10.4. Development of Sustainable Tertiary Shipping System

10.4.1. Institutional Framework

(1) Maintaining Countrywide Shipping Network under Deregulated Environments

During the period of the KPM's monopolized inter-island shipping and the inter-island RLS system, an internal cross-subsidy mechanism worked well to maintain a countrywide shipping network, particularly covering underdeveloped and isolated areas.

Deregulation and liberalization have recently been the mainstream economic regulation in various business sectors, and the overall trend of the times indicates that this will continuously be so in the foreseeable future. Generally speaking, in terms of many business fields in urban areas, it may be said that this policy measure proved effective in making various types of new services available there. However, on the other hand, in such places as isolated islands or areas where the scale of population and economic demands are limited, in terms of various kinds of convenience, service level and charges, disparity with urban areas seem to be widened.

In particular, such phenomenon has been observed in the inter-island shipping business of this country wherein the impact of the policy measure prompted several shipping companies to move into "fat" routes and, in the meantime, leave "thin" routes behind. With these kinds of development in mind, it could be said safely that, were it not for a supply-demand adjustment rules, the intensification of competition would narrow the room of internal subsidy of business entities.

The advent of the deregulation policy in the domestic shipping sector in the late 1980s showed the existence of non-commercial shipping, partly forming in the national shipping network. The government recognized the gap between social need and industrial supply in transport services and theorized pioneer service into four modes (Presidential Decree No. 16/1994):

(i) Pioneer land transport (bus) service

(ii) Pioneer ferry services

(iii) Pioneer shipping services, and

(iv) Pioneer air services

Pioneer shipping, which was started in 1974, is now regarded as one of the pioneer transport services and providers. It provides limited services to the designated areas through the coordination between the central and local governments.

Aside form pioneer shipping, other forms of shipping also contribute to complementing commercial shipping services, as follows:

PELNI passenger shipping: Although PELNI has provided nationwide passenger services by a fleet of pure passenger ships since 1983, many routes are internally regarded as less or least commercial. Taking account of the government's financial support in acquiring

new tonnage, its commercially viable routes seem limited as discussed in the previous section.

Local governments' shipping: Local governments may arrange shipping services to meet essential local needs. The Study Team, however, has not collected such many local practices. One case is Kabupaten Merauke, Papua, which owns several small vessels and provide shipping services through Djakarta Lloyd as an operator. Although similar cases are not many so far, it is a good non-commercial shipping form in this age era of regional autonomy.

Traditional shipping: It is a self-financing shipping system without operational subsidy. In recent years, however, traditional shipping is being phased out from trunk routes due to emerging container and Ro-Ro vessels. As a whole, traditional ships are suffering from decreasing productivity and increasing waiting time. Since it has a unique profit sharing system, setting fair shares of revenue among shipowner, captain and crew, their business becomes less commercial and more or less subsistence shipping.

(2) Introduction of a Common Basket System

The existing non-commercial shipping services are largely owed by PT. PELNI. As already discussed in Section 10.3, the system may not continue during the M/P period. PENLI will not be able to shoulder an increasing deficit to be brought about by the current shipping pattern, that is, calling many small to large ports by a large ship in a 14-day itinerary.

As a rational shift from the current pattern, the Study proposes a hierarchical passenger shipping network consisting of primary, secondary and tertiary routes. The financial evaluation anticipates profitable operations for the primary and secondary routes and far away from financially sustainable operations for the tertiary routes. It is predicted that some 11.3 million passengers will need the tertiary shipping services by 2014. But those demand segments are totally scattered over the country and therefore the load factor in 2014 will be as low as 28%. This ratio is slightly better than that of the current pioneer shipping (26% in 2002).

Taking into account the magnitude of and scattered demand for non-commercial shipping services and the difficulty to continue the present system in the future, the Study proposes to introduce a common basket system. There are definitions of a common basket system. One is to throw all non-commercial shipping needs into one basket and the other is to provide various supportive measures to those shipping needs from one basket in a coordinated manner.

The central government should be primarily responsible for the establishment and management of this common basket system. Since many of traffic demand are not completed within one tertiary route, the system must function as part of the national transportation system. The system should cover, among others, (i) demand research and coordination of local needs, (ii) ship procurement support and ship quality control and (iii) operation monitoring and financial support.

10.4.2. Necessary Services and Required Fleet

(1) Planning Criteria to Provide Non-commercial Shipping Services

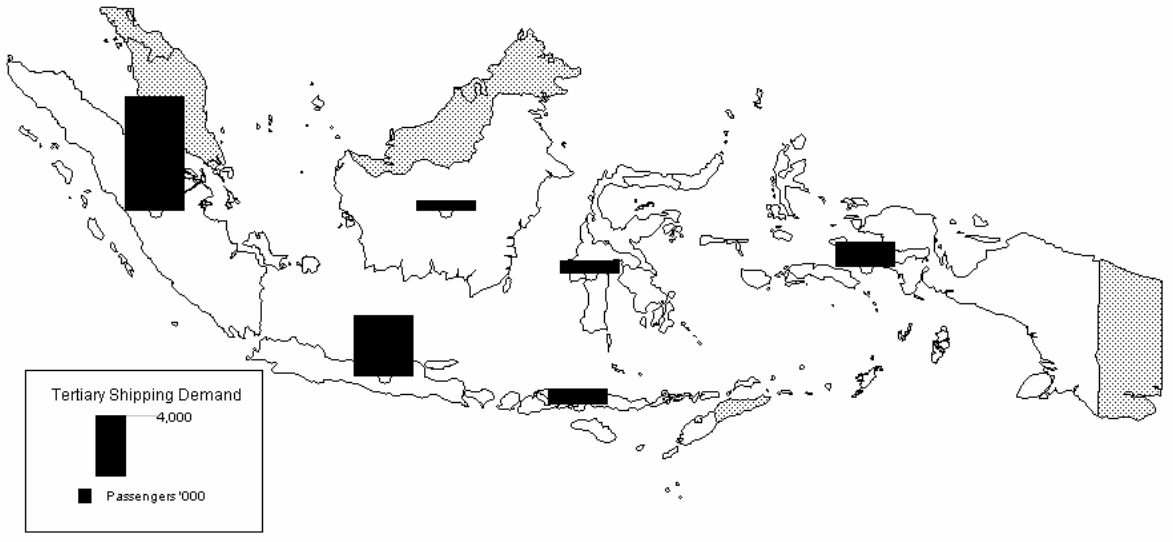
In principle, non-commercial shipping covers the areas where shipping services are not viable on a commercial basis. The Study sets the following criteria to gauge the magnitude of non-commercial shipping services in terms of traffic demand and required fleet:

(a) Service areas and routes

As discussed in Section 10.3 (Reorganizing of Inter-island Passenger Shipping), there will be five tertiary service areas beside commercially viable primary and secondary routes, as follows: coastal voyages around Sumatra, Kalimantan, Sulawesi, and coastal and island hopping voyages at Java and Nusa Tenggara, and Maluku and Papua. Those areas are regarded as non-commercial shipping service areas.

A variety of routes will be necessary within each local shipping area, ranging from short to long itineraries and calling different ports. The average route distance is 334 nautical miles. It is desirable for those tertiary routes to connect with the major ports which receive many ship calls of large vessels plying on inter-island trunk routes.

Figure 10.4.1 Tertiary shipping Service Areas with Future Traffic Demand, 2014



(b) Priority to passenger demand

Compared with freight traffic, passenger traffic is sensitive to regular and frequent shipping services. Presently, the government extends its financial support to PELNI passenger services and pioneer shipping where cargo transportation is marginal. It implies more public value on passenger shipping.

Passenger shipping has seasonal fluctuation in volume. However, there must be considerable demand where substantial local populace reside in regardless of its economic conditions. For instance, Biak Island, Papua, has suffered from economic depression after the Asian economic crisis. In the last decade, the number of ship calls decreased by 20% and the loading/unloading cargoes decreased by over 50%. However, only the passenger traffic has kept to its same level. In planning for non-commercial shipping services, therefore, its priority must be given to passenger demand.

Table 10.4.1 Throughput Traffic at Biak Port, 1993 – 2002

No	Year	Number of Vessels	Unloading		Loading		Total	
			Cargo	Passenger	Cargo	Passenger	Cargo	Passenger
1	1993	1,036	438,514	42,344	166,913	41,749	605,427	84,093
2	1994	1,036	344,043	72,879	160,580	83,702	504,623	156,581
3	1995	1,166	322,329	72,681	119,088	88,049	441,417	160,730
4	1996	1,209	317,169	60,270	94,519	71,865	411,688	132,135
5	1997	1,204	414,429	72,720	108,077	91,112	522,506	163,832
6	1998	1,197	333,403	73,402	95,411	89,405	428,814	162,807
7	1999	1,345	259,118	61,605	78,480	86,917	337,598	148,522
8	2000	958	184,973	67,879	65,520	82,090	250,493	149,969
9	2001	952	167,600	63,128	40,956	82,981	208,556	146,109
10	2002	820	148,260	65,874	27,642	86,001	175,902	151,875

Source: ADPEL Biak

(c) Fleet composition

Due to its non-commercial nature, a large vessel with capacity of over 1,000 passengers is not advisable to be assigned on a tertiary route. An adequate ship size is to be determined with consideration of traffic demand on route (particularly passenger demand), service frequency (at least weekly calls at small ports), trip length (avoiding a small vessel on long route due to limited accommodation space), and seaway calmness (preferably larger vessels on hazardous waters).

The Study has prepared four representative ship types for this planning exercise. They are all passenger cargo types with ship gears. Limited containers can be loaded on deck.

Table 10.4.2 Representative Ship Types

Ship Type	GT	Pax Capacity
Large	1,500	500
Middle Large	860	315
Middle Small	665	210
Small	570	150

(2) Provision of Non-commercial Shipping Services by Feeder Area

In accordance with the STRAMINDO demand forecast, traffic demand for both passengers and cargoes (mainly break bulk cargoes such as bagged) and their required fleet have been calculated by tertiary shipping service area.

As a result, an aggregated fleet of 110,000 GT will be the necessary throughout during the M/P period. The required tertiary shipping fleet is 4 times bigger than the present pioneer shipping fleet (49 units, 28,000 dwt in 2002).

Table 10.4.3 Tertiary Shipping Fleet Requirement by Area in 2014 and Beyond

Traffic & Fleet \ Area		Sumatra	Kalimantan	Sulawesi	Java & NT	Maluku and Papua	Total
Passenger Traffic	Pax ('000)	3,805	314	453	2,587	849	8,008
	Pax.Mile (mill.)	393	88	269	793	377	1,920
Cargo Traffic ('000 MT)	2014	11,553	4,092	1,169	5,313	681	23,257
	2024	19,758	6,079	2,763	8,737	1,263	38,600
Require Fleet Tonnage (GT)		19,533	5,258	13,861	46,559	25,462	110,672
Fleet Composition	> 1,000 GT	13,295	-	13,482	32,988	24,638	84,403
	< 1,000 GT	19,533	5,258	379	13,571	823	26,269

Note: 1/ Exclusive of passengers on trunk-route passenger ships

10.4.3. Implementation Plan

(1) Organizational Set-up

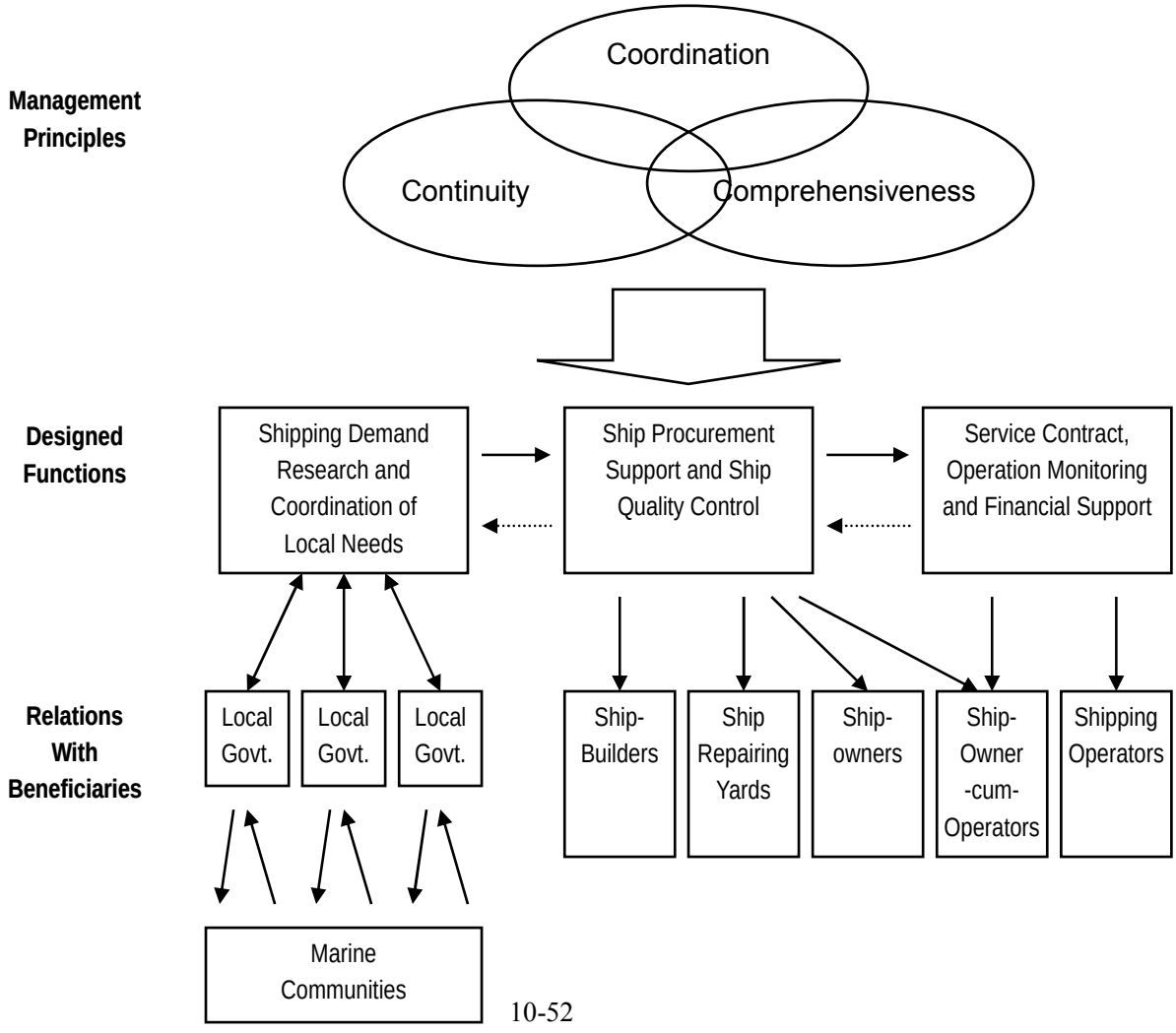
One common basket for tertiary shipping (or expanded pioneer shipping) is an unprecedented challenge which calls for the involvement of numerous entities that includes shipping operators and shipowners, shipbuilders and repairers, local government units and their marine communities. The system may also require not only financial support from the state budget but also other internal and external funding assistances. Therefore, a capable management body is badly needed to cover the common basket for nationwide non-commercial shipping and must harness the following principles inside. DGSC must be responsible for overall management.

Coordination: The organization is a coordination body that is responsible for distributing tertiary shipping services to meet local demand. Many consultation meetings and dialogues will be held at different levels such as local government level, marine community level and industry level. Thus, one common basket is advantageous to treat local demand, particularly non-commercial but serious local shipping demand, equally over the country.

Continuity: The organization is a body responsible in providing continuous and stable shipping services. The tertiary shipping covers less populated and underdeveloped areas. It poses much different characteristics than commercial shipping service. It is more or less lifeline maintenance type service for the local residents. Service continuity is one of the most important requirements among local shipping users.

Comprehensiveness: The tertiary shipping has important missions such as unifying the country, reducing economic disparity and meeting basic social needs. Therefore, public funding is justifiable to support it. To tap public fund in the most effective and efficient way, a comprehensive approach is essential. For example, it enables identifying sound demand segments through research and consultation with local entities, procuring and assigning the most suitable vessels with adequate quality control and effectively disbursing operation subsidy through contract bidding and daily operation monitoring. Accordingly, a three-tiered management structure is proposed for the tertiary shipping.

Figure 10.4.2 Concept of Organizational Set-up for Tertiary Shipping Development



(2) Shipping Demand Research and Coordination of Local Needs

It is already customary for DGSC to modify PELNI routes and pioneer shipping routes. Although it is a proof of coordination and negotiation among the government, operators and local communities, it is questionable that patchy modifications without quantitative analysis will work well. Since traffic demand always changes, a scientific research must be periodically conducted to identify traffic demand volume at a port's hinterland and traffic movement volume between ports. Planning efforts should be paid to identify ideal shipping routes: calling necessary ports efficiently and minimizing the number of passengers to transfer to other vessels on a computer basis.

It is understood that, even under decentralization, inter-island shipping (planning and service provision) is the responsibility of DGSC. However, tertiary shipping covers numerous coastal, sea-cum-river and island-hopping services and thus, greater local governments' involvement is required. In the tertiary shipping development, local government units will take a more significant role rather than how it used to be a petitioner to the government. Options are ship ownership, ship co-ownership with the central government and equity investment to local shipping companies, among others.

Since the Study proposes that the country be divided into 5 regions, it is suggested that consultation meetings be held at every region. An annual tertiary shipping performance report is to be prepared for the meetings.

(3) Ship Procurement Support and Ship Quality Control

DGSC started to construct pioneer ships from 2002 taking into account the limited number of existing fleet. However, the construction pace, more or less 3,000 gt per year, is not enough to fulfill the required tonnage of 116,800 gt until the year 2014. To compensate for such fleet shortage, preparation of attractive bidding packages for private shipowners and operators and other funding arrangements are necessary. In this connection, establishment of a Tertiary shipping Fund as a financial unit to receive an external funding assistance is worth considering.

All the vessels engaged in tertiary shipping must be well maintained. Vessel quality will be controlled by internal superintendents provided that the vessels are partly or fully owned by the government. In the case of contracted operators who own vessels, they can entrust this to ship management companies.

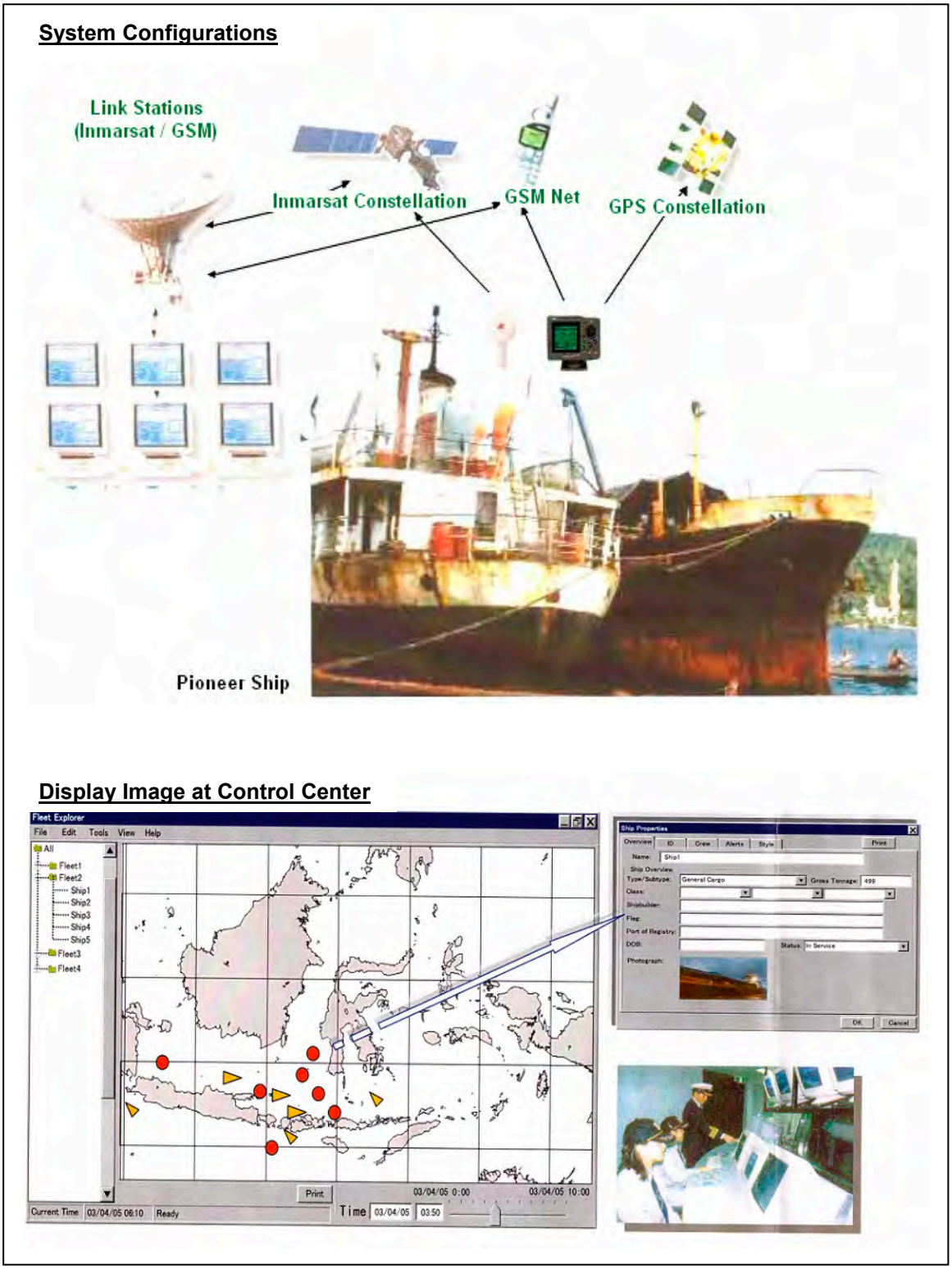
(4) Service Contract, Operation Monitoring and Financial Support

Contract procedures will be as flexible as possible with due consideration for economy and contractor's motivations to improve services while still maintaining safeguard measures to insure that vessels to be contracted and subsidized, if any, are used only for the purposes specified in the respective shipping operation entrustment agreements.

A sound and objective monitoring and evaluation mechanism for the entire contracted services is needed. For monitoring daily shipping operation, it is recommended that the monitoring works be done not only by the operation reports submitted by the contract

operators, but also by using IT technology. An internet and satellite system can be a potent tool to check ship conditions such as location, fuel consumption, sailing speed, passenger, and cargo conditions wherever a ship is within the Indonesian territorial waters (refer to Figure 10.4.3).

