

### 2-1-3 Post-Implementation Stage of Development Studies

This section seeks to clarify the possibility of the development of the projects proposed and established as a result of the implementation of development studies, as described in the previous section.

The development into projects, and secondary effects from the implementation of projects will be assessed, examining the impacts of development studies and considering policy proposals from the development studies.

#### (I) Impact

##### 1) Reflection on Development Policies

The development studies targeted in this evaluation study were implemented to develop the eastern seaboard and have been reflected in policies of the Thai Government over a wide area, including the eastern seaboard. The projects established from the development studies in this evaluation were mainly directed towards actualizing policies for the implementation of projects in line with the national economic and social development plan, rather than being used for the conversion of development policies of the Thai Government. Therefore, in this context, 'development policies' refers particularly to the actualizing policies for the implementation of projects. Assessing development studies from the viewpoint of actualizing the implementation of projects, the process becomes possible to show in simplified form as follows in <sup>7</sup> (see Figure 2-1-1).

When proposals from the M/P are utilized:

- i) The controlling ministry or agency of the counterpart organization, or the counterpart ministry or agency, will prepare a master plan incorporating high-priority project plans from each ministry or agency. In this case, prioritization is with reference to the contents proposed in the M/P.
- ii) Each plan is submitted to a cabinet meeting and, after alignment with the national economic and social development has been confirmed, the plan will be approved.
- iii) After approval has been given by the cabinet meeting, the appropriate ministry or agency will establish an action plan. In this case, the contents proposed in the M/P form the basic plan for implementation.

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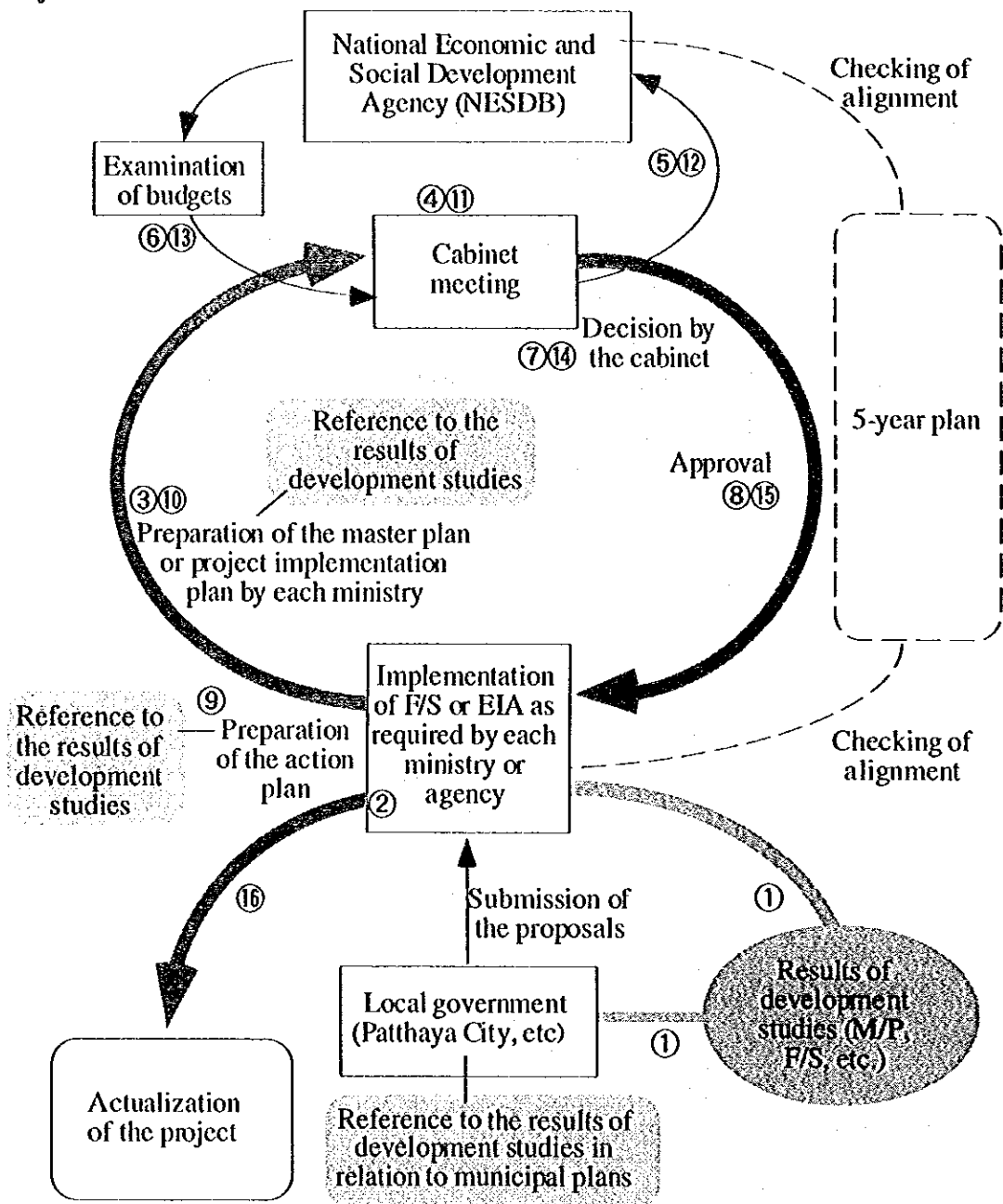
<sup>7</sup> Though the process until the implementation of a project is actually more complex, depending on the ministry or agency and related implementation organization, the diagram is simplified here because the focus is placed on the manner of utilizing the results of the development studies in this context.

- iv) Furthermore F/S and EIA will be implemented, based on the action plan for the formation of the project.

When M/P proposals are utilized:

- i) F/S will often be carried out before the implementation of the plan that has been set as a high-priority item by each ministry or agency. The appropriate ministry or agency will prepare the project implementation plan, based on the plan examined in the F/S and the result of FLA to be implemented as required. Then, the project implementation plan will be approved by a cabinet meeting after alignment with national economic and social development has been confirmed.
- ii) After the approval has been given by the cabinet meeting, the appropriate ministry or agency will begin the actual project.

Figure 2-1-1. Flow of the Results of Development Studies Towards Forming of Projects



Thus, development studies are utilized by each ministry and agency in the formulation of projects. According to the DTEC, generally speaking, the results of development studies by the Japanese team are fully utilized in the formulation of projects. Where they do not form a project, mostly the reason will be problems in the assignment of

budgets on the part of the Thai Government. In any case, the results of development studies by the Japanese team are referred to as data that give clear indications for the formulation of projects when the appropriate ministry or agency selects the project for implementation. There are many such cases where they are ultimately employed in the formulation of projects.

The "Toll Highway Development" project (MP) can be cited as an example of utilization of the results of development studies in the process of forming a project, as described above. In this project, a plan was established for constructing 4,300 km of toll highways throughout Thailand. Based on this project, the Ministry of Transport and Communications prepared a master plan <sup>8</sup> for establishing the toll highway construction plan in order to obtain cabinet approval. The contents of the master plan prepared by this ministry are almost the same as the contents of the plan proposed in the "Toll Highway Development" project, where a toll highway network of 4,150 km out of 4,300 km was proposed as the plan of that ministry. Utilization of the results of development studies can be fully confirmed by the fact that one third of the master plan, over several tens of pages, is occupied by quotations from the final report of JICA. Furthermore, after the plan has been submitted to the cabinet meeting and the necessary approval obtained, an action plan <sup>9</sup> was prepared by the Ministry of Transport and Communications. The action plan shows the implementation schedule for realizing the proposed project.

## **2) Utilization of Development Policies and Plans at Local Level**

There are two types of administrative organizations at local level in Thailand: central government and local government. Central government consists of Provinces, Districts, Sub-districts, and Villages and has a local office on each level <sup>10</sup>. However, local government comprises the Provincial Administrative Organizations (PAOs), Municipalities, Local Administrative Organizations (TAO), Bangkok Metropolitan District (BMA) and Pathaya City. It is said that decentralization of power is promoted in Thailand but, in reality, the power of the central government is still strong.

Local governments in the areas covered by the development studies targeted in this evaluation study include the Leam Chabang Municipality, Map Ta Phut Municipality and Pathaya City. Among these, Leam Chabang Municipality and Map Ta Phut Municipality are not subject to implementation of plans examined and proposed by the development

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<sup>8</sup> DOH, MOTC, Master plan of Inter-City Motorway Construction of Thailand (Government Data), June 1996

<sup>9</sup> DOH, MOTC, Proposed Inter-City Motorway Projects in the Kingdom of Thailand for Privatization, May 1999

<sup>10</sup> Head of Provinces and Districts are appointed by the Ministry of Internal Affairs.

studies.

The “Development Project of the Industrial Port on the Eastern Seaboard” for Map Ta Phut and “Development Project of Leam Chabang Coastal Area” for Leam Chabang consisted mainly of the development of industrial areas and ports with the objective of industrial development, where this development has been promoted mainly by implementation organizations such as the Industrial Area Public Corporation (IEAT), the Port Public Corporation (PAT) and the National Housing Public Corporation (NHA), as well as the appropriate ministry or agency. The Leam Chabang Municipality and Map Ta Phut Municipality did not receive feedback from the development studies after completion and little cooperation can be seen with central government offices, such as those in the Province.

However, Paththaya City received feedback of the results of the development studies from time to time and some officials of that city participated in the implementation of the “Development of Paththaya Area”. According to officials of Paththaya City, the results of development studies are used as the blueprint for the development policy of the city and are also referred to when preparing development plans for the city. Indeed, during the decade since the completion of “Development of Paththaya Area” to the time of this evaluation, Paththaya City has developed projects within the framework proposed in the development studies. Furthermore, Paththaya Area has submitted proposals for securing budgets for high-priority projects to the appropriate ministries and agencies and, as a result, many of the plans proposed have been used in connection with setting up projects.

### **3) Development to Next-Phase Development Studies and Forming of Projects**

#### Next-Phase Development Studies

There are four patterns of development from a plan examined and proposed from the cases in this evaluation study to next-phase development studies:

#### **i) Where M/P develops into F/S or D/D via funding from counterpart government**

“Development of Paththaya Area” is a typical development study that falls into this category. Among the plans proposed in this project, F/S (one case), F/S+D/D (four cases), and M/P+F/S+D/D (one case) have been implemented by funding from the Thai Government. Also in “Toll Highway Development”, two items that developed into F/S have been confirmed.

#### **ii) Where F/S develops into D/D by funding from the counterpart government.**

“Measures to Promote the Container Handling System through Leam Chabang Port” falls into this category. In this instance, however, F/S was implemented again after the completion of development studies and D/D was then implemented. F/S was implemented by the Thai Railway Public Corporation (SRT) to confirm the feasibility of the plan proposed by the JICA.

iii) Development into E/S as the preliminary stage of setting up a project with funding from the JBIC

“Development Project of the Industrial Port on the Eastern Seaboard”, “East Coast Water Resources Development Project”, “East Coast Water Resources Development Project (Phase II)” and “Nong Kho - Leam Chabang Water Pipeline Project” fall into this category. Plans examined and proposed in these development studies became projects after the implementation of E/S with funding from the JBIC (the OECF, at that time). The “Development Project of the Industrial Port on the Eastern Seaboard” formed “Industrial Construction in Map Ta Phut”, etc. after developing into “Eastern Seaboard Development” (E/S), the “East Coast Water Resources Development Project” formed “Nong Brarai Construction Project” after detailed designs for the construction of dams were implemented as part of “Irrigation Development Project” (E/S), the “East Coast Water Resources Development Project (Phase II)” formed “Nong Brarai - Nong Kho Water Pipeline Construction Project” after developing into “Nong Brarai - Nong Kho Water Pipeline Construction Project” (E/S), and the “Nong Kho - Leam Chabang Water Pipeline Project” developed into “Nong Kho - Leam Chabang Water Pipeline Construction Project” after “Nong Kho - Leam Chabang Water Pipeline Construction Project” (E/S) was implemented.

iv) Development into Next-Phase Development Studies by JICA Funding

“Road Development of Central Region”, “Toll Highway Development” and “East Coast Water Resources Development Project” fall into this category. “Road Development of Central Region” (M/P+F/S) was developed into D/D with JICA funding, “Toll Highway Development” developed into “Inter-City Toll Motorway Project” (F/S), which is also a case study in this evaluation, and “East Coast Water Resources Development Project” (F/S) developed into “Dok-Krai - Map Ta Phut Water Pipeline Project in the East Coast Area” (D/D).

