THE REPUBLIC OF INDONESIA

FINAL REPORT

FOR

THE STUDY ON MARITIME SAFETY PLAN

CONCERNING

SEARCH AND RESCUE

SUPPORTING REPORT
FOR
LONG-TERM DEVELOPMENT PLAN

FEBRUARY 1989

JAPAN INTERNATIONAL COOPERATION AGENCY

18824

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PREFACE

In response to a request from the Government of the Republic of Indonesia, the Japanese Government decided to conduct a study on the Maritime Safety Plan concerning Search and Rescue in the Republic of Indonesia and entrusted the survey to the Japan International Cooperation Agency (JICA).

JICA sent to Indonesia a survey team headed by Mr. Reijiro Shiobara from October to December, 1987 and Mr. Inehiko Yoshino of the Japan Association for Preventing Marine Accidents from July to September, 1988.
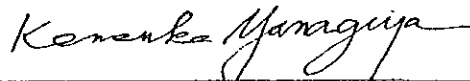
The team held discussions with concerned officials of the Government of Indonesia, and conducted field surveys.

After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the development of the Project and to the promotion of friendly relations between our two countries.

I wish to express my sincerest appreciation to the concerned officials of the Government of the Republic of Indonesia for their close cooperation extended to the team.

February, 1989

Kensuke Yanagiya
President
Japan International Cooperation Agency

February 21 , 1989

Mr. Kensuke Yanagiya
President
Japan International Cooperation Agency

Dear Mr. Yanagiya:

        We have the honor to submit to you our final report for the Study on
Maritime Safety Plan Concerning Search and Rescue in the Republic of
Indonesia.   It is a great pleasure for us that this Study has been
completed under the close cooperation of two governments of Japan and
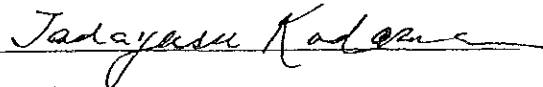Indonesia.

        The final report was prepared during the past 18 months by the Study
Team organized by members of Japan Association for Preventing Marine
Accidents in association with Japan Life Boat Institution and Yachiyo
Engineering Co., Ltd., and headed by Mr. Inehiko Yoshino.   It comprises
Summary, Long- and Short-term Development Plan, and Supporting Reports.

        In preparing this Report, our Team benefited a great deal of the
cooperation from officials and experts of Japan International Cooperation
Agency and other authorities concerned of the Government of Japan.

        On behalf of the study team, I would like to express my deepest
appreciation to the officials concerned and other related agencies of the
Republic of Indonesia for their enormous cooperation, assistance and warm
hospitality extended to the study team members.

        We sincerely hope that this Report will contribute to the further
development of the Republic of Indonesia.

                                        Sincerely yours,

                                        Tadayasu Kodama
                                        President
                                        Japan Association
                                        for Preventing Marine Accidents

TK/ma

SUPPORTING REPORT

FOR

LONG-TERM DEVELOPMENT PLAN

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ABBREVIATIONS

A

AC	JICA Advisory Committee
ADPEL	Port Administrator Office (Administrasi Pelabuhan)
AMVER	Automated Mutual Assistance Vessel Rescue System
ARMADA KPLP	KPLP Fleet
ARQ	Automatic Request
ASEAN	Association of Southeast Asian Nations
AUSREP	Australian Ship Reporting System

B

BAG. UMUM	General Affair Division
BASARI	Indonesian SAR Board
BASARNAS	National SAR Agency
BR	Banjarmasin rescue

C

CD	Character Display
COSPAS	Kosmicheskaya Sistyema Poiska Avariynych Sudov (Space system for search of distress vessels)
CH	Channel
CPU	Central Processing Unit

D

Dit.	Directorate
DGSC	Directorate General of Sea Communication
DISNAV	District of Navigation
DRCS	Digital Radio Concentrator System
DSC	Digital Selective Calling
DWT	Dead Weight Tonnage

E

EGS	Engine Generator System
EPD	Equipment Protection Device
EPIRB	Emergency Position Indicating Radio Beacon
ETA	Estimated Time of Arrival

F

FAX	Facsimile
FKSD	Regional SAR Coordination Forum

G

GD	Graphic Display
GDP	Gross Domestic Product
GHz	Giga Hertz
GMDSS	Global Maritime Distress and Safety System
G & R Dept.	Guard and Rescue Dept.
G/T	Gross Tonnage

H

HB/ADPEL	Harbour Master Office
HF	High Frequency
HUKUM	Legal Division

I

IMO	International Maritime Organization
Indonesia	The Government of the Republic of Indonesia
INMARSAT	International Maritime Satellite Organization
INSPEC.	Inspection
INSPIRES	Indian Ship Position and Information Reporting System

J

JASMAR	Directorate of Marine Service
JASREP	Japanese Ship Reporting System
JICA	Japan International Cooperation Agency

K

KANWIL	Maritime District Office
KAPPEL	Shipping and Marine Safety
KEPEGAWAIAN	Personnel Division
KKR	Rescue Coordination Center
KPLP	Directorate of Sea and Coast Guard
KPLP/ADPEL	Sea and Coast Guard Unit

L

LALA/ADPEL	Sea Transportation Unit
LUT	Local User Terminal

M

MCC	Mission Control Center
MES	Message Exchange System
METEO	Meteorology
MF	Medium Frequency
MIS	Management Information System
MRDTS	Maritime Radio Direct Telephone System
MSTC	Maritime Safety Training Center

N

NAVIGASI	Directorate of Navigation
NAV/ADPEL	Navigation Unit
NAVTEX	Navigation Telex
NBDP	Narrow Band Direct Printing
NM	Nautical Mile

O

OPEC	Organization of Petroleum Exporting Countries

P

PELPENG	Port Dredging Division
Pelita/Repelita	Five-year Development Plan
PERENCANAAN	Planning Division
Perumpel	Public Port Corporation
Perumpen	Public Dredging Corporation
Pertamina	State Owned Oil Company
PUSDIKLAT	Education & Training Agency

R

RCC	Rescue Coordination Center
RDP	Radar Data Processor
RLS	Regular Liner Service
Rp	Rupiah
RS	Relay Station
RX	Receiving Station

S

SAR	Search and Rescue
SAR Convention	International Convention on Maritime Search and Rescue, 1979
SARSAT	Search and Rescue Satellite-Aided Tracking
SES	INMARSAT Ship Earth Stations
SKR	Rescue Coordination Sub-Center
SOLAS 1974	International Convention for the Safety of Life at Sea, 1974
SS	Subscriber Station
S-S	Ship-to-Ship
SSB	Single Side Band
STCW 1978	International Convention on Standards of Training, Certification and Watchkeeping for Seafares of 1978
STRATA	Education System meaning "Grade" in Dutch
S/W	Scope of Work

T

TDMA	Time Division Multiple Access
TDP	Traffic Data Processor
TP	Telephone Device
TRX	Transmitting and Receiver
TTY	Teletypewriter
TX	Transmitter

U

UPS	Uninterruptive Power Supply System
U.S.	United State of America

V

VHF	Very High Frequency
VLR	Very Long Range
VTS	Vessel Traffic Services

1 Introduction

Section 1 Introduction

1.1 Composition of the Field Survey Groups (Phase I)

The composition of the field survey groups is shown in Table 1-1-1.

Table 1-1-1 Composition of the Field Survey Groups
(Phase I; Oct.-Nov., 1987)

(1) Field Survey Group I

JICA Study Team	Advisory Committee
Mr. R. Shiobara	Mr. Y. Hayafune
Mr. M. Manabe	Mr. T. Toyokura
Mr. O. Hosokawa	Mr. M. Yokoyama
Mr. A. Takahashi	Mr. A. Kobayashi
Mr. T. Onda	Counterpart:
Mr. M. Kida	Mr. Ch. Paath
Mr. M. Sakamoto	Mr. Albert Samboh
Mr. M. Katayama	Capt. Conrad Siahaan

(2) Field Survey Group II

JICA Study Team	Advisory Committee
Mr. S. Tokieda	Mr. A. Kobayashi
	Counterpart:
	Capt. Ronny Beaupain
	Mr. Hartono
	(Tg.Priok and Medan/Belawan only)
	Mr. W.H. Simorangkir
	(Surabaya and Banjarmasin only)

(3) Field Survey Group III

JICA Study Team	Advisory Committee
Mr. T. Chiba	Mr. S. Teramoto
	Counterpart:
	Mr. Triyuswoyo
	Mr. Judistar

1.2 Itinerary of the Field Surveys

1.2.1 Phase I Survey

The field surveys were carried out by the three groups for the period of about six weeks from 10th October through 18th November 1987.

Field survey group I paid a visit mainly to the following places in KANWIL areas:

- Regional Maritime Office (KANWIL):
- Port Administrator Office (ADPEL):
- Sea and Coast Guard Office (KPLP unit):
- Harbour Master Office (HB unit):
- Sea Transportation (LALA unit):
- District of Navigation (DISNAV unit):
- National SAR Agency (BASARNAS):
- Rescue Coordination Center (KKR):
- Sub Rescue Coordination Center (SKR):
- Public Port Corporation (PERUMTEL):
- Pertamina

Field survey group II in charge of the traffic control system visited the areas of KANWIL's I, III, IV, V and VI together with survey group I. Survey group II also visited Palembang separately.

Survey groups I and II went on board vessels belonging to KPLP and DISNAV, and also visited some other vessels to collect information related to maritime safety and SAR, including marine accidents, etc.

Field survey group III visited the education and training institutes in Jakarta, Surabaya, Semarang and Ujung Pandang.

1.2.2 Phase II Survey

The Field Surveys were carried out by seven groups from 25th July to 8th September 1988. Study Team and Indonesian counterpart personnel discussed the Interim Report.

Group 1   carried out field survey in Jakarta and Surabaya.

Group 2   carried out field survey in Jakarta, Surabaya and Ujung Pandang.

Group 3   carried out field survey in Jakarta, Semarang and Ujung Pandang

Group 4   carried out field survey in Jakarta, Surabaya, Ujung Pandang and Menado.

Group 5,6 carried out field survey in Jakarta and Surabaya.

Group 7   carried out field survey in Jakarta.

1.2.3 Submission of and Discussion on Draft Final Report

The study team submitted the Draft Final Report to the Indonesian counterpart personnel to hold discussions with them in Jakarta from 1st to 14th Decembedr, 1988.

1.3 Philosophy for Maritime Safety

On the occasion of newly establishing a maritime safety development plan concerning Search and Rescue (SAR), it is advisable to look back again into the philosophy for Maritime Safety which has been regarded as a basic concept and/or idea and deemed suitable for the situations in the Republic of Indonesia relating to Maritime Safety concerning SAR.

It is natural that the philosophy should be derived from God will, based on PANCASILA and then classified into the main three categories according to the important Laws such as "Shipping Law 1936/TZMKO-1939", "Law No. 4 (Prp) 1960 regarding the Sea of Indonesia" and "Law No. 20/1982 regarding Defense & Security" which maintain a close relation between them. The categories are referred to as "Economy", "Safety maritime" and "Sovereignty and law principle" slightly overlapping one the other adjoining in their activities and lead to the fleets; Merchant feet, Government fleet of Maritime safety and Navy feet.

The must is to recognize for Maritime Safety how important a maritime safety fleet is, occupying a position between a merchant fleet for economy and a navy fleet for defense and security. The three columns of the philosophy have legitimately been strengthened to be reasonable for the situations as aforementioned. The following flow chart (obtained from KPLP) of the philosophy is self-explanatory.
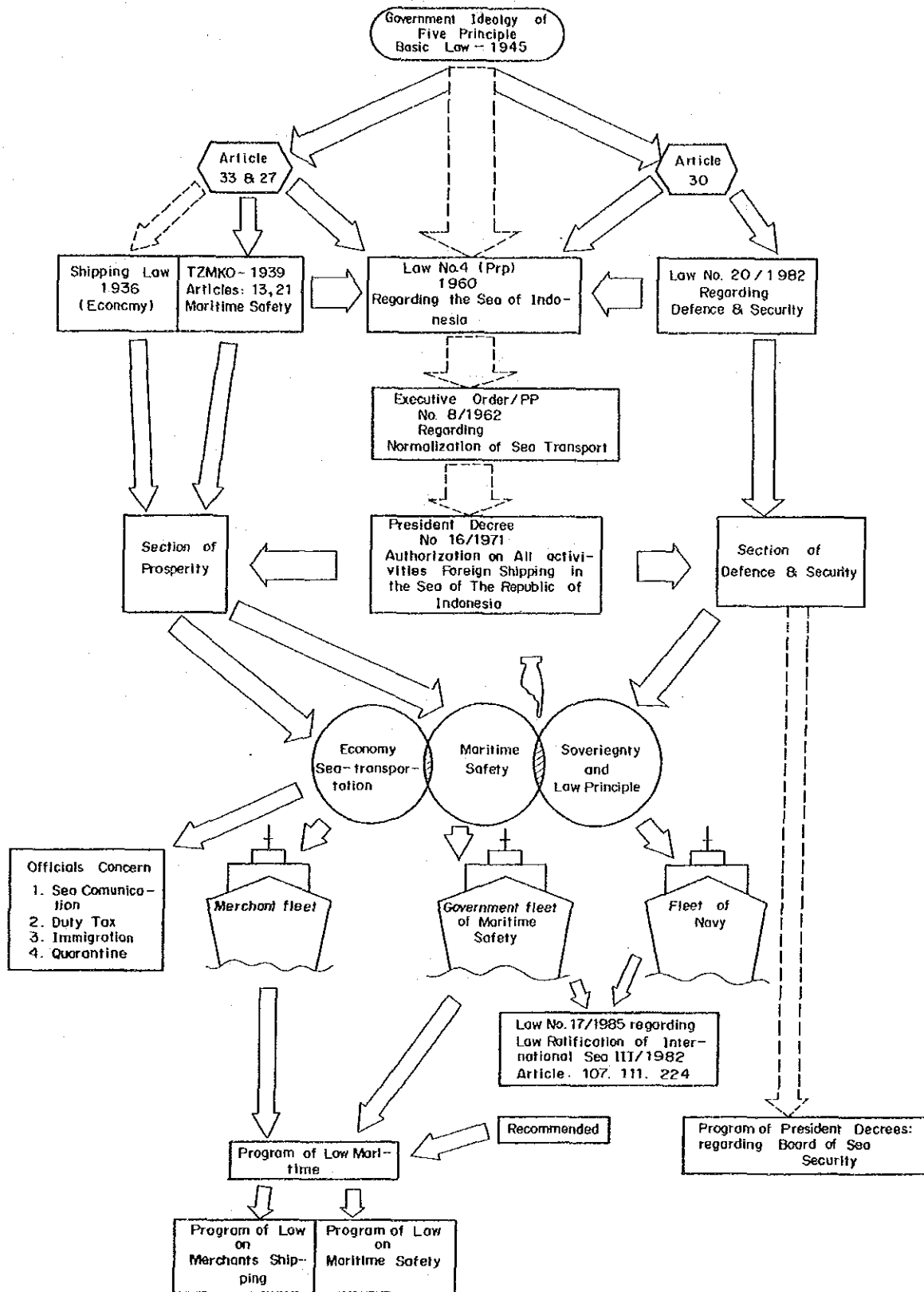
Fig. 1-1-1   Flow Chart of Philosophy

2 Socio-economic Study

Section 2 Socio-economic Study

2.1 Socio-economic Conditions

The following are a summary of the present socio-economic structure of
Indonesia.

