Chapter 2

APPRECIATION OF THE STUDY AREA

2. APPRECIATION OF THE STUDY AREA

2.1. Habitation and Migration

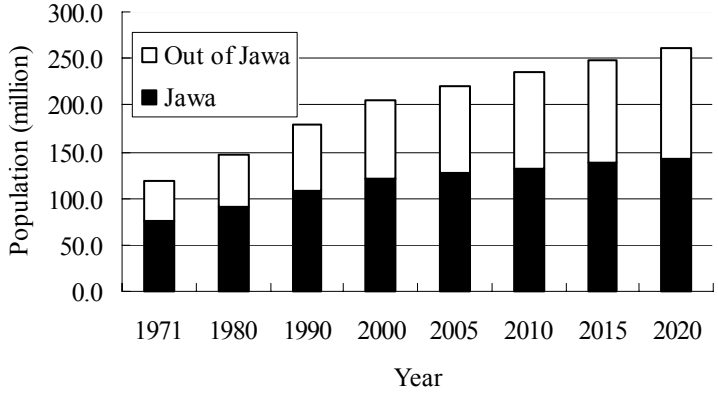
2.1.1. Population Growth and Distribution

The Government conducts the national population census every ten years since 1961, and is the main data source for estimating demographic indicators at regional and national levels. According to the census data, the population of Indonesia was 205.7 million in 2000, accounting for about 3.5% of the global population. The population size became double during the last four decades from 100 million in 1960s and exceeded 200 million at the end of the 20th century. Table 2.1.1 and Figure 2.1.1 present the population size and growth rates in Indonesia between 1971 and 2003 (Population in 2003 is estimated by the Study Team.).

The population growth rate increased in 1961 - 1980 and afterwards decreased significantly from 2.35% p.a. in 1971 - 1980 to 1.44% in 1990 - 2000. This slowdown of population growth is largely attributed to the promotion of family planning in Indonesia, which started in 1970. The family planning program firstly concentrated in Java and Bali, since these islands were over-populated. A few years after Java and Bali succeeded in promoting the program, family planning was also launched in other regions. Partly because of this, population growth rate in Java had decreased faster than in the rest of Indonesia.

According to the 1987 and 1997 IDHS data, the total fertility rate (TFR) decreased considerably from 3.4 children per woman during 1984 - 87 down to 2.8 during 1995 - 97 while the infant mortality rate (IMR) was reduced from 75.2 per 1,000 live birth during 1977 - 87 to 52.2 during 1987- 97. As a result, life expectancy improved from 59.8 years in 1986 to 64.4 years in 1991 The changes can be explained by an increase in schooling levels, a higher female participation rate and increasing use of contraceptives.

Figure 2.1.1 Population Growth in Indonesia, 1971 - 2020



Source: Statistical Yearbook of Indonesia, 2001, BPS

Table 2.1.1 Population Growth in Indonesia

(Population in million)

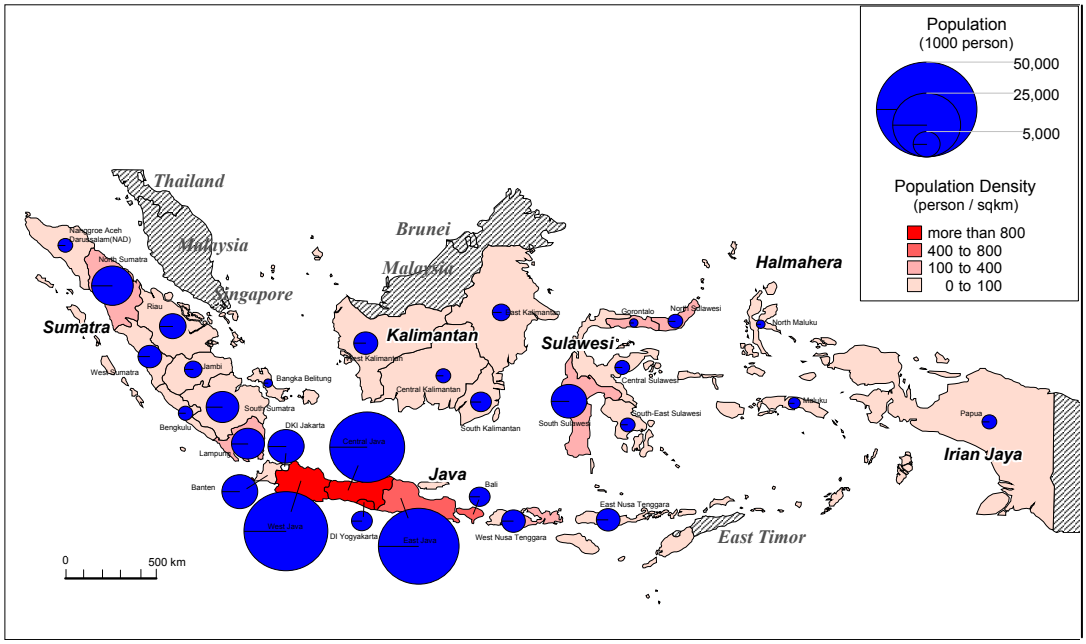
Year	Java Island			Out of Java			Indonesia		
	Population	AGR(%)	%	Population	AGR(%)	%	Population	AGR(%)	%
1971	76.1	-	63.8	43.1	-	36.2	119.2	-	100.0
1980	91.3	2.04	62.1	55.7	2.88	37.9	146.9	2.35	100.0
1990	107.6	1.66	60.3	70.9	2.45	39.7	178.5	1.97	100.0
2000	121.3	1.21	58.9	84.5	1.77	41.1	205.8	1.44	100.0
2001	122.7	1.16	58.8	86.0	1.70	41.2	208.7	1.38	100.0
2002	124.1	1.11	58.7	87.4	1.63	41.3	211.5	1.33	100.0
2003	125.4	1.07	58.6	88.8	1.57	41.4	214.2	1.27	100.0

Note: AGR; Annual Growth Rate
Source: Statistical Year Book of Indonesia, 2001

2.1.2. Regional Population Distribution

As shown in Figure 2.1.2 as well as Figure 2.1.1, the population of Indonesia is unequally distributed: Java is densely populated while the rest of Indonesia is sparsely populated. This is mainly due to difference in soil quality between the major regions. Islands of Java (and Bali) are endowed with the most fertile land and were therefore first to be populated develop and be developed, and later on many big cities such as Jakarta, Bandung, Semarang, Jogyakarta and Surabaya emerged.

Figure 2.1.2 Population Distribution and Density in Year 2000



Source: Statistical Yearbook of Indonesia, 2001, BPS

Java Island is the most populated in Indonesia with more than 120.4 million, or 59 percent of the total population in 2000 residing on only seven percent of the nation's land area. On the other hand, the rest of the country such as Sumatra, Kalimantan, Sulawesi and Irian Jaya/Papua with its dense forest canopy, or Nusa Tenggara islands, with their more arid climate are inhabited by smaller numbers of people (41%) scattered over huge area (93%).

2.1.3. Migration

Indonesians' mobility on a permanent or temporary basis has increased, especially during the last two decades. In the period 1975 - 1980, 3.7 million people older than 5 years of age migrated from their origin residence to other regions within Indonesia. This number increased to 5.3 million in the period 1985 - 1990.

Table 2.1.2 Migration in Indonesia during 1995 – 2000

To / From	Sumatra	DKI Jakarta	Jawa /Bali	Nusa Tenggara	Kaliman-tan	Sulawesi	Maluku	Irian Jaya /Papua	Total Out-migration
Sumatra	875,526	93,743	281,892	5,056	22,493	16,879	1,341	2,561	1,299,491
DKI Jakarta	68,578	-	751,199	3,832	13,940	9,290	1,975	1,529	850,343
Jawa/Bali	325,731	561,752	1,213,581	47,310	215,050	53,277	9,607	29,822	2,456,130
Nusa Tenggara	7,217	5,338	49,097	10,046	19,725	10,413	732	3,135	105,703
Kalimantan	10,633	10,788	48,351	5,432	89,599	9,533	927	751	176,014
Sulawesi	17,785	15,150	47,784	7,512	49,284	137,491	5,185	14,556	294,747
Maluku	3,053	3,853	12,357	2,401	2,193	76,237	9,759	11,408	121,261
Irian Jaya/Papua	2,128	1,659	11,334	1,690	1,911	7,804	3,629	-	30,155
Outside Country	7,497	9,919	19,311	46,595	4,212	8,211	266	67	96,078
Total In-migration	1,318,148	702,202	2,434,906	129,874	418,407	329,135	33,421	63,829	5,429,922

Source: BPS, 2000 Census

Table 2.1.2 shows transmigration data in the period of 1995 – 2000. The data does not include intra-provincial migrants, but includes only inter-provincial and international migrants. Total number of migrants during the period was about 5.4 million, 2.6 % of the total population.

It is noted that DKI Jakarta recorded net out-migration at 1.8% of its population, as well as Maluku at 4.6%. On the other hand, in-migrants are observed more than out-migrants in Kalimantan and Irian Jaya/Papua and in- and out- migrants are almost balanced in Sumatra, Java/Bali and Sulawesi. In DKI Jakarta, in-migrants had been outpacing out-migrants until 1990, except the period of 1985-1990 when the Government implemented an intensive transmigration program in Replita III, encouraging people in over-populated Java Inland to Sumatra. It is however somewhat doubtful if DKI Jakarta really experienced a net population out-flow in 1995 – 2000, because of lack of census surveys for verification.

International migration seems to have started in the 1990s, with the economic boom in Malaysia, Singapore and the Middle East. During the period 1994 – 1999, 1.5 million overseas workers were legally registered at the Ministry of Labor. However, international migration has still very limited effect on the total population.

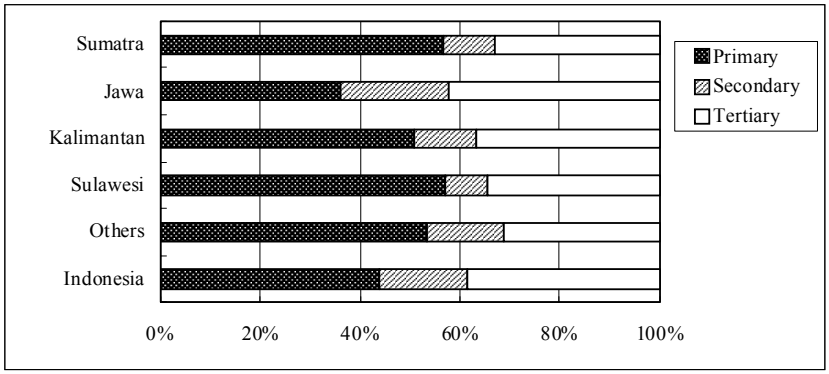
2.1.4. Labor Force

Working age population (aged 15 years and over) in Indonesia was 144 million persons in 2001, of which total labor force (economically active population) was 98.8 million persons. The labor force ratio was 68.6% in 2001, and had been increasing to 56.6% in 1995, mainly due to a rise in female participation.

The labor force includes those that are unemployed but are looking for work. In 2001, the unemployment was 8.0 million persons. The unemployment rate was 8.1%.

Out of the total employment of 90.8 million, 44% are engaged in the primary sector (agriculture, forestry and fishery), 18% in the secondary sector (manufacturing and construction) and 38% in the tertiary sector (service sector). Out of the workers in the tertiary sector, 11% of the total workers are working in the public sector.(Figure 2.1.3)

Figure 2.1.3 Workers Composition by Industrial Sector in 2001



Source: Statistical Yearbook of Indonesia, 2001, BPS

Table 2.1.3 shows employment status, comparing all industry and transportation/ storage/ communication sector. In the latter sector, more than half of employment are own account workers and 33% of the total are regular employees.

Table 2.1.3 Employment Status of Transportation & Communication Sector

(1,000 person, %)

Main Employment Status	[A]		[B]		[B]/[A] (%)
	All Industry	(%)	Transportation/ Storage/ Communication	(%)	
Own Account Workers	17,451	19.2	2,345	52.7	13.4
Self-employed Assisted by Family Member/Temporary Employee	20,329	22.4	128	2.9	0.6
Employer	2,789	3.1	237	5.3	8.5
Regular Employee	26,579	29.3	1,489	33.5	5.6
Casual Employee	6,072	6.7	211	4.7	3.5
Unpaid Worker	17,586	19.4	38	0.9	0.2
Total	90,806	100.0	4,448	100.0	4.9

Source: Statistical Yearbook of Indonesia, 2001, BPS

As of the end of 2001, the average monthly wage in Indonesia (excluding supervisory level jobs and over) was Rp. 554,000. As it was Rp. 427,300 at the end of the previous year, nominal increase was over 30%. The CPI rose 12% in the same period and thus the wage rate increased by 12% in real terms.(Table 2.1.4)

There are large differences among sub-sectors: wages in the metal industry, for example, are more than twice as high as those in the food industry. Comparing the average wages by region, wages in DKI Jakarta and West Java are higher than those in Central Java by 1.8 – 2.2 times and also than those in East Java by 1.4 - 2.0 times.

Table 2.1.4 Average Monthly Wage by Industry

(Rp. 1,000/month)

Industry	2000	2001
Food	326.6	390.4
Textiles	404.6	519.0
Wood	534.9	608.6
Paper/Printing	452.6	475.3
Chemical/Rubber	409.7	627.0
Non-Metallic Mineral	386.1	495.9
Metals	604.7	903.0
Average	427.3	553.7

Note: Workers below supervisory level
Source: Statistical Yearbook of Indonesia, 2001, BPS

2.2. Economy and Trade

2.2.1. Economic Growth

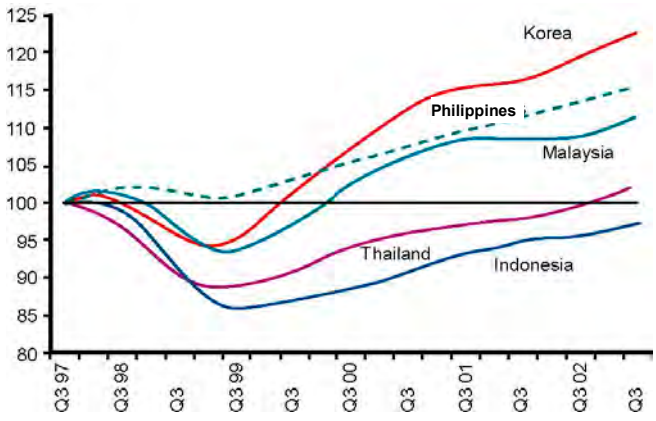
Under President Suharto's regime, the Indonesian Government took policies endorsing an open market and outward looking economy and attained a high economic growth at 7.4 % to 8.2 % p.a. until the financial crisis in the mid-1997. This high growth was realized partly by international support and easy access to foreign aid and loan as well as by oil production.

Just after the crisis, the growth rate recorded a sharp decline of –13.2% in 1998 and was marginally positive at 0.8% in 1999. The economy seemed to recover in 2000, with the growth rate at 5% (the level in 1997) but afterwards fell down to 3.3 % in 2001 and 3.7% in 2002. For the year 2003, the growth rate is estimated by ADB at 3.4%. Thus, economic growth has not yet recovered to the level before the crisis.

Indonesia remains as the only country that has yet to reach its pre-crisis GDP levels. GDP per capita, in rupiah terms, is still some 10% below that of 1997 levels, and in dollar terms it is still down by over 30%.

Figure 2.2.1 GDP Curves after the Economic Crisis

(Index, 1997 Q3=100)

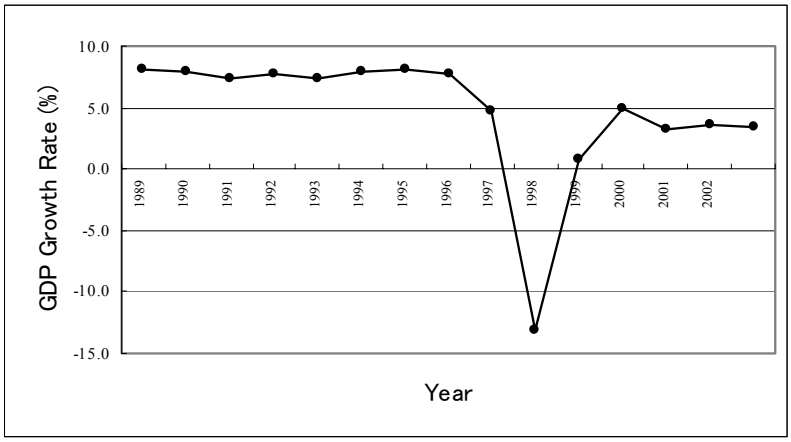


Source: The World Bank Report to the CGI Meeting 2003

Recent economic growth is supported by an increase of consumption expenditure as well as the government's efforts for political stability, progress on structuring reforms focusing on control of the currency, interest rate, stock market and inflation. However, investment in Indonesia has been stagnant after the recession. At the 12th meeting of Consultative Group for Indonesia (CGI) held in January 2003, it was pointed that the Government should (1) create a more consistent and conducive business environment, (2) continue with the restructuring and re-privatization of banks taken over by the state after the crisis, and (3) strengthen law enforcement and judicial system, in order to encourage investment commitment.

GNP per capita (in US dollar) had been rising during early 1990s from US$ 570 in 1990 to US$ 880 in 1994 and exceeded US$ 1,000 (at US$ 1110 in 1997). However, 6 months after the 1997 crisis, GNP per capita slumped to US$ 415.

Figure 2.2.2 Past Economic Growth in Indonesia



Source: Statistical Yearbook of Indonesia, 2001, BPS

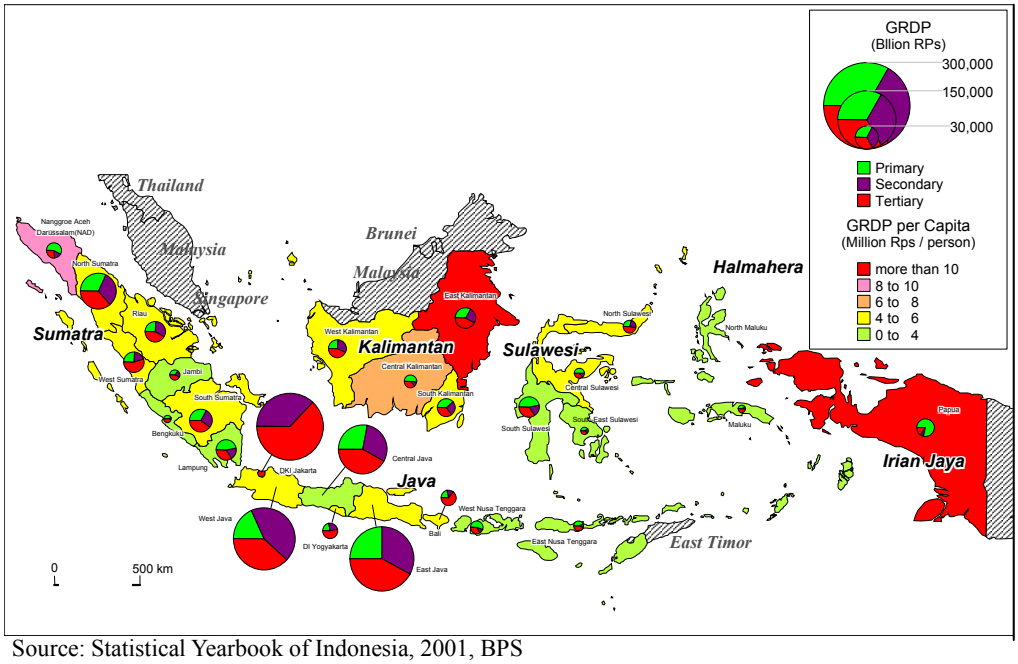
Table 2.2.1 Regional GDP in 1996 - 2000

(Trillion R$)

Price	Region	1996	1997	1998	1999	2000
Current Price	Sumatera	108.6	126.7	198.2	227.9	257.2
	Jawa and Bali	316.1	363.9	525.1	608.7	694.8
	Kalimantan	45.1	51.5	87.0	96.4	118.6
	Sulawesi	21.7	25.0	42.4	46.8	52.3
	Others	19.2	22.1	36.7	36.3	43.5
	Total	510.8	589.2	889.3	1016.2	1166.4
1993 Constant Price	Sumatera	87.9	91.4	84.5	86.1	74.0
	Jawa and Bali	250.3	261.4	220.7	224.3	233.7
	Kalimantan	36.5	38.4	37.3	38.6	39.6
	Sulawesi	16.8	17.6	16.8	20.4	18.3
	Others	15.8	16.8	17.4	16.6	18.0
	Total	407.3	425.6	376.7	386.1	383.6

Source: Economic Indicators, May 2002, BPS

Figure 2.2.3 GRDP Distribution and Industrial Composition in 2001



Source: Statistical Yearbook of Indonesia, 2001, BPS

2.2.2. Industrial Composition

In 2001, Indonesia's primary, secondary and tertiary industrial sectors have a ratio 25:31:44 in terms of GDP. Historically, the share of the primary industry (including the mining industry) has been decreasing while the secondary/ tertiary industry have been increasing. The oil and gas sector has also been losing its share, which was 18% in the early 1990s and 13.7% in 2001 (Table 2.2.2).

Table 2.2.2 Industrial Composition of GDP of Indonesia

(Billion R$, %)

Industrial Origin	2000		2001	
	Production	%	Production	%
Agriculture, Livestock, Forestry & Fishery	218,301	17.0	244,381	16.4
Mining & Quarrying	176,640	13.8	202,680	13.6
Manufacturing Industry	335,339	26.2	389,321	26.1
Electlicity, Gas, & Water Supply	15,072	1.2	17,286	1.2
Construction	76,090	5.9	84,045	5.6
Trade, Hotel & Restaurant	194,910	15.2	239,959	16.1
Transport & Communication	64,550	5.0	79,824	5.4
Financial, Ownership & Business Service	79,477	6.2	92,459	6.2
Services	121,637	9.5	141,018	9.5
GDP	1,282,017	100.0	1,490,972	100.0
GDP without Oil & Gas	1,097,771	85.6	1,286,033	86.3

Source: Statistical Year Book, 2001, BPS

Table 2.2.3 shows the GDP share of the transportation sector (at 4.4 – 5.4%) and the sea transportation sub-sector (at 0.45 - 0.54%). Both sectors have been recently gradually expanding their share. Roughly speaking, sea transportation is about 10% of the entire transportation sector.

The transportation sector holds approximately 3.2 million workers. Assuming that the labor productivity be uniform among all the transportation sub-sectors, the number of workers directly engaging in the sea transportation sub-sector is estimated at 323,000.

Table 2.2.3 GDP Contribution of Sea Transportation Sub-sector

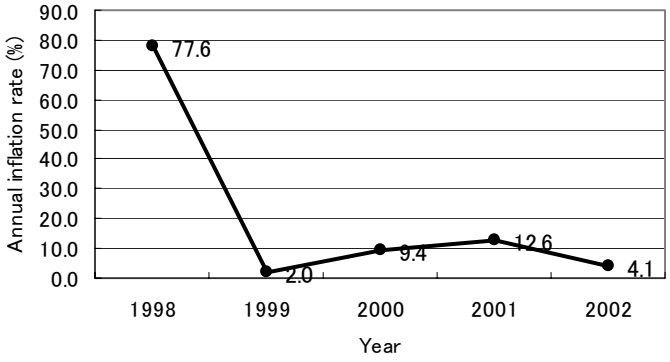
(Million R$, %)

Year	GDP	GDP w/o Oil & Gas		Transportation Sector		Sea Transportation	
		Production	%	Production	%	Production	%
1998	955,753.5	847,697	88.7	41,837	4.38	4,284	0.45
1999	1,099,731.6	992,179	90.2	55,190	5.02	5,321	0.48
2000	1,282,017.6	1,097,771	85.6	64,550	5.04	6,630	0.52
2001	1,490,974.2	1,286,033	86.3	79,825	5.35	8,062	0.54

Source: Economic Indicators, 2002, BPS
Note: Percent(%) shows the share of GDP

Inflation in Indonesia had been in a rather moderate range of 6 to 12% but inflation rate jumped up to 77.6% in 1998 due to the financial crisis. Since 1999, inflation has curbed down to the level before the financial crisis due to the government's anti-inflation measures.

Figure 2.2.4 Inflation Rate in Indonesia



Source: Statistical Yearbook of Indonesia, 2001, BPS

2.2.3. International Trade

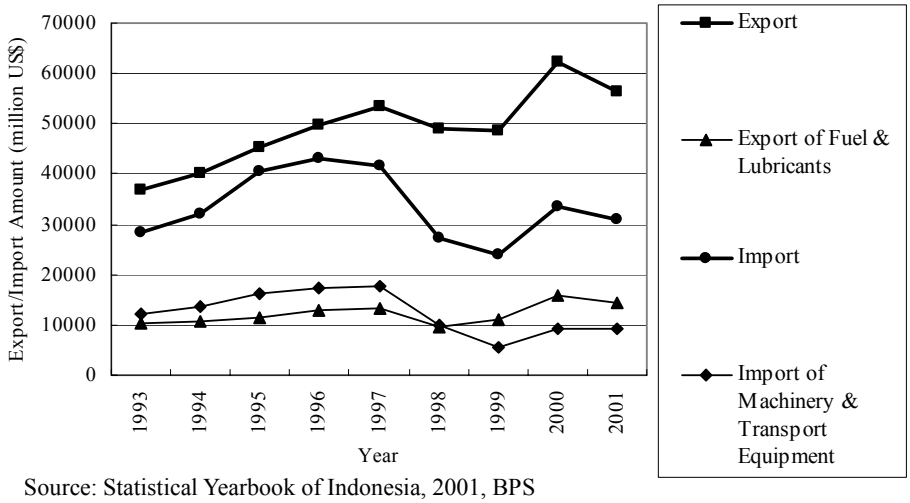
Indonesian export had been dominated by oil and gas until the government's new deregulation measures and policies in the mid-1980s which encouraged producers and exporters of non-oil commodities to increase their output. A decade since deregulation, exports increased mainly because of the increase of non-oil commodities (Figure 2.2.5). By the mid-1990s, export of non-oil commodities reached about three times of oil export in monetary terms. Main non-oil export commodities were manufactured goods, raw materials, foodstuff, live animals, machinery and transport equipment.

The Indonesian import had been increasing up to the mid-1990s almost at the same rate as export. Main import commodities are machinery and transport equipment, minerals, chemicals and petroleum products.

The economic and financial crisis in the mid-1997 seriously affected the Indonesian trade, especially import, which dropped to half of 1996 values. The most severe decreases

were recorded in 1998 and 1999. In 2001, both of export and import increased but has not yet recovered to the 1996 level.

Figure 2.2.5 Past Trend of International Trade



Source: Statistical Yearbook of Indonesia, 2001, BPS

The main destination countries of Indonesian export are Japan, USA and Singapore. In the year 2000, these three countries accounted for 46% of the total export in monetary terms. Also as Indonesian import partner, these three countries are dominant, accounting for 35% of total imported value in 2000 (Table 2.2.4). Indonesian trade has been recording an excess of export over import to most countries.

Table 2.2.4 Export and Import by Country in 2000

(Million US$)

Country	Export	Import	Export-Import
Singapore	5364	3147	2217
Other ASEAN	4143	2315	1828
Honkong	1290	257	1033
Japan	13010	4690	8321
Rest of Asia	11863	8546	3317
Africa	1182	1371	-189
USA	7749	3208	4541
Canada	390	357	34
Rest of America	993	442	552
Australia	1845	1814	31
Rest of Oseania	241	227	15
European Union	7745	4047	3698
Rest of Europe	506	543	-37
Total	56321	30962	25359

Source: Economic Indicators, May 2002, BPS

2.2.4. Freight and Balance of Payment

Balance of payment in freight trading services in Indonesia has been in constant deficit. This deficit comprises a large portion of non-trade balance deficit and even of total balance of payment prior to the 1997 financial crisis. Due to changes in monetary polices

and the substantially depreciated Rupiah, the balance of payment has shifted from deficit to surplus at the time of financial crisis.

For a robust national economy, non-trade balance or cross-border services is also important besides trade balance. In this sense, overseas shipping development is important. However, an aggressive stance of the government in protecting overseas domestic shipping would disrupt import and export industries with probably adverse effects.

The characteristics of the overseas shipping in Indonesia[1] have been pointed out as follows:

- Terms of trade whether CIF or FOB is decided by agreement between exporter and importer; or, buyer and seller. The government doesn't have a role or jurisdiction to dictate the terms of trade. Anyway, the choice of the terms of trade will not matter much. The most important thing is if the national fleet is selected to transport the export and import commodities as the exporter or importer has the prerogative to nominate the transporting ship.
- The cargo volume of export and import is unbalanced in Indonesia. The volume of export cargo is almost four times bigger than that of import. It is understood in the shipping business that this condition provides a more competitive advantage to foreign fleet than the national fleet. The reason is that inbound vessels with cargo will have a better opportunity to acquire cargo for their return voyage.

Table 2.2.5 Freight, Non-trade Balance and Balance of Payment

(Unit: US$ million)

Year	Net Freight in Export and Import	Non-trade Balance	Balance of Payment
1991	-2,385	-3,742	-4,392
1992	-2,601	-4,709	-3,122
1993	-2,730	-5,887	-2,298
1994	-3,189	-6,619	-2,960
1995	-4,118	-8,071	-6,760
1996	-4,430	-8,540	-7,801
1997	-4,606	-9,666	-5,001
1998	-3,050	-7,334	4,097
1999	-2,365	-11,659	5,783
2000	-2,709	-12,500	7,991
2001	-2,367	-11,499	6,900
2002	-2,129	-11,471	

Source: Bank Indonesia

[1] Development of Indonesia's Sea Transportation Fleet: Reliable Data by Petrus Sumarsono, Bappenas, for STRAMINDO Workshop on Shipping Investment and Ship Finance, 22nd October, 2003

2.3. Maritime Traffic

This section is a review of the current maritime traffic in Indonesia. This review draws from various data sources including a survey conducted especially for this Study. For details of the primary data sources used in this Study refer to Annex. 2.3.1.

2.3.1. Role of Maritime Transportation

(1) Comparison with Other Modes

Indonesia being an archipelago is highly dependent upon maritime transport for the movement of goods and people across the country.