**Table 2-1-20. The Next-Phase Development Studies Implemented by Referring to the Results of Development Studies**

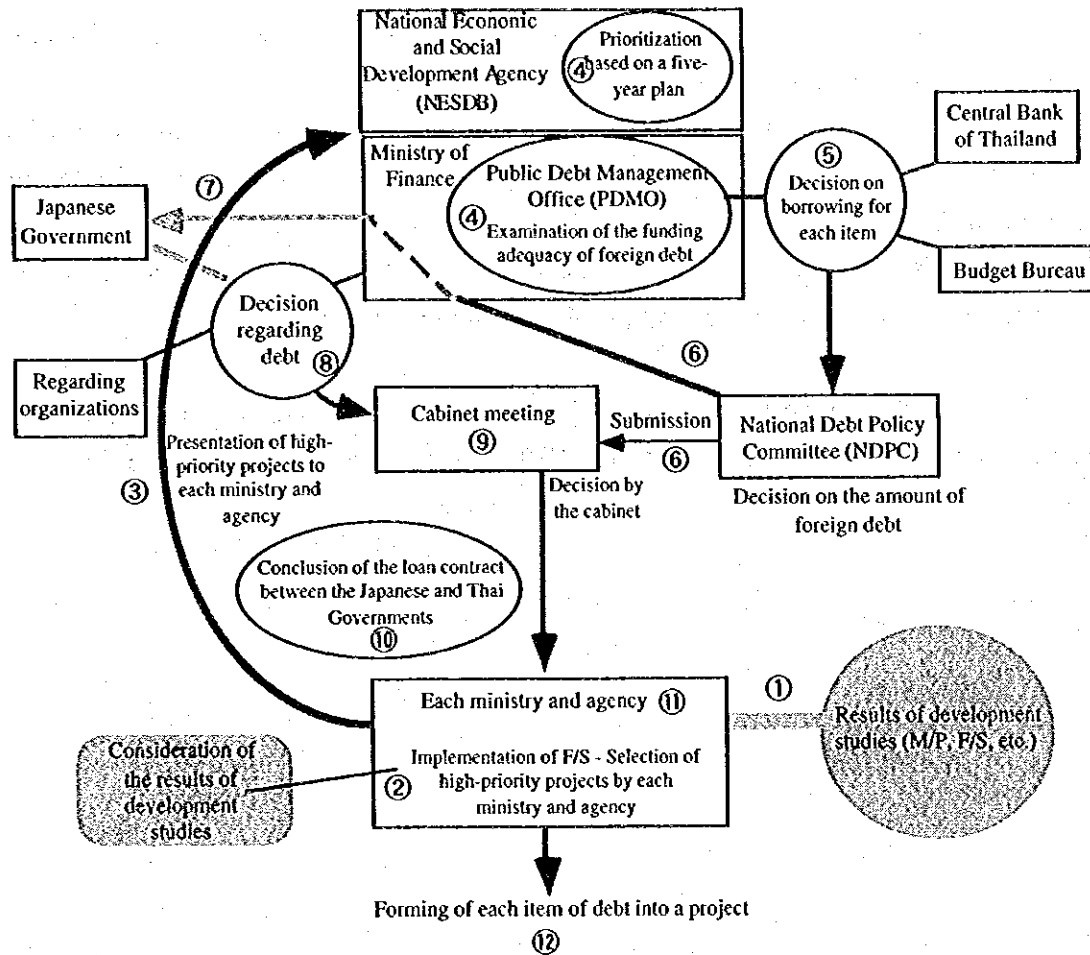
Target	Item	Contents	Year of completion	Source of funding
"Development Project of the Industrial Port on the Eastern Seaboard"	"Eastern Seaboard Development"	E/S on the construction of the Map Ta Phut industrial port and Map Ta Phut industrial area	1986	OECD
"Development of Pattaya Area"	Feasibility Study and Detailed Design on South Pattaya Land Reclamation, Tourist Port, and Pattaya Beach Restriction	F/S, D/D, and EIA of the South Pattaya seaboard reclamation plan, tourist port construction plan and Pattaya beach improvement plan	1994	Thai Government
	Feasibility Study on Pattaya 3 Road	F/S on road development plan	1994	Thai Government
	-	F/S and D/D on the Ta-Van pier	1994	Thai Government
	-	F/S and D/D on sewage plan	Unknown	Thai Government
	-	D/D on water supply plan	1991	Thai Government
	Feasibility Study and Detailed Design on Solid Waste Disposal	M/P, F/S, and D/D on refuse disposal facilities	1994	Thai Government
"Measures to Promote the Container Handling System through Leam Chabang Port"	Feasibility Study for the Development of Inland Container Transport System	F/S and D/D on the construction of an inland container depot	1994	Thai Government
"Road Development of the Central Region"	-	D/D on the development of trunk roads between Rang Bang and Saiket	1997	JICA
"Toll Highway Development"	Inter-City Toll Motorway Project	F/S on toll highways on the Bang Bong-Cham route and Rang Bang-Chemmal route	1995	JICA
	Feasibility Studies on the Outer Bangkok Ring Road (Southern Portion)	F/S on the outer circular road (southern part)	Unknown	Thai Government
	Feasibility Studies on the Bang Yai - Ban-Pong Motorway Project	F/S on the construction of a toll highway between Bang Yai and Bang Bong	Unknown	Thai Government
	-	D/D on the outer circular road (southern part) and Chao Braya route	1998	ADB
"East Coast Water Resources Development Project"	Part of "Irrigation Development Project"	E/S on the construction of the Nong Brarai dam	1982	OECD
	"Dok-Krai-Map Ta Phut Water Pipeline Project in the East Coast Area"	D/D on the construction of a water pipeline between Dok-Krai and Map Ta Phut	1982	JICA
"East Coast Water Resources Development Project"	"Nong Brarai-Nong Kho Water Pipeline Construction Project"	E/S on the construction between the Nong Brarai reservoir and Nong Kho reservoir	1990	OECD
"Nong Kho - Leam Chabang Water Pipeline Project"	"Nong Kho - Leam Chabang Water Pipeline Project"	E/S on the construction of the Nong Kho - Leam Chabang Water Pipeline	1986	OECD

### Forming into projects

The formation of projects from cases evaluated in this study is achieved by funding from either the Thai government, Japan (JBIC loans) or from the private sector. JBIC funding made a large contribution to the formation of eastern seaboard projects, in particular. Therefore, a general view is taken in this section on the process whereby the

results of development studies are connected to the formation of projects by JBIC funding.

Figure 2-1-2. Forming of Projects With Loans From Donor Organizations (in the case of JBIC)



### Results When Development Studies Lead to Projects Via JBIC Funding.

- i) Based on completed development studies, F/S on the items suggested is implemented by the appropriate ministry or agency or the implementation organization on the basis of necessity. A list of items is then submitted to the NESDB and Public Debt Management Office (PDMO).
- ii) In the NESDB, prioritization and coordination among ministries and agencies is implemented according to the five-year plan and, in the PDMO, the adequacy of foreign financing for the relevant items is examined within the restrictions on foreign



- debt set by the NDPC.
- iii) In consultation with the Budget Bureau and the Central Bank of Thailand, the PDMO establishes the borrowing plan for each item and submits it to the NDPC. After approval, the National Debt Policy Committee (NDPC) reports to the cabinet.
  - iv) A request is submitted by the Thai Ministry of Finance to the Japanese Government and surveys for promoting the forming of the items (SAPROF) are implemented by the JBIC as required. Upon receipt of such a request, loan requirements are examined by the Japanese Government and provision is then decided.
  - v) An examination mission is dispatched from Japan, and then loan negotiations take place between the Japanese Government, the Thai Ministry of Finance and relevant organizations.
  - vi) The negotiation content is decided by the Thai cabinet and the loan contract concluded. Items are implemented under the control of the appropriate ministry or agency.

Having followed the above-mentioned process, the plans examined and proposed in the cases studied in this evaluation became JBIC funded projects, as listed in Table 2-1-21.

**Table 2-1-21. JBIC Items Formed into Projects in Connection With Development Studies**

Target of evaluation study	JBIC Items Formed into Projects in Connection With Development Studies	Contract date of loan
Development Project of the Industrial Port on the Eastern Seaboard	Map Tap Phut industrial port construction	1984
	Map Tap Phut industrial port II	1985
	Industrial area	1985
	Satahip - Map Tap Phut railway	1988
	Map Tap Phut industrial port III	1991
Development Project of the Leam Chabang Coastal Area	Leam Chabang commercial port construction project	1984
	Leam Chabang industrial area construction project	1985
	Leam Chabang commercial port construction project II	1986
	Leam Chabang industrial area construction project	1987
	Shiracha - Leam Chabang railway construction project	1988
	Leam Chabang commercial port construction project III	1990
East Coast Water Resources Development Project	Nong Brai construction project I	1988
Dok-Krai - Map Ta Phut Water Pipeline Project in the East Coast Area	Eastern seaboard water pipeline plan * Including the E/S on the Map Ta Phut-Satahip water pipeline project	1982
	Map Ta Phut-Satahip water pipeline project	1988
East Coast Water Resources Development Project (Phase II)	Nong Brarai - Nong Kho water pipeline construction project	1993
Nong Kho - Leam Chabang Water Pipeline Project	Nong Kho - Leam Chabang water pipeline construction project	1985
Road Development in the Central Region	Chon Buri - Pattahaya road construction project	1988
	Chon Buri - Pattahaya road construction project II	1991
	Bangkok - Chon Buri road construction project I	1990
	Bangkok - Chon Buri road construction project II	1993
Toll Highway Development	Eastern Bangkok outer circular road construction project I	1990
	Eastern Bangkok outer circular road construction project II	1993

The outline of all the projects that were actualized in keeping with the framework proposed in the development studies, is shown below (including projects funded by the JBIC (the OECF, at that time) ).

**Table 2-1-22. "Development Project of the Industrial Port on the Eastern Seaboard"**

Projects proposed from the development studies		Results of projects implemented, with reference to the results of development studies	Year of completion	Source of funding
<b>M/P</b>				
Industrial development project	Gas separation plant, soda ash complex, fertilizer complex, iron & steel plant, supporting industries, backward related industries	Industrial area - Premises (241 ha) (Phase II)	1992	Thai Government
Port development project	Volume of cargo: 23 million tons, 45 berths (total length: 5,750 m), breakwaters	Dredging, reclamation, arrangement of berths (Phase II)		Thai Government
Urban development project	A new town - population: 71,000, area: 575 ha, number of households: 17,000	Planning of streets (240 ha) (Phase II)	1992	Thai Government
Basic facilities project	Roads, railways, water supply and sewage, drainage, refuse disposal facilities, power supply and communications facilities	Refer to F/S		
<b>F/S</b>				
Industrial development project	Industrial area - area: 410 ha (petrochemical complex, fertilizer complex, soda complex), wharf wall: 820 m	(Part of Phase I planned by the Thai Government) Industrial area - Premises (38 ha) and related infrastructure	1990	OEFC Thai Government
		Rest of the total area of industrial area in Phase I (655 ha)	1991	Thai Government
Port development project	Wharf wall: 850 m, wharf: 280 m, breakwater: 3,000 m, length of berth: 1,750 m, yearly volume of cargo: 400 tons	(Part of Phase I planned by the Thai Government) Breakwater, shore protection, dredging, reclamation, berth, nautical marks, etc., reclamation of industrial land, equipment and materials (tugboats, crane) (Phase I)	1992 1994 (procurement of equipment and materials)	OEFC Thai Government
		Berth for fertilizer (expansion of Phase I)	-	Private Fund
Urban development project	Area: 131 ha, population: 18,000, number of households: 4,800	(Part of Phase I planned by the Thai Government) Planning of streets (40 ha), independent residences, apartment houses, commercial properties	1990 (Planning of streets)	OEFC Thai Government
		Rest of the total area of industrial area in Phase I (80 ha)	1991	Thai Government
Basic facilities project	Roads, railways (Extension: 24 km, yearly volume of cargo transport: 2 million tons), water supply and sewage, drainage, refuse disposal facilities, power supply (total demand: 133.5 MW), telephone lines: 3000	Roads, water supply and sewage, rain water drainage, substation facilities, power transmission lines, etc.	1992	OEFC Thai Government
		Railways (Satáhip - Map Ta Phut railway)	1997	

**Table 2-1-23. "Development Project of Leam Chabang Coastal Area"**

Projects proposed from the development studies		Results of projects implemented with reference to the results of development studies	Year of completion	Source of finding
<b>M/P (Long-term plans until 2001)</b>				
Industrial development	Industrial area: 2,100 rai, export-orientated goods manufacturing area: 700 rai (1 rai = 1,600 m <sup>2</sup> )	Industrial area: 104 ha (648 rai)	1996	OECF Thai Government
Port development	16 berths, wharf: 1,100 m, wharf area: 258 ha, length of breakwater: 3,070 m	Expansion of berths (Phase II)	Completion planned for 2012	Thai Government
Urban development	Residential area - planned population: 120,000, planned area: 930 ha	Refer to F/S		
Transport plan	Inter-city trunk roads, intra-city trunk roads, auxiliary trunk roads, block-dividing streets, small streets, connecting roads	Refer to F/S		
Basic public facilities	Water supply and sewage, drainage, refuse disposal facilities, power supply (substations), communications facilities, land reclamation (banking bases: 3 million m <sup>3</sup> )	Refer to F/S		
<b>F/S (Short-term plans until 1991)</b>				
Industrial development	Industrial area: 219 ha	Industrial area: 465 ha (2,908 rai)	1991	OECF Thai Government
Port development	6 berths, wharf: 280 m, wharf area: 116 ha, length of breakwater: 2,400 m	Dredging, reclamation, waterbreak/shore protection, berth, other equipment and materials (Phase I)	1991	OECF Thai Government Private funding
Urban development	Residential area - planned population: 24,000, planned area: 130 ha	Independent residences, apartment houses, commercial properties		Thai Government
Transport plan	Intra-city trunk roads, auxiliary trunk roads, block-dividing streets, small streets, connecting roads	Block-dividing streets, small streets, connecting roads	1991	OECF Thai Government
Basic public facilities	Water supply and sewage, drainage, refuse disposal facilities, power supply (total demand: 88.5 MW), number of telex terminals: 32, land reclamation, etc.	Water supply and sewage, refuse disposal facilities, drainage, etc.	1991	OECF Thai Government