(1) Indonesia consists of about 13,700 islands within a north-south
range of 1,800 km and an east-west range of 5,500 km. About 164 million
people live in the area.

(2) The regional distribution of the people is very uneven. Jawa
island, which occupies only 6.9% of Indonesia's total land area, has 62%
of the total population in Indonesia.

(3) The average population density in Indonesia is 77 people per
1 km^2. The breakdown of the above figure is 693 people per 1 km^2 in
Jawa island, 13 people per 1 km^2 in Kalimantan island and 3 people per
1 km^2 in Irian Jaya.

(4) There are about 13,000 small islands which have less than 1,000
inhabitants.

(5) The administrative system of Indonesia consists of 27 Provinces as
the primary districts, 246 Kabupaten(s) and 54 Kotamadya(s) as the
secondary districts, 3,539 Kecamatan(s) as the tertiary districts, and
67,534 Desa(s) as the smallest administrative districts.

(6) The growth rate of the real Gross Domestic Product (GDP) between
1973 and 1981 was 7.5% per year. The nominal GDP per capita reached
US$560 in 1981. Indonesia in 1981 was classified as a medium income
nation according to the World Bank. The GDP growth rate, however, went
down to 2.2% per year in 1982 due to the decrease of oil revenue caused
by the world-wide recession, and in 1983 went up to 4.2% per year with
the devaluation of Rupiah currency. In 1984, the nominal GDP per capita,
however, still ranked under US$500, though the GDP growth rate was 6.1%.

The GDP growth rates from 1985 through 1987 were 2.3%, 3.2% and 3.8% respectively. It now seems that it would be difficult to realize the GDP growth rate of 5% per year, the target figure of Pelita-IV.

(7) Indonesia has been trying to change its industrial structure from an agriculture-led structure to a manufacturing-led structure through large government-initiated projects financed primarily by oil revenue.

(8) The industrial structure of Indonesia reads as follows; the agricultural sector (24% in the 1984 real GDP share), the mining sector (19%), the manufacturing sector (12%) and the transport sector (6%). The share of the agricultural sector has been decreasing. The share of the mining sector is quite large due to oil production. The mining sector had only 0.2% share in 1973 but went up to 19% in 1984. The share of the manufacturing sector has been rapidly increasing. The manufacturing sector together with the services sectors, is predicted to be the lead in the Indonesian economy in the near future.

(9) There are two problems which the manufacturing sector in Indonesia has to solve in order to make a further advancement. They are (a) expansion of capital goods production through development of domestic manufacturing firms and (b) development of strategic goods which can compete in the world market besides oil.

(10) The balance of payments has recently been negative due to excess imports. To improve this situation, Indonesia has to export more manufactured goods or to depend on foreign aid if the oil revenue keeps going down. Foreign Exchange Reserves at the Central Bank recently turned upward from US$ 5.3 billion at the end of 1986 to US$ 6.5 billion at the end of 1987, with the export increment of non-oil and gas products, and the reserves are estimated to total US$ 10.5 billion if Foreign Currency Holdings of foreign exchange banks are added to those of the Central Bank. However, the debt service ratio has also been at unhealthy figures. It was over 20% in 1985 and is now estimated to be 35% for fiscal year 1987/88 (April 1987 – March 1988).

Table 2-1-1 Annual Growth Rate of GDP (1973 Constant Price)

Year	Rate of Growth (%)
1961	5.74
1962	1.84
1963	2.24
1964	3.53
1965	1.08
1966	2.79
1967	1.38
1968	6.88
1969	10.90
1970	7.53
1971	7.01
1972	7.04
1973	8.10
1974	7.64
1975	4.98
1976	6.89
1977	8.76
1978	7.86
1979	6.25
1980	9.87
1981	7.93
1982	2.24
1983	4.19

Source: All data are derived from the National Income Accounts, prepared by BPS, Jakarta

Table 2-1-2 Sectoral Growth Rates, 1960-81

Sector	% Share of GDP 1973	Annual Growth Rates		
		1960-67 (%)	1967-73 (%)	1973-81 (%)
Agriculture	40.1	1.6	4.1	3.5
Mining	0.2	1.8	18.1	3.6
Manufacturing	9.6	1.0	9.6	14.2
Utilities	0.5	9.4	10.9	14.1
Construction	3.9	-2.3	24.2	13.0
Trade	16.6	2.2	11.7	7.4
Transport	3.8	0.9	10.8	13.8
Finance	1.2	-2.7	28.5	14.6
Dwellings	2.1	1.7	7.2	12.1
Public Administration	6.0	4.6	4.9	12.8
Other Services	3.9	2.4	2.3	2.4
Total	100.0	2.0	7.9	7.5

Table 2-1-3 GDP Growth in Constant Prices, 1983-85

(Unit: Rp billion)

Sector	1983	Share (%)	1984*	1985*	1986**	Share (%)	Present Growth 1983-86
Agriculture	17,696	24.0	18,431.1	19,209.0	19,687.0	23.9	3.6
Foodcrops	11,057		11,598.7	11,894.6	12,116.5		
Smallholder Crops	2,295		2,349.3	2,575.7	2,722.2		
Estate Crops	375		445.5	510.8	511.8		
Livestock	1,754		1,890.1	2,036.5	2,097.0		
Forestry	994		894.4	850.7	841.6		
Fisheries	1,220		1,253.1	1,340.7	1,397.9		
Mining	13,968	19.0	14,788.7	13,980.5	14,572.0	17.7	1.4
Oil and Gas	13,346		14,203.4	13,368.7	13,936.4		
Others	622		585.3	611.8	635.6		
Manufacturing Industry	8,211	11.1	9,770.3	10,579.1	11,161.5	13.5	10.8
Non-oil	6,211		6,593.6	7,000.7	7,340.8		
Oil Refining	129		386.5	659.9	897.9		
LNG	1,871		2,790.2	2,918.5	2,922.8		
Utilities	524	0.7	550.3	594.9	633.7	0.8	6.5
Construction	4,597	6.2	4,393.8	4,508.0	4,197.6	5.4	-3.1
Trade	12,009	16.3	12,159.7	12,363.0	12,730.3	15.4	2.0
Wholesale, Retail,	10,412		10,451.5	10,619.8	10,963.2		
Hotels, etc.	1,598		1,708.2	1,743.2	1,767.1		
Transport	3,978	5.4	4,442.4	4,481.8	4,541.6	5.5	4.5
Finance	2,039	2.8	2,422.3	2,430.6	2,558.5	3.1	7.9
House Rental	1,962	2.7	2,072.3	2,145.2	2,220.7	2.7	4.2
Public Administration	5,712	7.8	5,996.7	6,438.5	6,601.4	8.0	4.9
Other Services	3,001	4.1	3,116.8	3,180.2	3,270.2	4.0	2.9
GDP	73,698		78,144.4	79,910.8	82,474.5		3.7

 * Revised figures

** Preliminary figures

Source: Statistical Yearbook of Indonesia 1987, BPS

2.2 Pelita and Economic Development

(1) Past Development Plans (Pelita I - III)

Development plans in Indonesia started with the First Five-year Development Plan (Pelita I) in 1969, and have continued every five years. They are now being implemented in the Fourth Five-year Development Plan (Repelita IV).

Pelita I, which started in 1969, targeted enhancement of self-sufficient capabilities of foods and construction of infrastructures. The real growth rate of GDP showed 7.7% as an annual average rate, which exceeds the target rate of 5%.

In Pelita II started in 1976, the real growth rate of GDP was recorded as 6.9% against 7.5% targeted. This decrease was caused by the world-wide economic recession due to the first oil crisis and lead to execution of a 50% Rupiah devaluation.

Pelita III, which started in 1979, aimed at establishment of an economic structure not depending on oil. The Government devaluated again the currency 38% due to decrease of oil revenue.

The outline of each Pelita is described in Table 2-2-1.

Table 2-2-1   The Outline of Pelita I, II and III

Years	1969/70 – 1973/74 Pelita I	1974/75 – 1978/79 Pelita II	1979/80 – 1973/84 Pelita III
	(Urgent stabilization of the National Economy	(Making a foundation for "Take-off" and Balanced Development)	(Further Development and Equitable Distribution)

Main Objectives	1) Expansion of the agricultural sector, especially in foods production.
	
	2) Expansion of the textile and apparel industry, construction of infrastractures, development of agriculture supporting industries.
	
	3) Control of inflation
	
	GDP growth rate
	  Target 5%
	  Realized 7.7%
		1) Production expansion of goods, construction of infrastructures
		
		2) Fair provision of social welfare, equalization of income distribution
		
		3) Creation of job opportunities
		
		4) Making a foundation to build the heavy industry
		
		GDP growth rate
		  Target 7.5%
		  Realized 6.9%
			1) Faster economic growth
			
			2) Stabilization of a sound and dynamic society
			
			3) Promotion of export of non-oil related goods
			
			4) Development of labor-intensive industries, and development of leading firms
			
			5) Growth of the private sector
			
			6) Self-sufficiency of foods
			
			GDP growth rate
			  Target 6.5%
			  Realized 6.1%

(2) Forth Five-year Development Plan (Pelita IV)

The objectives of Pelita IV are to improve the living standard, the educational level and the welfare level in order to build a strong foundation for future advancement. Mostly emphasized are economic developments, especially creating self-supply capability of foods in the agricultural sector, and producing capital goods in the manufacturing sector.

The financial policy stresses the continuation of balanced budgets, together with the increase of government revenue from non-oil sources and the increase of government surpluses by more efficient spending. The monetary policy emphasizes the promotion of saving in the private sectors and the control of inflation (8% per year). The trade policy emphasizes the increase of the export of non-oil related products, particularly the export of manufacturing products, and expresses caution about foreign debt. The investment policy stresses the larger injection of the government funds into labor intensive activities which also depend less on imported goods. In general, the increase in efficiency for economic activities, simplification of trade procedures, rules and regulations, and the increase of activities initiated by the private sector are emphasized.

The GDP growth rate per year during Pelita IV is targeted to be 5%, which is set far below the target levels of Pelita II and III. The industrial growth rates are targeted as follows: 3% in the agricultural sector, 2.4% in the mining sector, 9.5% in the manufacturing sector, 5% in the construction service sector, 5.2% in the transportation/communication service sector and 5% in the other sectors. The manufacturing sector is expected to be the leader. As a result of Pelita IV, by the end of 1988, the following are planned to be realized; the agricultural sector share in GDP goes down to 26.4% from 29.2% in 1983; the manufacturing sector share in GDP goes up to 19.4% from 15.8%; hence, the more balanced economic structure is anticipated.

Indonesia's population is predicted to increase at 2% per year and to reach about 175 million by the end of 1988. Hence, the GDP per capita growth rate is estimated to be 3% per year. The labor force will grow at 2.5% per year. The new addition to the labor force during Pelita IV will be approximately 9.3 million. Creation of new jobs will be expected to become the most important problem.

Pelita IV is in a difficult situation for achieving its objectives due to the drastic decrease in the government revenue caused by the oil revenue decline. The annual GDP growth rates were 6.1% in 1984 and 1.9% in 1985 and 3.2% in 1986 respectively. The government carried out the devaluation of Rupiah in 1986 to boost the oil revenue. Whether or not this policy will improve the economy is yet to be seen.

Pelita IV plans to build the framework for "Take-off". Repelita V plans to strengthen the foundation. Repelita VI plans to achieve "Take-off". "Take-off" means to put the economy on a steadily growing path through reduced dependence on oil and more powerful private sector activities. The central force to lead the economy is expected to be shifted from the government to the private sector. Hence, the agricultural products-led export structure must be changed into the structure in which high value-added manufacturing goods become main exporting goods. At the same time, domestic capital goods production must be developed urgently but steadily.

The future policies must be designed to solve the following problems; creation of new job opportunities, development of the outer Jawa islands, domestic production of capital goods, export of a high value-added manufacturing goods and reduction of foreign debts.