Table 2.3.1 Comparison of Modes in Domestic Transport in Indonesia

	Rail[/1]	Air[/1]	Road	Sea
Passenger (mill. Pax)	192	8.6	N/A	Ferry[/2]: 45 Inter-island[/3]: 11.8
Cargo (mill. MT)	19.5	0.1	N/A	152[/3]

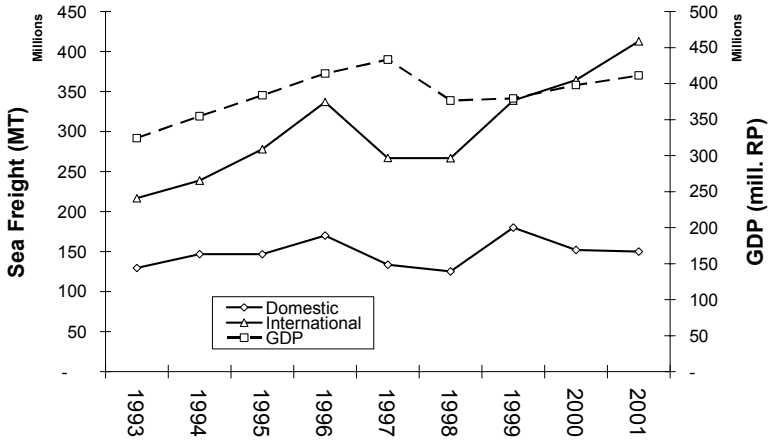
Source: /1. BPS 2000, Rail is available only in the islands of Java and Sumatra
/2. PT ASDP 1999
/3. DGSC 2001

For freight transport, sea-based modes carries much of the long-distance traffic accounting for more than 150 million MT of freight compared to around 20 million MT for rail. However, land based modes account for much of the passenger traffic; but, land-based modes are restricted by the country's topology – for example rail trips average only around 100 km in distance. This puts the load of transporting people across the country to sea based and air based modes and sea based modes account for much of such traffic. However, most of sea base trips are ferry trips which are typically short distance trips such as the Surabaya to Madura link. Excluding ferry trips, other sea based modes (i.e. inter-island passenger sea transport) still handle the majority at 11.8 million compared to 8.6 million to air based modes.

(2) Sea Traffic and GDP Growth

Economic activity and sea transport activity in Indonesia goes hand in hand. From the period from 1993 to 2001, GDP grew by 27% and at the same time domestic sea traffic grew by 16% and international sea traffic by 90%. Sea traffic mirrors the movements in GDP growth – for example in 1998 GDP contracted by 13% as a result of the Asian financial crisis and in 1997 both domestic and international sea traffic dropped by around 20%.

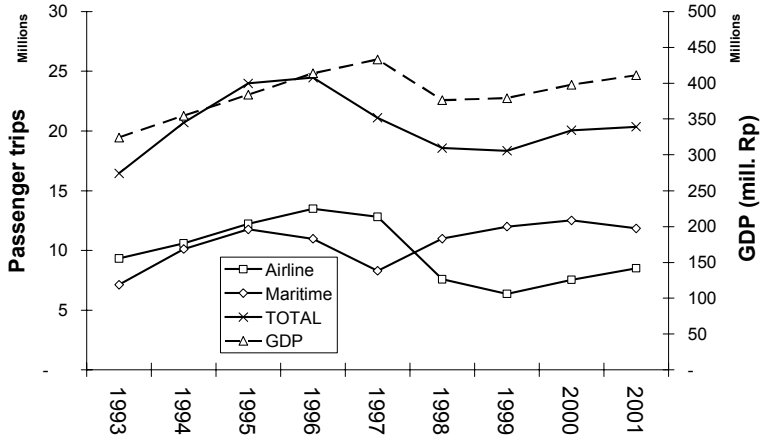
Figure 2.3.1 Relation between Sea Freight and Economic Growth



Note: GDP in constant 1993 Rupiah
Source: Sea traffic from DGSC 2001; GDP from BPS 2001

As GDP grew by 27% in the period from 1993 to 2001, long-distance inter-city travel grew by 24%. The growth however, is due to increase in maritime traffic as air traffic decreased by 9% during the period. Prior to the financial crisis, the air industry handles a slight majority of the market and was continually cornering more market share as maritime traffic started to decrease from 1995. However after the financial crisis in 1997, there was a decline in air travel and maritime traffic started to increase after 1997 – as sea based modes offered a more attractive and cheaper alternative to air travel during poor economic times. The trend however, appears to have again reversed after 1999 as GDP growth started to stabilize.

Figure 2.3.2 Relation between Long Distance Inter-city Travel and Economic Growth



Note: GDP in constant 1993 Rupiah
Source: Sea traffic from DGSC 2001; GDP from BPS 2001

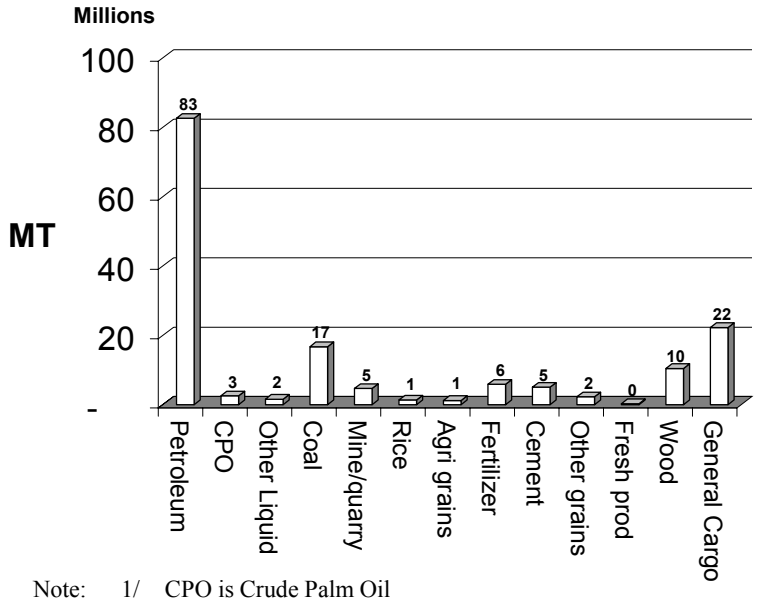
2.3.2. Domestic Sea Freight

(1) Domestic Sea Traffic by Commodity

Domestic sea freight is largely dominated by petroleum accounting for a little over half of the total tonnage. General cargo is the second largest commodity type followed by coal

at 14% and 10% of the total respectively. Wood products - primarily composed of sawn wood, logs, and plywood - accounts for nearly 7% of domestic tonnage. Other major commodities include cement, fertilizer and mining/quarrying products.

Figure 2.3.3 Commodity Breakdown of Domestic Sea Freight



Note: 1/ CPO is Crude Palm Oil
2/ Other liquid primarily composed of chemicals
3/ Mine/quarry refers to mining and quarry products other than coal, e.g. sand and gravel
4/ Agri grains refer to agricultural grains; e.g. legumes
5/ Other grains, refers to granular cargo other than agricultural or mining/quarrying products; e.g. sugar
6/ Fresh prod refers to fresh products such as fruits, vegetables, fresh or frozen meat
7/ General cargo refers to other unclassified cargo

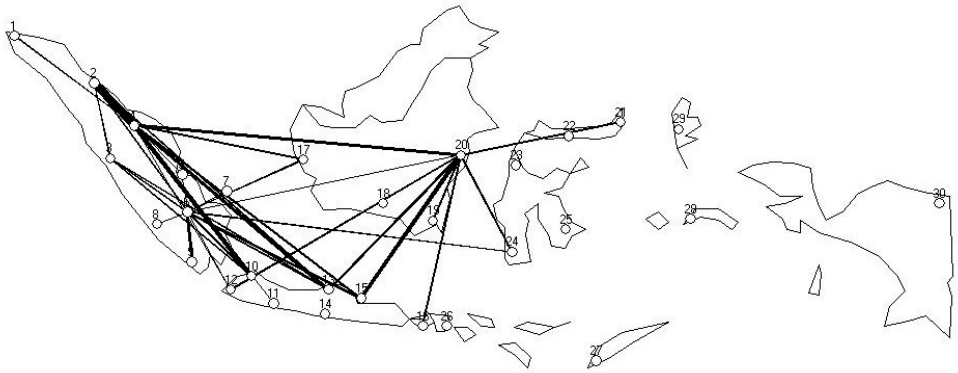
Source: STRAMINDO Survey, Year 2002 figures

(a) OD Structure of Main Commodities

The following presents the Origin-Destination structure of main commodities – including petroleum, general cargo, coal, wood, fertilizer and cement.

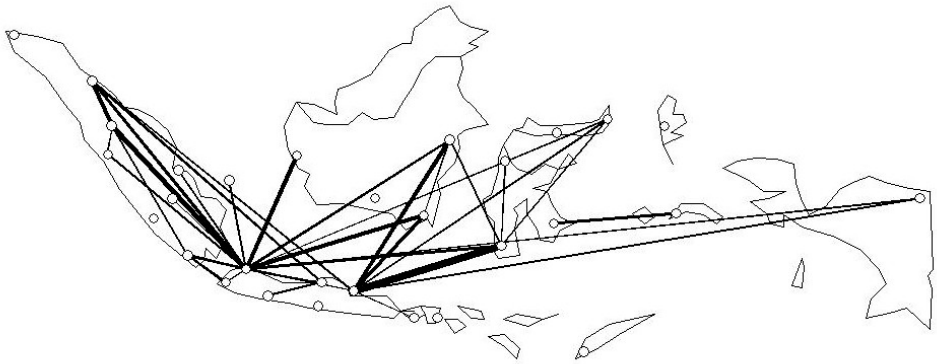
Petroleum Traffic: Much of the petroleum is being produced at Kalimantan and Sumatra. The province of Riau generates about 40 million MT of domestic petroleum sea traffic – the highest of all provinces accounting for about 45% of all generated domestic petroleum traffic. However, a quarter of this volume is transported within its borders only and another quarter to neighboring Sumatra Utara. The rest largely goes to Java Island, especially Jakarta at nearly 5 million MT. About 3 million MT of the Riau traffic (primarily crude oil for refining) goes to Kalimantan Timur. Kalimantan Barat also receives about 1.5 million MT of petroleum from Riau. Kalimantan Timur is second to Riau and generates about 31% of the domestic petroleum traffic. About half of the traffic however, is being loaded and unloaded within Kalimantan Timur only. The primary recipient of Kalimantan Timur traffic is Jawa Timur at nearly 5 million MT. The rest of the traffic goes to Jawa Tenggah, Bali, Kalimantan Selatan, and Sulawesi Selatan. The third highest generator of petroleum traffic is Sumatra Selatan, which goes to ports in Sulawesi and Jawa – in particular Lampung, Jakarta and Jawa Timur.

Figure 2.3.4 OD Structure of Domestic Petroleum Sea Traffic



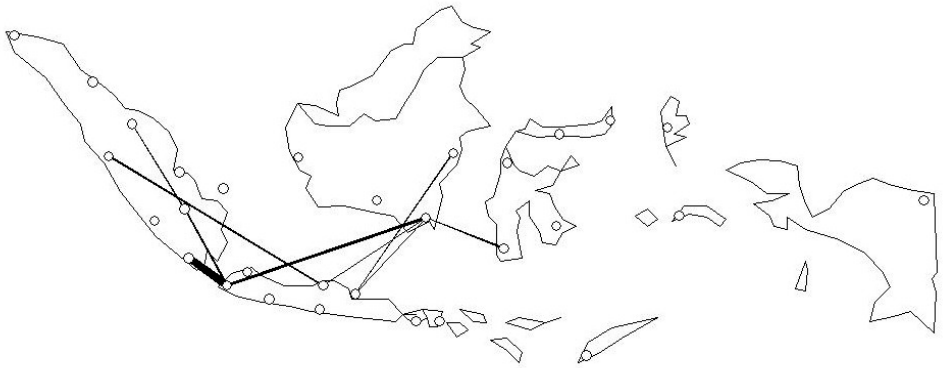
General Cargo Traffic: General cargo traffic is centered at Jakarta and Jawa Timur (Surabaya) the first and second largest industrialized areas in Indonesia. Traffic entering and leaving Jakarta is dispersed to major cities in the central and western parts of the country. Jawa Timur on the other hand is by and large exchanging general cargo with major cities in the eastern parts of the country, especially Sulawesi Selatan. Unlike petroleum traffic (and other commodities as well), general cargo traffic tends to be more dispersed.

Figure 2.3.5 OD Structure of Domestic General Cargo Sea Traffic



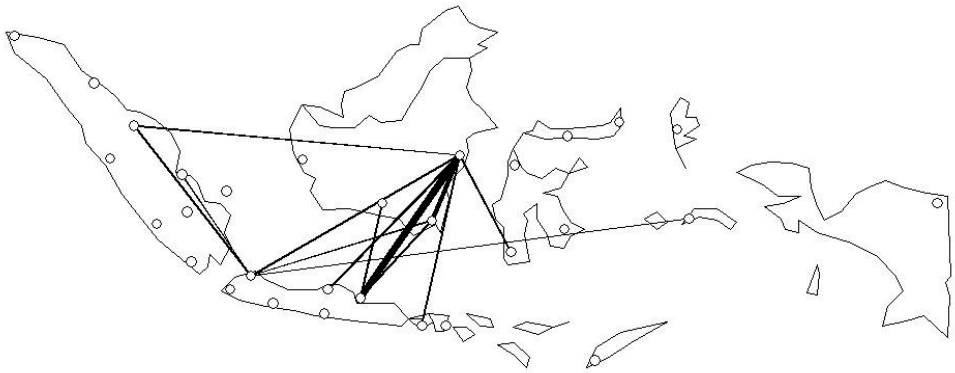
Coal Traffic: Banten attracts 10.3 million MT seaborne coal or 62% of the entire seaborne coal traffic and about 6.9 million MT of which comes from Lampung just across the Sunda Channel. 2.7 million MT of Banten coal comes from Kalimantan Selatan. Jawa Tenggah also attracts much seaborne coal of around 1.4 million MT – much of it comes from Sulawesi Barat. There is also substantial intra-province traffic of coal in Kalimantan Selatan of around 3.1 million MT.

Figure 2.3.6 OD Structure of Domestic Coal Sea Traffic



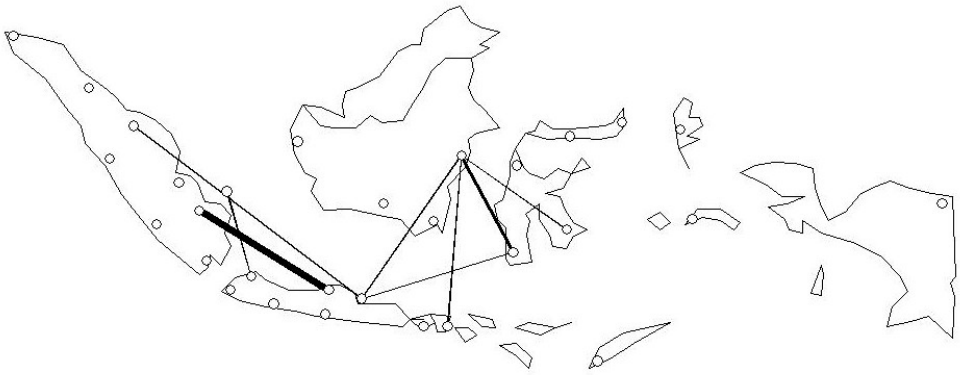
Wood Traffic: Much of the seaborne wood traffic originates from Kalimantan Timur and Riau at 5.5 million (52%) MT and 1.2 million MT (11%) respectively. About a third of the wood traffic from Kalimantan Timur goes to Jawa Timur and about 20% of the Kalimantan Timur wood traffic is intra-provincial traffic and Jawa Tenggah accounts for about 9%. Jakarta attracts 15% of the wood sea traffic but derives it from varied sources from Kalimantan as well as Sumatra. Riau wood sea traffic is largely transported intra-provincially.

Figure 2.3.7 OD Structure of Domestic Wood Sea Traffic



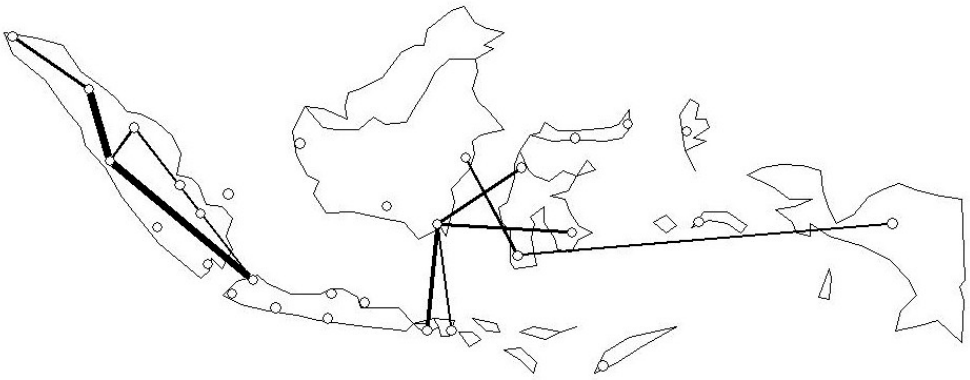
Fertilizer Traffic: The origin of fertilizer traffic is by in large concentrated at Sulawesi Selatan and Kalimantan Timur at 47% and 30% of the total fertilizer sea traffic respectively. 2.7 million of the 2.8 million MT of seaborne fertilizer coming from Sulawesi Selatan goes to Jawa Tenggah. About half of the 1.8 million MT Kalimantan Timur traffic goes to Sulawesi Selatan. The rest of the Kalimantan Timur traffic largely goes to Jawa Timur, Nusa Tenggara Barat and Sulawesi Tenggara.

Figure 2.3.8 OD Structure of Domestic Fertilizer Sea Traffic



Cement Traffic: Around 71% of the 5 million MT cement traffic originates from Sumatra Barat, Kalimantan Selatan and Sulawesi Selatan – 1.5 million MT, 1.3 million MT and 0.8 million MT respectively. Sumatra Barat traffic largely goes to Sumatra Utara and Jakarta. Kalimantan Selatan cement traffic serves demand in the central region of the country – most especially, Bali, Nusa Tenggara Barat and some parts of Sulawesi. Sulawesi Selatan traffic, on the other hand, serves the demand of the eastern region of the country. About a third of the traffic goes to Kalimantan Timur and Papua with Kalimantan Timur getting a slightly higher share.

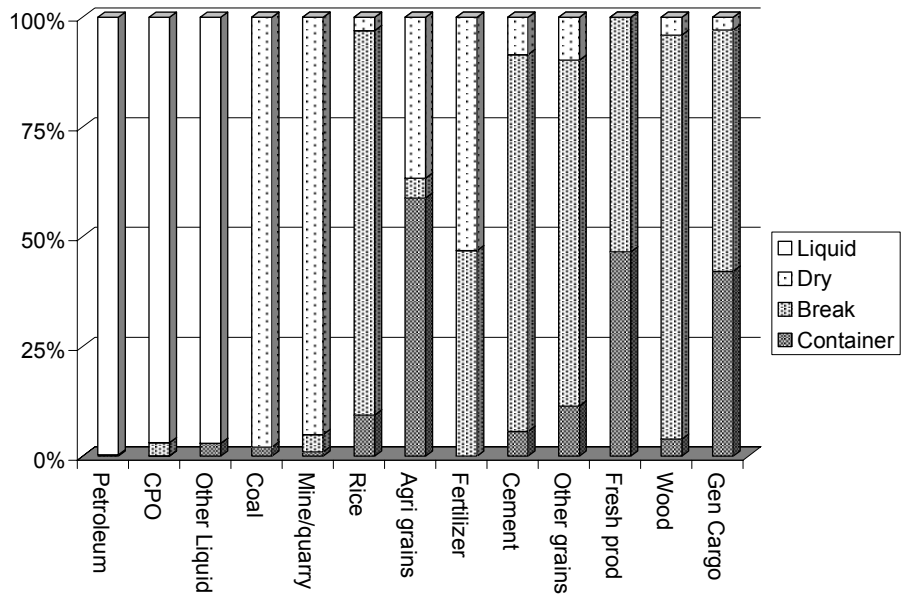
Figure 2.3.9 OD Structure of Domestic Cement Sea Traffic



(b) Packaging Trend of Seaborne Commodities

Petroleum, CPO, and other liquid cargo (e.g. liquid chemicals) are largely carried in liquid bulk form. Coal and other mining/quarrying commodities are predominantly carried dry bulk form. Rice, cement and forestry products are predominantly carried in break bulk form – such as by bags for rice and cement and palletized or by stringing for forestry products. About half of the fertilizer is carried in dry bulk form and the other half by bags. Nearly all of the dry bulk fertilizer comes from Sumatra Selatan and goes to Jawa Tenggah. About 55% of general cargo is in break bulk form and about 40% is containerized.

Figure 2.3.10 Current Trend in Packaging of Seaborne Commodities

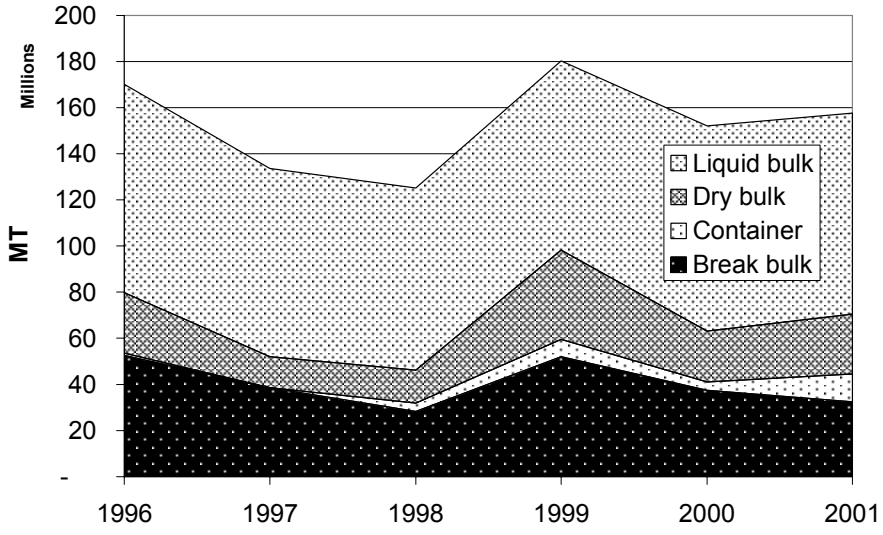


Source: STRAMINDO Survey, Year 2002 values

(2) Domestic Sea Traffic by Package Type

Currently and historically, liquid bulk cargo takes up most (55%) of the domestic sea traffic, followed by break bulk cargo (20.7%) and dry bulk cargo (16.6%). Containerized traffic comprises the least at only 7.6%; however, containerized traffic has been rapidly increasing starting from 1997.

Figure 2.3.11 Trend in Domestic Sea Traffic by Package Type

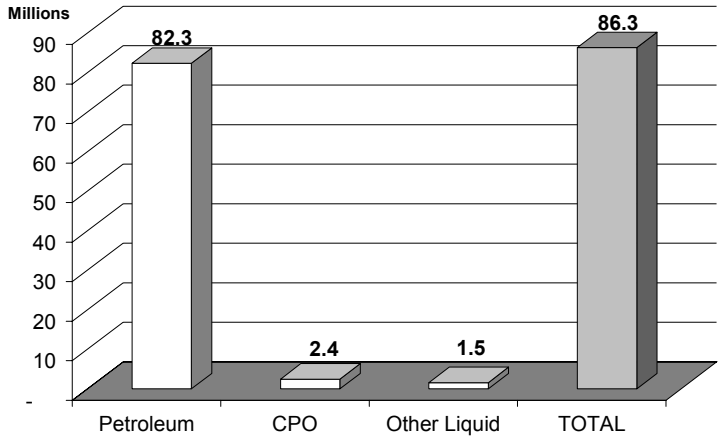


Source: DGSC, 2001

(a) Liquid Bulk Traffic

Liquid bulk traffic is primarily composed of petroleum – accounting for around 82 million MT of the 86 million MT of liquid bulk traffic. Crude Palm Oil and various chemicals make up the rest.

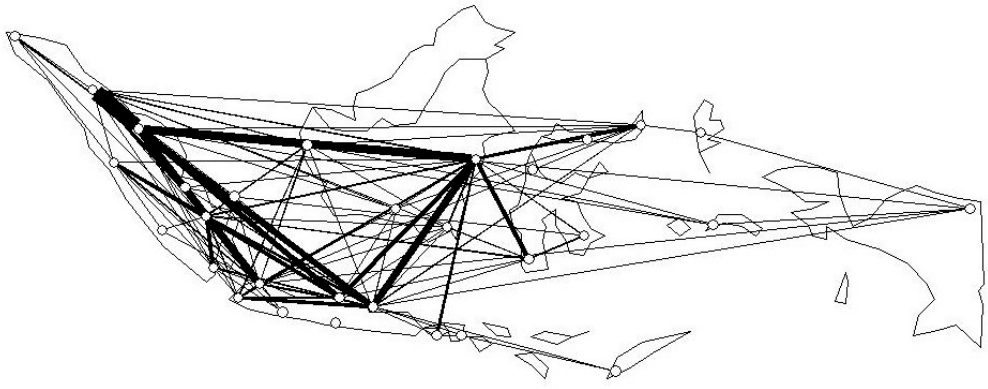
Figure 2.3.12 Composition of Liquid Bulk Traffic (MT)



Source: STRAMINDO Survey, Year 2002 values

As liquid bulk is primarily composed of petroleum it fundamentally follows the same OD structure of petroleum traffic. The general structure of liquid bulk traffic is from Sumatra and Kalimantan to Jawa. There is also very significant coastal traffic within Sumatra as well as Kalimantan. For example about half of the traffic originating from Kalimantan Timur is intra-zonal traffic. In Sumatra, Riau generate much of the liquid bulk traffic at nearly 40 million MT, but about half of the tonnage is either unloaded within Riau or to neighboring Sumatra Utara.

Figure 2.3.13 OD Structure of Liquid Bulk Sea Traffic



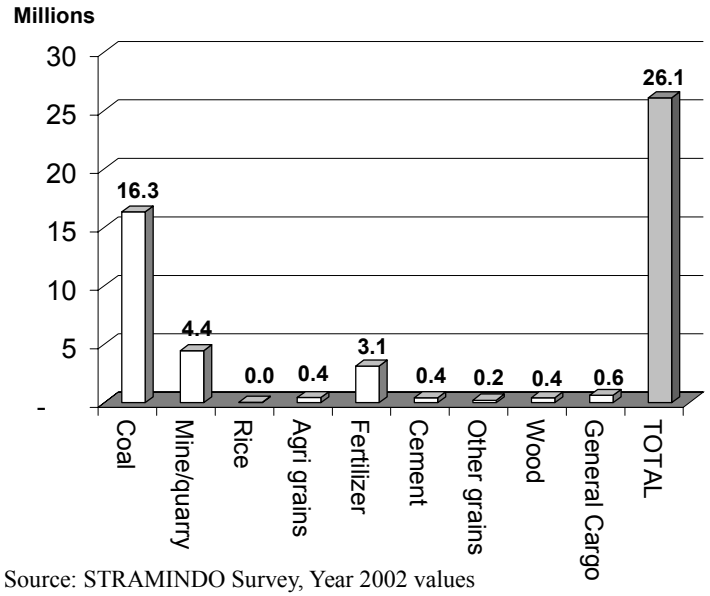
Source: STRAMINDO Survey, Year 2002 values

(b) Dry Bulk Traffic:

Dry bulk traffic is primarily composed of mining and quarrying based commodities. About 62% of the total tonnage is coal and about 17% is other mining and quarrying products. Fertilizer as well comprises a relatively significant share of 12% of total

tonnage. The rest of the dry bulk traffic is composed of various commodities – including cement, general cargo, wood, etc.

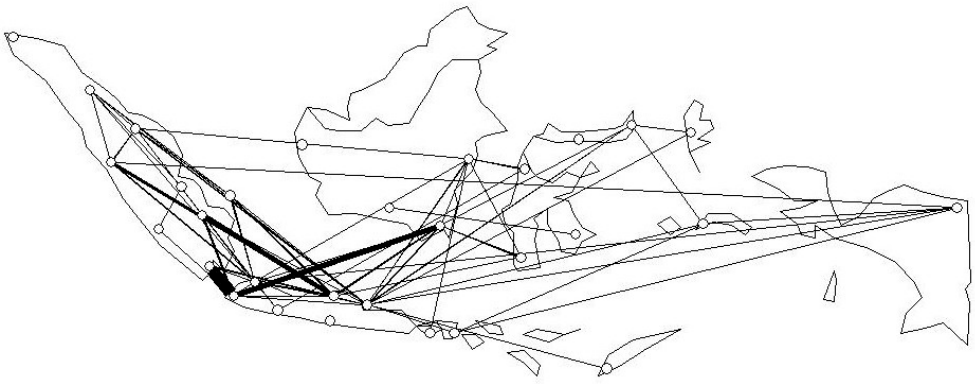
Figure 2.3.14 Composition of Dry Bulk Cargo (MT)



Source: STRAMINDO Survey, Year 2002 values

The general structure of dry bulk traffic is from Sumatra and Kalimantan to Jawa. 27% of the dry bulk traffic is traffic from Lampung to Banten, across the Sunda Channel, a narrow body of water separating Jawa and Sumatra. About 17% of the total traffic is intra-provincial traffic in Riau and Kalimantan Selatan.

Figure 2.3.15 OD Structure of Dry Bulk Sea Traffic

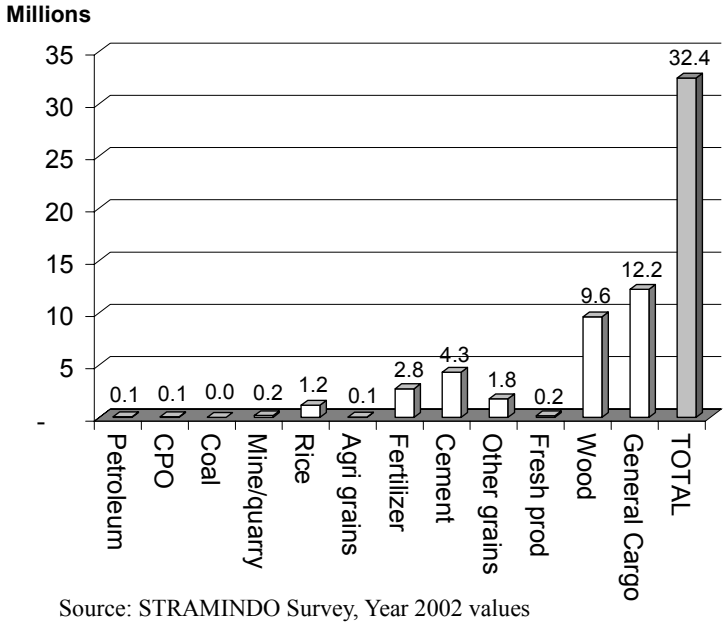


Source: STRAMINDO Survey, Year 2002 values

(c) Break Bulk Cargo:

Nearly 90% of break bulk cargo tonnage is comprised of general cargo (38%), wood (30%), cement (13%) and fertilizer (8%). Various commodities make up the rest of the tonnage.

