plan for infrastructure development, there are two conceivable sources of development funds. One is the central government budget and the other is private investment, including public private partnership (PPP) scheme. The central government budget is further divided into two categories, namely, (i) Rupiah budget and (ii) external loans/grants. For external loans/grants, a planning document called “Blue Book” is prepared, which contains information on activities and projects proposed by the state ministries/agencies, etc. The Blue Book is prepared to target a five year

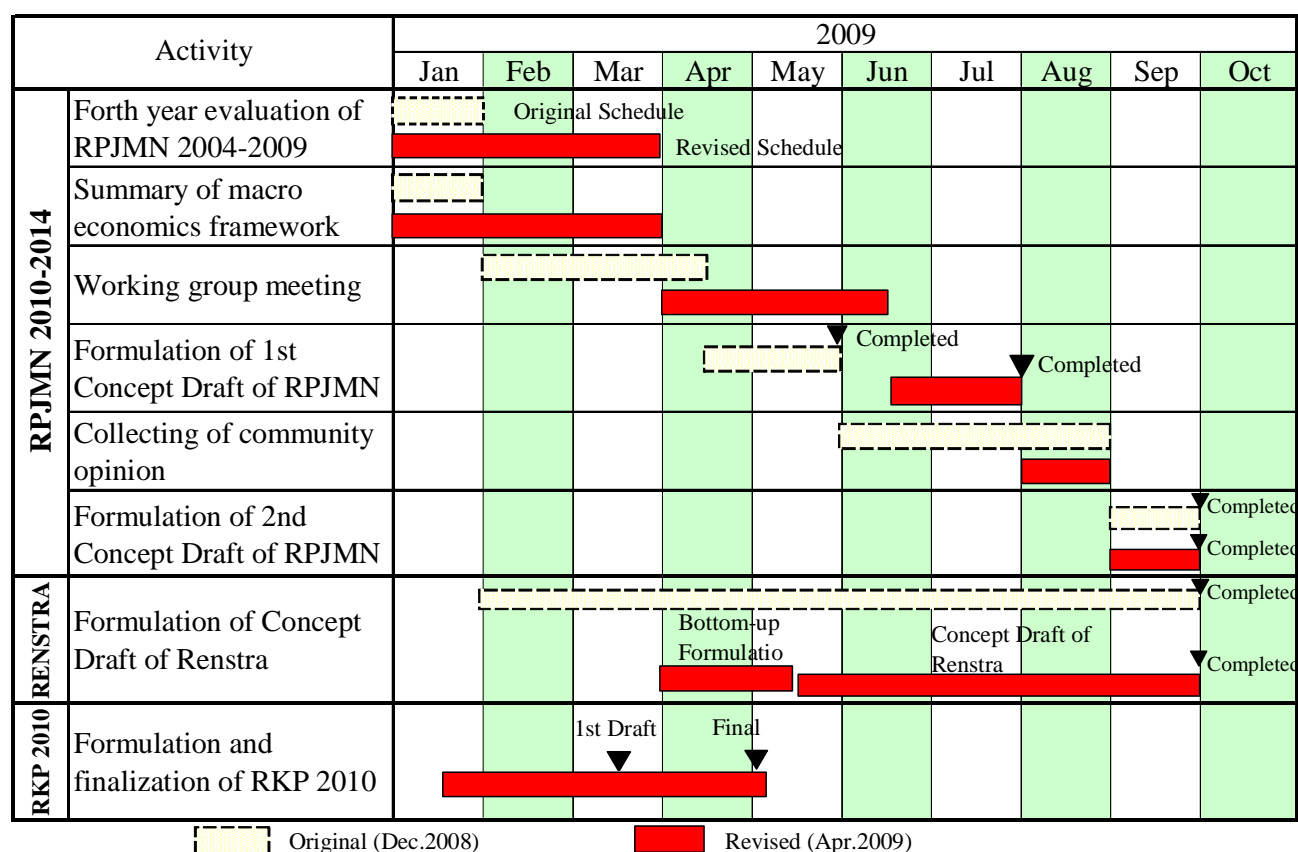
period, the same period as the RPJM. “PPP Book” is prepared by BAPPENAS and shows the list and outlines of projects, which have the potential to be realized as PPP projects. In Indonesian PPP practice, the funds for the public portion are either prepared by the government budget or by foreign loans. In case foreign loans are to be applied for PPP scheme, such project should also be listed in the “Blue Book”.

There is a guideline called “Submission of Proposals for Projects financed by Foreign Loans and/or Grants” prepared by BAPPENAS. The Book I, General Guidelines gives a description of the entire process of planning, proposing of and monitoring of projects financed by foreign loans and/or grants.

