of the private sector is rising sharply from 0.43 in 1977 to 0.74 in 1981.

16. In short, the performance of the Thai economy over the past 25 years has ranked high among developing countries. Some basic economic problems such as income disparity, the need to conserve natural resources, the high dependence on energy consumption and the need for improving administrative efficiency remain to be solved, but judging from the past performance as well as from the present economic outlook, it is clear that Thailand has the potential to greatly expand its economy.

Industrialization

17. Industrialization in Thailand began in the early 1960s. Although the Industrial Promotion Act was enacted in 1954, it was actually implemented in 1960 through the establishment of the Board of Investment. The Act was revised in 1962 to include the promotion of investment through such incentives as exemption from customs duties and other taxes on imported materials, equipment and machinery, and was revised again in 1972 together with the change in policy emphasis from import substitution toward export promotion. Today, four Investment Promotion Zones have been designated and additionally three industrial estates are given the same incentives defined in the Investment Promotion Act.

18. Major industries in Thailand are cement, textiles, electric appliances, sugar, paper and gunny bag production, oil refining, automobile assembly, saw mills and iron and steel. Light industries producing consumer goods are dominant. Almost all the major industries are concentrated in the Bangkok Metropolitan Area except for sugar mills and gunny bag producers which are located in the northeastern region, and tin smelting in the southern region.

19. Over the past decade, the west part of the northern region, the central part of the northeastern region, the central region, the western region and the central southern region showed the highest growth rates in the manufacturing sector. Based on the industrial sector shares in the national total and the growth rates, industrialization in Thailand is

proceeding in the central, eastern, western and northeastern regions sprawling from the Bangkok Metropolitan Area, and various projects mainly of heavy industrial development are planned for these regions. It is expected that these industries will become the core of the Thai economy.

20. Major mining products in Thailand are tin, fluorite, manganese, antimony, lead, lignite, gypsum and rock salt. Almost all of these mining products are exported to neighboring countries in South Asia, Japan, England, West Germany and the Netherlands as raw materials. Among these, smelted tin is exported through a private berth in Phuket.

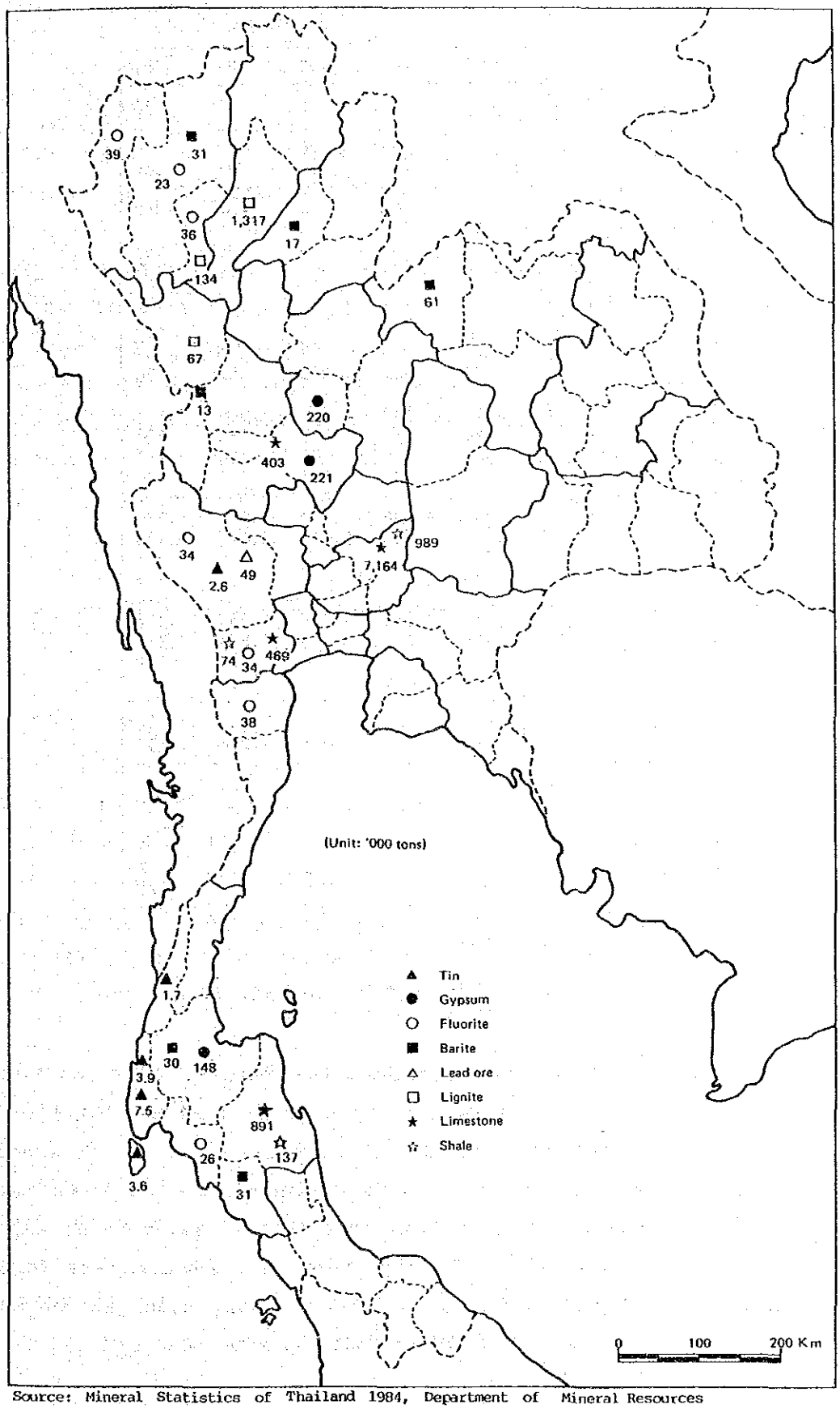
Energy Issue

21. The energy intensity and the petroleum intensity of the Thai economy are growing at an annual rate of 3.2% and 2.5% respectively, reflecting the energy consuming characteristics of the Thai development process. The growth of commercial energy consumption was rapid during the 1960s and 1970s. From 1964 to 1973, the average annual commercial energy consumption growth rate was 15.3%, while from 1973 to 1979 and from 1979 to 1981 the average annual growth rates were 9.5% and 5.2%, respectively. During these three periods, the average annual GDP growth rate was 9.3, 7.7 and 6.0%, respectively. The energy elasticity of the GDP was 1.65 before the first oil crisis in 1973, 1.2 from the first oil crisis to the second one in 1979, and 0.86 after the second oil crisis.

22. Commercial use of non-traditional energy sources in 1981 amounted to 17.49 million kiloliters or 237,000 barrels per day of oil equivalent. The energy sources were imported oil 87%, hydro 7.6%, coal and lignite 3.6% and natural gas 1.8%. The contribution of traditional energy sources is assumed to be 21% of the total energy consumption.

23. The sectoral composition of commercial energy consumption in 1981 consisted of industrial use 28.8%, transportation 35.5%, agricultural use 7.2%, and other use including commercial and residential 28.5%. The relative shares of the sectoral consumption did not change significantly during the last decade.

Fig. 2.2 Distribution of Mining Products



Source: Mineral Statistics of Thailand 1984, Department of Mineral Resources

Table 2.6 Mining Products of Thailand

(Quantity: 1,000 tons)
(Value: Million Baht)

Commodity		1980	1981	1982	1983	1984
Tin	(A)	46	43	36	27	30
	(B)	-	-	-	-	-
	(C)	33	32	26	18	18
		11,169	9,653	7,986	5,225	5,267
Fluorite	(A)	336	326	364	284	352
	(B)	0.2	-	-	0.01	-
	(C)	214	195	180	183	255
		300	327	315	288	355
Barite	(A)	305	307	331	187	175
	(B)	-	-	12	3	0.3
	(C)	362	230	303	170	182
		278	227	318	182	176
Gypsum	(A)	412	540	753	760	1,111
	(B)	256	317	433	346	306
	(C)	144	205	380	470	738
		48	76	150	161	230
Limestone	(A)	3,958	5,486	6,372	8,944	9,236
	(B)	3,230	4,955	5,484	8,223	9,168
	(C)	0.7	1.4	1.2	1.0	3.3
		0.02	1.1	0.9	0.8	1.5
Lignite	(A)	1,426	1,686	1,964	1,866	2,337
	(B)	1,513	1,664	1,970	1,838	2,276
	(C)	-	5	-	0.1	-
		-	5	-	0.1	-
Shale	(A)	801	1,124	1,248	1,200	1,564
	(B)	696	885	1,083	1,216	1,600
Iron ore	(A)	85	62	27	40	61
	(B)	84	49	40	30	15
Lead ore	(A)	25	41	44	49	39
	(C)	21	37	38	43	42
		165	239	174	203	176

Note : (A)Production (B)Domestic Consumption
(C)Export(Quantity)
(Value)

Source: Mineral Statistics of Thailand 1980-1984,
Department of Mineral Resources

24. The minor balance of payment problem stems largely from two factors: increased import of raw materials and capital goods in the manufacturing sector and an ever increasing oil import bill which reflects the excessive oil dependency of the economic structure. Although the Thai economy got over the first oil crisis with its then prosperous primary goods exports, it had to face the second oil price hike under less advantageous terms of trade. In 1981 oil imports reached Baht 63 billion, which accounted for 30% of total imports and absorbed 40% of total export earnings.

C. Transport Network

General

25. The country's transport system is multimodal, consisting in order of importance of road, rail, inland water, maritime, air and pipeline transportation. The road system is divided into National and Provincial Road Systems both of which are administered by the Department of Highways under the Ministry of Communications (MOC) and total about 45,000 km in length, and Rural Road Systems, which are administered mainly by agencies of the Ministry of Interior. The railway system is managed and operated by the State Railway of Thailand (SRT) which was established as an independent legal entity under the SRT Act of 1951, and operates under the supervision of MOC. The railway system extends some 3,800 km.

26. Thailand also has a comprehensive inland waterway system of about 1,300 km in the northern corridor stretching from Bangkok to Uttaradit in the central region. The main components are:

i) The Chao Phraya River from the Gulf of Thailand to Nakhon Sawan (325 km)
ii) The Nan River from Nakhon Sawan to Taphan Hin (78 km) and from there to Uttaradit (247 km)
iii) The Pasak River from Ayutthaya, where it enters the Chao Phraya, up to the Rama IV Dam (45 km)
iv) Sections of the Noi and Suphan (Tha Chin) Rivers (about 100 km), which offer a bypass of some difficult sections of the Chao Phraya

27. During the low water season from January to May, however, navigation on the Nan and Chao Phraya, except for the section from the Gulf to Ayutthaya (110 km), is restricted, and barge traffic is forced to detour on slow and more costly routes, reduce payloads or cease operations. As a result, inland waterways' traffic is thinning out quickly to the north of Ayutthaya, even though the rivers reach into the heartland of Thailand's most productive agricultural region, and large quantities of agricultural and other bulk commodities, which are in principle suitable for barge

traffic, are being carried by road.

28. Thailand has four major ports which are under the control of MOC: Bangkok, Sattahip, Songkhla and Phuket. Most of the foreign trade passes through these ports. The coastal ports sector, which covers all shallow draft seaports, comprises about 40 facilities ranging from small fishing and cargo wharves of purely local importance to large regional ports with annual volumes of several hundred thousand tons of cargo. Most coastal ports are located on the east and west coasts of the southern Peninsula and are managed by local governments or private operators.

29. Most of the foreign trade cargo is handled at Bangkok (95% of imports and 90% of exports). Bangkok Port comprises private and public wharves and is spread along some 40 km of the River Chao Phraya upstream from its mouth. The main wharves, operated by the Port Authority of Thailand (PAT), are located about 27 km up river at Klong Toei. PAT is also responsible for operating Sattahip Commercial Port.

Domestic Freight Transport

30. According to the study on National Transport Plan (1986), inter-regional transport amounts to 177 million tons in 1985 and concentrates on the Bangkok Metropolitan Area. Especially, 60% of the total inward cargo is shipped to Bangkok, which shows that Bangkok is the center of the Thai economy and of national consumption. About 45% of the total outward cargo is shipped from the northern region, 23% from Bangkok and 22% from the central region.

31. Except for a few zones in the southern and central regions, outward cargo exceeds inward cargo in tonnage, and almost all the outward cargo from the regions is shipped to the Bangkok Metropolitan Area. Agricultural products such as tapioca, maize and rice are shipped from the northern and northeastern region, and construction materials such as sand, gravel and cement and agricultural products such as sugar and rice are shipped from the central region excluding Bangkok.

Table 2.7 Port Facilities

Name of Port	Number of Berths	Length of Berths (m)	Water Depth (m)	Cargo Forecast at Target Year (2000 or 2001)	Remarks
Bangkok Port	116				
Klong Toei Wharves					
West Quay	10	1,660	8.2		
East Quay	8	1,528			
Container	6	1,240	8.2		
Lighter	2	288			
Dolphin Berths	7		4.8		
Buoy Berths	6				
Private Berths	85				
Other Facilities					Thai Maritime Wharves, Oil Jetties
Sattahip Commercial Port	5				
West Quay	3	540	10.5		
North Quay	2	350	10.5		
Phuket Port					
Thaisarco Pier	1	61.1	6.0		2 moorning buoys
Buoy Berths	2		(4,000DWT)		Pipeline for oil
Klong Tachin	1	50	4.0		For lighters
New Berths	2	360	10.0	425,000 tons	---excluding oil
(Under Construction)				(Rubber 257,000 tons)	
					Master Plan --6 Berths
Songkhla Port					
Ferry Jetties, H.D.	1	Pontoon 5			All location in
Pier, etc.	4	Berths 100			Songkhla Lake
		20x3			
	1	Jetty 30			
New Facilities	3	510	9.0	1,019,000 tons	1 Container Berth
(Under Construction)				(Rubber 964,000 tons)	2 Conventional Berths
Laem Chabang Port				8,680,000 tons	
Container Berths	3	2,700	15.0	(Container 55,	
General Cargo Berth	1	250	14.0	Tapioca 13,	
Bulk Cargo Berths	2	590	15.0-17.0	Break Bulk 9.8, Sugar/	
Domestic Berths	1	500		Molasses 900,000 tons)	
Map Ta Phut Port (Industrial port)					
1st Stage (Planned)					
Fertilizer	2	390	11.5		
			13.0		
Agriculture	1	330	13.0		
Small vessel		330			
Liquefied					
Dangerous goods	1	340	13.5		

Source: MOC

32. Major items transported to the Bangkok Metropolitan Area are construction materials such as sand and gravel and agricultural products such as rice, maize and tapioca. Most of the construction materials are transported by trucks, and sand drained from river beds is transported by barges via inland waterways. Agricultural products, especially tapioca and maize, are transported by barges via inland waterways from storage points along the rivers to the foreign trade vessels anchored at Ko Sichang (about 2.7 million tons in 1981). From Bangkok petroleum products and consumption goods are the major items outward to all the regions. About 5.6 million tons of petroleum products are transported from the refineries at Si Racha and Bangkok by tank lorries to the central region and mainly by railways to the northern and northeastern regions, and by coastal shipping to the southern region.

33. The total freight of inter-regional transport increased from about 39 million tons in 1973 to 177 million tons in 1985 at an average annual increase rate of 13.8%. Especially freight by trucks increased from 25 million tons to 160 million tons at an annual 16.7% increase rate and in terms of ton-km, it increased from 11 billion ton-km in 1973 to 32 billion ton-km in 1985 at an annual 9.3% increase rate.

34. Modal shares in 1985 are 90% by road, 3% by railway, 6% by inland waterway and only 1% by coastal shipping in terms of tons transported, and 84% by road, 8% by railway, 3% by coastal shipping and 5% by inland waterways in terms of ton-km. Thus the road sector has come to play the dominant role. However, for the transport to the northeastern region and the southern region, the railway subsector plays an important role and for the southern region, coastal shipping plays a key role. Within the central region, inland waterways are an important transport mode in the Bangkok Metropolitan Area.

35. As for the railway subsector, freight volume increased from 5,156 thousand tons in 1976 to 6,447 thousand tons in 1979. However, after 1982, railway freight decreased to 5,600 - 5,700 thousand tons. Major items transported by railway are petroleum products which amount to 2.4 million tons or 42%, cement which amounts to 1.3 million tons or 22% and agricultural products such as rice and maize. These major items together

Table 2.8 Inter-regional Cargo Arrived/Departed (1982)