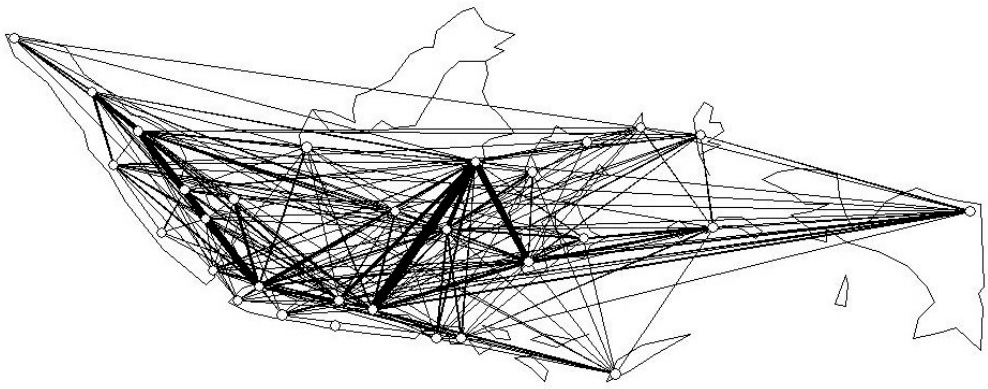
Figure 2.3.16 Composition of Break Bulk Cargo (MT)



Source: STRAMINDO Survey, Year 2002 values

About a 28% or 9.2 million MT of the break bulk traffic is generated from Kalimantan Timur and much of this traffic goes to neighboring islands of Sulawesi and Jawa and a significant portion is coastal traffic. In Sumatra, Riau generates much of the break bulk traffic at nearly 5 million MT, but about 2.8 million MT is intra-provincial traffic. Sumatra Utara and Riau attract most of the traffic, much of it is coastal traffic and Jawa generated traffic. In Java Island, break bulk activity is concentrated at Jakarta, Jawa Tenggah and Jawa Timur. Break bulk activity in Java Island, comes from many parts of the country and with little coastal traffic.

Figure 2.3.17 OD Structure of Break Bulk Sea Traffic



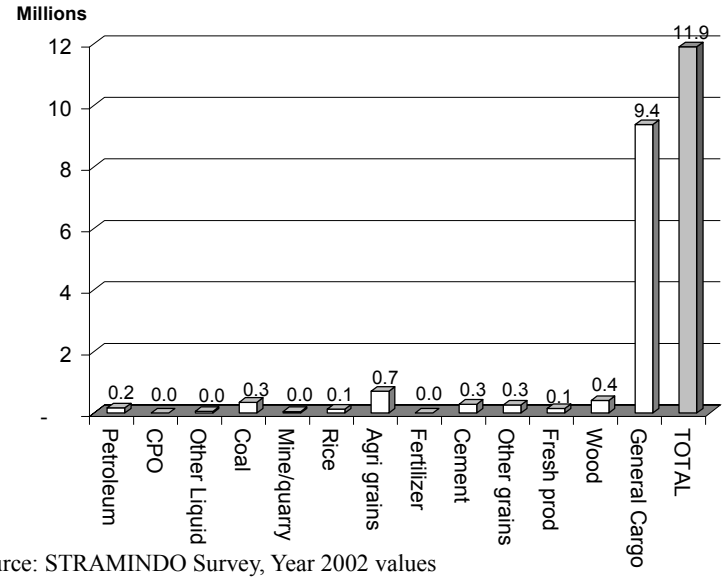
Source: STRAMINDO Survey, Year 2002 values

(d) Containerized Traffic:

Almost all of seaborne commodities have been in some way, transported using containers. However, general cargo takes up much of the tonnage at 79% of total tonnage. The rest of the tonnages are distributed to all other commodity types, with

agricultural grains – having a relatively higher share at around 6% of the total tonnage.

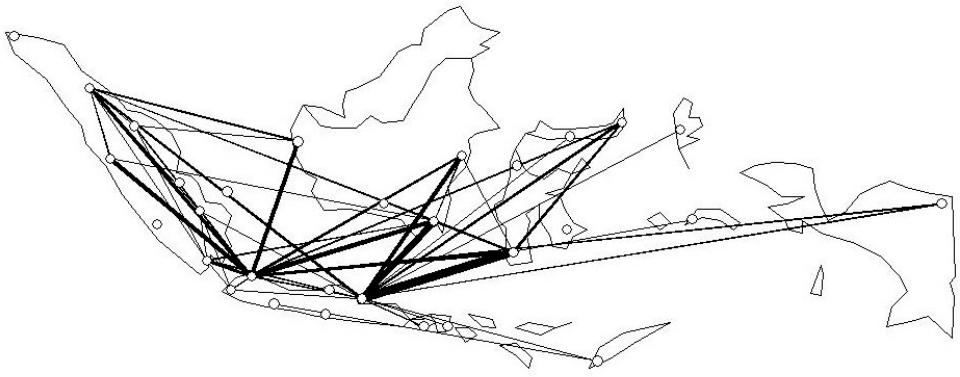
Figure 2.3.18 Composition of Containerized Cargo (MT)



Source: STRAMINDO Survey, Year 2002 values

Much of container activities are centered in Java Island particularly Jakarta and Jawa Timur – with Jakarta being the center of activities in the western side of the country and Jawa Timur being the center at the eastern part of the country. There is very little east-west container traffic.

Figure 2.3.19 OD Structure of Containerized Sea Traffic



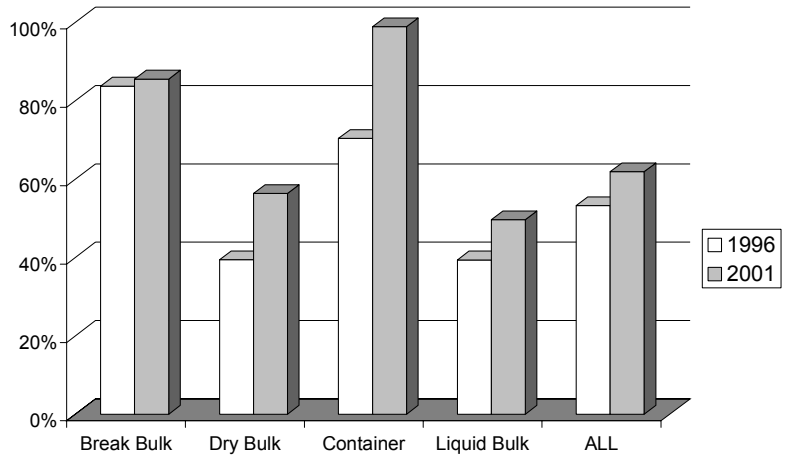
Source: STRAMINDO Survey, Year 2002 values

(3) Domestic Sea Traffic by Flag of Carrier

In 1996, only a little over 50% of the total domestic tonnage is carried by Indonesian flagged vessels. This has improved to 62% in 2001. Much of the improvement has been in containerized tonnage, where previously about 70% of the traffic is carried by Indonesian vessels and currently almost all tonnage is carried by Indonesian flagged vessels. There has been little improvement in break bulk cargo, but break bulk tonnage is already significantly serviced by Indonesian vessels at 84% even in 1996. There has been

some improvement in dry bulk carriage and liquid bulk carriage, but still the share of Indonesian vessels continues to be low and is currently only slightly over the 60% mark.

Figure 2.3.20 Past and Current Share of Indonesian Flag Carriers in Domestic Seaborne Tonnage



Source: DGSC, 1996 and 2001

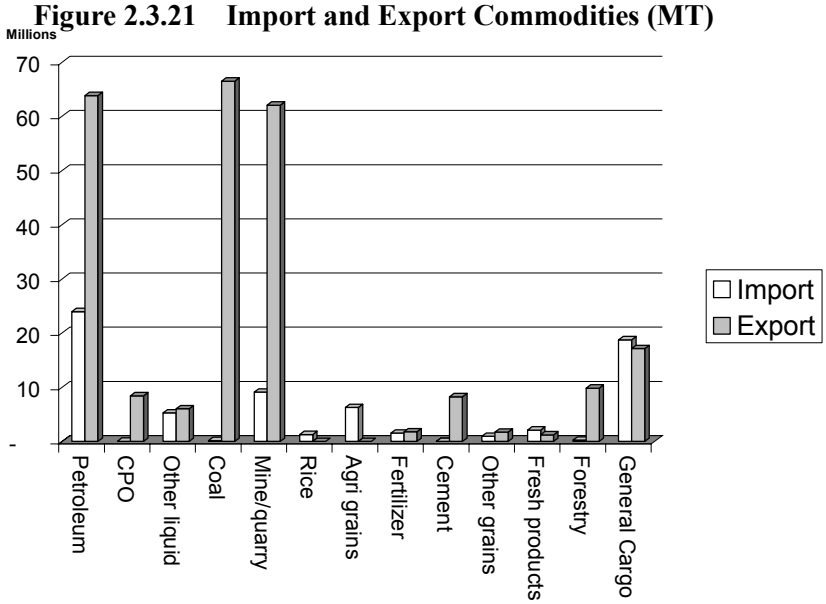
(4) International Sea Traffic

(a) International Trade Overview

In terms of tonnage, Indonesia is a net exporter with exports at around 272 million MT and imports at 65.6 million MT. The largest volume of exports are petroleum, coal and mining and quarrying products (e.g. copper ores) – which combines for 78% share of the total export tonnage. Other key export commodities are CPO, cement, chemicals, forestry products and general cargo. Coal and mining/quarrying exports primarily originate from Kalimantan. General cargo exports primarily originate from Jakarta and Jawa Timur ports. A significant volume also originates from Sumatra Utara, Riau and Kalimantan Timur ports. Much of cement exports are loaded at ports in Java Island. CPO exports come from Sumatra Utara and Riau ports. Forestry exports come from Riau, Kalimantan Selatan and from Kalimantan Timur ports. Petroleum traffic is exported from Kalimantan and Sumatra while imported petroleum goes to Jawa primarily with some traffic going to Kalimantan and Sumatra.

To take advantage of high international prices for its petroleum, Indonesia sells its petroleum in the international market and buys cheaper but lower quality petroleum for domestic use. Thus the primary import commodity of Indonesia is as well petroleum, which accounts for 34% of total imports. General cargo is also a primary import for Indonesia accounting for 27% of the total tonnage. Other key imports include chemicals, mining products, and agricultural grains (e.g. soya beans).

Figure 2.3.21 Import and Export Commodities (MT)

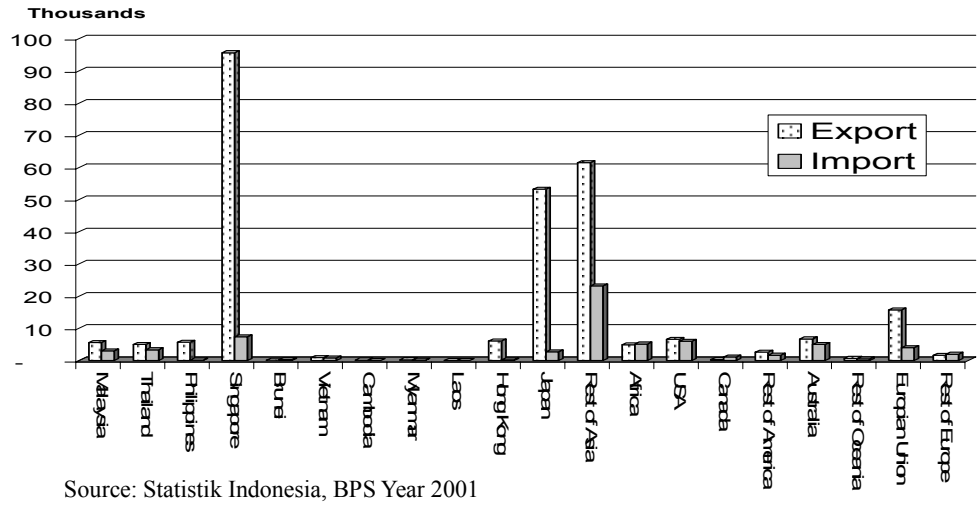


Note: discussions above are based on DGSC data on import and export, Year 2002
Source: Adopted from Indonesia Foreign Trade Statistics, BPS Year 2001

The primary destination of Indonesian exports is Singapore accounting for around 35% of total exports in tonnage. Commodities being exported to Singapore are petroleum, chemicals and general cargo. Japan is the second export destination which covers 20% of export tonnage. Primary exports to Japan include petroleum, coal, other mining and quarrying products and with some smaller but significant volume of forestry products, CPO and general cargo.

Primary importer to Indonesia is Singapore at about 11% of total tonnage and Singapore imports are primarily petroleum products which accounts for 64% of the total tonnage. Saudi Arabia also accounts for a relatively substantial portion (7%) of import tonnage similarly in the form of petroleum. Other primary importers include Japan (machines), USA (oil seeds and pulp and waste paper), South Korea (petroleum and chemicals), China (petroleum and chemicals), Australia (wheat) and Malaysia (petroleum).

Figure 2.3.22 Indonesian Export and Import Activities by Country (1,000 MT)

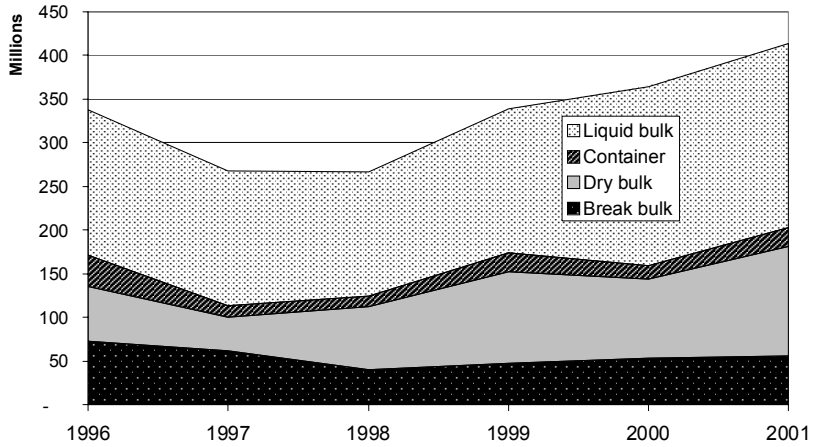


Source: Statistik Indonesia, BPS Year 2001

(b) International Sea Freight Traffic

About half of the international seaborne freight traffic is in liquid bulk form. In 1996 dry bulk traffic comprises about 18% of the total international tonnage, but in 2001 dry bulk traffic has increased to 30% in 2001 – largely due to the sharp increase in coal exportation. The rest of the tonnage is break bulk and container traffic with break bulk traffic about 2.5 times larger container traffic. Both break bulk traffic and container traffic have experienced declines, comparing 1996 to 2001 values, by about 30% and 38% respectively – however, both break bulk and container traffic have started to stabilize and slowly increase as a result of the economy getting on track after the 1997 financial crisis.

Figure 2.3.23 Internal Sea Freight Trend per Package Type (MT)



Source: DGSC 2001

(c) Indonesian International Trade of Petroleum

Saudi Arabia and Singapore are the primary source of imported petroleum – though the volume of Singapore petroleum has drastically declined starting right after the financial crisis of 1997. On the other hand, Saudi Arabian, South Korean and Malaysian petroleum imports have compensated for the decline in Singaporean petroleum imports.

In terms of petroleum exports, Japan is the primary recipient accounting for about a third of the total in terms of crude oil and nearly three quarters of the gas exports. Destinations of refined petroleum products are more diversified with Japan, South Korea and Singapore being the key recipients.

Table 2.3.2 Export of Petroleum Country of Destination (1,000 MT)

(a) Crude Oil

	1997	1998	1999	2000	2001
Japan	13,202	11,758	12,198	10,152	10,511
Singapore	2,992	2,893	2,190	2,090	2,846
PRC	5,983	3,932	4,183	4,483	2,618
Australia	4,968	6,890	5,308	2,691	4,951
USA	2,792	3,221	3,521	1,927	2,170
Korea	5,610	4,937	6,033	5,065	6,922
Others	3,430	3,283	2,471	2,818	2,840
Total	38,977	36,914	35,903	29,226	32,857

(b) Petroleum Products

	1997	1998	1999	2000	2001
Japan	2,633	2,107	1,963	2,163	1,623
South Korea	2,174	1,573	1,995	2,481	1,988
Singapore	1,766	1,047	1,212	1,625	1,299
Taiwan	265	627	464	355	381
Australia	664	114	207	200	190
USA	563	669	272	331	208
Others	2,157	2,300	1,713	1,632	1,321
Total	10,221	8,436	7,826	8,787	7,008

(c) Gas

	1997	1998	1999	2000	2001
Japan	19,825	19,643	19,924	18,570	18,279
South Korea	7,051	7,006	7,595	5,841	3,626
Taiwan	1,824	1,952	2,286	2,644	2,900
Singapore	5	22	-	-	29
Hong Kong	36	13	39	27	4
Others	275	317	223	534	398
Total	29,016	28,954	30,066	27,615	25,236

Source: Statistik Indonesia, BPS Year 2001

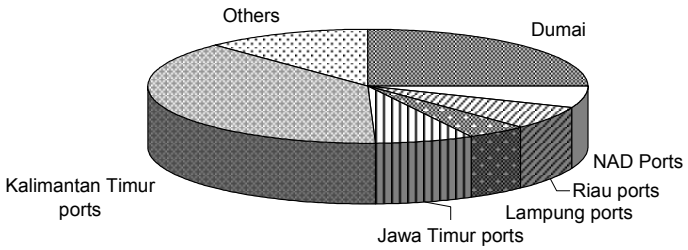
Table 2.3.3 Import of Crude Oil and Petroleum Products by Country of Origin (1,000 MT)

	1997	1998	1999	2000	2001
Japan	50	26	29	74	68
Singapore	7,460	7,760	6,261	7,044	4,877
South Korea	282	1,083	803	966	1,765
Taiwan	51	5	8	18	66
Malaysia	891	2,231	1,605	1,810	1,748
Saudi Arabia	2,386	4,017	5,826	6,596	5,480
Australia	1,338	847	278	78	238
USA	137	66	105	49	69
UK	9	3	1	1	0
Netherlands	33	14	8	8	9
China	1,091	235	655	1,151	1,469
Iraq	238	-	618	128	-
Iran	2,816	1,771	52	330	475
Others	3,778	3,443	7,526	7,205	9,692
Total	**20,560**	**21,500**	**23,773**	**25,456**	**25,956**

Source: Statistik Indonesia, BPS Year 2001

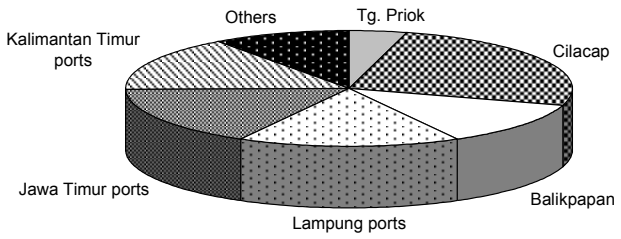
Petroleum for export is primarily loaded in Dumai. The rest are loaded in a number of non-commercial ports Kalimantan Timur, Sumatra and to some extent Jawa. The primary port of importation for petroleum is Cilacap in Java Island. Kalimantan Timur also is a primary gateway for imported oil as well as Lampung in Sumatra and several other ports in Jawa, especially in Jawa Timur.

Figure 2.3.24 Share of Primary Ports in Exportation of Petroleum



Note: 1/Estimated from DGSC Import/Export Database Year 2002
2/{province} ports means all non-commercial in the {province}

Figure 2.3.25 Share of Primary Ports in Importation of Petroleum



Note: 1/Estimated from DGSC Import/Export Database Year 2002
2/{province} ports means all non-commercial in the {province}

(d) Container Traffic between Singapore and Indonesia

Tanjung Priok in the nation's capital, Jakarta, is the primary port of importation and exportation of international container traffic with Singapore – accounting to about half of the total TEU's. Other ports in Java Island especially Tanjung Perak attracts most of the remaining traffic. Ports in the western side of Kalimantan and ports Sumatra also attract significant share of the container traffic. The eastern parts of Indonesia have limited share in the Singaporean container traffic.

Table 2.3.4 Indonesian Ports Activity in Container Traffic between Indonesia and Singapore

Port of Importation	TEU's	%	Port of Exportation	TEU's	%
Belawan	32,692	9.9%	Belawan	36,235	11.5%
Pekanbaru	5,848	1.8%	Pekanbaru	6,330	2.0%
Tg. Balai Karimum	425	0.1%	Teluk Bayur	400	0.1%
Teluk Bayur	150	0.0%	Kuala Tingkal	49	0.0%
Kuala Tingkal	50	0.0%	Talang Dukuh	2,581	0.8%
Palembang	9,682	2.9%	Palembang	11,277	3.6%
Panjang	5,863	1.8%	Panjang	8,565	2.7%
Tg. Priok	145,419	44.1%	Tg. Priok	122,296	38.8%
Banten	16,619	5.0%	Banten	15,360	4.9%
Semarang	39,100	11.9%	Semarang	33,861	10.7%
Surabaya	54,822	16.6%	Surabaya	63,100	20.0%
Pontianak	8,829	2.7%	Pontianak	8,185	2.6%
Banjarmasin	3,197	1.0%	Banjarmasin	1,700	0.5%
Balikpapan	834	0.3%	Balikpapan	428	0.1%
Samarinda	2,527	0.8%	Samarinda	500	0.2%
Jambi ports	1,403	0.4%	Riau ports	310	0.1%
KBB ports	50	0.0%	Sumatra Selatan ports	900	0.3%
Kalimantan Selatan ports	22	0.0%	KBB ports	49	0.0%
Kalimantan Timur ports	290	0.1%	Jawa Barat ports	240	0.1%
NTB ports	494	0.1%	Kalimantan Timur ports	334	0.1%
Papua/Irian Jaya ports	1,551	0.5%	Sulawesi Tengah ports	2,000	0.6%
			Papua/Irian Jaya ports	782	0.2%
TOTAL	329,867	100.0%		315,482	100.0%

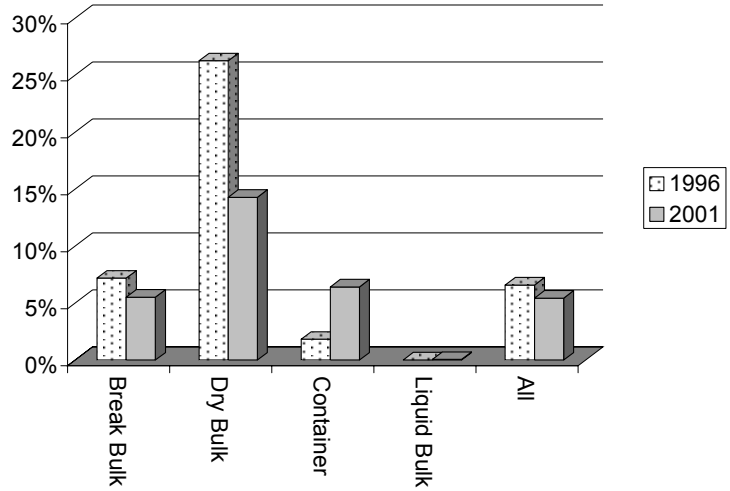
Note: {province} ports means all non-commercial in the {province}
Source: DGSC Export/Import Database Year 2002

(e) International Sea Freight by Flag of Carrier

In 1996, only 7% of the total international sea tonnage was carried by Indonesian flagged vessels. The situation has worsened and that currently only 5% of the total tonnage is carried by the national fleet.

The decline is due to the lack of improvement in break bulk and liquid bulk traffic, compounded by the drop in national carrier tonnage of dry bulk cargo from a share of 26% in 1996 down to 14% in 2001. On a positive note, there was a slight increase of Indonesian vessel's share in container traffic from a share of only 2% in 1996 to 6% in 2001.

Figure 2.3.26 Share of Indonesia Flagged Vessel of International Sea Freight Tonnage



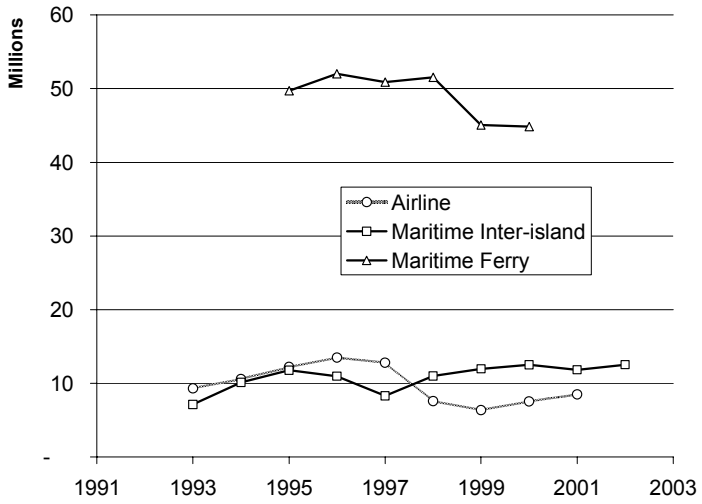
Source: DGSC Year 2001

2.3.3. Domestic Sea Passenger

(1) Trend in Domestic Passenger Traffic

In the early 1990's maritime travel peaked in 1995, after which air travel started to out compete maritime travel, causing maritime travel to decline in 1996 and 1997. The financial crisis in 1997, however, slowed down the economy and people started using maritime travel causing a reverse trend with airline travel. Since then, maritime travel has remained steady at around 12 million trips per year. With the economy recovering, airline travel is again trying to pick-up steam and is poised to again overtake maritime travel. Ferry service, which is quite different from other maritime passenger service, is provided for short-distance water based modes of travel – such as river and straits crossings. Ferry handles approximately 45 million passengers per year.

Figure 2.3.27 Trend in Air and Maritime Travel



Source: DGSC, Statistik Indonesia and P.T. ASDP

(2) Maritime Passenger Profile

(a) Socio-Economic Profile

Inter-island passengers are predominantly male which comprise 67% of the total passenger. The age bracket of between 21 to 30 years old accounts for much of the passengers at 43% while the age bracket of 31 to 40 years and 41 to 50 years comprise 27% and 15% of the total respectively. About half of the passengers are employed as laborers while those with white collar jobs are 28% of the total. The rest are students (11%) and retired or unemployed (13%). 28% of the passengers have monthly income of 500,000 to 1 million Rp; while, 27% have monthly incomes of less than 500,000 Rp. 19% of the passengers fall in the income bracket of 1.1 million to 2 million Rp. Only 8% of the passengers have monthly incomes greater than 2 million Rp.

Table 2.3.5 Socio-Economic Profile of Inter-island Passengers

(a) Gender

Gender	Count	%
Male	744	67%
Female	360	32%
No answer	14	1%
All	1,118	100%

(b) Age

	< 10	11 ~ 20	21 ~ 30	31 ~ 40	41 ~ 50	>50	No Answer	ALL
Count	1	75	484	299	169	89	1	1,118
%	0%	7%	43%	27%	15%	8%	0%	100%

(c) Income

Income (Rp/Month)	Count	%
< 500,000	303	27%
500,000 ~ 1 million	313	28%
1.1 ~ 2 million	213	19%
2.1 ~ 4 million	65	6%
4.1 ~ 7.5 million	13	1%
> 7.5 million	7	1%
No answer	204	18%
ALL	1,118	100%

Source: STRAMINDO Survey Year 2003

(b) Trip Characteristic

Most of the passengers are on personal trips – e.g. visiting relatives and friends – which accounts for near three-quarters of the passengers. Business related trips accounted for 22% while tourist trips are very low at only 5% – even in Denpasar port. Most of the travelers travel very infrequently where most (73%) take a sea trip only once a year. About 60% of the passengers are in a group (average of 4 in a group). About 57% of the passengers carry 1 or 2 pieces of heavy baggage (i.e. heavier than 15 kg or bigger than a sack of rice) and only 9% have no large accompanied baggage and 11% have more than 5 pieces of heavy baggage.

As a mode of access and egress, passenger uses a variety of modes, the most predominant of which is bus and taxi. About half of the embarking passengers originate from and embark in the same city and about a quarter of the disembarking passenger's final destination is in the same city as the port. That means a significant number of passengers are traveling from one city to another as part of their maritime trip.

Table 2.3.6 Trip Characteristic of Inter-island Maritime Travel

(a) Trip Purpose

	Count	%
Tourist	51	5%
Personal	809	72%
Business	248	22%
No Answer	10	1%
ALL	1,118	100%

(b) Frequency of Ship Travel

	< 5X/wk	1~4X/wk	1~3X/mo	6~11X/yr	< 6X/yr	No answer	ALL
Count	1	75	484	299	169	89	1,118
%	0%	7%	43%	27%	15%	8%	100%

(c) Accommodation Class

	1st Class	2nd Class	3rd Class	4th Class and Economy	No answer	ALL
Count	39	56	111	908	4	1,118
%	3%	5%	10%	82%	0%	100%

(d) Mode of Access and Egress

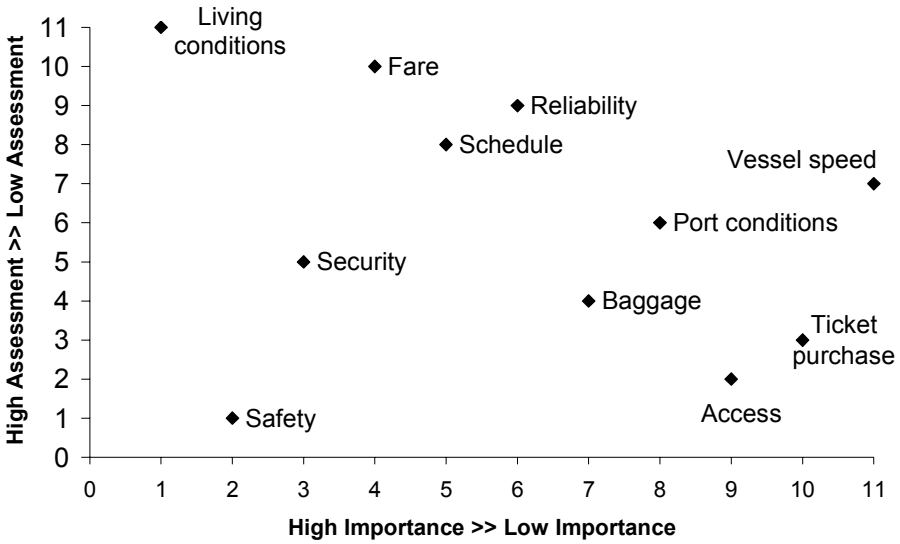
	Access		Egress	
	Count	%	Count	%
Car	130	12%	161	14%
Rail	18	2%	11	1%
Bus	424	38%	412	37%
Taxi	273	24%	294	26%
Others	273	24%	237	21%
No answer	0	0%	3	0%
ALL	1,118	100%	1,118	100%

Note: Others include mini-bus, motorcycle, Non-Motorized Transportation, High Occupancy Taxi and ships
Source: STRAMINDO Survey Year 2003

(c) General User Perception of Current Level-Of-Service

Passengers rate living conditions, safety, security and fare levels as the most important aspects of maritime passenger service. However, fare levels and most especially living conditions aboard the ships are rated poorly by passengers. Passengers therefore are keen on any improvement in ship's living conditions as well as fare levels. Security as well is a major complaint of passengers. On the positive side, maritime passengers rate ship safety highly as well as port accessibility and ticketing services.