By referring to this document, the state ministries/agencies prepare a list of activities that are worthy of being financed by foreign loans/grants for the RPJM period.

A1.3 Procedures and Schedule for Formulation of RPJM 2010-14

Figure A1.3.1 shows the schedule of RPJM 2010-14 preparation. Basic work items are as stipulated in the National Development Planning System.



Source: BAPPENAS

Figure A1.3.1 RPJM Formulation Schedule

Appendix-2

Appendix to Chapter 3

A2.1.1. Sources of Infrastructure Investment

The sources of infrastructure investment are becoming more diversified in Indonesia. The financial sources are broadly divided into “public” and “private”. In APBN, the public funds are classified as either “Domestic Financing” or “International Financing”. Under the framework, financial sources for infrastructure investments can be categorized as follows:

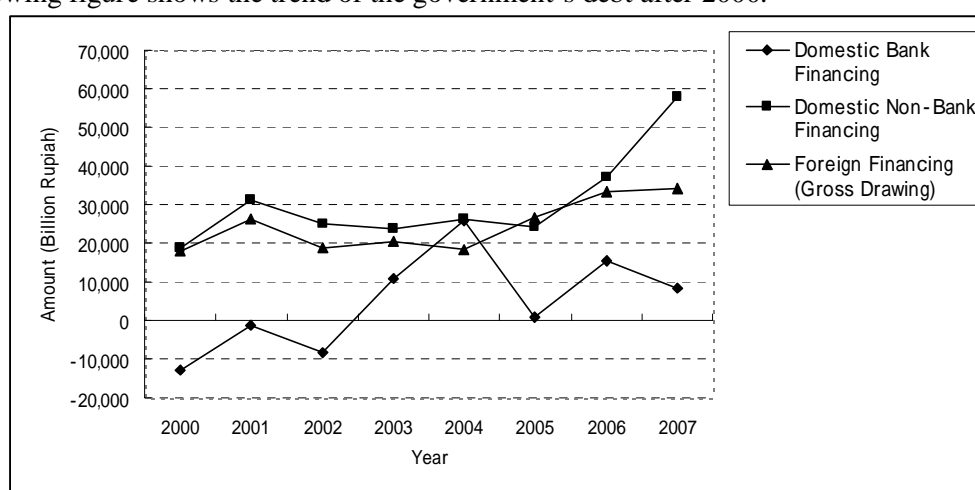
Table A2.1.1 Funding Sources for Public Sector Projects

	Category	Funding Source	Types		Examples of Sources
a.	Public	Domestic	General Budget	-	Tax Revenues
b.			Debt	Loan	Domestic Bank
c.				Bond	Domestic Bank
d.		International	Grant	-	ODA (Bi/Multi)
e.			Debt	Loan	ODA/OOF (Bi/Multi)/IIF
f.				Bond	Foreign Bank
g.			Equity	-	IFC/IIF
h.	Private	Domestic	Debt	Loan	Domestic Bank
i.				Bond	Domestic Insurance Company
j.			Equity	-	Domestic Investing Company
k.		International	Debt	Loan	Foreign Bank
l.				Bond	Foreign Insurance Company
m.			Equity	-	Foreign Investing Company

Source: JICA Study Team

a. Public-Domestic Source

Regarding the “Public-Domestic” source, the first source is the general budget (tax and non-tax revenues). Government’s debt through loans and bonds is often used to cover the budget shortage. The following figure shows the trend of the government’s debt after 2000.



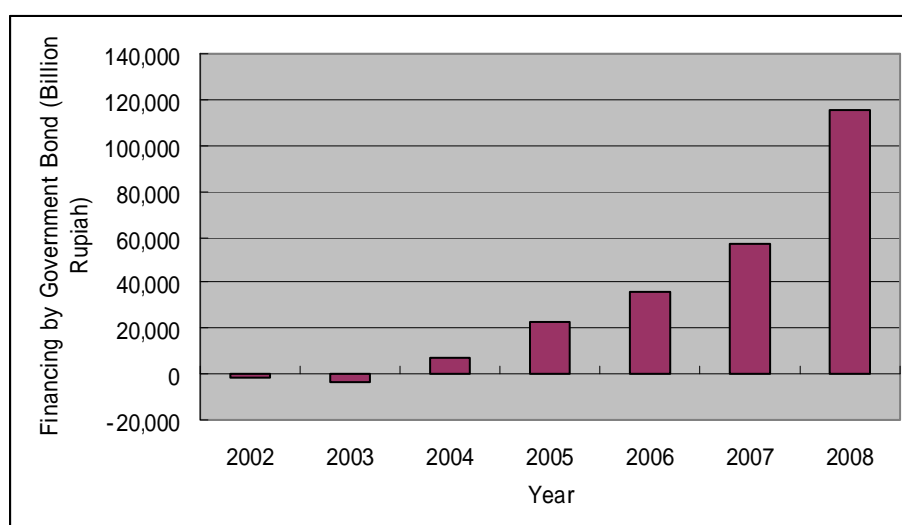
Source: MOF

Figure A2.1.1 Trend of Government Financing (Borrowing)