Table 2-2-2 Composition of GDP by Sector

(Unit: %)

S E C T O R	1983	1988	Annual Growth Rate
Agriculture, Forestry & Fishery	29.2	26.4	3.0
Mining	7.4	6.6	2.4
Manufacturing	15.8	19.4	9.5
Construction	6.3	6.3	5.0
Transportation & Communication	6.0	6.0	5.2
Services & Others	35.3	35.3	5.0
Total	100	100	5.0

Source: Repelita IV

Table 2-2-3 Gross Domestic Product and Investment

(Rp. billion, current prices)

	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	Repelita IV (Average increase rate)
1. GDP	73,692	84,465	96,579	109,624	123,515	138,127	552,309 (13.4%)
2. Investment	16,673	19,116	23,533	28,337	34,211	40,027	145,225 (19.1%)
a. Government Development Expenditures	9,196	10,459	12,849	15,415	18,543	21,343	78,609 (18.3%)
b. Others	7,482	8,657	10,684	12,922	15,668	18,684	66,615 (19.9%)
3. Investment/GDP Ratio	22.6%	22.6%	24.4%	25.8%	27.7%	29.0%	26.3%

Source: Repelita IV

Table 2-2-4 Composition of Budgetary Development Funds

(Rp. billion, current prices)

	1984/85	1985/86	1986/87	1987/88	1988/89	Repelita IV
Government Savings	6,048.3	7,751.0	9,699.0	11,856.0	14,139.9	49,495.7
Official Aid nd Loans	4,411.0	5,098.0	5,715.3	6,686.8	7,202.7	29,113.8
Budgetary Development Funds	10,459.3	12,849.0	15,414.3	18,542.8	21,342.6	78,609.5

Source: Repelita IV

Table 2-2-5 Domestic Revenues by Source

(Rp. billion, current prices)

	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	Repelita IV (Average increase rate)
I. Revenues from Oil and Natural Gas	8,869	10,367	12,668	15,227	17,874	20,623	76,758 (18.4%)
a. Oil	7,903	8,895	10,905	13,188	15,417	17,855	62,251 (17.7%)
b. Natural Gas	967	1,472	1,763	2,038	2,457	2,768	10,417 (24.1%)
II. Non-oil and Gas Revenues	4,955	5,783	7,126	9,056	11,708	15,037	48,710 (24.9%)
a. Taxes	4,453	5,168	6,424	8,228	10,751	13,940	49,510 (25.7%)
b. Non-taxes	502	615	702	828	958	1,098	4,199 (16.9%)
Total	13,824	16,150	19,794	24,283	29,582	35,660	125,468 (20.8%)

Source: Repelita IV

(3) Policies for Growth and Adjustment

As already noted, the Indonesian Government, faced with lower oil revenues, in acting to maintain balance of payments and domestic financial stability through demand restraint. However, over the medium term, Indonesia's ability to achieve its goals of sustainable growth with equity will depend crucially on the skill with which it manages the transition from oil dependency toward a more diversified, semi-industrial economy. Some of the elements of this strategy, including structural reforms and financial systems, are already in place. However, successful adjustment will require continued action in three key policy areas: management of the public investment program (and improvements in the regulatory/policy environment for private investment), rationalization of the external trade regime and development of the financial sector.

The recent decline of oil price has clearly demonstrated the importance of reducing the economy's heavy dependence on a single source of foreign exchange and, more generally, the need to rationalize the external trade regime. The Government has set a target of doubling non-oil exports in nominal terms over the next five years. This target should be attainable provided that economic recovery in the industrial economies is sustained.

The Government, through the bitter experiences of serious inflation in the past, has maintained the balance between the outgoings and the incomings. The budgetary scale was expanded for the period from 1981 to 1985 in accordance with the increase of earnings from oil market. In 1986, however, due to decline of oil prices, the apparent budgetary amounts were squeezed significantly. The budget for 1987 announced in January 1987 was increased by 6.4% in apparent figure. In real terms, the budgetary scale was compacted to the level of 73% of that of the previous year, when the devaluation of Rupiah was taken into account.

Table 2-2-6 shows the historical trend of national budgets applied from 1981 to date. In 1987 budget, the fund for almost of all sectors is reduced.

Given the substantial increase in funds needed to service the debt and given the domestic resource constraint and the balanced budget principle, fewer funds are available for development expenditures, which declined in nominal terms by 6.5%. Rupiah-financed development expenditures have been cut by 51%; the cut is even higher when compared with the estimated realized figures for 1986/87. The main reductions were in spending by ministries and agencies, defence, fertiliser subsidies and equity investments by government. Inpres and regional development expenditures experienced a smaller decline. On the other hand there has been a substantial increase in project aid funded expenditures, which is mostly a reflection of the devaluation; when compared with the realized figures for 1986/87, the increase is not so marked. The limited rupiah financing available for projects means no new projects will be started. Priority spending areas are ongoing projects, provision of counterpart funding, employment generating projects and O&M costs of existing projects. There has also been a fall in the rupiah component of development expenditures; of the Rp 7.8 trillion allocated for development expenditures, 43% comes from domestic savings (domestic revenues minus routine expenditures) and the rupiah component of project aid (c.f. 57% in the 1986/87 budget).

A look at the sectoral breakdown of development expenditures shows that industry and transmigration experienced the largest cuts, and agriculture, mining, communications and regional development continue to get the largest shares of development expenditures.

Table 2-2-6 Government Budget (1981-87)

(Rp. billion, current prices)

	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	Changes from 1986 (%)
(Revenues)								
A. Internal revenues	12,274	13,757	13,824	16,149	18,678	17,832	17,236	-3.3
1. Oil and LNG	8,575	9,122	8,869	10,367	11,160	9,738	6,939	-28.7
(1) Oil	8,575	9,122	7,903	8,895	9,480	8,146	5,978	-26.6
(2) LNG	-	-	967	1,472	1,680	1,593	961	-30.7
2. Non-oil and LNG	3,699	4,636	4,955	5,783	7,518	8,094	10,298	27.2
B. Development revenues	1,626	1,851	2,742	4,411	4,368	3,589	5,547	54.6
	13,900	15,607	16,565	20,560	23,046	21,422	22,783	6.4
(Expenditures)								
A. Routine expenditures	7,501	7,002	7,275	10,101	12,399	13,126	15,027	14.5
1. Civil servie	2,412	2,492	2,598	3,190	4,177	4,213	4,317	2.5
2. Goods procurement	994	1,021	1,099	1,200	1,452	1,367	1,175	-14.0
3. Subsidies for regions	1,209	1,315	1,388	1,785	2,590	2,640	2,649	0.4
4. Debt interest & installment	964	976	1,417	2,686	3,559	4,223	6,805	61.1
a. Domestic	30	30	30	30	30	40	40	0
b. Foreign	934	946	1,387	2,656	3,529	4,183	6,765	61.7
5. Others	1,921	1,150	724	1,177	602	683	80	-70.0
B. Development expenditures	6,399	8,606	9,290	10,459	10,647	8,296	7,757	-6.5
Expenditures Total	13,900	15,607	16,565	20,560	23,046	21,422	22,723	6.4

Source: Repelita IV
"Survey of Recent Development" published in Bulletin of Indonesia Economic Studies, August 1987

Table 2-2-7 Development Expenditure Budget (1981-87)

(Rp. billion, current prices)

Sector	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88
1. Agriculture & Irrigation	941.9	1,252.5	1,323.8	1,401.7	1,430.3	1,105.5	1,180.7
2. Industry	330.3	366.1	448.1	650.0	655.1	489.3	229.7
3. Mining & Energy	683.5	938.2	1,116.0	1,300.9	1,301.7	1,036.6	1,129.1
4. Communication & Tourism	810.2	1,098.4	1,307.3	1,392.1	1,425.4	1,063.3	1,288.1
a. Road	395.9	508.1	500.7	592.6	621.7	581.1	744.5
b. Land Transportation	88.0	145.0	230.7	236.6	238.1	146.1	108.3
c. Sea Transportation	158.7	212.7	231.8	274.4	274.7	146.3	161.0
d. Air Transportation	122.1	162.9	163.2	189.2	190.4	103.0	172.4
e. Post & Telecommunications	24.3	42.9	63.9	70.7	71.6	68.7	84.8
f. Tourism	21.2	26.9	27.0	28.6	28.9	18.1	17.1
5. Trade & Cooperation	64.2	106.4	106.7	127.1	128.8	111.6	132.5
6. Manpower & Transmigration	435.9	605.8	621.9	675.1	676.8	394.5	156.6
a. Manpower	42.0	79.2	82.7	98.3	98.5	69.1	45.2
b. Transmigration	394.0	526.7	539.2	576.8	578.3	325.4	111.2
7. Regional, Rural & Urban Development	612.5	740.6	783.0	809.9	868.2	938.9	873.8
8. Religion	46.5	60.3	60.7	62.9	63.6	41.9	15.6
9. Education, Youth, Culture	786.7	1,301.7	1,329.3	1,501.9	1,510.8	1,145.9	1,021.5
10. Health, Welfare, Family Planning	258.4	322.1	344.0	408.0	413.4	311.6	207.7
11. Housing	156.0	281.3	297.1	432.7	437.7	332.7	412.0
12. Law	66.6	79.3	79.5	80.4	80.7	40.6	14.0
13. National Defense & Security	481.2	568.7	524.2	697.7	714.1	554.0	510.0
14. Information, Press	45.7	54.5	57.0	67.6	67.7	41.5	24.0
15. Science, Research & Technology	100.2	121.9	158.3	205.9	207.9	169.6	158.6
16. State Apparatus	190.2	223.0	187.4	162.0	176.4	127.0	45.4
17. Business Enterprise Development	100.5	264.8	264.9	226.9	229.2	202.0	191.1
18. Natural Resources & Environment	188.2	220.2	231.3	257.0	259.2	189.5	166.3
	6,399.2	8,605.8	9,290.3	10,459.3	10,647.0	8,296.0	7,756.6

Source: "Indonesia Handbook (1985)" published by Jakarta Japan Club
Bulletin of Indonesian Economic Studies (April 1987) ─── Survey of Recent Developments

The growth of GDP in nominal terms and its share of various categories concerning sea transport in current prices is shown in Table 2-2-8. Within a span of six years, development expenditure as a proportion of GDP remained constant at around 11.5%. Development expenditure for communication sector as a proportion of total development expenditure ranged from 12% to 17%. The sea transportation sector as a proportion of the communication sector ranged from 13% to 20%. It is noted that communication sector had a stable percentage, while sea transportation sector has shown a slowly declining shares in recent years.

Table 2-2-8   Analysis of Development Budget, 1981-87

	GDP Rp. Billion Current Price	Realized Development Budget	As % of GDP	Communication Sector Budget As % of Planned Development Budget	Sea Transportation Budget As % of Communication Sector Budget
1981	54,027.0	6,940.1	12.8	12.7	19.6
1982	59,632.6	7,359.6	12.3	12.8	19.4
1983	73,697.6	9,899.2	13.4	14.1	17.7
1984	87,054.8	9,951.9	11.4	13.3	19.7
1985	94,491.5	10,873.1	11.3	13.4	19.3
1986	96,489.3	8,332.0	8.6	12.8	13.8
1987				16.6	12.5

Source: Statistical Yearbook of Indonesia 1984, 85, 86

2.3 Socio-economic Framework towards the Year 2005

The population growth rate is predicted to be 2.06% per annum from 1980 to 2000. The population will increase from 148 million in 1980 to 223 million in 2000.

Table 2-3-1 shows how population share changes in the main islands.

Table 2-3-1 Population Share Changes by Main Island

(%)

Island	1971	1980	2000
Jawa	63.83	61.88	56.75
Sumatera	17.75	19.00	23.09
Kalimantan	4.32	4.56	5.37
Sulawesi	7.15	7.65	7.19
Others	7.25	7.51	7.60

Source: Statistical Yearbook 1985

The original average growth rate of GDP of 5% in Repelita IV is unlikely to be accomplished. Although GDP growth rate is recorded as high as 6.1% in 1984, it is reported that the growth rate in 1985 dropped to 1.9% which is the lowest since Pelita was implemented.

The annual GDP growth rate for the period from 1990 to 2005 is predicted as 4% for a base case, taking the following factors into consideration.

- OPEC countries fixed the price of crude oil at US$ 18 per barrel, and it is presumed such a level will be maintained for the future, though some fluctuations may occur occasionally.

- Indonesia is endowed with much economic development potential: an extensive land area, a large labour force and abundant natural resources.

- The realized annual growth rate in the past three Pelitas was 7.7% for Pelita I, 6.9% for Pelita II and 6.1% for Pelita III. In March 6, 1987 it was reported that the GDP rate for 1988/89 (April to March) would exceed the 3.8% of 1987/88. However, to be on the safe side 4% should be regarded as achievable annual GDP growth rate in the light of average GDP growth rates for the recent few years.

- The new direction toward the industrialization may be realized from the present mono-cultural society depending largely on oil and natural gas.

3 Maritime Activities

Section 3 Maritime Activities

3.1 Actual Status

There is no necessary to specifically mention the importance of the socio-economic role assumed by the maritime activities in Indonesia as a country consisting of a number of islands. Here, the maritime activities will be classified into the shipping and fishing activities for analysis of the present condition of sea traffic of Indonesia and forecast of the future sea traffic.

The maritime activities in Indonesia are classified broadly into international shipping engaged in international trade, and domestic shipping engaged in transportation between the islands and fishing activities. Their present conditions are described below.

3.1.1 International Shipping

The international shipping is divided into the general service and special service. The special service is assumed by the industrial carriers which carry crude oil, forest products, cement and fertilizers, and the general service carries the other general cargos.

(1) Cargo Flow

The international shipping includes that by foreign flag vessels, and the shipping of cargos in recent years is shown in Table 3-1-1.

Table 3-1-1 International Cargo Flow (1980 - 1984)

(Ton)

	1980	1981	1982	1983	1984	Growth Rate (%)	Annual Average Growth Rate (%)
General Cargo	17,254,565	17,637,460	18,464,696	18,964,122	19,379,451	12.3	2.9
Special Cargo	84,489,933	93,581,067	104,822,363	79,781,459	122,850,440	33.6	7.5

Source: Statistical Yearbook of Indonesia 1986, BPS

As seen, the international cargos showed a growth of 12.3 percent, in general cargo, from 17 million tons in 1980 to 19 million tons in 1984, in an average annual growth rate of 2.9 percent in five years, and a growth of 33.6 percent, in special cargo, from 84 million tons in 1980 to 113 million tons in 1984, or 7.5 percent in annual mean. Seeing the cargo share of the Indonesian vessels during these five years, a considerable improvement is noted from less than 10 percent of the total transport in 1980 to about 14 percent in 1984, as shown in Table 3-1-2.

Table 3-1-2   Share of National Vessels (1980 - 1984)

	1980	1981	1982	1983	1984
National Vessels	9,920,087	8,585,947	8,457,503	13,828,836	18,138,655
	(9.75%)	(7.27%)	(6.86%)	(14.00%)	(13.72%)
Foreign Vessels	91,824,411	102,632,580	114,829,556	84,916,745	114,091,236
	(90.25%)	(92.28%)	(93.14%)	(86.00%)	(86.28%)
TOTAL	101,744,498	111,218,527	123,287,059	98,745,581	132,229,891
	(100.00%)	(100.00%)	(100.00%)	(100.00%)	(100.00%)

Source: Statistical Yearbook of Indonesia 1986, BPS

(2)   Fleet

Now, by seeing the development by service of the international shipping fleet in 1980-1984, it is shown in Table 3-1-3.