**Table 2-1-24. "Development of Patthaya Area"**

Projects proposed from the development studies		Results of projects implemented with reference to the results of development studies	Year of completion	Source of funding
M/P (until 1996)				
South Patthaya seaboard reclamation project	Reclamation project with a total area of 19 ha	Reclamation of 18 rai, pier - 1		Thai Government
Tourist port construction project	Construction of the pier for tourists, terminal building, pier for high-speed boats and boat yard	Not yet underway		Thai Government
Improvement of the Patthaya beach	Beach expansion project	Not yet underway		Thai Government
Ta-Van pier	Construction of a pier beside the TaVan beach on the Ko Lan Island	Implemented by changing the site	1994	Thai Government
Sewage arrangement project	Emergency arrangement projects in the Na Klua district and Jomitien district and expansion of existing facilities in the urban area of Patthaya	Sewage facilities	Completion planned for the end of 2000	Thai Government
Rain water drainage project	conservation of rivers and arrangement of water collecting facilities	Roads and drainage facilities	1995	Thai Government
Water supply project	Raw water pipeline, pump plant, filtration plant, waste water treatment facility	water pipeline, filtration plant, water distribution facilities		Thai Government
Refuse disposal facility project	Sanitary arrangement of the reclaimed land, construction of final disposal facility	Sanitary arrangement of the reclaimed land, incineration plants	Completion planned for the end of 2000	Thai Government
Road arrangement project	Expansion and arrangement of Patthaya 3 Roads	Expansion and arrangement of Patthaya 3 Roads		Thai Government

**Table 2-1-25. "Establishment of a Large Repair Shipyard"**

Projects proposed from the development studies		Results of the projects implemented with reference to the results of development studies	Year of completion	Source of funding
F/S				
Dry dock	175 m x 28 m x 11.1 m, premise: reclamation with an area of 300 m x 300 m = 90,000 m <sup>2</sup> , mooring wall: 150 m	Floating dock	1994	Private funding

**Table 2-1-26. "Measures to Promote the Container Handling System through Leam Chabang Port"**

Projects proposed from the development studies		Results of projects implemented with reference to the results of development studies	Year of completion	Source of funding
M/P (target year = 1996 (short term), 2001 (long term))				
Construction of ICDs (Long term)	6 ICDs (300 rai)	6 ICDs including Central Freight System (CFS), branch line of railway, etc.	1995	Thai Government
Of the above, first-phase plan (short term)	4 ICDs (container freight station, container yard, loading-unloading equipment, parking area, container gate, management office building, maintenance shop), branch line of railway, management zone (main office: 1,200 m <sup>2</sup> , over-time cargo warehouse: 2,100 m <sup>2</sup> ) (200 rai)			

**Table 2-1-27. "East Coast Water Resources Development Project"**

Projects proposed from the development studies		Results of projects implemented with reference to the results of development studies	Year of completion	Source of funding
F/S				
Nong Burai sub-project				
Reservoir and dam	Water storage (irrigation area) 23.0 m <sup>2</sup> , total storage capacity: 200,700,000 m <sup>3</sup>	Irrigation area: 220.9 m <sup>2</sup> , total storage capacity: 151,200,000 m <sup>3</sup>	1993	*OECF Thai Government
Water pipelines	Between Dok-Krai and Map Ta Phut, between Map Ta Phut and Satahip, between Dok-Krai and Leam Chabang	1) Between Dok-Krai and Map Ta Phut (East Coast Pipeline Construction Implementation Plan, 2) Between Map Ta Phut and Satahip	1) 1984 2) 1993	*OECF Thai Government
Irrigation and drainage systems	Irrigation area: 3,600 ha, extension of irrigation channel: trunk channel, - 46.2 km, branch			
Ban Bun sub-project				
Reservoir and dam	Accumulation area: 53 m <sup>2</sup> , total storage capacity: 21,900,000 m <sup>3</sup>			

**Table 2-1-28. "East Coast Water Resources Development Project" (Phase II)**

Projects proposed from the development studies		Results of projects implemented with reference to the results of development studies	Year of completion	Source of funding
F/S				
Kron Ruan	Multi-purpose dam, water pipeline between the dam and Chon Buri, irrigation drainage facilities			
Kron Yai	Multi-purpose dam, water pipeline between the Nong Burai dam and the Nong-Kho dam, irrigation drainage facilities	Water pipeline between the Nong Burai dam and the Nong-Kho dam	1997	*OECF Thai Government
Kron Tap Ma	Multi-purpose dam, irrigation drainage facilities			

**Table 2-1-29. "Dok-Krai - Map Ta Phut Water Pipeline Project in the East Coast Area"**

Projects proposed from the development studies		Results of projects implemented with reference to the results of development studies	Year of completion	Source of funding
D/D				
Between Dok-Krai and Map Ta Phut	Intake facility, pipeline, header tank, reservoir	Water pipeline between Dok-Krai and Map Ta Phut, other accessory facilities	1984	Thai Government

**Table 2-1-30. "Nong Kho - Leam Chabang Water Pipeline Project"**

Projects proposed from the development studies		Results of projects implemented with reference to the results of development studies	Year of completion	Source of funding
F/S				
Water pipeline	Between Nong Kho and the turnout and between the turnout and water receiving well	Water pipeline between Nong Kho and Leam Chabang (Phase I & II)	1989(PI) 1998(PII)	Thai Government
Turnout	Water conveying pipe, gate valve			
Pipe beam	27.5 x 900 mm			
Water receiving well	63.3 (W) x 4.4. (H) x 16.4 (L)			

**Table 2-1-31. "Road Development of the Central Region"**

Projects proposed out from development studies		Results of projects implemented with reference to the results of development studies	Year of completion	Source of funding
M/P				
Trunk road network	8 links, 288.8 km	8 links *(Including Chon Buri - Patthaya road)	-	Thai Government *(OECF)
Auxiliary road network	33 links, 718.2 km	23 links	-	Thai Government
Repair project	8 links, 206.8 km	8 links	-	Thai Government
Improvement of crossings	48 points	-	-	-
F/S				
Trunk road network	7 links, 320.3 km (6 links: proposed in M/P, 1 link: examined in F/S)	6 links are included in the above mentioned M/P. * Bangkok - Chon Buri road newly added in F/S.	*1998	*OECF Thai Government
Auxiliary road network	11 links, 297.2 km	Included in M/P		
Repair project	3 links, 96.7 km	Included in M/P		

**Table 2-1-32. "Toll Highway Development"**

Projects proposed from the development studies		Results of projects implemented with reference to the results of development studies	Year of completion	Source of funding
M/P				
1st phase (1991 to 1995)	900 km (Chon Buri - Patthaya, Patthaya - Map Ta Phut)	(Implementation is being planned.)	-	-
2nd phase (1996 to 2000)	1,000 km		-	-
3rd phase (2001 to 2010)	2,400 km (Saraburi - Bang Bakon, Chon Buri - Nakong Rachashima)	(Implementation is being planned.)	-	-

**Table 2-1-33. "Inter-City Toll Motorway Project"**

Projects proposed from the development studies		Results of projects implemented with reference to the results of development studies	Year of completion	Source of funding
F/S				
Between Rang Bang and Dosaiket	5 interchanges, 2 tunnels, 30 bridges, 35 elevated bridges	*This project has no direct connection with the eastern seaboard.		
Between Bang Bong and Chaam	8 interchange junctions, 111 bridges, 21 elevated bridges	*This project has no direct connection with the eastern seaboard.		

**Table 2-1-34 "Effective Port Management and Operation System"**

Projects proposed from the development studies	Results of the projects implemented with reference to the results of development studies	Year of completion	Source of funding
Development studies on management systems of ports	Used as manuals.		
Proposal of basic principles for the management and operation of ports			
Proposal of a basic framework for the administration of ports			
Concrete proposals on the management system for international ports			
Proposal on the review of legislation on ports			
Proposals for improvement of loading-unloading methods			

#### 4) Impact on the Eastern Seaboard

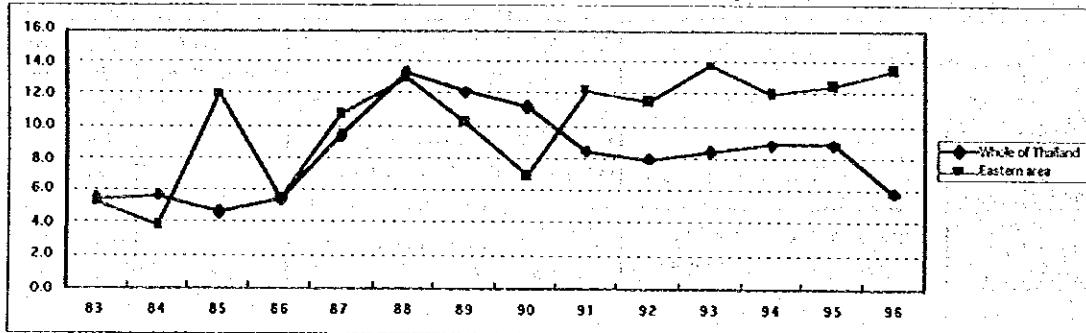
##### Stimulation of Economic Activity in the Eastern Seaboard

Since the Eastern Seaboard Development Project began in 1982, as industrialization has been promoted, development has been remarkable. So far, the eastern seaboard has grown to the extent that it is the second largest base for economic activity, next to Bangkok.



Development studies were implemented convergently in the eastern seaboard from 1981 to 1990. Thereafter, plans proposed were utilized when most of them were developed into projects through funding by the Thai Government or Japanese funding. After the Plaza Accord in 1985, the formation of projects was spurred on by increased expectations of economic activity, due to the promotion of foreign investment. In addition, in the 1990s, related infrastructure, including industrial ports and industrial areas, began to be arranged. Since then, economic activity in the eastern seaboard has continued with a high rate of growth.

Figure 2-1-3. Substantial Growth Rate of GDP (at 1988 prices)



The figure shows the substantial transition of rates of GDP growth in the whole of Thailand and the eastern area. Since 1991 the growth rate of GDP in the eastern area has exceeded the growth rate in the whole of Thailand.

Additionally, the figure below compares the rate of growth of GDP during the 15-year period from 1982 to 1996 in the whole of Thailand, the eastern area<sup>11</sup>, and the Chun Buri and Rayong Provinces, which were covered principally by the development studies looked at in this evaluation.

The figure shows that the average growth rate of the eastern area, from 1982 to 1996 inclusive, exceeded that of the whole of Thailand. When looking at the average over periods of five years, it can be seen that, while Rayong Province has achieved high rates of growth since 1982, growth in Chung Buri Province occurred from 1992 to 1996.

<sup>11</sup> The Eastern area contains a total of eight provinces: Chonhaburi, Chachoengsao, Trat, Nakhon, Nayok and Prachin Buir provinces, as well as Chon Buri and Rayong provinces.

**Table 2-1-35. Substantial Growth Rate of GDP (at 1988 prices)**

	Average of 15 years (1982 to 1996)	Average of 5 years (1982 to 1986)	Average of 5 years (1987 to 1991)	Average of 5 years (1992 to 1996)
Whole of Thailand	8.1	5.4	10.9	8.0
Eastern area	10.5	8.2	10.7	12.7
Chon Buri Province	10.0	6.4	9.7	13.9
Rayong Province	18.0	19.6	12.4	22.0

Prepared using data from the National Statistical Office (OSO)

Looking at the substantial growth rate of GDP in the manufacturing sector shown in the table below, in terms of the five-year average from 1987 to 1991 and from 1992 to 1996, the growth rate of GDP in the manufacturing sector has exceeded the growth rates of GDP shown in the table above in all categories for the whole of Thailand, eastern area, Chon Buri Province and Rayong Province. This means that the added value produced by the manufacturing sector pushes up the growth of GDP. Furthermore, it can be seen that Rayong Province, in particular, contributed remarkably to the growth of GDP of the relevant area in terms of the three averaged five-year periods (1982 to 1986, 1987 to 1991, and 1992 to 1996), and in Chon Buri Province, in terms of the average over the period from 1992 to 1996.