Increasing the share of domestic financing in total government debt is President Yudhoyono's basic policy and the share of international borrowing is decreasing in recent years¹. In an article from a domestic press, an economist points out that foreign debt is considered by GOI only as the last option to cover deficit².

Along with the above-mentioned Presidential policy, loans from the domestic banks are becoming active in recent years. For example, there is information that twenty three regional banks have signed a commitment to provide a total of Rp. 4.73 trillion in loans to the state electricity company PLN's 10,000 MW electricity program, which consists of 13 coal-fired projects³.

Financing through government bonds is also increasing in recent years as shown in the following figure.



Source: MOF

Figure A2.1.2 Amount of Government Financing through Bond (NET)

It is considered that improvement of the credit rating of Indonesia, which is discussed in Chapter 2, helps to increase the issuance of the national bonds.

b. Public-International Source

The “Public-International” source is classified into grants, debt (loan and bond) and equity. In this source, loan is still a major source of infrastructure funding. It is in the forms of ODA and OOF. The institutions which provide funds can be either bilateral or multilateral agencies. In recent years, GOI tries to procure more funds through bonds in the international market. For example, in April 2009, GOI announced the issuance of Islamic bond and raises US\$ 650 million from the global market. This has two important implications. One is GOI enlarges its option of raising funds through issuance of bonds in the international market. The other is that it adopts the Islamic financing.

Islamic financing is based on interpretations from the Koran. Its two central tenants are “no interest can be earned on loans” and “socially responsible investing”. The key difference from a financial perspective is the “no-interest” rule. Islamic financing method is becoming more popular in Indonesia

¹ This is a quotation from Jakarta Post of June 17, 2009.

² Ibid

³ For details, see Jakarta Post of April 24, 2009.

with a back ground of Middle-East's economic upraise. In June 2009, ADB announced that it has reached an agreement with the Islamic Development Bank (IDB) to set up Asia's first major multi-country Islamic infrastructure fund. It is expected by the organization concerned that this will provide infrastructure investments funds to Asian countries, including Indonesia.

Infrastructure investment funds are also available in the form of equity, which is provided by organizations such as IFC and Indonesia Infrastructure Financing Facility (IIFF). IIFF is an organization which was newly established by GOI in 2009 with supports from several organizations, such as the World Bank and ADB. Under the scheme, IIFF receives funds from international organizations and foreign governments, and provides financial assistance in the form of long-dated debt instruments, equity, or guarantees for infrastructure projects⁴.

GOI has been expanding its portfolio of funding sources, and it will in general decrease the total procurements cost of funds. But still, the role of public-international source is important in that it has following advantages in general:

- Lower interest rates
- Longer grace periods
- Avoidance of market fluctuation risks, e.g. Interest rates, Exchange rates

It will be more and more important to think about the best portfolio of financial source in each project. There is not general theory or rule for infrastructure project financing but GOI needs to seek for best combination of sources for each project. Considering above conditions, "Public-International Source", including ODA, still is one of the attractive sources of finance.

c. Private Source

Regarding the "Private Finance", it is also classified into "Domestic" and "International", and both are further divided into Equity and Debt (Loan and Bond). Regarding the trend of investment, according to Indonesia Investment Coordinating Board (BKPM), direct investments to Indonesia, both domestic and foreign, have been increasing steadily since 1990s⁵. Table A2.1.2 shows the trend in the domestic and foreign direct investments⁶.

⁴ IIFF started operation in May 2009 with 30% of the stakes contributed by the government and the rest coming from the World Bank, ADB and other international financial institutions. In April 2009, ADB approved investment of up to US\$140 million in IIFF to support infrastructure development in Indonesia. ADB provides funds to government-sanctioned infrastructure holding company PT Sarana Multi Infrastruktur (SMI) and the company will relend the loan to IIFF as subordinated debt.

⁵ For details, see BKPM's URL

⁶ These figures show investments for all sectors and are not limited to investments in infrastructure.