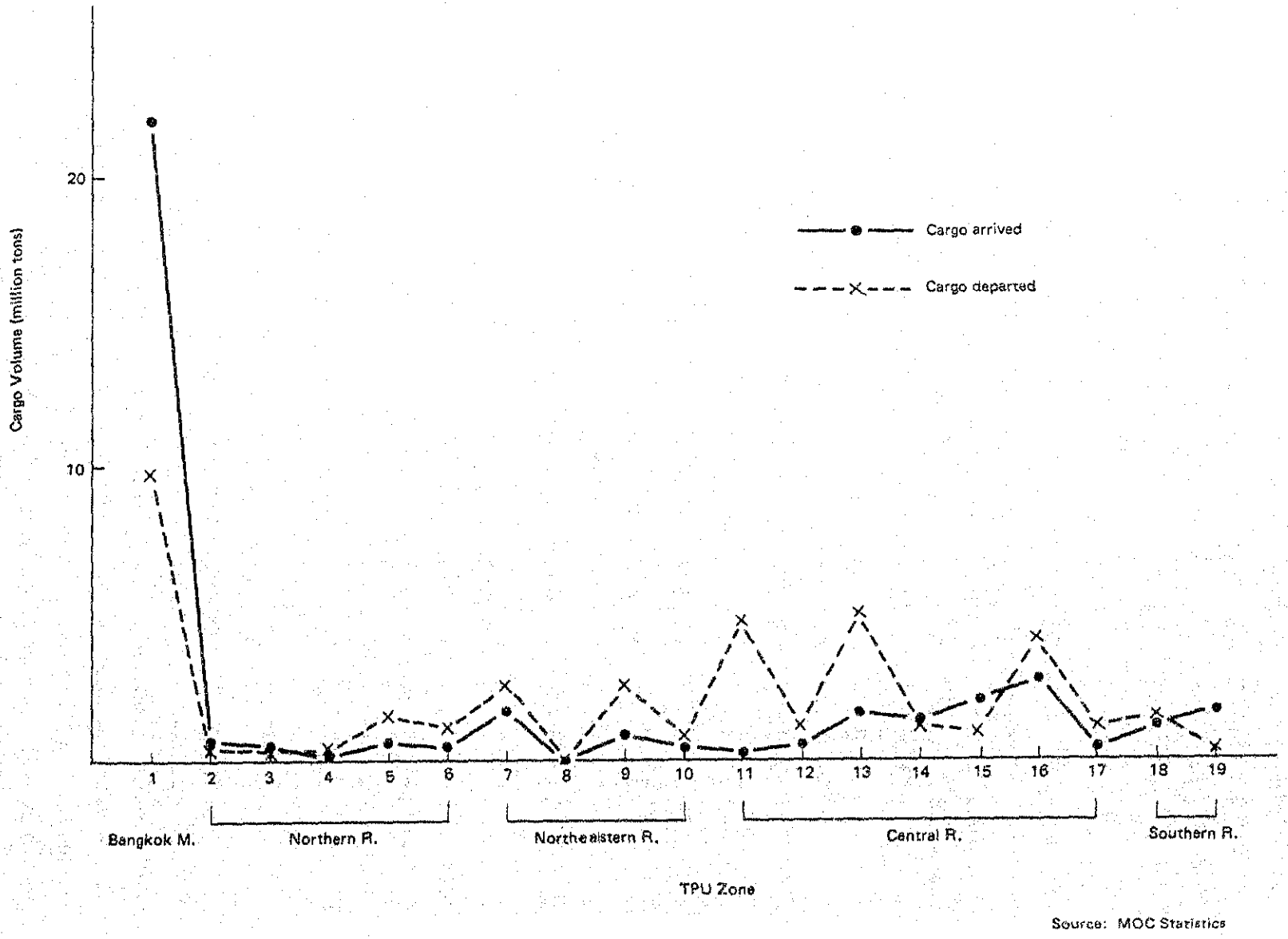
(A) ALL MODES

	RICE		MAIZE		TAPIOCA		SUGAR		RUBBER		OTHER FARM		FOREST PRODUCTS		MINERALS		PETROLEUM		CONST. MATERI.		OTHER MANU.		ALL OTHERS		TOTAL	
	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D	A	D
BANGKOK	3,158	272	2,552	24	2,031	30	1,935	34	194	7	1,504	265	1,065	197	577	1	108	3,509	12,471	775	140	352	2,334	4,653	27,996	10,129
NORTHERN	18	922	2	905	4	487	5	245	7	30	73	431	24	143	-	290	882	10	195	756	67	23	1,054	333	2,271	4,575
NORTH-EASTERN	77	1,115	-	419	10	2,799	11	310	1	12	159	417	75	165	-	8	979	3	340	40	50	17	1,248	422	2,514	5,727
CENTRAL	481	1,694	63	1,491	1,888	615	54	1,430	8	56	168	795	180	462	175	455	1,161	209	516	11,811	162	114	2,005	1,449	6,867	20,571
SOUTHERN	256	7	216	-	1	3	19	5	8	113	89	77	7	388	24	10	876	1	120	130	115	11	847	567	2,578	1,302
OTHERS												8		8		12		224				7				321
TOTAL	4,011	4,011	2,839	2,839	3,934	3,934	2,024	2,024	218	218	1,993	1,393	1,351	1,351	776	776	3,356	3,956	13,512	13,512	524	524	7,488	7,488	42,626	42,626
(B) ROAD																										
BANGKOK	2,436	245	1,304	5	2,031	30	1,905	29	74	4	1,488	243	1,011	197	223	1	108	1,355	8,589	764	138	158	2,290	3,982	21,597	7,013
NORTHERN	18	547	2	499	4	487	5	214	1	-	44	421	23	109	-	76	199	10	175	64	45	22	953	314	1,463	2,763
N-EASTERN	70	1,032	-	386	10	2,799	11	310	1	2	141	416	66	165	-	8	419	3	257	40	39	16	1,210	412	2,223	5,589
CENTRAL	447	1,170	27	444	1,888	615	54	1,426	2	52	168	738	154	458	5	136	750	176	449	8,652	81	110	1,667	1,413	5,692	15,393
SOUTHERN	25	2	1	-	3	7	7	3	2	22	47	70	4	329	1	7	69	1	94	44	11	8	523	522	785	1,011
TOTAL	2,996	2,996	1,334	1,334	3,934	3,934	1,982	1,982	80	80	1,888	1,888	1,258	1,258	229	229	1,545	1,545	9,564	9,564	314	314	6,643	6,643	31,767	31,767
(C) RAILWAY																										
BANGKOK	89	27	48	6			30	3	120	3	16	22	54	-	214	-	-	1,258	1,152	11	1	49	44	482	1,869	1,831
NORTHERN	-	176	-	205			-	31	6	30	29	10	1	34	-	214	633	-	20	92	12	1	101	19	802	812
N-EASTERN	1	83	-	33			-	-	-	10	18	1	9	-	-	-	560	-	53	-	11	1	38	10	690	138
CENTRAL	34	64	42	46			-	4	6	4	-	57	23	4	170	178	14	-	67	1,229	1	4	245	34	602	1,624
SOUTHERN	231	5	200	-			10	2	6	91	34	7	-	49	11	3	21	-	26	86	32	3	162	45	733	291
TOTAL	355	355	290	290			40	40	138	138	97	97	87	87	395	395	1,228	1,228	1,418	1,418	58	58	590	590	4,696	4,696
(D) COASTAL																										
BANGKOK	-	-	-	14	-	-	-	2	-	-	-	-	-	-	-	-	-	826	-	-	-	65	-	159		1,066
NORTHERN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-EASTERN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CENTRAL	-	-	-	1	-	-	-	-	-	-	-	-	3	-	-	-	297	33	-	-	-	-	63	2	365	36
SOUTHERN	-	-	15	-	-	-	2	-	-	-	8	-	3	-	12	-	786	-	-	-	72	-	162	-	1,060	-
OTHERS	-	-	-	-	-	-	-	-	-	-	-	8	-	6	-	12	-	224	-	-	-	7	-	64	-	321
TOTAL	-	-	15	15	-	-	2	2	-	-	8	8	6	6	12	12	1,083	1,083	-	-	72	72	225	225	1,423	1,423
(E) INLAND WATERWAYS																										
BANGKOK	660	-	1,200	-	-	-	-	-	-	-	-	-	-	-	140	-	-	100	2,530	-	-	80	-	30	4,530	210
NORTHERN	-	200	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	600	-	-	-	-	-	1,000
CENTRAL	-	460	-	1,000	-	-	-	-	-	-	-	-	-	-	-	140	100	-	-	1,930	80	-	30	-	210	3,530
SOUTHERN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	660	660	1,200	1,200	-	-	-	-	-	-	-	-	-	-	140	140	100	100	2,530	2,530	80	80	30	30	4,740	4,740

NOTE : A: CARGO ARRIVED
D: CARGO DEPARTED

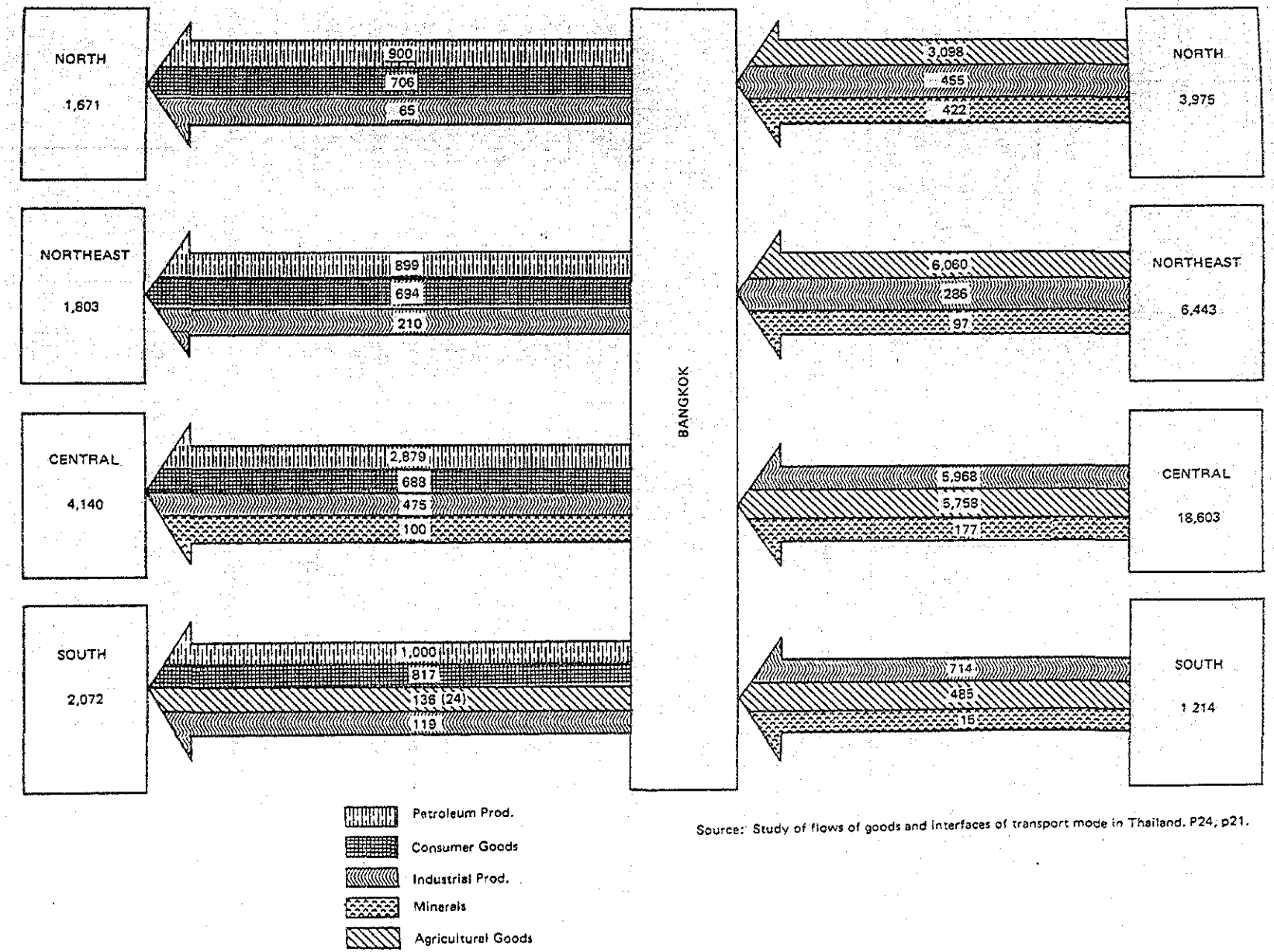
SOURCE: MOC ANNUAL TRANSPORT STATISTICS 1984, 1985
INLAND WATERWAYS PROJECT PRE-FEASIBILITY STUDY, DECONS JUN. 1983

Fig. 2.3 Total Inter-district Traffic (1982)



Source: MOC Statistics

Fig. 2.4 Inter-regional Flow of Major Commodities



Source: Study of flows of goods and interfaces of transport mode in Thailand. P24, p21.

Table 2.9 Inland Freight Traffic of Thailand by Mode

	Road	Railway	Inland Waterways	Coastal Shipping	Total
			A.Tons(Million)		
1973*1	25.0	5.0	8.0	n.a.	-
1981*2	157.0 (91.5%)	6.1 (3.6%)	5.4 (3.1%)	3.0 (1.8%)	171.5 (100%)
1985*3	160.0 (90.0%)	5.6 (3.1%)	10.1 (5.7%)	2.1 (1.2%)	177.8 (100%)
			B.Ton-km(Billion)		
1973	6.5	2.0	1.3	n.a.	-
1981	22.0 (79.4%)	2.7 (9.8%)	1.2 (4.3%)	1.8 (6.5%)	27.7 (100%)
1985	26.7 (84.0%)	2.6 (8.2%)	1.5 (4.7%)	1.0 (3.1%)	31.8 (100%)

Source:
*1 World Bank Report 1980
*2 World Bank Report 1985
*3 National Transport Plan-Phase I Report, GTZ, 1986

Table 2.10 Rail Transport Flows by Major Commodities

(Unit: 1,000 tons)

Year	Petroleum Prod.	Cement	Rice	Gypsum	Maize	Forestry Prod.	Misc.	Total
1976	1,203	1,026	470	94	190	316	1,857	5,156
1977	1,324	1,456	569	154	192	369	2,079	6,142
1978	1,430	1,622	347	263	121	253	2,125	6,161
1979	1,483	1,829	398	313	132	206	2,086	6,447
1980	1,376	1,614	506	351	270	198	1,986	6,301
1981	1,434	1,598	451	363	265	176	1,843	6,121
1982	1,539	1,551	425	325	330	110	1,387	5,667
1983	1,442	1,460	367	273	206	110	1,401	5,259
1984	2,096	1,479	476	244	200	81	997	5,573
1985	2,361	1,266	425	242	216	66	1,113	5,689

Source: Information Booklet, SRT

Table 2.11 Commodity-pattern of Railway Transport, 1985

(Unit: 1,000 Tons)

Commodity	Cargo Volume	%
Petroleum Products	2,361	41.5
Cement	1,266	22.3
Rice	425	7.5
Gypsum	242	4.2
Maize	216	3.8
Forestry Products	66	1.2
Miscellaneous	1,113	19.5
Total	5,689	100

Source: Information Booklet, SRT

account for 75% of the total freight carried by railways in 1985.

36. The total volume of cargo carried via inland waterways was 10.1 million tons in 1985 (excluding freight carried by lighters between Bangkok/Bang Pakong and the Gulf of Thailand). Cargoes transported through each waterway system were as follows:

North Chao Phraya River System	1,350	thousand tons
Lower Chao Phraya River	2,700	"
Pasak/Ayutthaya Corridor	4,500	"
Suphan/Noi River	1,060	"
Mae Klong River	500	"
Total	10,110	"

Source: National Transport Plan Report, GTZ, 1986

37. Through the North Chao Phraya River, sand is mainly transported, and through the Lower Chao Phraya River, maize, tapioca pellets and rice for export are transported. Return cargo from the Bangkok Metropolitan Area is mainly petroleum products. Maize, cement, sand, gravel, mineral and tapioca including items for export are transported through Pasak River, and sand, gravel, rock salt and mining products for export are transported through the Mae Klong River and rice through Noi River.

38. There are many stock yards (storages and silos) for agricultural products such as maize and tapioca located along these rivers. The capacity of these stock yards totals approximately 3 million tons.

39. Coastal ports in Thailand consist of 14 major ports and many other smaller fishery ports. Among them, only 8 ports handle more than 100 thousand tons. They are Bangkok, Si Racha, Sattahip, Songkhla, Ban Don, Samut Songkram, Pak Phanang and Phuket, and these ports mostly handle petroleum products.

40. About 80% of the cargo transported by coastal shipping is petroleum products from Bangkok and Si Racha to southern Thailand, and about 50 % of the remaining cargo is fertilizer. Coastal shipping plays an important

role in the transport of goods between Bangkok and southern Thailand. The total freight volume carried between Bangkok and southern Thailand was 2,792 thousand tons in 1983; 64% of it was carried by roads, 19% by railways and 17% by coastal shipping.

Foreign Trade

41. The amount of foreign trade cargo increased from 25,752 thousand tons in 1976 to 39,828 thousand tons in 1985, at an average annual rate of 5%. Total imports fluctuated between 15 million tons and 20 million tons during the period from 1978 through 1985, but total exports increased steadily from 14 million tons in 1978 to 22 million tons in 1985. Especially after 1983, imports decreased while exports increased, reflecting the new export promotion policy.

42. As for imports into Thailand, petroleum product is the major item amounting to 9.4 million tons in 1985 followed by iron and steel (2.7 million tons) and chemicals (2.6 million tons). These three items comprise 81% of total imports. Oil and petroleum products, however, are decreasing their share due to the operation of a natural gas project (1983).

43. Saudi Arabia, Malaysia and Singapore are the main sources of the petroleum products and thus the main sources of Thai imports followed by Japan, Europe and the U.S.A. which are the sources of iron and steel, chemicals, paper and machinery.

44. As for exports, the major items are tapioca, rice, maize and sugar which total 15.6 million tons or 77% of total exports. Rubber and tin account for an additional 3% of exports. Thus most of the exports are primary products. In recent years, however, the share of textile exports has increased along with the progress of light industry from 6.9% in 1978 to 19.2% in 1984 on a value basis.

45. The major destinations for exports are the Netherlands for tapioca, Japan for rubber and sugar, Malaysia and the Gulf and Asian countries for maize and rice, and China for sugar.

46. Containerized cargoes are handled at Klong Toei Wharves in Bangkok and the volume increased from 578 thousand tons in 1977 to 4,794 thousand tons in 1986. The containerization ratio of the total cargo handled at facilities managed by PAT is 44% for imports and 99% for exports as of 1986.

Table 2.12 Foreign Trade Cargo of Thailand by Maritime Transportation

(Unit: 1,000 Tons)

Cargo	1978	1979	1980	1981	1982	1983	1984	1985
Import	17,272	19,740	18,369	16,972	15,135	20,031	18,908	18,091
Export	14,206	13,636	13,854	16,520	21,110	17,013	20,266	21,737
Total	31,478	33,376	32,223	33,492	36,845	37,044	39,174	39,828

Source: MOC Statistics

Table 2.13 Coastal Cargo Movement through Major Coastal Ports

(Unit: 1,000 Tons)

Port	1974	1975	1976	1977	1981	1982
Samut Songkram *	153.8	213.8	180.2	214.9	-	185.5
	6.4	2.7	3.2	4.7	-	-
Chumphon *	17.8	14.3	34.3	39.3	45.5	57.3
	1.4	0.6	3.3	2.2	-	3.0
Lang Suan	0.3	0.3	0.2	0.1	-	0.2
	0.3	0.4	0.2	0.1	-	-
Ban Don *	120.1	123.8	165.6	202.3	258.3	233.1
	89.3	85.7	74.9	80.7	12.1	13.0
Pak Phanang *	150.2	135.2	132.6	129.2	157.3	140.0
	11.0	10.0	10.6	13.0	0.3	1.3
Pattani	43.4	613.8	35.9	35.6	0.3	-
	34.1	27.9	25.9	24.7	2.7	8.9
Narathiwat	3.0	-	-	-	-	-
	1.3	0.3	-	-	-	-
Satun	-	0.1	-	-	-	0.1
	1.7	1.0	0.9	1.1	-	0.2
Phang-nga	-	-	-	0.1	-	-
	0.5	0.5	0.3	0.1	-	-
Krabi	-	-	-	-	-	-
	0.2	2.6	1.6	2.8	-	1.4
Kantang *	11.0	11.5	9.3	7.7	3.6	-
	-	0.2	0.1	0.1	-	1.6

Upper Row: Inward
Lower Row: Outward
Note : * Including Petroleum Traffic
Source: 1974-1977 Coastal Ports Study Vol-I P.16, April 1980:
1981-1982 MOC Statistics

Table 2.14 Coastal Shipping Domestic Cargo Flow
(Bangkok/Si Racha --- South)

(Unit: 1,000 tons)

Year	to South					to North
	Total	Petroleum Products	Percent %	Fertilizer	Others	Total
1974	573.5	397.6	69.3	0	175.9	162.9
1975	575.0	417.5	71.4	18.8	148.7	119.0
1976	644.7	494.7	76.7	1.5	148.5	101.6
1977	689.8	545.0	79.0	11.5	133.3	109.0
1978	813.6	698.4	85.8	10.4	104.8	76.6
1979	868.8	689.2	79.3	78.5	101.1	70.8
1980	839.1	718.3	85.6	30.7	90.1	62.6
1981	754.5	637.5	84.5	55.0	62.0	45.9
1982	864.1	629.5	72.9	63.4	171.2	44.7
1983	869.4	691.6	79.5	82.1	95.7	n.a.