Figure 10.4.3 System Image for a Ship Monitoring System



Source: Technical Research Institute, JMS

10.5. Modernization of Traditional Shipping Industry

10.5.1. Introduction

Traditional shipping is positioned as an important and unique part of sea transportation in Indonesia as the Shipping Law No. 21/1992 classify the shipping industry into five groups one of which is traditional shipping industry (Pelayaran Rakyat: Pelra). The others are international, domestic, special and pioneer shipping. Its uniqueness lies in the utilization of wind energy as motive power. Thus, a separate shipping license is issued to Pelra Operators.

In the course of the Study, much has been heard about the worsening business environments of Pelra. However, available Pelra related documents and reports are limited and the exact nature and extent of the worsening situation of Pelra under the recent decentralization move is largely unknown as DGSC has not updated its industrial database since 2001. Taking such circumstances into account, the Study conducted a Pelra survey in order to get an update on Pelra's condition, confirm its contemporary role in the Indonesian sea transportation system and work out a modernization plan.

STRAMINDO commissioned this task to a team of local experts[1]. The team held many consultation meetings and individual interviews with Pelra's stakeholders including ship-owners, operators, seafarers, shippers and shipbuilders at Sunda Kelapa (Jakarta), Kalimas (Surabaya), Pasuruan, Gresik, Tanjung Bumi (all in East Java), Paotere (Makassar), Bulukumba, Banjarmasin, Batulicin, Pekanbaru, Dumai and Batam. The STRAMINDO workshop on Traditional Shipping Modernization was convened on 28th August in Jakarta to discuss the survey results among academic researchers, government officers, numerous Pelra association members and the STRAMINDO Study Team including the local experts. This section has been compiled based on the survey results and the workshop discussions.

Modernization means making something suitable for modern use, or for the needs of the present time (taken from Longman Dictionary of Contemporary English). In this sense it is understood by the Study that, in the shipping industry, the need of the present time is a reliable and efficient shipping service in terms of safety, travel time and cost, and service continuity.

10.5.2. Institutional Framework

Law No. 21/1992 provides general rules to expedite maritime transportation business in Indonesia. The law also attempts to bring about a conducive and healthy business environment in order to support national economic development. As mentioned previously, Pelra has both social and political importance to Indonesia and hence, Pelra needs to be protected and preserved. To do this, the Indonesian Government provides special attention to the development of the Pelra business as implied in the Law No. 21/1992. In this law, however, the special treatment to Pelra is unclear. The section outlines the relevant regulations that defines and supports Pelra.

[1] Prasetyo Hatmodjo (Transport Planner), Heru E. Jatmiko (Shipping Expert), Setyo M. Utomo (Shipbuilding Expert) and A. K. Jaelani (Pelra Advisor)

(1) Protective Industry

To prevent foreign enterprises from entering the traditional shipping business, the government has enacted the Presidential Decree No. 118/2000. The decree relates to a list of business sectors that cannot be conducted by foreign firms or by domestic firms having foreign stakes. The decree in effect prohibits large business enterprise from entering the Pelra business, so that only small- and medium-scale business owned by Indonesian nationals can conduct such business.

(2) Business Establishment and Privileges

The Government Regulation No. 82/1999 and, notably the Minister of Communication Decree No. 33/2001, clearly stipulates the special facilitations and privileges that are given to the Pelra business which are as follows:

(a) The government facilitates business establishment of Pelra companies by imposing very loose requirements as follows:

- The company should own at least one Indonesian flagged vessel powered by sails, or;
- The company should own at least one traditional Indonesian flagged vessel - with a maximum capacity of 500 GT - having the motive power of wind and assisted, in part, by diesel engine, or;
- The company should own at least one motorized Indonesian flagged vessel with a maximum capacity of 500 GT and a maximum engine power of less than 535 HP (The Decree of the Director General of Sea Communication No. PY 66/1/2-02 on Condition for the Safety of Motorized Sailing Vessel).
- The company should employ at least one expert in the field of management, and/or maritime engineer, and/or commercial maritime expert.
- The company should have a tax file number.
- The company should have a notification letter of residence issued by the local authority

(b) The government also furnishes some privileges in terms of business operation of the Pelra as given below:

- In conducting cargo consignment activity, Pelra can also function as a cargo forwarder.
- During cargo handling operations, the seafarers of Pelra are allowed to involve in loading and unloading activities.
- The Pelra has rights to serve cross border shipping to neighboring countries with a maximum sailing distance of 150 nautical miles and with a maximum capacity of vessels of less than 175 GT.
- The Pelra is permitted to undertake tramp routes for their operations.

(c) The government provides special transport infrastructure and facilities for Pelra, especially Pelra ports in centers for collection and distribution of commodities in order to improve the productivity of cargo handling operations.

(d) The government provides some financial assistance to Pelra business as follows:

- The government exempts Pelra companies from port fees to help support their marginal financial condition.
- The government assists the Pelra, through the Pelra Co-operative, in obtaining soft loans or credits from financial institutions to streamline their businesses.
- The government acts as a mediator in forming joint partnerships between Pelra companies and private enterprises having strong capital funds in order for Pelra to improve its performances.

(3) Ship Material and Motor

The ship-hull material is unregulated that means that the hull can be made of wood, steel or even composite materials. In terms of size, the Minister of Communication Decree No. 33/2001 does not specify the maximum size of sailing ships. The motorized sailing ships, however, is allowed to have a maximum size of 500 GT. Meanwhile, motorized ships have size limitation that ranges from 7 GT to 35 GT.

The engine power for the traditional vessels also has limitations. According to the Director General of Sea Communication Decree No. PY 66/1/2-02 on Condition for Safety of Motorized Sailing Ship (Persyaratan Keselamatan Bagi Kapal Layar Motor – KLM) the engine power depends on size of the vessel as listed in Table 10.5.1.

Table 10.5.1 Size Alteration and Engine Power

No.	Gross Tonnage (GT)			Maximum Power (HP)	
1.	0	Up to less then	10	Not more than	50
2.	10	Up to less then	20	Not more than	75
3.	20	Up to less then	35	Not more than	105
4.	35	Up to less then	80	Not more than	175
5.	80	Up to less then	165	Not more than	275
6.	165	Up to less then	260	Not more than	360
7.	260	Up to less then	315	Not more than	400
8.	315	Up to less then	500	Not more than	535

Source: DGSC as quoted by the Lembaga Penelitian Universitas Indonesia (2002).

(4) Human Resource Development

The intervention of the Government in the Pelra business is directed to three groups of human capital in Pelra operation: the operators, the seafarers, and the shipbuilders. These three play an important role in influencing the business performance of the traditional shipping industry. Due to the importance of human capital, the government provides special attention to improve human resources. According to the Ministerial Decree No.

33/2001, there are three main factors concerning human resource development that the Government has to provide:

- The improvement of the managerial and marketing skills of Pelra companies by conducting basic training and education of commercial maritime management;
- The improvement of seafarer quality that specifically aims to enhance technical skills in operating communication tools and navigational equipment, and to be proficient on recent maritime technology.
- The standardization of ship design, such as ship types, ship construction, and ship model, that is economically feasible and technically acceptable.

The Indonesian government realizes that protecting the traditional shipping business is an unsustainable effort. The protection and development of traditional shipping should be accompanied by the improvement of human resources such that in the long-term, traditional shipping companies could be able to survive independently. The government, through a series of decrees from the Director General of Sea Communication, provides more effort to enhance the skill quality of the Pelra community.

The most important is the decree of the Director General of Sea Communication No. DL. 21/2/5-89 on skill improvement of Pelra human capital which include the following subjects:

- Basic management for commercial shipping
- Shipbuilding technology for traditional shipping
- Shipyard management for traditional shipping industry
- The improvement of technological skills of seafarers, such as engine maintenance and radio operator courses.

The decree also determines the schedule and syllabus of the training courses. The head of the Sea Communication Training Centre and the head of the Regional office of the Ministry of Communications are responsible for supervising the implementation of the training courses. Meanwhile, the central organization of Pelra Association (DPP Pelra) is responsible for managing the courses, funding the training courses, and for issuing the certificates of accomplishment. This training requirement becomes the prerequisite for the establishment of a traditional shipping company and a shipbuilding company. These requirements can be likened to the prerequisite of having ship captain and ship engineer certificates. In practice, however, these programs are not properly conducted due to lack of funds and coordination amongst the associated executing organizations.

10.5.3. Changing Business Environments and Pelra Stakeholders

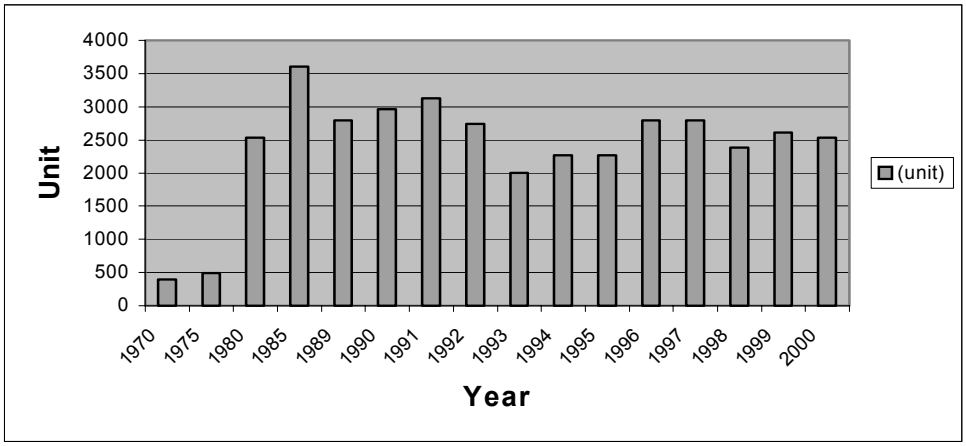
(1) Change in Industry Scale

(a) Fleet Growth

Figure 10.5.1 shows the growth of the Pelra ships between 1970 and 2000. During the period between 1970 and 1975 the average growth is only 5% annually. The motorization program enacted by the government had low impacts on the growth of the Pelra fleet. Between 1975 and 1985 the number of ships grew rapidly at a rate of around 80% per annum, in line with the instruction of Minister of Communication in the late 1970s to promote the Pelra business nationwide by allowing the Pelra fleet to consign the transport of staple food (Mr. Salimin, 2003, pers. Comm.)[2]. As a result, the operators increased the number of their ships tremendously to keep abreast with the expected high demand for sea transportation.

Between 1985 and 1990, the number of ships decreased by 22% but continued to increase by a rate of 1.2% per annum between 1989 and 1991. In the period between 1991 and 1993, however, the number of ships declined by 21% per year on average. Fleet growth recovered between 1993 and 1997 at an average rate of 10% per year. After the economic crisis in 1997, the number of ships was reduced by 15%. In 1999, the number of ships increased by almost 10% from the previous year. In 2000, the number of vessels declined by 3% due to reduced demand as a result of competition. Continuing lack of the demand - due to competition from Ro-Ro and container ships - has made many Pelra's previous patrons to shift their shipments to other companies with more modern services. Under such conditions some operators – such as those at Sepulu port (Madura) and Banjarmasin – decommissioned their ships owing to inadequate funds to operate and to maintain their ships.

Figure 10.5.1 The Number of the Pelra Ships from 1970 to 2000



Source: Adapted from Jinca (2002, Table 2.1, p.6) and DGSC (2002)
Note: Motorized sailing vessels only

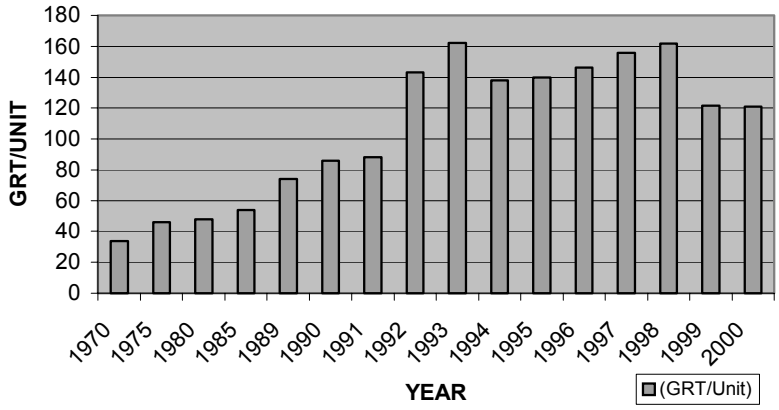
[2] Honored Member of Traditional Shipping Association of Surabaya Branch Office

(b) Ship Haulage Scale

In line with the growth of cargo demand, the average size of Pelra vessels also fluctuates over time as shown in Figure 10.5.2. The average ship size grew from only 34 GT per unit in 1970 to 162 GT per unit in 1998 or a five folds increase. On average, the ship size grew at a rate of 9% annually over the period between 1970 and 2000. During the crisis, the ship size growth dropped by 25% from the previous years. Between 1999 and 2000, the average ship size remains stable at 121 GT/unit.

It implies that the size of the wooden vessels tend to increase over time from 1970 to 2000. The increasing size of the wooden ships reflects the owner's anticipation or speculation of the growing demand in the future. Unfortunately, this speculation fails to consider the influx competitors or the changing business environment, such as the trade globalization.

Figure 10.5.2 Average Ship Size Development of Pelra Operations



(2) Losing Markets on Trunks Routes

Although an overall statistical picture can not be shown, Pelra has been losing its market share on trunk routes, judging from interviews conducted. The introduction of increased Ro-Ro and container service between major commercial ports has diminished the share of Pelra shipping significantly. Both Ro-Ro and container ships have several economic advantages. Firstly, modern ships have reliable services because ships have fixed schedules and routes. Secondly, modern ships are faster and safer. Thirdly, shipment costs of modern ships are relatively inexpensive due to economy of scale. Finally, modern ships have relatively low invisible costs (Supriyadi, 2003, personal communication)[3].

In the case of Banjarmasin, the number of Pelra ship calls has been declining in inverse proportion to container ship calls since 1995. This declining trend has been further exacerbated by the introduction of RORO passenger ships on the Banjarmasin-Surabaya route since 1999. Pelra Operators has either shifted their service routes or changed the nature of their business to other aspects of the shipping business such as shipbrokerage.

[3] Harbor Master of Banjarmasin Port

Table 10.5.2 Banjarmasin Port Traffic, 1995 - 2002

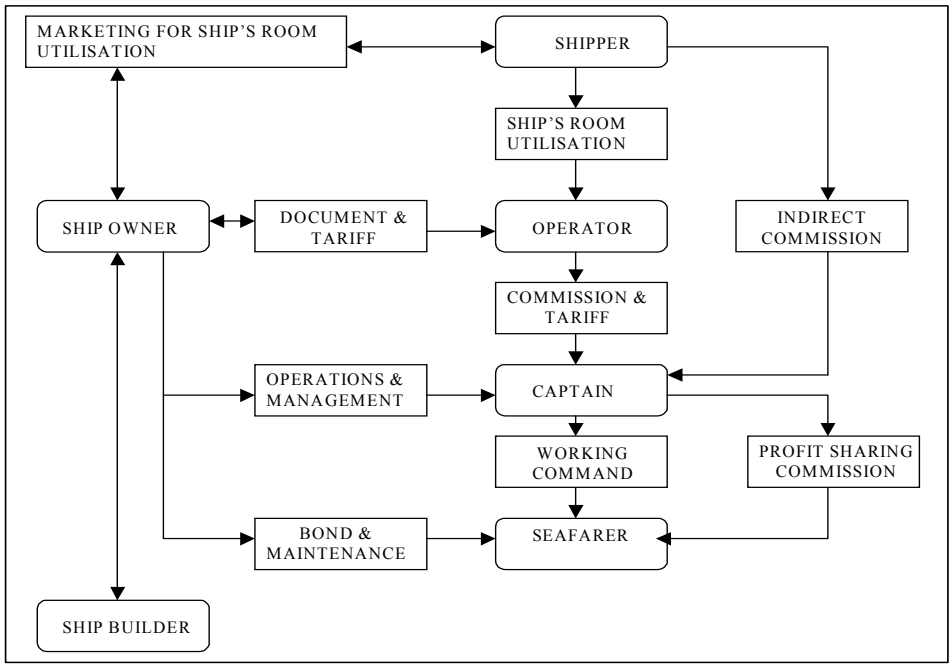
Year	Traditional Shipping		Container Shipping*		Passenger Shipping	
	Ship Calls	Ton/m^3	Ship Calls	Ton/m^3	Embarkation	Disembarkation
1995	1102	266731	297	584260	147356	152543
1996	912	190524	309	766272	146443	173273
1997	838	212376	390	932583	156412	154569
1998	652	170800	488	1249452	140866	148642
1999	509	146673	482	1165716	207891	216588
2000	333	95562	571	1504373	n/a	n/a
2001	156	60213	650	1797714	226729	171748
2002	78	48075	684	1974736	n/a	n/a

Note: * inclusive of international route
Source: ADPEL Banjarmasin

(3) Stakeholders Condition and Perceptions

In a much broader sense, there are five stakeholders who are directly involved in traditional shipping activities. They are the ship owner, shipping operator, shipper, seafarer and shipbuilders. Each stakeholder has a different function and role in the industry, and their interactions with one another form the structure of the traditional shipping industry. Figure 10.5.3 describes the interaction amongst stakeholders.

Figure 10.5.3 Stakeholder Interactions in the Traditional Shipping Industry



Source: Jinca (2002, Figure 8.2, p.133)

This section describes the conditions and perceptions of each stakeholder based on an interview survey (no. of respondents - 31 in total):

(a) Shipowner

- *Status of Vessels*: Almost 60% of the ship-owners have only one ship and 20% have two ships.
- *Fleet Expansion*: At this moment, none of the interviewed ship-owner plans to increase their fleet due to the recent down turn market.
- *Possibility of Altering Business*: 50% of the ship-owners are reluctant to change their businesses although their market shares continue to decrease.
- *The Preference of Cargo Handling Equipment*: Crane installation onboard ships depend on the decision of the ship owner. Some owners prefer to use ship crane to expedite cargo loading and unloading operations.

(b) Ship Operator

- *Hull Insurance*: Only one respondent (or 5% of respondents) insures his ships, and 95% have their ships uninsured.
- *Cargo Insurance*: Only 20% of the operators insure their cargoes.
- *Source of Capital Funds*: Almost 80% of the respondents use their own funds to run their business, 10% of the respondents borrow capital from cooperatives, and the other 10% acquire funds from traditional shipping organizations.
- *Shipment Philosophy*: Traditional shipping companies have their own business philosophies. Almost 65% of the operators obligate the captain to carry full cargoes for every voyage to and from their homeports, whereas 35% of the respondents delegate the decision to carry backhaul shipments to the captain or to their branch offices.
- *Possibility of Operating Steel-hull Ships*: Provided that Ministry of Forest would not impose stringent restrictions on timber supply, 65% of operators have no intention to change their wooden ships to steel-hull ships.
- *Branch Offices*: 70% of the operators have their branch offices opened in other areas.
- *Land Service*: Around 45% of the operators have trucks to support land-side shipment activities.
- *Internal Constraints of Business*: Around 95% of the respondents claim that the unavailability of capital funds is their primary problem, whilst the other 5% regard poor management and low quality of human resources as their primary concern.
- *External Constraints of Business*: Around 85% of the operators regard government policies as one of their main constraint. Conflicting policies issued by some government bodies has confused Pelra operators. Meanwhile, 15% of the operators' prime concern is the availability of business information and insufficient port infrastructure.

(c) Seafarer

- *Number of Seafarers*: 70% of operators employ 6 to 10 seafarers on each ship, while 20% respondents have 11 to 15 seafarers on every vessel and only 10% of operators have more than 15 crews onboard each ship.
- *Background of Education of Seafarers*: Most seafarers have only low level of education, and some are illiterate.
- *Possibility to Work on Steel-hull Vessels*: Most respondents state that they are unprepared to work onboard steel-hull ships because their educational background and skills are inadequate to operate such ship.
- *Preference of Cargo Handling Means*: Nearly 80% of seafarers prefer to use ship crane as a means to load and unload the cargoes. They consider that the use of ship crane is able to reduce the cargo handling time significantly.
- *Causes of Ship Disaster*: Almost 90% of the seafarer – based on their experiences – state that the inclement weather as the prime cause of ship accidents. Around 10% of the seafarers claim that ship sinking is primarily caused by pump failure during a storm. All respondents further claim that overloading or poor ship material have not been a primary cause of ship sinking.

(d) Shipper

- *Patronage continuation*: All respondents have special patronage with operators. Patronage is based mainly on personal relationship or kinship. Under such circumstances, all respondents will continue their shipments with current operators as long as the shipment cost remains competitive.

(e) Shipbuilder

- *Working Experience and Main Products*: All shipbuilders make only wooden ships. The shipbuilders never even use their tools to make other products, such as furniture or other wooden products.
- *Possession of Shipbuilding Certificate*: None of the shipbuilders have a certificate from BKI to build a ship. They only follow the directions of the port master standard as stipulated in the Decree of the Director General of Sea Communication No. PY 66/1/2-02. The shipbuilders are also confident that their ships are quite safe and seaworthy.

10.5.4. Analysis of the Traditional Shipping Industry (Pelra)

(1) Method of Analysis

The Study employed the SWOT analysis to assess factors determining the criteria to enhance the performance of traditional shipping services. The SWOT analysis is able to provide a general description of the current and future condition of the Pelra business. Moreover, the analysis is capable to furnish various alternatives of Pelra services that are efficient and effective in order to improve the service quality of the industry. By using

these alternatives, the study can provide recommendations or valuable inputs that may be used as the reference to conceptualize policies for improving the market share of the Pelra industry. (Refer to "Column: Method of the SWOT Analysis")

(2) Pelra's Strength, Weakness, Opportunity and Threat

In accordance with the survey results, the strengths, weaknesses, opportunities and threats of the traditional shipping industry are analyzed as follows:

(a) Strength

1. Most Pelra's ships are of small size and shallow draft. This enables a traditional ship to visit a small river port or a small seaport that is located in a remote area, despite the lack of supporting facilities, such as wharf or berth and cargo handling equipment. Under such circumstances, seafarers must involve in cargo loading or unloading activities.
2. Traditional ships do not need special dock facilities for maintenance. Ships maintenance can be done at sea shore.
3. Traditional shipping can be classified as an independent industry because they can survive without support from financial institutions. In practice, they undertake multiple shipping business activities, such as trading, shipping and freight forwarding activities. In other occasions, they can purchase certain goods, store the cargo in a warehouse (sometimes of their own), and then haul the cargo to the final destination.
4. Traditional shipping applies a profit-sharing practice as the main source of their revenue. Under such system, each party shares revenue and business losses fairly. In this system, there is no labor exploitation practice. Each party is responsible for maintaining ships and for preventing cargo from either being lost or damaged.
5. Pelra Association and Pelra Cooperatives are two bodies that are very important in promoting the interest of the traditional shipping business practices. The Pelra Association aims to uphold the business interests of Pelra firms especially in relation to persuading Government bodies to issue policies benefiting the Pelra industry. The Pelra Cooperative is another organization but especially dealing with financial matters associated with traditional shipping business.