Table A2.1.2 Trends of Private Direct Investments in Indonesia

TAHUN / Year	PMDN / Domestic Direct Investment		PMA / Foreign Direct Investment	
	PROYEK / Project	NILAI / Value (Rp. Miliar / Billion)	PROYEK / Project	NILAI / Value (US\$. Juta / Million)
1990	253	2.398,6	100	706,0
1991	265	3.666,1	149	1.059,7
1992	225	5.067,4	155	1.940,9
1993	304	8.286,0	183	5.653,1
1994	582	12.786,9	392	3.771,2
1995	375	11.312,5	287	6.698,4
1996	450	18.609,7	357	4.628,2
1997	345	18.628,8	331	3.473,4
1998	296	16.512,5	412	4.865,7
1999	248	16.286,7	504	8.229,9
2000	300	22.038,0	638	9.877,4
2001	180	9.890,8	454	3.509,4
2002	108	12.500,0	442	3.082,6
2003	120	12.247,0	569	5.445,3
2004	130	15.409,4	548	4.572,7
2005	215	30.724,2	907	8.911,0
2006	162	20.649,0	869	5.991,7
2007	159	34.878,7	982	10.341,4
2008	239	20.363,4	1.138	14.871,4
Jan-Feb 2009	29	2.628,3	176	1.970,9

CATATAN / Note :

1. Diluar Investasi Sektor Minyak & Gas Bumi, Perbankan, Lembaga Keuangan Non Bank, Asuransi, Sewa Guna Usaha, Pertambangan dalam rangka Kontrak Karya, Perjanjian Karya Pengusahaan Pertambangan Batubara, investasi yang pertizinannya dikeluarkan oleh instansi teknis/sektor, Investasi Porto Folio (Pasar Modal) dan Investasi Rumah Tangga / Excluding of Oil & Gas, Banking, Non Bank Financial Institution, Insurance, Leasing, Mining in Terms of Contracts of Work, Coal Mining in Terms of Agreement of Work, Investment which licenses issued by technical/sectoral agency, Porto Folio as well as Household Investment
2. Proyek : Jumlah Izin Usaha Tetap yang dikeluarkan / Projects : Total of Issued Permanent Licenses
3. Data sementara, termasuk Izin Usaha Tetap yang dikeluarkan oleh daerah yang diterima BKPM sampai dengan 25 Februari 2009 / Tentative data, including Permanent Licenses issued by regions received by BKPM until February 26, 2009

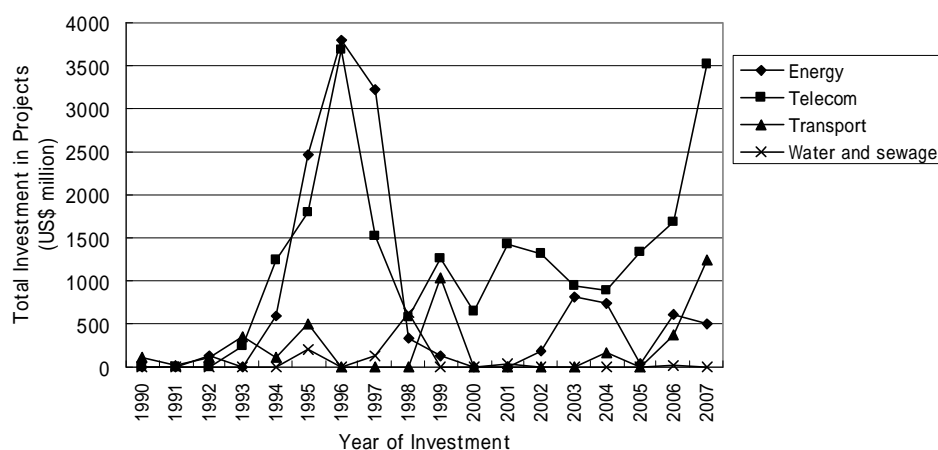
Source: BKPM

As can be seen from the table, both domestic and foreign direct investments have been increasing. Especially, in 2007 and 2008 a sharp increase in foreign direct investment is observed.

In recent years, GOI has greater expectation for direct investments in infrastructure. As mentioned in the Chapter 3, there is a significant gap between the necessary infrastructure investments and available government funds for 2010-2014. According to BAPPENAS's estimate, Rp.1,429 trillion is necessary for the next five years but GOI can only afford 31% or Rp.451 trillion from its budget. The balance of Rp.978 trillion is expected to be covered from private fund. This means, approximately Rp. 200 trillion per year is to be sought from the private investor⁷.