Source: MOC Statistics, Coastal Shipping Report 1984

Table 2.15 Major Import Commodities

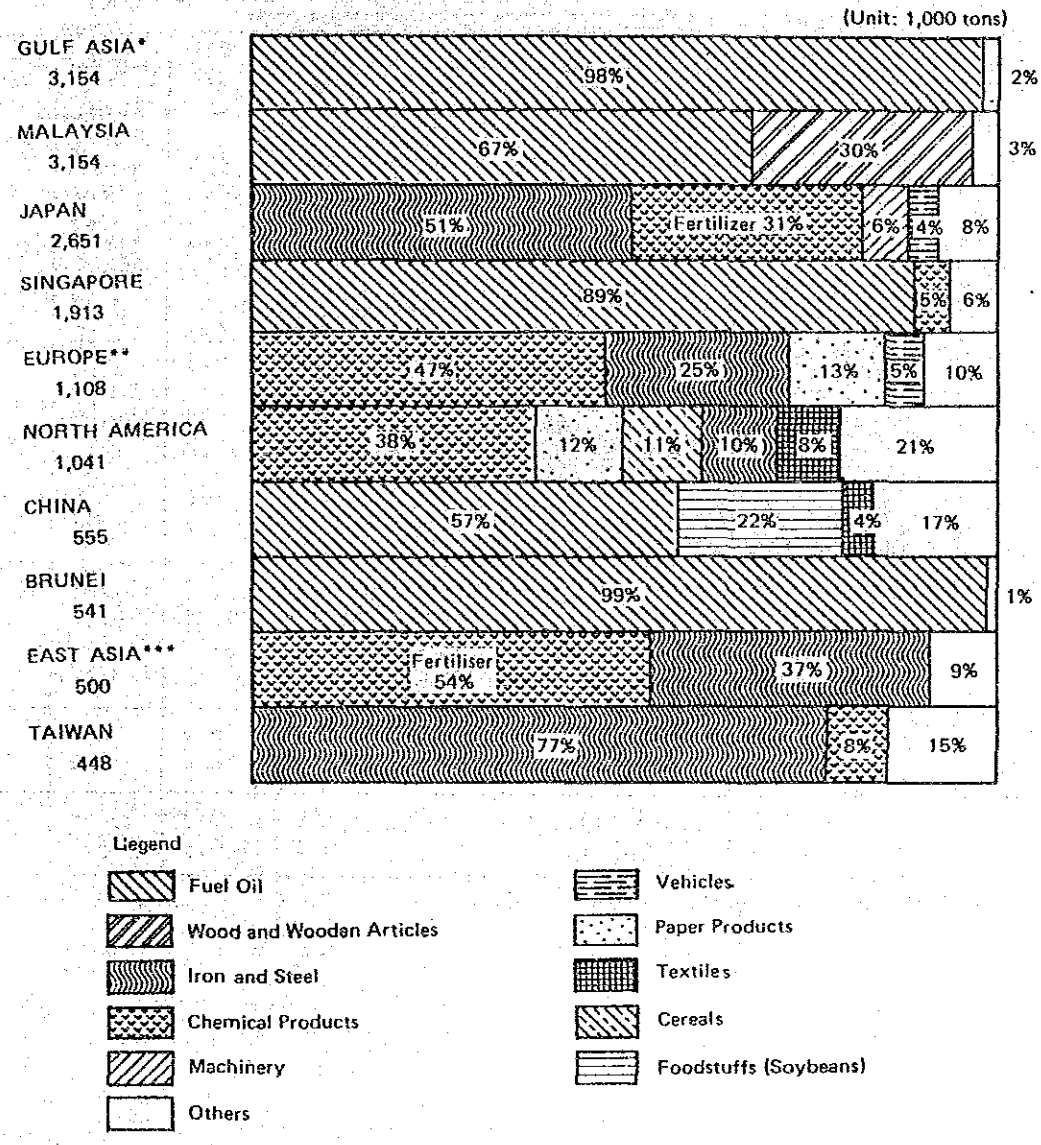
(Unit: 1,000 tons)

Commodity	1981	1982	1983	1984	1985
Fuel Oil	10,831	9,619	10,384	11,093	9,415
	63.0%	60.5%	51.4%	58.2%	51.7%
Iron & Steel	1,893	1,940	2,732	2,181	2,744
	11.0%	12.2%	13.5%	11.4%	15.1%
Chemical Products	1,760	1,812	2,715	2,417	2,588
	10.2%	11.4%	13.4%	12.7%	14.2%
Wood & Articles	415	359	461	428	1,032
(Lumber)	2.4%	2.6%	2.3%	2.2%	5.7%
Foodstuffs	437	450	521	684	528
	2.5%	2.8%	2.6%	3.6%	2.9%
Paper Products	413	349	427	359	429
	2.4%	2.2%	2.1%	1.9%	2.4%
Machinery	266	314	383	412	283
	1.5%	2.0%	1.9%	2.2%	1.6%
Cereals	192	130	172	132	150
	1.1%	0.8%	0.9%	0.7%	0.8%
Vehicles	196	147	194	189	116
	1.1%	0.9%	1.0%	1.0%	0.6%
Others	785	779	2,194*	1,165	949
	4.8%	4.6%	10.9%	6.1%	5.0%
Total	17,188	15,899	20,183	19,060	18,228
	100%	100%	100%	100%	100%

Note: *Including 1,459 thousand tons of ship floating structures

Source: MOC Statistics

Fig. 2.5 Import Cargo by Main Country (1985)



NOTE: * MAINLY SAUDI ARABIA
** MAINLY WEST GERMANY, FRANCE
*** MAINLY KOREA

Source: Based on MOC Statistics

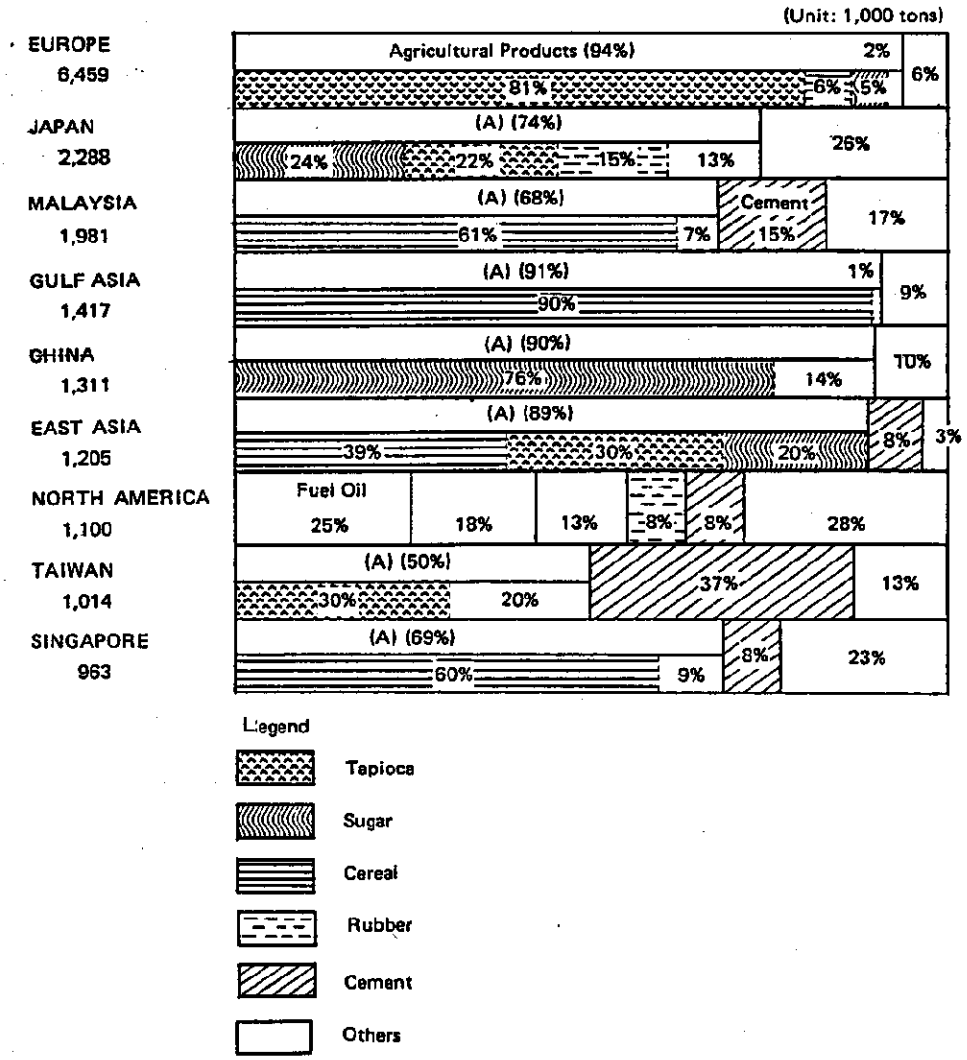
Table 2.16 Major Export Commodities

(Unit: 1,000 Tons ... upper figures
Billion Baht.. lower figures)

	1970	1978	1979	1980	1981	1982	1983	1984	1985
Tapioca	1,327 1.2	6,288 10.9	3,961 9.9	5,218 14.9	6,266 16.4	7,816 19.8	5,197 15.4	6,570 16.6	7,088 15.0
Rice	1,064 2.2	1,607 10.4	2,797 15.6	2,800 19.5	3,032 26.4	3,784 22.5	3,476 20.2	4,616 25.9	4,062 22.5
Maize	1,371 2.0	1,972 4.3	2,014 5.6	2,203 7.3	2,575 8.3	2,831 8.3	2,659 8.5	3,145 10.1	2,782 7.7
Sugar	56 -	1,040 4.0	1,190 4.8	452 3.0	1,119 9.6	2,206 12.9	1,537 6.3	1,242 5.2	1,724 6.2
Rubber	276 2.2	442 8.0	521 12.4	455 12.4	475 10.8	544 9.5	555 11.8	592 13.0	690 13.6
Tin	22 1.7	29 7.2	31 9.3	34 11.3	30 9.1	25 7.8	18 5.3	18 5.3	18 5.6
Sub-Total	4,116 - 9.6 (64.9%)	11,378 (80.1%) 44.8 (53.9%)	10,514 (77.1%) 57.6 (53.2%)	11,162 (80.6%) 68.4 (51.4%)	13,494 (81.7%) 80.6 (52.7%)	17,206 (81.5%) 80.8 (50.6%)	13,442 (79.0%) 67.5 (46.1%)	16,183 (79.9%) 76.1 (43.4%)	16,364 - 70.6 -
Textile Products	n.a -	n.a 6.9	n.a 8.8	n.a 9.6	n.a 12.6	n.a 14.0	n.a 14.4	n.a 19.2	n.a 23.6
Grand Total	14.8	14,206 83.1	13,636 108.1	13,854 133.2	16,520 153.0	21,110 159.7	17,013 146.5	20,266 175.2	- -

Source: Customs Department, MOC Statistics

Fig. 2.6 Export Cargo by Main Country (1985)



Source: Based on MOC Statistics

Table 2.17 Summary of Trade in Calendar Year
-Bangkok Port-

(Unit:Ton)

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Klong Toei										
Import										
-Containers *1	204,456	354,427	581,179	776,172	839,050	1,126,407	1,107,361	1,495,795	1,537,103	1,549,312
-Break Bulk	2,776,422	3,113,722	2,750,023	2,952,783	2,746,992	2,607,790	2,270,486	2,867,699	2,613,943	2,473,960
Total	2,980,878	3,468,149	3,331,202	3,728,955	3,586,042	3,734,197	3,377,847	4,363,494	4,151,046	4,023,272
Export										
-Containers *1	172,414	223,195	467,884	675,799	895,174	1,058,775	1,155,565	1,330,444	1,825,065	2,332,221
-Break Bulk	107,391	99,096	106,729	63,355	21,933	62,522	282,606	249,220	149533	5,135
-Bulk *2	92,899	152,451	148,462	117,528	99,787	63,637	-	-	-	-
Total *2	372,704	474,742	723,075	856,682	1,016,894	1,184,934	1,438,171	1,579,664	1,974,598	2,337,356
Total Cargo										
-Containers	376,870	577,622	1,049,063	1,451,971	1,734,224	2,185,182	2,262,926	2,826,239	3,362,168	3,881,533
-Break Bulk	2,883,813	3,212,813	2,856,752	3,016,138	2,768,925	2,679,312	2,553,092	3,116,919	2,763,476	2,479,095
-Bulk	92,899	152,451	148,462	117,528	99,787	63,637	-	-	-	-
Total	3,353,582	3,942,891	4,054,277	4,585,637	4,602,936	4,928,131	4,816,018	5,943,158	6,125,644	6,360,628
Other Facilities										
Import *2										
-TMN Wharves	150,087	232,969	291,678	274,701	146,513	260,555	140,334	172,680	103,969	109,617
-Dolphins and Anchorage	281,084	441,876	837,279	1,509,536	948,126	954,281	1,141,823	1,193,602	786,408	639,825
-Private Wharves	548,013	892,635	963,896	1,311,742	1,094,765	949,016	963,985	1,550,020	1,739,891	1,766,687
Total	970,184	1,567,480	2,092,853	3,095,979	2,189,404	2,163,852	2,246,142	2,916,302	2,630,268	2,516,129
Export										
-All Other Facilities	11,409,580	11,775,766	11,415,867	11,322,335	11,441,203	13,056,786	17,711,380	13,945,294	15,779,852	16,283,350
Total Trade										
-Import	3,960,062	5,035,629	5,424,055	6,824,934	5,775,446	5,898,049	5,623,989	7,279,796	6,781,314	6,539,401
-Export *3	11,782,292	12,230,508	12,138,942	12,185,785	12,458,097	14,954,665	19,149,551	15,524,958	17,754,450	18,620,706

Note : Imports do not include Oil
Source: *1 Technical Department, PAT
*2 Port Operations Statistics, PAT
*3 Foreign Trade Statistics, Customs Department

Table 2.18 Inland Waterways Fleet (1980-1982)

Type of Vessel/ Capacity Range*1	No. of Units	Total*2 Capacity	No. of Units	Toatal Capacity	No. of Units	Total Capacity
Wooden Barge						
40.1-60.0DWT	1,814	90,795	1,871	93,343	1,871	93,343
60.1-80.0	1,188	82,668	1,202	83,602	1,205	83,806
80.1-100.0	287	23,779	289	23,954	291	24,133
100.0-200.0	103	14,913	105	15,165	105	15,165
200.0-400.0	104	22,889	104	22,889	104	22,889
Over 400.0	53	24,409	53	24,409	53	24,409
Sub-total	3,549	259,453	3,624	263,362	3,629	263,745
Steel Barge						
100.1-150.0DWT	89	11,839	96	12,700	100	13,258
150.1-200.0	223	39,473	223	39,473	223	39,473
200.0-300.0	448	100,869	455	102,444	460	103,579
Over 300.0	59	23,541	87	32,865	87	32,865
Sub-total	819	175,722	861	187,482	870	189,175
Total	4,368	435,175	4,485	450,844	4,499	452,920
Tow Boat						
50-100HP	645	53,700	651	54,240	652	54,330
101-200	352	48,240	352	48,240	352	48,240
Over 200	75	21,750	75	21,750	78	22,620
Total	1,072	123,690	1,078	124,230	1,082	125,190

Note : *1 Excluding about 3,000-3,500 units with a capacity of below 40 DWT each.
*2 Capacity Measured in DWT for Barges and HP for Tow Boats.
Source: HD, June 1983

D. Water Transport Sector

General View

47. The water transport sector in Thailand includes businesses which are concerned with the movement of seaborne cargoes from ship to shore, barge, shed or warehouse, and onto inland conveyances and vice versa, including ships' agents, shippers' agents (freight forwarders), stevedoring, longshore cargo handling, weighing and survey companies, customs brokers, road transporters and export commodity standards inspectors.

48. The entry into these lines of business is completely open except for the following safeguards:

i) The controlling share in any company engaged in any of these businesses must be owned by Thai nationals under National Executive Council (NEC) Announcement No. 281;

ii) Registration with the Department of Commercial Registration, Ministry of Commerce under the Commercial Registration Act B.E. 2449 (1906) and business tax registration under the Revenue Code are required;

iii) Registration of stevedoring companies with PAT under Ministerial Regulations issued in accordance with PAT Act B.E. 2494 (1951) and permission under the Byelaws of PAT for businesses whose operations are carried out in PAT areas are required;

iv) A license from the Customs Department is required for persons dealing with customs matters under Thai Customs Law B.E. 2469 (1926);

V) Alicense for land transport is required under the Transport Act B.E. 2522 (1979);

vi) A license for bonded warehouse operation is required from the Customs Department under Thai Customs Law;

vii) A license is required under the Export Standard Act B.E. 2522 (1979), as amended, for commodity standards inspectors;

viii) The Maritime Promotion Act B.E. 2521 (1978) (MP ACT) contains provisions for the registration of maritime operators, port

operators and shipyard operators. However, this is merely for recording purposes and defunct companies have not been removed from the register.

49. Associations currently set up among related businesses include:

i) Bangkok Shipowners' and Agents' Association for ships' agents
ii) Lighter Owners' Association Thailand for lighter operators
iii) Shipping Association of Thailand for customs brokers
iv) One of the organizations of the Board of Trade for freight forwarders

50. The functions of the various businesses in the Thai water transport sector are considered below.

Forwarding Agents

51. Services which are traditionally carried out by forwarding agents include booking of ship space, preparation of shipping documents, arrangement of road transport, and attendance to customs formalities.

52. In the overall shipping activity of Thailand, however, forwarding agents have played only a marginal role for various reasons. In Thailand, most regular shippers employ shipping clerks, who not only prepare shipping documents, but in most cases, are also licensed to attend to customs clearance formalities. The smaller shippers who are not in a position to employ full-time shipping clerks generally utilize the services of forwarders on an ad hoc basis.

53. As more than 90% of Thailand's foreign trade is carried by foreign shipping lines, most of them have well-established shipping agents who serve as their representatives in Thailand. These agents directly accept cargo from the shippers without the intervention of any freight forwarders. Thailand's main exports are agricultural products, which are shipped as bulk cargo. This also tends to limit the area of operation of forwarding agents.

54. Entry to the forwarding agent business in Thailand is open with the following restrictions:

i) Persons dealing with customs clearance must hold a license from the Department of Customs.

ii) Persons operating their own vehicles to collect and deliver packages must obtain a license from MOC.

Warehousers

55. Warehousers offer services whereby goods may be stored, sorted, sampled, repacked, labeled, weighed or otherwise processed or handled.

56. Under the Announcement of the Revolutionary Party No.58 of 26th January B.E. 2515 (1972) and Conditions Controlling Warehouse Business B.E. 2526 (1983), the warehousing business is regulated by the Minister of Commerce. Persons desiring to engage in this business are first required to register as a company with the Minister, and then to apply for permission to engage in warehousing. The application for approval of registration as a company must be made according to the form prescribed by the Minister. Upon receiving approval, an application for authorization to operate a warehouse business is made within 90 days from the date of registration as a company.

57. Warehouse business operators are required to have a paid-up capital of not less than Baht 5 million and to own a warehouse and have an office both as prescribed by the Minister.

58. The warehousing can be either what is known as the "Free" type or the "Bonded" type. Goods which are either duty paid or duty free are deposited in free warehouses. These buildings are simply and solely places where goods are serviced and stored as required. A bonded warehouse is a warehouse which is licensed by the Customs for the storage of dutiable goods. It provides all the advantages of a free warehouse plus the advantage that the duty on goods stored there is not paid until the goods are delivered from bond, i.e. released from the warehouse upon payment of duty. The Director General of the Customs Department is empowered to approve and to designate bonded warehouses for the examination and storage

of imported goods, and to lay down the procedures and limitations on the storage of goods as well as regulations for the operation, supervision and control of bonded warehouses. Presently, there is only one such bonded warehouse in Thailand; Bonded Warehouse No.1 located at Klong Toei Wharves.

Marine Cargo Surveyors

59. There are less than ten marine cargo surveyors operating in Thailand. Most of them are the agents of well-known international surveyors or their subsidiary companies in Thailand. The main services provided by the marine cargo surveyors are:

i) Inspection of the quality and quantity of agricultural products, consumer products, and natural resources;
ii) Measuring and weighing;
iii) Supervision of loading and discharging of cargo, including loading and stowage surveys, draft surveys, hatch surveys, etc.;
iv) Fumigation;
v) Cargo damage surveys; and
vi) Chemical laboratory services.

Foreign buyers normally utilize the services of these surveyors to ensure that the quality and quantity of the goods purchased are in accordance with the specifications of the contract.

60. As for the weighing of goods, surveyors have to always make sure that the scales are mechanically sound, and in good operating condition. They emphasize the necessity of introduction of regulatory rules or government control over weighing instruments whereby newly manufactured or imported scales can be verified according to standard rules, and regularly checked to ensure that the margin of error does not exceed a permissible allowance.

61. The Exports Standardization Act B.E. 2503 (1960), as amended, states that shippers or exporters must arrange for commodity inspections as specified by the Minister of Commerce for kenaf, maize, castor seed, kapok, sorghum, tapioca products, salt, teak conversion, nielloware, Thai silk,

and Thai silk products, and apply for a certificate of commodity standard from the Office of Commodity Standard (OCS). No company is allowed to engage in the business of commodity standard inspection unless it is licensed by OCS. Inspectors have to pass an examination prepared by OCS according to the rules set by the Act.

Customs Brokers

62. The Shipping Association of Thailand is an association of the companies and individuals engaged in the business of customs brokering, with approximately 600 members. The customs brokers, on behalf of their clients, prepare and lodge customs documents and attend to customs formalities in compliance with the Customs Law. The customs documents have to be signed by qualified persons who are approved by the Customs Department as such, and who hold licenses issued by the Customs Department.

63. This licensing requirement was only imposed in May 1986 by Notification (No.33/2529) of the Customs Department. Further requirements are expected to be imposed in the future. Under Notification (No.33/2529), customs brokers are required to apply using a prescribed form for Customs Formalities Certificates to conduct official matters with the Customs Department. The certificates are issued within 15 days from the date of application, and the applicants must meet the following requirements:

i) They have never obtained any such certificates and have never committed any offense concerning the Customs Law and have never done anything likely to cause damage to the Customs Department.
ii) They have a bachelor's degree or the equivalent or they have technical training certificates issued by the Customs Training Centre, the Shipping Association of Thailand or by any of the shipping educational institutes acceptable to the Customs Department.
iii) They hold a letter of authorization to act as a customs agent issued by their principals.