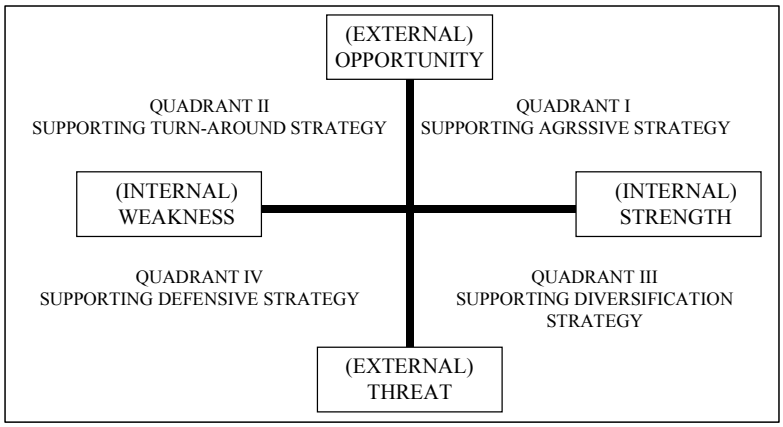
Column 1: Method of the SWOT Analysis
– Strength - Weakness - Opportunity - Threat –

The SWOT analysis describes the condition of the organization or certain industry in the form of strategic advantage profile and the environmental threat and opportunity profile. The strategic advantage profile depicts the strategic position and internal condition of the organization within the context of comparing the competitiveness of the traditional shipping industry with the other shipping industries. The strategic advantages comprise the strength and weakness aspects that can be fully controlled by the management. The strength relates to controllable aspects that can provide positive impacts on the organization. The weakness associates with factors that are beyond the control of the management so that these aspects can bring about negative effects on the organization.

Meanwhile, the environmental threat and opportunity profile shows both the external support and threat possibilities that might occur at the time when organization or industry develops its business policies. The aspects of opportunity and threat are elements that are completely beyond the control of the management. The opportunity factor is a chance of success that an organization has if it has power to realize the chance. The threat is external factors that have the potential to jeopardize the future viability of an organization. The threat aspects include social, economy, culture, politics, demography, technology, and government policy.

Both the external and internal factors need to be valued qualitatively by giving weighting and rating factors to every element of the SWOT analysis, such as strength, weakness, opportunity and threat elements. The internal factors of strength and weakness must be compared with the external factors of opportunity and threat as seen in the figure below.

The Framework of the SWOT Analysis



Quadrant 1 describes a desirable situation in which strength and opportunity is very dominant. Under such circumstances, the desirable action is to support the growth-oriented strategy.

Quadrant 2 shows a situation whereby the organization suffers from some weaknesses in running its business but the organization still have chances to capture any business opportunity in the market. In this case, the best strategy is to minimize internal problems so as to gain better share in the occurring market opportunity.

Quadrant 3 depicts a situation in which an organization has internal strength but has some serious external threats. The perceived good strategy is to use the strength in order to gain a long-term opportunity by diversifying its market or product.

Quadrant 4 describes an unwanted situation whereby the organization faces both many external threats and internal weaknesses. Under such conditions, the organization better apply a defensive strategy to survive the non-lucrative situation.

(b) Weaknesses

1. Human resources:

- Traditional shipping generally lacks adequate managerial and/or entrepreneurial skills. As a result, most Pelra entities have difficulties in changing or modernizing their business.
- Traditional shipping suffers from limited skills and low education of their operation staff, including seafarers. The skill of seafarers is limited in the sense that they only engage in traditional shipping business only. In addition, most of its seafarers are not well educated and they have little knowledge of modern maritime technology. These situations have made the traditional shipping community unprepared for business modernization, let alone to enter a new business environment by operating a larger and modern steel hull ships.

2. Ship condition:

- The Pelra firms operate only small ship sizes. On the one hand, the small size of Pelra's ship can be regarded as strength, because it allows them to feasibly operate in rivers and visit small ports in remote areas, but on the other hand, this is a weakness because transport capacity is very low. The consequence is, they cannot compete with large modern ships on a busy route.
- Most Pelra ships are old ships. The age of ships is not always directly related to seaworthiness. However, a shipper may prefer to use a newer ship that is more reliable and in this case, the shipper would tend to opt for a larger and more modern ship.
- Most Pelra vessels have no classification standard. The Pelra ship does not fall into any standard classification; therefore, Pelra ships are not constructed and maintained in accordance with a certain standard. The consequence is that the extent of the ship conditions becomes poor and difficult to be reliably determined by shippers, so that:

  (i) The shippers would tend to use a large modern ship whose conditions are more easily and reliably determined.

  (ii) Most insurance companies would tend to refuse to provide insurance coverage, unless the premium rate is very high.

- Sailing ships are difficult to be altered for other purposes, for example to transport passengers or tourists, because the sail occupies almost the entire upper deck.
- Most of ships are not equipped with cargo handling facilities. It takes a long time for loading/unloading process. Hence, it would increase port time and decrease sailing time.
- Some ships are not equipped with proper communication systems.

3. Some of traditional shipping ports have poor design and lack adequate cargo handling equipment. In many cases, the wharf is too short so that the ships are unable to berth properly. As a consequence, loading/unloading operations have to be done manually. This procedure would take a long time and thus increases port time. Table 10.5.3 shows infrastructure conditions of some busy Pelra ports. Major Pelra centers have relatively good conditions although shallow waterways and poor cargo handling equipments and storage facilities are common.

Table 10.5.3 Infrastructure Conditions of the Selected Study Areas

Location	Relative Condition				
	Waterways	Wharf	Crane	Warehouse	Open Storage
Jakarta	shallow	Good	none	none	good
Kalimas (Sby)	good	Good	none	good	None
Gresik	shallow	Good	none	none	Not good
Pasuruan	shallow	Not good	none	good	None
Tanjung Bumi	bad	None	none	none	None
Paotere (Mks)	good	Good	none	none	None
Banjarmasin	good	Good	none	none	None
Batulicin	good		none	none	None
Pekanbaru	good	Not good	none	none	None
Dumai	shallow	Good	none	Often flooded	Often flooded

4. Packaging type of cargo has no standardized form. This makes the use mechanical equipment to handle the loading and unloading activities impractical.

5. Traditional shipping is highly affected by weather condition. This increases the uncertainty and irregularity of shipping services.

6. Most of owners/operators have limited funds. Financial institutions are unwilling to provide soft loans for the Pelra community. The reason is that the rate of return is very low. Secondly, the business is considered as high risk (i.e. high occurrence of sea accidents).

7. The evaluation of traditional shipping business may be problematic because of the lack of accurate data on accident, population, size, and type of vessels.

(c) Opportunities

1. Human resources:

- Recruitment process is very simple, and it does not require highly qualified seafarers.
- Most of seafarers undergo an apprenticeship program to improve their skills on handling ship operations.
- Most of Pelra community are confident that they can survive in the business

2. There are still many undeveloped small ports in remote areas that are unreachable by large modern ships. These areas are Pelra's potential market.

3. Traditional shipping has privileges in conducting shipping activities, such as simple clearance process, simple cargo handling procedure, and lower administration fee than other shipping industries.

(d) Threats

1. The existence of Ro-Ro ships, ferries or barges that operate on the same routes that is capable of carrying container or freight trucks with relatively low unit transportation costs.

2. There is no limitation on new entrants to traditional shipping business. In a homeport, there is no limitation to the number of ships owned by each company. The lack of control may result to the over-supply of traditional shipping services leading to the reduction of ship utilization in the future.

3. Human resources:

   - Seafarers are ineligible to operate steel-hull ships, unless they follow special training courses to enhance their skills and to obtain a certificate of eligibility that is required by law.
   - Most of seafarers have low level of education and limited knowledge to work onboard ships. Moreover, they seem to be reluctant to join additional training programs to increase their skills and qualifications.
   - Most of the Pelra community is still unaware of the adverse effects of globalization on their future business. Most of them have no strategy to prepare for the negative impacts of trade globalization.

4. Shipbuilding industry:

   - All Pelra shipbuilding workers are qualified for wood works only.
   - All Pelra shipbuilding equipments are specific for wood works.
   - All the experiences in the Pelra shipbuilding industry are only on making wooden-hull ship.
   - Shipbuilders have no formal standards in making a ship.
   - Timber has become increasingly difficult to obtain owing to the reduction of wood production as a result of the government policy on forestry conservation. Therefore, the use of alternative materials, such as composite material and steel, will gain much significance. At this moment, shipbuilders are unable to build a steel hull ship or to make vessels from any other alternative material, for example composite material.

5. Shippers usually expect rapid and safe transport services having low transport costs and regular schedules. These requirements have become very difficult for traditional shipping to meet.

6. Infrastructure:

- Development of port infrastructure at remote areas will have the potential to invite Pelra's competitors, such as large modern ships, that eventually threaten the viability of future Pelra business there.
- In the case of river shipping services, the development of road infrastructure may cause the shifting of freight transport from rivers to road.

7. The unavailability of business information may hinder ship operators from finding cargo demand. In many cases, there is no business communication between homeports.

(3) Conclusion

The SWOT analysis finds that the weaknesses and the threats are more dominant than the strengths and the opportunities in traditional shipping business practices. Pelra will face great difficulty to overcome their internal (i.e. the weaknesses) and external problems (i.e. the threats). The consequence is that they are unable to capture any available business opportunity. This shows that the position of Pelra is very weak. Therefore, they need protection from the Government to be able to survive. In the short-run, therefore, the action plans to help invigorate the Pelra business needs to emphasize on survival and protection strategies.

As identified in the SWOT analysis, there are five main problems faced by the traditional shipping industry: low quality of human resources, including owners, operators and seafarers; inadequacy of business information; low level of managerial skill; insufficiency of freight demand; and severe competition among operators. These problems have left Pelra shipping industry with little competitive strength to deal with other shipping industries. In addition, lack of entrepreneurial skills, has made the traditional shipping unable to capture any kind of business opportunity created by the changing business environment.

The second problem relates to the provision of port infrastructure. There are many dilapidated ports with poor design. These ports also suffer from inadequate and inappropriate handling equipment. In most cases, Pelra's ships are unable to berth properly alongside the wharf. Instead ships are arranged at angle positions. This position requires longer cargo handling time. Another problem faced by the traditional vessel is the low level of demand for sea freight. These two problems have caused increasing waiting time of Pelra ships. Consequently, port days of the traditional ship have become longer than it used to be. The site survey shows that the average waiting time of a ship at a port is around two months.

The third problem of Pelra industry is the absence of shipbuilding standards and the unavailability of appropriate technology for constructing an economical wooden ship. Because of this, there is no guarantee that the wooden ship construction is seaworthy. Accordingly, insurance companies are reluctant to cover the risky Pelra ships. In some cases, insurance companies agree to cover the ship; however, the insurance premium is very expensive and prohibitive. In addition, lack of technology has lowered the ship performance. This in turn will increase operation, maintenance and repair costs. Proper technology is also needed at ports and shipyards to increase safety and efficiency.

The fourth problem is associated with the supporting policies in the form of laws and regulations. There are many prevailing legislations and regulations with regard to the traditional shipping industry. However, some of the policies have not been implemented consistently. The main things in this area is the regulation Pelra Shipping so that it can make a mutual synergy with other shipping industries, such as Domestic Shipping, International Shipping and Pioneer shipping in order to establish an efficient and competitive sea transportation system in Indonesia.

Column 2: Wooden Fleet Dispute
– In the Case of the Philippines –

There was a dispute whether Indonesian Government continues to support wooden-hull ships or changes its policy to phase them out. We observe considerable fleets of sea-going wooden-hull ships at many countries. In Japan, a fleet of small wooden-hull ships transported 103 thousand tons of cargo or a marginal share of 0.02% in 2001. However the countries like Indonesia are rare where large wooden-hull ships of over several hundred gt still engage in major domestic trading routes.

Although each country has distinct conditions and reasons to allow wooden-hull ships in domestic shipping, it is worth noting that Philippine Government decides to phase out the existing fleet in the domestic trade by virtue of MARINA's Memorandum Circular No. 190 (MC No. 190) in August 2003.

Prior to the MC No. 190, MARINA already controlled wooden-hull ships including a scrapping age of eight (8) years taking their insufficient seaworthiness and difficult maintenance into account. In order to further enhance and ensure the safety of life and property at sea, and to accelerate fleet modernization plying in the domestic trade, MC No.190 provides rules on the progressive/gradual phase-out of wooden-hull ships as follows:

Over 100 – 500 gt: within three (3) years

Over 35 – 100 gt: within five (5) years

Over 3 – 35 gt: within seven (7) years

When enforcing such scrapping policy, MARINA is required to take the following institutional support mechanisms:

1. MARINA will develop the appropriate and affordable financing scheme and incentives for the acquisition of replacement vessels by existing wooden-hull operators in close coordination with the Development Bank of the Philippines (DBP) and the Board of Investment (BOI).
2. MARINA will develop a standard ship design and alternative boat-building technology (steel, fiberglass, aluminum, etc.) for the replacement of such wooden-hulled ships.

10.5.5. Proposed Modernization Plan

(1) Modernization Roadmap

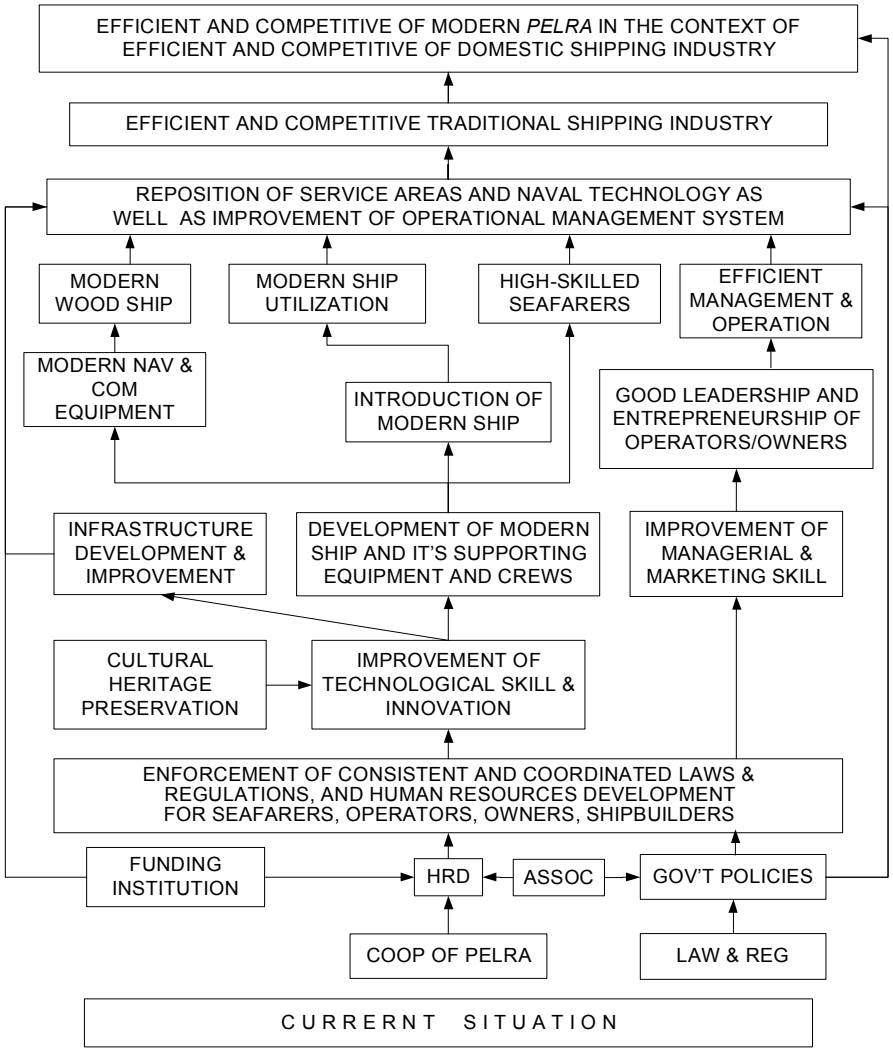
A roadmap is a framework of action describing a sequence of working programs or strategies applied to achieve certain objectives of an organization. The main objective of the modernization roadmap is to achieve an efficient and competitive modern Pelra industry within the context of an efficient and effective domestic shipping industry. In pursuing the objective of modernizing traditional shipping, it is necessary to take the whole modernization process into account. Traditional shipping modernization is a process consisting of some sequential stages that have to be performed to obtain the main objective. Each stage has its own objective and each respective result affects the following modernization phases. The explanation of the working sequences illustrated in Figure 10.5.4 is as follows:

- The current situation provides strategic information for devising an achievable roadmap for traditional shipping modernization. In this roadmap, the development of human resources directly involved in the industry should be given top priority (1) in the short-term.
- In developing human resource, the financial support from financial bodies, including the Pelra cooperatives is very essential to sustain the activity (2).
- The human resource development also needs assistance and guidance from the Pelra Association who understands well the needs and the problems of the traditional shipping firms (3).
- The modernization of traditional shipping industry also requires consistent and coordinated law enforcement to create conducive business environments. Conducive environment for business practice can be achieved through the enactment and implementation of consistent and non-contradictory policies and strategies for traditional shipping development (4).
- The policies should be in accord with the prevailing laws and regulations (5).
- To produce effective policies, the Pelra association has to be the main source of information of government agencies to devise suitable policies and strategies for traditional shipping development (3).
- Conducive business environments and high-skilled human resources will become a valuable asset and a basis to further modernize traditional shipping industry in the short-term (6).
- In the medium-term, improvement of managerial and marketing skills (7) and, the improvement of technological skills and innovation (8) should be continued regularly and consistently.
- In conducting improvement of technological skill and innovation, it is necessary to take the preservation of cultural heritage into account (9).

- The above improvements aim to provide good infrastructure development for Pelra ports (10), and to support modern ship development including seafarers (11).
- The development of modern ships comprises two main goals: the development of modern wooden ships and its supporting equipment (12) and the development of non-timber-hull ships in traditional shipping business (13) and utilize the modern ships efficiently (14).
- The development of seafarers' quality aims to provide high-qualified seafarers to support traditional shipping operations (15).
- Meanwhile the improvement of managerial and marketing skills intends to instill excellent leadership and entrepreneurship to traditional shipping operators (16). This may lead to the achievement of an efficient management system and efficient operations (17).
- By attaining improved ship design, high quality of seafarers, and efficient management of operations, the traditional shipping industry should be able to reposition their service and improve the quality of their services (18) by the end of the medium-term. This expected condition may help improve the efficacy and competitiveness of the traditional shipping industry (19).
- In the long-term, it is hoped that the efficient and competitive modern Pelra shipping business may support the efficacy and competitiveness of the whole domestic shipping industry (20).

Having devised the roadmap, the following step is to prepare action plans for the practical implementation of the roadmap. The roadmap clearly identifies that there are four different aspects that need to be further investigated, namely (1) human resources development, as the most important, (2) port infrastructure, (3) introduction of standards and technology, and (4) supporting policies.

Figure 10.5.4 The Roadmap for Modernization Traditional Shipping in Indonesia



(2) Human Resources Development

In the globalization era, high-quality human resources have become the main requirement for business survival. Therefore, human resource development should be put as the highest priority in the modernization of the traditional shipping industry. By improving the quality of human resources, they would be able to keep pace with modernization.

Based on the SWOT analysis, the results of the previous studies and the existing law and regulations, the human resources development program is proposed below:

Short-Term Plan:

1) Identifying problems that hampered accomplishment of human resources development programs.
2) Formulating syllabus and training's material that covers at least:

a. Management, including shipping business, marketing strategy and basic financial analysis.

b. Freight forwarding knowledge

c. Shipbuilding technology, including capability of understanding technical drawings

d. Maintenance and repair

e. Seafaring

f. Navigational expertise

g. Technical operations

3) Formulating training programs, issuance of training certificate, including the legal basis on the conduct of training courses and issuance of certificates.

4) Formulating role-sharing between Government and Pelra Association - as representative of Pelra community - especially on funding for training courses.

Medium- and Long-Term Plans

1) Research and Development on human resources needs for the Pelra Industry.

(3) Port Infrastructure Development

One of the problems identified in the SWOT analyses is the low quality of port infrastructure, especially in terms of port capacity and facilities. The Pelra's ports could be provided by the government, private organizations (including cooperatives), or even individuals using a very simple structure. The ports can either be located at seashore (i.e. seaport) or at a riverbank (i.e. river port). In case of river ports, they may be scattered along a river, so that it may be very difficult for the Government to check, thus may be more amenable for private party operation.

Based on the above, it is clear that in the future port infrastructures need to be improved, in terms of capacity as well as facility-wise, so that the time for loading and unloading can be reduced. This proposal is in line with the expectation of the DPP Pelra, as stated in the minutes of meeting dated on 29 May, 2002 (DPP Pelra, 2002), which states, "the government is expected to provide more ports that are dedicated for Pelra, including supporting facilities, such as office for Pelra Association, office for Pelra Cooperation, mosque, fuel tank, small hospital, and lighting."

Development and improvement of port infrastructures may be done in several stages. The main goal is how to increase operation efficiency that helps reduce total port time and increases ship's productivity. The stages may be outlined as follows:

Short-Term Plan:

1) Integrating port development plan with local (land) transport development plan, in the context that a port is an interface between sea/water transport system and land transport system. This is very important, especially in terms of developing access

to and from the port to streamline cargo flows.

2) Introducing a standard for small and major port provision. The standard should cover both demand and supply parameters.

   a. Demand parameters consist of cargo volume, type and size of ships, and number of calls.

   b. Supply parameters comprise length of quay, depth of water, and cargo handling facilities.

3) Developing existing ports that have not been designed in accordance with a defined standard, including the provision of cargo handling equipment in major Pelra ports, such as Sunda Kelapa (Jakarta), Gresik, Kalimas (Surabaya), Pasuruan (East Java), Paotere (South Sulawesi), and Dumai, to expedite cargo handling activities to and from large Pelra vessels.

4) Devising an appropriate mechanism for managing the involvement of private sector in the development process of port infrastructures.