**Table 2-1-36. Substantial growth Rate of Added Value in the Manufacturing Sector (at 1988 prices)**

	Average of 15 years (1982 to 1996)	Average of 5 years (1982 to 1986)	Average of 5 years (1987 to 1991)	Average of 5 years (1992 to 1996)
Whole of Thailand	10.4	5.0	15.1	11.0
Eastern area	18.6	8.4	13.5	20.8
Chon Buri Province	11.3	8.0	12.0	21.1
Rayong Province	35.3	13.5	31.7	42.5

Prepared using data from the National Statistical Office (OSO).

Furthermore, when looking into the mining sector from a similar viewpoint to the above, the average over the period of 15 years shows that the growth rate of added value is remarkably high in Rayong Province, in particular. This pushes up the growth of GDP in Rayong Province greatly. Furthermore, it has largely contributed to the growth of GDP in the mining sector for the whole eastern area.

**Table 2-1-37. Substantial Growth rate of Added Value in the Mining Sector (at 1988 prices )**

	Average of 15 years (1982 to 1996)	Average of 5 years (1982 to 1986)	Average of 5 years (1987 to 1991)	Average of 5 years (1992 to 1996)
Whole of Thailand	13.2	22.0	10.9	7.9
Eastern area	31.6	73.6	12.2	8.1
Chon Buri Province	7.8	4.5	22.3	-2.8
Rayong Province	38.0	92.6	12.2	8.3

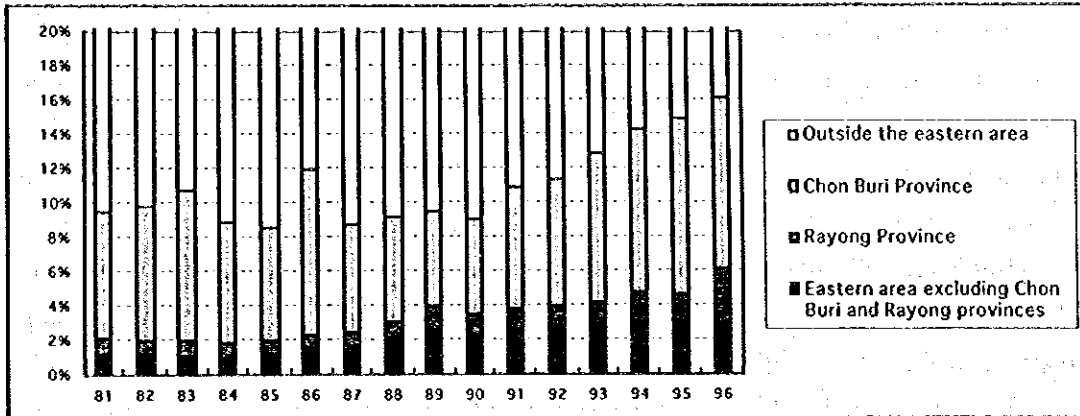
Prepared using data from the National Statistical Office (OSO).

### **Contribution to the Thai Economy of the Manufacturing and Mining Sectors in Chon Buri and Rayong Provinces**

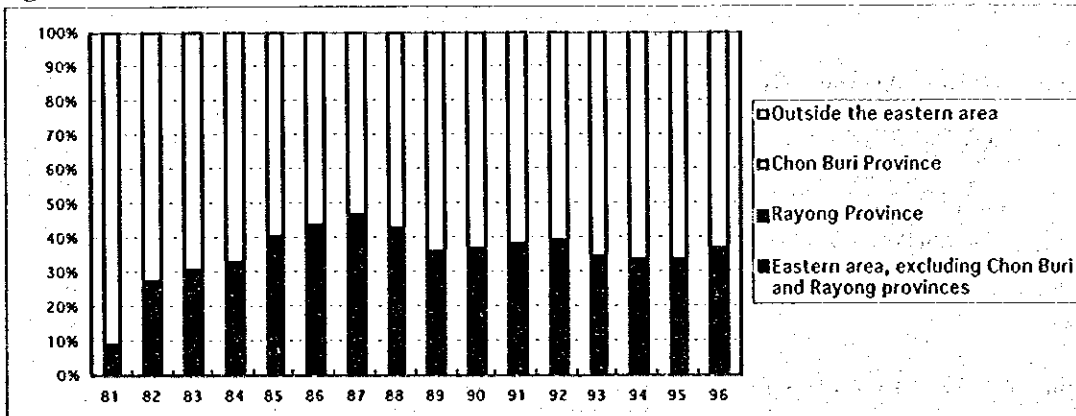
When examining the added value contributed by the manufacturing and mining sectors in Chon Buri and Rayong provinces, it can be seen that in general, Chon Buri Province makes a higher contribution in the manufacturing sector and Rayong Province in the mining sector.

Year on year, Chon Buri Province has increased its contribution to the manufacturing sector of Thailand since 1990. According to data from the National Statistical Office (OSO), while the contribution of the manufacturing sector in Chon Buri Province accounted for approximately 6% of total added value in 1980, this had increased to 10% by 1996. The development of the Leam Chabang port and Leam Chabang industrial area, the implementation of a series of water resource development studies to meet the demand for water in the eastern seaboard and investment in the upgrading of common roads largely contributed to the industrial development in this province.

**Figure 2-1-4. Rates of Contribution to Added Value in the Manufacturing Sector in Thailand**



**Figure 2-1-5. Rates of Contribution to Added Value of the Mining Sector in Thailand**



Rayong Province has consistently contributed to the mining sector of Thailand since the mid-1980s as a result of the promotion of natural gas development from the beginning of the 1980s, after the discovery of natural gas resources in 1973. Natural gas production for the whole of Thailand is based at Map Ta Phut and it has also contributed to the development of the petrochemical complex that utilizes this natural gas. Consequently, this district is already playing a core role within the petrochemical industry.

Map Ta Phut was positioned as a base for heavy industries, including the petrochemical industry, at the beginning of the 1980s. The studies for water resource development and for the construction of Map Ta Phut port and industrial area, which have since been implemented, and the additional projects implemented as a result of these development studies, have all contributed greatly to this area.

### Expansion of Private Investment

Private sector investment greatly influenced the development of the manufacturing

and mining industries in Chon Buri and Rayong provinces. According to the Eastern Seaboard Development Committee (OESB), the amount of initial investment input during the Eastern Seaboard Development Project Phase I (1984 to 1994) was approximately 1.26 trillion yen (420 billion Bahts), 310 billion yen (104 billion Bahts) of which was invested by the public sector and approximately 950 billion yen (316 billion Bahts) was private sector investment. Of the public sector investment, 70% was for infrastructure in general, 18% was for port projects and 12% for other projects.

However, investment by the private sector was mainly in the industrial area, including that for other purposes, such as the construction of hotels. When examining private sector investment, it can be seen that while the increase in the number of enterprises over the whole of Thailand was higher than that in Chon Buri Province or Rayong Province during the 1980s, this relationship reversed during the 1990s.

**Table 2-1-38. Average Growth Rate of the Number of Enterprises**

	1981 to 1989	1991 to 1998
Whole of Thailand	11.9	6.6
Eastern area	9.3	9.8
Chon Buri Province	7.3	11.4
Rayong Province	8.8	11.3

Prepared using data from the National Statistical Office (OSO).

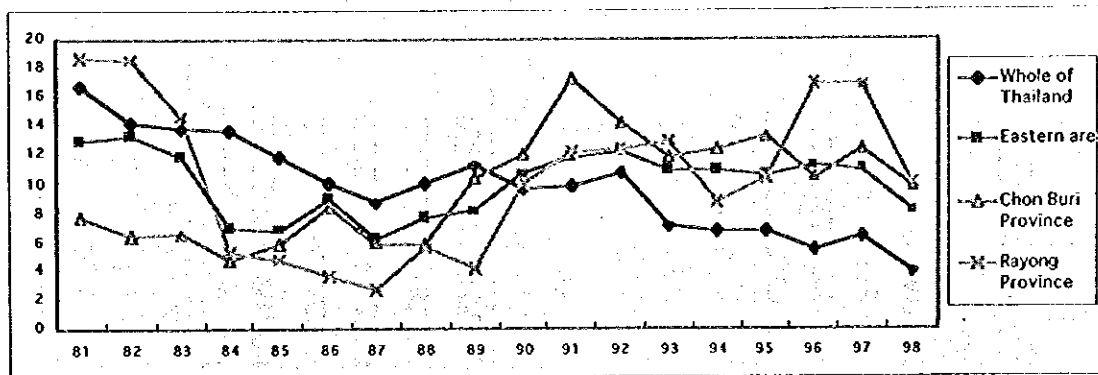
**Table 2-1-39. Increase in the Number of enterprises**

	80	85	90	95
Whole of Thailand	22914	44095	70467	104197
Eastern area	1213	1976	2938	4998
Chon Buri Province	339	457	684	1300
Rayong Province	209	372	477	814

Same as above

The figure below shows the transition in the growth of the number of enterprises. This figure shows that while the growth of the number of enterprises over the whole of Thailand was negative after 1981, the number in Chon Buri Province and Rayong Province shows an increasing trend since 1987, exceeding the growth rate in the number of enterprises over the whole of Thailand.

Figure 2-1-6. Transition in the Growth Rate of the Number of Enterprises



Data: Same as above.

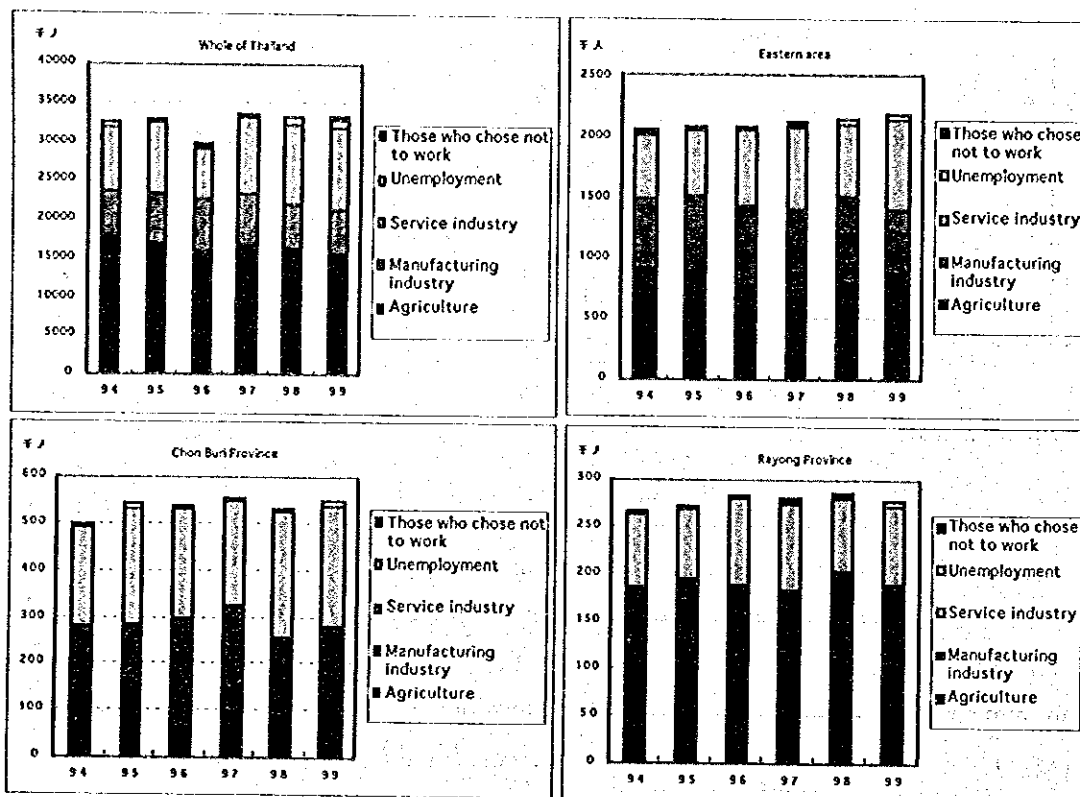
### Creation of Opportunities for Employment

In the eastern seaboard, new opportunities for employment were created as the number of enterprises increased. According to the OESB, the number of opportunities for employment created by the Eastern Seaboard Development Project (Phase I) was 460,000. It is said that opportunities for employment increased in the service industry, in particular, as well as in manufacturing industry, as a result of the progress of industrialization by the Eastern Seaboard Development Project.

The figure below shows the breakdown of labor population in recent years in the Whole of Thailand, the eastern area, Chon Buri Province and Rayong Province. This figure shows that while the ratio of workers engaged in agriculture to the labor population of the whole of Thailand is approximately 50-60%, the proportion is 30-40% in the eastern area.

When examining the breakdown of labor population at provincial level, the proportion of the population in the manufacturing and service industries is overwhelmingly large in Chon Buri Province, in particular. This is because investment was actively undertaken, mainly in the manufacturing industry, so the number of enterprises increased accordingly and the needs of the service industry grew in with the activation of the local economy.

Figure 2-1-7. Breakdown of Labor Population



Data: Same as above.