64. To transact business at the Customs House, a licensed person is

required to produce:

i) A letter of authorization from the exporter or importer, authorizing the company, of which he is an employee, to act on behalf of the client
ii) A letter of authorization from the president of the company, authorizing him to represent the company
iii) A registration card for the signature of the president of the company to identify the signature in item ii), above

Most shipping agents and forwarding agents employ licensed persons and offer their services to shippers and consignees.

Road Transport

65. Road transport is governed by the Transport Act. The Minister of Communications and the Minister of Interior are responsible for the execution of this Act.

66. Persons engaged in the business of road transport are required to obtain a license from the Registrar. Applicants for licenses must be Thai nationals. In the case where the applicant is a limited company, not less than half of the directors must be Thai nationals and not less than 51 % of the capital of the company must be owned by shareholders who are Thai nationals. The Central Registrar issues licenses for engagement in the transport business in Bangkok Metropolis, inter-Changwat transport business and international transport business, and the Registrar of each Changwat issues licenses for engaging in transport business within the Changwat.

67. Persons licensed to engage in the transport business cannot raise, reduce or exempt transport charges or other service charges prescribed and recorded in the license conditions without the prior permission of the Registrar. Licensees are required to make available a Vehicle Registration Book, a resume of the persons attached to each vehicle and/or a bill of lading of cargo in transport, and to make reports on such transport and accidents which occur during such transport. Transport vehicles must be in

sound condition and complete with equipment and component parts as prescribed in Ministerial Regulations, and must be properly registered.

68. Businesses engaged in gathering cargo and arranging to have the cargo transported by other licensed transporters from one place to another under the responsibility of the persons undertaking such transport arrangements are also required to obtain a license from the Central Registrar. Such licensees are required to deposit funds with the Registrar as a pledge for compliance with such transport contracts.

Shipping Companies

69. The Thai inland waterway fleet of barges and tow boats is almost all privately owned except for a few units and operated by the Express Transport Organization of Thailand. The fleet consists of some 4,500 units ranging in size from 40 to over 300 DWT and 3,000 - 3,500 smaller units. About 3,300 of the 4,500 barges are wooden structures of below 100 DWT. The total capacity of all the vessels is around 450,000 DWT. The vessels handle 8.6 million tons annually. The inland waterway transport industry is highly competitive and free from regulation.

70. As for the coastal fleet, only one common carrier, Narinsuit Transport Company, Ltd., maintains regular domestic coastal shipping services to Songkhla. The company maintains a fleet of 12 vessels ranging from 100 to 250 NRT. Three other small companies, with a total of eight vessels, operate weekly non-scheduled services serving Bangkok, Songkhla, Ko Samui, Pak Phanang and Tha Thong. The main coastal cargo, bulk petroleum, is carried by 300 to over 2,000 DWT tankers operating out of Si Racha.

71. The Thai ocean going merchant fleet consists of 87 dry cargo vessels with a total capacity of 435,341 DWT and 62 tanker vessels with a total capacity of 243,236 DWT. The largest number of vessels (76) with a combined capacity of 248,000 DWT serve the trade with Southeast Asia. Other major services are to Japan, Korea, and Europe. 28 vessels with a capacity of 65,000 DWT serve domestic trade exclusively while 2 ships with 9,000 DWT and 22 ships with 175,000 DWT capacity serve foreign and unspecified trade

routes, respectively.

72. Some of the smaller Thai vessels are engaged in container feeder service and operate between Bangkok and Singapore or Hong Kong. There is only one 4,000 DWT full container feeder ship in the Thai fleet. Agricultural goods, usually dry bulk cargo, are almost exclusively carried by large foreign flag bulk carriers.

Legal Conditions

73. Thailand has not yet ratified the UNCTAD Liner Code of Conduct which came into force on October 6, 1983. The Thai Government has continued to introduce various pieces of legislation designed to advance the interests of Thai shipping. Government agencies are encouraged to use government-owned forwarding agents and vessels belonging to the Thai Maritime Navigation Co., Ltd., the United Thai Shipping Corp., Ltd. The MP Act aims at promoting Thai flag vessels through fiscal measures including cargo preference and the prevention of dumping by foreign flag vessels. It empowers the Government to permit a deduction amounting to not more than 50% of the costs of carriage from the shipper's net income prior to income tax calculation when using Thai flag vessels for the sea-borne transport of cargoes ordered by government agencies and enterprises.

74. Although there are regulations requiring government agencies, governmental organizations, and state enterprises to use Thai ships to transport their imported goods on six routes (Japan, Korea, Hong Kong, Taiwan, Europe and the U.S.A.), most imports to date have fallen into the non-reserved category. Most of the legislation deals with liner type shipping, but much of Thailand's foreign trade is in bulk shipping of agricultural exports and petroleum, cement and other imports. Therefore, as long as Thailand does not acquire a reasonable bulk carrying capacity, any legislation designed to promote the shipping subsector would be moot.

75. Privately owned Thai shipping companies appear to be more efficient in their operations and marketing activities, and participate quite effectively in competition with government-owned shipping. However,

ownership and management of Thai shipping is highly fragmented.

76. Laws concerning port management and operation directly or indirectly are the Port Authority of Thailand Act B.E. 2494 (1951), Thai Vessels Act B.E. 2481 (1938), Navigation in Thai Waters Act B.E. 2525 (1982), Act for Prevention of Collision at Sea B.E. 2522 (1979), Thai Customs Law, and Labour Law in addition to the MP Act.

E. National Economic and Social Development Plans

First Plan

77. In 1959, Thailand established the National Economic Development Board following the recommendations of the International Bank for Reconstruction and Development (IBRD) and the first National Economic Development Plan was formulated by the Board in 1961.

78. The first plan mainly concerned public works, and the major objectives were as follows:

i) To raise the standard of living;
ii) To encourage economic growth in the private sector;
iii) To promote increased agricultural production and improved quality;
iv) To promote industrial expansion; and
v) To promote commercial competition in the private sector.

79. During the first planning period (1961-1966), the Investment Promotion Act was enacted and import substitution industries such as the textile industry were promoted.

80. As for the transport sector, all kinds of development goals were incorporated in the plan without designating clear priorities, and dredging of the navigable channels at Pattani, Kantang, Songkhla, Phuket and Narathiwat, as well as development of midstream dolphins at Bangkok and Si Racha, were planned.

Second Plan

81. From the second development plan, the name of the plan was changed to the National Economic and Social Development Plan considering the importance of social development in Thailand.

82. The second plan aimed to achieve: i) mobilization of human and natural resources for optimum utilization in expanding the productive capacity and national income of the country so that the benefits of the development could be shared equitably by all classes of people, ii) promotion and maintenance of social justice; preservation of social stability, national institutions, customs and culture; and provision of relief to people in isolated areas who cannot effectively help themselves, iii) maintenance of economic and financial stability to enable the development process to continue on the basis of sound values and productive investments for long-term growth, and iv) preservation of national security, which depends in the final analysis upon the economic strength and social unity of the country.

83. During the second planning period (1966-1971), modern manufacturing industry grew with increased foreign investment and a high degree of diversification took place, enabling Thailand to boost its export items from only three major commodities -- rice, teak and rubber -- in the early 1950's, to more than 10 agricultural products including maize, tapioca and sugar.

84. As for water transportation, the objectives of the plan were set as follows:

i) To improve efficiency and to extend international port facility services
ii) To develop a sound shipping industry as a means of supporting the domestic economic development plan and the expansion of foreign trade
iii) To encourage private enterprise in coastal and inland shipping by extension and improvement of piers, dredging of navigable channels at coastal ports, and construction of major inland navigable channels

85. Under these objectives, the following specific works were incorporated in the plan:

i) The survey and improvement of inland waterways, initiated during

the first plan, will continue in order to facilitate freight and passenger ship movement. The project involves mapping and technical surveys to obtain basic data on the Chao Phraya River from Rama VI Bridge to Nakhon Sawan, the Noi River, the Pasak River and the Lob Buri River. After the completion of this survey, dredging will take place along an estimated distance of about 60km.

ii) The survey and improvement of the southern coastal ports including a technical survey and the dredging of the navigation channels to facilitate access to the ports and reduce midstream transport. During 1967-1971 technical studies will be made for coastal ports at Songkhla, Chumphon, Satun, Ranong, Krabi, Pak Phanang and Surat Thani. Construction of a port at Songkhla and the dredging of the navigation channel to Kantang will be completed. Dredging will also be carried out at Songkhla, Pattani, Pak Phanang, Surat Thani, Narathiwat and Phuket.

iii) Economic and engineering surveys of an appropriate port site on the eastern coast will be conducted with the objective of reducing the heavy burden on Bangkok Port.

iv) Improvements in the efficiency and capacity of freight loading facilities at the berth sites at Bangkok Port will be made. This project was started during the first plan, and emphasized replacement and increase of lifting equipment. During this plan period, warehouses will be constructed, and 50-56 lift trucks, 5 cranes, and other lifting equipment will be procured each year.

v) Major transportation will be improved by the procurement of both coastal and transoceanic vessels. The Thai Maritime Navigation Company will dispose of three old ships and replace them with two new freighters of 5,000 tons capacity each. The Thai Shipping Company will replace its old ship with two new freighters of 800 tons capacity each for coastal operations.

Third Plan

86. The third plan started in 1971 and its major objectives were as follows:

i) To restructure the economic system and to promote economic growth
ii) To maintain economic stability
iii) To promote economic growth in rural areas and to reduce the income disparity gap
iv) To improve social justice
v) To develop manpower resources and to create employment
vi) To promote the private sector's role in economic development

87. During this planning period (1971-1976), the major objectives could not be achieved due to the unfavorable economic situation caused by the oil crisis. However, foreign trade grew rapidly beyond the targeted volume. Imports increased at an average annual rate of 11.5% and exports increased at an average annual rate of 14% mainly through the diversification of agricultural products for export.

88. As for the waterways projects, almost all the items planned in the second plan were not actually completed during the second planning period due to the tardiness in the tender process and problems of land acquisition at Bangkok Port. Therefore, in the third plan, major projects were inherited from the second plan, while an economic and technical survey for improving the coastal ports was planned for more effective investment. Also, a new deep sea port was planned for the eastern coast. However, because of the lack of skill in planning and coordination, projects were not fully implemented. On the other hand, the development of the inland transport network, especially of roads, progressed rapidly in accordance with the government policy to develop the highway sector.

Fourth Plan

89. The fourth plan was formulated under various political and socioeconomic changes in Thailand including the revolution of October 1976.

However, the major objectives of the plan were inherited from the third plan, since the objectives in the third plan addressed the basic structural problems of the country. These were i) acceleration of economic recovery, ii) reduction of income disparity, iii) reduction of the population growth rate, iv) improvement of the management of critical resources and rehabilitation of environmental conditions and v) strengthening of national security management.

90. During the planning period (1976-1981), Thailand achieved a high economic growth rate of around 7.3% per year. However, inflation and trade imbalances caused by the rapid industrialization and the increase in imported raw materials including oil, imported intermediate manufactured products and imported capital goods became a serious burden on the country's finances.

91. As for the waterway transport sector, both inland water transportation and coastal transportation declined mainly because of the inadequate investment in this subsector and lack of adequate planning and coordination.

Fifth Plan

92. The fifth plan aimed at the restoration of the country's economic and financial position intending to make the country one of the newly industrialized countries in the long run, as well as at the decentralization of economic activities away from the Bangkok Metropolitan Area.

93. Major strategies for the industrial sector were:

i) Restructuring of specific industries
ii) Industrial export promotion
iii) Promotion of small-scale industry and industrial development in provincial areas
iv) Foreign investment promotion
v) Development of basic industry especially in ESB area

94. During the fifth planning period (1981-1986), foreign debt greatly increased and the accumulated debt of state enterprises became a serious problem. Also, some state enterprises were privatized.

95. As for the transport sector, the imbalance in the structure of the transportation system due to too much emphasis on road transportation was recognized, and the plan aimed to form a less energy consumptive transport system and to improve coordination among various modes of transport. Along these lines, improvement of the inland waterway system and the coastal shipping system as well as construction of new deep sea ports have been considered and related studies have been executed.

III. Port Development Policy

A. Goals of Port Development

General

1. During the past 25 years of planned development under five-year plans (1961-1986), Thailand has achieved high economic growth and is now approaching the stage of development which the so-called newly industrializing countries have reached. This progress is largely due to the fine performance of the primary sector, together with the increasing contribution of the secondary sector. Through this period of economic growth, the transport sector has played a positive role in coping with the increasing demand and promoting economic development. However, the transportation network has not kept pace with the increasing national economic dependence on foreign trade. A recent trend is the greater volume of trade with developing countries and with neighboring countries in particular. The total amount of the trade with developing countries has expanded to exceed the volume of trade with traditional major trading partners such as the United States and Japan.

2. The transport sector, faced with these major structural changes, is experiencing many problems including over-concentration of traffic in the Metropolitan Area, insufficient handling capacity at the foreign trade ports, and a serious financial deficit in the state administered transportation enterprises due to the increase in oil prices and the distorted development among transport subsectors. Moreover, the Thai economy has been moving steadily towards industrialization and internationalization, which will lead to better national integration and sound economic expansion when combined with the decentralization of economic activities. Along with this continuing trend, transport demand will increase rapidly and will also change qualitatively.

3. Under these conditions, it will be difficult for the transport sector

to cope with the new demand through continued piecemeal development, especially for the underdeveloped port sector. Hence, there is a need to establish a comprehensive policy on port development in Thailand as a part of a comprehensive national transport plan.

Promotion of Industrial Location and Regional Development

4. Ports basically function as the junction between inland and maritime transport. The Thai economy and the entire world economy highly depend on the international trade of raw materials, intermediate goods and final products. Therefore, efficient ports are essential to the economic activity of Thailand.

5. This is also true of the domestic trade ports. Thailand is developing its manufacturing sector and its export-oriented agricultural sector as major economic pillars, and at the same time, the decentralization of economic activities to remote regions is the key issue in the regional development of Thailand. Hence, the ports, as the domestic transport junctions, will play an important role in integrating dispersed activities into the national economy. As in other countries with long coastlines and navigable rivers, domestic shipping plays an important role in Thai transport.

6. The transport cost of inputs and outputs is an important factor in industrial location, and especially for industries which require massive transport for their production activity, water transport is more economical than other transport modes. Thailand aims to industrialize its economy while maintaining the importance of the agricultural sector for export products. Necessary raw materials should be imported directly by efficient vessels and then transported to industrial estates located adjacent to wharves. Thus, industrial ports can be well arranged for effective processing through minimization of unnecessary transportation and maximization of the relative benefits of maritime transport.

7. Moreover, it is necessary to promote equitable land use throughout the nation and to overcome the unfavorable effects of excessive concentration.

When a port is properly constructed to fully function as an industrial infrastructure, it provides an area for economic and industrial activities. Storing, processing and shipping of export products, and assembling and processing imported parts to create finished goods are basic port-related activities. If a port thus provides a base for industry, the regional economy in the hinterland will prosper. In this way ports play an important role in regional development. In fact it is possible to use port development as a strategic means to promote regional development. Historically, this development strategy has worked well in many countries. Port development can play a key role in the decentralization of the economy and population. Therefore, the development of ports as a leading infrastructure for the promotion of industrial location and a nucleus of regional economic development should be stressed.

Promotion of Local Industries

8. Thailand currently depends on earnings from exported agricultural products such as tapioca, rice, maize and rubber for a substantial share of its foreign currency revenue. As industrialization proceeds in the future, the agricultural sector will continue to play a major role as much of the national land is well suited for agriculture.

9. In order to maintain the competitive power of Thai agricultural goods in the world market, it is necessary to reduce their delivery price through the reduction of transport cost as well as of production cost. It is a general principle that water transport becomes efficient as transport distance becomes longer, and this is especially true for bulky cargoes which require less time and cost for cargo handling.

10. However, this is also true for other products. Remote regions away from major markets have to compete with other more favored regions by minimizing the transport cost of products through selecting the least expensive transport mode. If shipping lines connecting directly with major markets are available, local industries are encouraged to locate close to local ports.

11. Thus, it is necessary to develop ports in areas where the local industries will grow and bring about regional development.

Promotion of Effective Transport Networks

12. The function of the ports in Thailand is changing from merely serving as a junction between land transport and maritime transport to serving as a basic infrastructure for the balanced development of the national land through regional economic development and the industrialization and internationalization of the Thai economy.

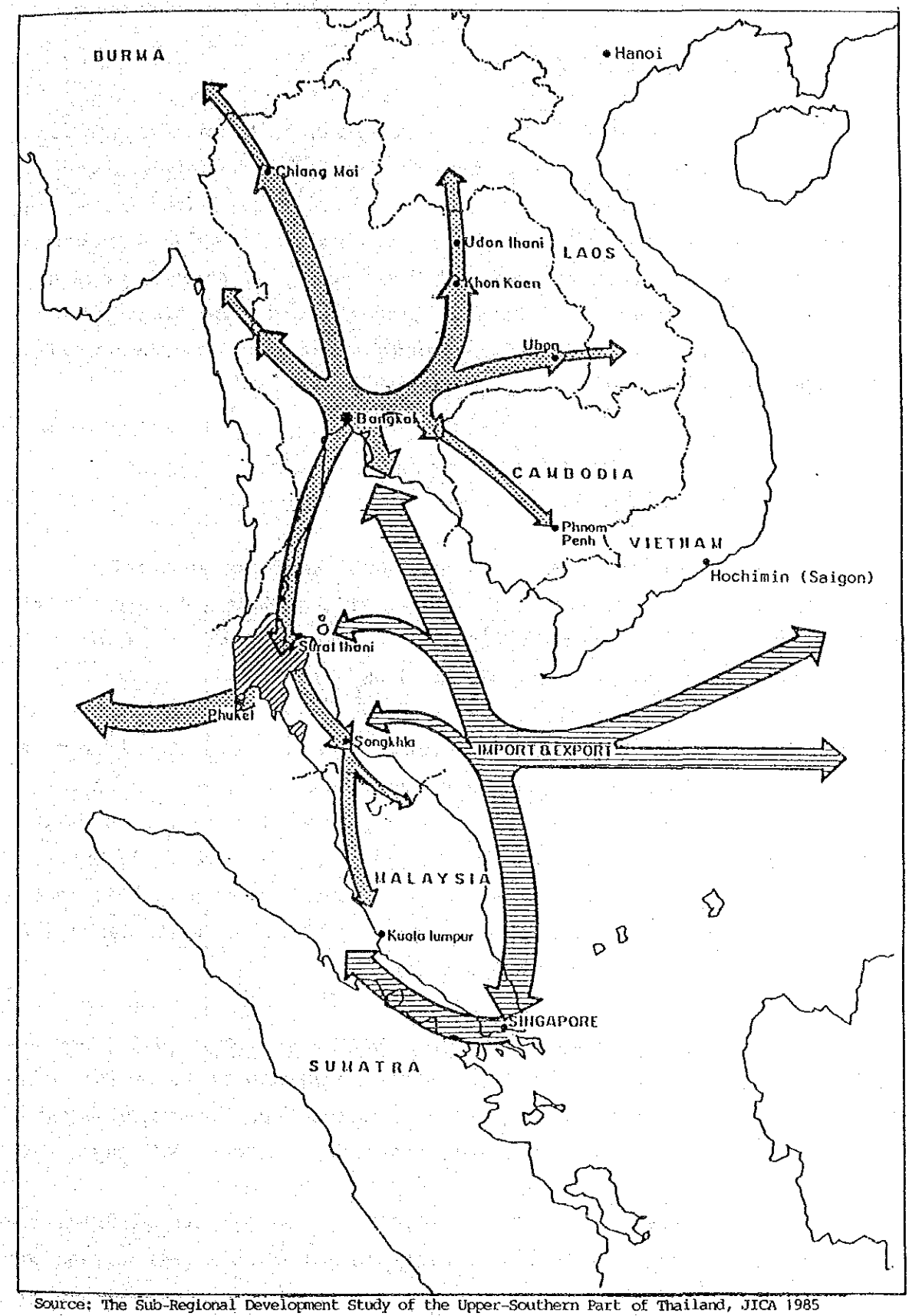
13. Toward the next century, each region will be required to become self-supporting while strengthening its relation with other regions of the nation and of the world, and the local socioeconomic system will have to change from a one-sided dependence on the Metropolitan Area to that of a mutual dependence among various regions through improved transportation and communication networks.