Figure 2.3.28 Assessment of Various Aspects of Maritime Passenger Service



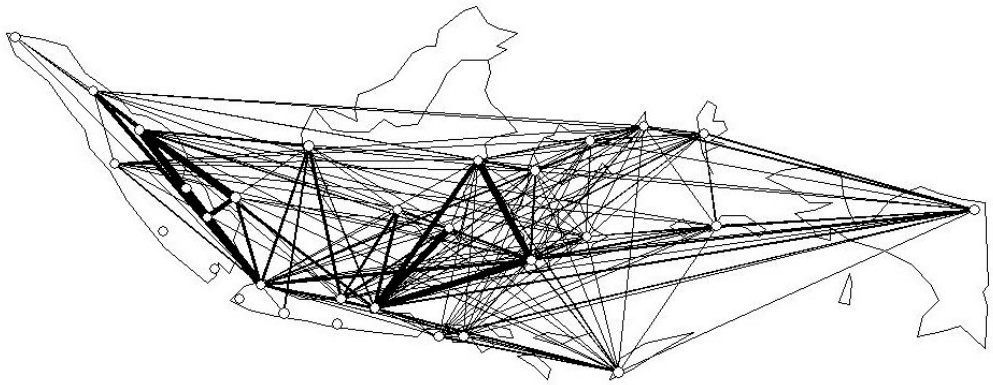
Source: STRAMINDO Survey Year 2003

(3) Desire Lines of Long Distance Inter-city Passenger Traffic

About 27% of the trips are generated from Riau, however, most (73%) of these are intra-provincial trips. About 22% of trips originate from Jakarta and Jawa Timur. Sulawesi Selatan and Kepulauan Bangka Belitung generate nearly 1 million trips, accounting 8% and 7% of total trips respectively. The primary trip destination is Riau (28%) but again most of these trips are intra-regional trips. Jakarta, Sulawesi Selatan, and Jawa Timur each receive more than 1 million trips per year and are the primary destination of inter-regional travel. Kalimantan Timur and Kepulauan Bangka Belitung also receives a lesser but relatively substantial traffic at nearly 800,000 per year each.

Inter-island maritime traffic concentrates on the Riau-Jakarta route in the western side of the country. In the eastern-side of the country, traffic is highest between the eastern provinces of Kalimantan, Sulawesi Selatan and Jawa Timur.

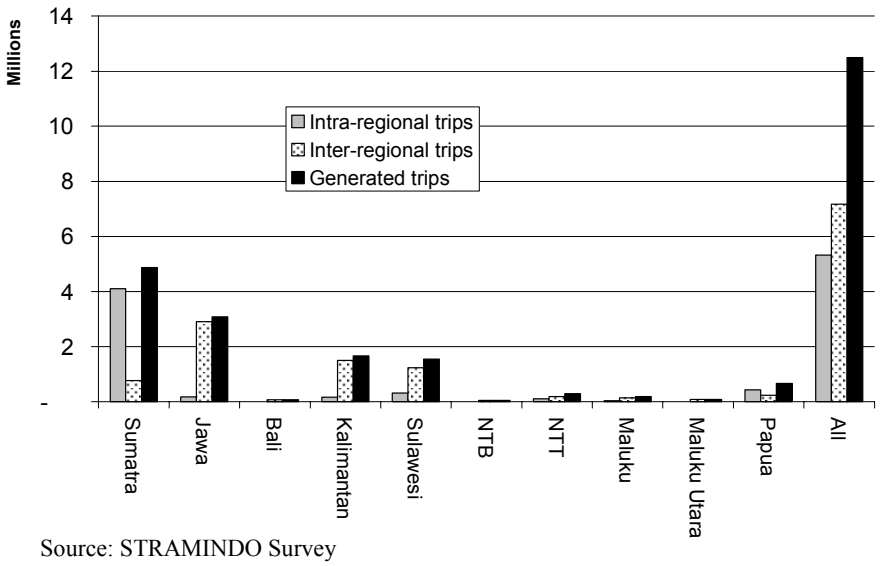
Figure 2.3.29 Inter-island Maritime Sea Passenger OD



Source: STRAMINDO Survey

About 40% of all maritime trips are coastal trips – originating from one region and ending within the same region. However, the trend is not uniform as Jawa, Kalimantan and Sulawesi generated trips are predominantly inter-regional while Sumatra and Papua are predominantly coastal in nature.

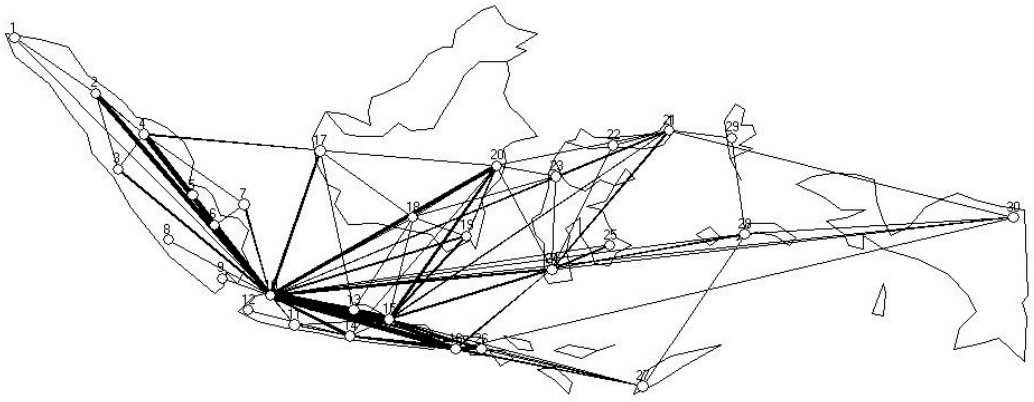
Figure 2.3.30 Inter-regional and Intra-regional Maritime Trips



Source: STRAMINDO Survey

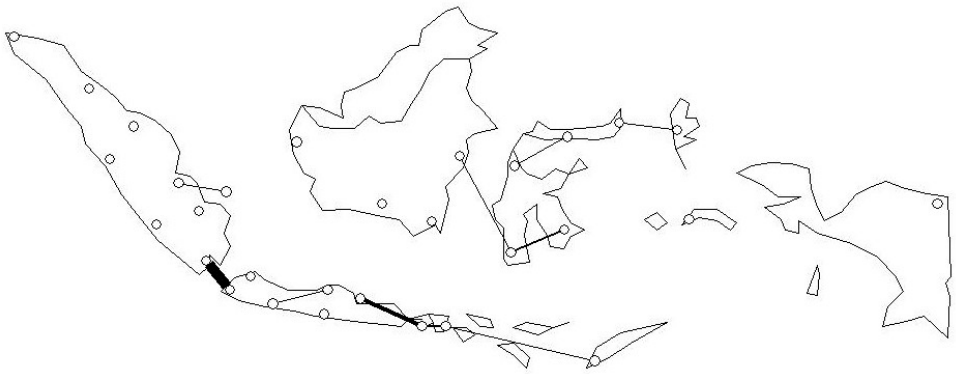
Airline passenger traffic tends to concentrate to Indonesia's largest cities – especially Jakarta which generates and attracts about a third the total traffic. Bali – a popular tourist destination – also accounts for a significant portion of the traffic.
Ferry passenger traffic are primarily intra-provincial. About 40% of the total ferry traffic is within Jawa – most important of which is the Surabaya-Madura link. Traffic between Jawa and Sumatra across the Sunda Channel accounts for 18% of the total ferry traffic. The link between Jawa Timur and Bali is also very important accounting for about 6% of the total ferry traffic.

Figure 2.3.31 Airline Passenger OD



Source: Statistik Indonesia Year 2000

Figure 2.3.32 Ferry Passenger OD

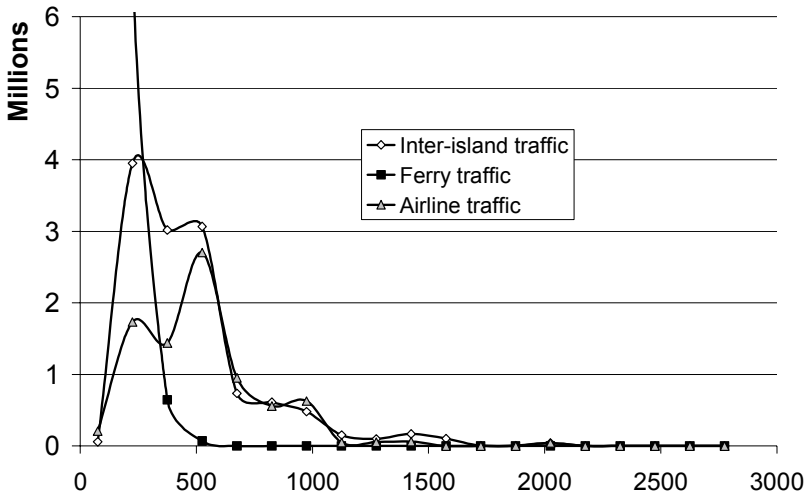


Source: Ferry Development Study, JICA and MOC, Year 1999

(4) Modal Share between Air and Maritime Modes

The share of maritime transport against airline is highest with trips less than 500 NM distance or an equivalent of 1-day travel by ship. For trip distances less than 500 NM, the ratio of maritime passenger to airline passengers is between 2:1to2.3:1. With distances longer than 500 NM, the ratio of maritime passengers to airline passengers is nearly 1:1.

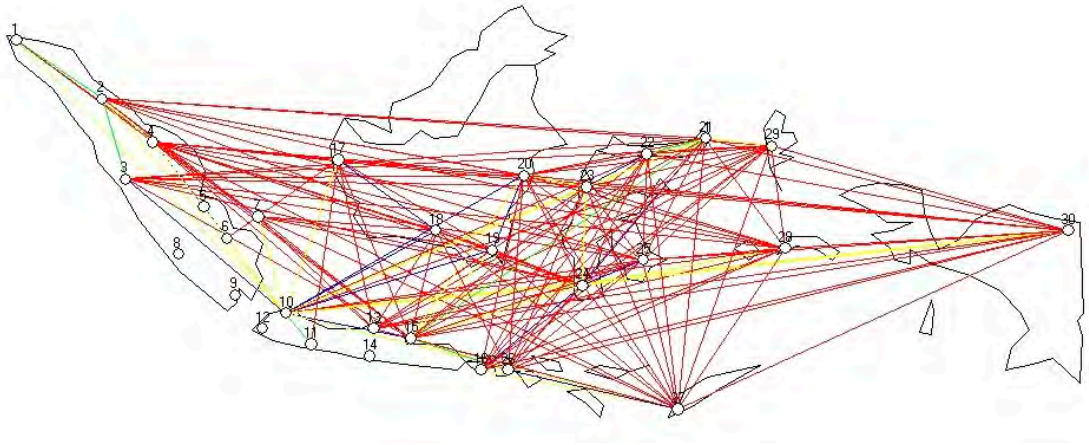
Figure 2.3.33 Distance vs. Passenger Traffic per Key Mode



Source: STRAMINDO Survey, Statistik Indonesia, Ferry Study year 1999

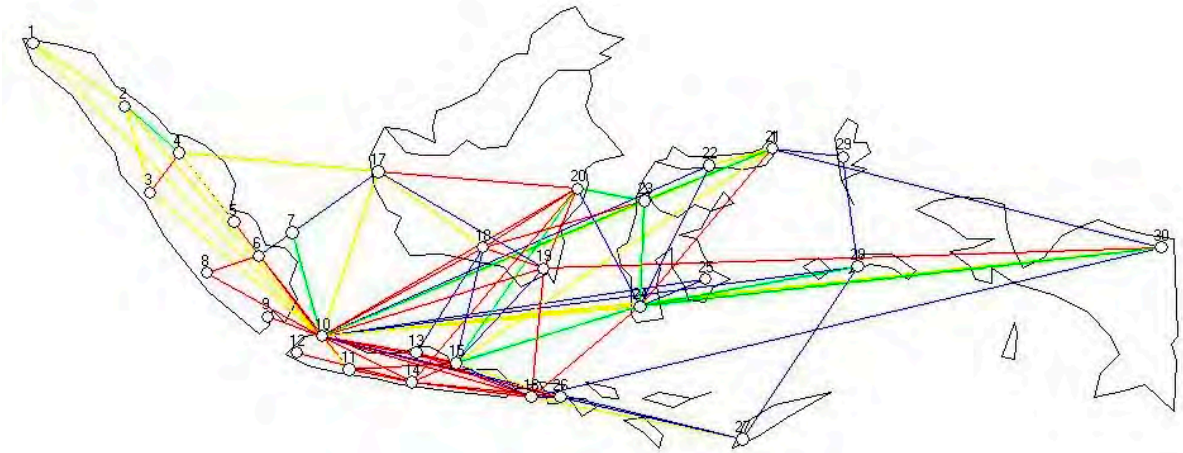
Inter-city intra-Jawa trips are largely air travel vis-à-vis maritime travel. Similarly intra-Sumatra travel is predominantly air travel, but to a lesser extent than Jawa. Trips between Jakarta to Kalimantan are also predominantly by air; however, trips from Jawa Timur and Jawa Tenggah to Kalimantan are predominantly by sea. Trips between Sumatra and Kalimantan are largely by sea as well. The eastern regions of Indonesia including Sulawesi are predominantly served by sea travel.

Figure 2.3.34 Maritime Passenger Share per OD Line



Note: 1/ Blue line (share < 30%); green line (share = 30% ~ 49%); yellow line (share = 50% ~ 79%); red line (share ≥ 80%)
2/ Share = Maritime/(Air + Ferry + Maritime)

Figure 2.3.35 Air Passenger Share per OD Line

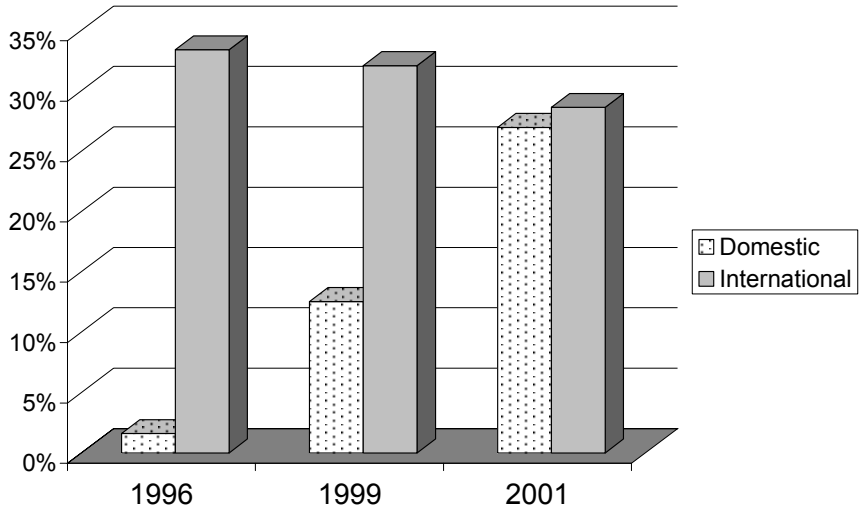


Note: 1/ Blue line (share < 30%); green line (share = 30% ~ 49%); yellow line (share = 50% ~ 79%); red line (share ≥ 80%)
2/ Share = Air/(Air + Ferry + Maritime)

2.3.4. Containerization

Containerization rate is defined in this report as the quotient of containerized tonnage over the sum of containerized tonnage and break bulk tonnage. International traffic has been containerized at an early stage compared to domestic traffic. International cargo containerization is around 25% to 30%. In 1996, domestic traffic containerization is nearly 0% but it has rapidly increased to over 25% at almost the same level as international freight.

Figure 2.3.36 Trend in Containerization



Note: Containerization rate = Container cargo/(containerized cargo + break bulk cargo)
Source: DGSC, 2001

Loading factor is defined as the net weight per TEU of containerized cargo. Loading factor of domestic container traffic is very similar (in average) for loaded and unloaded containers. International traffic however, is different with loading factors higher for loaded containers than unloaded containers (by about half) – due to the imbalance of trade. For domestic containers, there are cases wherein loading factor could be as high as nearly 20MT/TEU such as loaded containers in Panjang – but on the other hand this is typically balanced by a lower loading factor for reverse traffic for example only 5MT/TEU for unloaded containers in Panjang.

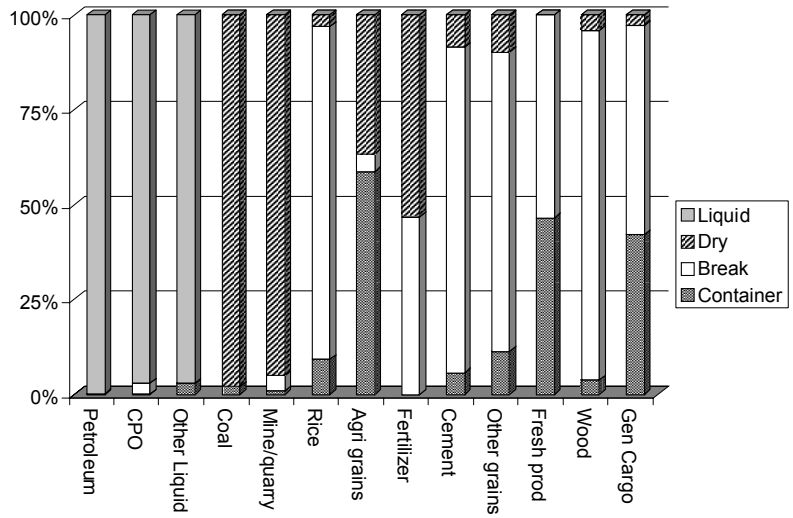
Table 2.3.7 Loading Factor of Containers (MT/TEU)

	Loading	Unloading
Domestic	9.9	10.0
International	10.2	5.3
All	10.0	8.5

Note: Estimated from a sample of about 50% of container tonnage and covering 12 ports
Source: STRAMINDO Survey 2003

Based on the current packaging trend per commodity, there is much room for further containerization. In particular general cargo has a containerization rate of about 30%. There is also much potential for cement, fertilizer and other granular cargo. This however, will depend on the investments in port as well as the nature of traffic structure. It needs to be further clarified if further containerization will result in benefits.

Figure 2.3.37 Current State of Packaging and Potential for Further Containerization



Source: STRAMINDO Survey, Year 2002 values

2.4. Maritime Safety and Marine Environment

2.4.1. Sea Casualty

(1) Relevant Regulation

Shipping Regulation No.51/2002, Part Thirteen: Ships that Experience Accidents (Article 88 & 89)

Each time a ship accident occurs, the captain and/or the ship owner at the first opportunity must report it to the port administration of the nearest port or the nearest representative of the Republic of Indonesia if the accident occurs abroad. Then an inspection must be made by the official designated by the minister and determine matters for improving ship safety, effectiveness of certificates and improvement of further inspections.

Following the result of the inspection referred to Article 88, further inspection can be made by the Maritime Court (Mahkamah Pelayaran) which is carried out for making decision on the causes of the ship accident and to impose administrative sanctions to those responsible.

(2) Accident Statistics

Statistics since 1982 until 2002 are available. However, nature of accidents is not detailed prior to 1997. Therefore, only accidents from 1997 up to 2002 can be analyzed. Based on the data, the primary causes of all accidents are considered to be attributable to human error, force majeure and defective hull structure.

However, The Study for the Maritime Traffic Safety System Development Plan in the Republic of Indonesia carried out under the auspices of JICA and issued in June 2002 stated that DGSC's statistics did not include some accidents reported by local newspapers.

Nevertheless, even with such deficiencies in mind, the DSC statistics is still useful in the analysis of ship safety and is used extensively in this Study.

Table 2.4.1 Maritime Accident Statistics, 1997 - 2002

No	Category	FISCAL YEAR						Total
		1997	1998	1999	2000	2001	2002	
A								
1	Sunken	51	37	42	29	18	26	203
2	Fire	13	10	17	8	7	11	66
3	Collision	20	12	10	5	11	12	70
4	Engine Trouble	1	5	1	1	1	1	10
5	Aground	13	13	19	9	7	11	72
6	Drifting	0	1	0	1	1	0	3
7	Leakage	1	5	3	3	1	1	14
8	Other	7	10	10	12	2	4	45
	Total	106	93	102	68	48	66	483
B	LOOSES							
1	Human Looses	190	150	843	657	58	46	1,944
2	Cargo Looses	24,109.4	2,988	4,037.8	17,023.5	4,646	16,471.7	69,276.4
3	Car Looses	0	15	3	0	0	0	18
4	Animal Looses	0	36	204	560	0	0	800
C	FLAG							
1	Indonesia	110	92	95	59	45	62	463
2	Foreign	21	7	11	10	8	9	66
	Total	131	99	106	69	53	71	529
D	GROSS TONNAGE							
1	100 M3 / < GT 35	23	25	12	10	5	6	81
2	GT 35 Until GT 175	9	9	15	5	3	6	47
3	> 500 M3 / > GT 175	99	66	81	54	44	60	404
	Total	131	100	108	69	52	72	532
E	TYPE OF SHIP							
1	Motor Ship	97	84	81	59	44	59	424
2	Motorized Sail Boat	12	10	16	4	5	6	53
3	Sail Boat	11	5	7	1	1	2	27
4	Barge	11	0	5	5	1	4	26
	Total	131	99	109	69	51	71	530
F	CAUSES							
1	Human Error	42	35	40	26	17	34	194
2	Force Major	55	23	38	28	17	15	176
3	Hull Structure	9	35	24	14	14	16	112
	Total	106	93	102	68	48	65	482

Source: DGSC

(3) Kinds and Causes of Casualty:

The DGSC statistics categorizes the kinds and causes of accidents as follows:

(a) Kind of accident

There are 8 kinds, namely, Sunken, Fire, Collision, Engine Trouble, Aground, Drifting, Leakage and Others.

(b) Causes of accidents

1. Human Error
2. Force Majeure
3. Hull Structure

(4) Rough Sketch of two recent accidents

(a) The most serious accident in 2000

The ferry boat "Cahaya Bahari" carrying 476 passengers and 16 crew members sank at a position about 60 kilometers eastward of Siau Island, North Sulawesi on 29 June 2000 enroute to Manado, North Sulawesi from Halmahera Island, North Maluku.

The accident was caused by over-boarding of passengers, exceeding capacity by about 200%. The ferry boat capsized in rough seas. 10 persons were rescued and the rest were either killed or missing.

The maritime court concluded that the cause of casualty was attributable to human error.

(b) Ferry Tragedy: A news paper article on 27 February 2003

The sinking of an over-loaded ferry off Tanjung Balai Asahan in North Sumatra left 29 passengers killed and 45 passengers missing. The boat caught fire due to cooling system failure followed by high temperature, which caused the fuel tanks of at least three motorcycles in the hold to explode. The boat KM Mutiara Indah was packed with 140 passengers while it is rated to carry a maximum of 60 passengers only.

The accident was the second to occur in the waters off Tanjung Balai Asahan. A similar accident happened in 1978 when the KM Permos ferry capsized, leaving hundreds of passengers dead or missing.

The news paper article concluded that accidents at sea are common throughout the archipelago, where much travel is undertaken by ship. Most accident involves overloaded vessels.

(5) Summary

As for maritime accidents, the reports on the study carried out on the subject in the past pointed out its high frequency and a high number of persons dead or missing as a result. On a positive note, the number of maritime accidents have declined in 2001and 2002, but still human losses were still significant at 58 and 46 persons respectively.

As is shown in the above, the similar accidents have been re-occurring so far. However, it is probably easily preventable if attention is paid to some sustainable and continuous campaign in that respect.

2.4.2. Piracy and Armed Robbery

(1) Relevant International Convention Code

IMO Maritime Safety Committee (MSC) adopted as an amendment to SOLAS '74 the new International Ship and Port Facility Security Code (ISPS Code) which contains measures to strengthen maritime security and prevent and suppress acts of terrorism against ships. The amendments will come into force 1 July 2004.

In addition IMO's 1988 Rome Convention on the suppression of Unlawful Acts against the Safety of Maritime Navigation (SUA Convention), Article 10 of which empowers law enforcement agencies to investigate and prosecute violators where the crime was committed, even if this is in foreign waters

(2) Relevant ASEAN Cooperation

(a) Agreement for the Facilitation of Search of Ships in Distress and Rescue of Survivors of Ship Accidents, Kuala Lumpur, 15 May 1975.

The member countries are Indonesia, Malaysia, Philippines, Singapore and Thailand being members of ASEAN (the Association of Southeast Asian Nations) and IMCO (Inter-Governmental Maritime Consultative Organization). The agreement signed in April 14, 1972 in Singapore enunciated that it is in the interest of the contracting parties to undertake and provide measures of assistance to ships and to permit the owners of the ship or authorities of the State to provide measures of assistance as necessary.

(b) Work Program to Implement the ASEAN Plan of Action to Combat Transnational Crime, Kuala Lumpur, 17 May 2002

The ASEAN Countries established a new work program to Implement the ASEAN Plan of Action to Combat Sea-Piracy and Armed Robbery, which includes information exchange, the feasibility study for developing multilateral legal arrangement, enhancement of programs for anti-piracy coordinated patrols cooperation and coordination and sharing of intelligence, training programs, seeking technical and financial assistance for training and acquisition of effective communication equipment and assets in consideration of Article 43 of the UN

Convention on the Law of the Sea 1982 and for increased patrolling of particular vulnerable sea areas.

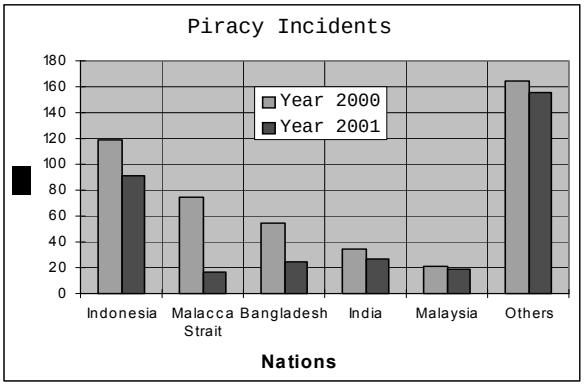
(3) Recent Piracy Incidents

According to IMO "Reports on Acts of Piracy and Armed Robbery against Ships" annual Report 2002, the number of acts of piracy and armed robbery against ships, which were reported to the Organization to have occurred or to have been attempted in 2002, was 383, an increase of 13 (4%) over the figure of 2001.

According to the statistics on piracy and armed robbery incidents in 2000 and 2001, the Indonesian waters are still recorded as the most incident prone area.

Table 2.4.2 Piracy Incident Records

Year	Year 2000	Year 2001
Indonesia	119	91
Malacca Strait	75	17
Bangladesh	55	25
India	35	27
Malaysia	21	19
Others	164	156



Source: International Chamber of Commerce Piracy Report 2001

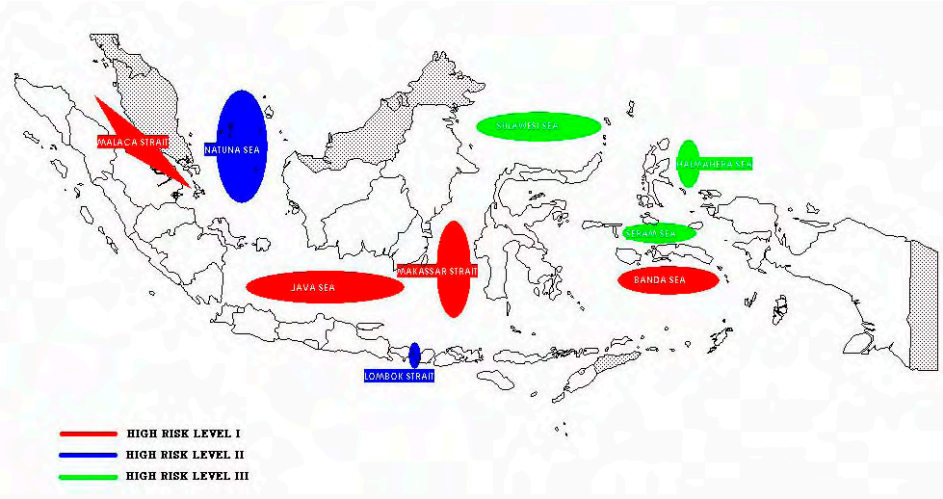
(4) Urgent Preventive Actions

As above-mentioned, IMO has recommended some preventive measures and regional cooperation, particularly ASEAN, has guided coordinated actions. Those matters in relation with Indonesia can be summarized as follows:

- Information collection and exchange among ASEAN countries
- Strict law enforcement with avoiding bureaucratic hindrance within the government
- Training relevant officials for the prevention and suppression of sea piracy
- Introduction of ISPS Code

In response to such rampant piracy activities in and around Indonesia, DGSC has mapped high-risk waters from I to III levels.

Figure 2.4.1 Mapping of High Risk Area in Indonesian Waters



Source: DGSC

2.4.3. Oil Spills (MARPOL/Environment Protection)

(1) Present state of ratification and Regulation issued.

The Government has ratified MARPOL Annex I & II and issued KM.86/1990 particularly prepared for Annex I for non-convention ship, which stipulates the requirements for equipment and construction of ships in respective size and control of discharge from all ships machinery room and oil tanker loading room.

KM.86/1990 stipulates requirements for respective size and kind of ships. They are categorized into two, namely: (1) for ship except tanker with a size of 100/GT/400 and tanker with a size of 100/GT/150; and (2) control of discharge from all ships inside as well as outside Special Areas.

In addition, the Regulation No.51/2002 was issued and requires prevention of pollution in Chapter VIII, which stipulates that:

- people concerned are required to prevent pollution of the environment by oil, hazardous and toxic substances, dirt, trash and hazardous and toxic waste substances from their ship
- the effective time of certificate is five years and such certificate issued by the authorized foreign official is recognized as equivalent
- the certificate is issued by the minister

(2) Present condition of discharge from ships.

Discharge of contaminant materials from ships is strictly prohibited and ships are to be provided with pollution prevention equipment. But proper discharge of oil bilge from small size ships are actually not practiced mainly because the shore reception facilities

are not available even though the aforementioned regulation requires all ship less than 400GT to be provided with equipment for clean oil residue storage on board and disposal.