The fact that the labor population in the Chon Buri and Rayong provinces consists mainly of those engaged in the manufacturing and service industries can also be verified from the following viewpoint. The table below shows the unemployment rates during the quiet and busy seasons for farmers in the whole of Thailand, the eastern area, Chon Buri Province, and Rayong Province. This table shows that the unemployment rate is higher during the quiet season for farmers both in the whole of Thailand and the whole eastern area. On the other hand, this table shows that the unemployment rate in the Chon Buri and Rayong provinces is not affected by either the quiet or busy seasons for farmers. It is considered that this is because the labor populations in the Chon Buri and Rayong provinces are employed mainly in the manufacturing and service industries.

**Table 2-1-40. Unemployment Rate in Recent Years During the Quiet and Busy Seasons for Farmers**

Unemployment % rate (in the quiet season - Feb.)

	94	95	96	97	98	99
Whole of Thailand	4.0	2.3	2.0	2.2	4.6	5.2
Whole eastern area	9.9	12.8	9.6	11.8	16.9	21.8
Chon Buri Province	2.1	2.0	1.1	1.2	0.9	2.0
Rayong Province	0.2	0.9	1.5	1.9	1.8	3.3

Unemployment % rate (in the busy season - Aug.)

	94	95	96	97	98	99
Whole of Thailand	1.3	1.1	1.1	0.9	3.4	3.0
Whole eastern area	1.3	0.9	0.7	1.0	2.2	2.0
Chon Buri Province	1.6	2.3	0.3	0.8	1.2	1.8
Rayong Province	1.2	0.9	1.3	1.0	1.2	2.5

Prepared using data from the National Statistical Office (OSO).

### **Impact on Map Ta Phut, Leam Chabang, and Patthaya**

This section explores the impact of the Eastern Seaboard Development Project on Map Ta Phut and Leam Chabang, on which most importance was placed. This section also examines Patthaya, to illustrate the impact on a particular area.

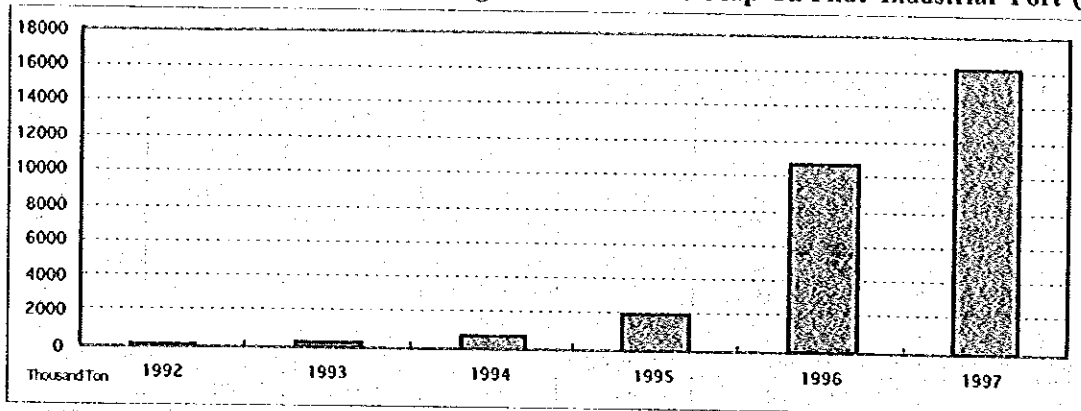
#### Map Ta Phut

The "Development Project of the Industrial Port on the Eastern Seaboard", as one of the cases in this evaluation study, was examined in terms of the development of the related infrastructure in the Map Ta Phut district, including the industrial port and industrial area. Plans for the industrial port and industrial area were developed into projects with funding from Japan (Yen loans) and Thailand (refer to Table 2-1-22) after being subject to examination by the government. After the completion of the project by yen loan funding, expansion of the berths in the Map Ta Phut industrial port, as well as expansion of the industrial area, are still being promoted by the Thai Government.

The figure below shows the changes in the volume of cargo handled by the Map Ta Phut port since its completion in 1992. The annual volume of cargo handled reached 16,233 thousand tons by 1997. It has increased in pace with the increase in the number of enterprises siting in the Map Ta Phut industrial area.

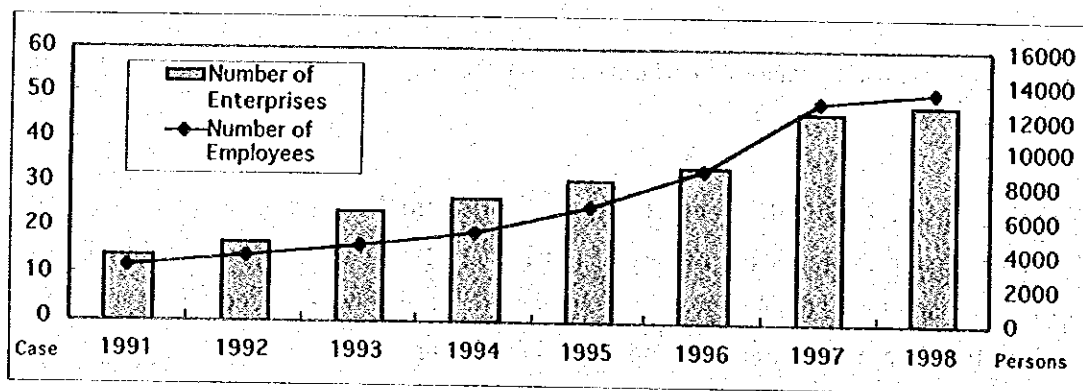


Figure 2-1-8. Annual Volume of Cargo Handled in the Map Ta Phut Industrial Port (t)



Based on IETA data.

Figure 2-1-9. The Number of Enterprises and Employees in the Map Ta Phut Industrial Area



Data: Same as above

The figure above shows the numbers of enterprises and employees in the Map Ta Phut industrial area. The number of enterprises in the area has increased year on year in the Map Ta Phut industrial area and new opportunities for employment have also been created.

As described previously, because Map Ta Phut has, since the beginning of the 1980s, been positioned as the base for heavy industries that utilize the natural gas in the Siam Bay, the make-up of the enterprises sited in the Map Ta Phut industrial area is as follows: petrochemical (approximately 40%), steel-making (approximately 15%), chemical/fertilizer (approximately 15%), oil refining (approximately 5%) and electricity/gas-related industries (approximately 10%).

## Leam Chabang

The "Development Project of Leam Chabang Coastal Area" has played a significant part in the industrial development of Leam Chabang. The development of related infrastructure, including the industrial port and industrial area in the Leam Chabang district was examined. As in the case of industrial development in Map Ta Phut, plans proposed for the industrial port and industrial area were developed into projects by funding from Japan (Yen loans) and Thailand (Table 2-1-2-23), after being subjected to examination by the government.

In addition, both the "Establishment of a Large Repair Shipyard," which examined the arrangement of the repair shipyard in the Leam Chabang port, and "Measures to Promote the Container Handling System through Leam Chabang Port", which examined the construction of an inland container depot (ICD), have been developed into projects (Table 2-1-25 and 26), and are considered to have contributed indirectly to Leam Chabang.

Figures 2-1-10 to 2-1-12 show comparisons of the usage of Bangkok port and Leam Chabang port with regard to the volume of cargo handled, number of containers handled and the number of calls for vessels. According to these figures, it is obvious that while the frequency of use of Bangkok port has been in a decreasing trend since 1994, Leam Chabang port is, contrastingly, in an increasing trend. Leam Chabang port has a vessel accepting capacity larger than that of Bangkok port - for example, while Leam Chabang port can accept vessels with a draft of up to 13 m and a hull length of up to 300 m, Bangkok port can only accept vessels with a draft of up to 8 m and a hull length of up to 170 m.

It is considered that the frequency of use of Leam Chabang port increased partly due to such a large gap in accepting capacity. Thus, the construction of Leam Chabang port is contributing to the alleviation of congestion in Bangkok port. According to the authorities concerned, it seems that use of Leam Chabang port will increase in the future and the predicted total number of containers handled for import and export will reach 2.1 million TEUs<sup>12</sup> in 2000. Incidentally, the large size of the port can be confirmed by comparing Leam Chabang with Japanese ports, since the number of containers handled by Yokohama port is approximately 2.2 million TEUs; Kobe port, 2.0 million TEUs and Nagoya port, 1.5 million TEUs<sup>13</sup>.

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<sup>12</sup> TEU is the unit of measure for containers: 1 TEU = a container with a length of 20 ft.

<sup>13</sup> Information based on a Japanese expert in port management.

Figure 2-1-10. Volume of Cargo Handled in the Bangkok and Leam Chabang Ports (t)

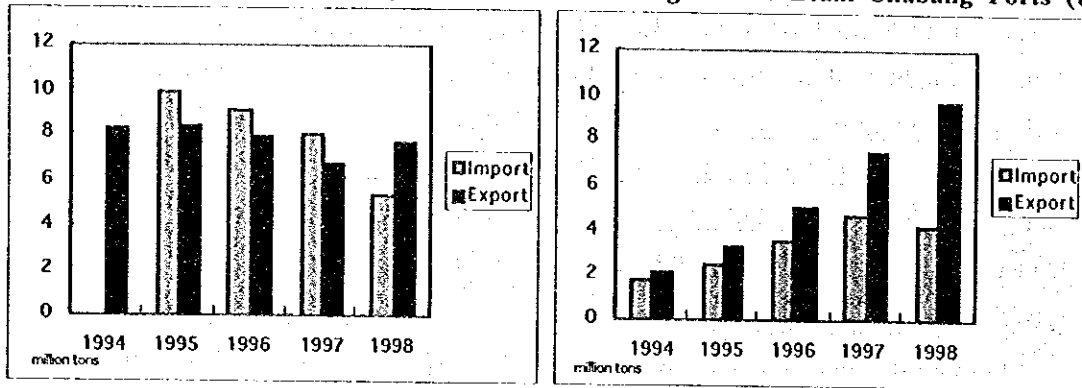


Figure 2-1-11. Container handling volumes in the Bangkok and Leam Chabang ports (TEU)

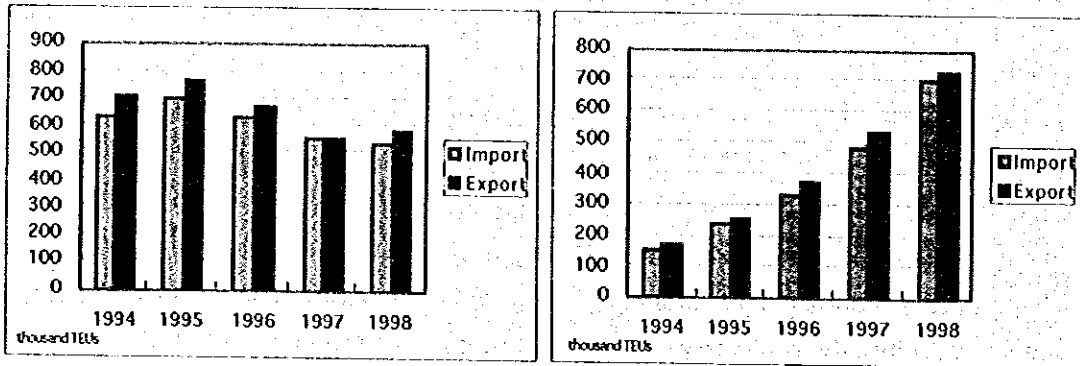
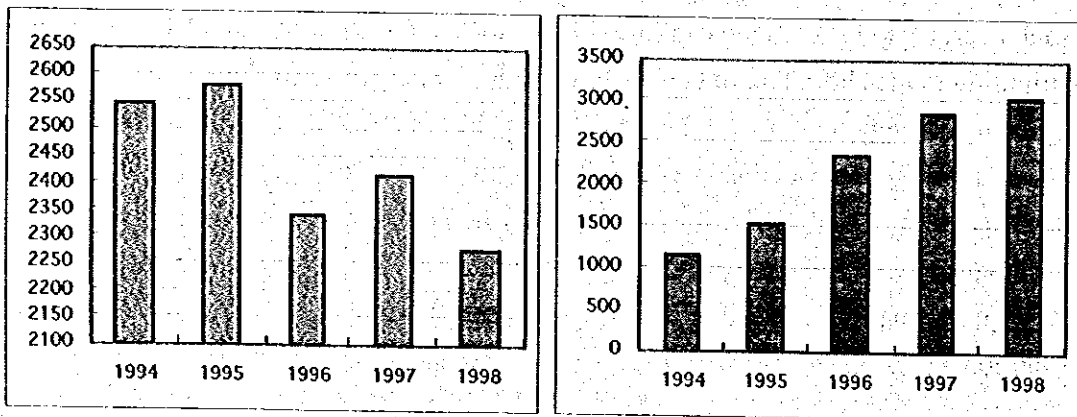


Figure 2-1-12. Number of Calls of Vessels in the Bangkok and Leam Chabang ports (Calls)



Figures 2-1-10 to 2-1-12 are based on PAT data.