Table 3-1-3 International Shipping Fleet by Service (1980 - 1984)

	1980	1981	1982	1983	1984	Growth Rate (%)	Annual Average Growth Rate (%)
General Service							
Number	58	61	62	51	58		
DWT	667,270	796,619	827,227	732,052	832,530	24.8	5.7
Average DWT	11,504	13,059	13,342	14,354	14,354		
Special Service							
Number	89	96	96	88	88		
DWT	582,663	636,285	774,603	688,617	688,617	18.2	4.3
Average DWT	6,547	6,628	8,069	7,825	7,825		
TOTAL							
Number	147	157	158	139	146		
DWT	1,249,933	1,432,904	1,601,830	1,420,669	1,521,147	21.7	5.0

Source: Statistical Yearbook of Indonesia 1986, BPS

The general shipping had 58 vessels or 667,000 DWT in 1980, but in 1984, it had 58 vessels or 832,000 DWT, showing an increase of 24.8 percent in tonnage or an average annual growth rate of 5.7 percent in these five years. During that period, the average ship size showed a growth of 24.8 percent from 11,504 DWT in 1980 to 14,354 DWT in 1984, or an annual rate of 5.7 percent. In 1978, the average ship type was 9,860 DWT, and when this was taken, the growth in these six years was 45.6 percent 6.5 percent a year, indicating a steady progress toward greater size of ship. The fleet of special shipping was 89 vessels or 583,000 DWT in 1980, but in 1984, it was 88 vessels or 688,000 DWT, showing a growth of 18.2 percent in tonnage or an average annual growth rate of 4.3 percent. During that period, the average ship size increased from 6,547 DWT in 1980 to 7,825 DWT in 1984, showing a growth of 19.5 percent or 4.6 percent in annual rate, or when compared with 6,395 DWT in 1978, showing a trend toward larger size by 22.3 percent or 3.4 percent in annual rate.

According to the Lloyd statistics, the composition by type of Indonesian vessels (100 G/T or more) and its recent trend are shown in Table 3-1-4.

Table 3-1-4 Indonesian Shipping Fleet (1981 - 1985)

Type of ships	1981		1982		1983		1984		1985	
	Number	G.T.	Number	G.T.	Number	G.T.	Number	G.T.	Number	G.T.
Oil Tankers	114	267,070	130	317,924	141	367,194	153	410,950	183	481,268
Oil/Chemical Tankers							1	9,506	1	9,569
Chemical Tankers	3	6,355	3	6,355	2	1,493	2	1,493	2	1,493
Liquefied Gas Carriers	5	2,962	5	2,962	6	3,929	7	8,523	7	9,104
Miscellaneous Tankers	2	1,289	3	4,286	3	4,508	6	11,965	7	16,894
Bulk/Oil Carriers										
Ore & Bulk Carriers	12	219,140	12	219,140	11	205,768	11	148,530	11	128,255
General Cargo (Single Deck)	419	453,311	428	462,921	446	493,965	472	503,769	508	505,011
General Cargo (Multi-Deck)	218	540,107	220	554,247	232	550,128	215	411,132	222	386,444
Passenger/Cargo Ships	16	64,615	17	52,947	16	46,477	13	20,900	13	20,900
Container Ships			2	30,905	4	58,937	4	58,937	4	58,888
Vehicle Carriers	2	1,617	2	1,617	2	1,617	2	1,617	2	1,617
Fish Factories & Carriers	3	450	5	1,444	5	1,510	5	1,510	5	1,510
Fishing	148	29,620	155	31,087	168	34,914	193	42,143	229	49,149
Ferries & Passenger Vessels	52	45,001	52	35,889	52	35,466	61	65,146	73	95,830
Supply Ships & Tenders	39	27,298	25	15,616	22	15,158	24	15,914	25	15,749
Tugs	181	42,166	208	55,324	215	58,754	231	60,765	261	65,208
Dredgers	10	25,738	12	34,539	14	39,718	18	52,497	21	54,597
Research Ships	5	3,965	5	3,965	5	3,986	5	3,986	6	5,359
Miscellaneous	31	14,254	35	15,656	47	26,177	61	27,684	73	29,575
TOTAL	1,260	1,744,958	1,319	1,846,824	1,391	1,949,699	1,484	1,856,967	1,653	1,936,420

Source Lloyd's Register of Shipping 100G/T

This classification includes many other miscellaneous ships than the fishing boats and cargo ships, but when the fleet in 1981 is compared with that in 1985, the tankers show an increase of 61 percent in number or 84 percent in G/T, while the cargo ships are of less growth.

Based on the composition by age of the fleet according to the Lloyd statistics of 1985, the classification of ship size is shown in Table 3-1-5.

The age composition of all ships of 100 G/T and larger is represented below.

0 - 4 years	153 ships	371,565 G/T	19.2%
5 - 9 years	239 ships	383,371 G/T	19.8%
10 - 14 years	414 ships	555,353 G/T	28.7%
15 - 19 years	257 ships	179,437 G/T	9.3%
20 - 24 years	187 ships	168,499 G/T	8.7%
25 years -	403 ships	279,195 G/T	14.4%

Ships at the age of 20 years or more account for more than 23 percent of the total, which indicates that the obsolete ships constitute a considerable part. However, when the fact that the ships at the age of 20 years or more constituted 37.4 percent of the whole fleet in 1981 is taken into consideration, efforts for improvement of the marine transportation through renewal of old ships will be seen.

Table 3-1-5 Classification of Ships by Size and Age (1985)

DIVISION OF GROSS TONNAGE	DIVISIONS OF AGE															
	0-4 YEARS		5-9 YEARS		10-14 YEARS		15-19 YEARS		20-24 YEARS		25-29 YEARS		30 YEARS & OVER		TOTAL	
	No.	Gross Tonnage	No.	Gross Tonnage	No.	Gross Tonnage	No.	Gross Tonnage	No.	Gross Tonnage	No.	Gross Tonnage	No.	Gross Tonnage	No.	Gross Tonnage
100 - 499	80	16,023	118	22,663	252	52,077	164	37,929	99	25,248	83	24,615	144	34,633	940	213,188
500 - 999	20	14,424	50	37,858	68	50,255	45	35,065	40	29,702	25	17,556	79	49,725	327	234,585
1,000 - 1,599	9	10,822	25	29,131	25	33,584	17	21,379	23	27,100	6	7,600	22	27,144	127	156,760
1,600 - 1,999	14	6,583	-	-	4	7,049	6	11,617	4	7,088	8	13,635	4	7,298	30	53,270
2,000 - 3,999	14	42,822	25	83,141	28	90,854	23	65,434	15	47,486	11	26,593	15	37,689	131	394,019
4,000 - 5,999	5	23,664	6	28,526	12	55,565	2	8,013	3	12,696	3	13,104	1	5,411	32	146,979
6,000 - 6,999	-	-	-	-	2	12,503	-	-	3	19,179	1	6,042	-	-	6	37,724
7,000 - 7,999	3	22,738	5	37,031	1	7,709	-	-	-	-	1	7,150	-	-	10	74,628
8,000 - 9,999	3	27,607	3	28,696	19	174,142	-	-	-	-	-	-	-	-	25	230,445
10,000 - 14,999	11	138,480	3	34,077	1	12,577	-	-	-	-	-	-	-	-	15	185,134
15,000 - 19,999	3	46,311	2	39,888	1	17,749	-	-	-	-	-	-	-	-	6	103,948
20,000 - 29,999	1	22,091	2	42,360	-	-	-	-	-	-	-	-	-	-	3	64,451
30,000 - 39,999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40,000 - 49,999	-	-	-	-	1	41,289	-	-	-	-	-	-	-	-	1	41,289
50,000 - 59,999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60,000 - 69,999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70,000 - 79,999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80,000 - 89,999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90,000 - 99,999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100,000 - 109,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110,000 - 119,999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
120,000 - 129,999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
130,000 - 139,999	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
140,000 and above	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	153	371,565	239	383,371	414	555,353	257	179,437	187	168,499	138	116,295	265	161,900	1,653	1,936,420

Source: Lloyd's Register of Shipping

(3) Service Routes

The liner service network centering around Indonesia extends to Japan, Europe, U.S.A, Middle East, and South Korea, and the transports by route in 1982 are shown in Table 3-1-6.

According to the transports in 1982, the Indonesia-Japan route accounts for 51.8 percent of the whole with a total of 288 ships, 640 navigations and 4,373,000 tons, the Indonesia-Europe route for 21.8 percent with 1,860,000 tons carried by 1979 vessels and 254 navigations, and the Indonesia-U.S.A route for 18.0 percent with 177 vessels, 193 navigations and 1,540,000 tons. The transport share of Indonesian ships in these routes shows 40.9 percent as a whole. The irregular service carried 9,935,000 tons of cargos or 8.1 percent of the general cargos according to the result in 1982.

The special service carried log, liquid cargo and dry cargo in a total of 105 million tons, accounting for 85 percent of the whole. Most of them are for export, and the dry cargo is generally directed to Japan and South Korea, and the liquid cargo for Japan and U.S.A.

Table 3-1-6 Liner Cargo Quantity by Service Route (1982)

Nationality of Vessels	Vessels Number	Vessels DWT	No. of Voyages	Cargo Quantity (Ton) Import Ton	Import %	Export Ton	Export %	Total Ton	Total %	%
Indonesia-Europe	179	2,704,674	254	1,044,688	100	811,994	100	1,856,682	100	21.8
National	21	288,263	40	315,665	30.2	216,980	26.7	532,645	28.7	
Foreign	158	2,416,411	214	729,023	69.8	595,014	73.3	1,324,037	71.3	
Indonesia-Middle East										
National	15	197,544	35	158,050	100	379,097	100	537,147	100	6.3
Indonesia-Japan	288	2,261,647	640	3,924,964	100	448,612	100	4,373,576	100	51.3
National	119	842,260	307	1,736,573	44.2	197,324	44.0	1,933,897	44.2	
Foreign	169	1,419,387	333	2,188,391	55.8	251,288	56.0	2,439,679	55.8	
Indonesia-South Korea	35	249,103	102	217,503	100	4,835	100	22,338	100	2.6
National	9	67,928	23	43,373	20.0	51	1.0	43,424	19.5	
Foreign	26	181,175	79	174,130	80.0	4,784	99.0	178,914	80.5	
Indonesia-USA	177	3,321,585	193	985,915	100	554,008	100	1,539,923	100	18.0
National	23	314,078	36	181,878	18.4	257,490	46.5	439,368	28.5	
Foreign	154	3,007,507	157	804,037	81.6	296,518	53.5	1,100,555	71.5	
Grand Total	694	8,434,553	1,224	6,331,120	100	2,198,546	100	8,529,666	100	100
National	187	1,710,073	441	2,435,539	38.5	1,050,942	47.8	3,486,481	40.9	
Foreign	507	7,024,480	783	3,895,581	61.5	1,147,604	52.2	5,043,185	59.1	

Source: Lloyd's Register of Shipping

3.1.2 Domestic Shipping

For Indonesia, being the archipelago country and having a very long coastline, improvement or expansion of the transport capacity of domestic shipping is one of the major concerns, and for improving the maldistribution of population as well as socio-economic activities to the Java Island, the domestic shipping has a very important role assigned.

Domestic shipping in this country is classified into the following five forms of service according to role, operation form, etc.

    Regular Liner Service (RLS)
    Local Service
    Traditional Service
    Pioneer Service
    Special Service

These services complement to one another to link about 210 ports over the vast area for transporting commodities and personnel. These services are described below.

RLS is to connect the islands with one another by the regular liners and is the main of the domestic service. It also includes, in addition to the domestic shipping, some international shipping connecting Malaysia and Singapore. It assumes accumulation of export cargos and domestic transport of daily necessaries and staple foods. (Refer to Fig. 3-1-1)

Local Service is to support RLS, and the shipping is mainly made by small vessels of 500 m^3 and 175 G/T or less. (Refer to Fig. 3-1-2)

Traditional Service is to support the local service and is mainly comprised of sailing boats. From the number of the vessels, the service constitutes the main of the domestic service and has recently motorization in progress.

Pioneer Service was started in 1974 to connect the remote sites and has the number of vessels and the route network as well as the traffic developed increasingly.

Special Service is the service division which is comprised of special vessels carrying crude oil, natural gas, minerals, log, cement and fertilizers and has been rapidly expanded in recent years.

(1) Cargo Flow

The cargo shipping of the domestic service in recent years is shown in Table 3-1-7.

Table 3-1-7 Domestic Cargo Flow (1980 - 1984)

(1,000 ton)

	1980	1981	1982	1983	1984	Growth Rate (%)	Annual Average Growth Rate (%)
Regular Liner Service	6,595	6,794	7,458	7,800	7,252	9.9	2.4
Local Service	2,201	2,271	2,445	2,481	2,521	14.5	3.4
Traditional Service	1,461	1,959	2,155	2,294	2,493	70.6	14.3
Pioneer Service	96	97	54	31			
Special Service	53,588	59,160	55,225	61,061	53,852		
Total	63,941	70,281	67,337	73,667	78,600	22.9	5.3

Source: Statistical Yearbook of Indonesia 1986, BPS

The total transport in 1985 was 78.6 million tons, showing an increase of about 23 percent over 64 million tons in 1980 or 5.3 percent in the average annual growth rate of five years. Breaking down, RLS was 7.25 million tons representing a growth of 9.9 percent over 1980 or 2.4 percent in annual mean; Local Service was 2.52 million tons representing a growth of 14.5 percent or 3.4 percent in annual mean; and Traditional Service was 2.49 million tons representing as high a growth rate of 70.6 percent or 14.3 percent in annual mean. Pioneer Service nearly doubled during the period, while Special Service showed no substantial growth statistically, probably reflecting the recent reform in energy structure.

(2) Fleet and Service Routes

The domestic fleet of Indonesia between 1980 and 1984 is shown in Table 3-1-8.

Table 3-1-8 Domestic Fleet by Service (1980 - 1984)

	1980	1981	1982	1983	1984	Growth Rate 1980-1984 (%)
RLS						
Number	342	361	397	387	398	16.3
DWT	392,912	425,556	503,371	486,824	500,661	27.4
Average	1,149	1,179	1,268	1,258	1,258	(6.2)
Local						
Number	896	1,087	1,162	1,168	1,220	
BRT	138,286	161,302	177,177	178,092	186,021	34.5
Average BRT	154	147	152	152	152	(7.7)
Traditional						
Number	2,563	3,346	3,486	3,657	3,807	48.5
m^3	190,476	280,529	282,746	306,270	318,832	67.4
Average m^3	74	84	81	84	84	(14.0)
Pioneer						
Number	33	35	36	31	26	
DWT	22,072	23,179	20,805	15,684	12,210	
Average DWT	669	662	578	506	472	
Special						
Number	2,039	2,302	2,597	2,633	2,669	30.9
DWT	4,865,533	5,338,573	6,022,708	6,106,196	6,189,684	27.2
Average DWT	2,386	2,319	2,319	2,319	2,319	(6.2)

Source: Statistical Yearbook of Indonesia 1986, BPS

It is represented by service in the following.