(3) Summary

Despite the prohibition of improper oil waste discharge from ships, the practice of improper discharge continues to persist. One primary factor is the lack of shore reception facilities.

However for oil tankers, reception facilities are provided at the special terminals at the Port of Tanjung Priok, Tanjung Perak and 6 others.

Considering that improper oil discharge is mainly done by small size ships and the total amount of which is not significantly contaminative with regards to Indonesia's wide territorial waters, the current situation will unfortunately may not be taken so seriously and implementation of environment protection facility will practically be put off for another time in the future.

2.4.4. PSC

(1) Background of Establishment

PSC is the inspection of foreign ships in national ports to verify that the condition of the ship and its equipment comply with the requirements of international regulations and the ship is manned and operated in compliance with these rules.

These inspections were originally intended to be a back up to flag state implementation, but experience has shown that they can be extremely effective, especially if organized on a regional basis. A ship going to a port in one country will normally visit other countries in the region before embarking on its return voyage and it is to everybody's advantage if inspections can be closely coordinated.

This ensures that as many ships as possible are inspected but at the same time prevents ships from being delayed by unnecessary inspections.

IMO has encouraged the establishment of regional port state control organizations and agreements of port state control have been signed covering most of the world's oceans: There are 8 MOU worldwide in total and Tokyo MOU is for Asia and Pacific

Tokyo MOU: Date of signing was on 1 December 1993.
Date of effectiveness is 1 April 1994.

The maritime authorities of 18 countries have reached an understanding, noting the resolutions adopted by the International Maritime Organization (IMO), and especially Resolution A. 682(17) adopted at its 17th Assembly, concerning regional co-operation in the control of ships and discharges, and recognizing the necessity of an improved and harmonized system of port state control and strengthening cooperation and exchange of information.

Each member authority will determine an appropriate annual percentage of individual foreign merchant ships to be inspected, with a target rate of 75% of the total number of ships operating in the region.

The PSC inspection is based on the International Conventions related to Load Line/SOLAS/MARPOL/STCW/COLREG/TMS.

(2) PSC Statistics

Table 2.4.3 Port State Inspection Statistics 2002, Inspections and Detentions per Flag

Flag	No. of Detentions/ Inspections			Average Detention Percentage (%)
	2000	2001	2002	
Indonesia	47/123	47/148	31/144	30.12
Malaysia	46/302	36/419	35/364	10.78
Philippines	22/418	12/423	15/373	4.04
Singapore	34/693	19/763	30/807	3.67
Thailand	21/191	23/222	19/235	9.72
Vietnam	22/79	32/117	19/144	21.47
Total	192/1806	169/2092	149/2067	Regional 8.55%

Source: ASIA-PACIFIC COMPUTERIZED INFORMATION SYSTEM (APCIS)

Table 2.4.4 Port State Inspection Statistics 2002, Carried Out by Authorities

Authority	No. of Inspections	No. of Deficiencies	No. of Detentions	Detention Percentage (%)
Indonesia	985	947	1	0.10
Malaysia	351	834	5	1.42
Philippines	443	2,071	19	4.29
Singapore	1,221	6,897	66	5.41
Thailand	11	0	0	0
Vietnam	174	1,000	18	10.34
Total	3,185	11,749	109	Regional 6.67%

Source: ASIA-PACIFIC COMPUTERIZED INFORMATION SYSTEM (APCIS)

PSC is a process to check and verify deficiencies of a ship and is conducted by flag states and port states through Paris/Tokyo MOU.

According to the Tokyo MOU Annual Report, detention rate of Indonesian flag ships was the highest among all flags.

On the other hand, PSC carried out in Indonesian ports detained only 1 ship out of 985 ships inspected, with a detention rate of only 0.1%, which is too low in comparison with the average rate of 6.67% of ASEAN member countries.

(3) PSC Officers

PSC Officers are deployed throughout the archipelago after having completed IMO Model course for PSC. This implies that PSC Officers are competent to undertake PSC inspection.

There are 132 Ports countrywide where PSC Officers are deployed.

- About 20% of them have taken training courses required by Tokyo MOU at Yokohama
- Expert missions from Tokyo MOU came to conduct training for Indonesian officials 8 times and 40 officials participated each time
- The minister requires PSC Officers to be holders of either of C/E or C/O license

(4) Summary

The Administration has instructed the Port Offices to ensure that a ship before its departure from the nation's ports to foreign ports is complying with the requirements of International Convention Codes. However, the detention rate of Indonesian flag ships in foreign ports' PSC still remains high which may be attributed to the lax application of Convention requirements or reluctance of detention.

As a countermeasure, more intensive and extensive training course to be able to achieve required performances needs to be considered. Moreover, causes of the low performance of PSC system needs to be clearly identified and properly addressed.

Chapter 3

OVERVIEW OF MARITIME TRANSPORT SYSTEM IN INDONESIA

3. OVERVIEW OF MARITIME TRANSPORT SYSTEM IN INDONESIA

This chapter aims to review the multi-faceted maritime transport system from various aspects such as fleet, human resources and aggregate economic forms, i.e. shipping companies, maritime infrastructure and ship operations. Each of these aspects affects the others and this interactive relationship determines the degree of competitiveness and sustainability of the whole maritime transport system in Indonesia.

The Study employs the Directorate General of Sea Communications' (DGSC) database. Although it is objective, comprehensive, and adequate to outline the maritime transport system, it is not sufficient in assessing system performance and in identifying necessary development needs. Therefore, the Study used the following information sources in addition to the DGSC's benchmark data:

- BKI and Lloyd's Register of Shipping: BKI is the national ship classification society while Lloyd's is the most reliable worldwide fleet directory. Both the directories enable comparative analysis by ship type as well as historical analysis. The weaknesses include limited coverage of Indonesian flagged vessels and no segregation of overseas shipping vessels from domestic ones.
- STRAMINDO Shipping Company Interview Survey: The interview survey was conducted to obtain up-to-date information on the profile, activities, cargo types, and operating and management status of shipping companies. 167 shipping companies were selected as survey respondents with assistance from the DGSC and the Indonesian National Ship-owners Association (INSA). Although the survey successfully interviewed 80 respondents only, accounting for 9% of INSA members (914 companies in 2002), they cover all shipping services such as bulk, container, general cargo, tanker, and passenger.
- STRAMINDO Port Reconnaissance Survey: The STRAMINDO Team Members conducted a supplementary survey of 14 ports to study port facilities and operating conditions before they visited the ports for the on-board ship survey. Particular attention was given to the worst congested port, Tanjung Priok, to analyze causes of long waiting time for ships at anchorage.
- STRAMINDO On-board Ship Survey: The survey was conducted to investigate actual ship operational conditions. The STRAMINDO Team Members conducted on-board surveys of 48 vessels, including direct interviews with captains and engine officers on ship operations and safety, as well as inspections at bridge, hull space, and engine rooms.

3.1. Fleet

3.1.1. Registered National Tonnage

There are two depository organizations for registered Indonesian flagged vessels. These are the DGSC and the Pt Biro Klasifikasi Indonesia (BKI). A ship over 7 GT must be registered with the DGSC or its local Adpel (Administratur Pelabuhan) or Kanpel (Kantor Pelabuhan) offices (approx. 70 in total) after tonnage measurement. Government Regulation No. 51/2002 stipulates that a vessel over 100 GT, or over 20 m long, must be registered with the BKI or its offices (8 in total).

(1) DGSC Registry

According to the Directorate of Shipping and Seafarers, DGSC, the combined Indonesian national fleet consists of 22,382 units or 9.24 million GT. The total fleet can be divided into:

• cargo vessels	9,319	units	or	4,217,020	GT
• tanker	491	units	or	1,129,068	GT
• tug boats	2,912	units	or	267,934	GT
• barges	3,892	units	or	2,187,878	GT
• motorized sailing vessels	3,478	units	or	375,396	GT
• others	2,290	units	or	1,048,911	GT

The DGSC registry was entirely renewed in 1992. Thus, it is understandable that the registry encompasses the vessels which were operational in 1992 and the vessels which have been newly registered since its resumption. Regrettably, the DGSC registry is not public in either hard copy or electronic form. Therefore, it is not suitable for fleet analysis and projection works.

(2) BKI Registry

As of December 2002, 7,167 vessels are registered in BKI including non-propelled barges. Total tonnage amounted to 7 millions GRT including 112 foreign flagged vessels. Logically, DGSC's data, which contained smaller ships than ones registered in BKI, should have a large number of fleets. Therefore, no discrepancy was found between the two fleet databases.

Table 3.1.1 BKI Registered Fleet Database, December 2002

Ship Type		No. of Total Vessels	GT	Average GT
1. General Cargo	General Cargo	1,052	1,884,834	1,792
	Landing Craft	259	82,350	318
	Self Propelled Barge	23	8,283	360
	Other General Cargo	5	7,029	1,406
2. Container	Container	70	420,343	6,005
3. Ro-Ro	Ferry	264	263,021	996
	Other Ro-Ro	22	86,488	3,931
4. Bulk Carrier	Bulk Carrier	27	398,918	14,775
	Other Bulk Carrier	12	37,809	3,151
5. Tanker	Oil Tanker	330	1,148,425	3,480
	Chemical Tanker	20	25,836	1,292
	Vegetable Tanker	11	17,239	1,567
	Other Tanker	25	41,226	1,649
6. Barge	Pontoon	1,350	1,199,965	889
	Barge	439	174,272	397
	Oil Barge	409	192,598	471
	Hopper Barge	67	26,502	396
	Work Barge	50	55,351	1,107
	CPO Barge	43	47,100	1,095
	Water Barge	33	7,825	237
	Crane Barge	25	38,874	1,555
	Glue Barge	13	3,929	302
	Other Barge	23	110,174	4,790
7. Passenger	Passenger	41	284,005	6,927
	Other Passenger	5	27,827	5,565
8. Others	Tug Boat	1,448	175,058	121
	Fishing Vessel	381	92,334	242
	Crew Boat	268	8,434	31
	Supply Vessel	87	50,747	583
	Pilot Boat	58	2,439	42
	Mooring Boat	39	1,605	41
	Sea Truck	35	532	15
	Dredger Barge	29	11,269	389
	Fire Fighting Ship	29	1,768	61
	Dredger	22	67,199	3,054
	Research Vessel	18	9,132	507
	Utility Vessel	15	4,227	282
	Inspection Vessel	13	999	77
	Navigation Ship	12	6,282	524
	Accommodation Barge	11	10,068	915
	Work Boat	11	1,560	142
	Others	73	51,414	704
Grand Total		**7,167**	**7,085,286**	**989**

3.1.2. Actual Fleet Volume on Indonesian Waters

The national tonnage cannot meet all domestic shipping demands. Therefore, more or less two fifths of the domestic cargo is transported by foreign flags. In Indonesia's international shipping market, the national tonnage plays a marginal role of only 5%. This section examines the actual fleet volume plying and tramping on Indonesian waters.

(1) Domestic Shipping

The Indonesian domestic shipping industry has always suffered from fleet shortage. But its dependence on foreign fleet varies from time to time. In 1986 after the scrapping policy, the foreign fleet share was 8.4% or 0.8 million tons, while the share jumped to 18.4% or 2.8 million tons in 1990 after the implementation of Pak Nov 21/88. In the 1990s, Indonesia recorded high dependency rates.

The share of Indonesian vessels differed by shipping type. During 1998-2001, container and general cargo vessels took a dominant role in Indonesian shipping. These shipping services have common characteristics. They deal with numerous shippers even with small consignments; thus, they are mostly scheduled liner operators. Since liner operators exploit new routes and ply them for a certain period, they need to have medium- to long-range business plans, which may require them to choose Indonesian vessels over chartered vessels which usually have costly, long-term charter arrangements. On the other hand, Indonesian and foreign vessels contend for market shares in dry bulk and liquid bulk shipping where some shippers have superior advantages over other shipping companies in choosing vessels for long-term contracts.

Table 3.1.2 Shares of Indonesian Flagged Vessels in Domestic Cargo Transportation

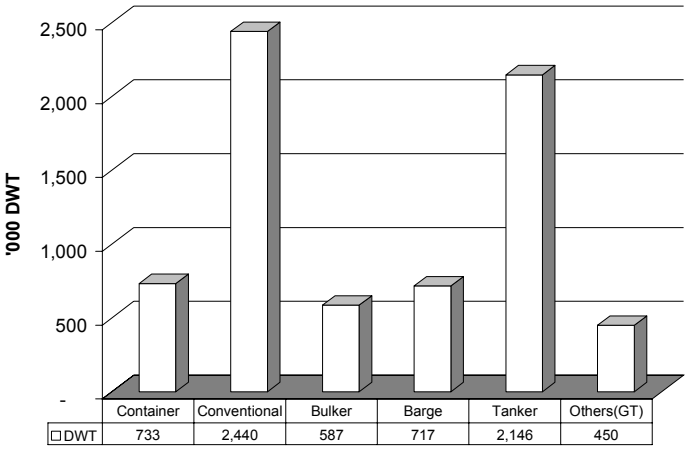
	1998	1999	2000	2001
Cargo Transported by Indonesian Vessels *	58,719	90,986	80,630	89,638
Cargo Transported by Foreign Vessels *	66,455	89,244	71,470	59,991
Share of Indonesian Vessels				
Cargo Total	47%	50%	53%	60%
General Cargo	80%	87%	84%	86%
Container	83%	99%	97%	99%
Dry Bulk	64%	31%	54%	56%
Liquid Bulk	30%	32%	38%	50%

Source: DGSC
Note: * '000, combined amounts of ton and m3

The operational fleet is determined from DGSC sources with corresponding adjustments.[1] The current fleet is estimated to be 6,653 thousand DWT for freight fleet and 450 thousand GT for passenger fleet. In terms of ship type, the domestic fleet is comprised of mainly conventional vessels and tankers. In regard to vessel flag, 3,576 thousand DWT is registered with Indonesian flags while 3,047 thousand DWT are registered as non-Indonesian flags. All passenger ships fly an Indonesian flag.

[1] Refer to Technical Report 1 for detailed adjustment procedure.

Figure 3.1.1 Composition of Domestic Fleet



Source: Estimated by STRAMINDO

(2) Foreign Shipping to/from Indonesia

In foreign trade in 2001, Indonesian flagged vessels carried 22.5 million tons to and from Indonesian ports. The amount accounted for 5.4% of the country's trade volume. There is no supporting data available from the DGSC to delineate the foreign shipping fleet from the domestic fleet, particularly in specifying the magnitude of the Indonesian fleet that is engaged in foreign trade.

In estimating Indonesian vessels involved in foreign trade, flagged-out vessels must be counted. Registration confers "nationality" on a ship which gives the ship the right to fly the flag of the country where it is registered. Shipowners may register their ships under open registries when their ships, engaged in overseas shipping services, face stiff competition. Therefore, the actual controlled fleet of a country combines both flagged and flagged-out ships. The country of domicile must be based on where the controlling interest of the fleet is located in terms of the parent country.

In the case of Indonesia, as of January 2001 the UNCTAD Secretariat reported that 98 vessels, or 1,253,390 DWT, were considered as flagged-outs. The flag-out rates, 16.6% in number and 28.7% in tonnage, are not so high compared with neighboring countries (Refer to Table 3.1.6).

Figure 3.1.2 Foreign Cargo Transported by Indonesian Flag and Foreign Flags

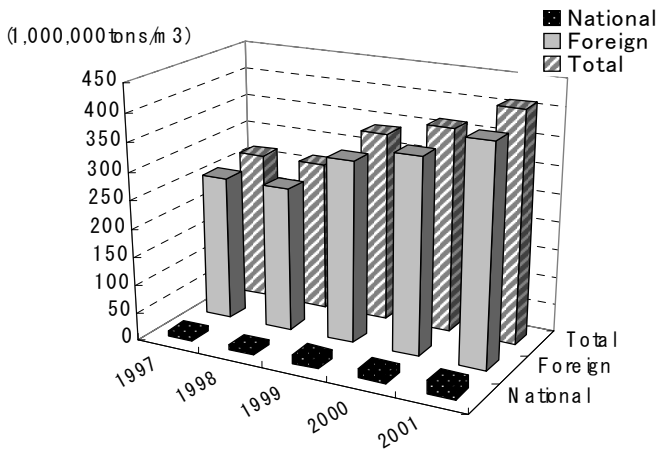
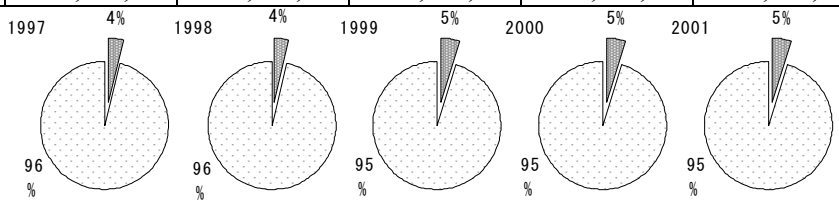


Table 3.1.3 Foreign Cargo Transported by Indonesian Flag and Foreign Flags

(unit: Mil.Ton)

Description	Year				
	1997	1998	1999	2000	2001
National	10,283,183	9,381,171	16,236,366	16,835,613	22,479,534
Foreign	256,795,489	257,405,305	322,532,608	347,695,325	390,024,503
Total	267,078,672	266,786,476	338,768,974	364,530,938	412,504,037



Source: DGSC data

Table 3.1.4 Countries' Fleet Tonnage Registered with National and Foreign Flags, 2001

Country of Domicile	No. of Vessels			Dead Weight Tonnage ('000)		
	National Flag	Foreign Flag	Flag-out Rate (%)	National Flag	Foreign Flag	Flag-out Rate (%)
Indonesia	494	98	16.6	3,110	1,253	28.7
Malaysia	240	55	18.6	5,405	1,074	16.6
Myanmar	1	25	96.2	1	161	99.5
Philippines	328	27	7.6	4,290	607	12.4
Singapore	476	280	37.0	12,842	7,789	37.8
Thailand	218	49	18.4	2,066	478	18.8
Vietnam	143	5	3.4	1,121	66	5.5
Australia	56	36	39.1	1,726	1,551	47.3
China	1,617	599	27.0	22,340	18,392	45.2
Japan	781	2,150	73.3	15,224	83,509	84.6
Korea	473	430	47.6	7,605	18,059	70.4

Source: Review of Maritime Transport 2001by UNCTAD, Myanmar Five Star Line
Vietnam Ship-owners' Association

Note: The country of domicile indicates where the controlling interest of the fleet is located.
Vessels of 1,000 GRT and over

3.1.3. Indonesian Fleet Analysis

(1) Purpose

The purpose of this fleet analysis was to find out, analyze, and assess present and past conditions of Indonesian flagged ships, based on the Lloyd's Register of Ships.

The historical trend of fleet condition in the past 12 years (1990-2002) was analyzed according to number, type, age, size, and shipbuilding country.

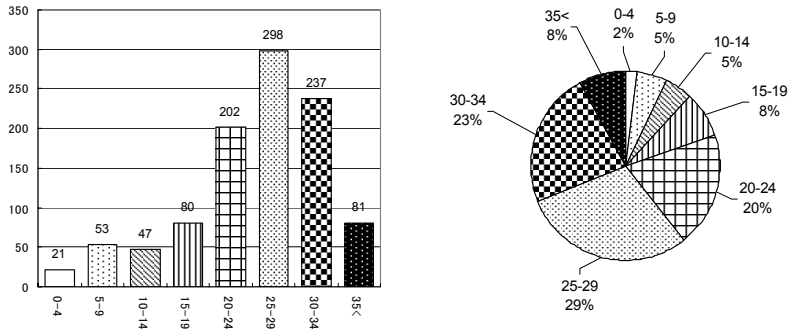
(2) Existing Fleet

Total Indonesian-registered ships in the Lloyd's Register of Ships in 2002 reached 1,019 which was divided into passenger ships (125), general cargo ships (641), bulk carriers (16), and liquid and petroleum ships (237). Their current features are as follows:

- On the whole, there were 1,019 Indonesian registered ships in 2002, and the average age of vessels was 25 years old.
- The average age of passenger liners was 20 years old, younger than general cargo ships for the past five (5) years.
- The average DWT of general cargo ships, bulkers, and tankers was 4,531 DWT and their average GT was 2,988 GT.
- As for the number of ships by category, the largest was general cargo; the second liquid cargo; the third, passenger. The number of general cargo ships totaled 641 (75% out of the total except passenger ships); oil product tankers, 237; and bulk carriers, 16.
- As for the number of total DWT, the largest was general cargo ships with 2,170,345 tons (53% out of the total except passenger ships). On the other hand, average DWT of bulk carriers was the largest.

This means that general cargo ships provide shipping freight services through medium-size vessels, and bulk carriers offer mass transportation through large vessels.

Figure 3.1.3 Number of Indonesian-flagged Ships by Age



Source: Register of Ships 2002, Lloyd's Register

Table 3.1.5 Summary of Indonesian-flagged Ships by Ship Type

Category	Ship Type	No. of Ships	Total DWT	Ave. DWT	Ave. Age	Ave. GT
Passenger	Passenger	69	61,693	894	17	3,759
	Passenger / Ro-Ro	43	29,240	680	24	1,949
	Passenger / General Cargo	13	12,233	941	28	978
General Cargo	General Cargo	600	1,930,452	3,217	26	2,205
	Container	25	187,827	7,513	16	5,755
	Refrigerated Cargo	4	6,126	1,532	20	922
	Ro-Ro	12	45,940	3,828	31	4,244
Bulk Carrier	Bulk Carrier	10	413,037	41,304	24	23,741
	Bulk Cement Carrier	6	36,252	6,042	31	3,942
Liquid, Petroleum Ship	Chemical/Oil Products Tanker	4	22,478	5,620	21	3,350
	Chemical Tanker	20	31,005	1,550	24	905
	Crude Oil Tanker	12	413,099	34,425	24	20,580
	LPG Tanker	2	8,699	4,350	20	4,264
	Oil Products Tanker	199	956,533	4,807	26	3,028
Total		1,019	4,154,614	4,077	25	2,971

Source: Register of Ships 2002, Lloyd's Register

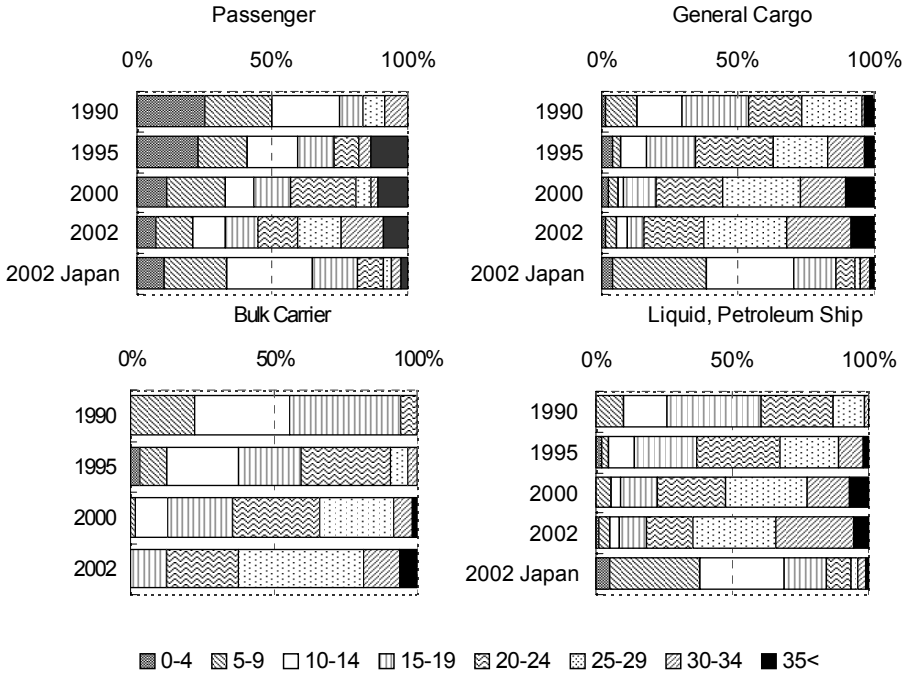
(3) Historical Fleet Analysis

According to the 2002 data on ship age, almost all Indonesian ships, especially bulk carriers and liquid/petroleum and general cargo ships, were more than 20 years old and about 70% of them were more than 25 years old. Ship average age became higher every year for the past 12 years due to the procurement of second-hand ships without new ship acquisitions and no ship breaking.

On ship size, increasing ship capacity was a common trend among various ship types:

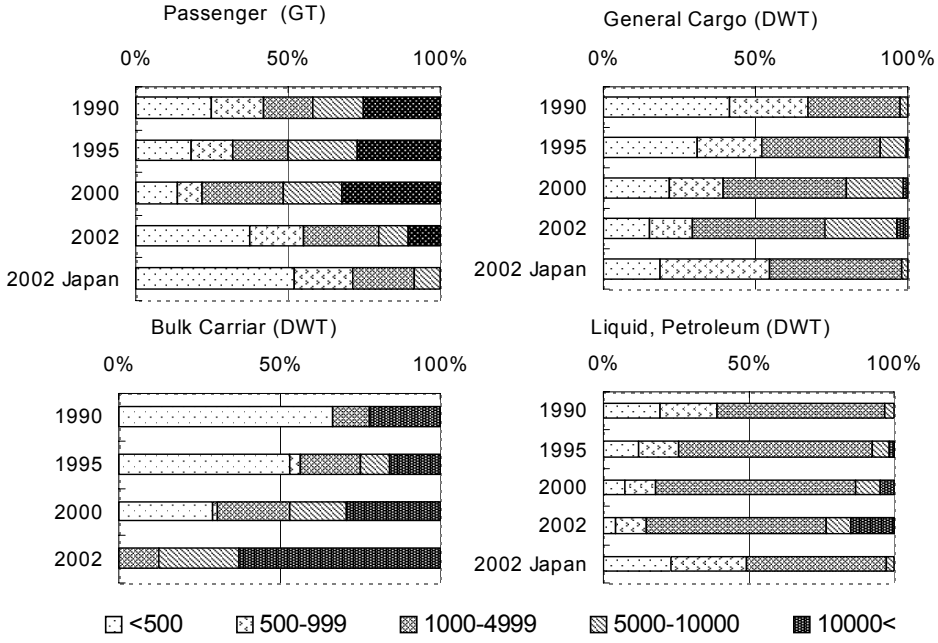
- Passenger ships' capacity increased from 1990 to 2000. However, in 2002, the proportion of ships with less than 500 GT increased, while those with more than 10,000 GT decreased.
- In 2002, the proportion of general cargo ships with less than 1,000 DWT decreased by 56%, and those with more than 5,000 DWT increased 10 times, compared with that in 1990.
- In 2002, the proportion of bulk carriers with less than 500 DWT decreased by 58% compared with that in 1990. Bulk carriers with 1,000-4,999 DWT increased twice compared with those in 1990. Although ships with 5,000-10,000 DWT were not seen in 1990, they accounted for 9% of the total number of ships in 1995, 17% in 2000, and 25% in 2002.
- Although the proportion of liquid/petroleum tankers with less than 1,000 DWT occupied 39% in 1990, it decreased to 14% in 2000. In 1990, there were no ships with more than 10,000 DWT, but they shared 1.8% of the total in 1995 and 14% in 2002.

Figure 3.1.4 Changes in Ship Age by Ship Type, 1990-2002



Source: Register of Ships 1990, 1995, 2000, 2002, Lloyd's Register

Figure 3.1.5 Changes in Ship Size by Ship Type, 1990-2002

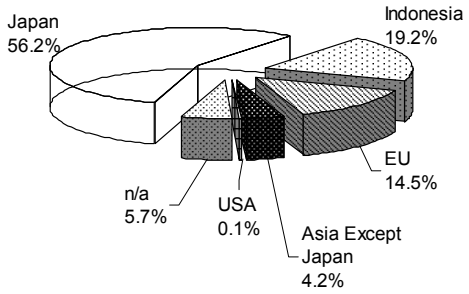


Source: Register of Ships 1990,1995,2000,2002, Lloyd Register

(4) Shipbuilding Countries

Indonesian vessels come from many countries in addition to those locally constructed. In terms of shipbuilding countries, Japan accounted for the largest number with 573 ships (56% of the total); Indonesia, 196 (19% of the total); and Europe, 148 (14% of the total). Other Asian countries shared only 4.2% of the total.

Figure 3.1.6 Shipbuilding Countries



Source: Register of Ships 2002, Lloyd's Register

3.2. Shipping Companies

3.2.1. Number of Shipping Companies

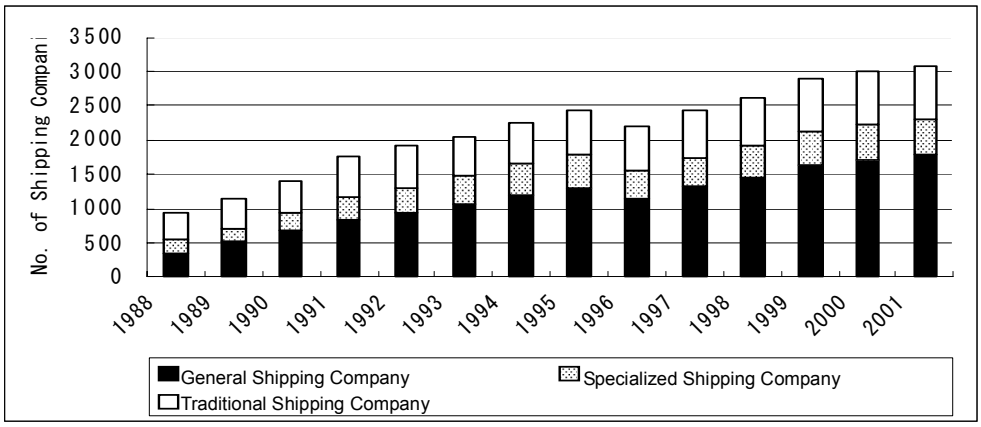
(1) DGSC Data

Shipping companies in Indonesia have three groupings: general shipping companies, specialized shipping companies, and traditional shipping companies. In 1988-2001, the number of shipping companies and those with their own fleet changed as follows:

- Shipping companies – increased 3.24 times or 949 in 1988 to 3,078 in 2001
- With own fleet – increased 1.33 times or 8,002 in 1988 to 10,656 in 2001

This shows that the shipping industry has proliferated through small shipping companies. Since national tonnage remained mostly the same during the period, i.e. 8.5 million tons in 1988, the shipping policy adopted in the 1990s only increased the number of shipping companies.