Medium-Term Plan:

1) Introducing a suitable technology to increase efficiency and productivity of Pelra's Port. This could include cargo-handling equipment, data and information centers, and communication facility for interchanging data and information between ports.

2) Developing small ports to become major ports as indicated by demand parameters.

Long-Term Plan:

1) Building new port(s) in area(s) where they are needed, as indicated by demand level, as well as origin and destination of cargo flow, following the prevailing standard.

(4) Introduction of Standards and Technology

The emphasis of this action plan is to encourage the Pelra community to implement a suitable standard and technology to increase safety, efficiency and competitiveness. To do this, it is necessary to prove and illustrate the usefulness of the new technology to the community through a pilot project. A successful pilot project will help assure the community that the new technology and standards are worth following. The suitable standards and technology may be applicable in a port, shipyard or ship. By improving safety, efficiency and effectiveness of traditional shipping practices, insurance companies will be convinced to cover Pelra's fleet business operations. It is expected that the insurance coverage may attract more customers to use Pelra's services in the future.

The action plan may be outlined as follows:

Short-Term Plan:

1) Organize a working tour that will cover shipbuilding, ships maintenance and repair, port development and operational and navigation systems. Visiting hydrodynamic

laboratories, coastal laboratories, modern shipyards, and model modern ships could provide useful information and ideas.

2) Create a demonstration project by involving the Pelra community covering at least (a) shipbuilding, planning and design, application of standards, and laboratory testing; (b) maintenance and repair works in a shipyard; (c) modern ship's operation and navigation; and (d) operation and maintenance of a port.

Medium- and Long-Term Plan:

1) Coordinating both research and development activities on the assessment and application of suitable technology for Pelra's vessels.

2) Introducing alternative design and material for Pelra's ships as indicated by the findings of research and development activities.

(5) Supporting Policies

The supporting policies aim to provide legal support to the proposed working programs in the short-, medium- and long-term plans. This sub-section has two main objectives. Firstly, this section proposes some suggestions to improve the implementation quality of the prevailing policies. Secondly, this section also proposes new policies for achieving the final objective of traditional shipping modernization.

The action plan of the supporting policies may be outlined as follows:

Short-Term Plans:

1) Reviewing controversial policies, such as the decree of the Minister of Forestry No. 41/1999 on illegal logging.

2) Imposing political pressure to the Government to rectify the controversial policies.

3) Conducting continual field monitoring to put the rectified policies into order.

Medium and Long-Term Plans:

1) Proposing sufficient budget allocation for conducting human resources improvement programs to the government.

2) Proposing loan assistance programs with low interest rate as initial funds for Pelra firms to the government.

3) Proposing suggestions on government policies for regulating the requirements for the establishment of new traditional firms that should be based on business viability and improvement of business management quality.

4) Proposing additional terms to the prevailing decree of the Minister of Communication No. 33/2001 on the opening of new branch office of Pelra firms. The additional terms aim to obligate newly established Pelra firms to send its ships to visit branch offices at least twice a year.

10.6. Assessment and Requirements to the Strategic Ports System

The performance of port operation is one of the most important factors for the improvement of vessel operating productivity.

Although port infrastructure planning is out of the scope of this study, it is important to consider it from the shipping industry's viewpoint. Thus this section analyzes the 25 strategic ports, which were designated by DGSC in order to develop the country's major ports system in a hierarchical and effective manner.

10.6.1. Assessment on Existing Port Conditions

Besides port infrastructure conditions, vessel dwelling time in port is longer in comparison with ports in developed countries as far as recent situations are seen in the 25 strategic port operations. The main reasons are indicated as follows:

(1) Shortage of berth

According to the UNCTAD Report ("Port development, a handbook for planners in developing countries"), berth occupancy ratio should be set so as not to exceed the following figures on ordinary berths.

Table 10.6.1 Berthing Occupancy Ratio (BOR)

Number of berth	Upper limit of adequate BOR (%)
1	40
2	50
3	55
4	60
5	65
6-10	70

Source: UNCTAD

The above table shows that BOR over 70% will make calling vessels wait for berth even if the port has more than six (6) berths, while a BOR 60% will be required for ports with more than four (4) berths in order for calling vessels to be accommodated without waiting.

According to the records of PELINDO in 2002, BOR was 100 % in Banjarmasin, more than 80% in Jayapura, Balikpapan, Kupang, Sorong, and more than 65% in Dumai, Bitung, Pontianak, Tg. Perak, Tg. Pinang Tg. Priok, Palembang, Biak, and Samarinda. (Refer to Appendix 3.3) As a result, waiting times for berth in 14 out of 25 strategic ports might be inefficiently high, with the exception of liner service vessels such as container and passenger ships. In the case of domestic conventional vessels, a higher percentage of waiting time is due to waiting for berth than in the case of international and passenger ships.

Although there are other main reasons for higher waiting time due to poor port operation and low cargo handling productivity, the shortage of berths is currently one of the most serious issues confronting ports in domestic operation.

(2) Low Cargo Handling Productivity

DGSC had enacted the Decree of Minister of Communication No.53, 2002 regarding the hierarchy of port roles and functions such as international hub, international and national, and the decree stipulated standard performance for cargo handling productivity for each. Cargo Service Performance in 2001 and 2002 of each strategic port is showed in the following table.

Table 10.6.2 Cargo Service Performance

Port Name	Standard of Performance				Year 2001				Year 2002			
	GC T/G/H	BC T/G/H	LC T/G/H	DC T/G/H	GC T/G/H	BC T/G/H	LC T/G/H	DC T/G/H	GC T/G/H	BC T/G/H	LC T/G/H	DC T/G/H
I. International Hub												
1 Tanjung Priok	30	35	150	100	33	34	0	0	35	35	179	147
2 Tanjung Perak	30	35	150	100	20	17	83	21	21	18	85	-
II. International												
1 Belawan	25	35	150	100	27	18	155	98	21	19	42	37
2 Lhokseumawe	25	35	150	100	-	-	70	144	-	-	70	146
3 Telukbayur	30	35	150	100	18	53	239	164	30	49	201	123
4 Palembang	30	35	150	100	33	37	149	85	35	32	177	67
5 Panjang	20	35	150	100	23	26	105	36	25	28	109	37
6 Banten	30	35	150	100	18	-	150	245	18	49	240	-
7 Pontianak	30	35	150	100	19	-	-	-	19	32	-	-
8 Tanjung Emas	30	35	150	100	30	38	51	78	30	37	61	78
9 Benoa	30	35	150	100	28	-	-	-	25	-	-	-
10 Kupang	25	35	150	100	17	39	-	-	17	40	-	-
11 Makasar	25	35	150	100	16	20	70	89	18	20	-	-
12 Bitung	20	35	150	100	17	20	60	40	18	21	60	40
13 Balikpapan	20	35	150	100	15	18	-	-	16	18	-	-
14 Ambon	20	35	150	100	18	20	-	-	12	11	-	-
15 Sorong	20	35	150	100	-	-	-	-	-	-	-	-
16 Jayapura	20	35	150	100	10	-	-	-	18	-	-	-
17 Biak	20	35	150	100	-	-	-	-	-	-	-	-
18 Tanjung Intan	30	35	150	100	26	40	86	-	25	42	86	-
19 Banjarmasin	30	35	150	100	20	-	-	-	20	-	-	-
20 Samarinda	20	35	150	100	11	18	-	-	-	-	16	18
21 Dumai	25	35	150	100	21	38	38	141	20	38	85	29
III. National												
1 Pekanbaru	20	35	150	100	11	17	-	-	11	17	-	103
2 Tanjung Pinang	25	35	150	100	23	28	39	-	24	28	38	-
3 Sibolga	20	35	150	100	12	-	-	-	11	-	-	-

Source: DGSC
Remark: GC: General Cargo, BC: Bagged Cargo, LC: Liquid Bulk Cargo, DC: Dry bulk Cargo
T/G/H: Tons / gang / hour

(a) The above cargo service performance might be based on net working hour i.e. excluding work suspensions due to rain, waiting cargo, and so on. Performance could be improved, provided cargo will be ready for loading and cargo acceptance to discharge at berth could be made smoothly, because currently the main reason of low productivity in almost all ports is idle time during cargo operation.

(b) Container handling productivity using ship's gear is currently from 7 to 12 boxes per gang-hour, while the productivity using quayside container crane is 15 to 22 boxes in case of Tg. Priok and Tg. Perak Container terminals. That means container handling productivity is approximately four (4) times to eight (8) times faster (using ship's gear and quayside container crane respectively), compared with the productivity of break bulk cargo as the average laden container weighs 12 tons. Therefore containerization in general cargo shall further increase in the near future, although container lines services have already been established in domestic trunk lines (Refer to Section 10.1).

(c) Productivity will be further improved by the introduction of RO-RO ship, because greater than 80 units of 20 to 30 ton trucks could be loaded and unloaded per hour in the case of domestic shipping in Japan.

(3) Shortage of Cargo Storage

(a) According to the records of PELINDO in 2002, yard occupancy ratio was 89 % in Balikpapan and 82 % in Samarinda. Both ports have limited cargo storage space and container stacking yard is used as an area for unpacking and packing container cargo, regardless if the cargo is FCL or LCL.

(b) Kupang has only one closed shed of 1,000 sq.m., therefore unloading cargo operation was frequently suspended when the shed is fully occupied, especially during rainy season (January and February).

(4) Shallow Depth Channel in River Ports

(a) There are eight (8) river ports out of 25 strategic ports in which Banjarmasin, Samarinda, Pontianak and Palembang have significant problems in the estuary channel.

(b) Especially the channel depth in Banjarmasin is currently -3.2 m to -4m, although dredging works are carried out periodically. Therefore maximum size of calling vessel is currently restricted to a draft of 5m (5,000 DWT) with tide.

(c) The introduction of special shallow draft vessel with greater DWT for domestic shipping is one option to cope with shallow river ports.

(5) Maintenance of Port Facilities

(a) Marshalling yards on berth in almost of all ports assigned to domestic shipping are old and needs to be rehabilitated. In Samarinda and Balikpapan Ports, the operation of unloading and loading containers for small domestic vessel and barge is done by floating crane placed in between the wharf and vessel because mobile cranes cannot be used due to the structurally weakened pier. These piers should be rehabilitated as soon as possible.

Figure 10.6.1 Balikpapan Port

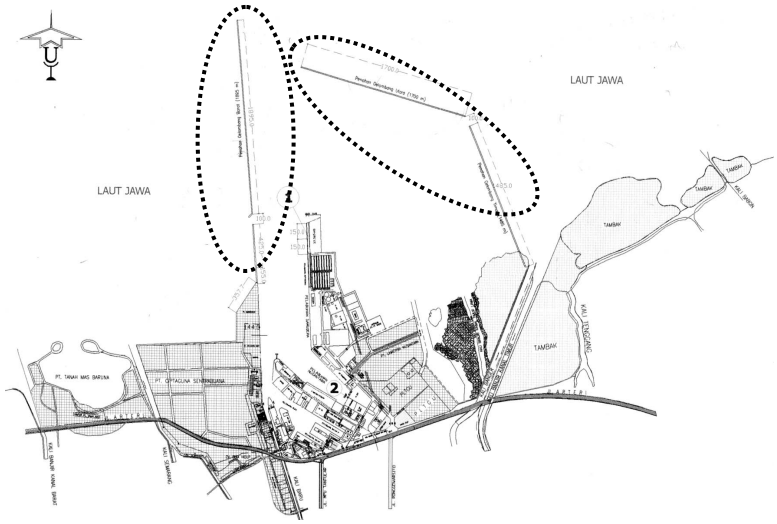
(b) Tg. Emas port in Semarang has serious problems especially concerning that the breakwaters and piers are flooded during high water due to land subsidence as a result of excessive groundwater extraction. Particularly, the conventional pier is lower than container pier by one (1) meter and the pier is heavily affected by rising water levels on a spring tide twice a month, adversely affecting conventional vessels operation. And also the East, North, West including Old West Breakwaters are partially submerged during low tide and totally submerged during high tide, and open sea water invades into the harbor, as a result, sedimentation and siltation in the harbor has been causing problems in the fairway and in front of container terminal. Taking account of the current rate of subsidence, i.e., 10cm per year, there is an urgent need to rehabilitate the port's infrastructure including the pier and breakwater for reliable port operation. (Refer to the pictures below)

Figure 10.6.2 Tanjung Emas Port

<Land Subsidence of Old West Breakwater>

<Flood Waters on the Conventional Pier>

Figure 10.6.3 Breakwater Sections necessary for Urgent Rehabilitation in Tg. Emas



(c) In Biak Port, about 60m in length of the detached pier for conventional vessels collapsed in 1996 due to huge waves and has not been rehabilitated (it was built in 1920 by Dutch company.). To cope with the future cargo demand, urgent action to rehabilitate the port will be required.

(6) Access Road to Port

(a) Heavy traffic surrounding Tg. Priok affects to the efficiency of vessel operation. Urgent action is needed to resolve this problem.

(b) Jayapura port area is surrounded by hilly and steep mountains and port services are confined within a narrow area. Once passenger boats come, access road to the port becomes heavily congested. The port requires the relocation of the passenger terminal.

(7) Cargo Handling Equipment

Almost all minor ports are experiencing problems with regard to the maintenance of old and obsolete equipment, primarily due to the lack of spare parts. These conditions, if left uncorrected, will cause further deterioration of cargo handling productivity. Port management has to take suitable countermeasures.

(8) Port Management

(a) As mentioned in Chapter 3, the port management of the 25 strategic ports is handled by ADPEL in regards to port safety and by PELINDO in regards to port operation. However the maintenance of berth and channel, pilotage and tug boats is managed by PELINDO, although these aspects of the port also cover safety matters. The present management system needs to be further studied including VTS (Vessel Traffic Service), Coast Guard and ISPS.

(b) Berth assignment for calling vessels are managed by PELINDO, but it is not currently being done efficiently, because PELINDO is constrained by special

contracts for berth utilization with large shipping companies in major ports. As a result, vessels owned by minor companies are obliged to wait for berth, even if there are vacant berths. PELINDO is considering amending such contracts in order to improve berth assignment.

10.6.2. Study on 25 Strategic Ports Capacities

Port capacities is investigated and studied from the viewpoint of depth of approaching channel and berth, length of berth, cargo storage capacities, cargo handling productivity, cargo dwelling time and hinterland conditions. For this section, however, only berth capacity is considered.

(1) Appropriate Berth Capacity by Type and Size of Vessel

To analyze port capacity, analysis is made on the berth capacity of typical container ships, conventional ships, RO-RO ships, bulk carriers and liquid tankers. In principle, port capacity should be considered from berth and yard capacity, and smaller one be chosen, but yard capacity are varies by cargo dwelling time in port and the type of cargo being handled, i.e. container, break bulk, dry or liquid cargo. Therefore, in this section, port capacity is calculated using cargo handling productivity and the length of berths assigned for permissible size of vessel by each kind of cargo (container, break bulk, bulk and liquid).

Using the representative ships, cargo handling productivity, working time, berth occupancy ratio, available gangs per vessel and required length of berth, the estimated berth capacity are calculated and are summarized in Table 10.6.3. Major findings are as follows:

- The berth capacity per meter in for RO-RO, container and conventional cargo berths is quite different as shown in the below table, and has a ratio of approximately 10:3:1 respectively. In other words, for the same amount of cargo, conventional berths length will require three (3) times more length than container berth and 10 times more length than RO-RO berth.
- Berth capacity by quayside container crane is 1.3 times of that by ship's gear, but it is not quite different for smaller size of containerships such as those less than 10,000 DWT, because only one (1) crane can be used. Therefore berths, which accommodate smaller vessels, might not be required to use quayside container crane if ship's gears can be used.
- Berth capacity for bulker of 30,000 DWT is calculated with one (1) unit of special loader or unloader per berth, therefore berth capacity will be decided by the available number of berths regardless of berth length and the capacity of vessels less than 11,000 DWT is calculated with the number of workable gangs using ship's gears or shore mobile cranes.
- Berth capacity for liquid tanker is calculated with one (1) loading / unloading pipe line per berth, therefore it is dependent on the available number of berths.

Assumptions for Berth Capacity Calculation

1. Model ships:

- Containership --- 20,000, 15,000, 10,000, 7,500 and 5,000 DWT
- Conventional ship --- 10,000, 5,000 and 3,000 DWT
- RO-RO ship ---6,000 DWT (16,000 GRT) and 3,000 DWT (14,000 GRT)
- Bulk carrier --- 30,000, 11,000 and 6,000 DWT
- Liquid tanker --- 87,000, 36,000, 20,000 and 5,000 DWT

2. Cargo handling productivity:

- Container by quayside container crane = 18 boxes /C/H (with average weight of 10tons including empty container and one (1) box is assumed to be nearly one (1) TEU)
- Container by ship's gear or mobile crane = 10 boxes /C/H
- Conventional (break bulk) = 30 tons /G /H
- RO-RO = Cargo 20 tons / 12m truck x 145 units = 2,900 tons for 6,000 DWT and cargo 20 tons / 12m truck x 100 units = 2,000 tons for 3,000 DWT
- 12m trucks can lade cargo of 30 - 35 tons / unit (equivalent to 2 TEUs), but it is assumed to be average 20 tons / unit as Load Factor 0.6.
- Bulk = 1,000 tons / C / H for 30,000 DWT and 100 tons / G /H for 11,000 and 6,000 DWT
- Liquid = 3,000 tons / H for 87,000 DWT, 1,000 tons / H for 36,000 DWT and 150 tons / H for 5,000 DWT

3. Working Time:

- Containership = 24 hours x 0.7 = 17 hours /day
- Conventional ship = 24 hours x 0.6 = 14 hours /day
- RO-RO ship = total hours in port = 5 hours for 6,000 DWT and 4.5 hours for 3,000 DWT
- Bulk carrier = 24 hours x 0.9 =22 hours / day for 30,000 DWT and 24 hours x 0.7 = 14 hours / day for 11,000 and 6,000 DWT
- Liquid tanker = 24 hours x 0.9 = 22 hours
- Annual working days = 365 days x 0.95 = 347 days for all vessel

4. Berthing Occupancy Ratio:

- Container and RO-RO ship: BOR is increased by 10 to 20 % to UNCTAD figures due to their more regular calls than conventional ship.
- Other ships: UNCTAD figures are used.

5. Available gangs per vessel:

- Containership by quayside container crane: Two (2) gangs for 20,000 and 1.5 to 1.0 gang for 15,000 to 5,000 DWT
- Containership by ship's gear or mobile crane: 2.5 gangs for 20,000 and 2.0 to 1.4 gangs for 15,000 to 5,000 DWT
- Conventional ship: 3.5 gangs for 10,000 DWT, 2 for 5,000 and 1.5 for 3,000
- Bulk ship: one (1) gang for 30,000 DWT, 2.5 for 11,000 and two (2) for 6,000
- Liquid ship: One (1) gang for all size of vessels

6. Required length of berth:

- RO-RO ship = LOA + 2.0 x Breadth (distance between ships)
- Other ships = LOA + 1.5 x Breadth (distance between ships)

Table 10.6.3 Berth Capacities by type and size of vessel

(Unit: Tons / m /year)

Number of Berth	No.1 berth	No.2 berth	No.3 berth	No.4 berth	No.5 berth
Containership (1)	DWT 20,000, LOA 175m B 30m Draft Max. 9.0m				
Total length of berth (m)	220	440	660	880	1,100
Capacity of berth (Cont. Crane) Tons/m	4,766	5,719	6,673	7,626	8,103
Capacity of berth (Ship's Gear) Tons/m	3,310	3,972	4,634	5,296	5,627
Containership (2)	DWT 15,000, LOA 160m B 25m Draft Max. 8.5m				
Total length of berth (m)	195	390	585	780	975
Capacity of berth (Cont. Crane) Tons/m	4,033	4,840	5,646	6,453	6,856
Capacity of berth (Ship's Gear) Tons/m	2,987	3,585	4,182	4,780	5,079
Containership (3)	DWT 10,000, LOA 150m B 23m Draft Max. 7.4m				
Total length of berth (m)	185	370	555	740	925
Capacity of berth (Cont. Crane) Tons/m	3,684	4,421	5,158	5,895	6,263
Capacity of berth (Ship's Gear) Tons/m	2,834	3,401	3,968	4,534	4,818
Containership (4)	DWT 7,500, LOA 130m, Breadth 24m, Draft Max. 5.0m				
Total length of berth (m)	165	330	495	660	825
Capacity of berth (Cont. Crane) Tons/m	3,177	3,813	4,448	5,084	5,402
Capacity of berth (Ship's Gear) Tons/m	2,824	3,389	3,954	4,519	4,802
Containership (5)	DWT 5,000, LOA 120m, Breadth 20m, Draft Max. 6.0m				
Total length of berth (m)	150	300	450	600	750
Capacity of berth (Cont. Crane) Tons/m	3,495	4,194	4,893	5,592	5,942
Capacity of berth (Ship's Gear) Tons/m	2,719	3,262	3,806	4,350	4,621

Number of berth	No.1 berth	No.2 berth	No.3 berth	No.4 berth	No.5 berth	No.6 berth
Conventional (1)	DWT 10,000, LOA 130m, Breadth 20m, Max.. Draft 8.4m					
Total length of berth (m)	160	320	480	640	800	960
Capacity of berth Tons/m	1,311	1,638	1,802	1,966	2,130	2,294
Conventional (2)	DWT 5,000, LOA 95m, Breadth 16m, Draft Max. 6.2m					
Total length of berth (m)	120	240	360	480	600	720
Capacity of berth Tons/m	999	1,248	1,373	1,498	1,623	1,748
Conventional (3)	DWT 3,000, LOA 80m, Breadth 12m, Max. Draft 5.0m					
Total length of berth (m)	100	200	300	400	500	600
Capacity of berth Tons/m	899	1,123	1,236	1,348	1,461	1,573
RO-RO Passenger (1)	DWT 6,000, GRT 18,000, LOA 165m, Breadth 25m, Max. Draft 7.0m					
Total length of berth (m)	215	430	645	860	1,075	1,290
Capacity of berth Tons/m	11,225	13,470	15,715	17,960	19,083	19,083
RO-RO Passenger (2)	DWT 3,000, GRT 14,000, LOA 140m, Breadth 23m Draft, Max. 5.0m					
Total length of berth (m)	175	350	525	700	875	1,050
Capacity of berth Tons/m	10,568	12,681	14,795	16,908	17,965	17,965

Number of berth	No.1 berth	No.2 berth	No.3 berth	No.4 berth	No.5 berth
Bulk (1)	DWT 30,000, LOA 185m B 27m Draft Max. 11.0m				
Total length of berth (m)	225	450	675	900	1,125
Capacity of berth Tons/m	13,315	16,644	18,308	19,973	21,637
Capacity of berth Thousand tons	2,996	7,490	12,358	17,976	24,342
Bulk (2)	DWT 11,000, LOA 130m B 20m Draft Max. 7.8m				
Total length of berth (m)	160	320	480	640	800
Capacity of berth Tons/m	3,641	4,551	5,006	5,461	5,916
Bulk (3)	DWT 6,000, LOA 110m. B 15m, Draft Max. 6.7m				
Total length of berth (m)	135	270	405	540	675
Capacity of berth Tons/m	3,452	4,315	4,747	5,178	5,610
Liquid (1)	DWT 87,000 LOA 240m, Breadth 42m Draft Max. 15.3m				
Capacity of berth Tons/m	29,959	37,449	41,194	44,939	48,684
Capacity of berth Thousand tons	8,988	22,469	37,075	53,927	73,026
Liquid (2)	DWT 36,000 LOA 180m, Breadth 27m.Draft, Max 12.1m				
Capacity of berth Tons/m	13,618	17,022	18,725	20,427	22,129
Capacity of berth Thousand tons	2,996	7,490	12,358	17,976	24,342
Liquid (3)	DWT 20,000 LOA 175m, Breadth 25m.Draft, Max 10.0m				
Capacity of berth Tons/m	5,707	7,133	7,846	8,560	9,273
Capacity of berth Thousand tons	1,198	2,996	4,943	7,190	9,737
Liquid (4)	DWT 5,000 LOA 105m, Breadth 15m, Draft Max.7.0m				
Capacity of berth Tons/m	3,457	4,321	4,753	5,185	5,617
Capacity of berth Thousand tons	449	1,123	1,854	2,696	3,651

Source: STRAMINDO

(2) A Study on 25 Strategic Ports Capacities

As described above, the port capacity can be improved by means of (1) effective/ efficient cargo handling operation, (2) appropriate fleet assignment and (3) smooth port management. But even though such treatment could be made, existing Indonesian ports capacities will be insufficient due to huge cargo growth in the future. The analysis here is for the purpose of prospecting and assessing the 25 strategic ports capacities in line of cargo demand forecast up to 2024 with the following conditions.