14. Therefore, in the port sector, it is necessary to promote port development to realize efficient interface with other transport modes to create an efficient inter-regional transportation network along with the development of the shipping sector.

15. This is also true for foreign trade as the world trade fleets are pursuing more effective freight transport networks by forming feeder service routes and reducing the number of ports of main call to enjoy the scale benefits of larger carriers. Hence, it is necessary to develop ports which offer more effective and cheaper transport from shipper to consignee in order to compete with other ports in neighboring countries.

16. Thus, the port development policy should stress the development of facilities supporting efficient and comprehensive domestic and international transportation networks.

Fig. 3.1 International Setting



Source: The Sub-Regional Development Study of the Upper-Southern Part of Thailand, JICA 1985

B. Development Policy for Foreign Trade Ports

Future Foreign Trade in Thailand

17. The future demand of foreign trade in Thailand is estimated to reach over 80 million tons around the year 2000 from about 40 million tons in 1985 based on past studies. As well as the increase in volume, the structure of foreign trade will also change along with the growth of industry and the decentralization of the economy. The present pattern of exporting mainly primary agricultural products and importing petroleum products will change as the export of manufactured goods and the import of intermediate products increase.

Upgrading the Port Facilities

18. The size of vessels throughout the world has been increasing in an effort to reduce unit transportation costs. This is true not only for bulk carriers, but also for container ships. Especially the size of grain carriers has been increasing markedly as shown in Fig. 3.2.

19. To cope with the larger size container ships, deeper facilities are being constructed in Thailand's neighboring countries as well as in Europe and the United States. However in Thailand, container berths at Bangkok Port are not sufficiently deep and the shallow channel to Klong Toei Wharves limits the navigation of larger size container ships. This is one of the reasons why Thai container shipping is limited to feeder routes except for the line between Bangkok and Japan.

20. At the Ports of Songkhla and Phuket, which are major export ports for rubber, the containerized rubber has to be transshipped to mother ships anchored offshore using small barges because of the shallow water depth in the ports. Therefore, Thailand is burdened with high transport costs.

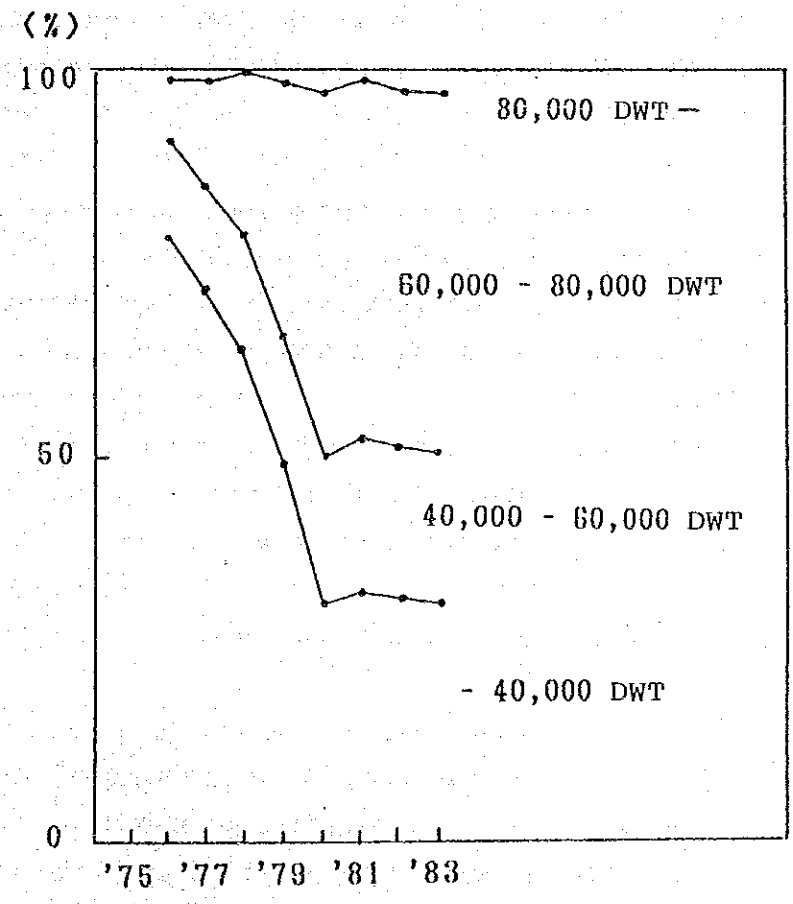
21. As for bulk carriers, although 80,000 to 100,000 DWT carriers are calling at the ports, they are not fully loaded at the wharves and are

Table 3.1 Water Depth of Container Berths in Neighboring Countries

Country	Name of Port	Maximum Water Depth
Hong Kong	Hong Kong	12.2m
Malaysia	Port Kelang	13.4m
Singapore	Singapore	12.7m
Taiwan	Kaohsiung	14.0m

Source: Container Terminals in the World

Fig. 3.2 Size of Grain Carriers



Source: H.P. Drewry, Grain Trade and Shipping in the 1980s'

obliged to shift to offshore facilities for the loading of the remaining cargo. Thus, it is necessary to provide deeper water facilities for both bulk carriers and container ships in order to reduce the transport costs through more efficient operations.

Upgrading the Port Status for International Shipping Lines

22. Liner service on the major trading routes is rapidly being containerized using larger size ships. Although the smallest size of container ship in 1987 is 736 TEU and the largest one is 3,147 TEU, currently the average size of container ships serving Far East/North America and Far East/Europe routes is 2,500 TEU to 3,000 TEU. However, still larger container ships will probably serve these routes in the future. The number of calling ports will decrease while other ports will be served by feeder ships.

23. Therefore, competition among container ports will become stronger and only those ports which can provide well-equipped facilities at low cost and quick despatch through effective operations and also provide a sufficient volume of cargo will be able to survive as the main ports of call.

24. Thailand is less favored in this respect considering the deviation from long distance main routes, at least while the cargo volume is insufficient. On the other hand, there is a good possibility for the continued direct call of container ships on relatively short distance routes such as the Thailand/Japan route.

25. Thus, new well-equipped container berths at Laem Chabang Port with highly effective operations are necessary for the upgrading of the status of Thai ports. At the same time, in and around Bangkok inland depots which will function as CFS, CY and empty container storage areas are also necessary to realize safe, speedy and reliable transport to Laem Chabang and to realize smooth liner service.

Supporting Regional Independence

26. Much of the inter-regional transport is related to the secondary transport of international trade goods because of the industrial dependence on foreign trade. For the coming decades when the internationalization will progress rapidly, direct connection of each region with the world market is one of the keys to establish regional independence which will reduce the burdens presently placed on the Bangkok Metropolitan Area. It is therefore necessary to locate international trade ports in remote regions.

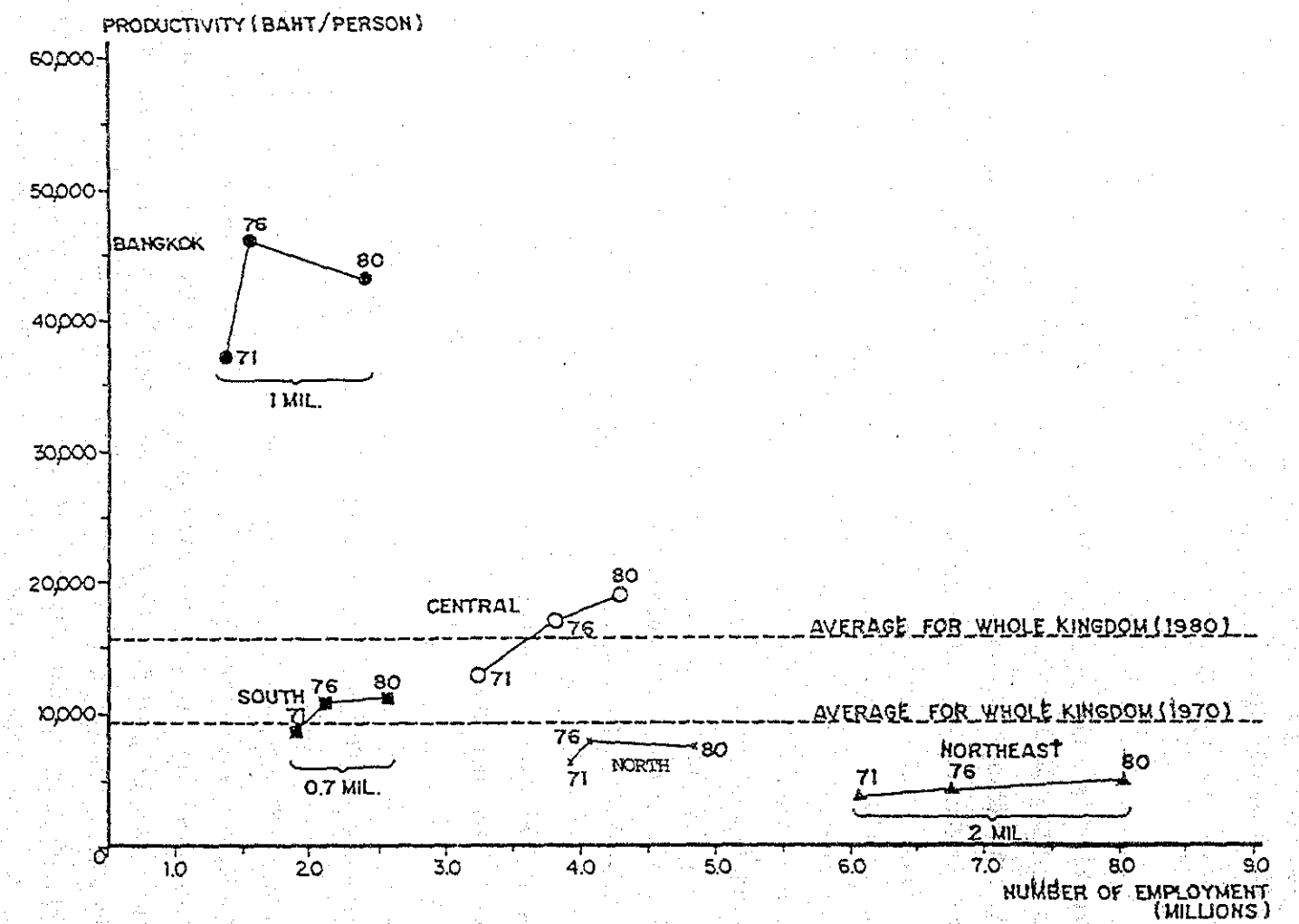
27. Thailand's major export goods such as tapioca, sugar and rubber are produced all over the country. Rubber is mainly planted in the southern region, tapioca in the northeastern and eastern regions, and sugar in the western region. Although the share of these agricultural products in total exports will decrease, they will still remain as important earners of foreign currency. Therefore, it is necessary to provide more efficient ports at locations as close as possible to the production sites in order to maintain a stable position in the world market by decreasing the transport cost (Tables 3.2 and 3.3).

28. Considering this situation, it is necessary to construct the Ports of Songkhla and Phuket to be able to accommodate vessels which will carry containerized rubber, as well as to construct tapioca berths at Map Ta Phut and build berths for tapioca and sugar at Laem Chabang to replace the offshore anchorages at Si Racha in the future.

Upgrading the Energy and Resource Supply System

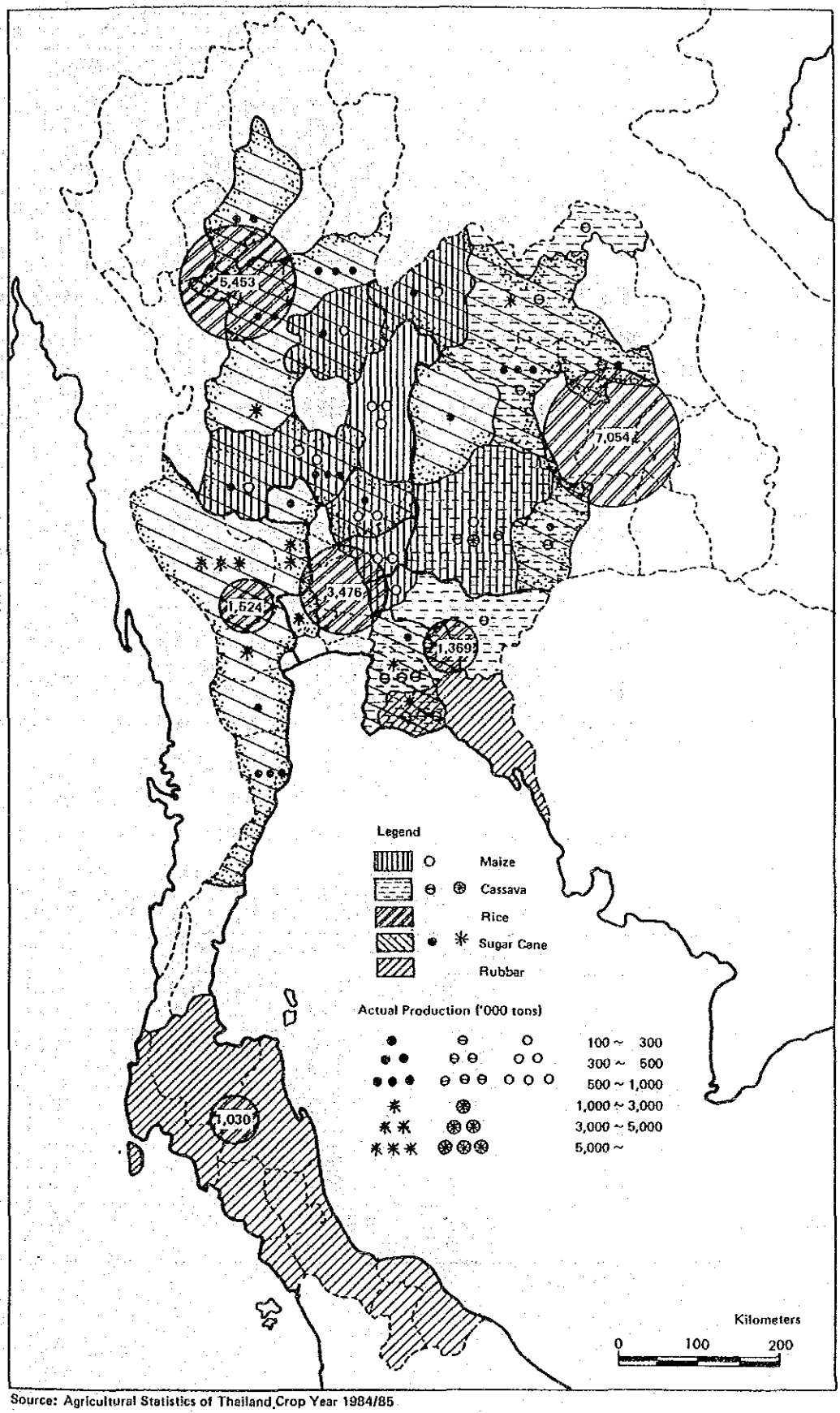
29. After 1991, the country will suffer increased imports of refined oil despite the planned expansion of the oil refinery in Bangkok. According to the Petroleum Authority of Thailand (PTT), the gross total oil demand will increase from 237,840 to 367,240 barrels per day during the period from 1983 to 2000. Out of this the net demand will be 211,510 barrels in 1983 and 271,580 barrels per day in 1995, after deduction of the oil demand planned to be replaced by other sources of energy including natural gas and lignite. The present capacity of the oil refinery is 175,000 barrels per day of which 155,400 barrels were actually supplied in 1983. This supply

Fig. 3.3 Productivity and Employment by Region



Source : W.B. MANAGING PUBLIC RESOURCES FOR STRUCTURAL ADJUSTMENT, MARCH 1983
NSO, LABOR FORCE SURVEY, VARIOUS ISSUES

Fig. 3.4 Distribution of Agricultural Products



Source: Agricultural Statistics of Thailand,Crop Year 1984/85

Table 3.2 Rubber Export by Country

(Unit: 1,000 Tons .... upper figures
Billion Baht... lower figures)

Country \ Year	1981	1982	1983	1984	1985
China	10.2 0.2	20.9 0.5	38.9 0.8	41.0 0.9	60.3 1.2
Japan	329.0 7.6	320.3 5.6	319.9 6.8	322.1 7.1	348.9 6.9
S. Korea	6.0 0.1	16.6 0.3	11.2 0.2	16.4 0.3	23.3 0.5
Malaysia	16.5 0.4	17.9 0.3	17.1 0.4	15.4 0.3	15.5 0.3
Singapore	32.0 0.7	58.2 1.0	53.9 1.0	7.15 1.6	47.3 0.9
Taiwan	3.9 0.1	7.5 0.1	5.8 0.1	9.0 0.2	17.4 0.4
W. Germany	10.2 0.2	10.7 0.2	9.1 0.2	17.4 0.4	25.9 0.5
Romania	11.1 0.3	10.2 0.2	7.5 0.2	1.5 -	1.6 0.2
U.S.A.	42.0 1.0	48.5 0.9	69.1 1.5	65.7 1.5	81.6 1.6
Others	11.1 0.2	24.8 0.4	22.6 0.5	32.0 0.7	60.3 1.2
Total	472.1 10.8	544.5 9.5	555.1 11.8	591.9 13.0	690.0 13.6

Source: Customs Department

Table 3.3 Tin Export by Country

(Unit: 1,000 Tons .... upper figures
Billion Baht... lower figures)

Country \ Year	1981	1982	1983	1984	1985
Japan	4.5 1.4	4.3 1.3	3.9 1.2	3.3 0.9	4.0 1.3
Netherlands	14.7 4.5	10.4 3.5	5.9 1.8	6.8 2.0	6.3 2.0
U.S.A.	9.9 3.0	9.8 2.9	7.3 2.2	6.8 1.9	6.2 1.9
Others	1.1 0.3	0.4 0.1	0.6 0.2	1.6 0.5	1.5 0.5
Total	30.1 9.1	24.9 7.8	17.7 5.3	18.5 5.3	18.0 5.8

Source: Customs Department

is planned to be increased up to as much as 197,950 barrels per day in 1995 with the plan to expand the existing refinery, and oil product imports will increase steadily from 56,070 to 73,630 barrels per day during the period from 1983 to 1995. As natural gas or lignite will mainly replace heavy oil, demand for light petroleum products should increase more rapidly.

30. The Fifth National Economic and Social Development Plan proposed to expand and/or construct local oil refineries in accordance with the planned targets in order to increase refining capacity to satisfy local requirements. The construction of an oil refinery outside the Bangkok Metropolitan Area would help the decentralization of industries, and decentralized supply of energy is desirable from the security point of view. On the other hand, natural gas is desirable for use in the Bangkok Metropolitan Area and along the Eastern Seaboard (ESB). It is suitable for large-scale, concentrated consumption because natural gas is rather difficult to transport and distribute to scattered and limited consumption areas where local refineries could better meet demand.

31. From the standpoint of port location, it is desirable to locate facilities which handle dangerous goods apart from other facilities as to be able to operate other port facilities smoothly even in the event of an accident at the dangerous goods facility. However, it is also desirable to locate as close as possible to consumption areas such as industrial estates or power plants to minimize transport cost. Location of port facilities near consumption areas is also important for other imported resource-based industries. Overall, it is crucial for the national economic security to secure stable transportation of energy resources to and from foreign countries as well as within the nation.

C. Development Policy for Domestic Trade Ports

Promotion of an Effective Transport System

32. Domestic trade ports consist of coastal ports and inland ports. There are about 14 local ports which play a major role in inter-regional transport and numerous inland ports located along the inland waterways.

33. The total domestic maritime cargo is forecast to reach 5.8-8.7 million tons in 1992 and 8.0-14.0 million tons in 2000 (Table 3.4), according to the Study on the Coastal Shipping Promotion Plan, and the freight transported via inland waterways ports is forecast to reach about 6 million tons (Table 3.5).

34. The coastal ports currently handle fertilizer, petroleum products and a small volume of general cargo mainly from Bangkok/Si Racha to the southern region, and the inland ports mainly handle agricultural products and construction materials from the northern and the northeastern regions and from the central region to the Bangkok Metropolitan Area. However, coastal ports in the southern region and in the eastern region will play an important role in the future when the industrial activity is decentralized away from Bangkok as is expected under the sixth plan. As for the northern and the northeastern regions, the agricultural sector will still play an important role.