Figure 3.2.1 Trend in Shipping Companies in Indonesia, 1988-2001



Source: DGSC

(2) INSA Data

INSA, the only legitimate association of Indonesian shipowners, was founded in 1967. All shipping companies and industrial carriers possessing shipping or operating licenses issued by the DGSC are qualified to become full members of the INSA. The number of INSA members increased thrice, from 306 companies in 1989 to 914 companies in 2001. Total Indonesian flagged ships, as reported by its members, as of January 2001 accounted for:

- 4,208,412 DWT (64% of national tonnage)
- 740,678 GT (70% of national tonnage)
- 870,493 HP (96% of national tonnage)

INSA data confirmed that small-scale shipping characterizes Indonesia's shipping industry. Companies with less than three vessels accounted for 82% of INSA members, while those with 10 or more ships accounted for a mere 4%.

The shares of owned and chartered vessels among INSA members were 80% and 20%, respectively. Leasing arrangements were not popular.

In Indonesia, dry bulk cargo was carried through a combination of tug and barge. Barge operators are considered as a major vessel-holder group in Indonesia, belonging mostly to the INSA.

Figure 3.2.2 Number of Shipping Companies by Number of Owned Vessels

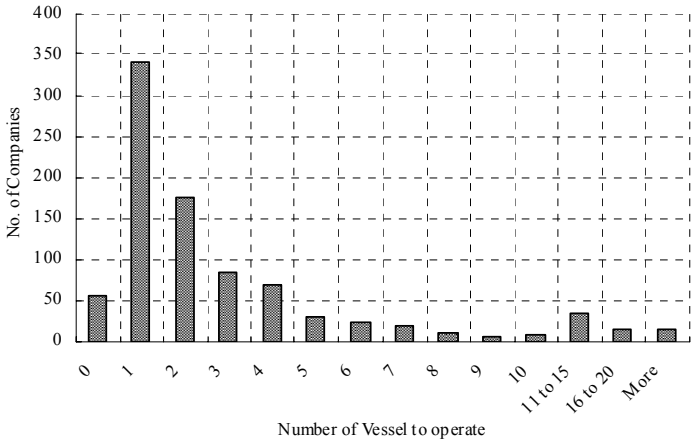


Table 3.2.1 Vessel Ownership based on INSA Registration

Status		Number	To
Charter	Charter	403	
	Bareboat Charter	18	
	Hire Purchase (Bbc)	1	
	Leasing (Bbc)	2	**424**
Leasing			**19**
Owned	Owned	1,846	
	Hire-Purchase	37	**1,883**
Total			**2,326**

Source: INSA data, 2001-2002

3.2.2. Maritime Human Resources

The number of human resources in the maritime industry including government officers, staff of maritime educational institutions, shipping companies, and shipyards is estimated at 258,000 persons. Of this figure, seafarers comprise the biggest segment (approx. 63,000), followed by shipping company office workers (approx. 60,000). This figure, however, does not include the labor-intensive traditional shipping companies.

Seafarers are further divided in Table 3.2.3. The number of overseas shipping seafarers is three times bigger than that of domestic shipping seafarers due to the considerable number of KPI (Kesatuan Pelaut Indonesia or Indonesian Seamen's Association) members working on foreign vessels.

Table 3.2.2 Present Manpower of Maritime Industry

Classification		No. of Persons
1. Government Officer (Ministry of Communication)		20,000
2. Maritime Education Institutions		1,000
3. Shipping company	Office workers	Approx. 60,000
	Seafarers	63,000
Traditional Shipping		Approx. 80, 000
4. Shipbuilding Industry	Office workers	9,000
	Naval Architect and Labor	25,000
Total		258,000

Source: DGSC

Table 3.2.3 Number of Seafarers

Position		Number of Seafarers in Overseas Shipping*	Number of Seafarers in Domestic Shipping
Officer	Deck	2,844	1,290
	Engine	2,371	990
	Radio	714	411
Rating	Deck	19,571	8,325
	Engine	9,931	3,650
	Catering	12,517	510
Subtotal		47,948	15,176
Total		63,124	

Source: *KPI[2] members

3.2.3. Interview Survey of Shipping Companies

(1) Overview

This section deals with the activities of domestic shipping companies. As a method to collect information and understand their activities, an interview survey was carried out by visiting selected companies and asking questions concerning both the company and its vessels.

Information collected by the survey came from 80 shipping companies and 323 vessels, which is roughly half of the samples originally aimed to be collected. In the collected information, major companies and important vessel types were all covered. The following table describes the profile of samples and the collected answers.

Table 3.2.4 Rate of Response in the Shipping Company Questionnaire Survey

	Number of Companies			Number of Vessels		
	Selected	Answered	Ratio	Selected	Answered	Ratio
Bulk	23	11	48%	39	30	77%
Container	50	16	32%	220	69	31%
General Cargo	27	28	104%	80	94	118%
Tanker	39	13	33%	186	59	32%
Passenger	28	12	43%	90	71	79%
Total	167	80	48%	615	323	53%

Source: STRAMINDO Interview Survey

As an overview, there are several key considerations such as optimal size of shipping company, optimal capacity of a vessel to operate domestic freight shipping, vessel operation types, and annual cargo handled by these companies. They can be outlined based on the survey results as follows:

(a) Age and Size of Shipping Company

Distribution of companies by age group indicated that the most common group is between ages 5 to 10 years old and 10 to 15 years old. The number of companies decreased as they

[2] KPI: Indonesia Seafarers Union (Kesatuan Pelaut Indonesia)

get older, which suggests that it is not easy surviving in the shipping business.

Table 3.2.5 Distribution of Freight Shipping Companies by Age

Age Group	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-	Total
No. of Companies	9	12	12	5	3	5	4	5	1	2	2	60
Group Share (%)	16	20	20	8	5	8	7	8	2	3	3	100

Note : The number of effective answers = 60
Source: STRAMINDO Interview Survey

Company size can be classified by the number of its employees. Medium-size companies with less than 50 personnel or "50 to 100" are the most common in the cargo shipping industry.

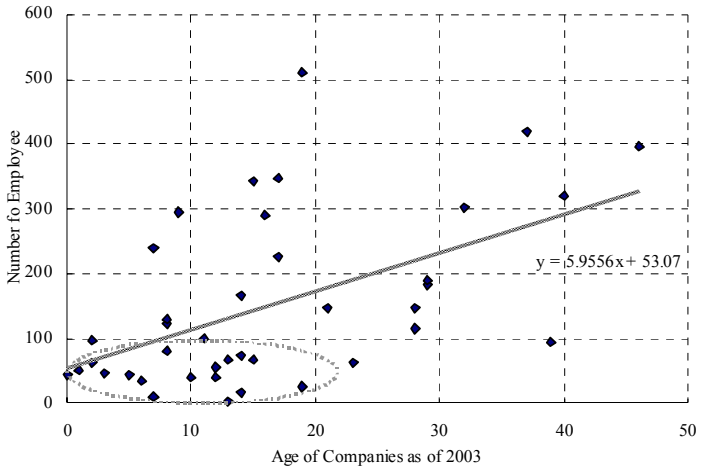
Table 3.2.6 Number of Freight Shipping Companies by Number of Employees

No. of Employees	50	100	150	200	250	300	350	more	Total
No. of Companies	19	15	8	6	2	3	6	5	64
Group Share (%)	30	23	13	9	3	5	9	8	100

Source: STRAMINDO Interview Survey

Figure 3.2.3 shows a positive correlation between age and size of company, i.e. a company tends to grow as it ages. It also shows that there are concentrations of companies with employees of less than a 100 in companies less than 20 years old.

Figure 3.2.3 Distribution of Companies by Age and Number of Employees

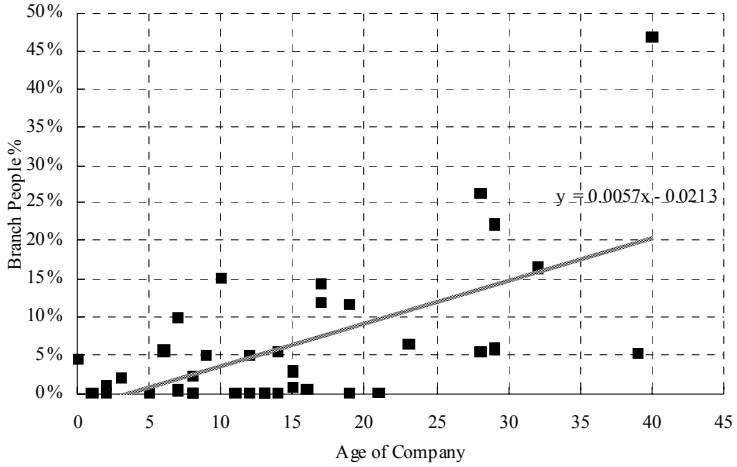


Source: STRAMINDO Interview Survey

It may be possible to consider two ways in the development of shipping companies – either to grow in size or not. The growth strategy is to invest in the establishment of branch offices and the operation of liner and feeder networks. Another strategy focuses on the optimal size of operation with tramper services. The following figure indicates the

relationship between company age and branch office rate among domestic freight shipping companies. Private companies exclude state-owned enterprises.

Figure 3.2.4 Development of Branch Offices by Age of Domestic Freight Company



Source: STRAMINDO Interview Survey

(b) Recent Trend in Cargo

The recent trends in cargo indicated that cargo amount in majority of the companies was either increasing or constant. Despite the economic downturn in 1998, cargo amount did not seem to drop much.

Table 3.2.7 Number of Companies by Rate of Cargo Increase, 1998-2002

70% less	70-90%	**90-110%**	110-130%	130-150%	150-170%	170-190%	190% more
1	2	**6**	3	2	0	1	2
6%	12%	**35%**	18%	12%	0%	6%	12%

Source: STRAMINDO Interview Survey

Cargo increase is gradually being realized in relation to the rate of economic growth. As a result, it is possible to say that the shipping industry, in recent years, has survived adverse financial and political upheavals.

(2) Inter-island Fleet and Operation

(a) Vessel Information by Age

The age group of up to 10 years had 33% of the survey answers due to the large number (81 out of 249) of responses from passenger vessels which dominate this age group.

Majority of both general cargo carriers and container vessels are in the 21 to 30 years old group which corresponded with the ratio of composition to total vessels in this

country. On the other hand, information on the 11 to 20 years old group was less than expected.

Table 3.2.8 Number of Vessel Information by Age (Total: 249 Answers)

Age group	Bulk	Container	General	Passenger	Tanker	Others	Total
Up to 10	2	13	12	35	8	11	81
11 to 20	4	18	14	8	1	7	52
21 to 30	4	36	38	5	8	5	96
31 to 40	0	4	7	4	2	2	19
over 40	0	0	1	0	0	0	1

Source: STRAMINDO Interview Survey

(b) Vessel Ownership by Age

Vessel ownership by age indicated a preference to purchase vessels among the surveyed companies in Indonesia. Chartered vessels were less than expected but the tendency to charter newly built ones showed.

Table 3.2.9 Vessel Ownership by Age (Total 249)

Age Group	Owned	Chartered	Other	Total No.
Up to 10 years	71	10	1	81
11 to 20	46	5	1	52
21 to 30	91	5	0	96
31 to 40	19	0	0	19
More than 40	1	0	0	1

Source: STRAMINDO Interview Survey

(c) Vessel Speed by Age

To understand the optimal operation of inter-island transportation, vessel speed by age group was analyzed. This analysis indicated that newly built vessels as a trend, do not have high speeds. Rather, the 21-30 year age group had the highest proportion of speed at 12 knots, whereas newly built vessels only had 10 knots as the most common speed. There may be some correlations among vessel speed, age and size. Small vessels usually sail at low speed and large vessels sail faster than smalls ones. In the case of Indonesia, most of small vessels were locally built with a young profile but large vessels are mostly imported thus old.

Table 3.2.10 Number of Cargo Vessels by Speed and Age

Age Group	Less 8	8 Knots	9 Knots	10 Knots	11 Knots	12 Knots	over 12	Total
Up to 10	4	2	0	**10**	5	2	5	28
11 to 20	4	1	7	6	8	6	10	42
21 to 30	0	4	7	13	21	**33**	13	91
31 to 40	0	2	1	6	3	2	0	14
Over 40	0	0	0	1	0	0	0	1
Total	8	9	15	36	37	43	28	176

Source: STRAMINDO Interview Survey

(d) DWT of Cargo Vessels by Age

The capacity of cargo vessels indicated in DWT showed two peaks, one in the range of up to 2,000 tons and the other in the range of 6,000-8,000 tons. The first peak mainly consists of young vessels of up to 20 years of age. Majority of the vessels in this group were bulk carriers and container vessels.

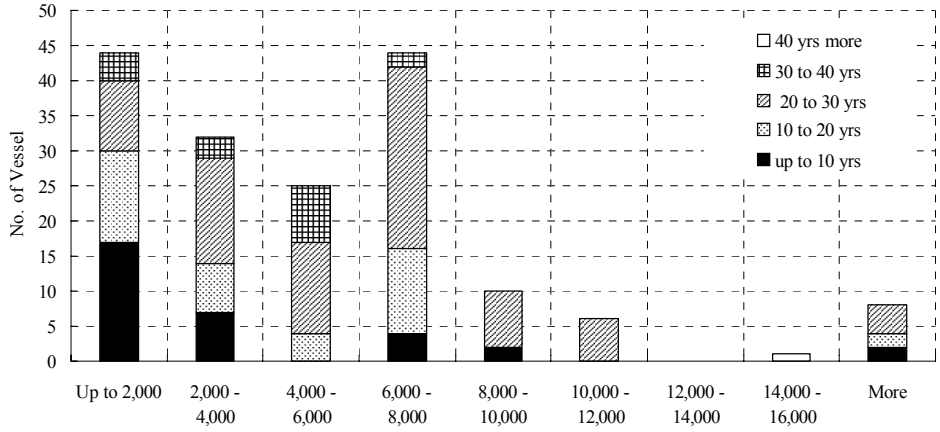
The second peak consisted of vessels with ages from 21 to 30 years old (60%). Majority of these vessels were general cargo vessels. Younger vessels with the same DWT covered containers and tankers.

Table 3.2.11 Number of Cargo Vessels by DWT and Age

Age Group	Up to 2,000	2,000 - 4,000	4,000 - 6,000	6,000 - 8,000	8,000 - 10,000	10 - 12,000	12 - 14,000	14 - 16,000	More	Total
up to 10 years	**17**	7	0	4	2	0	0	0	2	32
11 to 20 years	**13**	7	4	12	0	0	0	0	2	38
21 to 30 years	10	15	13	**26**	8	6	0	0	4	82
31 to 40 years	4	3	8	2	0	0	0	0	0	17
41 years more	0	0	0	0	0	0	0	1	0	1
Total	**44**	32	25	**44**	10	6	0	1	8	170
Cumulative (%)	26%	45%	59%	**85%**	91%	95%	95%	95%	100%	

Source: STRAMINDO Interview Survey

Figure 3.2.5 Number of Cargo Vessels by DWT and Age



Source: STRAMINDO Interview Survey

It should be noted that newly built vessels in the 1,500-5,000 DWT range have the largest number, which may suggest that vessel size in this range is the most economical to operate in Indonesia, whereas before vessels were larger in size.

(e) Draft of Cargo Vessels

The draft of cargo vessels operating in Indonesia was generally shallow with nearly 90% having less than 8 meters, as shown in the following table.

The distribution of vessels by draft and age indicated correlation, which was strange because recent vessels tended to have shallower depths.

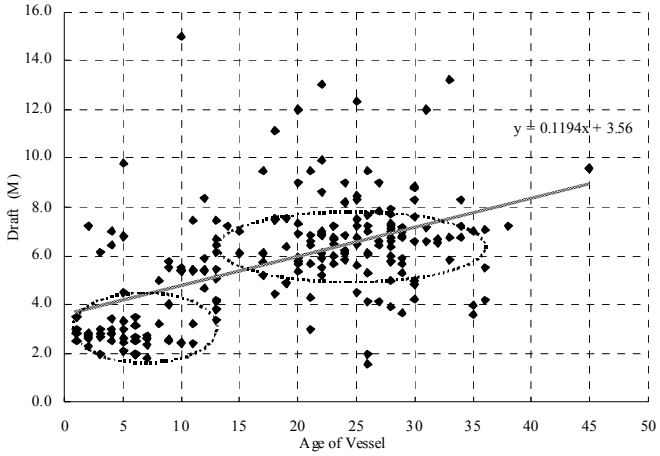
Table 3.2.12 Number of Vessels by Draft

Draft Range	Less than 4 m	4 to 6 m	**6 to 8 m**	8 to 10 m	10 to 12 m	more	Total
No. of Vessels	57	65	**81**	18	4	4	229
Cumulative %	25%	53%	**89%**	97%	98%	100%	

Source: STRAMINDO Interview Survey

Apart from the correlation, two distinct groups of vessels characterized the relationship of draft and age. A large number of vessels in the 20 to 30 years age group had a draft of between 6 to 8 meters. A younger group with less than 10 years of age had a draft of less than 4 meters. This is considered to be a result of the conditions of ports often located upstream of rivers more than 20 miles from the ocean.

Figure 3.2.6 Distribution of Vessels by Age and Draft



Source: STRAMINDO Interview Survey

An overview of vessel utilization as seen in the age group indicated that Indonesian companies were looking at optimizing the scale of vessels by speed size and draft according to conditions in the country.

(f) Dock-in Days for Vessel Maintenance

The Survey questioned shipping companies on non-operational fleet conditions such as idle days due to breakdown, lack of cargo and maintenance, and dockyard maintenance. Among those survey result, regular maintenance of cargo vessels was identified by dock-in days and idle days for maintenance. The following table indicated a reasonably large number of dock-in days even for the younger vessels of less than 10 years. Dock-in days are generally dependent on company policy on vessel management. As a result, dock-in days vary according to the selected dock; age does not make much difference.

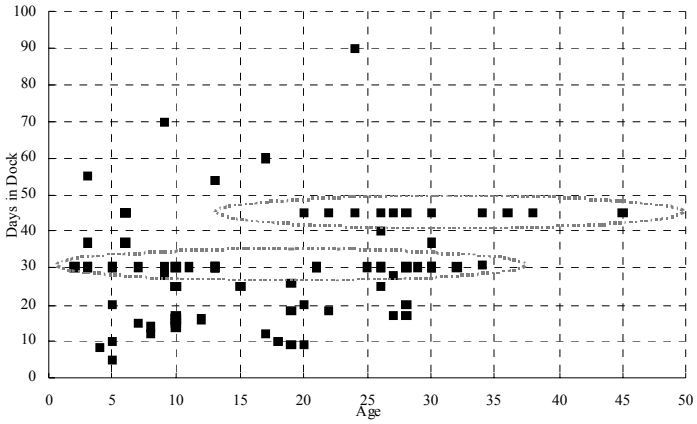
Table 3.2.13 Dock-in Days & Idle Days by Age

Age Group	Ave. Dock Days	Ave. Idle Days	No. of Samples
0 to 5	26	62	12
5 to 10	29	81	24
10 to 15	33	53	9
15 to 20	21	36	11
20 to 25	41	88	7
25 to 30	32	65	19
30 to 35	35	86	3
35 to 40	45	55	2
40 to 45	45	55	1

Source: STRAMINDO Interview Survey

By the distribution of dock-in days, several patterns of dock-in days were observed such as a 30-day case and a 45-day case.

Figure 3.2.7 Distribution of Vessels by Dock-in Days and Age



Source: STRAMINDO Interview Survey

Vessels were usually sent to dock for mechanical maintenance or for hull and deck maintenance. Even for new vessels dock-in frequency per year was similar to that of vessels over 20 years old. For hull and deck maintenance, the frequency increased by age. However, it decreased after 35 years. This survey lacked in number of samples.

Table 3.2.14 Number of Maintenance Per Year by Age

Age Group	Mechanical Maintenance	Hull / Deck	No. of Samples
0 to 5 yrs	2.4	1.0	8
5 to 10	2.0	1.1	20
10 to 15	1.8	1.6	10
15 to 20	2.7	1.7	3
20 to 25	2.5	1.8	4
25 to 30	2.2	1.4	13
30 to 35	2.0	1.7	3
35 to 40	1.0	1.0	2
40 to 45	1.0	1.0	1

Source: STRAMINDO Interview Survey

Major dockyards are identified in the following table. Jakarta and Surabaya were the

ports conducting vessel maintenance.

Table 3.2.15 Major Dockyards in Indonesia Selected by Cargo Vessels

Dockyard	No. of Serviced Vessels
Dock Koja Bahari	41
Dock Surabaya	30
Jasa Marina Indah (Semarang)	20
PAL (Surabaya)	12

Source: STRAMINDO Interview Survey

(3) Cargo-carrying Performance per Person

Average cargo volume in the past 5 years is indicated as average cargo-carrying capacity per person per year by shipping company. Operators of bulk carriers carried approximately 5,000-10,000 tons. This feat was subject to company strategy on the following points.

- Fleet composition with vessel size
- Marketing strategy with client locations and commodities
- Network operation with branch offices and diversity in operation

The following tables indicate the performance of each category of shipping companies.

Table 3.2.16 Bulk Carrier: Average Cargo-carrying Capacity per Person per Year

	MT/Person/Year	% of Shipping Business to Total
Bulk Carrier Company A	9,526	90% more
Bulk Carrier Company B	3,125	60 - 70%
Bulk Carrier Company C	4,730	90% more
Bulk Carrier Company D	7,399	80 - 90%
Bulk Carrier Company E	7,296	80 - 90% (Special Shipping)

Source: STRAMINDO Interview Survey

General cargo carriers had a generally lower cargo-carrying capacity than bulk carriers. Average cargo amount carried by companies owning general cargo carriers was within the 1,000-3,000 tons per employee range.

Table 3.2.17 General Cargo Carrier: Average Cargo Volume per Person per Year

	MT/Person/Year	% of Shipping Business to Total
Company A	1,648	80 - 90%
Company B	3,068	90% more
Company C	2,985	80 - 90%
Company D	2,513	90% more
Company E	1,186	90% more
Company F	2,817	90% more
Company G	1,939	90% more

Source: STRAMINDO Interview Survey

Operators of large vessels showed high performance, whereas other shipping companies with medium-size vessels showed low performance as with that of general cargo carriers.

Table 3.2.18 Tanker: Average Cargo Volume per Person per Year

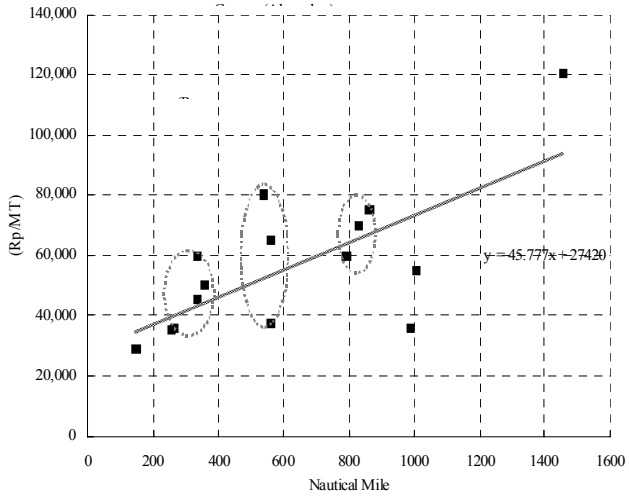
	MT/Person/Year	% of Shipping business to Total
Company A	4,125	90% more
Company B	2,577	NA
Company C	1,292	90% more
Company D	643	90% more

Source: STRAMINDO Interview Survey

(4) Freight Rate of Selected Commodities

Based on information from the shipping companies, several data on charges by commodity in relation to loading port and destination were obtained. Translating the loading port and destination to distance, the distribution of data is presented in the following scattergram.

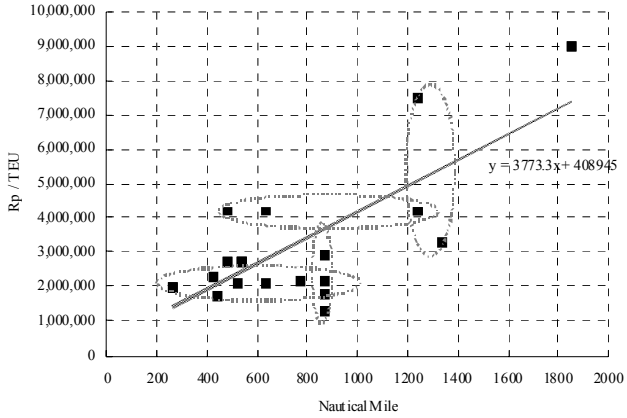
Figure 3.2.8 Cement Charge



Source: STRAMINDO Interview Survey

Cement cargoes gave a fairly distinct relation between charge rate and distance either in the form of bulk or bag. For a 400-mile distance, the charge was between 40,000 and 60,000 Rp/MT; for 800-mile distance, the charge was between 60,000 and 80,000 Rp/MT.

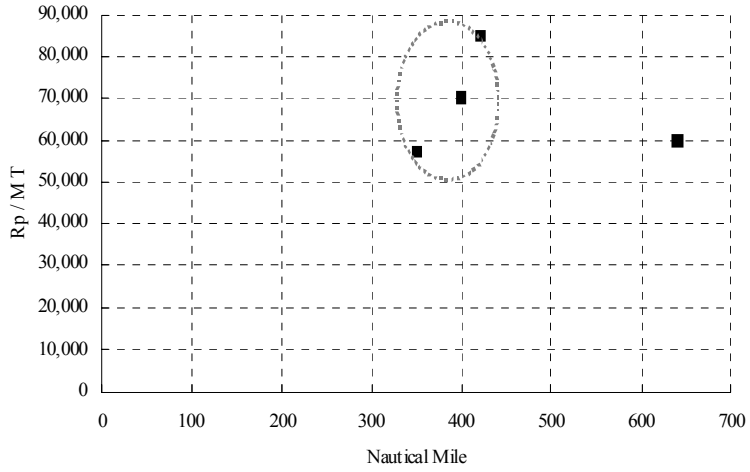
Figure 3.2.9 Container Charge According to Distance



Source: STRAMINDO Interview Survey

Container cargo figures indicated that a charge of 2 million Rp/teu was one of the competitive rates between 200 miles and 850 miles. At the same time, in an 850-mile distance, charges ranged between 1 million and 3 million Rp/teu. A similar horizontal and vertical variation was observed in the level of 4 million Rp and 1,300 miles.

Figure 3.2.10 Agricultural Products: Freight Rate according to Distance



Source: STRAMINDO Interview Survey

Crude palm oil and agricultural products do not seem to have any particular relationship with distance. Agricultural products, however, had charges ranging between 60,000 and 90,000 Rp/MT for 400 nautical miles.

(5) Management Intention for Development

Management intention in procuring additional vessels on company policy and on identified impediments is presented in the following table by vessel preference or by indicating the top 5 important items.

(a) Plan for Fleet Expansion

The intention to increase fleet was stronger among general cargo and passenger cargo operators. Special shipping operators, on the contrary, had low intention of adding to their existing fleet.

Table 3.2.19 Preference to Increase fleet (Shipping Co.)

	Yes	No	Ratio of 'Yes'
International	3	7	30%
Bulk Carrier	3	5	38%
Container vessel	6	7	46%
General Cargo	**11**	8	**58%**
Tanker	2	3	40%
Special ship	1	5	17%
Passenger vessel	4	3	57%
Total (Average)	30	38	44%

Source: STRAMINDO Interview Survey

(b) Ranking of Management Issues by Managers

In the survey, managers of shipping companies ranked several management issues according to their importance to their respective companies with 1 as the most important. The table below shows the number of companies which ranked the management issues by order of importance.

Twenty-two (22) executives listed 'Revenue increase' as the most important item. A total of 46 companies recognized its importance. 'Cost cutting' was second in importance; 13 companies considered it their first important item. 'Marketing' was listed by 15 companies as the third important item. 'Safety in operations' was the fourth important item.

'Organizational strength' and 'Human resource development' were listed behind the above top four items and were identified as semi-important maybe because the long-range picture – which encompasses investment, education and training and where results show up as operational efficiency and financial returns – is too much of a burden for private companies.

'Fleet expansion' came only after the above items which might be a reflection of the companies' view that vessels as operational assets are considered not crucial in current situations, because cargo volume is not large enough to fill up vessels. A common complaint was that consumer goods always had the largest share among general and container cargoes, but return cargo from rural areas were very limited. Shipping companies have found it hard finding efficient ways to operate.

Table 3.2.20 Ranking of Management Issues by Managers

	No. 1	No. 2	No. 3	No. 4	No. 5	Total
Revenue increase	**22**	**13**	4	5	2	46
Cost cutting	**13**	12	7	7	7	46
Marketing	9	5	**15**	6	10	45
Safety in operation	5	1	7	7	11	31
Organizational strength	0	6	8	5	10	29
Human resource development	2	10	8	3	3	26
Fleet expansion	2	2	4	10	2	20
Financial resources	5	3	1	2	4	15
Environment al consideration	0	4	1	3	2	10
New technology introduction	1	1	0	1	1	4

Source: STRAMINDO Interview Survey

(c) Impediments Ranking by Managers

Managers considered 'Regulation and its implementation', 'Old age of vessels' and 'Lack of fund' as the top three issues that hamper the development of the domestic shipping industry. Among these items, 'Old age of vessels' garnered the highest votes.

It is interesting to note that 'Poor port operations' and 'High rate of invisible costs'

were both rated as the fourth important impediments. 'Invisible costs' seemed to be an annoying issue for shipping companies.

Table 3.2.21 Impediments Ranking by Managers

	No. 1	No. 2	No. 3	No. 4	No. 5	Total
Regulation & its implementation	8	8	**14**	7	7	44
Old age of ships	**17**	**10**	7	5	4	43
Lack of fund	**18**	7	1	3	6	35
Poor port operations	7	1	6	12	6	32
Invisible cost (High rate)	4	**11**	8	4	5	32
Lack of skills of seafarers	6	6	7	6	3	28
Shortage of vessel	1	4	5	2	6	18
Lack of manpower	0	5	3	4	2	14
Lack of information technology	0	3	1	6	4	14
Others	1	0	0	0	0	1

Source: STRAMINDO Interview Survey

Items related to operations were ranked low among the assumed impediments. 'Lack of skills of seafarers', 'Shortage of vessel', and 'Lack of manpower' were the items considered as semi-important.

(d) Points for Consideration in the Management of the Shipping Industry

Future procurement of vessels

Current fleet compositions indicated the dominance of second-hand vessels from Japan especially among general cargo carriers which mostly are in their twenties. When these vessels retire in ten years time, the procurement of new vessels from Japanese second-hand markets will not easy.

There might be two ways to deal with the situation; one is that Indonesian shipping companies accept available vessels from the second-hand market even if their size gets smaller. Another is that they build up management skills to order and operate new vessels. Under such circumstances the ODA program will be effective in developing a shipping industry on the following items.