- Berth capacity requirement is calculated on the basis that calling vessels can be accommodated without waiting.
- The berth capacity is calculated in terms of domestic cargo demand forecast, excluding passenger and international cargo. Therefore the calculated needed capacity will be the minimum required. But berths exclusively assigned for international trade such container terminals as JICT and TPK Koja in Tg. Priok, TPS in Tg. Perak, Hatta in Makassar and International Terminal in Belawan are basically not included in calculation, although some international terminals shall be used for domestic container after 2014.
- Traditional berths are not included in the calculation.
- Special berth capacity for liquid cargo is calculated only when data is available.
- All capacities are calculated by using the estimated figures in Table 10.6.3.

The detailed calculation results of the 25 strategic ports capacity using the formation "Assumptions for Berth Capacity Calculation" is shown in Appendix 10.6 and the summary of the result is shown in the following Table.

Table 10.6.4 Assessment of 25 Strategic Ports Capacities for Domestic Dry Cargo (1/3)

No.	Name of Port	2002	2014	2024
1	Batam	Batu Ampar Port for multi-purpose (1,250m) can be used. BIDA is currently expanding the capacity of Batu Ampar Port.	Batu Ampar Port for multi-purpose (1,250m) can be used, but 35 % of shall be converted to cont terminals.	Even if container terminal will prepare cont crane, port capacity will be short before 2024. Additional berth for cont will be required.
2	Lhokseumawe	Sufficient capacity	Will be sufficient.	Will be sufficient
3	Belawan	Sufficient capacity	Unless international cont terminal can be used or domestic cont terminal prepares cont crane before 2014, the capacity will be not be sufficient.	Will not be sufficient and additional berth be required for cont and break bulk.
4	Tg. Pinang	Sufficient capacity	Berth length of 800m (Break bulk 380m and bulk berth 420m) will be required before 2014. (Present berth length 540m)	Total berth length of 1,200m (Break bulk 700m and bulk berth 500m) will be required before 2024.

(2/3)

No.	Name of Port	2002	2014	2024
5	Dumai	Sufficient capacity	Will be sufficient.	If container terminal with cont cranes will be prepared, no berth extension will be required.
6	Pekanbaru	Sufficient capacity	Will be sufficient.	Will be acceptable.
7	Teluk Bayur	Sufficient capacity	Will be just sufficient.	Additional berths of more than 500m will be required after 2014, especially cont terminal with cont cranes for 15,000 DWT will be required.
8	Palembang	Sufficient capacity	Will be sufficient.	Will be short before 2024
9	Panjang	Sufficient capacity	If convent berth of 486m can be converted to 15,000 DWT cont terminal with cont cranes and international cont terminal can be used, it will be acceptable.	If the 486m berth can be upgraded to 20,000 DWT terminal, container berth capacity will be acceptable, though additional convent berth of 350m shall be required.
10	Tg. Priok	Sufficient capacity	Convent berths of approx. 1,400m shall be converted to 20,000 DWT cont terminals with cont cranes. Otherwise JICT & TPK be used for domestic cont.	Additional 1,400m shall be converted from convent to cont terminal. Otherwise all international cont terminals be used for domestic cont.
11	Bojonegara / Banten	Huge amount international cargo and domestic bulk are being handled.	As far as domestic cargo is seen, there will be sufficient capacity.	As far as domestic cargo is seen, there will be sufficient capacity.
12	Pontianak	Berth No.7 & 8 (205m) are used as container terminal. The capacity is barely sufficient.	Total berth length of about 500m will be required for domestic cont terminal with cranes before 2014.	Huge cargo increase (5 times in cont and 2.5 in break bulk compared with 2002) will be expected. Additional 500m berth for cont and 250m for convent will be required.
13	Tg. Emas	Sufficient capacity	Will be sufficient.	10,000 DWT container terminal of 500m will be required for domestic.
14	Tg. Perak	Sufficient capacity	20,000 DWT cont terminal will be short by 450m, (total 1,300m), which shall be converted from convent and cont cranes shall be installed.	Additional 20,000 DWT cont terminal of 800m (total 2,200m) will be required. Convent berth will be also short.
15	Benoa	Sufficient capacity	Will be sufficient.	Will be acceptable.
16	Kupang / Tenau	Sufficient capacity	Will be sufficient. New multi-purpose terminal (238m, –8m) can be used.	Will be acceptable.

(3/3)

No.	Name of Port	2002	2014	2024
17	Banjarmasin	All berths capacities are already in excess of cargo throughput in 2002. Current BOR is over 100 %.	Urgent action to resolve this case will be required.	See Appendix Table 10.6.2
18	Samarinda	All berths capacities reached to a limit for cargo throughput in 2002.	Berth length of 2,100m (Cont 750m, convent 1,100m and 250m bulk berths) will be required in 2014. (Present berth length 837m)	Berth length of 3,100m (Cont 1,250m, convent 1600m and bulk berths 250m) will be required in 2024.
19	Balikpapan	Sufficient capacity	Cont berth will be short.	15,000 DWT cont terminal of 750m with crane for domestic will be required. (Present berth length 590m)
20	Bitung	Sufficient capacity	Will be acceptable. New cont. terminal (145m) can be used.	Will be acceptable.
21	Makassar	Acceptable capacity, provided Hatta cont terminal can be used for domestic.	Berth length of 3,500m (Cont 1,000m, convent 2,200m and 300m bulk berths) will be required before 2014. (Present berth length 2,420m)	Berth length of 5,300m (Cont 1,700m, convent 3,200m and 400m bulk berths) will be required before 2024.
22	Ambon	Sufficient capacity	Will be sufficient.	Will be sufficient.
23	Jayapura	All berths capacities reached to ones for cargo throughput.	Berth length of 530m (Cont 330m and convent berth 200m) will be required before 2014. (Present berth length 303m)	Berth length of 890m (Cont 560m and convent berth 330m) will be required before 2024.
24	Biak	Sufficient capacity	Will be sufficient.	Will be short by approx. 100m.
25	Sorong	Sufficient capacity	Berth length of 500m will be required before 2014. (Present berth length 280m)	Berth length of 800m will be required before 2014.

Remark: Exclusive of international shipping and traditional shipping, and passenger shipping in calculating port capacity
Source: STRAMINDO

As a result of this study, the following points are considered.

(a) Considerable number of conventional berths shall be converted to container terminals within the coming decade and numerous quayside container cranes be installed to improve handling productivity.

(b) Therefore conventional berths will be insufficient soon. To minimize port infrastructure investment and improve the handling productivity of break bulk cargo in the future, cargo shall be unitized and carried by Ro-Ro ships, because the berth length requirement of Ro-Ro ships can be shortened to less than that of container ships as well as conventional ships.

10.6.3. Modernization of Ports

(1) Port Hierarchy in National Port System

The government had stipulated in August 2002, the National Transportation System, which is aimed at realizing an integrated, effective and efficient transportation services. The structure of ports in the national transportation system is differentiated into trunk ports and feeder ports (Bojonegara/Tg. Priok and Tg Perak as International Hub Ports, Belawan, Dumai, Teluk Bayur, Palembang, Banten, Tg Emas, Benoa, Tenau/Kupang, Pontianak, Banjarmasin, Balikpapan, Bitung Makassar, Sorong, etc. as international trunk ports, and Balikpapan, Ambon, Biak, etc. as national trunk ports). And also the government prepared a development plan for port facilities as follows (covering 25 strategic ports):

(a) Eight (8) full container terminals:

Belawan, Tg. Priok, Tg. Perak, Makassar, Panjang, Tg. Emas, Palembang and Pontianak

(b) Seven (7) semi container / multi purpose terminals:

Dumai, Teluk Bayur, Bojonegara, Kupang, Banjarmasin, Balikpapan and Bitung

(c) 10 conventional terminals:

Batam, Lhokseumawe, Tg. Pinang, Pekanbaru, Benoa, Samarinda, Ambon, Jayapura, Biak and Sorong

Regardless of the government plan, the demand for container terminals will come out in each conventional port including the above 10 terminals, because containerization and unitization of general cargo (break bulk cargo) in domestic sea borne trade will progress quickly. Therefore the above government plan needs to be improved some more.

(2) Modernization of Ports

(a) Countermeasures against Shallow Depth River Ports

River ports, especially Banjarmasin, Pontianak and Samarinda in Kalimantan currently and in the future play an important role as container trunk routes (Top OD ranking 2nd, 4th and 8th respectively according to the demand forecast), but the depth of the channel and berth is very shallow (-4m to –5m MLW) and unsafe for navigation.

The following measures will be considered to cope with such problems.

- Floating Berth (Mega-Floating Berth) in the Estuary of Shallow Depth River Ports

Jawa Sea is relatively still; therefore Panamax bulkers are currently loading coal from big barges in the estuary of the Barito River (Banjarmasin). One idea is that small size vessels carry cargo between port and floating berth to transfer cargo to larger size vessel at the floating berth.

- Transferring Inner River Port to Outer River Port

  To accept larger sized vessels which call at major ports like Tg Priok, Surabaya and Makassar, it is considered that deep sea ports will be constructed near river ports, if necessary in the future.

(b) Overall Port Inspection and Urgent Action Plan on Revitalization of Superannuated Port Facilities

Almost all of existing port facilities does not function to capacity due to delayed maintenance. As a result, port productivity is reduced and added costs are incurred for rehabilitation. Therefore periodical overall port facility inspection system by relevant organization such as PELINDO under government control shall be introduced.

(c) Improvement of Container and Ro-Ro Terminals

The future increase of container and RO-RO cargoes will accelerate the conversion from conventional berths to container and Ro-Ro terminals as well as new construction of container and Ro-Ro berths.

Container Terminal

- Quayside container cranes are preferable to be installed in order to attain higher productivity and handle 40' containers easily. If ships are equipped with ship gears then cranes may not be necessary.
- Container yard shall be provided to stack container by four (4) to five (5) tiers as well as CFS and office.
- Container equipment such as transfer cranes, stacker, yard tractors/ chassis should be provided.

Ro-Ro Terminal

- Berths should be strengthened and the height above seawater be considered to support vessel's ramp way. Container terminal can be used if necessary.
- Parking yard for cargo vehicles shall be provided, although container and Ro-Ro yard can be used together if space is available.

(d) Establishment of Geographic Information System (GIS)

GIS has been established in Singapore water, its approaches and the Straits of Malacca as well as the hinterland. This system can be used for Electronic Navigation Chart System and Electronic Chart Display and Information System

(ECS/ECDIS) in compliance with IMO and IHO (International Hydrographic Organization).

Although the system is not currently widely used yet all over the world, it is expected to be prevalently used by 2024. Vessels which have installed the system can improve safety of navigation, and save fuel and time during voyage. In case of Indonesian waters, this system shall be introduced from port waters, especially shallow depth river ports in the future.

(e) Port Management

Minimizing Cargo Dwelling Time in Port

Cargo storage capacity in almost all ports is limited due to space. Once cargo stacking yards are filled with cargo, cargo handling productivity on ships is surely reduced unless the cargo can be loaded and unloaded directly. Cargo dwelling time in port is the most important factor to determine port capacity. Therefore port management shall consider minimizing cargo dwelling time in port by means of the establishment of penalty regulations for long dwelling cargo in port.

Improvement of Cargo Handling Productivity

In the future, almost all break bulk cargo will be containerized and unitized, especially for strategic ports, as a result, cargo handling productivity would be improved by three (3) to four (4) times. Otherwise the productivity of break bulk cargo will not be improved so much even if suitable equipment is additionally provided.

Introduction of EDI

Port management in all ports shall introduce EDI system to facilitate cargo flow in port by means of data exchange among ports, shipping agents and so on through e-mail and paperless system for cargo and ship documents.

Establishment of the International Ship and Port Facility Security (ISPS)

IMO has adopted the amendments to the 1974 SOLAS Convention on Dec. 2002 that makes reference to the International Ship and Port Facility Security Code and requires ships, companies and port facilities to comply with the relevant requirement of the code to detect security threats and take preventive measures against security incidents affecting ships or port facilities used in international trade. The code requires port authorities to undertake the following matters:

i. Port Facility Security Assessment

- Identification and evaluation of important assets and infrastructure;

- Identification of possible threats to the assets and infrastructure and the likelihood of their occurrence, in order to establish and prioritize security measures;
- Identification, selection and prioritization of counter measures and procedural changes and their level of effectiveness in reducing vulnerability; and,
- Identification of weakness, including human factors in the infrastructure, policies and procedures.

ii. Port Facility Security Plan

- A recognized security organization shall prepare the port facility plan, on the basis of the above assessment.

iii. Port Facility Security Officer

- A port facility officer shall be designated for each port facility.

iv. Training, Drills and Exercises on Port Facility Security

- The port facility officer and relevant personnel shall carry out the training, drills and exercises at appropriate interval to have sufficient knowledge and ability to perform their assigned duties.

This code will take effect on 1 July 2004 upon entry into force for international ports. Due to the short time allotted for adjustments many ports will find difficulty in implementing the necessary measures. It is necessary that the 140 international ports including the 25 strategic ports in Indonesia will also prepare for implementation as soon as possible.

VTS (Vessel Traffic Service)

There are about 90 calling vessels at Tg. Priok and 60 at Surabaya per day in 2002, according to statistics from PELINDO. Tg. Priok and Surabaya ports have started to study the control of vessel traffic at port. It is recommended that VTS be introduced in ports having more than 10 thousands calling vessels to maintain navigation safety and efficient vessel traffic.

Chapter 11

SHIPPING BUSINESS MANAGEMENT PROGRAMS

11. SHIPPING BUSINESS MANAGEMENT PROGRAMS

11.1. Issues and Measures for Modernization of Indonesian Shipping Business

It is often pointed out that good management comes from proper allocation of resources such as human resources, facilities and financial resources. Indonesian shipping business can be reviewed from this perspective and summarized by the following items.

(1) Fleet Composition

a. Old Second-hand vessels dominate in domestic shipping. More than half of conventional vessels are over 25 years old.

b. Indonesian flagged vessels are limited especially among tankers, being only 39 %.

c. Mismatch of vessel size being too large for demand

Measures: Purchase of new vessels will become possible through financial support, which comes only after the management of domestic shipping operators is improved by the upgrade of managers and staff. Efficiency in operation together with good maintenance needs to be realized by outsourcing to ship-management companies. For increasing the share of Indonesian flagged vessels, taxation and interest rate of financing needs to be as competitive as those of neighboring countries through the efforts of the administration.

(2) Management of Shipping Company

a. Company size is small: 82% of shipping companies operate not more than 3 vessels.

b. Lack of market access to capture enough cargo for the vessels to operate fully.

c. Limited access to financial sources: shipping company's business performance is too small and week for financing of a new vessel

Measures: Human resource and management improvements are key to the success of shipping companies. The result will be manifested in satisfactory financial performance and expansion of operation, which will give the company stability and growth along with the expected market growth.

(3) Ship Operation: not efficient

a. Low level of vessel utilization because of long cargo-waiting and berth-waiting time

b. Loss of working days because of poor maintenance and long docking time

c. Lack of cooperative and synergistic relationships among operators for vessel

sharing at times of shortage of either cargo or vessel.

Measures: Management effort to market services will improve capacity utilization. Therefore, advanced education on operation management will help improve the productivity of vessels. Ship-management with good superintendents will greatly reduce docking time and total cost of maintenance. Capable operation managers will be able to manage situation wherein there is a shortage of cargo or vessel.

(4) Ship Maintenance: not sufficient (most vessels are sub-standard based on the requirements of SOLAS)

a. Instruction documents are not understood nor practiced accordingly

b. Spare parts are not supplied nor readily available

c. Navigation machines and mechanical equipment are not properly supplied

Measures: Education of crew is important. Ship-management services will be able to train the crew on-board and help procure deck supplies. Usage of navigation equipment will be taught at schools and on-board. Procurement of deck supplies will be made efficiently by ship-management services not only by traders.

(5) Ship Safety and Environmental Consideration

a. Stability is not appropriately calculated at the time of loading and vessel operation

b. Illegal disposal of waste and oil

Measures: Ship-management will be able to instruct the crew to calculate stability and thereby greatly reduce the risk of accident. Moreover, ship-management will be able to educate the crew regarding proper disposal of waste.

(6) Maritime Administration

a. Lack of sufficient maritime law

b. Lack of law enforcement capability

c. Compliance with international maritime law

Measures: Development of good administrators is important for the improvement of legal frameworks including regulation drafting and enactment, and enforcement of law. Administrators will guide the shipping industry to comply with international laws including those by IMO, ILO, ISF etc.

As have been described in the measures above, there are several key common activities for the improvement of shipping industry. These are summarized in the following items.

(a) Introduction of cooperation among shipping companies: Consolidated effort will help companies to improve marketing and reduce cost by way of economy of scale and logistic chain. This topic will be discussed in Section 11.2.

(b) Introduction of ship-management: Ship management is an essential element of modern shipping industry in preventing marine accidents; reduce repairing days and cost; and, extending the service life of ships. This topic will be discussed in the Section 11.3.

(c) Advanced education for the development of experts and managers including administrators: The education and training of ship-management experts and top managers is expected to be key in the human resource development and modernization of the industry. This topic will be discussed in the Section 11.4.

(d) Development of regulatory system to define government policy and to support the industry: Setting up of institutional framework is important for financial assistance, databasing and reporting which include operational reports, financial reports and employment reports. This topic will be discussed hereunder.

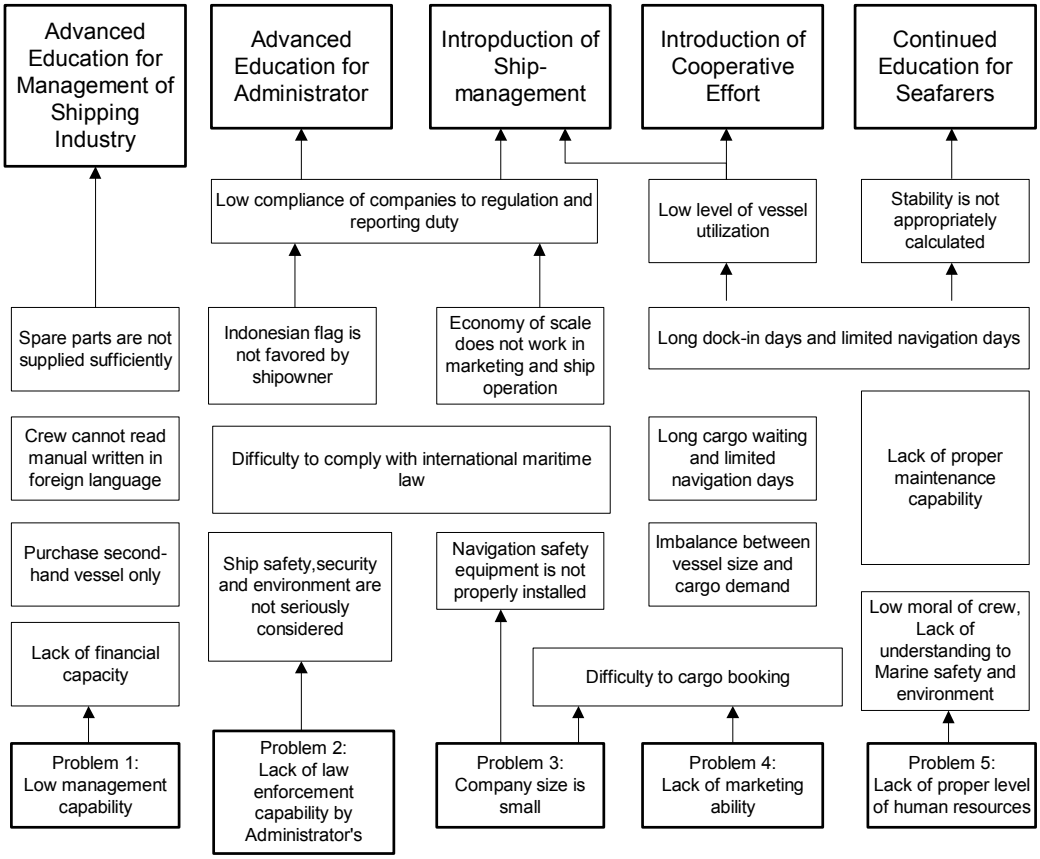
It is important to sufficiently introduce quality management that is ISO9002 accredited, or equivalent international requirements concerning ship inspection and safety regulation of IMO. For safety and security management, various ship inspections based on safety regulation in accordance with SOLAS and Safety Management System (SMS) needs to be enforced. Moreover, the number of accidents reported is smaller than actual because there is no organized system for recording accident statistics. Taking into account the ISPS Code, which will take effect in July of 2004, Safety and Security Management Systems must be immediately established by both government and private entities.