(1) Regular Liner Service

The feet was 398 vessels, 500 thousand DWT, showing a growth over 1980 of 16.3 percent in the number of vessels, 27.4 percent in DWT or 6.2 percent in annual mean, and during the period, the mean ship size increased by

about 24 percent from 1,015 DWT to 1,258 DWT. Ships actually engaged in shipping activities are mainly those of 500-2,000 DWT, and they are generally superannuated. The RLS operation is mainly made by the government-financed P.T. Pelni, the remaining made by 40 companies forming 12 enterprise groups under the guidance of the government. For the service routes, it has a liner service network extending over the whole area of Indonesia, as shown in Fig. 3-2-1, and some of the routes include Malaysia and Singapore. In Pelita IV, a total of 68 routes and 1,258 navigations a year by the end of FY 1989 is contemplated. Now, the annual number of navigations per vessel calculated from the results of shipping was 16.8 navigations a year in 1980, but in 1984, it decreased to 14.5 navigations.

(ii) Local Service

The fleet was comprised of 1,220 vessels, 186 thousand BRT, representing a growth of 36 percent in the number of vessels, 34.5 percent in BRT or 7.7 percent in annual mean during these five years, but no change in the average ship size at about 150 BRT.

The service routes are generally confined in the respective KANWILs, but some extend to the adjacent KANWILs and to Singapore. The service network is as shown in Fig. 3-1-2. It comprises 148 routes throughout the country and also serves as traffic means for transportation of personnel. According to Pelita IV, the number of routes by the end of FY 1989 is 148. (Refer to Fig. 3-1-2) The annual number of navigations per vessel in 1984 is 13.6 against average 15.9 navigations in 1980.

(iii) Traditional Service

The fleet was comprised of 2,563 vessels, 190 thousand m^3, representing a growth of 48.5 percent in the number of vessels, 67.4 percent in m^3 or 14 percent in annual mean in five years, and during the period, the average ship size increased from 74 m^3 to 84 m^3, this suggesting progress of motorization. But, the navigation efficiency showed little change from average 7.7 navigations per vessel in 1980 to average 7.8 navigations in 1984.

(iv) Pioneer Service

When the service was started in 1974, it had 9 vessels and 11 routes
connecting 70 ports. In 1983, it developed to 42 vessels, 36 routes and
214 ports, representing a growth of 27 percent in the number of vessels
with the average ship size decreased to 506 DWT. The service route
network is shown in Fig. 3-1-3, and in Pelita IV, 25 routes and 522
navigations are contemplated by 1989.

(v) Special Service

In 1984, the fleet was comprised of 2,669 vessels, 6,190 thousand DWT,
showing a growth of 30.9 percent in the number of vessels, 27.2 percent
in DWT over 1980 or an average annual growth rate of 6.2 percent during
five years. Except the special cargos, shipping to off-shore structures
and that by towing are made, but for the service routes, no data are
available.

3.1.3 Fishing Activities

Being the largest archipelago in the world, Indonesia has a vast water area extending over 7.9 mil, km^2 with the declaration of 200 NM economic zone in addition to the 12 NM territorial water.

Fishery of the country is mainly comprised of marine fishery and inland fishery, and the present condition of the marine fishery is described below.

(1) Fishery Production

The fishery production during five years from 1980 to 1984 is shown in Table 3-1-9.

Table 3-1-9 Fishery Production by Subsectors

(Ton)

	1980	1981	1982	1983	1984	Growth Rate 1980-1984 (%)
Marine Fishery	1,394,810	1,408,272	1,490,719	1,682,019	1,712,804	22.8 (5.3)
Inland Fishery	454,852	506,233	506,822	532,462	548,185	20.5 (4.8)
Open Water	254,498	264,983	265,348	265,562	269,321	
Other	200,354	241,250	241,474	266,900	278,864	
Total	1,849,662	1,914,505	1,997,541	2,214,481	2,260,989	22.2 (5.1)

Source: Statistical Yearbook of Indonesia '86

The catch in 1984 was 1.7 million tons for marine fishery and 548 thousand tons for inland fishery or total 2.26 mil tons. The marine fishery shows a growth, as compared with 1980, of 22.8 percent or 5.3 percent in annual mean, and the total catch a growth of 22.2 percent or 5.1 percent in annual mean during five years.

In the production price, the total production noted Rp. 1,261 billion in 1984, a growth of 43 percent or 12.7 percent in annual mean over 1981. Particularly, the marine fishery noted Rp. 740 billion in 1984, a growth of 46.7 percent or 13.5 percent in annual mean over 1981. The proportion of the marine fishery in the total production of fishery is 75.7 percent in the catch or 58.7 percent in the production price.

As for the catch by area, the result of 1984 is shown in Table 3-1-10.

Table 3-1-10 Fishery Production by Major Island 1984

Major Island	QUANTITY						VALUE					
	TOTAL		MARINE FISHERY		INLAND FISHERY		TOTAL		MARINE FISHERY		INLAND FISHERY	
	Tons	%	Tons	%	Tons	%	Rp.	%	Rp.	%	Rp.	%
TOTAL	2,260,989	100	1,712,804	100	648,185	100	1,261,170	100	739,893	100	521,277	100
SUMATERA	619,961	27.4	516,591	30.2	103,370	18.8	325,956	25.8	218,894	29.6	107,062	20.5
JAWA	651,852	28.8	435,963	25.4	215,889	39.4	400,925	31.8	194,862	26.3	206,063	39.5
BALI, NUSATENGARA, TIMOR TIMUR	139,481	6.2	133,058	7.8	6,423	1.2	46,675	3.7	42,251	5.7	4,424	0.9
KALIMANTAN	307,335	13.6	165,870	9.7	141,465	25.8	193,166	15.3	85,404	11.6	107,762	20.7
SULAWESI	409,143	18.1	334,044	19.5	75,099	13.7	224,172	17.8	132,564	17.9	91,608	17.6
MALUKU IRIAN JAYA	133,217	5.9	127,278	7.4	5,939	1.1	70,276	5.6	65,918	8.9	4,358	0.8

Source: Statistical Yearbook of Indonesia '86

The particularly important water areas for productive activities of marine fishery in Indonesia are the north coast of the Jawa Island, northeast coast of Sumatera and southwest coast of Sulawesi, these areas accounting for about 75 percent of the whole in both catch and production price, particularly the Sumatera water area occupying the top in the catch at 30 percent of the whole.

According to the FAO Fishery Statistics, the production of marine fishery in Indonesia has been steadily increasing at an annual rate of 5 percent since 1965, and this trend is likely to continue as the motorization of fishing boats is promoted.

(2) Fleet and Operation

Details of the fishing boats engaged in the fishery of Indonesia are shown in Table 3-1-11.

Table 3-1-11   Type and Number of Fishing Boats

	1980	1981	1982	1983	1984	Growth Rate 1980-1984 (%)
(Marine Fishery)						
Non Powered Boat	226,866	225,949	215,466	220,706	219,929	
Out Boat Motor	26,523	31,105	55,265	57,490	61,789	
In Boat Motor	18,467	19,951	29,818	28,861	31,922	
Total Motorized Boat	44,990	51,056	85,083	86,351	93,711	20.8
Total	271,856	277,005	300,549	307,057	313,640	15.4 (3.6)
(Open Water Fishery)						
Non Powered Boat	130,870	136,411	128,011	132,659	128,363	
Motorized Boat	3,547	5,182	5,464	5,577	5,631	

Source: Statistical Yearbook of Indonesia '86

The marine fishery had 313,640 fishing boats in 1984, and this was a growth of 15.4 percent over 1980 or, in the annual mean during the period, an increase of 3.6 percent. Of these fishing boats, motorized boats numbered 93,711, two-fold of the figure in 1980, and the proportion of the motorized boats to the whole boats showed an appreciable increase at about 30 percent over 16.5 percent in 1980.

The local distribution of fishing boats is shown in Table 3-1-12.

Table 3-1-12 Type of Marine Fishing Boats by Major Island 1984

MAJOR ISLAND	TOTAL NUMBER	(%)	NO. OF MOTORIZED	(%)	NO. OF NON POWERED	(%)
TOTAL	313,640		93,711		219,929	
SUMATERA	68,034	(100)	27,156	(39.9)	40,878	(60.1)
JAWA	63,088	(100)	31,513	(49.9)	31,575	(50.1)
BALI, NUSATENGARA, TIMOR TIMUR	36,674	(100)	7,388	(20.1)	29,286	(79.9)
KALIMANTAN	22,004	(100)	12,278	(55.8)	9,726	(44.2)
SULAWESI	81,185	(100)	13,287	(16.4)	67,898	(83.6)
MALUKU, IRIAN JAYA	42,655	(100)	2,089	(4.9)	40,566	(95.1)

Source: Statistical Yearbook of Indonesia '86

Concerning the percentage of motorization of fishing boats by area as of 1984, Kalimantan is most advanced at 55.8 percent, followed by Jawa at 49.9 percent and Sumatera at 39.9 percent. The water area where the number of fishing boats is the largest is Sulawesi at 81,185 boats which account for 25.9 percent of the whole and 16.4 percent of which are the motorized boats, followed by Sumatera at 21.7 percent of the whole, 40 percent of which being motorized boats, and Jawa at 20 percent of the whole, about 50 percent of which being motorized boats.

It is obvious from the above that Sulawesi is the largest in the number of operating fishing boats but is the lowest in the rate of modernization or motorization at 16.4 percent.

The distribution of marine fishery grounds is shown in Fig. 3-1-3, in particular, important areas are:

(i)   The water area extending over 1,250 km along the north coast of Jawa
Island;

(ii)   The water area extending over 600 km on the side of the Strait of
Malacca along the northeast coast of Sumatera Island; and

(iii)   The water area extending over 500 km on the Makassar Strait side
at the southwestern part of Sulawesi Island.

Thus, the coastal fishery has no fishing base which is specifically
called to be so, and it is present along the whole coastline, and the
operation is generally according to pattern of going out for fishing in
the evening and coming back early next morning. Further, the fishing is
often precluded in October to January every year by heavy rainfall and
storm. The ocean fishery in the ground of about 100 miles from the land
on the Indian Ocean side is mainly comprised of tuna fishing by 100-300
G/T fishing boats, and the Bali, Maluku/Irian Jaya regions serve as the
bases and contain a number of large fishing boats, and the period of
going out for fishing is about 40 days each time.

For   the   fishing   method,   the   trawl   fishing   is   prohibited   by   the
Presidential Decree of July 1980 for conservation of resources and
protection of small fishermen in the water area around Jawa Island in
October 1, 1980 and in the other water areas including Sumatera in
January 1981. But, actually, it is conditionally allowed to continue.

Table 3-1-13 shows the catches by fishing method in 1983 when the trawl
fishing is prohibited against those in 1977.

Table 3-1-13 Comparison of Marine Fishery Production by Fishing Gear in 1977 and 1983

Type of Fishing Gear	Catch (1,000 Tons)				83/77 (%)	Annual Growth Rate (%)
	1977	(%)	1983	(%)		
Trawl	151	(13.1)	9	(0.5)	5.9	-60.0
Payang	92	(7.9)	133	(7.9)	144.6	+ 6.3
Dogol (Danish Seine)	19	(1.6)	19	(1.1)	100.0	+ 0
Beach Seine	40	(3.5)	63	(3.7)	157.5	+ 7.8
Drift Gillnet	158	(13.7)	243	(14.4)	153.8	+ 7.4
Encircling Gillnets	25	(2.2)	35	(2.0)	140.0	+ 5.8
Shrimp Gillnet	22	(1.9)	80	(4.8)	363.6	+24.0
Trammel Net	–		7	(0.4)	–	–
Bagan	43	(3.7)	73	(4.3)	169.8	+ 9.2
Kelong	73	(6.3)	97	(5.8)	132.9	+ 4.9
Serok (Scoopnet)	41	(3.5)	26	(1.5)	63.4	– 7.8
Other Life Net	9	(0.7)	39	(2.3)	433.3	+27.7
Tuna Long Line	2	(0.2)	4	(0.2)	200.0	+12.2
Other Drift Long Lines	11	(1.0)	6	(0.4)	54.5	-10.6
Set Long Line	11	(1.0)	25	(1.5)	227.3	-14.7
Skipjack Pole and Line	15	(1.3)	32	(1.9)	213.3	+13.5
Other Hook and Line	89	(7.6)	144	(8.6)	161.8	+ 8.3
Troll Line	38	(3.3)	54	(3.2)	142.1	+ 6.0
Sero (Guiding Barrier)	36	(3.1)	46	(2.7)	127.7	+ 4.2
Jermal (Strow Net)	27	(2.3)	35	(2.1)	129.6	+ 4.4
Bubu (Portable Trap)	22	(1.9)	14	(0.8)	63.6	– 7.8
Other Traps	19	(1.6)	26	(1.5)	136.8	+ 5.4
Shellfish Collection	36	(3.1)	47	(2.8)	130.5	+ 4.5
Sea-weed Collection	4	(0.3)	10	(0.6)	250.0	+16.5
Muro Ami	2	(0.2)	4	(0.2)	200.0	+11.2
All Other Grears	14	(1.2)	28	(1.7)	200.0	+11.2
Total	1,157	(100.0)	1,682	(100.0)	145.4	– 6.4

Source: Fishery Statistics of Indonesia, 1983

3.2 Forecast

3.2.1 Existing Development Plans

(1) Shipping Activities

Improvement and development of the maritime sector during the period of
the First to Third Five-year Development Plans (Pelita I to III) were
made in the infrastructures and related facilities expanded in order to
satisfy the requirements for sea transportation. Under Pelita IV, it is
intended to intensively improve and reinforce the maritime sector so that
all related factors will be well balanced in the inter-island transporta-
tion as well as the transportation between main areas and international
transportation. In Pelita IV, the maritime sector is considered to
assume an important role for national development, and well balanced
intensification and substantial work execution are called for.

In Pelita III, expansion of the sea transportation; more specifically,
domestic shipping service was aimed at, and in Pelita IV, it is designed
to increase and promote the shipping fleet, ports and harbors and dredg-
ing facilities, sailing safety facilities and related industries for
successive expansion of the domestic shipping.