35. Thus together with the national socioeconomic development policy promoting decentralization and industrialization, inter-regional transport will mainly carry long distance cargo, and thus each transport mode will play its role in the most economic and advantageous manner.

36. The railway system is advantageous for middle and long distance transport, while road transport is advantageous for short distance hauling with its characteristic flexible mobility. On the other hand, maritime transport is most suitable for long distance and mass freight transport. Maritime transport is the least energy intensive of the three subsectors.

Table 3.4 Estimated Domestic Cargo Volume

(Unit: Million Tons)

Commodity \ Year	1992	2000
Southbound		
General Cargo	1.9 - 2.3	2.9 - 4.2
Fertilizer	0.3	0.5
Construction Materials	0.7 - 0.8	1.0 - 1.4
Rice	0.06	0.07
Maize	0.07	0.1
Petroleum Products	1.1 - 2.0	1.2 - 3.6
Sub-Total	4.1 - 5.5	5.8 - 9.9
Northbound		
General Cargo	0.25 - 0.31	0.45 - 0.74
Wood Products	0.47 - 0.58	0.47 - 0.68
Fish Products	0.73 - 2.0	0.85 - 2.3
Vegetables/Fruits	0.15	0.22
Rice	0.06	0.07
Rubber	0.07	0.10
Sub-Total	1.7 - 3.2	2.2 - 4.1
Total	5.8 - 8.7	8.0 -14.0

Note : Low Estimate and High Estimate
Source: Coastal Shipping Report, Oct. 1984

Table 3.5 Inland Waterways Cargo Flows per Port (Area)

(Unit: Million Tons)

Year	1	2	3	4	5
1990	1.3	0.6	0.4	0.1	2.4
1995	2.7	0.8	0.7	0.2	4.4
2000	3.6	1.1	0.9	0.2	5.9
2002	4.0	1.3	1.0	0.2	6.5

Note : 1: Nakhon Sawan, 2: dredged sand, 3: Taphan Hin, 4: Other Ports along Nan River
Source: MARIN, River Port Tariffs and River Users Charges, June 1985

37. In general, road transport is suitable for distances within 150-300 km, while maritime or railway transport is favorable for distances longer than 300-500 km.

38. Considering the future spatial pattern of economic activities in Thailand and the necessity to establish a less energy intensive economic structure in order to improve the foreign trade balance, it is necessary to promote coastal shipping and inland waterway transport in the transport system which currently consumes about 35% of the total energy consumption in Thailand.

Promotion of Local Industries

39. Port development has a positive effect on regional economic development through its functions of distribution and production. Especially the sixth plan aims to establish 24 towns as regional growth centers, and among them 13 towns are located close to ports. Hence, it can be expected that the growth center function in these 13 towns can best be realized by integrating port functions and local economic activities.

40. Looking at the distribution function of ports, it is best to establish distribution complexes combining various modes of transport. This promotes effective intermodal transport and the development of centers of industrial activity. Transport-related industries such as warehousing and processing industries will soon gather in these distribution centers.

41. As for the production function of ports, it is necessary to provide port facilities to receive raw materials and intermediate products and to ship final products and raw materials to promote regional industry. Along with the development of ESB, it is expected that the southern region and ESB will have close industrial input-output relations between them as well as with the Bangkok Metropolitan Area.

42. Thus, it is necessary to develop ports especially in the towns of the southern region and along ESB as well as in the towns along the inland waterways.

Locational Strategy

43. In order to form a more effective transport network in Thailand and to accelerate the development of regional center cities, strategic development ports are selected as follows.

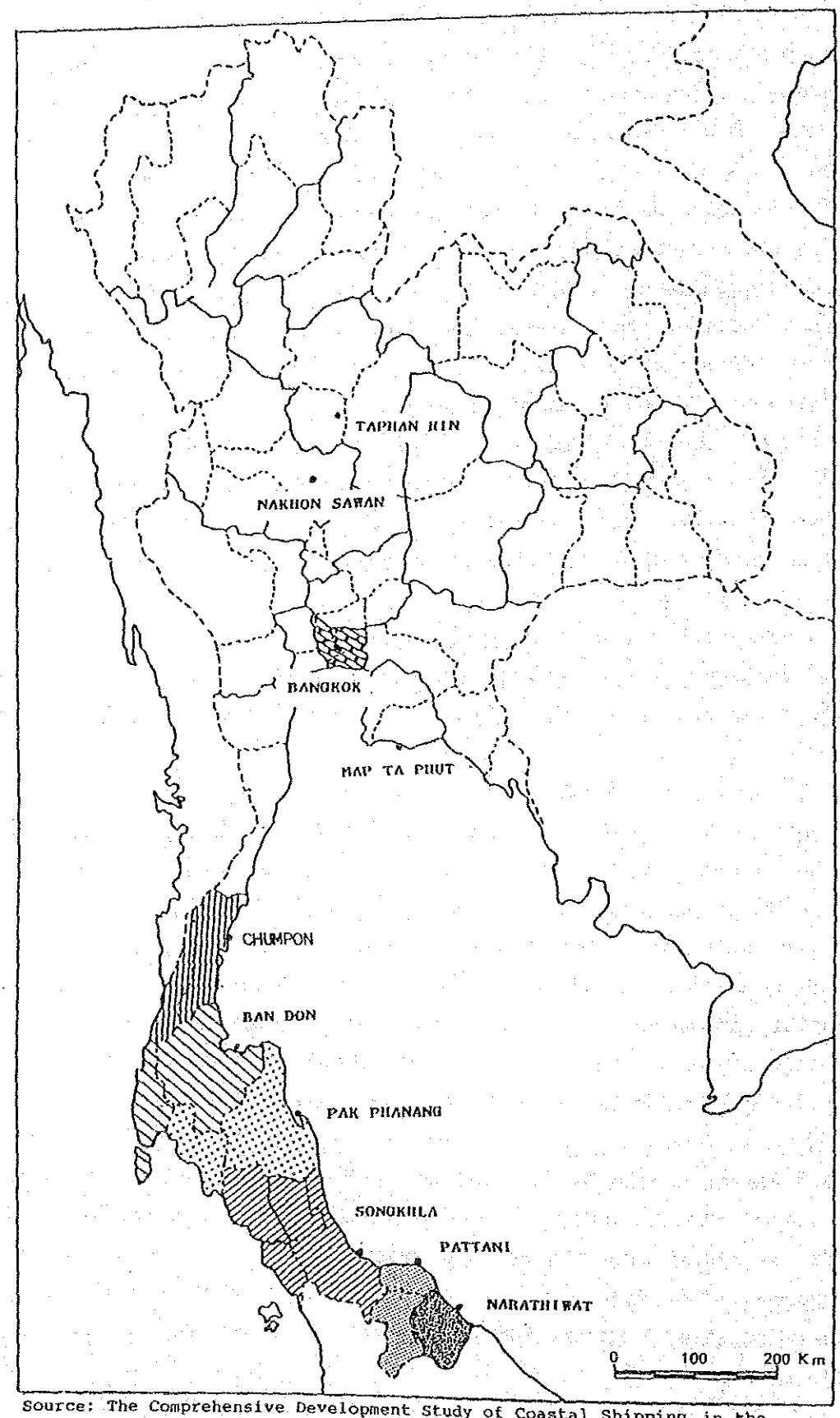
44. Considering the present transport network, the potential hinterlands of the ports are considered to be as shown in Fig. 3.5. Among these ports, Ban Don, Pak Phanang, Songkhla and Pattani have a population of over one million in each of their hinterlands, and they are also connected with the major highways and railways. Although Chumphon and Narathiwat have a population of 400-500 thousand persons in each of their hinterlands, these two ports are located about 100 km away from the nearest port and they are also connected with the main highways and railways. Therefore, it is expected that these six ports have the potential to serve as the backbone of the maritime freight distribution network.

45. As for the Ports of Bangkok and Map Ta Phut, they will play important roles, mainly as suppliers of the industrial outputs to the south. Therefore, it is also necessary to construct distribution centers at these two ports.

46. The ports of Nakhon Sawan and Taphan Hin currently function as distribution centers for agricultural products, and their roles will become more important along with the restructuring of the transport system to avoid excessive congestion in the metropolis. Therefore, it is necessary to also construct distribution centers at these two ports including processing and stock centers for the agricultural products of the northern and northeastern regions, as well as distribution centers for the products supplied from the central and the eastern regions.

47. Therefore, as the basic strategy for the development of the domestic trade ports, the following 10 ports will form the strategic distribution network connecting with highways and railways through the establishment of stock yards and warehouses and necessary facilities: Chumphon, Ban Don, Pak Phanang, Songkhla, Pattani, Narathiwat, Nakhon Sawan, Taphan Hin, Bangkok and Map Ta Phut.

Fig. 3.5 Hinterland of Main Domestic Ports



Source: The Comprehensive Development Study of Coastal Shipping in the Kingdom of Thailand, JICA, 1984

Ports of Refuge

48. Ports of refuge provide sheltered safe anchorage for vessels sailing in coastal areas. When coastal ships suddenly encounter typhoons or heavy storms and are still at a long distance from their next destination, ports of refuge provide safe emergency anchorage for the vessels until the weather improves. Generally, ports of refuge are not used as commercial ports. So the ports are not well equipped with various facilities. However, it may be possible to utilize an existing port as a port of refuge.

49. There is no standard set for the distribution of ports of refuge. The actual intervals should vary depending on the density of the maritime traffic and the local topography.

50. Following is a tentative proposal for the location of ports of refuge along the coast of Thailand based on the navigation chart.

Ports:	Sattahip Commercial Port
	Songkhla Port
	Phuket Port
Anchorages:	Around Ko Phangngan and Ko Samui
	Phuket Ocean Vessel Anchorage

51. However, there are many other factors which should be considered when selecting ports of refuge. Consequently, it would be advisable to collect the opinions of numerous experts including commanders of the Royal Thai Navy (RTN), chief pilots, and experienced masters in identifying ports of refuge.

52. The following facts are noted based on interviews with coastal shipping companies:

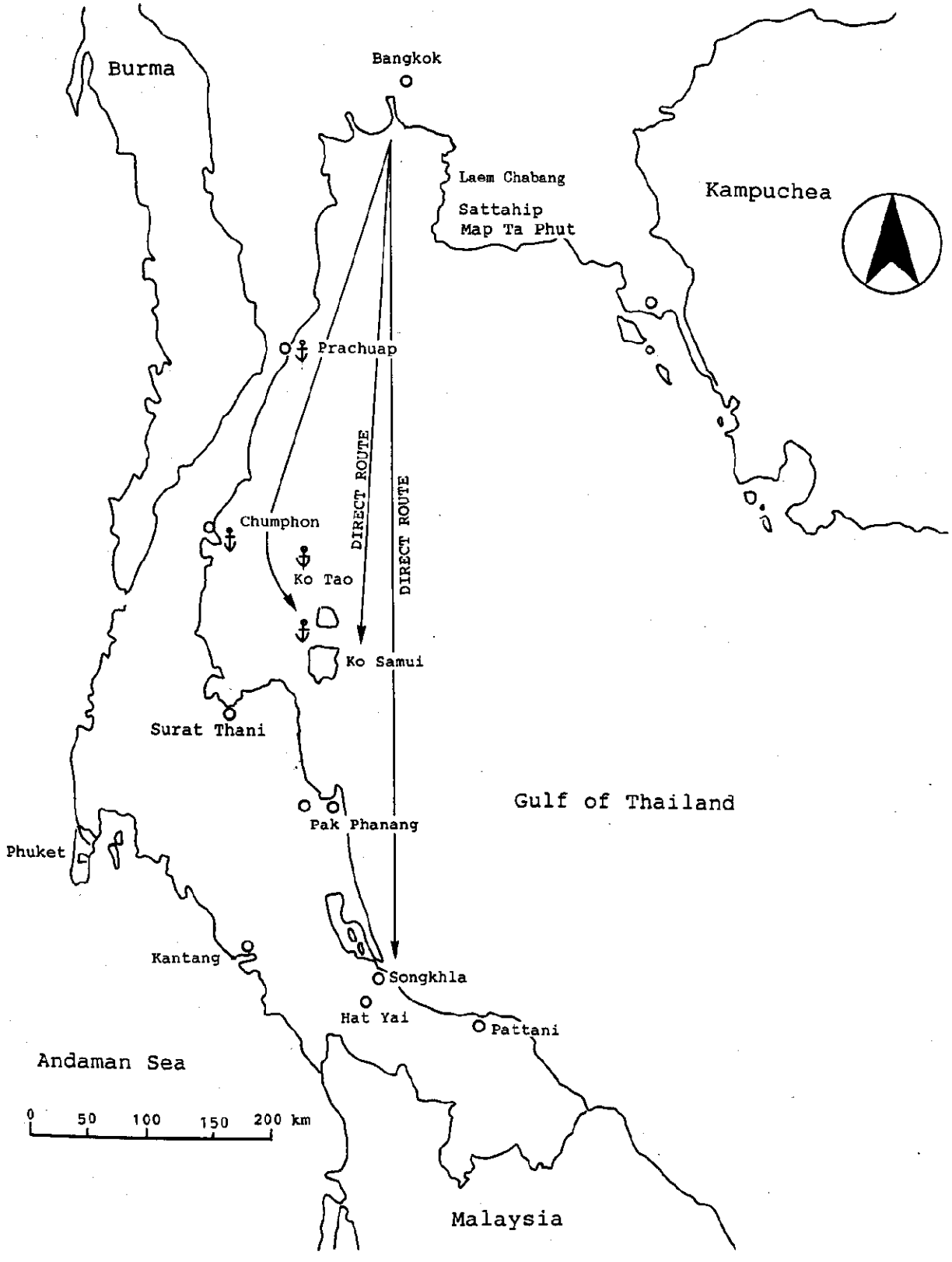
i) It is important to check the weather carefully before sailing.
ii) It is also important to select the route by season or weather condition.
iii) All ships equipped with VHF (very high frequency radio) make

contact with their companies three times a day, but other companies' vessels have no VHF at all.

iv) Customarily, pilots have a plan to select a port of refuge in case of emergency. Company spokesmen pointed out the location of ports of refuge such as Prachuap, Chumphon, Ko Tao and Ko Samui (Fig. 3.6).

53. The Thai Government has a plan to develop domestic coastal shipping to contribute to the economy of Thailand by saving energy. Thus, it is natural that the Government is concerned about the safe navigation of these coastal ships. At present, there are not so many ports of refuge officially authorized by the Government. So, it is advisable to check the current conditions of ports of refuge, and at the same time to study the usefulness and availability of present and possible future ports.

Fig. 3.6 Location of Ports of Refuge



D. Future Prospect of International Ports

54. There is no question that it will be necessary to construct international commercial ports if Thailand is to implement its national and regional development plans. However, for the Ports of Laem Chabang, Songkhla and Phuket, it is necessary to clearly establish an overall policy and strategy for operation considering the competitive power of neighboring ports such as Penang, Singapore and Hong Kong as well as Bangkok.

55. Concrete strategies could be established considering management and administration systems suitable to Thailand taking into account the political situation, and further study will be necessary.

The Port of Laem Chabang

(1) Cargo Volume in Bangkok and Laem Chabang Area

56. The future container cargo volume at Bangkok and Laem Chabang is estimated as shown in Table 3.6.

Table 3.6 Future Container Cargo Volume

(Unit: Million Tons)

Year	Total	Import	Export
1991	5.3 - 6.3	2.7 - 3.1	2.6 - 3.2
2001	8.1 -13.1	4.2 - 6.8	3.9 - 6.3

Source: Final Report for the Study on the Development Project of Laem Chabang Coastal Area, JICA, February 1985

57. The annual volume and number of containers handled at Klong Toei Wharves are rapidly increasing every year, and during the last 5 years (1982-1986) both indicators show 100% increases (See Table 3.7). PAT has successfully handled the increasing volume of containers within Klong Toei Wharves, facing many troubles and complaints. For instance in 1986, the handling volume of containers increased up to about 510,000 TEU compared

with the previous year's 400,000 TEU even though a certain part of the container yard area was out of use for nearly half the year due to repaving works to accommodate transtainers.

Table 3.7 Container Number (TEU) and Cargo Volume at Klong Toei Wharves

Year	Volume (1,000 Tons)	TEU (1,000 TEU)
1982	2,263	259
1983	2,826	304
1984	3,362	341
1985	3,882	400
1986	4,794	511

Source: PAT

58. Even if PAT only continued to maintain its present service level, more cargo volume could be handled after the completion of the improvement works of container facilities. Until the new port begins to operate in 1990, PAT may be able to handle all of the potential container cargo, although the service quality would be worse than at present.

59. The total maximum capacity of container handling in Bangkok Port and Laem Chabang Port may, at first, exceed the total demand due to the added capacity of the new port. This suggests the possibility of severe competition between the two ports in the international port service market at an early stage.

(2) Service at Laem Chabang Port

60. If the projected cargo movement is attained and the container handling capacity at Klong Toei Wharves cannot be increased, some of the existing or prospective shipping lines will unquestionably have to move to the Port of Laem Chabang.

61. Considering the fact that 90% of the cargo other than agricultural products have an origin or a destination within Metropolitan Bangkok and its outskirts, there may be some conflict of interest concerning which

lines should move to the Port of Laem Chabang, located about 130 km away from Metropolitan Bangkok.

62. The choice of port generally lies with the cargo owner and the shipping line. Unless the Port of Laem Chabang can provide the same level of cargo service as at Klong Toei, it will be very difficult to attract cargoes to Laem Chabang Port.

63. The overall service level includes the shipper's or the consignee's cost between his premises and the port, the speed of delivery and shipment and the necessary procedures involved.

64. To make the transportation route through Laem Chabang Port effective for cargo and ships and competitive with that through Bangkok Port, it is necessary to maintain highly efficient container handling and inland transportation including inland depot operation.

65. Table 3.8 shows inbound container movement by trade route in 1985. For outbound movement, data by trade route are not available. Inbound container movement to Thailand includes a number of empty containers on every trade route, from which it is inferred that outward loaded container movement from Thailand surpasses the inbound loaded volume on all trade routes, and that the number of loaded containers outbound is approximately equal to the total number of loaded and empty containers inbound.

66. The Singapore trade route includes feeder containers to/from Europe, the Middle East, etc. The Hong Kong and Kaohsiung trade route includes feeder cargoes to/from the U.S.A. and a substantial number of Hong Kong and Kaohsiung transhipped containers to/from Japan (approximately 5,000 - 6,000 TEU inward in 1985/outward unknown), reflecting a limited supply of container space by the direct service between Japan and Thailand. From this, it is inferred that there is a potential of placing larger container ships in direct service between Japan and Thailand when the Port of Laem Chabang starts operations.

67. Based on the size of cargo movement including feeder cargoes, the trade route to/from Singapore would be the next candidate for the possible

Table 3.8 Container Movement in 1985

(Unit: TEU)

Inbound

From	Empty	Loaded	Total	Weekly
Singapore	44,514 (35)	81,596 (65)	126,110 (100)	2,425
Hong Kong	10,913 (33)	22,000 (67)	32,913 (100)	633
Japan	3,834 (16)	19,731 (84)	23,565 (100)	453
Taiwan	3,228 (38)	5,325 (62)	8,553 (100)	164
Europe	662 (26)	1,845 (74)	2,507 (100)	48
U.S.A.	120 (22)	425 (78)	545 (100)	10
Others	2,684 (52)	2,446 (48)	5,130 (100)	97
Total	65,955 (33)	133,368 (67)	199,323 (100)	3,833

Outbound

Total	6,615 (3)	194,481 (97)	201,096 (100)	3,867

Note : Figures in parentheses show percentages.
Source: PAT

use of larger container ships. However, it should be kept in mind that for the feeder line the frequency of service is of great importance to meet the schedule of mother vessels.

68. Considering the size of trade and the required frequency of service, the capacity of the full container ships on the Japan-Thailand route would be, in average, 750 - 1,000 TEU and, at maximum, 1,500 TEU.