With regards to environmental protection, standards have been already defined in ISO14000, and it is time that shipping companies adhere to these standards. The Government and the private sector need to form a council to decide on measures for environmental protection. Both parties also need to identify their roles, and make a concerted effort to protect the environment.

In addition to the regulatory code above, financial reporting is important for the improvement of shipping policy and company management. Domestic shipping companies generally do not prepare financial statements because it is not required by the government not even by the internal revenue agency. Tax is levied on as a percentage of sales revenue thus the net profit is not required to be reported. An exception is when a bank requests for financial records for accreditation for a loan.

Financial report is important not only for third parties to evaluate the company but also for the company itself in preparing its investment plan and strategy to develop its own business. For modern shipping management, government should take some measures to enforce reporting of financial statements in accordance with international standards.

Figure 11.1.1 Issues and Measures for Modernization of Indonesian Shipping Business



11.2. Business Structure and Modernization of Shipping Industry

11.2.1. Profitability of Vessel Operation

Generally in Indonesia, inter-island freight shipping operators are owner-operators. Unless the company is large enough to hire marketing staffs to make cargo booking, shipping companies must wait until they have enough cargo to fill their vessel. Thus, competition for cargo results in lowering freight rates and sacrificing profitability or by securing regular operation schedules and attracting regular customers.

Profitability of a vessel depends on the type of operation; i.e. either liner service or tramper service. Liner service is based on a regular cargo demand or scheduled service for passengers, whereas tramper operation is based on irregular demand of cargo, mostly general and bulk cargo. Therefore the analysis here is categorized into these two types of operations, and the key issues are load factor and price level for liner service, and trip frequency for tramper service.

Vessel information is collected based on a questionnaire survey and interview of several companies, asking for operating costs including crew wages, food and water, store

expenses, insurance payment, repair and maintenance, lubrication oil and administration cost for fixed operational cost.

Capital cost is calculated by comparing the depreciation amount and lease charge. The tendency of companies in Indonesia is to buy second-hand vessel from abroad at the age of approximately 20 years old, and operate it until the vessel is nearly 40 years old. Therefore the capital cost is assumed to be very small.

In this analysis, the capital cost is calculated based on a young second hand vessel at the age of between 10 to 12 years. According to a survey of the vessel procurement market, it was clear that the young second-hand vessels are approximately twice more expensive than old second-hand vessels, but are significantly cheaper than the newly built ones. Therefore assuming a young second-hand vessel will provide a fair and reasonable estimate.

(1) General cargo and Bulk Cargo Carrier Profitability

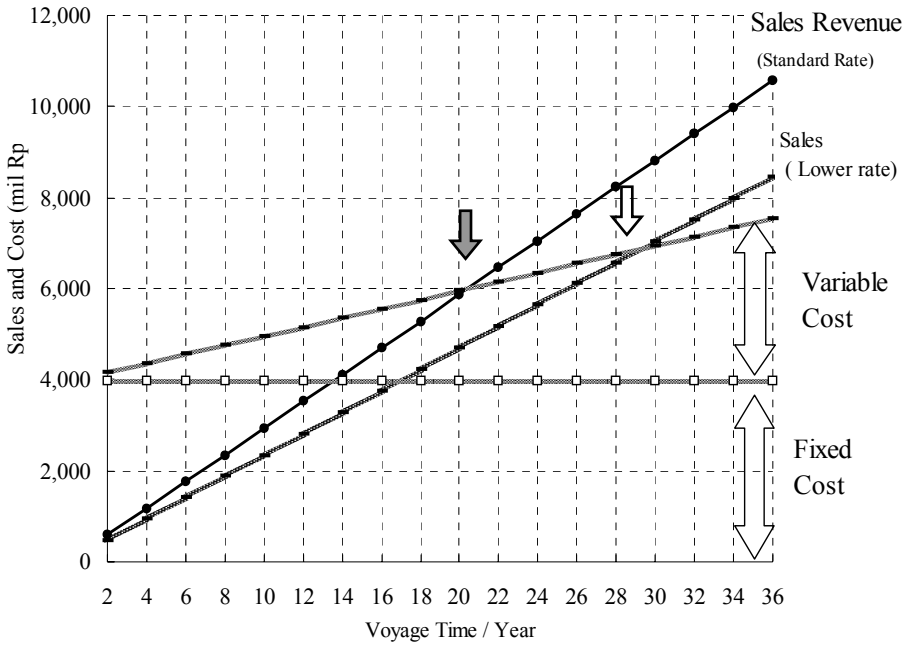
Smaller conventional vessels rather than larger size conventional vessels are more prevalent especially in the future in Indonesia. Therefore a 3,000 DWT conventional vessel is assumed for a case study. On the other hand, larger bulk carriers will take a more prevalent role in the future as it is projected that the average bulk carrier size will increase, therefore, a 10,000 DWT bulk carrier is considered as a case study.

Table 11.2.1 Conventional Vessel & Bulk Carrier: Performance and Fixed Cost

	General Cargo	Bulk Carrier
DWT (Ton)	3,700	10,000
GT	3,200	6,700
Capacity (Cbm)	4,100	12,000
Speed (Knots)	9	11
Draft (M)	5	5
Age (Years average)	15	15
Total volume (Ton/year)	74,000	100,000
Voyages (Times/year)	25	12
Average distance / trip (N-mile)	850	1,400
Operation at sea (Days/year)	320	350
Crew Wages (MilRp)	640	590
Food (million Rp)	70	200
Store Expenses (million Rp)	200	200
Other Fixed Cost (million Rp)	70	0
Repair cost Annual (MilRp)	650	1,260
Lubrication Oil cost (mill Rp)	60	100
Insurance Fee Annual (MilRp)	120	250
Administration Cost (mill Rp)	100	400
Fixed Ship Expense	**1,910**	**3,000**
Capital Cost (depreciation + Interest)	2,090	4,500
Fixed Expense Total	4,000	7,500

Source : Interview survey STRAMINDO

Figure 11.2.1 Break Even Chart of Conventional Vessel Proto-Type Case



Conventional vessels make about 12 to 36 trips annually depending on cargo demand. The freight rate is negotiated in relation to break-even revenue, which in this proto-typical case is about 6,000 million Rp/year and 20 trips in a year. But when the freight rate is 20% lower, the number of trips should increase to approximately 30 trips in order to cover cost.

The case study model pegs 25 trips in a year as the required number of trips so that the cost of vessel operation can be covered by freight revenues. In the case of actual operation, vessel depreciation is cheaper, therefore more profit is expected.

11.2.2. Container and Passenger Vessel Profitability

Container and passenger vessels provide liner service so that customers will be able to schedule their cargo haulage. For these services, load factor and freight levels are key concerns for the marketing of shipping service, and cost reduction is another aspect for profitability of business.

When the cargo amount is large enough, and vessel carrying capacity is at an optimal level, freight rates will be stabilized. But in most cases shipping companies are competing by trying to take as much market share as possible. As a result, they tend to sacrifice profit margins by reducing rates. In the competitive container market, capturing market share by achieving operational efficiency is the key factor to be successful. Influenced by the international market, only those companies with enough capital and management capability are able to survive. Small operators survive in alliance with these successful operators.

Typical operation model is shown in the following table which indicates a competitive environment in three different sizes of vessels. Without attracting enough cargo it is difficult to make a profit in the container transport market.

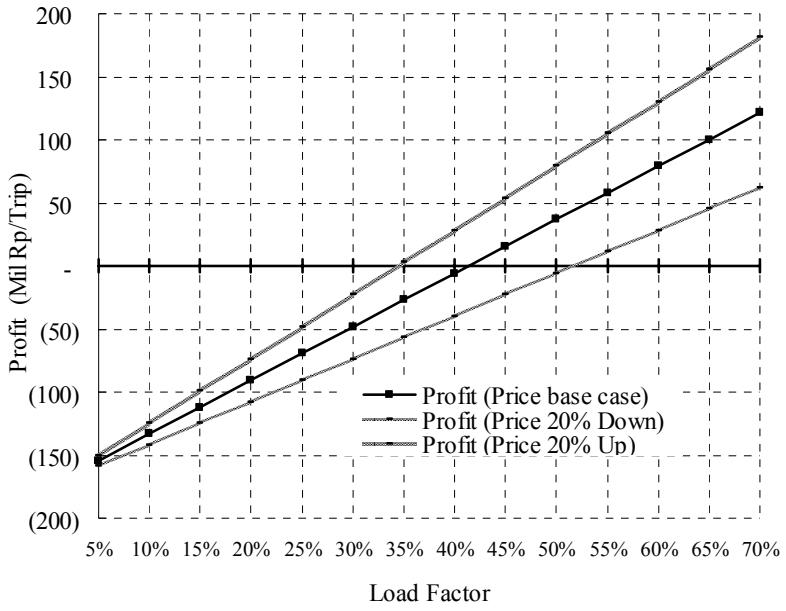
Container operation providing liner services have to cope with unbalanced cargo flow and often make return trips without much cargo. As a result, total load factor tend to decrease to less than 50 %. Together with price competition, the decrease of load factor puts strain to profitability.

Table 11.2.2 Container Vessel: Three Proto-type operations

	Medium	**Small**
DWT (Ton)	5,105	3,200
GT (ton)	**3,800**	**3,150**
Capacity (TEU)	**250**	**115**
Speed (Knots)	11	12
Draft (M)	6	5
Age (Years)	19	11
Operation Days	350	345
Insured Val (million Rp)	8,728	7,000
Wages (million Rp)	980	720
Food (million Rp)	160	130
Store Expenses (million Rp)	570	300
Other Fixed Cost (million Rp)	160	110
Repair cost(mill Rp)	490	300
Lubrication Oil cost (mill Rp)	510	220
Annual Insurance Fee (mill Rp)	280	300
Administration Cost (mill Rp)	170	120
Fixed Operational Cost	**3,320**	**2,200**
Lease charge (million Rp)	1,480	1,200
Fixed Cost total	**4,800**	**3,400**

Source: Interview survey STRAMINDO

Figure 11.2.2 Profitability by Load Factor (Medium size vessel Case)



As observed in the graph, load factors of less than 42% will result in a loss to operations and with a rate level lower than standard would require load factors to be much higher in order to maintain profitability.

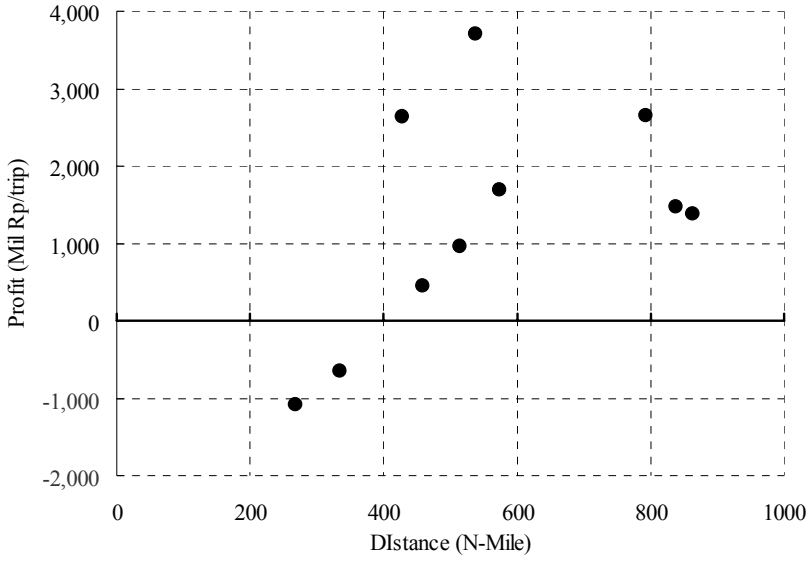
Domestic trunk lines based on the amount of cargo are identified as the following. Assuming that the route is covered by container carriers, profitability seems to be related with distance and inherent competitiveness.

Table 11.2.3 Identified Major Routes and Their Profitability

	Major Route : Port to Port		Distance (N-Mile)	Profit (mil Rp/trip)
1	Surabaya	Samarinda	537	3,712
2	Surabaya	Makassar	458	449
3	Surabaya	Banjarmasin	268	-1,090
4	Makassar	Samarinda	335	-645
5	Jakarta	Banjarmasin	515	956
6	Jakarta	Teluk Bayur	573	1,693
7	Jakarta	Belawan	863	1,379
8	Jakarta	Makassar	794	2,645
9	Jakarta	Pontianak	428	2,632

The relationship between distance and profitability is exhibited in the following graph. When the distance between ports is near, it might be difficult to achieve profitability because of competition. There are conflicting elements in regard to increasing frequency – that it would reduce the fixed cost per trip but would tend to adversely reduce load factor.

Figure 11.2.3 Container Major Route Profitability by distance



For passenger vessel operation, it is considered that the decline of load factors aggravate profitability. Cost accounting, based on the average financial performance of operating vessel of each type, indicates the difficulty of making profit under ordinary rules of accounting. However the vessels are provided to PT. PELNI as government contribution

of equity in kind and depreciation is accounted for as a cost item, therefore even when income statement by cost accounting indicates loss, actual cash flow results in cash surplus.

Table 11.2.4 Profitability of Passenger Vessel: Average Financial Performance by Type

Vessel type	**L-Vessel**	**M-Vessel**	**S-Type**
Passenger size (Person)	2,000	1,000	500
Number of vessel operating	Recent vessel Average	Recent vessel Average	Vessel Average
Rate of Trunk Route Operation	**40%**	**0%**	**8%**
Rate of Vessel Time Utilization	95%	96%	87%
Passenger (Person / year)	400,000	220,000	77,500
Total of Operating Income (Mil Rp)	**73,000**	**23,000**	**7,850**
Operating Expenses (Mil Rp)			
A. Variable Expenses			
1. Fuel Expense	15,500	4,500	3,000
2. Port Expense	1,200	580	250
3. Passenger Expense	10,000	4,660	1,650
5. Marketing Expense	1,850	550	180
6. Crew Insurance	2,700	800	300
Sub Total	**31,250**	**11,090**	**5,380**
B. Fixed Expenses			
1. Crew Expense	4,000	2,000	950
2. Maintenance Expense	8,760	4,130	2,600
3. Insurance Expense	2,740	1,350	850
4. Depreciation Expense	9,400	5,300	4,200
5. Overhead Administration	4,000	4,000	4,000
Sub Total	**28,900**	**16,780**	**12,600**
Total of Operating Expenses	**60,150**	**27,870**	**17,980**
Gross Profit (Loss) (Mil Rp)	**12,940**	**-4,737**	**-10,130**

Source : Interview survey STRAMINDO

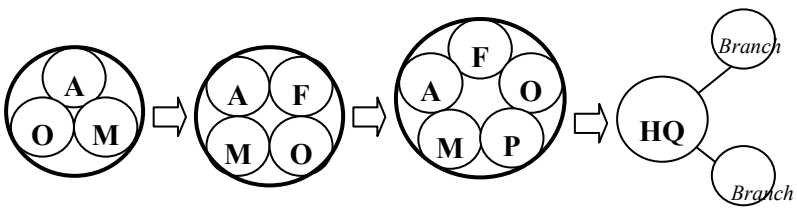
Large vessels manifest better performance mainly because the ratio of operation in trunk routes being 40% is significantly higher than other vessel sizes. Considering the fact that each vessel is almost fully placed into service operation, route profitability is more important than the size of vessel. PT. PELNI has RORO vessels but the size and specification varies so much that the average is not appropriate to be included here.

11.2.3. Shipping Company feasibility study

(1) Profile and growth pattern of organization of shipping company

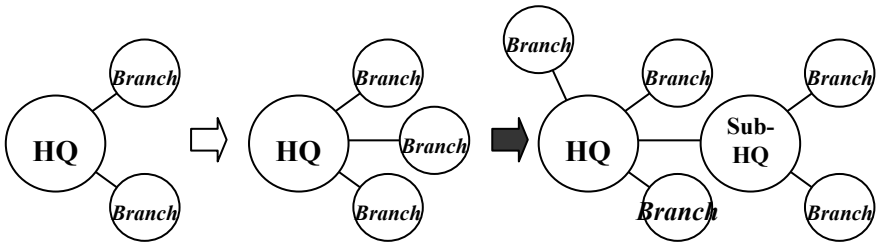
Careful analysis of the organization structure in each shipping company in Indonesia provides two distinctive characteristics. One is the growth pattern of companies from core functions of vessel operation, marketing and administration to more diversified specialty sections such as fleet management, financial management and personnel management. (This type referred to as type A)

Type A



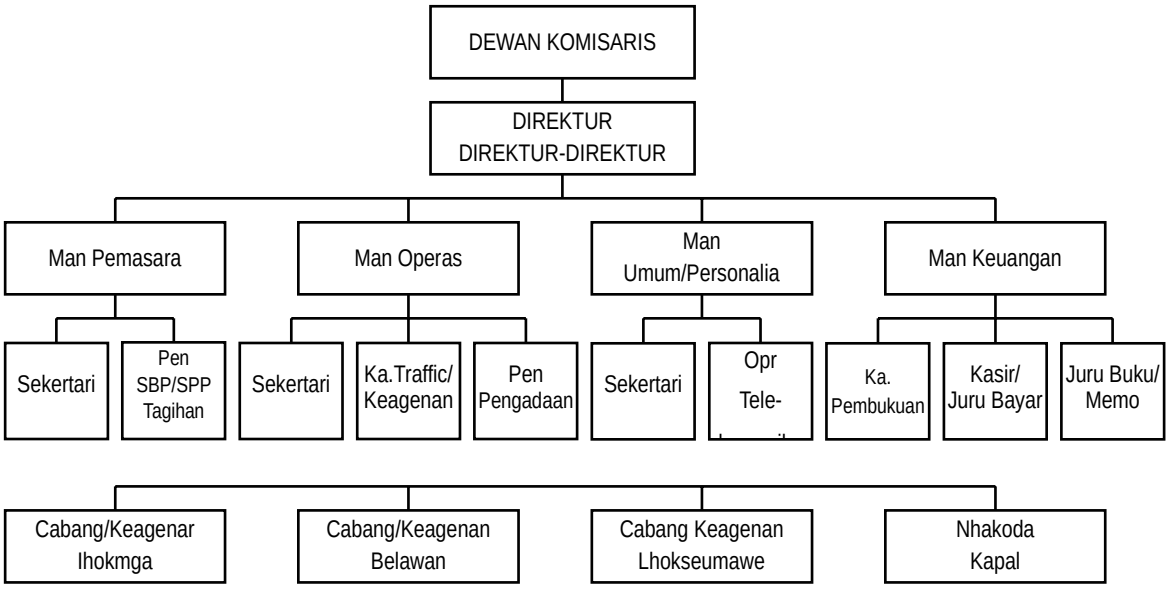
Another characteristic is to have a branch office from the early stage of operation. Even without branch offices, shipping companies usually have alliance with customers and forwarders defining some kind of networking. (This type referred to as type B)

Type B



Successful companies show strong network with either branch offices or alliance with agencies in local cities. New companies usually have relatively small organizations but branch offices play important functions for the development of business for both operations and marketing.

Figure 11.2.4 Sample Organization Chart



Based on a survey of 80 shipping companies, the organization profile was sorted by several characteristics according to the development stages. Composition of employees indicated an increasing importance of branch office staffs.

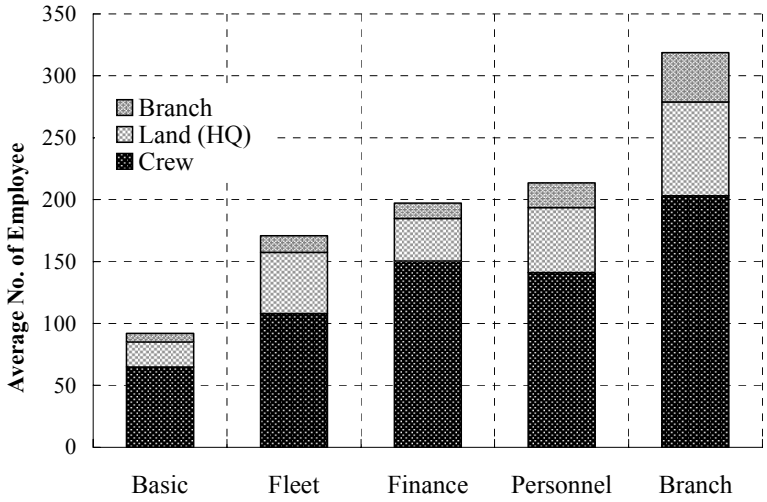
Table 11.2.5 Evolution Pattern and Composition of Personnel

(Average number of employee by type of organization)

	Crew	Land (HQ)	Branch	Total	Company
A: Basic Organizational Structure	65	20	7	89	20
B: Fleet Management separated from Operation	108	49	13	171	15
C: Finance Division independent	150	35	12	179	8
D: Personnel division independent	141	53	20	210	9
E: Branch operation independent	203	76	40	318	15
F: Other development made to the organization	89	48	17	153	11
Total					78

Source: Questionnaire survey to shipping companies STRAMINDO

Figure 11.2.5 Average Number of Employee by type of Organization



Aspects of modernization are related to organizational characteristics so that company growth and strengthening of organization are intrinsically linked together. A new company employs nearly 100 people among which 70% are crew and more than 20% are in administration, and less than 10% are in branch offices.

Employee composition ratio continues to be more or less the same when the organization grows by having several functions done independently. Finally the company evolves into a type of company with strong branch operations. In this stage, personnel of branch offices account for 13% of total employees and the average number of employee exceeds 300 people.

11.2.4. Modernization types and simulation

The confidential nature of financial information of shipping companies in Indonesia is a significant barrier for an analyst to understand the financial situation of shipping companies. Therefore in this study, based on the vessel information which is standardized according to average specification and performance, profit and loss of a company is estimated.

Modernization of the shipping industry through the effort of private sectors is considered in the form of (1) consolidation and (2) inter-modal integration. Both of these management effort should be considered in both financial and implementation aspects.

(1) Consolidation of small shipping companies by association (or cooperation)

Consolidation of companies to a reasonable size is highly recommended. The merit is to achieve quick preparation of funds for vessel renewal and better management of fleet, so that each special functions such as marketing, maintenance, operation planning, financial management, personnel management will be handled by a group of staff members specially trained for each task.

An additional merit is the flexibility to respond to fluctuating demand by sharing vessel capacity. As a result, shipping companies will have stronger bargaining power and will be able to withstand dumping of services of one client.