According to the IEAT, use of the Leam Chabang industrial area is also good, with almost all divisions of the area already occupied or contracted (approximately 100

enterprises, as of 1997). More than 30,000 employment opportunities were created. Most of the enterprises sited in the Leam Chabang industrial area are in the categories of electronic devices, automobile assembly, automotive parts and electric products and they are contributing greatly to the development of Leam Chabang as a base for export-orientated manufacturing industries.

In the Chon Buri Province, industrial areas under the control of IETA, such as the Chon Buri industrial area and the personal computer industrial area and other private industrial areas, are established. Furthermore, in these industrial areas, export-orientated industries such as automotive parts, electric parts and electronic devices have accumulated.

Thus, a series of projects, including commercial ports and industrial areas that were implemented as a result of the development studies for the industrialization of Leam Chabang, induced an accumulation of manufacturing industries in Leam Chabang. While Map Ta Phut is the base for heavy industry such as petrochemicals, Leam Chabang has prospered as the base for other manufacturing industries, including light industries.

#### Patthaya

In the development of Patthaya City, the "Development of Patthaya Area", which is among the cases in this evaluation study, has been involved significantly. As shown in the sixth national five-year plan, Patthaya City is positioned as a tourist industry base in the Eastern Seaboard Development Project. Much of the framework proposed in the development study (M/P) that was implemented with this policy was developed into projects after being subjected to a feasibility study and a detailed examination by the Thai Government of the environmental impact (Table 2-1-24).

The "Development of Patthaya Area" study was completed early in the 1990s, so completed projects related to it are relatively recent. Therefore the impact of those projects cannot yet be clearly assessed. However, Patthaya City has become a tourist industry base to rival Bangkok. The table below shows the changes in the number of tourists in the main sightseeing spots.

**Table 2-1-41. Numbers of Visitors to Main Tourist Cities (based on use of lodging facilities)**

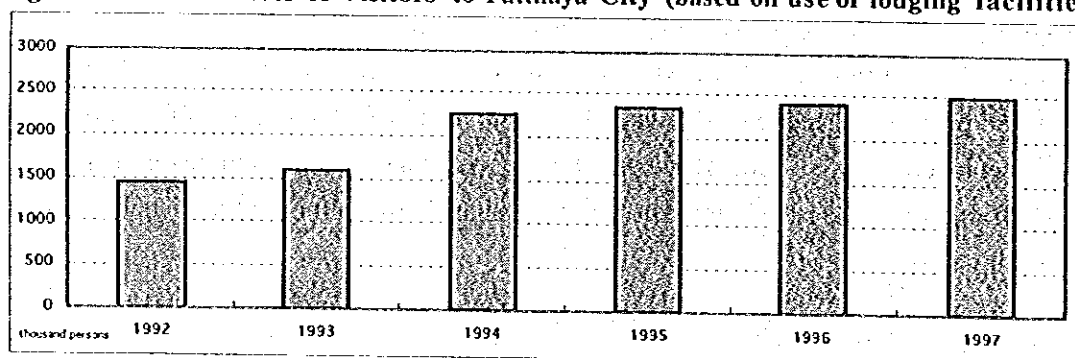
Main tourist cities	1994	1995	1996	1997
Bangkok	6,278	7,487	7,611	7,552
Chiang Mai	1,287	1,528	1,711	1,617
Haad Yai	1,198	1,347	1,287	1,320
Kanchanaburi	415	593	777	768
Nakhon Ratchasima	493	575	576	524
Patthaya	2,258	2,360	2,426	2,520
Puket	1,836	2,032	2,005	2,113
Sungal Go-lok)	272	305	347	332

Based on data from Alpha Research Co., Ltd., "Thailand in Figures, 1988 to 1999."

This table shows that Patthaya has already accepted the largest number of visitors next to Bangkok, corresponding to one third of the visitors to Bangkok. Furthermore, when considering the fact that visitors to Bangkok, which functions as the metropolis, include many who visited for business purposes, it can be said that Patthaya is already virtually the top sightseeing city.

Data up to 1997 suggests that the number of visitors to Patthaya City is increasing year on year, in line with the increase in the number of visitors to the whole of Thailand. When investment and tourists are attracted to Patthaya City with the upgrading of public facilities, such as sewage treatment plants, further tourist industry activity in this city can be expected.

**Figure 2-1-13. Number of Visitors to Patthaya City (based on use of lodging facilities)**



Based on data from Alpha Research Co., Ltd., "Thailand in Figures, 1988 to 1999."

## **(2) Sustainability after the Implementation of Development Studies - Proprietorial Role of the Thai Government**

Sustainability after the Implementation of Development Studies We cannot talk about sustainability after the implementation of development studies without considering the proprietorial role of the Thai Government, including the whole process of the Eastern Seaboard Development Project since the 1980s. Most proposals resulting from development studies were formed into projects and made a significant impact. This was achieved because of the framework of the Eastern Seaboard Development Project, as a large project both to be implemented by, and to be under the ownership of the Thai Government<sup>14</sup>, who made positive efforts for it in the background. Such ownership provided enhancement of the structure for promoting the Eastern Seaboard Development Project and has precipitated the promotion of concrete projects with careful scrutiny.

As described previously, the system for eastern seaboard development had already been enhanced in the implementation stage of the development studies by the installation of the Eastern Seaboard Development Committee (ESDC) and the establishment Office of the Secretary for the Eastern Seaboard Development Committee (OESB) in the National Economic and Social Development Agency (NESDB). The enhanced structure enabled full examination of the promotion of various administrative procedures and assignment of budgets that occurred when a series of development studies implemented mainly in the first half of the 1980s were formed into projects, subsequently to become case studies in this evaluation.

For example, when the Thai Government fell into financial difficulties in 1985, the whole national project came under review, including the Eastern Seaboard Development Project. The OESB decided on the policy to start the port construction project etc., as a minimum size project, and then to expand it step by step. Among the projects formed out of development studies, the loan contracts for those projects<sup>15</sup> that were made the object of the twelfth yen loan, almost concurrently with the above, were then advanced to the conclusion of contracts, by reflecting the policy of the Thai Government.

However, the debt repayment rate of Thailand was poor at that time due to sluggish exports and the deterioration of market conditions for primary products. Some influential

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<sup>14</sup> In this context, ownership means the making of development policy and the implementation of plans on the initiative of the Thai Government based on its own will.

<sup>15</sup> These include the projects of constructing the Leam Chabang port, Leam Chabang industrial area, Nong Kho - Leam Chabang water pipeline, Map Ta Phut port and Map Ta Phut industrial area.

people criticized the Eastern Seaboard Development Project, the promotion of which relied largely on foreign debt. Therefore, it was decided to freeze the Eastern Seaboard Development Project temporarily, but eventually, at the end of 1985, it was decided at ministerial level, including Mr. Plem, the Prime Minister, to continue the Eastern Seaboard Development Project.

As can be seen from this example, a structure and capability allowing full examination of a project from the financial aspect, etc. before implementation is essential in order for a development study item to be formed into a project. With regard to this point, it can be said that the Thai Government has promoted the Eastern Seaboard Development Project by performing careful examination in the process of forming projects under its own ownership.

#### 2-1-4 Conclusions

To judge whether development studies are successful or not, it is necessary to evaluate them in two stages: the implementation stage, which depends on the efforts of both the Japanese side and the counterpart government, and the post-implementation stage, which will be influenced largely by the efforts of the counterpart government.

This evaluation studied the 13 development studies that were implemented convergently in the 1980s and which are directly or indirectly related to the eastern seaboard development plan in Thailand, as a comprehensive evaluation study, where the 13 cases are considered as a group of investments in the whole area.

As a consequence of evaluating the whole process, including the implementation and post-implementation stages, it can be judged that this series of development studies implemented by Japan for the development of the eastern seaboard is quite successful.

In the implementation stage, from an overall viewpoint that the system for utilizing the results of development studies was well organized, and given that i) the development studies implemented by Japan for the development of the eastern seaboard adequately reflected the needs of that time, ii) cooperation between the Japanese and Thai sides was largely satisfactory and iii) the eastern seaboard development plan was supported by the Thai Government as a national project, it can be judged that the development studies were quite successful.

In the post-implementation stage, it has been confirmed that the overall impact of the development studies has been substantial. The following four points can be cited: i) the plans proposed as a result of the development studies were largely aimed towards the implementation of projects while remaining in line with the development plans of the Thai Government, ii) utilization of the results of the development studies as development policies and plans was seen on a local level, such as in the case of the Pathaya City Office, where the survey results were positioned as the guide for the city development plan, iii) many proposals became next-stage development studies for implementation of projects, and iv) the effect on the eastern seaboard was great, as indicated by the increased intensity of economic activity in the eastern seaboard, increased rates of contribution to the Thai economy by manufacturing and mining industries, increased investment by private enterprise and increased employment creation in Chon Buri and Rayong Prefectures.

Throughout the implementation and post-implementation stages, the following five main points can be cited as factors leading to the successful implementation of development studies in relation to the eastern seaboard development plan:

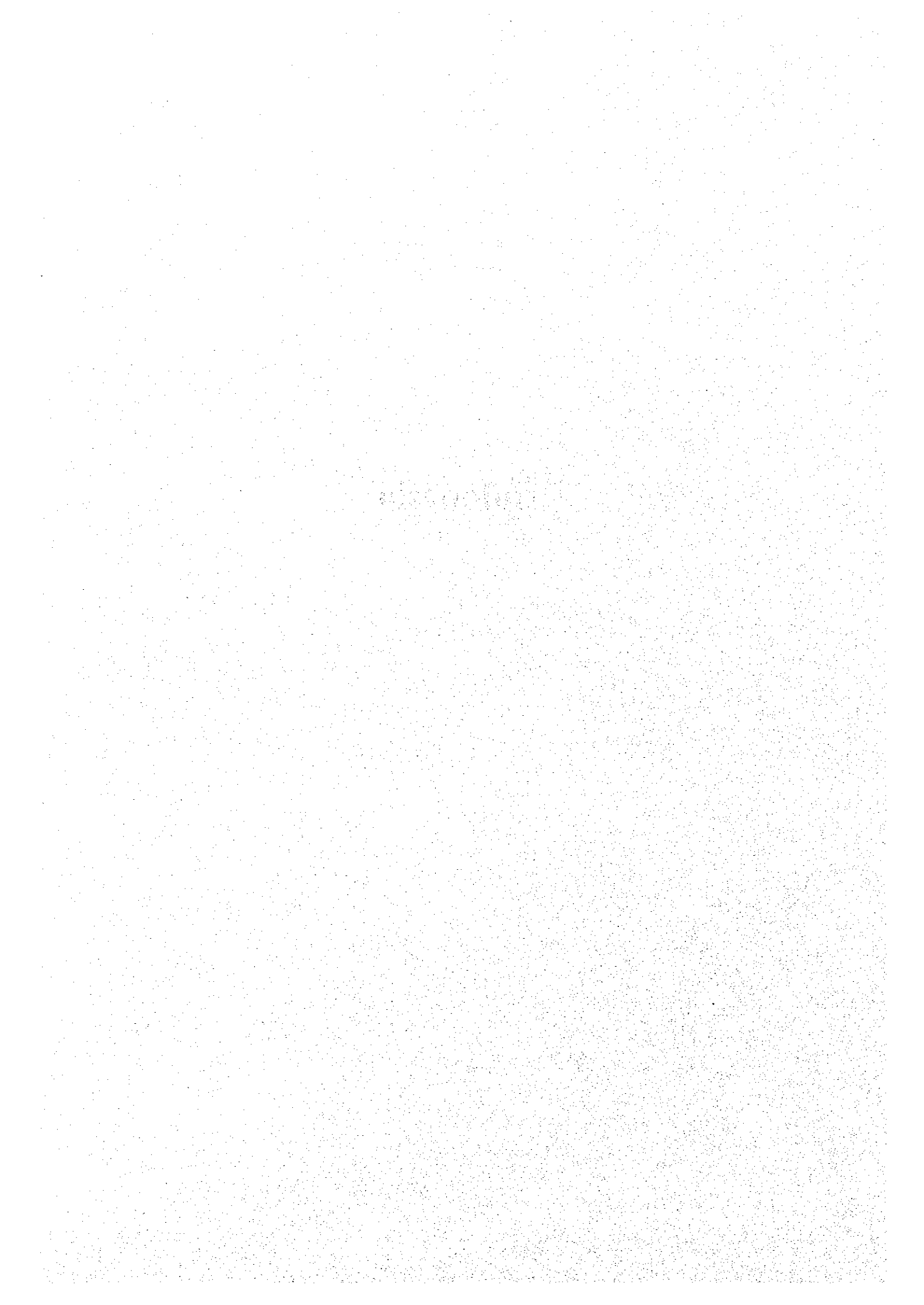


- i) The development framework of the Thai Government had been clarified in the form of the eastern seaboard development plan.
- ii) Within the framework, it had been kept in mind from the beginning of implementation that development studies by Japan would be fully utilized.
- iii) Decisions for the implementation of eastern seaboard development projects were clearly made on the initiative of the Thai Government .
- iv) With i) and ii) in the background, the system for utilizing the proposals and plans derived from development studies was well organized in the implementation and post-implementation stages.
- v) Investments increased after the Plaza Accord, activating the Thai economy.