Management training for corporate planning and financing

It is imperative to develop management capabilities to control vessel operations and handle seafarers so that efficiency in vessel operations will increase cargo-handling capacity. At the same time vessel maintenance will be necessary to guarantee the quality of services and operational safety.

At the time of procurement of new vessels, a development scheme of the company is important for financial support. The financial aspect is closely related to management issues. Government support will be necessary to control competition in price-cutting and financing.

Construction and improvement of port infrastructure

The current condition of port facilities, i.e. those without enough cargo handling facilities, requires vessels to be equipped with the required equipment. However, the increase in cargo volume will make these cargos handling system obsolete and inefficient. As a result, major ports where liners will call need to be equipped with sufficient machines and warehouses so that together with the upgrading of shipping equipment, logistics systems will also improve. For the smooth transition from general cargo handling to container transportation, improvement of port facilities including navigational facilities is crucial.

3.3. Ports

Ports play an important role in the shipping industry. In other words, the productivity of shipping operations greatly depends on the effectiveness and efficiency of ports. Therefore, they function as the most important factors in the improvement of shipping management and business, and in the modernization of shipping fleet This is the reason why the Study paid particular attention to port facilities and operational services from viewpoints of domestic fleet operation, although port development including infrastructure is not in the scope of the Study.

3.3.1. Indonesian Port System

(1) Port Categorization

In accordance with Shipping Law No.21, 1992, ports in Indonesia are categorized into two kinds: public ports and special (industrial) ports. Public ports are developed to serve public/common users while special ports are developed and used by and for the interest of and to support the industries themselves such as manufacturing, forestry, fishery, mining, tourism and other sectors. Public ports are further subdivided into commercial and non-commercial ports. Port Administration (ADPEL) and Port Corporation (PELINDO) manage major commercial ports. ADPEL in major ports belongs to the Ministry of Communications (DGSC), and PELINDO belongs to the Ministry of State Own Enterprises (MSOE). PELINDO generally handles the vast majority of public cargoes and have better capacities than non-commercial ports.

Non-commercial ports are smaller ports, which are operated by KANPEL. Usually subsidized by the Government, they are mostly located in remote areas. They have limited capacities, handle relatively small cargo volumes, and have almost no cargo handling equipment. The following table shows port categorization in Indonesia.

Table 3.3.1 Indonesian Port System

Type of Port	Port Management / Operator (Head Office)	Total Number of Port	International Port (25 Strategic Ports)	Local
A. Public Port	1) Commercial Port			
	PELINDO I (Belawan)	27		
	PERINDO II (Tj. Priok)	29		
	PELINDO III (Tj. Perak)	32		
	PELINDO IV (Makassar)	24		
	Sub Total	112	85	27
	2) Non-commercial			
	KANPEL (Government)	523	10	513
B. Special Port	Special Port of Industry, Mining, Fishery, Agriculture, etc.	1,412	45	1,367
Total		2,047	140	1,907

Source: DGSC (July 2003)

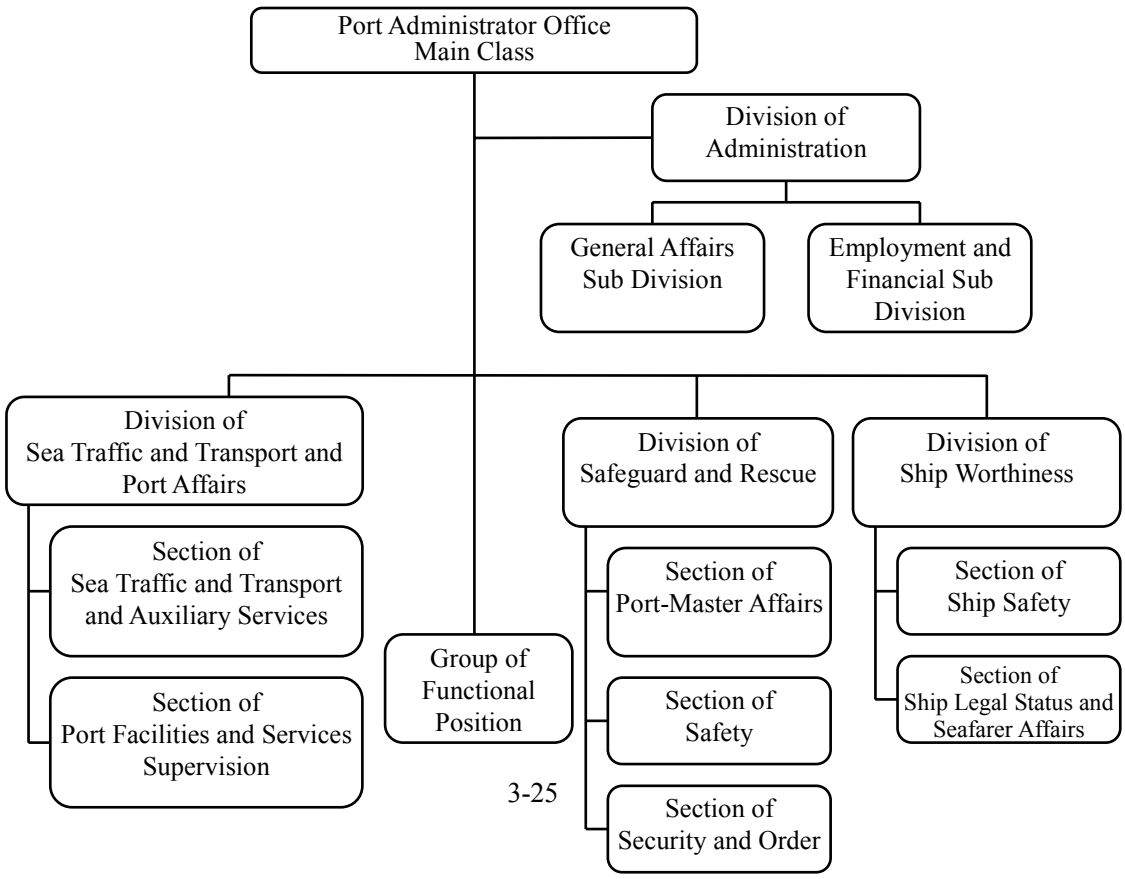
(2) Port Organization

Port Administrator Office (ADPEL) and Port Corporation (PELINDO) control and operate commercial ports in the public ports. ADPEL is in charge of ship safety matter in port and PELINDO is in charge of port operation. KANPEL (Class 1 to 5) controls and operates small non-commercial ports in the public ports.

(a) Port Administration Office (ADPEL)

ADPEL manages and controls sea traffic, ship safeguard and rescue, and ship worthiness including the inspection of ship's certificates and by PSC, and the issues of port clearance for sail as the organization chart below shows.

Figure 3.3.1 Organization Chart of Port Administrator Office Main Class



(b) Port Corporation (PELINDO)

Port Corporation functions as follows.

- Ship services such as pilotage, towage, berthage and anchorage arrangement
- Cargo services such as stevedoring services, cargo-doring, receiving and delivery of cargo

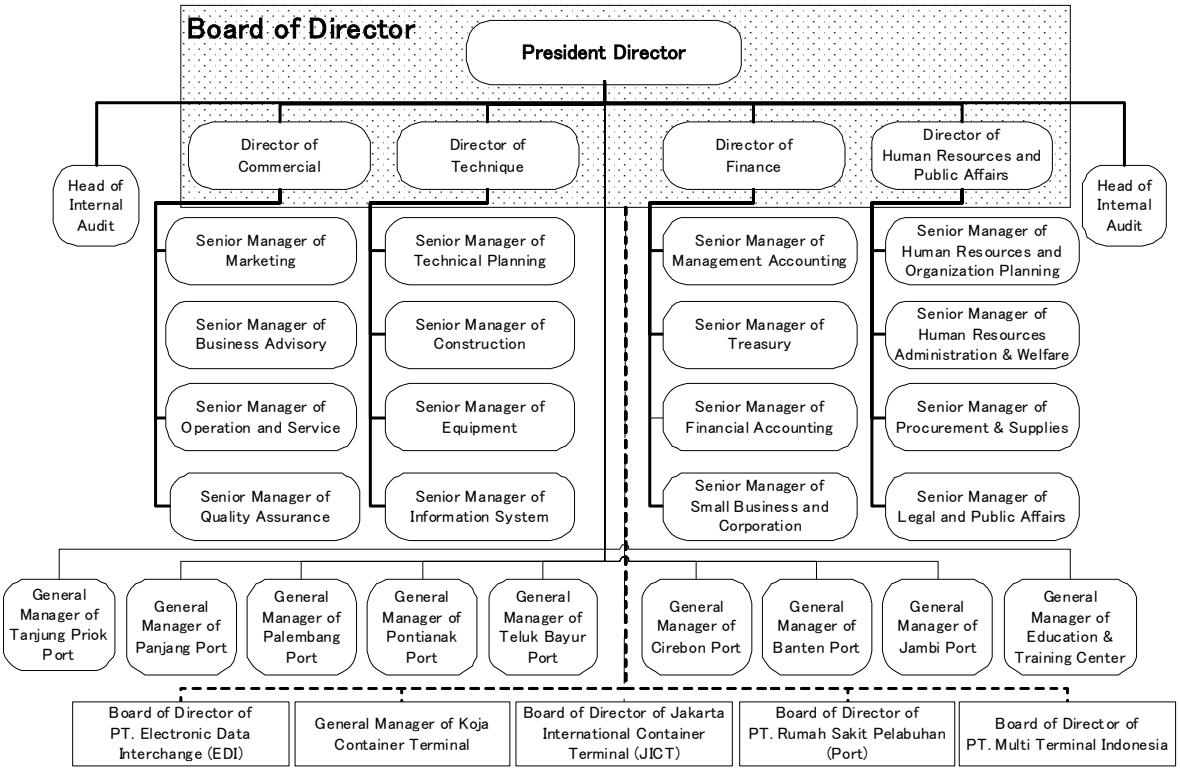
PELINDO has contracts with stevedoring companies, while it manages terminals under contracts with terminal operators, who control stevedoring operation with exclusive right to operate on dedicated berth for them.

- Other services such as land rental, office space rental, warehousing rental, Minimum level of EDI (Tj. Priok area), telecommunication, electricity, etc.

PELINDO usually conducts maintenance of navigation aids and dredging in the port area, while government is responsible for the waters outside port including approaching channel.

The organization chart of PELINDIO II is shown below as a typical case of Port Corporation.

Figure 3.3.2 Organizational Chart of Pelindo II



3.3.2. Port Reconnaissance Survey

(1) Survey Activities

Ports play a vital role in the shipping industry. In other words, the productivity of shipping operations largely depends on the effectiveness and efficiency of ports. Therefore, they function as one of the most important factors in the improvement of shipping management and business and in the modernization of shipping fleet. This is the reason why the Study paid particular attention to port facilities and operational services, although port development is not in the scope of the Study.

In order to grasp present conditions in Indonesia's strategic ports, the Study Team conducted a field survey of the 14 ports mentioned below out of the 25 strategic ports within a limited period of time. The survey was done through port inspections, interviews of port administrations, port corporations, local shipping associations, and an on-board survey from January to March 2003.

Table 3.3.2 14 of Strategic 25 Ports inspected by Study Team

1.Batam	2.Tanjung Pinang	3.Belawan	4.Pontianak	5.Tanjung Perak
6. Panjang	7.Tanjung Priok	8.Balikpapan	9.Samarinda	10.Banjarmasin
11.Jayapura	12.Kupang	13.Makassar	14.Bitung	

(2) Survey Results

Each of the 14 surveyed ports is briefly sketched in Appendix 3.2. The resulting general observations are as follows:

- Almost all ports require expansion of their berths. Although this might be addressed by improving cargo handling productivity and on-shore cargo flow, the latter will depend on yard capacity, cargo handling equipment, conditions of access roads, and cargo or truck readiness by shippers or consignees. This issue shall be further studied.
- Relationships between Adpel and PELINDO seemed to be systematic and friendly. PELINDO supervises and collects dues such as wharfage, anchorage, tugboat, pilotage, electric supply in port, water supply, bunkering (except supply by PERTAMINA), stevedoring, etc. On the other hand, Adpel collects light dues for vessels to use for navigation aids and fairway channels, which must be maintained for vessel navigation safety. Although PELINDO manages and conducts pilot and tugboat operations, the same may be done by Adpel, because they fall under maritime safety which is under Adpel's mandate.
- Some ports, particularly Tanjung Priok, Tanjung Perak, and Banjarmasi, are seriously congested to the extent that entering ships cannot expect to receive smooth port services. Each port suffers from different causes. Therefore, there is a need to work out individual port operational improvement plans.

(3) Port Congestion Survey

(a) Objective

Since numerous vessels have been observed to be always at anchor in Tanjung Priok Port, the Study conducted a supplemental port congestion survey in May 2003. It consisted of satellite image analysis, ocular anchorage observation, and direct on-board interviews with ship captains to find out the number of anchoring vessels, their waiting position and time, and primary causes of waiting.

(b) Tanjung Priok

Satellite image analysis and ocular survey

Tanjung Priok's congested conditions were analyzed by evaluating its satellite image through the following (Figure 3.3.3 and 3.3.4):

- First, the condition of and congestion (the position and number of ships in anchorage) in the target port were identified from the reduced photo.
- Second, the size and type of ships were investigated from an enlarged photo.
- An ocular survey done on May 14, 2003 by a patrol boat observed 76 ships at anchorage. These ships were categorized according to ship type and size as follows:
- 72 ships (94%) were domestic service ships, while only four (4) were ocean-going service ships.
- As for ship type, the number of general cargo ships was 32 (42%), as shown in the table and figure below. As for ship size, the number of ships with 2,000-2,999 GT was 42 (55%), as shown in the table and figure below.

Table 3.3.3 Number of Ships by Type

Type of Ship	Domestic	International	Total	%
General Cargo	30	2	32	42.1
Container	5		5	6.6
Cement	3		3	3.9
Other Bulker	10	2	12	15.8
Car Carrier	5		5	6.6
Tanker/LPG	10		10	13.2
Barge	5		5	6.6
Passenger	1		1	1.3
Navy	3		3	3.9
Total	72	4	76	100

Figure 3.3.3 Number of Ships by Type

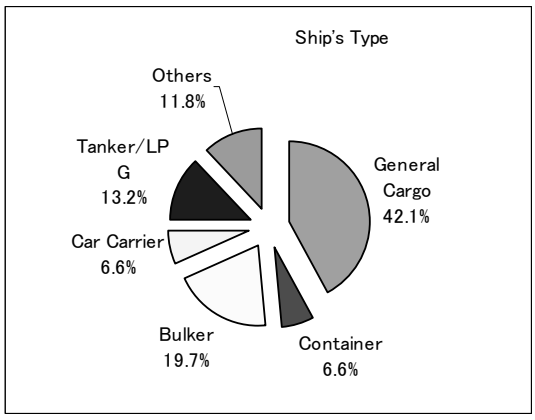


Table 3.3.4 Number of Ships by Size

Size of Ship (G/T)	No. of Ships	%
500 - 999GT	3	4
1,000 - 1,999GT	27	36
2,000 - 2,999GT	42	55
3,000GT over	4	5
Total	76	100

Figure 3.3.4 Number of Ships by Size

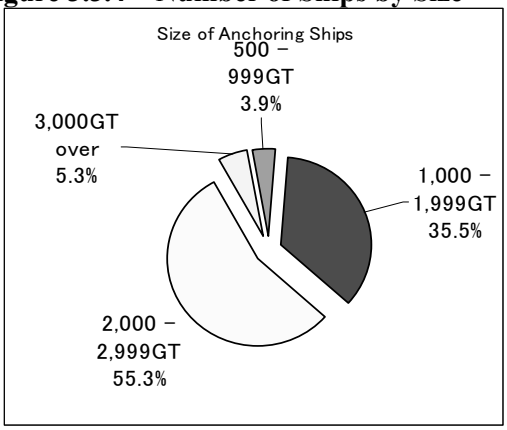


Figure 3.3.5 Tanjung Priok Port by Satellite Photograph

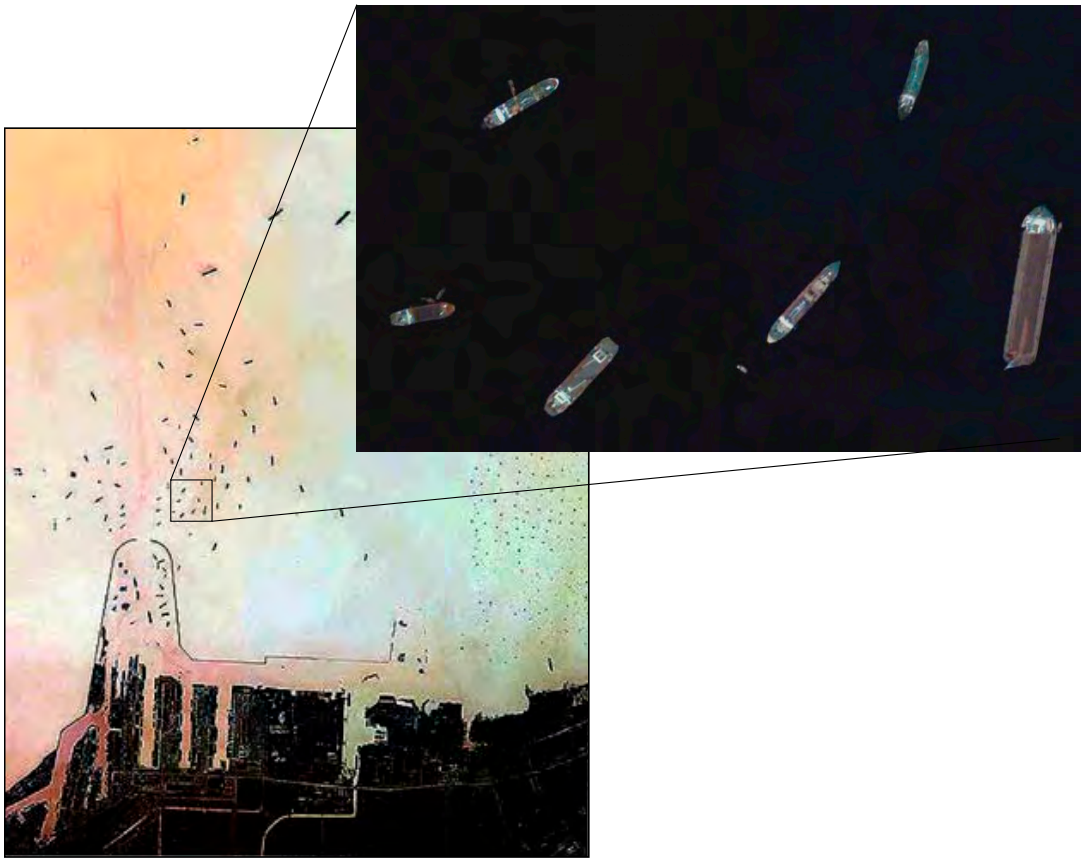


Figure 3.3.6 Pictures of Tanjung Priok

On-board Interview Survey

The results of the on-board survey of 20 domestic service vessels done at the same time as the port survey showed the following:

- Only two (2) ships out of 20 could berth directly. The remaining 18 ships waited in anchorage for some reason.
- Container and semi-container ships had shorter waiting time at anchorage and the average waiting day was two (2) days. The total waiting days for 10 container/semi-container ships were 21.7 days. General cargo ships (including cement ships) waited for 26.8 days. The average number of waiting days for nine (9) of these ships, excluding one ship which waited at anchorage for 240 days due to repairs, was 3.2 days.
- According to the interviews with captains of the 20 surveyed ships, the number of vessels waiting for berth was 10 ships (52.6% out of the whole) and those waiting for cargo was 6 ships (31.6%). The remaining three (3) ships (15.8%) were in anchorage for repairs.

Table 3.3.5 Number of Ships by Type

Reason	No. of Ships
Waiting for Berth	10
Waiting for Cargo	6
Repairing	3
Others	0
Direct on Berth	2
Total	21

Remark: One GC ship had two (2) reasons.

Figure 3.3.7 Number of Ships by Type

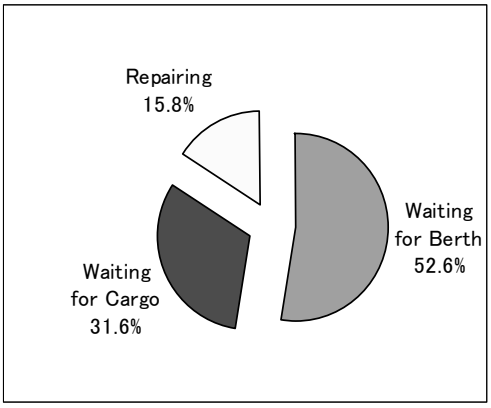


Table 3.3.6 Sampled Ships Waiting at Tanjung Priok Anchorage (May 14, 2003)

No.	Type of Ship	Reason of Waiting (Days)			TOTAL (Days)
		for Berth	for Cargo	Repairing	
1	Container	0.5			0.5
2		0.5			0.5
3		1.0			1.0
4			3.0		3.0
5				4.0	4.0
6		0.0			0.0
7		12.0			12.0
8	Semi Container	0.0	0.0		0.0
9				0.5	0.5
10		0.2			0.2
11	General Cargo		7.0		7.0
12			7.0		7.0
13			2.0		2.0
14			2.0		2.0
15		0.0	0.0	240.0	240.0
16		0.8			0.8
17		0.5			0.5
18		2.0	3.0		5.0
19		0.5			0.5
20	Cement Bulk	4.0			4.0
TOTAL Average		1.1	1.2	12.2	14.5

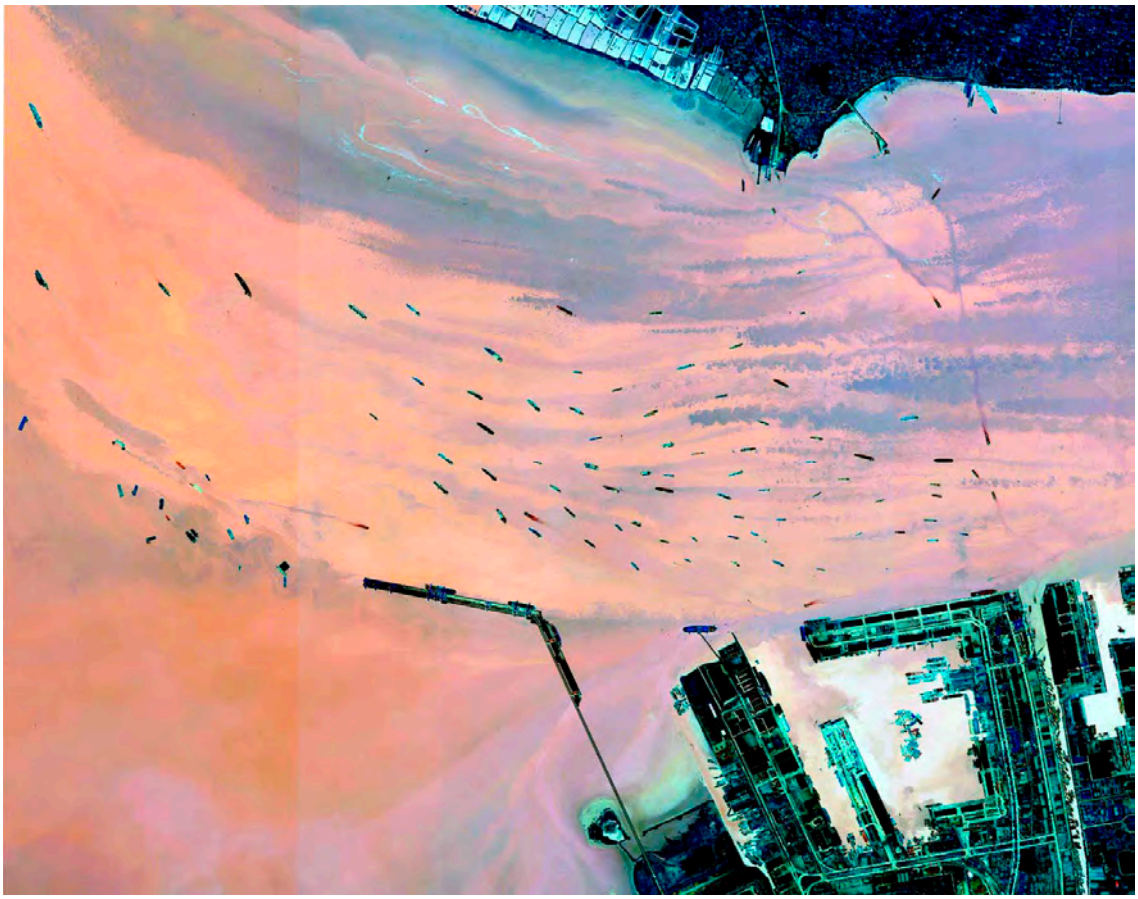
Source: STRAMINDO
On-board Survey

(c) Tanjung Perak

The Study Team visited the Port of Tanjung Perak many times during the course of the Study and every time, it has been observed that many vessels are waiting at anchorage. According to PELINDO III, over 80 vessels are anchored at designated areas for more than eight hours every day. It has been roughly estimated that reasons for waiting at port is as follows:

- Ship-repairing and maintenance: 40-50%
- Waiting for cargo: 25%
- Document preparation: 10%
- Others: 5-15%

Figure 3.3.8 Tanjung Perak Satellite Image



3.3.3. Present Activities of 25 Strategic Ports

In 2000, more than 400 million-ton of sea borne cargo excluding oil and gas was handled in Indonesian ports, of which about 54.5% was handled in 25 strategic ports according to 'Port Development and Operation in Indonesia, April 2003' by DGSC.

The Study Team investigated the present activities of 25 strategic ports by means of the collection of information from DGSC and PELINDO I to IVas well as 14 ports, which the Team surveyed and inspected.

(1) Summary of 25 Strategic port information

Following port data are summarized to study port scale and performance from the viewpoints of permissible size of and port operation on inter-island vessels.

a. Channel length, width and depth, and tide
b. Berth length and depth
c. Available facilities and main cargo handling equipment
d. Ship calls (Domestic and international)
e. Cargo throughput
f. Kinds of cargo
g. Cargo handling productivity by kind of cargo
h. Ship service Performance: Average waiting time, approaching time, effective time (operation time) and berthing time (hours)
i. Port facility utilization: Berth occupancy ratio, Shed occupancy ratio, yard occupancy ratio (%)
j. Maximum size of vessel to call
k. Present issues
l. Future Plan
m. Distance Chart in Indonesian Water
n. Distance Table among Strategy 25 Ports
o. Summary of Strategy 25 Ports Information

The summary table is shown in Appendix 3.3.

(2) Distance Charts

Distance Charts from Hub Port to other 24 strategic ports are prepared. (Refer to Appendix 3.4)

a. Tj. Priok

b. Tj. Perak

3.4. Safe Ship Operations

3.4.1. International Requirements on Maritime Safety

To meet international requirements on maritime safety and environment protection, the International Maritime Organisation (IMO) has been active in strengthening relevant

international conventions like the International Convention for the Safety of Life at Sea (SOLAS) 1974. Before, ships were the only target in this action; however, the IMO is heading for a total system on maritime safety involving all ships, on-shore ship management organizations, and relevant competent authorities.

Along with the SOLAS requirements, there are other significant international standards on maritime safety and environment protection, as follows:

(1) SOLAS Requirements

- International Safety Management - Safety Management System (ISM-SMS)
- Port State Control (PSC)
- High Speed Craft (HSC)-Code: Special Requirement on HSC
- Bulk Carrier Code: Requirement of hull strength depending on bulk cargo.
- Double-hulled Tankers
- Automatic Identification System (AIS) and Voyage Data Recorder (VDR): Domestic vessels with more than 500 GT are required to install AIS and VDR by 2008.
- Electronic Chart Display and Information System (ECDIS)
- Anti-piracy, Security Management System (for port / ship)

(2) Green Awards

Every ocean-going vessel should comply with international laws and regulations, which are known and accepted in the maritime industry worldwide. The Green Award Flag can be awarded by the IMO to vessels that are extra safe and extra clean. A Green Award ship has been able to meet high, but manageable technical and managerial international requirements.

(3) International Requirements for Quality Assurance (QA), Environment Protection and Disclosure / Transparency of Internal Materials on World Business

International maritime industries are going to introduce total quality control (TQC) systems based on ISO 9000s and environment protection systems based on ISO 14000 in response to business requirements in the world.

(4) United Nations Convention on the Law of the Sea (UNCLOS)

This convention was established to promote the peaceful uses of the seas and oceans; the equitable and efficient utilization of their resources; the conservation of their living resources; and the study, protection and preservation of the marine environment for the sovereignty of all States.

3.4.2. Rules and Regulations Adopted to Domestic Shipping Vessels

Safety requirements on domestic shipping vessels differ between BKI-classed vessels and non-BKI-classed vessels. Necessary certificates for a vessel also vary depending on its allowable navigation areas. Table 3.4.1 shows important international conventions, such as

SOLAS 74, the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78), and the Convention on the International Regulations for Preventing Collisions at Sea (COLREG 72), which are directly adoptable to Indonesian domestic vessels.

When a vessel enters a port, necessary certificates must be submitted to the port administration office (Adpel or Kanpel) during its port stay. A marine inspector may execute an unscheduled inspection at port to ensure that a vessel complies with international safety and maritime standards.

Table 3.4.1 Necessary Certificates and Adopted Rules and Regulations

Navigation Area	Ship Type	Length of Validity	Rules / Regulations
All Ocean Shipping Area	- C.S. Construction - C.S. Equipment - C.S. Radio - I.O.P.P Cert. (Prov)	1 Year 1 Year 1 Year 3 Month	- SOLAS 74 - MARPOL 73/78 - COLREG 72
Indonesian Territorial Shipping Area	- Seaworthiness - C.S. Construction - C.S. Equipment - C.S. Radio - I.O.P.P Cert. (Prov)	1 Year 1 Year 1 Year 1 Year 3 Month	- PP No. 51/2002 - SOLAS 74 - MARPOL 73/78 - COLREG 72
Local Shipping Area	- Seaworthiness - Load Line Cert. - Radio Cert. - I.O.P.P Cert. (Prov)	1 Year 1 Year 1 Year 3 Month	- PP No. 51/2002 - MARPOL 73/78 - COLREG 72 1. SK. Menhub No. KM 86/90 2. Keputusan DIRJENLA No. PY. 66/1/13-1983 3. Keputusan DIRJENLA No. DRP. 44/1/13-1983
Limited Shipping Area	- Seaworthiness - Load Line Cert. - NOPP Cert. (Prov) - Radio Cert.	1 Year 1 Year 3 Month 1 Year	- ditto-

3.4.3. On-board Ship Survey

(1) Survey Outline

The Study Team surveyed 48 vessels on-board at 14 ports out of the 25 strategic ports. The survey aimed at observing (i) ship operational conditions, (ii) ship management and navigation, and (iii) safe operations and maintenance practices.