In the process of consolidation, communication with anti-monopoly bureau will be necessary. In addition, government support is expected in order to facilitate consolidation.

a. Loan approval for newly consolidated organization with favorable interest and repayment condition.

b. Government assistance in the introduction of safety navigation equipment

c. Government initiative in the introduction of Information Technology for ship registration, document processing and reporting procedure.

Consolidation can be best implemented by forming associations or cooperative, with up to 20 vessels from participating companies. The system is to keep the company organization as it is and form a new economic entity as an association or cooperative, so that the organization works as one company for the purpose of taking advantage of economy of scale. Participating companies assign their vessel to the association as bare-boat charter, and operators are selected by the association according to cargo demand.

In order to restructure the shipping industry, large number of one-vessel operators needs to be consolidated by alliance, association or cooperative. One of the major objectives and merits of consolidation is to build sufficient financial capacity to purchase a new vessel for replacement of aged ones. Single vessel companies will have difficulty to borrow money from a private bank, but by consolidation it will become possible. The business foundation will become stronger and financial health will improve.

Cost reduction is achieved by the efficiency of utilizing various resources such as administration function and fleet capacity. Not only in terms of cost reduction, but advantages will also be gained in marketing and operations.

In the simulation, it is assumed that consolidation will improve load factor, voyage time (20% less), and total trip miles (10 % less). As a result, variable cost was reduced by approximately 15%. Cost items such as crew wages, food expenses and administration cost is lowered by 30%.

At the same time, because of careful and better fleet management, cost items such as repair cost and lubrication oil can be lowered by 10%. In total, it is expected that the profit after tax will significantly increase by three times from 4.8% to 14.4%. Moreover, quality of service will be up-graded.

Table 11.2.6 Simulation of Consolidation of Three Companies to One (Mil Rp)

	General Cargo-Company-1	General Cargo-Company-2	Bulk Carrier Company-1	Simple Total	Consolidation with chemistry
Number of Vessel	5	5	5	15	15
DWT (Ton)	18,500	50,000	50,000	118,500	118,500
GT((ton)	16,000	30,000	33,500	79,500	79,500
Capacity (Cbm)	20,500	50,000	60,000	130,500	130,500
Speed (Knots)	9	10	13	11	11
Draft (M)	5	8	5	6	6
Age (Years average)	15	15	15	15	15
Total volume (Ton/year)	390,000	750,000	850,000	1,990,000	1,990,000
Voyages (Times/year)	90	50	55	195	**156**
Trip Mile Total / year	4,250	5,150	7,000	5,467	**4,920**
Operation at sea (Days/year)	1,600	295	1,750	1,215	**1,458**
Crew Wages (MilRp)	3,210	2,500	2,950	8,660	**6,062**
Food (million Rp)	175	750	1,000	1,925	**1,348**
Store Expenses (million Rp)	1,060	2,500	1,000	4,560	4,560
Other Fixed Cost (million Rp)	375	150	0	525	525
Repair cost Annual (MilRp)	3,220	4,000	6,300	13,520	**14,872**
Lubrication Oil cost (mill Rp)	300	6,500	500	7,300	**8,030**
Insurance Fee Annual (MilRp)	560	5,000	1,250	6,810	6,810
Administration Cost (mill Rp)	500	600	2,000	3,100	**2,170**
Fixed Operational Cost	9,400	22,000	15,000	46,400	44,377
Capital Cost	10,450	27,500	12,500	50,450	50,450
Fixed Cost Total	**19,850**	**49,500**	**27,500**	**96,850**	**94,827**
Port Charges (MilRp/call)	0.48	2.38	2.30	1.72	1.72
Stevedore (MilRp/ton)	0.02	0.02	0.01	0.02	0.02
Fuel cost (milRp/mile)	0.04	0.14	0.16	0.11	0.11
Variable Cost	**24,827**	**55,218**	**69,567**	**149,611**	**126,456**
Total Cost	**44,677**	**104,718**	**97,067**	**246,461**	**221,282**
Cargo Unit Price (Mil Rp/ton)	0.12	0.14	0.13	0.13	0.13
Revenue	46,800	105,000	110,500	262,300	262,300
Gross Profit	**2,123**	**282**	**13,433**	**15,839**	**41,018**
Tax payment (1.2%corporate revenue)	562	1,260	1,326	3,148	3,148
Net Profit after tax	**1,562**	**-978**	**12,107**	**12,691**	**37,870**
Profit / Gross Sales	**3%**	**-1%**	**11%**	**4.8%**	**14.4%**

Source : Simulation by STRAMINDO based on vessel data and company data

(2) Inter-modal integration for customer oriented services

Current door-to-door transportation system needs to be re-organized to suit the demand in terms of volume and frequency. In a questionnaire survey to shippers and forwarders, all of them agree to the importance of an inter-modal transport system covering land and sea.

In addition, linkages to forwarding business and cargo flow management are growing in importance. As a result inter-modal systems that will provide door-to-door service will be a future target of logistic service. Shipping business is a part of this logistic chain, and in the overall structure will be a dominant mode of service in the future. In order to reach this goal, the following points will be important.

1. Build linkages with forwarding companies and propose services to cargo owners
2. Information system needs to be established at Ports and Government offices, which should be open to the private sector for efficient and quick document processing.

To get an understanding of the issues involved in inter-modal transport in Indonesia, a Delphi Survey was conducted[1]. A Delphi Survey is a type of survey that intends to extract industrial opinions. The survey was conducted on 30 industrial representatives coming from shipping and forwarding industries in Indonesia. Some of its results are presented in the following paragraphs.

- For the implementation of inter-modal integration it is suggested that government intervention is needed to ensure coordination between trucking companies and shipping companies. 70% of the industry managers in both shipping and trucking companies agreed on this proposition.
- New designs for domestic vessels are essential to improve inter-modal connectivity, as stated by 89% of surveyed company managers. This implies that the potential introduction of more RORO vessels in Indonesia and that 78% of managers strongly agreed to this concept.
- Yet at the same time, healthy competition is desired by 90 % of operators. It is very probable that the shipping and trucking companies have their own marketing background and both are hoping to take initiatives in the business.

Modernization of industry at the management level will be realized through a process of conflicts among agreements and various groups of active participant in the physical distribution business. Shipping business is no exception and will be deeply involved in this process. Then government intervention in terms of guidance and support will be a great help in this regard.

11.3. Ship-management

11.3.1. Structure and Activity of Ship-management

Ship-management is a revolutionary system that contributes to the reduction of not only expenses for fuel, docking/repair cost and ships store but also marine accidents and engine/hull trouble. Some companies have already started adopting this system in inter-island freight shipping such as container shipping. As a result, they have manifested improved management and growth in business. Therefore implementation of Ship-management system is the key for the development of shipping business in Indonesia.

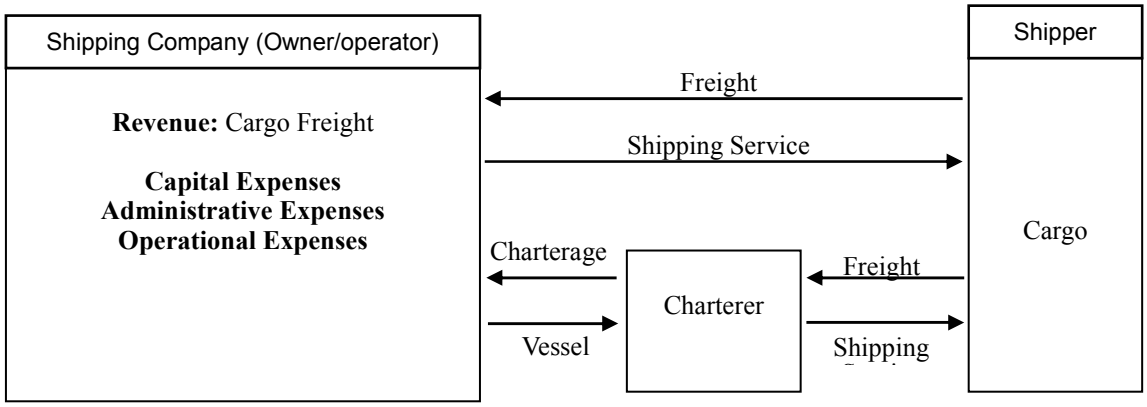
[1] Workshop on Shipping Business Modernization, 11 August 2003

(1) Current condition of Indonesian Shipping Operators

When we review the shipping companies in Indonesia, we recognize that most of them are operating vessels as owner-operator. The maintenance of vessels is dependent on the skill of the crew, and the consultant's on-board survey revealed that the level of maintenance is generally poor.

As a result, at the time of dock maintenance, items for repair become many so that the total docking expense increases. Sometimes vessel collapse during operation resulted in large amount of demurrage or accident. The following diagram indicates the current condition of Indonesian shipping operation.

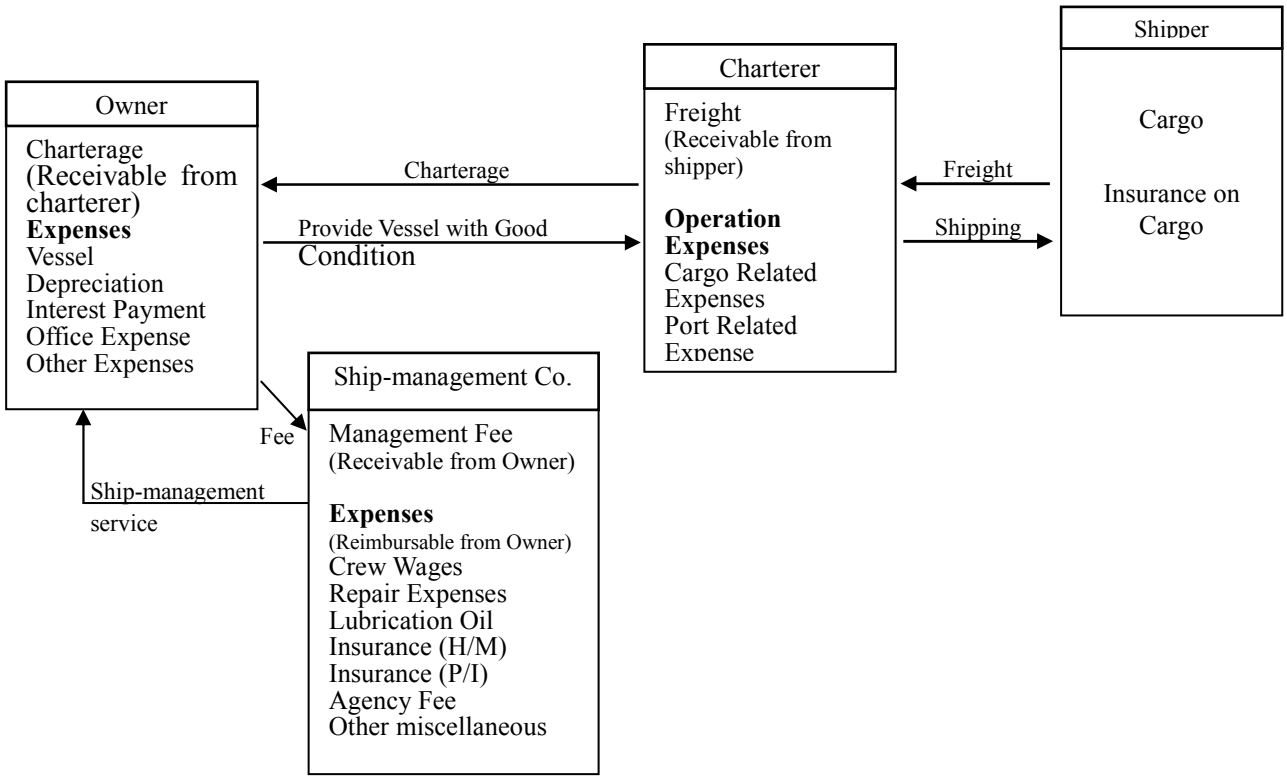
Figure 11.3.1 Relationship of Current Indonesian Shipping Operators



(2) Modern Shipping Operators with Ship-management companies in the Developed Countries

In developed countries, revolutionary movement has been underway since the past 30 years to separate the work of ship-management as an independent and specialized field. Based on the ship-management agreement, experts called superintendents will take care of vessels including mechanical maintenance, crew procurement and training, and procurement of navigation items. As a result, by taking advantage of economy of scale (i.e. consolidating the needs of several vessels) effective management of maintenance and manning can be achieved.

Figure 11.3.2 Relationship of Modern Shipping Operators



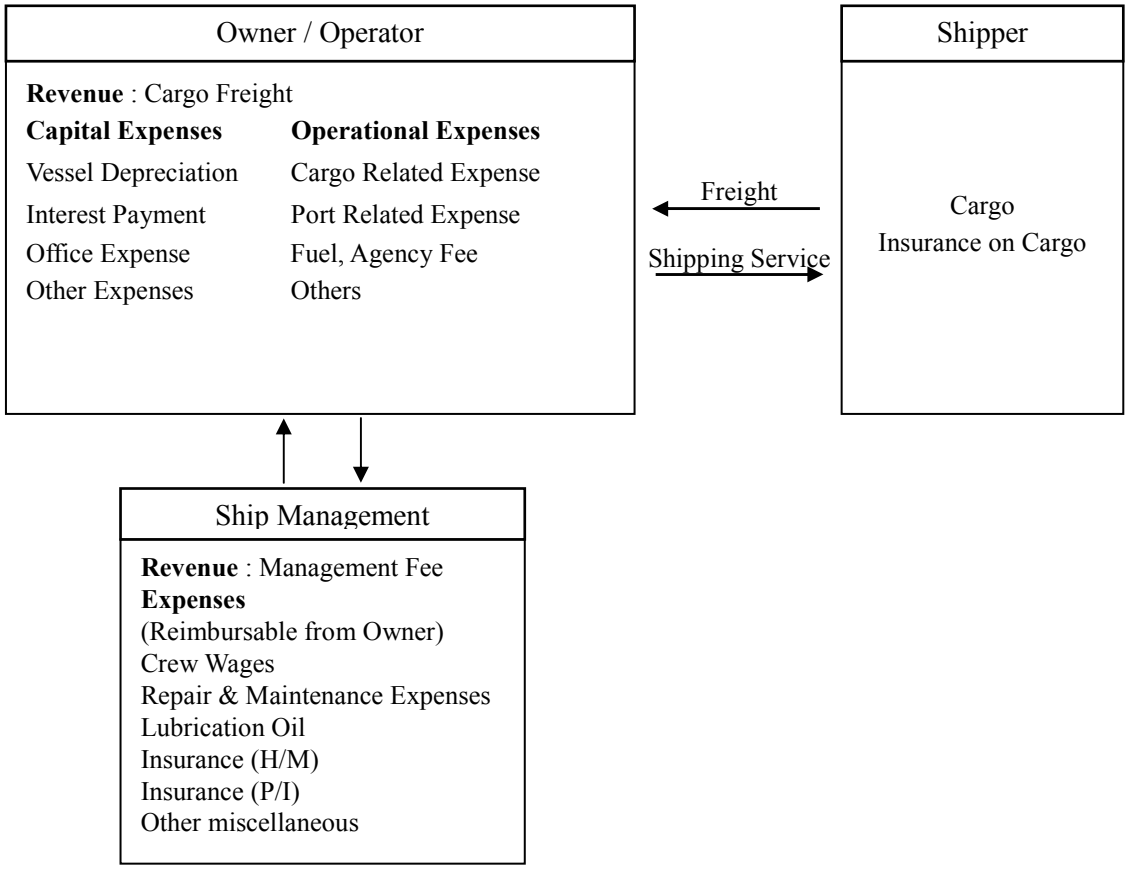
During negotiations, typically the position of the cargo owner/ consignee is the strongest while the position of the charterer and the owner is the weakest. The weak position of the charterer and owner sometimes damages the quality of management of the vessel. When ship-management is introduced, objective opinion to keep the vessel in good condition will be conveyed more strongly, thus, will help to preserve the asset value of the owner.

Figure 11.3.2 indicates that the Ship-management company receives management fee as remuneration from owners. Payment item such as crew wages, repair expenses are all budgeted and provided by monthly basis, and the ship-management company manages the payment in accordance with their activity as superintendent. At the end of every fiscal year, all the expanses are listed and reviewed and reported to the owner with adjustments of account balance.

(3) Future Proposal for Indonesia Shipping Operators

The future of Indonesian shipping industry is dependent on the successful implementation of ship-management, judging from the results of on-board survey, the state of Indonesian inter-island freight shipping management is 20 years behind the state of developed countries. Moreover, shipping industry developed nations has been making progress from the level of IMO-ISM Code to the level of global standards by Quality Management System such as ISO 9002.

Figure 11.3.3 Future Proposal for Indonesia Shipping Operators

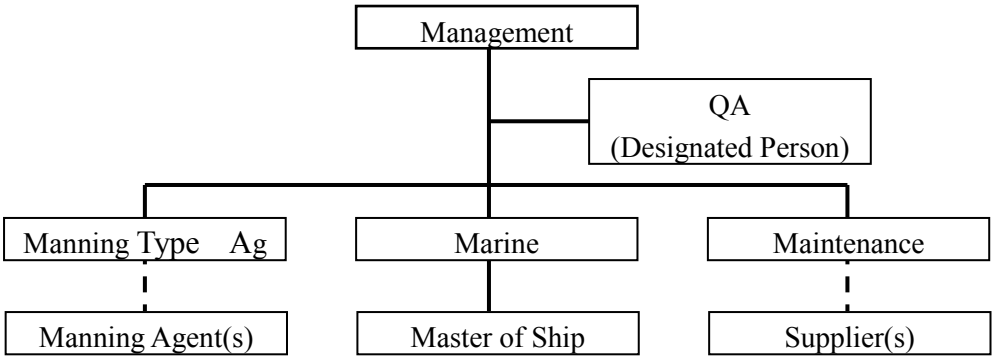


Separation of management from ownership is an idea to ensure that vessel is in the best condition and to the utmost possible workability. Delegation of management to experts gives great benefits to the owner in the long run which has been proven by shipping companies in developed countries.

11.3.2. Composition and major service of a Ship-management company

A ship management company consists of professionals who are experts in maintaining ships and enhancing the quality/performance on behalf of the owners. Based on contract, a company provides service for manning, maritime safety measures, procurement of ship store, regular maintenance, preparation of docking, application of insurance, supply of lubricating oil, etc.

Figure 11.3.4 Key Functions of a Ship-management Company (example)



A ship-management company keeps ships on schedule and installs ships with Safety Management System (SMS) to ensure quality in all aspects of operation. PDCA Cycle to achieve quality in performance

(a) Ship Audit/ surveillance

It is important for the PDCA cycle to check the vessel condition (vessel test) with ship audit/surveillance. Vessel evaluation consists of two parts:

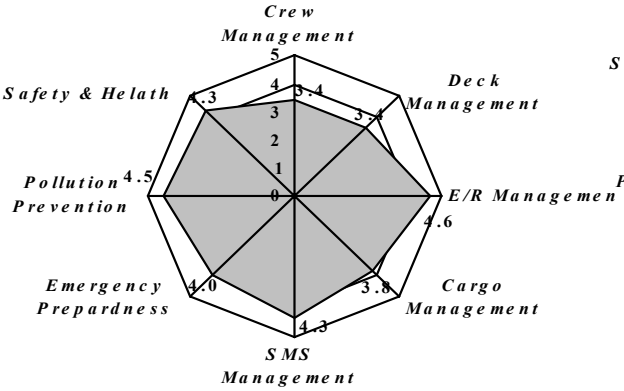
- Condition Assessment for Hull Structure
- Condition Assessment for Machinery and Cargo System

Figure 11.3.5 Ship Audit / Surveillance

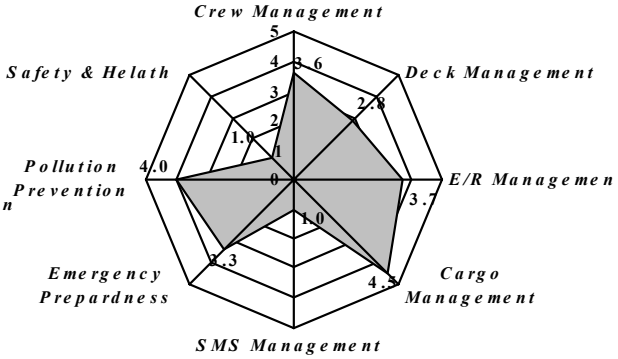
Analysis of the ship's condition using data obtained from the on-board survey would lead to concrete measures that will prolong the service life of vessels. This test system allows for the effective design of hull/engine maintenance plan. This chart, for example, shows the evaluation of two vessels:

Figure 11.3.6 Ship Audit Results by Comparison (Sample)

A Ship
Has good balance. Good performance.



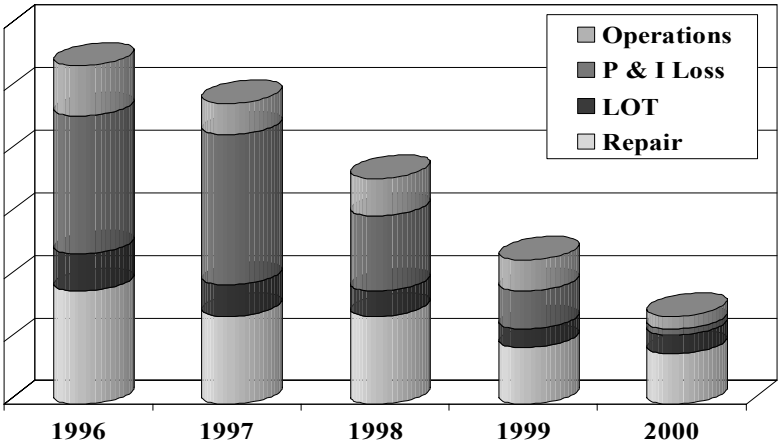
B Ship
Urgent rectification is needed.



(2) Effect of Ship Management System

As a result of the introduction of Ship Management System to a Japanese shipping company, the resulting impact is firstly the drastic reduction of P & I Loss, second is repair, operation loss of time and so on. After five years, the ship management system was able to cut costs on operations, P&I, LOT and repairs by 80%.