Factors i) to iv) are related to the fact that the development of the eastern seaboard has been promoted proprietorially by the Thai Government. Many of the proposals from the results of development studies were developed into projects and, furthermore, had great impact. This was achieved because, in the background, there was a framework consisting of a substantial plan of the Thai Government, i.e. the eastern seaboard development project, and, additionally, the proprietorial role of the Thai Government, who positively promoted the project in the background. This ownership aspect brought about the enhancement of the organized system for promoting the development of the eastern seaboard and enabled the promotion of concrete projects involving precise planning.

Factor v) can be said to be an external factor that had a positive influence on the post-implementation stage of the development studies. It seems that, in the first half of the 1980s, when a series of development studies such as those for industrial development in Map Ta Phut and Leam Chabang occupied an important position in the development of the eastern seaboard, it was difficult to predict the increased foreign investment in manufacturing industry after the Plaza Accord. Though the implementation of the projects relating to those industrial zones and industrial ports that relied on the loans had once been frozen when the debt repayment rate lowered due to sluggish exports, Thailand recorded a high growth rate of over 10% before entering the 1990s, accompanied by a large expansion of exports. With the upgrading of industrial zones and ports completed, foreign investment had already been activated through the changes in the economic situation. Owing to these changes, the infrastructure provision was utilized effectively.

**Indonesia**



## 2-2 Indonesia

Table 2-2-1. Evaluation targets in Indonesia

Target name	Field	Type of study	Period of implementation	Counterpart organization in the recipient country
Lower Jeneberang River Flood Control Project	Social bases Rivers, sand control	F/S	79.6~80.2	Directorate General of Water Resources, Dept. of Public Works Currently Directorate General of Rural Development, Dept. of Human Settlement and Regional Development
Jeneberang River Flood Control Project Phase II		F/S	81.1~82.3	
Ujung Pandang Water Supply Development Project	Public utilities Water supply and sewage	MP+ F/S	84.6~85.10	Directorate General of Human Settlement Cipta Karya, Dept. of Public Works Currently Directorate General of Urban Development, Dept. of Human Settlement and Regional Development

### 2-2-1 Background of implementing development studies

#### (1) Social and economic background

Indonesia began becoming conscious of regional differences in economic levels, social inequality, etc. after entering the 1970s, but no large political movement for resolving these issues has developed. In the latter half of the 1970s, Indonesian intelligentsia began to criticize the expanding income gap between urban and rural areas and the paucity of development activities outside the Java Island, particularly in the eastern area of Indonesia. Under these circumstances, the General Rules for National Policy GBHN published in 1978 advocated three main objectives of national policy: social equality was the first priority, economic growth the second, and economic stability the third. In response, the government began to focus on projects to eliminate inequalities among areas. This led to a policy that emphasized social development.

In the third national development plan 1979/80 to 83/84, development and fair distribution of development results became basic doctrines as Indonesia pursued the realization of equal opportunities in income, employment, education, and the economy, as well as in development activities related to them. Furthermore, to ensure social fairness, the government supplied much funds to promote regional development and achieve fairness through the policies for individual fields and regional development.

Ujung Pandang City hereinafter referred to as Makassar City is the base for development of eastern Indonesia. Furthermore, the projects evaluated in this study were among the projects implemented under these circumstances.

## **(2) Background of implementing development studies on the targets**

### **1) Lower Jeneberang River Flood Control Project**

Because of the generally low ground level of the peripheral area, as low as 0.3 m above the sea level, Makassar City has frequently suffered from flooding due to water overflowing the Jeneberang River, which flows south of the city. Furthermore, in 1976, before this project was implemented, this city experienced its largest flood ever. This flood that this city submerged 20 km<sup>2</sup> and caused a total of 450 million Rupiahs in damage based on exchange rates at that time.

In addition to the floods caused by the Jeneberang, the Pang Pang River, which flows west side of the city as a tributary of the Taro River, has poor drainage capacity because it is easily affected by the tide and therefore also causes flooding. There are a few channels in the city that drain water from the Pang Pang River into the Makassar Bay, but they proved inadequate during the flood that occurred. A comprehensive flood control plan and drainage improvement plans that must be implemented urgently were therefore formulated.

### **2) Jeneberang River Flood Control Project Phase II**

Flood control and drainage improvement plans had to be formulated urgently required in the Lower Jeneberang River Flood Control Project, but this feasibility study was implemented in view of the need to further increase the flood control capacity and develop water resources to meet the demand for city, industrial, and irrigation water in the Jeneberang River basin. Construction of the Bili Bili Dam in the upper Jeneberang River as well as the plans for improving rivers, water supply, irrigation, and power generation were examined.

### **3) Ujung Pandang Water Supply Development Project**

Demand for water was predicted to increase in pace with future population increases in Makassar City, the base for development of eastern Indonesia. However, water supply facilities were inadequate, so only 35% of the population can from benefit them. Furthermore, aging of existing facilities, such as water pipes and filtering plants, was remarkable. For living water, most inhabitants relied on shallow wells, most of which were simply excavated and produced unsanitary water.

This project was formulated and examined to improve this situation. In this development study, a master plan and a feasibility study were implemented to formulate the water supply plan for Makassar City. The master plan formulated the water supply plan

based on a long-term perspective until 2005, and all plans were divided into the first-phase plans target year 1995 and second-phase plans target year 2005 to smoothly implement the project. A feasibility study was implemented to examine the feasibility of the first-phase plans target year 1995. The feasibility study examined the feasibility of constructing filtering plants and repair and improvement of existing facilities.

### **(3) Development study results**

The projects examined in this evaluation study were implemented under the above circumstances and are described below.

#### **1) Lower Jeneberang River Flood Control Project F/S**

The Lower Jeneberang River Flood Control Project formulated flood control plans for the down-stream area of the Jeneberang River and examined their feasibility. The plans formulated in this project can be broadly divided into overall flood control plans and emergency flood control plans, and these shall be given higher priorities than other plans.

Overall flood control plans include Jeneberang River improvements assuming a large flood may occur once every 50 years, flood control on the Jeneberang River by constructing dams, and improvement of the drainage system to increase the efficiency of drainage from the inner water area rivers to outer water area sea.

Emergency flood control plans include Jeneberang River improvements assuming a large flood may occur once every 10 years and drainage system improvements.

#### **2) Jeneberang River Flood Control Project Phase II F/S**

The Jeneberang River Flood Control Project Phase II is an extension of the Lower Jeneberang River Flood Control Project and encompasses i a reservoir and dam construction project, ii a flood adjustment project, iii a water supply project, iv provision of irrigation systems, and v a hydraulic power generation project.

The reservoir and dam construction project i plans to construct the Bili Bili dam for flood control and water supply. The flood adjustment project ii seeks to expand rivers, construct discharge channels, elevate roads, and improve riverside areas. The water supply project iii will construct a water-intake facility on the Bili Bili dam and a water pipeline from the water-intake facility to the filtering plant. In iv, provision of irrigation systems, seeks to develop the e Bili Bili irrigation system in the Kampiri irrigation system were planned. The hydraulic power generation project iv will attempt to construct power generation facilities and power transmission lines.

### 3) Ujung Pangdang Water Supply Development Project M/P+F/S

The M/P of the Ujung Pangdang Water Supply Development Project establishes long-term plans up to 2005. The long-term plan consists of two portions, the first-term project up to 1995 and the second-term project up to 2005. The first-term and second-term projects are further divided into first-phase and second-phase projects; the long-term plan thus consists of a total of four phases.

The first-term project plans to take water from the Malos River, which flows north of Ujung Pangdang city, and from the Jeneberang River, which flows in the south of the city. The second-term project seeks to switch the water source from the surface water of the Jeneberang River to the water taken from the Bili Bili dam, which is planned to be completed in 1995 in the Jeneberang River Flood Control Project Phase II.

The first-term and second-term projects both consist of three portions: i water intake and water channel facilities, ii filtering facilities, and iii water supply and drainage facilities.

In the first-term project, repair of water pipes, construction of the water-intake facility, and construction of the water pipeline up to the Mangasa filtering plant<sup>18</sup> were planned for i water-intake and water pipeline facilities; repair and improvement of the Ratorangi filtering plant, increased capacity of the Panaikan filtering plant, and new construction of the Mangasa filtering plant were planned for ii filtering facilities; and replacement of private tap meters and water pipes, construction of reservoirs, and installation of water pumps, water pipes, public taps and fire hydrants, and private tap meters were planned for iii water supply and sewage facilities.

In the second-term project, construction of water-intake facilities, installation of water pipelines, construction of the water pipeline up to the Mangasa filtering plant were planned for i water-intake and water pipeline facilities; increased capacity of the Mangasa filtering plant was planned for ii filtering facilities; and construction of reservoirs and installation of water pumps water pipes, public taps and fire hydrants, and additional private tap meters were planned for iii water supply and sewage facilities as in the first-term project.

Plans formulated out of each development project are summarized below.

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<sup>18</sup> Because the filtering plant was later relocated from Mangasa to Sonbaopu, which has more suitable soil conditions, the Mangasa filtering plant no longer exists.

**Table 2-2-2. Lower Jeneberang River Flood Control Project**

<b>Overall flood control project</b>	
Flood control project on the Jeneberang River	The Jeneberang River facilities will be repaired and the Bili Bili dam will be constructed to adjust the assumed flow rate of the Jeneberang River of 3,700 m <sup>3</sup> /sec assuming large floods on every 50 years to 2,500 m <sup>3</sup> /sec.
Drainage system improvement project	Drainage requires pumping because the outer water level is above the minimum ground level, so drainage pumps and water gates will be installed, drainage will be repaired, land will be purchased, and houses will be moved.
<b>Emergency flood control projects assigned higher priorities based on the overall flood control project</b>	
Flood control project on the Jeneberang River	Repair the Jeneberang River to adjust the assumed flow rate of the Jeneberang River of 2,500 m <sup>3</sup> /sec assuming large floods every 10 years to 2,100 m <sup>3</sup> /sec.
Drainage system improvement project	Drainage will be repaired and excavated, bulkheads will be installed, and bridges will be replaced to improve the drainage system.

**Table 2-2-3. Jeneberang River Flood Control Project Phase II**

Reservoir and dam construction project	A dam with an effective capacity of 304 x 106 m <sup>3</sup> will be constructed for flood control on the middle Jeneberang River and for securing water sources.
Water storage	The effective capacity is 304 x 106 m <sup>3</sup> , 258 x 106 m <sup>3</sup> of which will be used for city and industrial water.
Flood control	The effective capacity is 304 x 106 m <sup>3</sup> , 46 x 106 m <sup>3</sup> of which will be used for flood adjustment.
Flood adjustment project	The Jeneberang River assumed flow rate of 3,700 m <sup>3</sup> /sec assuming large floods every 50 years will be adjusted to 2,500 m <sup>3</sup> /sec.
River expansion project upstream and downstream of the Sang Minasa bridge	The river will be widened from the river-mouth to 20 km upstream to limit the flow rate downstream of the Sang Minasa bridge to 2,300 m <sup>3</sup> /sec and upstream to 1,300 m <sup>3</sup> /sec assuming large floods every 8 years.
Construction of the Garashi discharge channel	The course of the Garashi River, which joins the Jeneberang River near the river mouth, will be changed by constructing a discharge channel so that the Garashi River flows directly into the sea.
Elevation of roads	The road with an extension of 3,000 m, which passes between the Jeneberang River and the city will be elevated to prevent submersion from the river to the city.
Provision of drainage	Drainage will be provided for 3,000 m on the right bank and 9,000 m on the left bank downstream of the Sang Minasa bridge.
Provision of riverside facilities	River walls, water-breaks, and bases will be paved to assure the safety of riverside areas.
<b>Water supply</b>	
Water-intake facility	A water-intake facility will be constructed to assure 2,300 l/sec of water supply from the Bili Bili dam.
Water-intake facility	A 25km long, 1.5m diameter water pipeline will be installed from the Bili Bili dam to the filtration plant.
Irrigation system	Irrigation systems will be augmented to resolve the shortage of irrigation water during the dry season so that 19,200 ha of 24,000 ha irrigated during the rainy season can be irrigated during the dry season as well.
Bili Bili system 5,000 ha	A channel that connects the new water-intake port with the existing irrigation channel and water-intake port will be constructed and related facilities will be improved.
Kanpiri system 19,000 ha	A narrow channel total length 2,500 m and related facilities will be improved.
<b>Hydraulic power generation</b>	
Power generating facility	A power plant with a capacity of 11,200 kW will be constructed.
Power transmission lines	15km, 30kV power transmission lines will be installed.