It is contemplated that the domestic and international shipping fleet has
to be increased for assignment to the shipping route pattern comprising
RLS, local shipping, traditional shipping and pioneer shipping in order
to meet increasing cargo demands and enhance productivity, and thus the
ships and cargo volume at the end of Pelita IV are shown in Table 3-2-1.

Table 3-2-1 Ships and Cargo Volume at the End of Pelita IV

Type of Service	Ship (DWT)	Cargo (tons)
(Domestic Shipping)		
Regular Liner Service	736,000	14,750,000
Local Service	217,000	4,200,000
Traditional Service	245,000	3,400,000
Pioneer Service	18,000	770,000
(International Service)		
General Service	1,149,000	23,700,000

Source: Repelita IV

(2) **Fishing Activities**

The water area of Indonesia is extensive, covering 5.4 million km^2 within the territorial water of 12 NM and 2.5 million km^2 within the 200 NM fishery conservation zone or a total of 7.9 million km^2. The possible catch in this water area is estimated at 4.7 million tons in the territorial water and 1.7 million tons in the conservation zone or a total of 6.4 million tons. In addition, a catch of 1.6 million tons in the inland water is prospected.

However, the productivity of fishery is low only at 1.7 million tons in the marine fishery in the record of 1984. For improvement, Pelita IV sets forth the targets as shown in Table 3-2-2, toward utilization of the 200 NM fishery zone for increase of the income of fishermen, improvement of the people's nutrition and expansion of the export and also toward modernization of the fishing ports, boats and implements, development and training of the fishing technology and improvement of the storage, processing and distribution structure.

Table 3-2-2 Fishery Production at the End of
Pelita IV

Fishing Sector	Production (tons)	Number of Fishing Boat
Marine Fishery	2,058,600	396,948
Inland Fishery	752,000	–
Total	2,811,600	396,948

Source: Ministry of Fisheries 1983

According to the long-term plan of fishery production in Indonesia (1985-2000) disclosed by the Ministry of fishery in 1983, the production schedule is shown in Table 3-2-3 and 3-2-4.

Table 3-2-3 Future Fishery Production by Fishery Sector

(1,000 ton)

Fishery Sector		1984	1985	1986	1987	1988	Average Growth Rate (%)	2000	Growth Rate after 1988 (%)
Marine Fishery	Sub Total	1,657.0	1,749.1	1,845.3	1,947.8	2,058.6	5.6	2,943.1	43.0
	Fishing	1,654.1	1,742.3	1,832.6	1,925.1	2,018.3	5.1	2,814.0	39.4
	Plantation	2.9	6.8	12.7	22.7	40.3	93.1	129.1	320.3
Inland Fishery	Sub Total	590.1	621.4	657.7	700.4	752.7	6.3	1,237.6	64.4
	Fishing	278.2	283.8	289.4	295.5	302.0	2.1	374.7	24.1
	Plantation	311.9	337.6	368.3	404.9	450.7	9.6	862.9	91.5
Total Production		2,247.1	2,370.5	2,503.0	2,648.2	2,811.3	5.8	4,180.7	48.7

Source: Ministry of Fishery 1983

Table 3-2-4 Future Marine Fishing Boats

	1984	1985	1986	1987	1988	2000
Number of Boats	325,480	342,655	360,383	378,666	396,948	553,346

Source: Ministry of Fishery 1983

According to the plan, the total production in 2000 is set at 4.18 million tons, and the average annual growth rate during the period is set at 5.8 percent until the end of Pelita IV in 1988 and 3.4 percent a year thereafter. For the marine fishery, the growth is assumed to be average 5.6 percent a year until 1988 and thereafter average 3 percent a year until 2000, and the production of the marine fishery in 2000 is estimated at 2.94 million tons. Also, for the number of marine fishing boats, the growth is set, on the average, about 3 percent a year until 1988 and average 2.8 percent a year thereafter until 2000, and the number of marine fishing boats in 2000 is estimated at 553 thousand. The feature of the fishery structure; more specifically, marine fishery of Indonesia may be summarized as follows: that the ocean fishery requiring a fund has developed to some extent but that there are a number of small managements still present so that in the catch, the coastal fishery is considerably great.

(3) Ports and Harbours

For increase of the sea transportation of Indonesia, the fleet will have to be increased and, at the same time, the port and harbour facilities will have to be developed and expanded in order that their operation may be improved.

The management and operation of the ports and harbours in Indonesia are directly assumed by the Government, but as common problems, there may be cited shortage of the ship mooring facilities, deterioration and inefficiency of the facilities and a number of estuary and river harbours requiring constant dredging. Thus, in the five-year development plan intended mainly for development and improvement of infrastructures and establishment of a self-supporting system of foodstuff, development of ports and harbours is taken up as one of the important items, but it requires a plenty of fund, and it is difficult to implement the development entirely by its own budget of Indonesia. Thus, the development of major ports and harbours has been carried out, as in cases of the large projects in the other areas, by the economic and technical cooperation of the *International Bank for Reconstruction and Development*

(IBRD), Asian Development Bank (ADB), Japan and the Netherlands. Five ports of Tg. Priok, Surabaya, Belawan, Dumai and Semarang are all such cases. Also, DGSC had an Integrated Sea Transport Study (ISTS) conducted by a Netherlandish consultant for improvement of the domestic shipping; more particularly, RLS and, upon the result of the study, formulated a so-called Gateway Port Policy with 1988 as a target year. By designating four ports of Tg. Priok, Surabaya, Belawan and Ujung Pandang as gateway ports and 14 ports including Semarang and Dumai as collection ports or important ports connecting the gateway ports and 25 trunk ports, a network of ports and harbours in the country is systematized and thus the efficiency of the RLS is enhanced. According to this system, the major ports and harbours in the country are classified as shown in Table 3-2-5, and these total 43 ports and harbours are developed preferentially with assistance of the advanced countries.

Table 3-2-5　List of 43 Ports

Gateway Ports	Belawan	Tg.Priok	Tg.Perak	U.Pandang
Collectors Ports	Lhok Seumaweh Dumai Batam	Palembang Panjang Padang Pontianak	Semarang Lembar Kupang Balikpapan	Bitung Kendari Ambon Sorong
Trunk Port I	Krueng Raya Sibolga	Bengkulu Cirebon	Cilacap Meneng Bjmasin Tarakan Samarinda	Gorontalo Pantoloan Ternate Jayapura
Trunk Port II	Pekanbaru Kuala Tanjung	Jambi Sintete	Kalianget Sampit Benoa	Pare-pare Toli-toli Biak Merauke

3.2.2 Forecast towards the Year 2005

(1) Shipping Activities

As stated in the foregoing (Table 3-2-1), the Indonesian Government Indonesia forecasts the general maritime cargo volume by international shipping at the end of Pelita IV in 1988 as 23.7 million tons. This represents an increase by 30.6 percent over 18.1 million tons in 1984 or a growth of 6.9 percent in annual average. Also, the Government forecasts the general service ships in international shipping in 1988 as 1.15 million DWT or a growth by 38 percent over 0.83 million DWT in 1984 or 8.4 percent in annual average. According to the real growth rate during the period of 1980-1984, the total cargo volume of international shipping is 30 percent or 6.8 percent on annual average, and when it is limited to general cargo, the growth is 12.3 percent or 2.9 percent on annual average. Forecast of the cargo volume or, more particularly, quantitative forecast of the cargo carried by international shipping in 2005 is very difficult because of being governed by complicated international, economic and social factors. However, if it is assumed that the changing energy structure Indonesia is now facing, that is, direction towards reduction of the crude oil dependency and expansion of the export of industrial products other than petroleum remains substantially the same and that there will be not much change in the socioeconomic factors, the growth of the international shipping cargo should appropriately be about 4.0 percent which will be commensurate with the forecasted growth rate of GDP in a long-range view. In calculating with this rate, the international seaborne cargo in 2005 is forecast to reach about 2 times more than the total in 1984, that is, 44.2 million tons in general cargo or from 132.2 million to 301.5 million tons in total volume. Of such volume, the cargo carried by the national ships of Indonesia will be 42.2 million tons if the national ships continue to maintain their share of 14 percent in 1984.

According to Pelita IV, the ship tonnage is forecast to be 1.15 million DWT in 1988, as stated above. The real growth in 1980-1984, is 21.7 percent or 5 percent in annual rate, and when the special service is excluded, the growth in these 5 years is 24.8 percent or 5.7 percent as on annual average. Assuming that the productivity per DWT of national ship remains unchanged (11.9 tons in 1984), in order to transport the increasing cargo at an annual rate of 3.5 percent, the ship tonnage will have to be increased at an annual rate approximately equals that of the growth of cargo volume, that is, 3.5 - 4.0 percent. Thus, the international shipping fleet in 2005 will be 3.47 million DWT.

According to Pelita IV, domestic shipping has the cargo volume forecast at 23.12 million tons in total by 1988 except special service. It represents a growth of 85.5 percent or 16.7 percent in annual rate over 12.46 million tons in 1984. Based on the results in 1980-1984, the traditional service had a growth of 14.3 percent as on annual rate, while RLS a growth of 2.4 percent and the local service a growth of 3.4 percent, both as on annual rate. During the period, the special service remained in a growth of only 0.5 percent as on annual rate, reflecting the drop of transport relating to oil during the same period. Thus, as a whole, the growth rate is 5.3 percent on an average. In the case of the domestic cargo, it is particularly required to consider the increasing rate of population (2 percent a year according to the result in recent years and forecast), growth rate of GDP and progress of the regional development, and in consideration of these factors, a growth rate of about 4.5 percent is considered to be adequate for forecasting over a long period to 2005. In calculation with such growth rate, the domestic cargo will come up to 198.1 million tons in 2005.

The domestic fleet in 1988 of Pelita IV is 1.21 million DWT except for the special service, and this represents a growth of 17.5 percent over total 1.03 million DWT in 1984 or 4.1 percent in annual average. The actual growth of the domestic fleet in 1980-1984 is, except the traditional service, 6.2 percent in annual rate for RLS, 7.7 percent for the local service or 6.2 percent for the special service.

Therefore, considering the improvement of operational efficiency through the improvement of ship quality, for example, by dismantling of deteriorated ships, the ship tonnage in 2005 will grow up, in the number, from 8,120 ships in 1984 to 2.06 times that number or 16,727 ships, with a growth rate of about 3:5 percent also considering the forecast increase in cargo volume.

Based on the foregoing forecasts, the shipping activities in 2005 are summarized below:

Table 3-2-6   Shipping Activities in 2005

	Quantity	Annual Growth Rate
International Shipping	Cargo flow (million tons) 301.5	4.0
	Fleet (million DWT) 3.47	4.0
Domestic Shipping	Cargo flow (million tons) 198.1	4.5
	Fleet (number of ships) 16,727	3.5

(2) Marine Fishing Activities

As stated above, the potential catch in the water area of Indonesia is estimated at 6.4 million tons, but the productivity is low, recording only 1.7 million tons in the catch of marine fishery in 1984. Thus, the Government is endeavoring for modernization of the fishing boats and development of the fishing techniques to secure proteins for the people

as well as resources for export. As shown in Table 3-2-1, according to its long-term plan up to the year 2000, the marine fishery has the annual average growth rate set at 5.6 percent until 1988 and at 3 percent thereafter until 2000 to secure a catch of 2.94 million tons in 2000. By taking the actual catch of marine fishery in 1980-1984, the growth during these five years is 22.8 percent or 5.3 percent on annual average, and when the growth of GDP, increase of the population and improvement of the productivity in future are taken into consideration, the said annual average growth rate is considered to be reasonable in forecasting the catch in 2005. With this growth rate taken, the forecast catch of marine fishery in 2005 will reach 1.86 times the catch in 1984 or 3.18 million tons.

The number of fishing boats engaged in marine fishery shows a growth of 15.4 percent, or 3.6 percent on annual rate, from 272,000 to 313,000 boats according to the result of 1980-1984. The Government's forecasting up to 2000 assumes an annual rate of growth of 5.1 percent until the end of Pelita IV in 1988 and 2.8 percent thereafter until 2000, and these are commensurate with the said forecast of the catch of marine fishery and may be said to be adequate values of forecast when the progress of fishing boats towards modernization including motorization and the resulting improvement of productivity are taken into account.

If the annual average growth rate is assumed to be 2.8 percent, the number of marine fishing boats in 2005 will reach 1.78 times that in 1984 or 558 thousand.

The foregoing situations of the marine fishery in 2005 are be summarized below:

Table 3-2-7 Marine Fishing Activities in 2005

|	Quantity	Annual Growth Rate (1985-2005)
Production (million tons)	3.18	3.0%
Fishing Boats (number)	558,280	2.8%

(3) Other Maritime Activities

For the other maritime activities affecting the sea traffic, oil drilling activities at sea may first be cited. The output of Indonesia as an oil producing country tends to decrease with the production of 1.68 million b/d in 1977 as a peak. Thereafter, with worldwide alternation of the energy environment, Indonesia shifts from the oil dependent system heretofore employed to the industry preference system, and in future, the oil production will remain in the level of 1.6 million b/d. The oil drilling activities extend nearly over the whole area of Indonesia. Particularly, the sea off the central part of Sumatera and eastern part of Kalimantan and Jawa Sea are important zones for oil production and have a number of sea facilities constructed.

On the other hand, the oil exploration activities remained dull for some period has become active since 1980, and the development of sea oil fields is actively carried out off the central and southeastern parts of Sumatera and in the Jawa Sea, and it is expected that the activities will continue in the future.

Along with the drilling and exploring activities in these sea oil fields, the coast along the Jawa Sea from the southeastern part of Sumatera to the Jawa Island has many oil rigs and other sea facilities constructed for exploring boring, and these will have a considerable effect caused onto the sea traffic; more specifically, the domestic inter-island shipping activities.