In terms of private investment for infrastructure, its trend of investments in major sectors is shown in Figure A2.1.3.

⁷ For reference, the national expenditure budget of GOI for 2008 is Rp. 989.5 trillion.



Source: The World Bank PPI Database

Figure A2.1.3 Trends of Private Investment in Major Sectors

As can be seen from the figure, investments in the telecom sector have been very active in recent years. Investments in the transport sector have increased since 2005. Investment in the energy sector was very active in the middle of 1990's but became stagnant afterwards. It however recovered in 2001. Slight investment is made in water and sewage. Generally, it is observed that investment in infrastructure is increasing in recent years and this data is consistent with the data of Table A2.1.2, which shows an increasing trend of private direct investment both domestic and international.

A2.1.2 Effective Use of ODA and PPP funds

In this section, combination of ODA and PPP are discussed as reference. Using ODA funds to PPP schemes has advantage because it increases credibility and stability of the project and improves conditions of project financing. Thus, it is recommended to seek for effective combination of ODA and PPP Funds. ODA funds can be used for both conventional and PPP schemes. The following table shows the variety of functions of ODA funds. The abstract of each scheme is explained in Table A2.1.3.

Table A2.1.3 Variety of Function of ODA Funds

Model	Scheme		Construction Fund Used	O&M done by
A.	Conventional		ODA	Public Authority
B.	PPP	O&M	ODA	Private Entity
C.		Lease	ODA	Private Entity
D.		Concession	ODA	Private Entity
E.		BOT "Vertical Split"	ODA+ Private Funds	Private Entity
F.		BOT "Horizontal Split"	ODA + Private Funds	Private Entity
G.		BOT "Pure Private"	Private Funds	Private Entity

Source: JICA Study Team

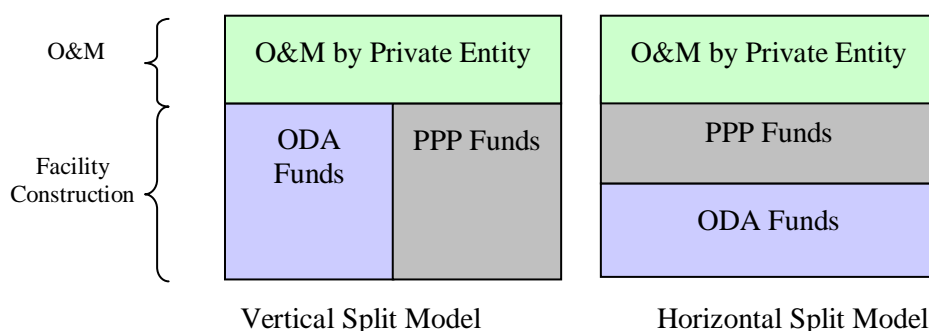
It is important to recognize that there are various combinations of ODA and PPP. In "O&M", "Lease" and "Concession", the project facilities are built with public funds and operated by private entities. In these schemes, ODA funds can be applied. ODA funds can be also applied for BOT "Vertical Split" and BOT "Horizontal Split". "Vertical Split" is one of the PPP schemes in which parts of segment are constructed by public entities and the rest are by private entities. "Horizontal Split" is another PPP

scheme in which, parts of project facilities' structures, are constructed by public entities and the rest of the facilities by private entities, for example, road substructures and superstructure respectively. Since parts of the facilities are built by public funds, ODA funds can be applied for those portions. On the other hands, BOT "Pure Private" is a scheme, in which all project facilities are constructed using private funds. Therefore in this scheme, ODA funds are not applied.

The most appropriate project scheme differs in each project. Project schemes must be decided by taking consideration of the following aspects:

- Scale
- Profitability
- Urgency
- Private Competency
- Project Risk

As a BOT scheme, there are three types of project schemes. These are BOT "Vertical Split", BOT "Horizontal Split", and BOT "Pure Private". In global practice, when ODA funds are used for PPPs, either vertical split or horizontal split model scheme is applied.



Source: JICA Study Team

Figure A2.1.4 Horizontal Split and Vertical Split Model

In Indonesia, the horizontal split model is not adopted because the Law No.17/2003 on state finance does not allow providing grants or subsidies to private entities. Vertical split model meanwhile is adopted in some projects, such as Solo-Kertosono Toll Road project. However, in global practices, it is widely accepted that the governments provide financial supports or grants/subsidies to private entities, which is called "Viability Gap Fund". This has a merit to improve the viability and stability of projects and accelerate private investment for infrastructure development. Thus, it is recommended that GOI considers establishing legal background to provide financial support to private companies who implement PPP projects.