**Table 2-2-4. Ujung Pangdang Water Supply Development Project**

M/P

<b>First-term project up to</b>		<b>Water source: Surface water of the Malos River and Jeneberang River</b>
<b>Water-intake and water pipeline facilities</b>	<p>The existing Malos water pipeline from the Rekopanchin water-intake port to the Panaikan filtration plant, particularly the water pipeline near Panaikan where 30% of the water transported is lost, will be repaired.</p> <p>The height of the Bili Bili water-intake dam will be increased to facilitate water intake.</p> <p>A water-intake facility to enable water intake of 1,000 l/sec will be constructed in the Bili Bili irrigation water pipeline.</p> <p>A 20.5 km water pipeline 1,100 mm x 20.5 km will be constructed between the Bili Bili water-intake dam and the newly constructed Mangasa filtration plant.</p>	
<b>Filtration plant</b>	<u>First phase</u>	
	<p>Repair and improve the Ratorangi filtration plant.</p> <p>Increase the filtration capacity of the Panaikan filtration plant.</p> <p>Construct the Mangasa filtration plant capacity 500 l/sec.</p>	
<b>Water supply and distribution facilities</b>	<u>Second phase</u>	
	<p>Increase the Mangasa filtration plant capacity to 1,000 l/sec.</p>	
<b>Water supply and distribution facilities</b>	<u>First phase</u>	
	<p>Replace 5,600 private tap meters and the 55km water distribution pipe.</p> <p>Construct 4,000m<sup>3</sup> water distribution ponds.</p> <p>Install three 170 kW water distribution pumps.</p> <p>Install main and branch water distribution pipes 115 km.</p> <p>Install 1,800 public taps and 80 fire hydrants.</p> <p>Install 40,000 private tap meters.</p>	
<b>Water supply and distribution facilities</b>	<u>Second phase</u>	
	<p>Construct 4,000 m<sup>3</sup> water distribution ponds.</p> <p>Install two 340 kW water distribution pumps.</p> <p>Install 111 km of main and branch water distribution pipes.</p> <p>Install 100 public taps and 30 fire hydrants.</p> <p>Install 12,000 private tap meters.</p>	
<b>Second-term project up to 200</b>		<b>Water source: Surface water of the Malos River and Jeneberang River</b>
<b>Water-intake facility</b>	<p>Construct a water-intake facility with a water-intake capacity of 3,000 l/sec downstream of the Bili Bili dam.</p>	
<b>Water pipeline facility</b>	<p>Construct a 1,350 mm diameter by 2.9 km water pipeline from the Bili Bili dam to the water-intake well near the irrigation channel.</p> <p>Construct a 900 mm diameter by 20.5 km water pipeline from the water-intake well to the Mangasa filtration plant.</p>	
<b>Filtration plant</b>	<u>First phase</u>	
	<p>Expand the Mangasa filtration plant to increase its filtration capacity to 2,000 l/sec.</p>	
<b>Water supply and distribution facilities</b>	<u>Second phase</u>	
	<p>Expand the Mangasa filtration plant to increase its filtration capacity to 3,000 l/sec.</p>	
<b>Water supply and distribution facilities</b>	<u>First phase</u>	
	<p>Construct 7,500 m<sup>3</sup> water distribution ponds.</p> <p>Install two 340 kW water distribution pumps.</p> <p>Install 142 km of main and branch water distribution pipes.</p> <p>Install 100 public taps and 40 fire hydrants.</p> <p>Install 31,000 private tap meters.</p>	
<b>Water supply and distribution facilities</b>	<u>Second phase</u>	
	<p>Construct 7,500 m<sup>3</sup> water distribution ponds.</p> <p>Install two 340 kW water distribution pumps.</p> <p>Install 84 km of main and branch water distribution pipes.</p> <p>Install 100 public taps and 30 fire hydrants.</p> <p>Install 37,000 private tap meters.</p>	

**First-term projects from F/S-M/P**

<b>New construction/expansion</b>	
Bili Bili water-intake dam	First phase - Achieve a water-intake capacity of 0.57 m <sup>3</sup> /sec Second phase - Achieve a water-intake capacity of 1.10 m <sup>3</sup> /sec
Construction of the Mangasa filtration plant Water receiving well  Flow-out ditch for the filtering pond	First phase - Achieve a filtration capacity of 0.52 m <sup>3</sup> /sec. Second phase - Achieve a filtration capacity of 1.03 m <sup>3</sup> /sec.  First phase - Achieve a water distribution capacity of 0.65 m <sup>3</sup> /sec Second phase - Achieve a water distribution capacity of 1.17 m <sup>3</sup> /sec.
Water distribution facility	First phase - Achieve a water distribution capacity of 0.65 m <sup>3</sup> /sec Second phase - Achieve a water distribution capacity of 1.17 m <sup>3</sup> /sec.
<b>Repair/improvement</b>	
Malos water pipeline	Repair the existing Malos water pipeline from the Rekopanchin water-intake port to the Panaikan filtration plant, particularly the water pipeline near Panaikan, where 30% of water transported is lost, will be implemented.
Ratorangi filtration plant	Maintain the Ratorangi filtration plant (constructed in the 1920s and planned to be abandoned when the Mangasa filtration plant is completed in the target year of the First term project 1995) so it can sufficiently supply water until it is abandoned, replace filtration sand, install flow rate meters, and repair the alumina sulfate injecting facility.
Panaikan filtration plant	Increase the capacity of the filtration facility that will be completed in 1987 from 500 l/sec to 600 l/sec. Water-water sludge, which has so far been discharged into nearby streams, will be reused.
Water distribution pipe network and water taps	Water distribution pipes installed more than 50 years ago are causing decreased flow and water quality due to deposits, as well as water leak due to aging, will be replaced. Only 11% of the water taps are equipped with meters; of those so equipped, 20% have failed. Meters will thus be installed on those taps.

## **2-2-2 Implementation of development studies**

### **(1) Necessity of implementing development studies**

#### **1) Lower Jeneberang River Flood Control Project and Jeneberang River Flood Control Project Phase II**

When implemented, these development studies were highly necessary due to the significant needs for flood control and the major damage Makassar City suffers when rivers flood.

Makassar City has a history of serious flood damage and experienced a large flood in January 1976, several years before the implementation of the development studies. At that time, approximately 20 km<sup>2</sup> were submerged, with the total damage amounting to 450 million Rupiahs in the value of currency at that time. Therefore, flood control on the Jeneberang River, which caused flooding, and increased drainage capacity of the Pang Pang River, which flows in the city, were urgently needed.

Furthermore, from the latter 1970s to the first half of the 1980s, when development studies were implemented, the central government began to promote the development of rural areas by adopting a policy seeking equally shared benefits of development as the basic doctrine. Under such circumstances, Makassar became one of the bases for development activities in eastern Indonesia. From the first half of the 1980s to the present, Makassar City has steadily developed socially and economically with its population steadily growing at a rate of 1 to 3% per year.

If no flood control measures are implemented, a flood the size of that in 1976 would cause considerably greater damage due to the current expanded economy. Furthermore, it is predicted that over 1.5 times more people will suffer from flooding if a simple population growth rate is considered.

#### **2) Ujung Pandang Water Supply Development Project**

The master plan formulated and feasibility studies implemented on the items in the master plan with higher priorities in the middle 1980s, where the increase in demand for water was predicted due to the increase in population of Makassar City and expansion of the economy, met the needs at that time, so the necessity of implementing the project was high.

Though increased demand for water in Makassar City was expected in that period due to the increase in population as a base for development of eastern Indonesia, only 34% of the population were enjoying water supply in 1983. Furthermore, water supply facilities

were inadequate, and existing facilities, such as water distribution pipes and filtration plants, had aged remarkably, so deterioration of the water supply was also a matter of concern. Most inhabitants relied on shallow wells for living water, and most of the wells were simply excavated ones that produced unsanitary water. The water supply would steadily be depleted due to the increased population and expanded economy in Makassar City. The needs to increase the pure water supply capacity and to provide a water distribution pipe network were thus very high in Makassar City. Therefore, it can be said that the timing of formulation of the a master plan based on a long-term prospect met the needs at that time.

## **(2) Cooperation between the survey team and the counterpart team**

Cooperation between the survey team and the counterpart team was generally good in all three development projects evaluated. To verify the cooperation between the survey team and the counterpart team, we collected information by interviewing persons who participated in the studies as members of the counterpart team. Because the development studies were implemented more than 15 year ago, it was impossible to interview all members of the counterpart team. However, judging from the information collected, the participation of the counterpart team organizations, and the positive attitude of the government as that time, the development studies seem to have been implemented efficiently with sufficiently formulated feasibility studies on projects were implemented. Conditions in the implementation stage of development surveys were as follows.

### **1) Lower Jeneberang River Flood Control Project and Jeneberang River Flood Control Project Phase II**

Because flood damage was serious in Makassar City at that time and there was an urgent need to implement the development studies, the Indonesian government was positive in implementing development studies. During the full-scale implementation of development studies, F/S was implemented by forming a subteam of one Japanese member and two Indonesian members and encouraging the members to cooperate with each other.

Results of interviews with counterpart members at that time suggest that their communication with Japanese members was sufficient. Meetings were held almost every week, and the state of progress was always clarified. Furthermore, the transfer of technology and knowledge for F/S in each technical field was also sufficient. Diligence of the members of the Japanese team was also highly evaluated.

## 2) Ujung Pangdang Water Supply Development Project

We confirmed the positive attitude of the Indonesian government toward implementing the development studies. During the full-scale implementation of the development studies, M/P and F/S were implemented through cooperation between members of the Japanese team and members of Indonesian team. Knowledge of surveying methods for M/P and F/S for providing water supply facilities and technology for water supply were transferred sufficiently. In particular, water leak inspection techniques were improved to reduce the volume of non-revenue water.

The persons in charge in the Dept. of Public Works stated that the meeting<sup>19</sup> of each level between the Japanese team and Indonesian team in the implementation stage of development studies had proper participation from the related organizations. Relations between the development studies and local governments can be confirmed from the fact that officials of the Development Planning Bureau BAPPEDA on the provincial and municipal levels participated in meetings. Some officials of the BAPPEDA stated that they participated in development studies to utilize the proposals resulting from the development studies by themselves.

Table 2-2-5. Transfer of Technology

Item		Technology transferred
Lower Jeneberang River Flood Control Project	F/S	<ul style="list-style-type: none"> <li>• F/S survey methods for flood control projectsn</li> <li>• F/S survey methods for dam projectsn</li> <li>• F/S survey methods for irrigation projects</li> </ul>
Jeneberang River Flood Control Project Phase II	F/S	<ul style="list-style-type: none"> <li>• Development study methods for water supply arrangement projects</li> <li>• Leak inspection techniquesn</li> <li>• Leak detection techniquesn</li> </ul>
Ujung Pangdang Water Supply Development Project	M/P+F/S	<ul style="list-style-type: none"> <li>• Development study methods for water supply arrangement projects</li> <li>• Leak inspection techniquesn</li> <li>• Leak detection techniquesn</li> </ul>

<sup>19</sup> In all development projects evaluated, meetings for inception reports, progress reports, interim reports, and draft final reports were held in Jakarta and Makassar in the implementation stage of development studies. In all of these projects, we confirmed the presence of BAPPEDA officials on the provincial and municipal levels.

**(3) Developing a system for the counterpart government to utilize the results of development studies**

When the proposals resulting from implementing development studies have a high urgency and positive participation of the counterpart government can be seen in the implementation stage, a system by which the counterpart government can utilize the development studies can be easily arranged in the implementation stage. The three development projects evaluated are not exceptions. The Lower Jeneberang River Flood Control Project and Jeneberang River Flood Control Project Phase II were formulated to provide urgently needed flood control, and the Ujung Pang Dang Water Supply Development Project was formulated to respond to increased water supply demand. Due to its high urgency, the Lower Jeneberang River Flood Control Project, in particular, already had a clear scope of developing into a project, and the environment facilitated the utilization of development studies.

Furthermore, the Indonesian Government positively implemented the development studies. As mentioned previously, proper relations between the development studies and local governments can also be confirmed from the fact that officials of the Development Planning Bureau BAPPEDA on the provincial and municipal levels participated in meetings. It is not certain to what extent the officials of BAPPEDA who participated in meetings fed back meeting information to the BAPPEDA organization itself and contributed to formulating local development projects for utilizing development studies. However, some persons stated that BAPPEDA, the development project formulating organization of each province and municipality, was involved in development studies because they already had a positive attitude at that time toward utilizing development studies. In the post-implementation stage, proposals resulting from development studies were formulated into projects with deep involvement of the Dept. of Public Works as the counterpart organization. Most of the proposed projects were put on the blue book of the BAPPENAS by the Dept. of Public Works and, as a result, were actualized as projects by JBIC funds. It is considered that this is because the Dept. of Public Works already showed a positive attitude in the implementation stage of development studies and had an appropriate structure. As a result, the proposed projects developed smoothly into actual projects. For these reasons, with the urgent necessity of flood control and with the positive involvement of the Indonesian Government, the structure for utilizing proposals was already provided in the implementation stage of development studies. The three development projects evaluated were thus oriented toward full utilization of the results of development studies under the structure at that time.