69. The economic operation of larger container ships turns upon the ability to make a relatively limited number of calls at ports which handle substantial numbers of inward and outward containers. If the container lines on the Far East-Europe route were to make direct calls at Laem Chabang, they would be forced to skip one of the other ports in the Far East in order to maintain the turn around time of the voyage.

70. Deviations from the trunk routes for three ports in the Far East are:

to Busan	220	nautical miles
to Hong Kong	190	"
to Laem Chabang	690	"

71. Thus, Laem Chabang will clearly remain in a disadvantageous position compared with other countries' ports for inviting direct port calls by larger container ships. However, if Thai exports and imports substantially increase, Laem Chabang Port can offer an opportunity for larger vessels to call directly and to reduce the total transportation cost of foreign trade.

72. Container movement inward and outward is shown in Table 3.8.

(3) Relation with Bangkok Port

73. For equalization of the shipper's or consignee's cost between the two ports, it will be necessary to provide a so-called inland depot in the Bangkok area where cargoes and/or containers can be received from and delivered to shippers or consignees. The depot could also occasionally be used as an empty container storage area. The accumulated total cost of

container handling at Laem Chabang terminal, land transport of the containers between Laem Chabang and the inland depot in Bangkok, and the operation costs of the inland depot itself must not exceed the total container handling cost at Klong Toei Wharves.

74. Thus to ensure quick delivery and shipment, measures have to be taken to secure smooth and flexible links between the inland depot and Laem Chabang Port.

75. To attain cost effectiveness and to establish a smooth and flexible transport system for the route via the Port of Laem Chabang, the container terminal, the land link and the inland depot must form one single working unit. Possibly one terminal operator could operate all three components. If the three sections are operated by separate organizations, it is imperative that the design and day-to-day operations be closely coordinated among the organizations concerned.

76. To diminish the risk which the extra land transport cost creates, the free market mechanism must be guaranteed and maintained in this land link, and the choice of transport mode must be left entirely to the judgment of the cargo interests. This will also lead to quicker development of transport links between the two points.

77. The location of the inland depot is also of vital importance to attract the cargo to Laem Chabang. The location should be at such a place where the urban congestion would not be worsened and be free from road regulations on hours and routes and where the cargoes can flow smoothly and efficiently.

78. For simplification of procedures, the inland depot must be given the same status, under the Customs Law, as is given to Klong Toei Wharves, including all necessary facilities such as bonded warehouses, customs stations, etc. The most simplified procedures for bonded transport of cargoes in containers must be introduced between the Port of Laem Chabang and the inland depot, so that the bonded transport between these two points may the shippers/consignees, the shipping lines, the terminal operator or the depot operator.

79. The extra land transport costs of break bulk general cargoes between Bangkok and Laem Chabang would not be compensated for by the reduced cost of cargo handling at the new port. There would not be much difference in the stevedorage and cargo charges. Therefore, conventional liner vessels and so-called combination vessels which carry break bulk cargoes to/from Bangkok Port would not offer their services via the Port of Laem Chabang.

80. The location of Laem Chabang is unique. The port is close enough to Bangkok to provide supplementary services to the Metropolitan Area and to help reduce the excessive centralization and congestion in Bangkok. On the other hand, the port is far enough away from the capital to promote the regional development of the ESB Region.

81. Laem Chabang's proximity to Bangkok is also important because the regional demand for ESB alone would not be sufficient to induce shipping lines to provide regular services. Similarly, unless regular shipping services are provided, it will be difficult to attract investment in the export processing zone and the general industrial zone.

82. Overall, it is reasonable to promote the development of Laem Chabang as it will serve to both supplement the transport infrastructure for Bangkok and promote local development. Of course, it will be necessary to strike a balance between these two goals to maximize the benefits from the use of the port facilities.

Southern Ports

(1) The Port of Songkhla

83. The planned water depth of the deep sea port is only 9 meters, which would accommodate full container ships with a capacity up to 700 - 750 TEU. Rubber is the only major export item expected to be shipped from the Port of Songkhla. Nationwide output and export of rubber in recent years are as follows:

(Unit: 1,000 Tons)

Item	1981	1982	1983	1984	1985
Output (A)	502	552	587	620	725
Export (B)	472	544	555	592	690
(B/A x 100)	(92)	(99)	(95)	(95)	(95)

The southern region accounts for some 90% of the total planted area and the remaining planted area is located in the eastern region.

84. Major buyers are Japan (348,854 tons in 1985 or 51%), followed by the U.S.A. (81,630 tons or 12%) and China (60,296 tons or 9%). The pattern of the rubber flow from southern Thailand to Japan includes the route via the Port of Bangkok (mainly by rail from the South to Bangkok), via Penang (mainly by road to Padang Besar, then by Malayan rail to Penang), and via Singapore (by feeder service to Singapore), with the estimated current share 50% via Bangkok, 33% via Penang, and 17% via Singapore.

85. Under the circumstances where the inward container movement from Japan greatly surpasses the outward volume, container lines on the Japan-Singapore-Malaysia route are offering competitive box rates for back-haul cargoes shipped to these ports, and these include Thai rubber. However, once the deep sea port at Songkhla begins operations and sufficient services from Songkhla are offered, the routes via Penang and Singapore will become less competitive.

86. However, an additional port call at Songkhla will increase costs to shipping lines. In addition to port charges and deviation cost (including hire-base and bunker cost), the lines will have to pay extra container handling charges to position empty containers from Bangkok to Songkhla, as the forecast inward container movement to this port is considered to be negligible.

87. On the basis of the small container ships of 450 TEU currently plying the Japan-Bangkok route, additional port charges and deviation costs are estimated at approximately US$ 6,500 per voyage (more for larger ships), and extra container positioning charges would be not less than US$ 150 per box.

88. To maintain the present level of profit, the container lines will have no choice but to increase their freight tariff for the cargoes shipped via Songkhla. In this case, Singapore and Penang may maintain their competitive position and also the rubber produced in the upper south (Surat Thani and the area to the north accounting for approximately 24% of the south Thai rubber) would be shipped cheaper via Bangkok or Laem Chabang.

89. The shipping lines might also try to avoid the extra costs resulting from direct calls to Songkhla by carrying rubber at their own expense to Bangkok or Laem Chabang by rail, truck, or coastal service.

90. Rubber to Europe would be carried by feeder service for transshipment at Singapore, and rubber to the U.S.A. would also be carried by feeder service for transshipment at Hong Kong or Kaohsiung. Conventional liner vessels or combination vessels would also call at Songkhla to load rubber in containers. However, due to the infrequency of port calls, the majority of the rubber would be carried by full container service.

(2) The Port of Phuket

91. Phuket is located on the west coast of Thailand facing the Andaman Sea about 200 nautical miles away from Penang, Malaysia. The projected cargo movement in 2000 is:

Export	Rubber	257,000 tons
	Tin	43,000 "
	Palm Oil	84,000 "
	Total	384,000 tons
Import	Coke	10,000 tons
	Others	31,000 "
	Total	41,000 tons

92. Major destinations for rubber and tin ingot would be the U.S.A., Japan and Europe. Due to the growing requirements for shipment in containers, the merchandise would be carried to the destinations by container services, mainly with transshipment at Singapore or at the west coast ports of

Malaysia. Container services to Singapore and Malaysia are facing a severe imbalance of trade, and container operators are striving to sell vacant space on the backward voyages. However, prices would depend on the volume of inward container cargoes to Phuket and the cost of positioning empty containers, as depend well as on whether these cargoes are stuffed into containers at Phuket or shipped to the transshipment ports in break bulk form for stuffing into containers there for onward transport.

93. Palm oil can be handled in drums or in barrels. However, when the size of the shipment is large enough, bulk transport in the vegetable oil tanks of conventional vessels or in small tankers would be more economical.

94. Petroleum coke is used in the process of tin smelting and shipments between 5,000 - 10,000 tons a year are projected mainly from the west coast of Canada and from Burma. Although the size of shipments may fluctuate reflecting the worldwide tin market, the coke would continue to be carried in bulk carriers as it is today. The international tin market is presently extremely depressed, and thus the future volume of these shipments is somewhat uncertain.

(3) Development of Potential Demand

95. Traffic at the two ports in southern Thailand will remain at a low level unless a concerted effort is made to develop the potential demand in their hinterlands. Songkhla has a better potential than Phuket from the viewpoint of cargo movement, but it is still not practical to take a laissez-faire attitude towards the development in the hinterland. It is necessary to utilize both of the ports as part of a unified regional economic development plan, which should be carefully coordinated with other national development projects, and this will require cooperation among central and local government bodies and the private sector.

Ⅳ. Existing Administration and Management System

A. Government Administrative System

Classification of Existing Ports

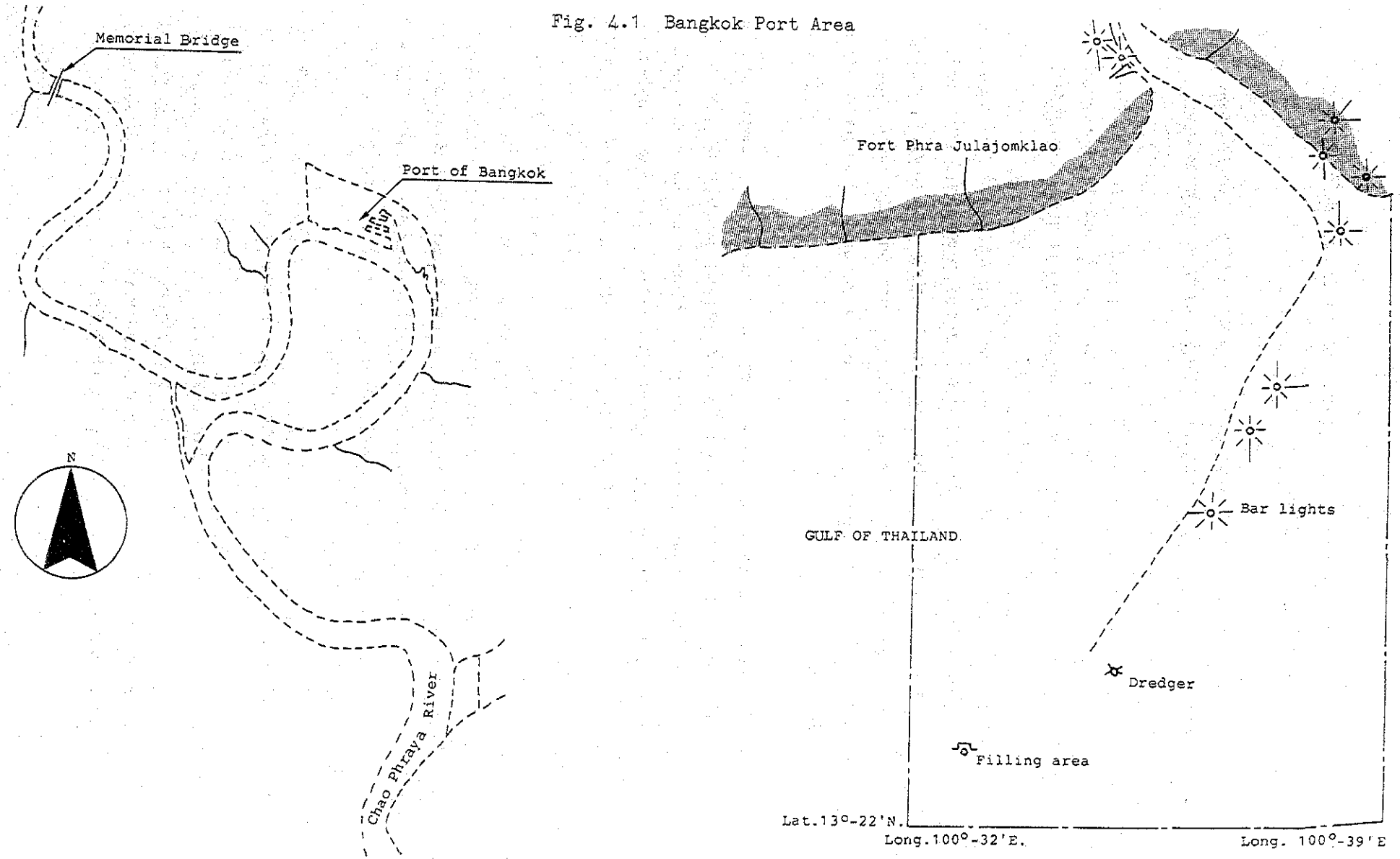
1. The definitions of "areas of ports" are defined in various Acts as follows:

i) The Port Authority of Thailand Act B.E. 2494 (1951) (PAT Act) gives no clear definition of ports, but the Authority Area, that is the port area, is defined as the area of land and water under the control and maintenance of PAT as determined by Royal Decree, which includes the water area between both banks from the Memorial Bridge down to the mouth of the Bar Channel and the land area of Klong Toei Wharves within the Customs fence for Bangkok Port (Fig. 4.1). Within the Authority Area, the Board of Commissioners of PAT has the power and duty (a) to dredge and maintain channels, (b) to control, develop and provide facilities and safety in port undertakings and navigation and (c) to fix the rates of various dues and charges.

ii) In the Navigation in Thai Waters Act (No.2) B.E. 2477(1934) (Navigation Act), the limits of four harbors and anchorages, all of which are offshore in the central region, are specified. The harbors are Bangkok and Ko Sichang and the anchorages are Anghin and the Bar. Within these limits, some additional controls by the Harbour Department (HD) of the Ministry of Communications (MOC) are provided to secure vessel safety because of the greater traffic and the larger size of vessels. The areas of other harbors are defined by individual special decrees. Within these harbor areas, the competent Harbour Masters have a duty to control navigation and usage.

iii) The Maritime Promotion Act B.E.2521 (1978) (MP Act) clearly

Fig. 4.1 Bangkok Port Area



Source: Royal Decree Fixing the Limits of the Port Authority of Thailand at the Port of Bangkok B.E.2499 (1956)

defines ports from the viewpoint of their primary function to serve vessels, as follows:

> "Port" means a place where services of anchoring, berthing, loading or discharging goods are provided for vessels.

A similar but more detailed definition is found in a regulation which requires port operators to obtain the permission of MOC.

> "Port" means a place where services are rendered to sea-going vessels of a size from 500 tons gross upwards in regard to landing, wharfing, loading or discharging of cargoes, and it shall include other floating things used for the same purposes but not for transportation, whether or not they be engine-driven.

This definition includes various sizes of ports from small single facilities like private wharves for barges to big complexes of port facilities, but supporting facilities such as breakwaters, channels, road and cargo movement facilities (for example, sheds and warehouses) are not included due to the limited viewpoint focusing on ship operation.

2. Although there is no clear legal classification of port in Thailand, the Thai ports are usually classified into two groups: international ports and coastal or inland ports. International ports other than Bangkok Port are sometimes called deep sea ports. Coastal and inland ports are referred to as domestic ports, but actually many coastal ports also serve international trade along the Peninsula coast.

3. The following six ports are classified as international ports:

(Existing)	Bangkok Port
	Sattahip Commercial Port
(Being planned or	Laem Chabang Port
constructed)	Map Ta Phut Port

Songkhla Port

Phuket Port

The Si Racha water area is used for international trade via loading/unloading from jettys and offshore anchorages.

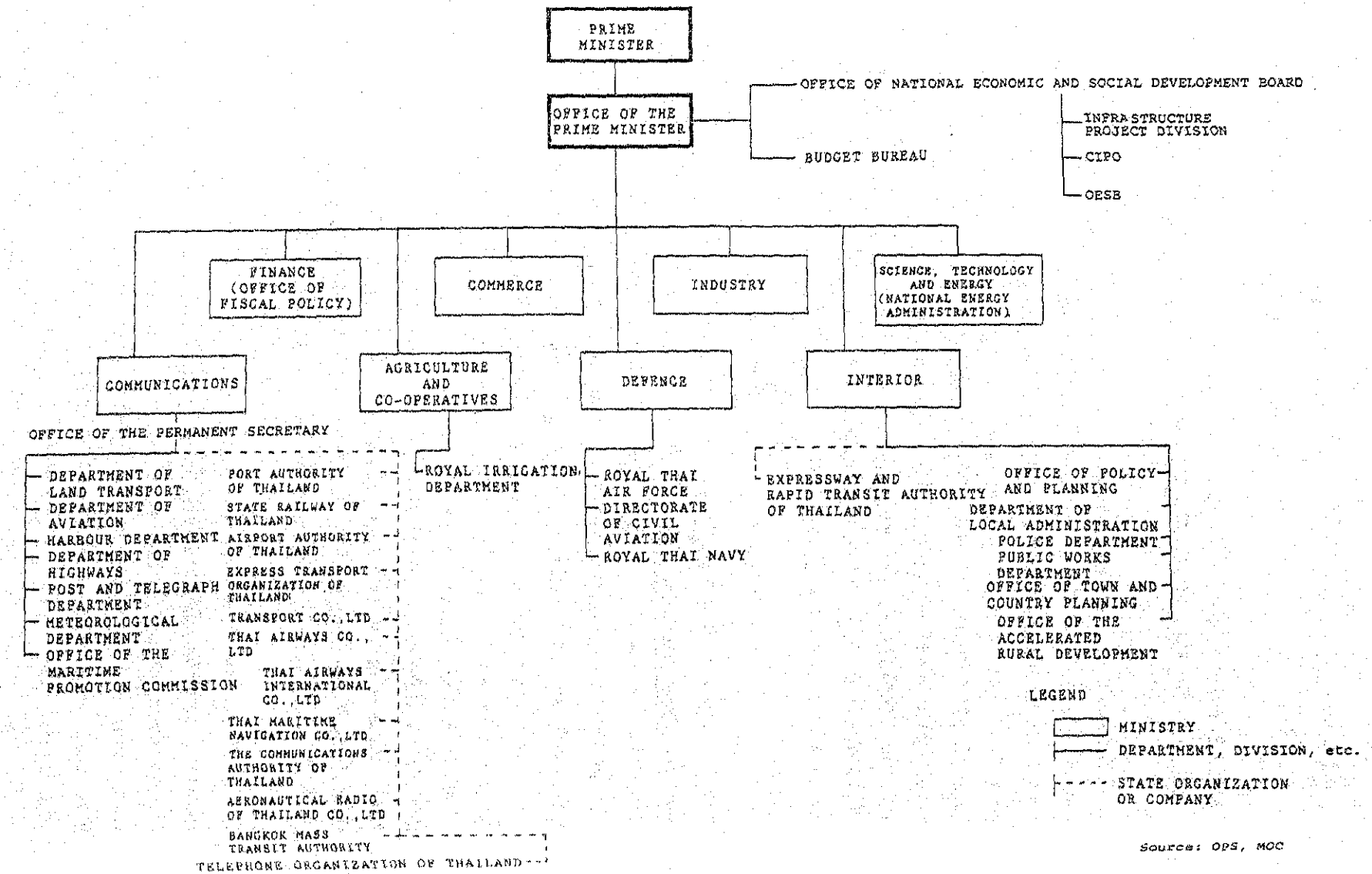
4. Coastal or inland ports comprise estimated 30 shallow draft ports spread along the Gulf of Thailand and the east and west coasts of the Peninsula and more than 100 terminals and a number of minor loading points privately constructed along navigable inland waterways. There are more than 12,000 Thai fishing vessels using the channels and ports. The development and maintenance of these channels are the responsibility of HD, and port facilities for fishing vessels are constructed privately or by the Government through the Fish Marketing Organization (FMO). Many fishing vessels use only natural banks or sand beaches for mooring and handling cargo.

Port-related Institutions

5. MOC is responsible for the fundamental policy and planning of the transport sector including ports, and executes its responsibilities through its own departments and through supervising transport enterprises, in cooperation with many other government agencies related to transport (Fig. 4.2). The organization of MOC is summarized in Fig. 4.3. The Office of the Permanent Secretary (OPS) of MOC formulates the fundamental policy of the comprehensive transportation system. In practice, the Transport and Communications Economic Division and the Planning Division are in charge of this matter, serving together as the Transport Planning Unit (TPU).