Table 3.4.2 Records of On-board Survey Activities

No.	Surveyed Port	Date of Survey 2003	Surveyed Vessel				
			Passenger	Container	GC	Wooden	S. Total
1	Pontianak	Jan. 20-21		1			1
2	Batam	Jan. 22	1		GC 1 Bulker 2		4
3	Tanjung Pinang	Jan. 23					
4	Belawan	Jan. 26-27			2		2
5	Surabaya (Tg. Perak)	Feb. 2-3		1	1		2
6	Panjang	Feb. 10-11			2		2
7	Tanjung Priok	Feb. 14		1	1		2
8	Balikpapan	Feb. 17		1		1	2
9	Samarinda	Feb. 18-19		1		1	2
10	Banjarmasin	Feb. 20-21		1	1		2
11	Jayapura	Feb. 24-25			2		2
12	Kupang	Feb. 26-27			2		2
13	Ujung Pandang	March 4-5		1	1	1	3
14	Bitung	March 6-7			2		2
15	Tanjung Priok	May 14-20		10	10		20
Total			1	17	25+2*	3	48

Source: STRAMINDO On-board Survey
Notes: * Figure included 2 bulk carriers
GC: General Cargo, Wooden: Traditional Ship

(2) Ship Operational Conditions

(a) Vessel Particulars and Loading Efficiency

- The average DWT and GT of container vessels were twice those of general cargo vessels.
- Container and general cargo vessels were 22 years of age.
- There was no big difference in ship speed between the two kinds of vessel, which was 11.2 knots for container vessels and 9.8 knots for general cargo vessels. Both of the types had very slow speeds.
- If the speed of a newly built ship is compared with that of present ones, container ships will be downgraded from 13.1 knots to 11.2 knots, and general cargo ships from 11.7 knots to 9.8 knots. This is because of ageing vessels and bad vessel maintenance.
- The loading efficiency (load factor) of container vessels was 49%, making them more efficient than general cargo vessels.
- When cargo ship productivity was considered, general cargo vessels seemed more productive than container vessels at 251 ton-mile/DWT. This was because container vessels had short frequency for fixed operations and many short-distance voyages.

Table 3.4.3 Results of On-board Survey

Classification	DWT	GT	Age	Ship Speed (at Present)	Ship Speed (Sea Trial)	Load Factor	Cargo Ship Productivity
	Ton	Ton	Year	Knots	Knots	%	(Ton-mile/DWT)
Container (17 vessels)	6,000	4,547	22	11.2	13.1	49	208
General Cargo (25 vessels)	3,095	2,082	22	9.8	11.7	46	251

Source: STRAMINDO On-board Survey

(b) Productivity of Vessel Operations (Details of working days in a year)

The vessels subject to the on-board survey were all active. It is clearly demonstrated by the collected data, because the commissionable days for container vessels and general cargo vessels are 345 days/year and 338 days/year, respectively. However it is questionable that those figures could represent all the domestic fleet. The on-board survey was conducted on actually working vessels at the strategic 25 ports. On the other hand, the shipping company interview survey reveals that many vessels spend a longer time docking and in idle for maintenance as indicated in Table 3.2.13.

Commissionable Days

- Average for Container Vessels: 345 days/year
- Average for General Cargo Vessels: 338 days/year

Actual Working Days

The actual working days were obtained by deducting waiting days from commissionable days, as follows:

- Average for Container Vessels: 288 days/year (78.9% per year)
- Average for General Cargo Vessels: 259 days/year (70.9% per year)

As shown in these figures, compared with container vessels, the operating rate of general cargo vessels was low.

Cause of Low Operating Rate

Both types of ship had more than 40 waiting days in a year to get a berth. This was due to low cargo-handling efficiency caused by insufficient cargo-handling facilities.

Although the difference in waiting days for berth between container vessels and general cargo vessels was not significant since there were 2 container ships that waited for berth for 100 days in a year. In practice the operating rate of container vessels was sharply higher than that of general cargo vessels.

Since the waiting period of a general cargo vessel for cargo and dock/repair was sharply longer than that of container ships, the former had a lower operating rate.

Table 3.4.4 Working Days

Classification	Sailing Day	Cargo Working	Waiting For Berth	Waiting for Cargo	Dock/ Repairs	Delay Due to Repairs	TOTAL	Commission-able Days	Actual Working Days
	Day / Year								
Container (17 Vessels)	165	123	44	14	17	2	365	345	288
General Cargo (25 Vessels)	124	135	47	32	17	10	365	338	259

Source: STRAMINDO On-board Survey

Figure 3.4.1 Details of Working Days in a Year (Container)

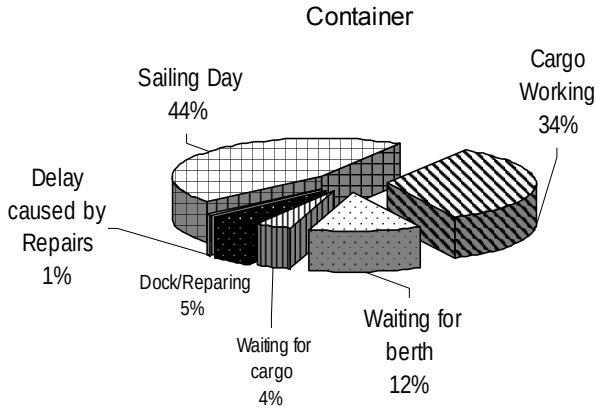


Figure 3.4.2 Details of Working Days in a Year (General Cargo)

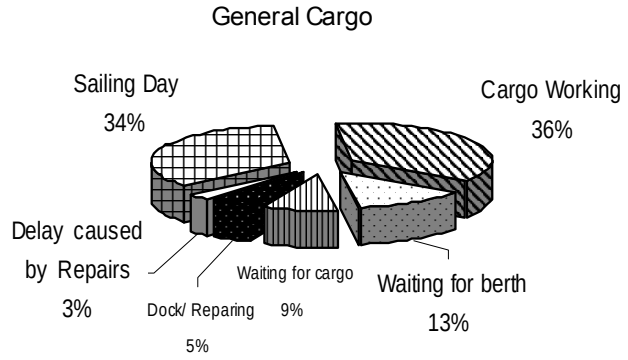


Table 3.4.5 Results of On-board Survey (Container Vessels)

Classification	Ship No.	DWT	GT	Age	Ship's speed (at present)	Ship's speed (Sea Trial)	Sailing Day	Cargo Working	Waiting For berth	Waiting for cargo	Dock/ Repairing	Delay caused by Repairs	TOTAL	Commission-able Days	Actual Working Days	Load Factor (%)	Cargo Ship Productivity
		Ton	Ton	Year	Knots	Knots	Days/year	Days/year	Days/year	Days/year	Days/year	Days/year	Days/year	Days/year	Days/year	%	Ton-mile /DWT
Container	S-01	4,980	3,666	18	10.0	14.4	172	129	0	41	23	0	365	342	301	62.8	204
	S-08	6,644	4,209	22	10.7	10.9	133	160	40	20	12	0	365	353	293	52.7	172
	S-13	12,000	9,110	30	15.0		149	144	21	10	30	11	365	324	293	15.2	52
	S-14	1,600	1,222	23	11.0		188	60	100	7	10	0	365	355	248	28.1	92
	S-16	7,722	6,182	19	10.5	13.0	144	100	100	0	21	0	365	344	244	19.2	114
	S-18	3,650	3,260	10	11.0	12.0	192	144	16	0	13	0	365	352	336	40.5	167
	S-24	4,695	3,289	29	12.0		181	78	63	18	25	0	365	340	259	28.0	112
	S-31	4,180	3,401	7	11.5	11.9	157	121	36	36	15	0	365	350	278	62.4	429
	S-32	6,200	3,497	30	10.5	12.8	160	120	60	0	10	15	365	340	280	28.2	106
	S-34	3,650	3,256	9	10.0	12.0	208	66	46	35	10	0	365	355	274	80.1	104
	S-35	6,600	5,283	29	8.5	13.0	167	123	62	0	10	3	365	352	290	76.1	469
	S-36	5,834	3,760	32	10.5	11.0	119	160	35	18	33	0	365	332	279	22.0	138
	S-38	4,542	4,152	22	11.0	13.6	188	147	15	0	15	0	365	350	335	55.0	214
	S-41	1,938	1,595	16	11.0	13.0	191	116	43	0	15	0	365	350	307	90.3	303
	S-42	11,075	8,639	25	11.5	13.0	191	147	7	0	20	0	365	345	338	87.5	546
	S-47	11,857	9,110	30	16.0	18.8	127	152	66	0	20	0	365	345	279	19.6	74
	S-48	4,830	3,666	18	10.0	14.4	132	126	42	42	15	8	365	342	258	73.4	239
17 Ships Container Average		6,000	4,547	22	11.2	13.1	165	123	44	14	17	2	365	345	288	49.5	208

Source: STRAMINDO On-board Survey

Table 3.4.6 Result of On-board Survey (General Cargo Vessels)

Classification	Ship No.	DWT	GT	Age	Ship's Speed (at present)	Ship's Speed (Sea Trial)	Sailing Day	Cargo Working	Waiting for berth	Waiting for cargo	Dock/ Repairing	Delay caused by Repairs	TOTAL	Commission-able Days	Actual Working Days	Load Factor (%)	Cargo Ship Productivity
		Ton	Ton	Year	Knots	Knots	Days/year	Days/year	Days/year	Days/year	Days/year	Days/year	Days/year	Days/year	Days/year	%	Ton-mile /DWT
General Cargo	S-04	1,100	681	33	7.0		156	94	47	24	21	23	365	321	250	68.2	284
	S-05	5,123	2,990	25	12.0		111	122	61	46	25	0	365	340	233	50.4	350
	S-06	6,013	3,376	25	11.0		129	136	55	30	15	0	365	350	265	41.6	286
	S-07	2,671	1,819	16	11.5	11.5	140	130	54	26	15	0	365	350	270	51.5	597
	S-09	500	494	21	9.0		79	163	92	16	15	0	365	350	242	68.8	451
	S-10	2,363	1,466	28	11.0	11.0	122	122	80	11	30	0	365	335	244	35.3	108
	S-11	6,039	3,414	24	10.0		122	170	39	19	15	0	365	350	292	32.4	132
	S-12	2,768	1,549	29	12.0		110	161	42	20	20	12	365	333	271	22.6	140
	S-15	1,950	1,683	21	10.0	13.5	192	65	66	21	21	0	365	344	257	18.6	157
	S-19	1,031	652	19	10.0	12.0	110	137	52	51	15	0	365	350	247	56.6	118
	S-20	725	680	20	10.5		208	78	39	26	14	0	365	351	286	43.1	195
	S-21	8,655	4,902	29	11.0		79	185	55	32	14	0	365	351	264	28.9	112
	S-22	2,000	1,384	17	9.0		93	182	42	28	20	0	365	345	275	46.9	270
	S-23	1,430	958	12	8.0		91	120	80	59	15	0	365	350	211	43.7	252
	S-26	4,911	3,114	20	9.0	13.0	60	230	36	24	15	0	365	350	290	35.0	124
	S-27	1,526	1,329	18	9.0		85	180	46	39	15	0	365	350	265	39.3	125
	S-30	1,696	977	26	8.0	10.0	32	90	17	12	15	199	365	151	122	88.4	293
	S-33	1,600	1,280	22	7.0	11.0	200	64	72	19	7	3	365	355	264	35.2	84
	S-37	2,347	1,824	22	9.0	12.5	134	126	37	35	27	6	365	332	260	47.9	325
	S-39	1,650	1,783	26	9.0	11.0	105	125	70	45	15	5	365	345	230	60.6	377
	S-40	4,700	3,018	22	10.0	12.0	131	189	15	15	15	0	365	350	320	30.6	121
	S-43	3,250	2,041	26	8.0	9.0	184	96	22	48	15	0	365	350	280	65.4	255
	S-44	3,000	3,256	14	10.0	11.5	106	166	18	60	15	0	365	350	272	58.3	307
	S-45	3,650	3,256	10	11.5	12.0	155	100	10	85	15	0	365	350	255	37.7	598
	S-46	6,668	4,126	22	12.5	14.3	175	133	32	10	15	0	365	350	308	38.4	207
25 Ships General Cargo Average		3,095	2,082	22	9.8	11.7	124	135	47	32	17	10	365	338	259	45.8	251

Source: STRAMINDO On-board Survey

Table 3.4.7 Items for Analysis of Ship Conditions and Productivity

	Description	Item	Formula	Unit
(a)	Target ship type	Container & General Cargo Ships		
(b)	Items for Analysis • Principal Particulars of the ship	Ship name, owner's name, DWT, GRT, ship age, speed		
	• Details of the ship's working days in a year	Annual navigation days; annual cargo working days; annual waiting days for berth, cargo, repairs, and docking out of 365 days		
	• Additional items for evaluation of productivity	- Commissionable Days Commissionable days refer to working days in a year including sailing days, cargo working days, and waiting days.	$HO_t = HL_t + HP_t$, or $HO_t = 365 - HD_t$ Where: HO_t = Average ship operational days at year t HL_t = Average sailing days at year t HP_t = Average anchorage days in port (port days) at year t HD_t = Average total days, ship in reparation/maintenance (docking) at year t	[Day] [Day] [Day] [Day] [Day] [Day]
		- Actual Working Days	Actual Working Days = Commissionable Days – (Waiting days for berthing + Waiting days for cargo readiness)	[Day]
		- Load Factor Load Factor refers to loading efficiency of ship.	$LFR_i = \frac{\sum M_i}{\sum KK_i} \times 100\%$ Where: LFR_i = Ship load factor at route space i $\sum M_i$ = Total cargo on board at route space i $\sum KK_i$ = Number of required ship-carrying capacity, that is 0.8 x ship DWT which through route space i	[%] [%] [Ton] [Ton]
		- Cargo Ship Productivity	$PRBv_i = \frac{\sum (Bv_i \times Jv_i)}{\sum BMKv_i}$ Where: $PRBv_i$ = Rate of cargo ship productivity at route/voyage space i Bv_i = Number of transported cargo at route/voyage space i Jv_i = Distance of route/voyage space i $BMKv_i$ = Ship dead weight through space i	[Ton-mile/ DWT] [Ton-mile/ DWT] [Ton] [Mile] [DWT]

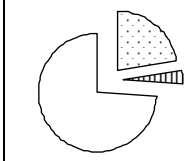
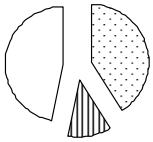
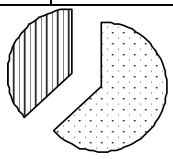
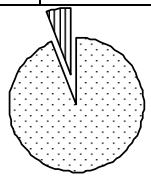
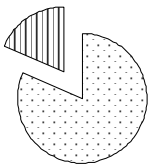
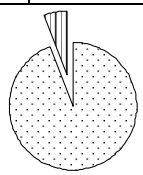
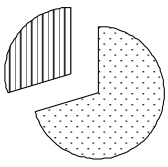
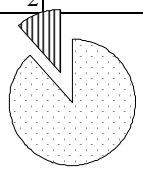
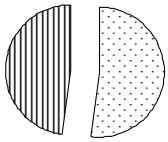
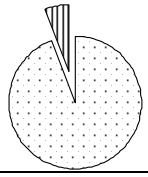
(3) Ship Management and Navigation Safety

(a) Present situation of ship management

There were too many captains who did not know whether their ships were insured. Meaning their consciousness of maritime accident prevention was very low.

- Among captains of general cargo vessels, 37% understood neither the drawing nor the manual. Moreover, since the manual, etc. were written in Japanese or in a European language, crews did not understand them.
- The engine parts of 30% of general cargo vessels were insufficient.
- About 50% of general cargo vessels had inadequate maintenance budget and inappropriate maintenance system.

Table 3.4.8 Results of Interview Survey (Safety Management)

No.	Question	General Cargo (27 Vessels)			Container (17 Vessels)		
1	P&I Insurance and Hull Machinery Insurance	Yes	No	n/a	Yes	No	n/a
		6	1	20	7	2	8
		74% of captains did not know if their ships were insured.			47% of captains did not know if their ships were insured.		
2	Drawings and instructions of manuals, books for ship board machinery and equipment	Yes	No	n/a	Yes	No	n/a
		17	10		16	1	
		37% of captains did not know where they were and almost all of such documents seemed unused.			94% of captains could show them on board, but some were written in Japanese or a European language.		
3	Tools and equipment for the workshop on board	Yes	No	n/a	Yes	No	n/a
		22	5		16	1	
		Almost all prepared them.			Almost all prepared them.		
4	Spare parts and ship stores for machinery maintenance	Yes	No	N/a	Yes	No	n/a
		19	8		15	2	
		30% did not prepare enough kinds and number.			Almost all prepared them.		
5	Is the ship provided with adequate budget and appropriate planned maintenance system?	Yes	No	n/a	Yes	No	n/a
		14	13		16	1	
		Nearly 50% are dissatisfied.			Almost all were satisfied with the arrangement.		

Yes
No
n/a

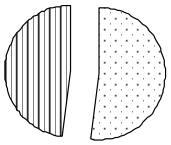
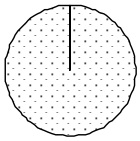
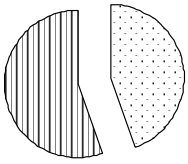
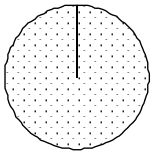
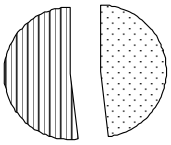
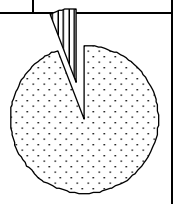
Source: STRAMINDO On-board Survey

(b) Present situation of navigation safety

The results of the interview on navigation safety are as follows:

- Stability calculation: About 50% of general cargo vessels did not adjust their ships' trim/heel nor calculate their stability for safe ship navigation.
- Passage Plan: 55% of general cargo vessels had no respective passage plans with which to guide their courses.
- Preparation of update charts: 50% of general cargo vessels did not prepare collecting charts to update.

Table 3.4.9 Results of Interview Survey (Safety Management)

No.	Question	General Cargo (27 Vessels)			Container (17 Vessels)		
6	Checking draft, trim and stability of the ship to preserve the integrity of the ship	Yes	No	N/a	Yes	No	N/a
		14	13		17		
		Nearly 50% were not interested in them.			All conducted the checking and showed the record books.		
7	Passage Plan for the voyage and perform voyage under the plan	Yes	No	N/a	Yes	No	N/a
		12	15		17		
		More than 50% were not interested in the plan.			All carried it out according to the order of captain.		
8	Preparation of the updated charts required for the voyage	Yes	No	N/a	Yes	No	N/a
		13	14		16	1	
		50% did not prepare			Almost all prepared them.		
9	Communication method for ship to shore and vice versa with (1) VHF (2) Mobile Phone (3) Inmarsat	Yes	No	N/a	Yes	No	N/a
		1) 27			1) 17		
		2) 5	22		2) 6	11	
		3) 4	23		3) 6	10	1
		VHF was installed in all vessels; 35% had Inmarsat.			VHF was installed in all vessels; 11% had Inmarsat.		

Yes
No
n/a

Source: STRAMINDO On-board Survey

(4) Safe Operations and Maintenance Practices

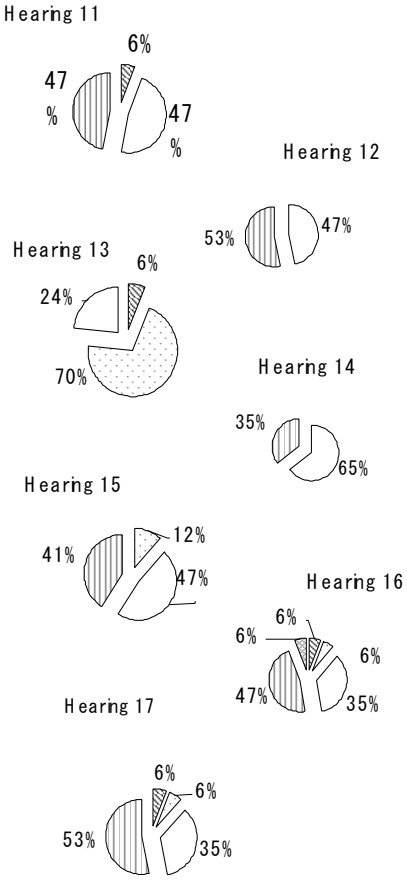
(a) Container vessels

Five-stage evaluations were performed on the navigation safety and maintenance of container vessels. The results are as follows:

- The deck and hull were well maintained and the navigation equipment were well operated.
- The propeller and underwater plating were coated with seaweeds and /or shells.
- The engine room of almost all container vessels were kept swept and clean.

Table 3.4.10 Results of Interview Survey (Safety/Ship Management of Container Vessels)

Question	1	2	3	4	5
Interview 11 Are the outside shell, upper deck and super structures maintained well or corroded?	1		8	8	
Interview 12 Are the navigation and bridge equipment operating well?			8	9	
Interview 13 Are the propeller and underwater plating fouled with seaweeds and /or shells?	1	12	4		
Interview 14 Are the mooring equipment and ropes maintained well?			11	6	
Interview 15 Is the engine room and engine bed kept swept and clean?		2	8	7	
Interview 16 Is the life saving equipment and apparatuses arranged in compliance with rules and kept in good condition?	1	1	6	8	1
Interview 17 Are the fire fighting equipment and apparatuses arranged orderly?	1	1	6	9	



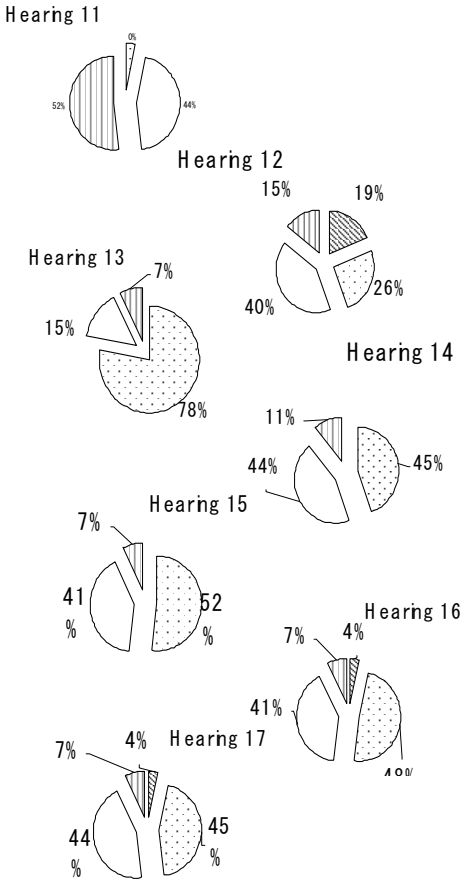
Note : Condition for Assessment
Raring Level 5…… Very Good Condition
Rating Level 4…… Good Condition (Satisfaction)
Rating Level 3…… Normal Condition (Standard Condition)
Rating Level 2…… Unsatisfactory Condition
Rating Level 1…… Very poor Condition
Source: STRAMINDO On-board Survey

(b) General cargo vessels

- Although the maintenance of hull parts, such as outside shell and upper deck, was done well, propellers and underwater plating were in very bad condition.
- The engine room and engine bed were stained
- The life saving and fire fighting equipment were in bad condition.

Table 3.4.11 Result of Interview Survey (Safety/Ship Management of General Cargo Vessels)

Question	1	2	3	4	5
Interview 11 Are the outside shell, upper decks and super structures maintained well or corroded?		1	12	14	
Interview 12 Are the navigation and bridge equipment operating well?	5	7	11	4	
Interview 13 Are the propeller and underwater plating fouled with seaweeds and /or shells?		21	4	2	
Interview 14 Are the mooring equipment and ropes maintained well?		12	12	3	
Interview 15 Is the engine room and engine bed kept swept and clean?		14	11	2	
Interview 16 Are the life saving equipment and apparatuses arranged in compliance with rules and kept in good condition?	1	13	11	2	
Interview 17 Are the fires fighting equipment and apparatuses arranged orderly?	1	12	12	2	



Source: Findings of STRAMINDO's On-board Survey

(5) Summary of On-board Survey (Problems Identification)

(a) Low productivity

The actual number of annual operating days (Actual Working Days) was very low for general cargo vessel, at 259 days, compared with that of container ships which had 288. This was due to long waiting time for berth, cargo, and dock/repairs.

(b) Ageing vessels

Almost all vessels were over 20 years of age. There was one vessel that was 43 years old (rebuilt in 1991).

Table 3.4.12 Vessel Age

Classification	Average Age at Time of Register	Average Ship Speed (at Present)	Average Ship Speed (at Sea Trial)
Container	15	11.2	13.1
General Cargo	12	9.8	11.7

Source: STRAMINDO
Note: Average age was obtained using procurement date of second-hand vessels.

(c) Poor maintenance

Vessel maintenance was not satisfactorily done to keep vessels in a safe and sound condition. Some had become superannuated as the picture below shows.

Figure 3.4.3 Superannuated Ship

(d) Limited spare parts

The minimum level of maintenance work on engines and nautical instruments required for navigation and operation was done by the ships' crews, although some parts were out of order due to lack of supply from ship-owners.

(e) Insufficient test and drill for safety

About 60% of surveyed vessels did not test the emergency generator, fire fighting system, and emergency steering gear to ensure that they are ready and working properly. Nor did they conduct fire and abandon ship drills.

(f) Poor crew facilities

Facilities, such as air conditioning units, galleys, toilets, and bathrooms, for the crews were far from satisfactory. Such poor conditions may indicate potential vulnerability to sea incidents and accidents.

(g) Lack of indispensable charts

Preparation of harbor and approach charts is very important in safely calling at port, but almost all surveyed vessels did not have harbor and approach charts.

In Japanese waters, more than 10 vessels are now aground on the coast and leaking oil. The vessels cannot be removed because they are not insured and were abandoned by ship-owners. The main reason for this kind of accident seems to be that vessels did not prepare harbor and approach charts as well as detailed coastal charts.

(h) No safekeeping of certificates

A considerable number of captains of the surveyed vessels did not have in their possession the necessary certificates and did not realize the necessity for them, although ADPEL in all ports collects and checks these certificates and, as the responsible authority, makes necessary actions against violators.

(i) Obsolete equipment

On-board life rafts were within their effective dates, but almost all the lifeboats and boat davits were past due their effective dates.

(j) Cargo handling gear

Many vessels did not show the Safe Working Load (SWL) mark on derricks.

(k) Smoking in the engine room

In almost all of vessels inspected, there were crew members smoking in the engine room. Many sea accidents caused by fire often started from the engine room. It must be stipulated in regulations that except in airtight engine control rooms smoking is prohibited in the engine room.

Figure 3.4.4 Smoking in Engine Room

(l) Frequent engine troubles due to poor maintenance

Main engines and generators were overhauled by the crew, but almost all of the engineers did not measure the thickness of piston rings resulting in frequent engine troubles. There were cases when the machinery could not be repaired because of lack of spare parts supply from ship-owners.

(m) Unused boiler

Almost all of the boilers in the engine room were not used even if heavy oil was used as fuel oil which requires the use of boilers.

(n) Lack of oil bilge separator

The utilization of oil-bilge separator could not be observed in all inspected ships. A considerable number of vessels seemed too overboarded with oil bilge at sea. MARPOL 73/78 requires not to overboard oil bilge above 15 ppm.

(o) Underused Purifier

Purifiers to clean fuel oil, especially heavy and lubricating oil, were not used effectively and efficiently.

(p) Language barrier

Eighty-two percent (82%) of the total number of surveyed vessels (container vessel and general cargo vessel) were second-hand. Almost all notice boards, drawings, and instructions on board were written in the language of the country where the vessel was built. Therefore, the crew could not understand them.

To perform on-board maintenance strictly, such on-board device information must be translated into and clearly visualized in Bahasa Indonesia.

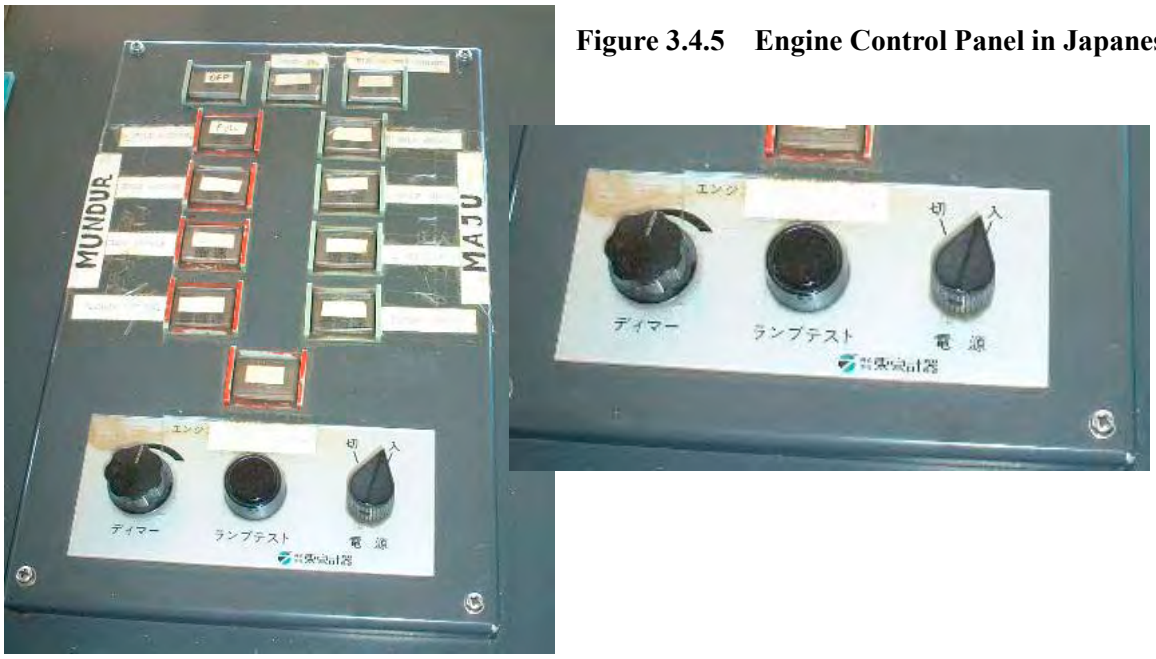


Figure 3.4.5 Engine Control Panel in Japanese

(q) Limited application of modern ship management

Almost all surveyed vessels were managed and operated by conventional and traditional methods by their owners. Except for a few vessels operated by large-scale enterprises, the management and on-board operations manuals could not be found in the surveyed vessels, a gross violation of ISO 9000s and ISM-SMS provision.