As another maritime activity having influence on the sea traffic, the maritime leisure is considerable. Presently, servicing of the leisure boats such as yacht, motor boats and trawling boats and the facilities therefor is not made except some touring sites in Indonesia, but from its topographic and natural conditions, Indonesia has a sufficient potential as a country of touring resources. Then, as the Government promotes the touring services, there is an ample possibility that the maritime leisure activities will become more active and come to cause a considerable influence onto the sea traffic in general.
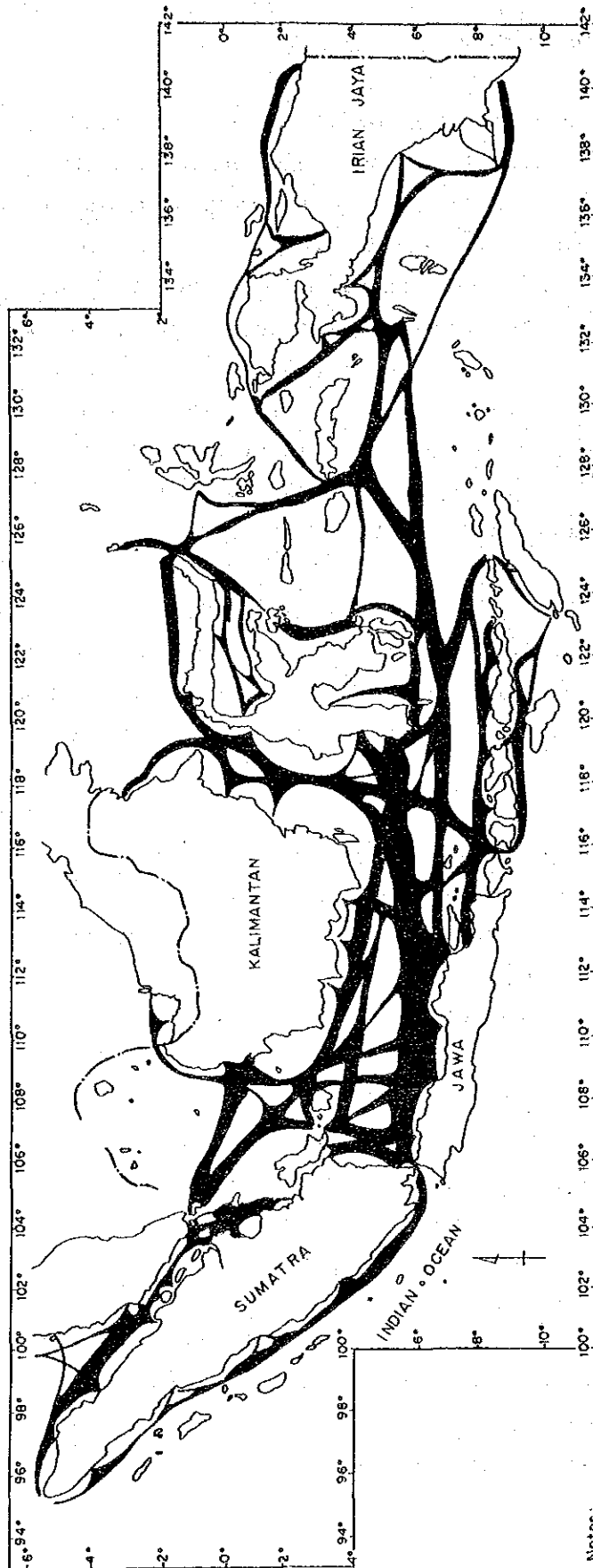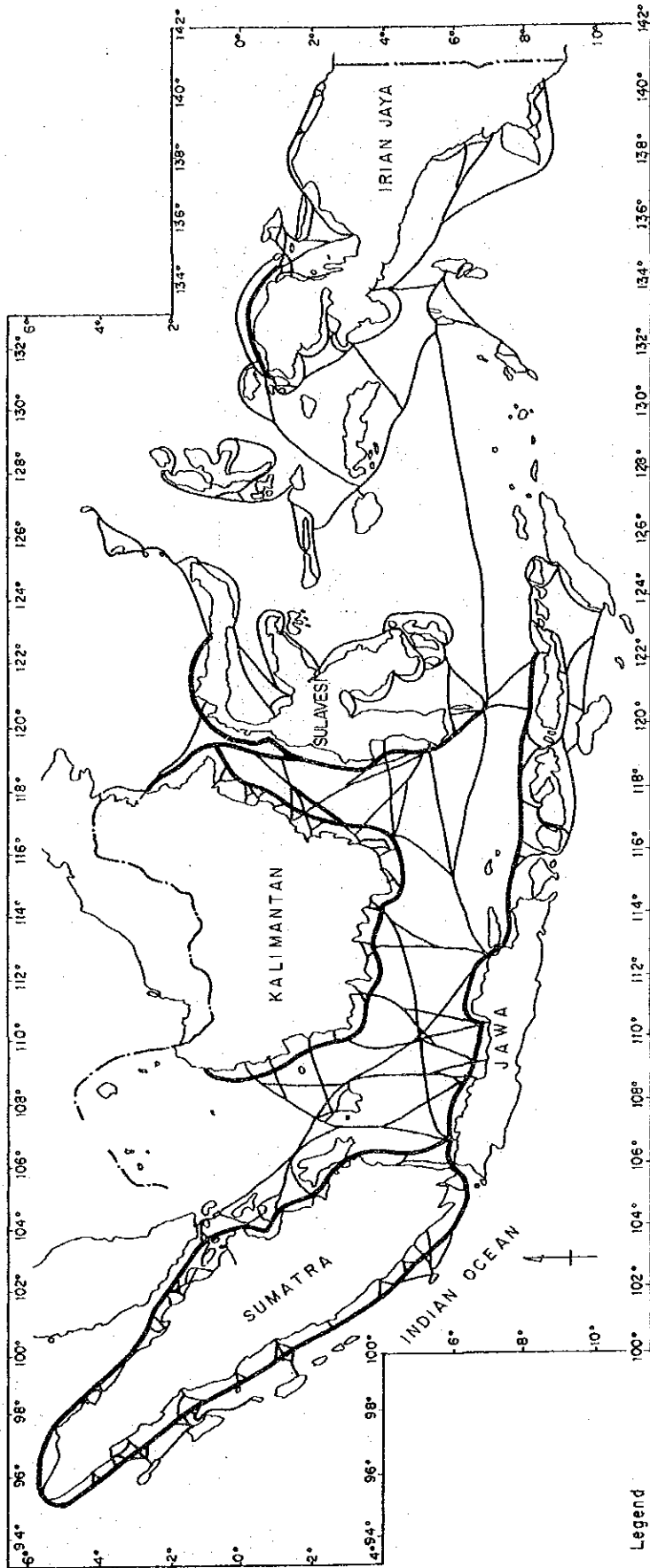
Notes:

The different size in width gives
general representation of the
number of voyages of RLS routes

Source

DGSC Susunan Trayek DAN PENEMPATAN
KAPAL-KAPAL, PELAYARAN NUSANTARA
(R.L.S.), Tahun 1984-1989

Fig. 3-1-1 Regular liner Service (RLS) Routes

Fig. 3-1-2 Local Liner Service Routes
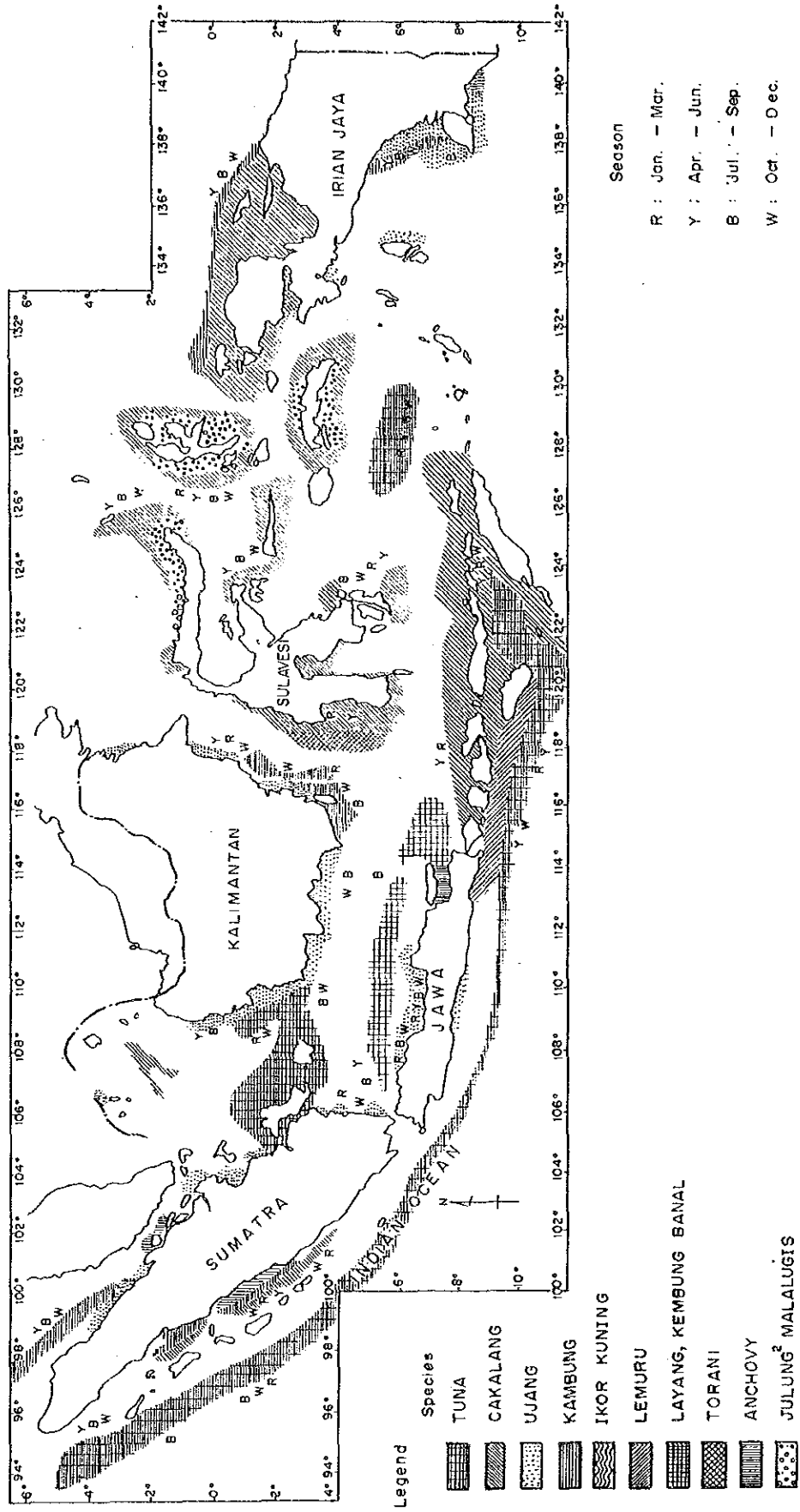
Fig. 3-1-3 Fishing Grounds by Species and Season

4 Marine Accidents

Section 4 Marine Accidents

The data on marine accidents in Indonesia collected varies in number and year according to the sources obtained as shown in Table 4-1.

Table 4-1 Number of Marine Accidents by Source and Year

	77/78	78/79	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87
INSAR				347	464	448	338	215	326	
DGSC LOG BOOK						467	358	303	353	300
KANWIL IV	99	132	108	166	102	166	133	155	90	142

The log book of marine accidents (DGSC Log Book), which is a raw data, made available for this study describes the accidents by category and type of ship, kind of accident, position and date occurred, damages, and so on. The data given in the Lloyd Register describes the details to a similar extent, but is limited in the volume of contents.

As seen in Table 4-1, there are some differences between the DGSC log book and INSAR in each year.
However, their trend in number of occurrences is more or less similar numbering the maximum range of around 460 – 500 accidents per year. The data from KANWIL IV, the continuous records of 10 years, shows that the ratio to the total number of occurrences is about 30% in the relevant years.
The data from other KANWILs have not been available in such a complete form as KANWIL IV's.
The examination of those data from the viewpoint of establishing the development plan for task forces has led to the conclusion that the analysis should be made on the data contained in the DGSC log book for the five years period from 1982 to 1986 to form a basis for the relevant study subjects, and the data from KANWIL IV is applied to the forecast to estimate the trend of occurrences.
The Lloyd data is applied to supplement the analysis.

4.1 Actual Status

Data analysis is made for the actual status based on marine accidents recorded in the DGSC Log Book, 1982 to 1986 for the five years. General trend in number of dead and missing persons by accidents has been on its increase as shown in Fig. 4-1-1.

The typical features of marine accidents in Indonesia are investigated both by kind like 'sunk', 'drifting', etc. and by category of ship like motor ship, motorized sailing ship, sailing ship and so on.

The actual status of marine accidents occurred is outlined hereunder by category and size of ship, area, and month occurred, and damage suffered.