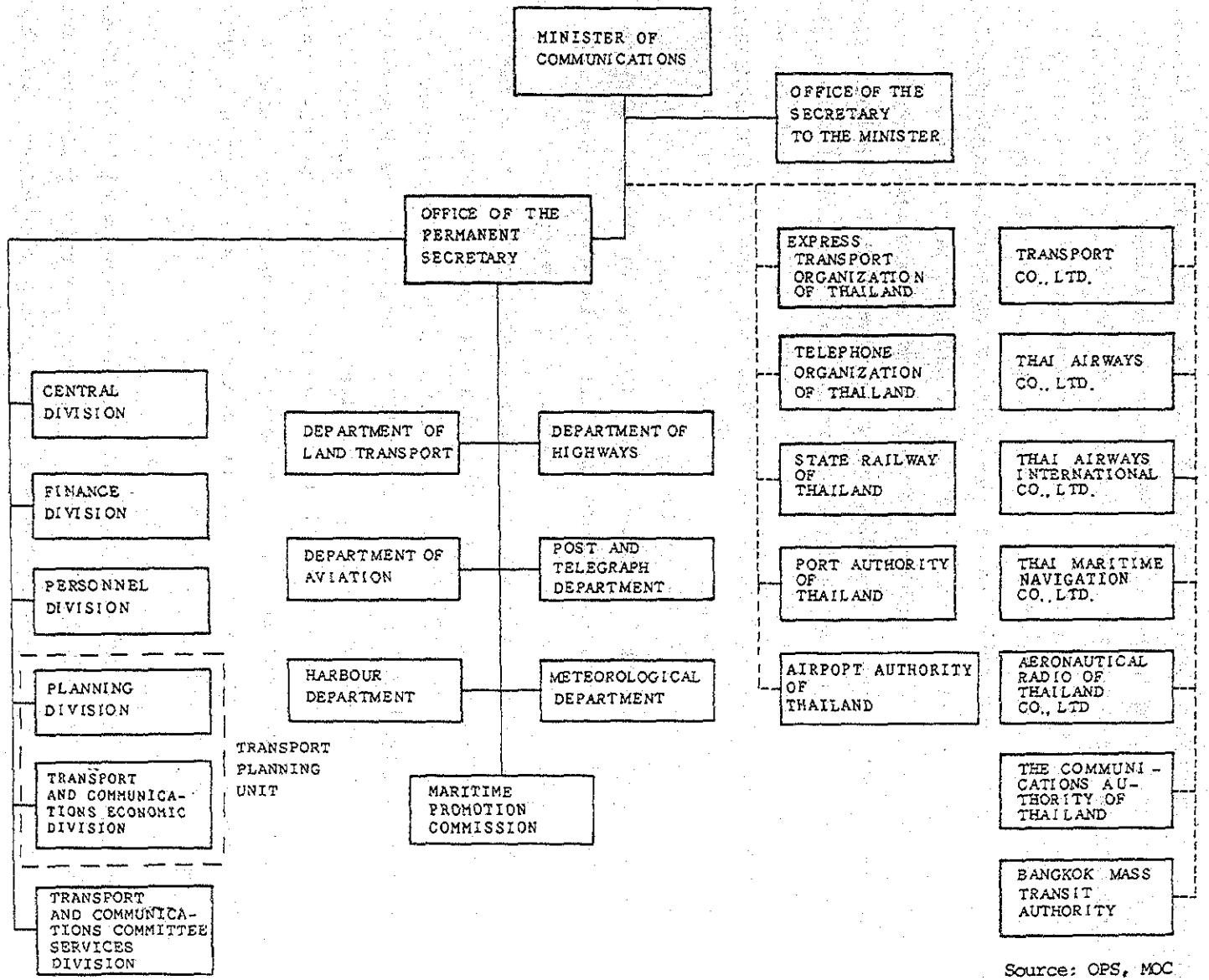
6. PAT is responsible for the expansion and improvement of the two existing international ports which are under its control. PAT takes full charge from planning and fund raising to construction and acquisition of facilities and equipment. PAT is also authorized to develop new ports, but this task is actually conducted by or under the strong leadership of other organizations.

Fig. 4.2 Summary Organization Chart of the Central Government Agencies Related to Transport



Source: OPS, MOC

Fig. 4.3 Summary Organization Chart of the Ministry of Communications



Source: OPS, MOC

7. In the case of the planned deep sea ports along the Eastern Seaboard (ESB) area, the National Economic and Social Development Board (NESDB) has more concern and plays an active role to promote these projects as a core of its regional development projects. Specialized organizations for the ESB Projects have been established and strengthened. The Center for Integrated Plan of Operation in NESDB was succeeded by the Office of the Eastern Seaboard Committee (OESB) in 1986. The ESB Committee was established by the Executive Order on the Eastern Seaboard Development and is chaired by the Prime Minister. OESB functions as the secretariat of the ESB Committee and coordinates the related government agencies. The planning of two international ports in ESB has taken place under the authority of the ESB Committee as a fruit of good cooperation among the related agencies, especially MOC, which was responsible for the study of these projects at the beginning stage. Two agencies are already assigned to be in charge of construction works, namely, the Industrial Estate Authority of Thailand (IEAT) for Map Ta Phut Port, and PAT for Laem Chabang Port.

8. As for the two other deep sea ports, the Port of Songkhla and the Port of Phuket, the planning and the construction works are executed by HD.

9. The development and investment plans of the coastal and inland ports, including channel dredging, are prepared and proposed by HD in MOC, often based on requests from its local offices or provincial governors who are appointed by the Minister of Interior. After receiving HD's proposals, the Planning Division of OPS reviews and evaluates the plans and submits them to NESDB to check their feasibility and suitability to the national development plan. For the financial check, MOC sends the plans to the Budget Bureau in the Office of the Prime Minister, and the final decision is made by the Cabinet.

10. After completion of construction, facilities are owned by the Treasury Department of the Ministry of Finance (MOF) and are principally transferred thereafter to the local administrative organs concerned, which are provincial governments, provincial administrative organizations and municipalities, in order to be managed. However, some ports remain under the direct management of HD due to the insufficient administrative,

financial and technical ability of relevant local administrative organs. In the case that local administrative organs take charge of managing ports, they usually request the assistance and participation of the Ministry of Interior (MOI). MOI, however, is not suited to this job due to the lack of a special section and accumulated know-how on port management affairs. Therefore, coastal and inland ports are practically managed individually without any standardization. For example, publicly constructed facilities and land are leased together to a company in Pattani Port, while in Kan Tang Port facilities are managed directly by the municipality and cargo handling is conducted by private firms.

11. For improvement and conservation of environmental quality, all port construction plans are sent at the first stage to the National Environmental Board for examination.

12. Aiming to ensure smooth coordination among related government agencies, many committees and sub-committees are established on the basis of Acts or authorities of the Prime Minister, the Cabinet Ministers, Director Generals or other heads of government institutions. Generally, they play a very important role to achieve consensus within the government and are an indispensable part of the decision-making process. But the relations among the committees and the permanent government institutions are not always clear, because some committees are not active, and also the assigned duties occasionally overlap. A list of the committees and sub-committees concerning port administration is attached in Appendix I.

B. PAT's Management System

General Functions

13. PAT is one of the state enterprises under MOC, and is the only agency which manages and operates the existing international ports: Bangkok Port and Sattahip Commercial Port. According to the PAT Act, PAT was established to manage and develop ports in the interest of the State and the public and to carry out related businesses which were previously carried out by the Office of the Port of Bangkok under the Department of Transportation, MOC.

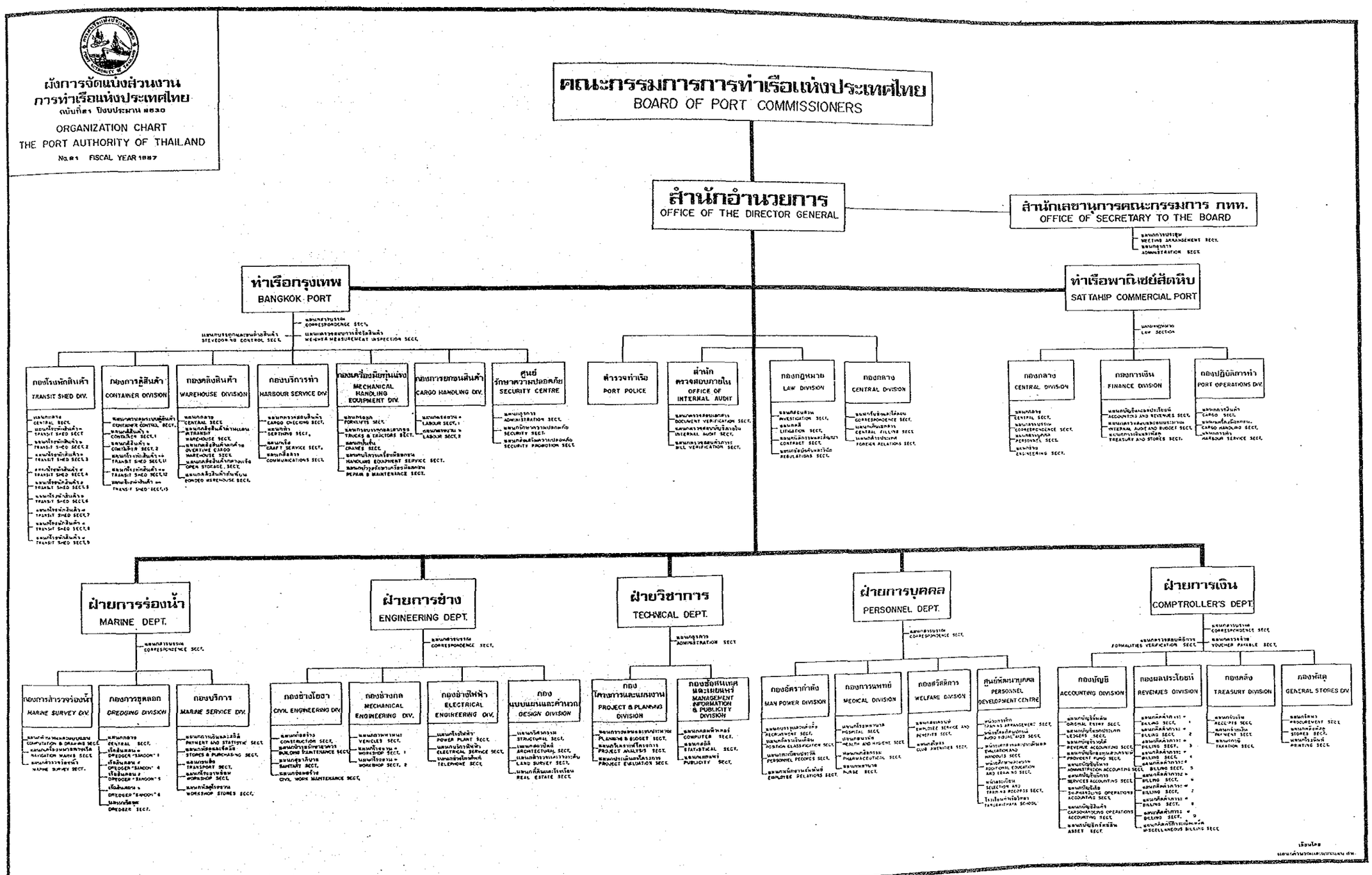
14. PAT owns land areas including all of the Klong Toei Wharves area used for cargo handling operations by PAT. PAT has no ownership of water areas, but has legal authority and duties within its Authority Area. Almost all facilities within the Customs fence are property of PAT, and port operations and maintenance including longshoring are the responsibility of PAT.

15. PAT is involved in new port projects. As for Laem Chabang, PAT is in charge of the construction work including land acquisition. As for Songkhla and Phuket Ports, PAT was expected to operate the ports, but the government policy has changed to separate PAT from the southern port projects. PAT was not actively involved with the planning of these projects.

Organizational Structure of PAT

16. Fig.4.4 shows the organization of PAT. PAT is managed by a Board of Commissioners consisting of a Chairman and ten members including the Director General of PAT. The Director General of PAT, assisted by three Deputy Director Generals and the Directors of the various service and operational departments, is responsible for day to day management and operations. The major departments include the Port Operations (Bangkok Port and Sattahip Commercial Port), Marine, Engineering, Technical, Personnel and Comptroller's Departments. Permanent employees total about

Fig. 4.4 Organization Chart of PAT



Source: PAT

6,000.

Board of Commissioners

17. The Board of Commissioners is entrusted with the power to formulate policies and to carry out the overall control of the affairs of PAT, and its chairman and members are appointed and remunerated by the Cabinet. Subject to the provisions of the PAT Act, the Board has the following powers and duties:

i) To conduct business and to issue rules and regulations regarding safety, the use of port services and facilities, and the method of payment of charges;

ii) To appoint, remove, increase or decrease the salaries of advisers, experts and heads of departments who assist the Director General, and to determine the salaries of the staff of PAT;

iii) To issue rules of procedures for its meetings and for the conduct of its business;

iv) To issue rules governing the performance of duties of the staff of PAT, disciplinary and penalty measures and other similar matters;

v) To fix the rates of various dues and charges within the Authority Area, and the rates of dues and charges for the use of the wharves, and for the facilities and services provided by PAT; provided that they are between the maximum and minimum rates fixed by the Council of Ministers.

18. In order for the Board to conduct these duties properly in the interest of the public and the State, the members are required:

i) To be Thai nationals;

ii) Not to have directly or indirectly any interest in any contract concluded with or in any work executed for PAT except in cases where the member is merely a shareholder of a company interested in such business;

iii) Not to be a staff member of PAT; and

iv) Not to hold any political post.

In addition to these qualifications, persons who are appointed as members are required to have knowledge of and experience in matters concerning ports or closely related fields which include transportation, navigation, commerce, economics and finance.

19. The actual composition of the Board (as of March 1988)is as shown in Table 4.1.

Table 4.1 Composition of the PAT Board

1. Commander in Chief of the Royal Thai Navy (RTN) (Chairman)
2. Director General of PAT
3. Retired Official of RTN
4. Representative of Police Department, MOI
5. Professor, Chulalongkorn University
6. Advisor, MOC
7. Director General of HD
8. Director General of Customs Department, MOF
9. Deputy Director General of Public Prosecution Department, MOI
10. Representative of Board of Trade of Thailand
11. Representative of NESDB

Source : PAT

The Board comprises representatives or retired officials of government agencies and persons wiht expertise. Other individuals such as representatives of the Bangkok Metropolis Authority are not only excluded from the Board but also have no official channel to present opinions to the Board even though the living environment of the region is greatly affected by the port activities. Port users, whose businesses are closely related with the Port Authority's business, also have no representation on the Board, which causes many problems such as those related to the designation

of an exclusive land transporter, that is, the Express Transport Organization of Thailand (ETO), from Klong Toei Wharves and introduction of obligatory mobile crane services.

Director General

20. The Director General, as the top man in the executive organ, administers the affairs of PAT in accordance with policies laid down by the Board, and is in charge of the staff. The Director General is responsible to the Board for the management and operation of PAT and has the powers:

i) To appoint, remove, increase or decrease salaries of the staff of PAT in accordance with the regulations laid down by the Board, except those directly stipulated by the Board

ii) To issue regulations governing the operation of PAT

As his position is regarded as important, the Cabinet holds the right to approve or disapprove the appointment or removal of the Director General by the Board. So far all the Director Generals have come from other agencies and have been supported by deputies who have spent all their careers with PAT. There are three Deputy Director Generals at present in charge of administrative, technical and operational matters, respectively.

Executive Organs of PAT

21. As PAT executes not only port development and management but also terminal operations including longshoring works, it has operational departments within its executive organs. The duties and number of employees of each Department as of May 1987 are as follows:

i) The Office of the Secretary to the Board has seven persons and coordinates between the Board and Office of the Director General, administers works under the authority of the PAT Board and performs all the clerical works of the PAT Board.

ii) The Office of the Director General consists of 439 persons including 287 port policemen, and has the duties to administer the port according to the PAT policy set by the Board and to control clerical, legal, internal auditing and security tasks.

iii) The Personnel Department, with 272 persons, performs tasks concerning personnel, design and controls of manpower, labor relations, personnel development, education, medical care, social welfare, and sanitation.

iv) The Comptroller's Department with 403 employees is responsible for finance, budget, accounts, inventory, charge setting and collection.

v) The Technical Department, with 50 employees, performs works regarding planning port development projects and other projects, research, statistics, computer operations, public relations and library service.

vi) The Engineering Department has 1,050 persons and plans and executes civil engineering, mechanical, electrical, and communications works, assisting the other departments to work effectively.

vii) The Marine Department with its 661 employees performs the works of dredging as well as surveying the depth and status of the channels; survey and collection of hydrological data and other related information; and procurement, operation and maintenance of navigation marks, ships and buoys.

viii) "Bangkok Port" consists of 3,026 employees and is responsible for providing services for passengers and cargoes and traffic clearance at the Port.

ix) "Sattahip Commercial Port", with 205 persons, is responsible for the daily management and operation of the Port.

Among these departments, the operational departments, which are "Bangkok Port" and "Sattahip Commercial Port", are the biggest with approximately 53% of the total employees.

22. Bangkok Port and Sattahip Commercial Port are managed and operated individually to some extent, having separate managers and staff and separate accounts. But they are not really independent because they are ultimately under the control of the Director General and accounts are consolidated into the overall PAT accounts on an annual basis.

23. Personnel transfers take place annually, and the average scale over the last decade is shown in Table 4.2. Around 7% of the total employees change their posts annually inside PAT, but there has been no personnel exchange between PAT and other organizations over the ten years. Although there may be difficulties in personnel exchange with other organizations including the adjustment of work conditions, salaries and welfare payments, such personnel exchanges should be promoted to increase the exchange of valuable accumulated knowledge and experience.

24. PAT employees have five labor unions as shown in Table 4.3. Their main objective is the improvement of work conditions, but they sometimes struggle against managerial or operational policies set by the Board or the Minister or the Cabinet when they feel that these policies are unacceptable. The unions are powerful and, therefore, failure of initial negotiations between the executives and the unions usually causes conflict followed by work delays and strikes.

Government Control Over PAT

25. As ports are social infrastructures and PAT is a state corporation, the Government participates in some important activities of PAT, as follows:

(1) The Cabinet has authority on:

Table 4.2 Average Scale of Personnel Transfers over the Last Decade

Classification		Number	Percentage
Same Ranking	between Sections within the same Division	78 persons	17.9%
	between Divisions within the same Department	20	4.6
	between Departments	77	17.7
	between PAT and Other Organizations	0	0
Promotion		260	59.8
Total		435	100.0

Source: PAT

Table 4.3 Labor Unions in PAT

Name	Number of Persons	Position	When Established
1. Port Authority of Thailand Workers Union	2,300	Staff and all of the lower ranks	Sept. 25. 1974
2. Port Authority of Thailand Officers Union	1,700	Staff and all of the lower ranks	May. 31. 1976
3. Port Supervisor Trade Union	260	Chiefs of Sub-sections and of the higher ranks	Oct. 14. 1981
4. Mechanical Staff Workers Union of the Port Authority of Thailand	800	Drivers of the trucks, forklifts and other vehicles concerned with handling equipment	Sept. 23. 1981
5. Bangkok Port Workers Union	400	Staff and all of the lower ranks working for Bangkok Port (checker, surveyors, tallymen, etc.)	Feb. 12.1985

Source: PAT

i) Approval of the construction of new ports

ii) Approval of the termination of business in any port under operation

iii) Decision of the maximum and minimum limits of the tariff

iv) Approval of the increase or reduction of capital

v) Approval of the capital budget

vi) Receipt of reports on the operating budget

vii) Approval of loans

viii) Approval of the disposal of immovable properties

ix) Approval of rules and regulations concerning the management of provident funds for the staff

(2) The general supervision of the affairs of PAT under the Act is vested in the Minister of Communications. For this purpose:

i) He, together with the Finance Minister, has the power to issue Ministerial Regulations concerning the control, development and provision of facilities and safety for port undertakings and navigation within the Authority Area, and other activities for the execution of the Act.

ii) He also has the authority to approve rules and regulations governing the performance of duties of, and disciplinary and penalty measures to be imposed upon, the staff of PAT and other similar matters.

iii) He receives an annual report which gives an account of the operations of PAT in the previous year together with a statement on future policies and programs contemplated by the Board.

iv) He may instruct PAT to state facts, give opinions, submit reports, or stop any act which is contrary to the policy of the Government or to the resolution of the Cabinet. He may also order inquiries into the facts concerning PAT's management.

v) Moreover, any matter that is to be submitted by PAT or its Board for the consideration of the Council of Ministers must first be