(1) Marine Accidents by Kind and by Category of Ship

Out of the total of 1,781 accidents occurred during the 5 years, as given in Table 4.1.1 (refer to Final Report) 'sunk' occupies the highest portion of 492 (27.6%), followed by 266 (14.7%) due to 'collisions' and then by 226 (12.7%) due to 'strandings', giving in all the majority of 984 (55%) out of the total occurrences. As regards the occurrences by category of ship, 'motorized sailing ships' stand highest in number at 524 (29.4%), followed by 'motor ships' at 422 (23.7%) and then by 'cargo ships' at 328 (18.4%), giving in all the majority of 1,274 (68%). The relationship between kind of accidents and category of ship shows that the number of 'sunk' of motorized sailing stands highest at 265 (14.9%), followed by 'sunk' of motor ships at 103 (5.8%), and then by cargo ships at 74 (4.2%). Notes are made especially on that the small number of accidents of fishing vessels. The marine accidents by kind and by category of ship occurred during the past five years are graphed in Fig. 4-1-2 and Fig. 4-1-3 respectively, according to which the 'sunk' of motorized sailing ships shows remarkably high.
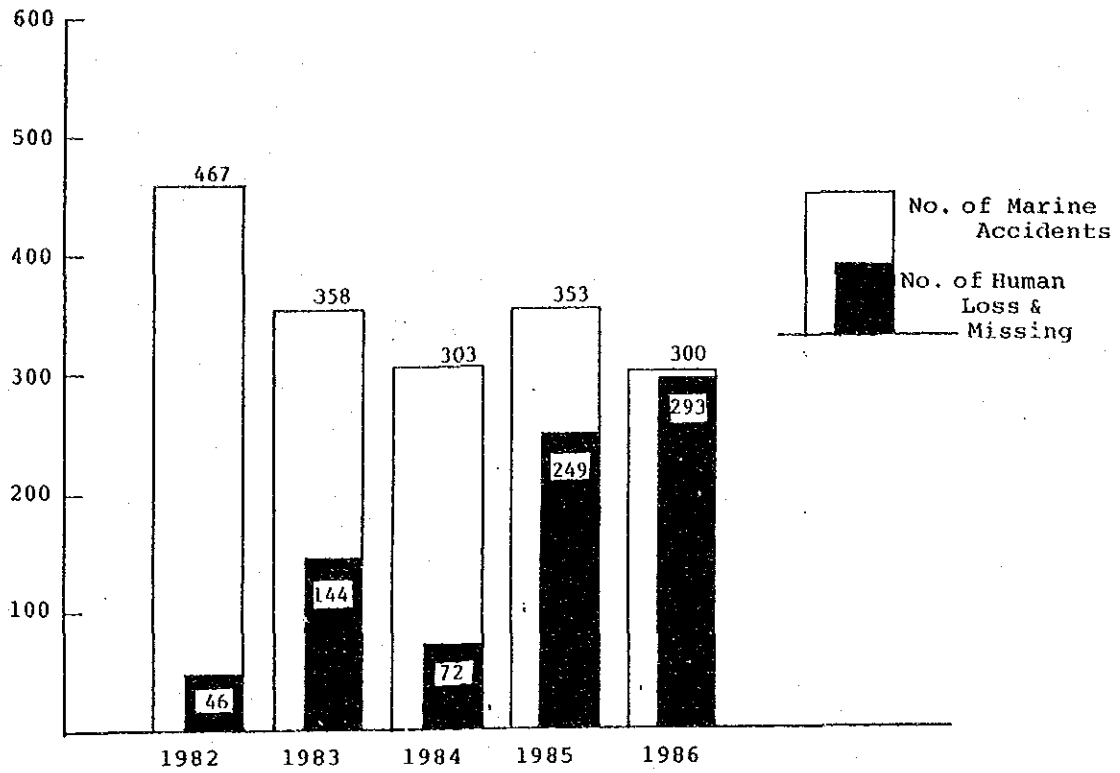
Fig. 4-1-1 Number of Marine Accidents and Human Loss & Missing (1982-86)
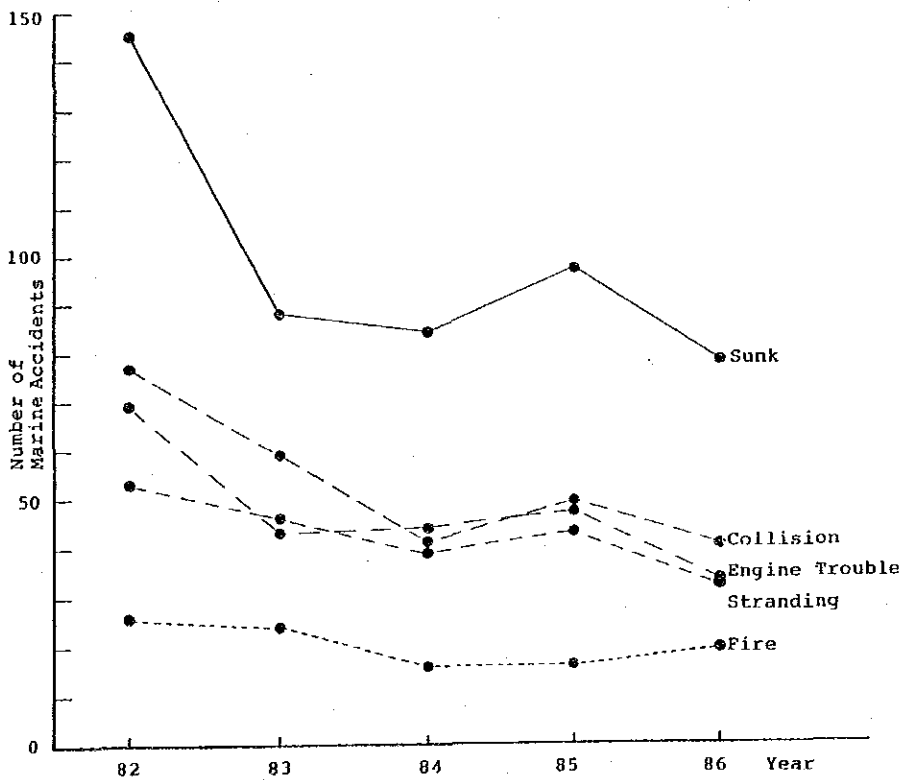

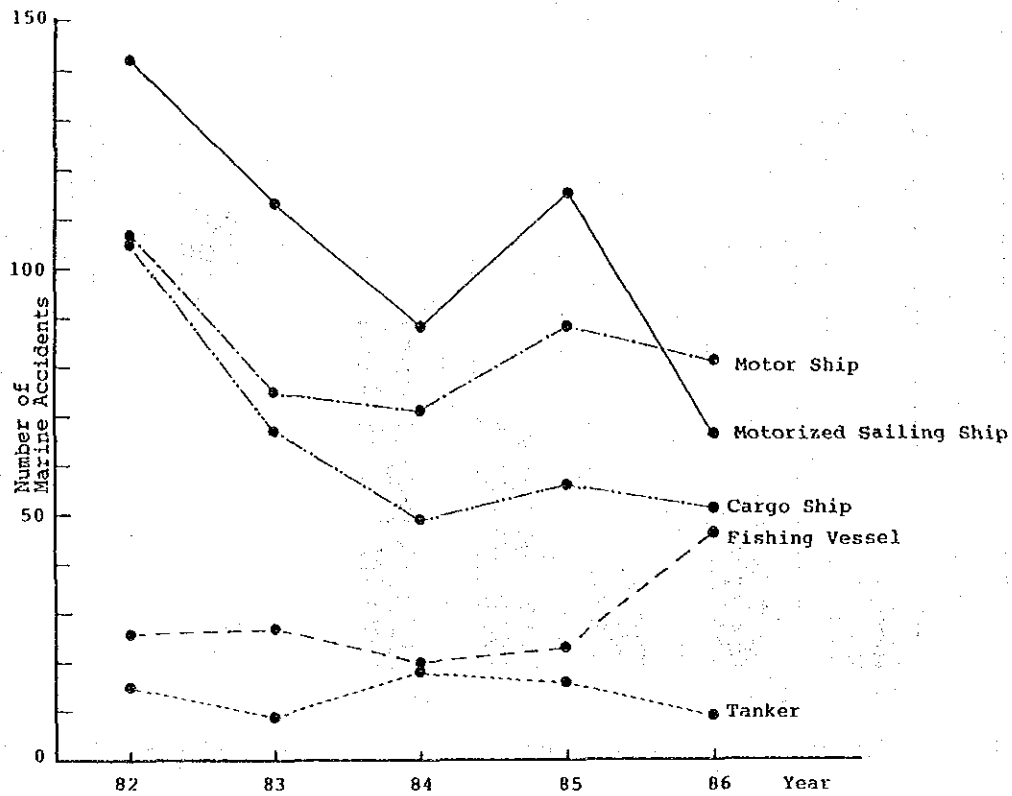Fig. 4-1-2 Marine Accidents by Kind (1982-86)

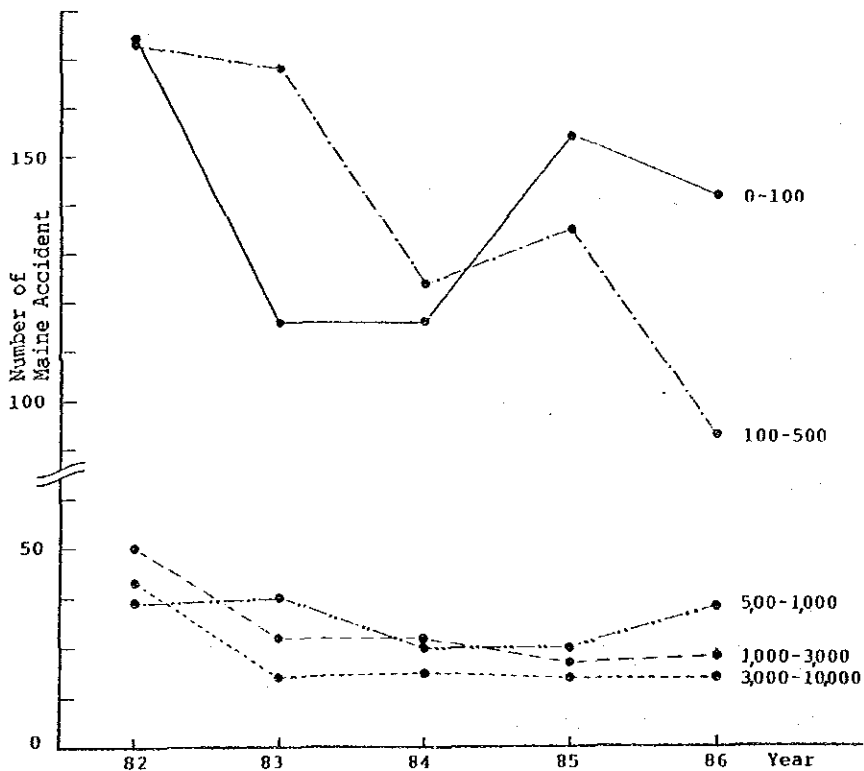Fig. 4-1-3   Marine Accidents by Category of Ship (1982-86)

Fig. 4-1-4   Marine Accidents by Size of Ship (1982-86)

Table 4-1-1 Number of Marine Accidents by Kind and by size of Ship
1982-86

Tonnage / Kind	0~100	100~500	500~1,000	1,000~3,000	3,000~10,000	10,000~20,000	20,000~	Unknown. Others	Total
Collision	80	65	34	47	28	6		6	266
Stranding	60	91	21	31	15	5		3	226
Capsized	24	10	1	3				3	41
Fire	37	43	8	3	5	2		3	101
Flooding	44	64	7	3	7			4	129
Sunk	232	243	6	3	1			7	492
Engine Propeller Rudder Trouble	81	88	31	12	6	2		3	223
Drifting	21	20	2	1	2			1	47
Human Loss-Injury	102	53	11	12	18	2	1	2	201
Others.Unknown	21	16	6	4	0				55
Total	702	693	127	119	90	17	1	32	1781

Table 4-1-2 Number of Marine Accidents by Kind and by Month
1982-86

Month / Kind	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Unknown Others	Total
Collision	33	15	25	24	16	24	23	18	26	25	17	16		266
Stranding	23	20	16	20	11	18	19	25	21	14	17	22		226
Capsized	3	3	5	2	2	5	8	1	3	2	2	5		41
Fire	9	8	3	12	5	8	16	8	9	7	10	6		101
Flooding	20	13	16	4	9	15	20	9	13	3	3	4		129
Sunk	58	40	35	22	42	54	58	64	24	34	32	29		492
Engine Propeller Rudder Troubles	26	11	14	13	12	16	19	21	17	19	22	28		223
Drifting	9	4	4	4	5	6	3	4			4	4		47
Human Loss-Injury	25	21	16	9	13	21	16	17	17	10	20	15	1	201
Others.Unknown		3	3	6	5	4	6	4	8	5	2	4	5	55
Total	206	139	138	116	127	171	188	171	138	119	129	133	6	1781

Table 4-1-3 Number of Marine Accidents by Kind and by Damage/Loss
1982-86

Damage / Kind	Ship	Human	Cargo	Port Facility	Others	Unknown	Total
Collision	68	26	19	5	10	138	266
Stranding	16	6	33		2	169	226
Capsized	1	17	24			9	51
Fire	6	21	14		3	47	91
Flooding	8	7	33	1	3	77	129
Sunk	16	54	284	4		134	492
Engine Propeller Rudder Troubles	11	3	3			206	223
Drifting	5	3	12			27	47
Human Loss Injury	10	82	29		10	70	201
Others.Unknown	1	12	2		3	37	55
Total	142	231	453	10	31	914	1781

The marine accidents by category of ship for the individual years are detailed in APPENDIX-IV/1.

(2) Marine Accidents by Kind and by Size of Ships

Table 4-1-1 shows the marine accidents, by kind and by size of ship, occurred during the five years from 1982 to 1986 in Indonesian waters. The accidents by size of ship, as given in the Table, shows that the small ships of less than 100 G/T had the highest number of 702 (39.4%), followed by the ships of 100 - 500 G/T at 693 (38.9%), thus occupying 78.3% of the whole accident. The relationship between kind of accidents and size of ship shows that 'sunk' of the small ships of less than 500 G/T dominates at 475 (26.7%), followed by 'human loss and injury' of the small ships of less than 100 G/T at 102 (5.7%). The accidents by size of ship is as shown in Fig. 4-1-4, which shows the general trend. The number by 100 - 500 G/T decreases while that by less than 100 G/T gradually increases. The number of accidents by 500 G/T and upwards shows a slight increase or a similar level. The marine accidents by size of ship for the individual years are detailed in APPENDIX-IV/2.

(3) Marine Accidents by Kind and by Area

The area-wise distribution of marine accidents occurred in 1982 is plotted by kind of accident. The distribution status of marine accidents indicates, as shown in Fig. 4.1.1 (refer to Final Report), that the high density areas of accidents are along the northern coasts of Jawa, from Jakarta areas through Sunda Strait, Surabaya port and its vicinity, and east of Sumatera, around Bangka is., in and around Singapore Strait, Belawan port and its vicinity, east to south of Kalimantan, and Ujung Pandang port and its vicinity.

(4) Marine Accidents by Kind and by Month

Table 4-1-2 shows the summary of marine accidents by kind and by month occurred during the five years from 1982 to 1986 in Indonesian waters. As shown in the Table, the accidents by 'flooding' and 'sunk' frequently occurred in January and from June to August period when south-east monsoon prevails. Accidents by other causes are almost averaged throughout the year regardless of seasons.

APPENDIX-IV/5 gives the graph of accidents by kind and by month.

(5) Marine Accidents by Kind and by Damage/Loss

The marine accidents by kind and by damage/loss occurred during the last five years are as given in Table 4-1-3. As shown in Table, the loss of cargo by 'sunk' stands highest at 284 in number (15.9%) for the reason that it has the highest occurrences among the whole accidents. The loss of ships numbers only 16 out of the total of 492. This is considerably low figure through whole damages occur to ships in case of 'sunk'. There are 'unknown' losses occupying the majority in percentage due to insufficient availability of data. It may be assumed that many of those include the total damage of ships due to 'sunk'. Therefore, the losses of ships, human lives and cargoes due to 'sunk' stand high in Indonesia.

4.2 Analysis of Marine Accidents

The natural conditions prevailing in Indonesia are firstly described followed by the analysis.