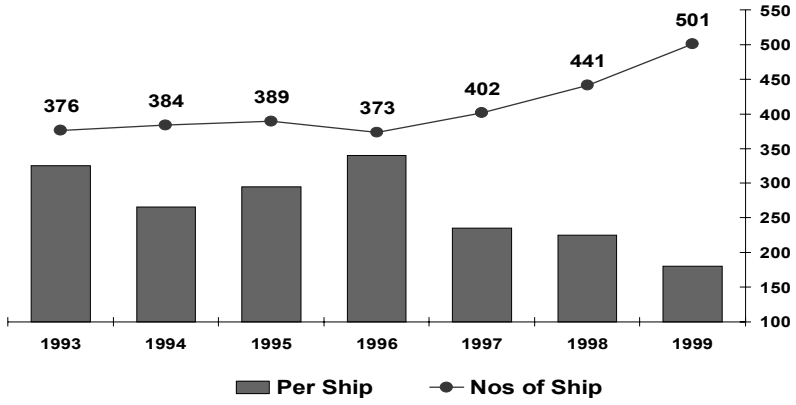
Figure 11.3.7 Effect of Ship Management System



Source: JMS

The chart below shows the down time trend for 7 years after installing the Ship Management System on a Japanese company. The down time per ship decreased by about 50%.

Figure 11.3.8 Down Time Trend (in Japan)



Source: JMS

11.4. Management Education in Maritime Industry

11.4.1. Concept of Management Education

So far, training programs has all been targeted to seafarers, and educational facilities all focus on the technical issues in maritime operations. Unlike this past trend, it is proposed to give focus on management education including ship management.

A new management education system needs to be established as a post graduate academy. This academy intends to develop capable managers and supervisors in the fields of engineering and management.

As described in the previous chapter on ship management, the industry is currently facing with the following challenging issues that could be solved by up-grading managers.

- Improvement of vessel management such as Total Quality Management with specialized Technical Management System.
- Improvement of shipping service through better coordination of human resource in the industry.
- Modernization and renewal of fleet with updated information system supported by financial, legal and regulatory systems.
- Improvement of Government Administration, both central and local

11.4.2. Expected Size of Demand

It is expected that the total number of personnel to be educated in the academy will reach more than one thousand mainly company managers and supervisors of the industry including vessel captains and chief engineers. In order to provide an education program to this estimated number of core members, approximately 60 people need to be educated every year. (1,200/20) Following these 1,200 target beneficiaries, 270,000 people in the industry will indirectly benefit from the improvement of management.

Table 11.4.1 Estimation of Personnel Engaged in Maritime Industry

	Year	2002	2014	2024
Shipping Business	General Cargo Carrier	23,065	20,759	16,146
	Container	1,189	1,712	2,675
	RO-RO	5,671	6,805	8,507
	Bulk Carrier	839	1,007	1,259
	Tanker	9,319	11,183	13,979
	Tug & Barge	20,462	20,462	20,462
	Passenger	2,680	3,216	4,020
	Other	8,177	7,359	5,724
	Crew Total	71,400	72,500	72,800
	Administration	28,600	29,000	29,100
	Total	**100,000**	**101,500**	**101,900**
Traditional Shipping	Crew	75,000	67,500	47,250
	Administration	15,000	13,500	9,450
	Total	**90,000**	**81,000**	**56,700**
Ship Building	Wooden Vessel	1,400	1,260	882
	Steel Vessel	25,000	30,000	37,500
	Other related industry	3,500	4,200	5,250
	Engineer Total	29,900	35,460	43,632
	Administration	9,000	10,600	13,100
	Total	**38,900**	**46,100**	**56,700**
Port Operation, navigation	PELINDO (1 to 4)	7,800	7,500	7,500
And Safety	Navigation	2,750	3,300	4,125
	Total	**10,600**	**10,800**	**11,600**
Administration	Government officers	35,000	35,000	35,000
Maritime Educational Institute		1,000	1,200	1,800
Logistic companies	Estimated Total	13,000	15,600	19,500
Grand Total		**273,500**	**277,700**	**273,750**
Business Manager (0.5%)		**1,200**	**1,300**	**1,200**

Note: Total numbers are rounded to hundreds.
Natural increase is expected in general by 20% and 50% for every 10 years.
Declining industry is forecasted to decrease by 10% and 30% in every 10 years.
Container industry is expected to grow twice as quickly as general increase.

Source: Estimated based on interview survey to each industry

Considering vessels to be managed by managers and superintendents, by 2024 it is estimated that the number of vessel to be considered as target would be 1,800, which can be managed by both superintendent of ship-management company or managers of shipping companies. Suppose that several vessels (about 4 to 6) are managed by one person, the required number of managers would be around 300 to 450. Therefore, ship-management and managers course should produce about 20 to 25 graduates in each course annually.

It is expected that these people will attend this academy by their own expense so that they will be fully motivated to utilize what they learn in the practical field. Government support will be needed in the beginning for the establishment of facilities. Operation will be managed by an independent academic board providing attractive and practical education to its constituents.

11.4.3. Structure of Management Education and Course Description

(1) Participants and Subjects

Eligible personnel from four groups will be encouraged to apply; namely shipping investors, shipping operators, ship builders, and administrators. Students of the academy are expected to have at least 5 to 10 years of practical experience and have the intention to become managers and superintendents in ship-management and maritime industry.

In addition, experienced professionals will be welcomed and registered as visiting specialists to participate as experts and help inter-relate other areas of business potentials. Visiting specialists will also include professors. Because the academy focuses on practical training and field experience, visiting specialists should be key persons who could introduce practical and workable knowledge.

There are several subjects to be grouped together for specific purposes, but total quality management and process management should be taught as a required course for all participants.

Specific topics include shipping business, ship-management including technical management of maintenance, shipyard engineering, government's role in maritime industry and environmental issues.

(2) Course description

(a) Mandatory Courses for all participants

Total Quality Management and ISO 9002 will be an important topic to master in the very beginning of study. Introduction of practical implementation of total quality management and ISO 9002 should be taught by inviting guest speakers who are practitioners, so that students would be able to learn applicable and practical concepts. In this way experience of quality control in actual practice will be widely disseminated. Process management is another key subject because every project needs to be properly coordinated in order to be successful. Therefore these topics are foundations of future managers in the maritime industry.

(b) Shipping Business Management

In business management, the main objective is to develop the ability to see the totality of shipping management – such as operational issues, chartering, ship acquisition, capacity adjustments and financial exposure. The transportation market is competitive and changing environments in trade and transportation requires proper response.

Logistics system deals with the shipping business in relation with land transporters such as trucking companies and other freight forwarders. Cost accounting and financial risk management are also important subjects for business management.

After reviewing the fundamentals of transport and logistics economics, focus is made on maritime transportation, to discuss the concepts of modern logistics, including supply chain management and the position of the shipping industry in the modern logistics system. IT-based logistics systems including legal and regulatory framework of international trade will also be discussed.

(c) Ship-Management

The concept to develop superintendent of ship-management is based on the understanding that ship management will enhance the efficient utilization of ships and realize cost efficiency as well as safety in operation.

Necessary subjects such as technical management inspection and reporting will be structured. Then, economy of scale for maintenance will be introduced, and in addition, basic principles of accounting and investment appraisal, including basic statistics and financial evaluation methods will be introduced in relation to the self-regulation of the shipping industry through the ISMA Code.

Organizational management and human factors in maritime safety will be introduced in the course. Various aspects of organizational behavior in the shipping industry include not only the effective management but also the human element in ship safety.

(d) Shipyard Management & Supervision

Ship building needs to be properly supervised so that process management will be effectively implemented. Procurement management is another important topic to be mastered. For safety management and improvement of productivity, understanding of the human factor is important. Innovation management is also important for the improvement of technology.

(e) Maritime Administration

Legal structure will be included in the program in order to develop an understanding of theoretical aspects and practical procedures in casualty and emergencies. In addition, it will provide understanding of international maritime safety regulations, including those regarding the survey of vessels, fire safety, navigation equipment, ship machinery, etc. It is intended to improve understanding of IMO conventions and methodologies to its implementation. Maritime and commercial law, such as ship-owners' liability, liens and mortgages, salvage, maritime claims, arbitration, arrest of ships, marine insurance practice, detailing, H&M, P&l and cargo insurance will be introduced.

Knowing government mandates for environmental protection improve understanding of international law relating to the environmental issues. In the course, examination will be done on the policy and technical issues relating to the prevention of marine pollution, with a focus on contingency planning, safe navigation, rules and technical details relating to the transportation by sea of dangerous and hazardous cargoes.

Port management and development planning will be introduced and discussed concerning the strategic development for the improvement of inter-island shipping.

(f) Interdisciplinary Approach

Interdisciplinary approach is taken as an important part of education because subjects are inter-related with each other. International logistics and multi-modal transport will give significant insight to shipping business because connections with land transport such as trucking companies and other freight forwarders will be important for the recent demand for door-to-door, just-in-time service.

Implementation of maritime conventions will be an opportunity to communicate with the state-of-the-art in technologies and management practices. It is also an integral part of practical experience and academic studies.

Case studies and field work will develop the ability to apply theories into practice and analyze financial risks in the maritime sector. Actual corporate activity may be experienced.

(3) Course preparation

Based on the policy and concept of the center, course curriculum is going to be prepared according to the following table. Participants are recommended to take major classes (marked A in the table) and some elective classes (marked B).

The four courses offered by the center deal with the study areas both extensively and profoundly. Preparation for these courses includes various teaching materials such as textbooks and computer software. It is therefore proper to consider the start of operation in several stages.

Table 11.4.2 Course Menu at Advanced Education and Training Center

	Superintendent for Ship-management	Administrator	Business Manager	Operation Manager	Shipyard manager	Visiting Specialist
Mandatory Courses for all Participants						
M-1 Total Quality Management & ISO 9002	A	A	A	A	A	B
M-2 Process Management & Project Coordination	A	A	A	A	A	B
Ship-Management [Expert Track]						
B-1 Planned Maintenance and Procurement	A				B	B
B-2 Technical Management for Ship Operation	A	A	B			B
B-3 Budget Control Accounting and Reporting	A		B	B		
B-4 Organization, Human resource management	A			B		
Administration & Government Mandate						
D-1 Legal issues and Maritime Administration	B	A	B	B	B	
D-2 Insurance (concept and practice)	B	A	B	B	B	
D-3 Environmental Issues in Maritime Industry	B	A	B	B	B	
D-4 Port Management and Development Planning		A		B		
Shipping Business Management						
A-1 Business Management and Marketing			A	B		B
A-2 Logistic system and Economics			A	A		B
A-3 Operation Planning, Costing and Accounting			B	A		
A-4 Finance and Risk Management			A	A		
Repair & Shipyard Management						
C-1 Repairing and Ship Building Supervision					A	B
C-2 Procurement Management					A	
C-3 Human factors for safety and productivity					A	B
C-4 Innovation Management					A	B
Interdisciplinary Approach						
E-1 Case Studies of Business Development	B	A	A	A	B	B
E-2 International Trend and Land Transportation	B	A	A	A		A
E-3 Field Work and OJT		B				A
E-4 Conventions and Symposium	C	C	C	C	C	A

Note: A: strongly recommended,
B: recommended
C: encouraged to participate even after graduation
+ Superintendent is an On-Board Maintenance Engineer

11.4.4. Considerations of Effective Implementation

This section has conceptualized management education in the maritime transport industry. Management education does not need specialized training equipment and facilities. Instead, it requires well-prepared syllabi and teaching materials, and the lecturers who are conversant with modern management. A ready-made package of syllabi and teaching materials is not available. In this sense, preparatory works means to develop original materials for most of the subjects. Management education in this field needs preparatory time rather than initial costs.

It is not advisable to commence all the courses at once taking heavy load on preparation. There is a need to select several courses as initially offering. The study has analyzed the necessity of management education at both shipping and shipyard sides. The results show that there is a need to introduce ship management system with training of superintendents in order to improve ship quality for small shipping companies and shorten ship repairing period for shipyards (refer to "11.2 Modern Shipping Management for Inter-island Shipping" and "13.1 Measure to Shorten Ship Repairing Period").

In regard to venue, Jakarta is the best location since most of the 1,200 target beneficiaries are working in Jakarta. Fortunately, the Education and Training Agency (ETA) under the Ministry of Communications, is keen on providing such education program not only to government officers but also to private individuals. ETA would be ideal if it could cooperate with DGSC in particular regard to international/domestic rules and regulations and the Research and Development Agency (RDA) in advanced technology under the same ministry.

Chapter 12

SHIP FINANCE PROGRAMS

12. SHIP FINANCE PROGRAMS

12.1. Mechanism of Development Finance in Indonesia

Like most other countries, development finance in Indonesia is categorized into (1) development finance for public sector and (2) development finance for private sector. The content of finance for each sector is as follows.

(1) Development finance for public sector

Development finance for public sector is categorized into two: investment for public infrastructure and finance for SOEs. Investments for public infrastructures are non-profit investments such as road, airport, port, irrigation, drainage, sewerage, school, hospital, etc. On the other hand, finance for SOEs are investments on SOEs for public infrastructures or utilities such as electricity, water supply station, toll road, railway, post & telecom, public transport (e.g. bus or ship), etc. which are aimed at profit making. There are many SOEs in Indonesia which are involved in petroleum, coal, cement production, industrial estate, shipping, air transport, etc. Therefore, the range of development finance for public sector is extremely large in Indonesia.

For public infrastructure investments, the government usually provides the budget. However, many developing countries including Indonesia have introduced foreign grant, ODA or OOF loans from developed countries or international organizations. This means that development finance has been provided on top of investment budget and grant. This fund, which is mostly foreign borrowing, shall then be repaid later by the government to the financier, whether the investment will make profit for the government or not. For finance for SOEs, government budget, ODA or OOF loans and foreign private loans have been provided on top of the income from the operation of SOEs. For most SOEs, it is the Indonesian government which has been guaranteeing the loan on their behalf. And since there are many SOEs established in Indonesia, the range of government guarantee has been very wide and large.

Many of these SOEs are in the process of privatization. But even those SOEs which have not been privatized are required to have autonomous budgets. In Japan, the GOJ has two sources of budget: (i) budget from tax or other government revenues which are used for recurrent budget or development budget with which income is not generated and (ii) budget from postal savings, government controlled insurance fund or from government bond which are used for development budget with which income is generated. Compared with Japan, Indonesia's budget for the latter category is very much limited thus the government has to resort to using ODA or OOF loan instead.

(2) Development finance for private sector

Private sector may also be divided into two categories. The first category is services which are traditionally purely private in nature such as agriculture, manufacturing, and trade. The second category involves the operation of public infrastructures or utilities which is traditionally public sector in nature. Modality of finance of these two types of private sector is also different wherein only private finance is provided for the first type while the second type in general is often provided with public sector finance such as

finance provided for SOEs, even in case they have already been privatized. The reason why public sector finance is provided for privatized companies operating public infrastructures or utilities is that, although they are privatized, their effective performance is vital for the development of industries or the improvement of peoples lives.

Shipping companies are involved in typical private sector infrastructure which is crucial for the development of the country. In Indonesia, many organizations which are in charge of operating public utilities or infrastructures are still SOEs. Because of this reason, newly privatized SOEs or private enterprises in charge of public utilities and infrastructures are eased out from government development finance. Shipping sector may be this type of sector. Public finance to this sector is still to be maintained in order for shipping to develop. Unfortunately, however, there is no effective public sector finance to this sector.

For the first type of private sector, there are times that public sector finance is provided, most typical type of financing of which is development loans through the banking system (DLBS) for agriculture or for SMEs including cottage industries. In many developing countries, without institutional support, agriculture cannot be modernized and industries cannot start up. In Indonesia, this type of fund is institutionalized by international organizations and provided for subsistence farmers and cottage industries through Bank Rakyat Indonesia (BRI) as micro finance scheme. For the development of tertiary shipping, integration with this funding scheme is being planned.

12.2. Mechanism of Ship Finance

(1) Finance for publicly-owned ship

There are two different types of government-owned ships. The first type are ships owned and operated by state-owned enterprises (SOEs) for their own transport needs, such as the vessels of Pertamina, Pusri Fertilizer company, etc. The second type are ships operated by SOEs but for public service, such as Pelni, Jakarta Lloyd, etc. There are also some ships owned by the government, including SOEs (PT.PANN, etc.) or local government, and leased out to private shipping companies. With regard to finance, the government either provides the budget for these SOEs or guarantee borrowings made by SOEs. In addition, some SOEs obtain loans from foreign as well as local capital market. In particular, Pertamina, etc. are considered to be credit-worthy and have been obtaining loans from foreign capital market for a long time without getting government guarantee. On the other hand, in the case of Pelni, GOI obtains foreign loan (KFW loan) and re-lends to Pelni. Under this scheme, the risk is primarily taken by the government.

Recently, SOEs are encouraged to obtain loans both from foreign and local capital markets without getting any government guarantee. However, considering their financial portfolio, it is very difficult for ordinary shipping SOEs to obtain foreign loans without government guarantee. There are three different foreign loans which can be provided for government- owned ships: ODA loans, OOF loans and private loans. ODA loan may not be provided for commercially-viable trunk line services or internationally-operated ships. Instead, it may be limited to commercially unviable but socially important tertiary shipping which includes pioneer shipping. OOF or non-ODA loan can usually be provided for commercially-viable sectors wherein credit line or credit limit is set by both

donors and recipient countries especially when it is guaranteed by the government. Private loans are of various natures. The amount, conditions or target are decided between borrowers (government or SOE) and lenders (bank syndicates). Typical export credit, that is, supplier's credit, is basically a tied loan and no condition is imposed on procurement. The loan is applied by supplier after their winning of bid.

(2) Finance for privately-owned ships

Private sector usually raises fund from the private financial market. However, with regard to shipping sector, due partly to their strategic importance to the countries' economic as well as social development and partly to very large capital outlay which is necessary for owning ships, long-term low interest institutional loans have frequently been provided by the government even for private shipping companies in many countries. In Indonesia, the government does not provide such institutional loans to shipping companies, but leases government-owned ships to private sector or provides subsidies to strategically important but less profitable tertiary lines as pioneer shipping support. However, the government is no longer active with regard to the leasing of government-owned ships because this policy is not popular among shipping companies.

So far, GOI has the policy that it does not provide or guarantee the loans for private sector, including foreign loans. Because of this government policy, financially weak small- and medium-scale shipping companies have limited access to foreign-made vessels. For most of these companies, the ships they are able to buy are cheap but very old or insufficiently functioning vessels due to very high interest rates of domestic loans. Under such conditions, it is very difficult to develop domestic shipping, particularly tertiary shipping which includes traditional shipping. On the other hand, since year 2000, both public and private banks are allowed to borrow loans from foreign capital market if Bank Indonesia agrees. This means that if these banks are deemed as credit worthy, it can sell bond at foreign capital markets with its own guarantee. This will open the door for shipping companies to borrow foreign currency loans or less costly domestic currency loans.

When ODA fund is provided to the private sector, the fund is usually conduit through government banks. This scheme is called as two step loan (TSL) or development loans through the banking system (DLBS). JBIC-OECF has been providing this type of loan to many projects in various countries, including those provided for maritime sector development in the Philippines. This is considered to be one of the most effective ways to develop handicapped or strategically important private sector with the support of the government. One of the most successful TSL may be the privatization support for Chinese small and medium SOEs. Through the TSL from OECF, many Chinese SOEs which received the sub-loan have been privatized later and have grown to become powerful export industries.

12.3. Present Situation of Ship Finance

(1) Finance for publicly-owned ships used for public transport

The government has been introducing foreign loans including ODA loans for their ships. Japanese government also provided loans for procurement and building of these of ships,

mostly for domestic shipping, ferry services, etc. For domestic shipping, the fund was provided for PT.PANN to build standard-type vessels for domestic shipping (Caraka Jaya Plan) at Indonesian shipyard. Other than Japanese loan, Spanish loan was provided to construct also for standard-type vessels for fishing (Minan Jaya Plan). However, these plans have already been suspended and only the German loan (KfW) is being provided to procure ships from the international market. The loan is EC tied and the ships are imported from EC countries. The ships are owned by PT. Pelni as government asset (share), serving for passenger transportation throughout the country.

Public transport SOEs for shipping are mostly financially not viable. Even though they are required to establish budgetary autonomy, it is difficult for them at present. They are more or less receiving government subsidies for their operation, therefore, they cannot obtain loan from banks without government guarantee. Moreover, the government itself is requesting rescheduling of existing loans from foreign lending institutions and thus cannot obtain or guarantee new loan at present. Even after the present debt-rescheduling has been completed, the government will not readily borrow or guarantee loan for SOEs. The tight monetary policy at present is strongly supported internationally and the government is successfully restoring stability to the country's financial sector.

On the other hand, prolonged tight budgetary limitations has made the condition of infrastructures as well as public facilities worse, insufficient and deteriorated due to shortage of fund for maintenance and rehabilitation as well as budget for covering their depreciation, not to mention the investment fund for increasing demand. At present, there is strong opinion within the government that the investment budget should be recovered even under the present tight monetary policy. It means for the shipping sector which have been seriously affected through the tight money policy would also be reviewed.

(2) Finance for ships owned and used for SOEs

These ships are categorized as publicly-owned ships, however, they are owned by SOEs which accounting system is autonomous and in cases when they procure ships, they do not require government guarantee. Basically, they have to buy their ships through their own finance. In the case of Pertamina, Pusri-Fertilizer and other coal or cement based SOEs, they are considered to be credit worthy even without government guarantee. They usually issue bonds at international capital market or obtain loans from foreign banks whenever they procure ships from foreign manufacturers. The government used to guarantee these SOEs when they buy ships or procure ships from foreign manufacturers directly and lend them to these SOEs. Some of LNG ships from Japan were purchased by GOI financed by Japanese ODA and lent to Pertamina. However, such method is no longer practiced these days, especially now that no new institutional loan is available for the government due to rescheduling of existing loans.

(3) Finance for privately owned ships used for trunk line transport

Private shipping companies so far have to borrow foreign loans by guaranteeing the loan by themselves. Those which are in charge of international shipping or domestic shipping to transport import and export cargo have foreign currency income and therefore can obtain foreign currency loan. However, ordinary domestic shipping companies which have no source of foreign currency income cannot obtain foreign loans. So far, interest rate of Rupiah loan is extremely high at 15-17% even though it is lesser compared to

previous highs of 19-20% per year. Although interest rate of short-term loan is less than long-term loan, for the shipping business, amortization period of ship loan should be five years or more and therefore cheaper loan is not available. Under such a condition, it is very difficult for shipping companies to borrow domestic bank loan for the procurement of brand new ships. Shipping companies, at present, can only buy very cheap second-hand, aged 10-20 years, and use them for another 15-25 years. Although the price is nearly that of scrap value (10-20% of brand new vessel), it is not easy for shipping company to buy these ships. Consequently, domestically-operated ships are not improving but are deteriorating every year. As long as present situation will be left as it is, domestic shipping sector will surely be weakened further in the future.

(4) Finance for privately owned ships used for feeder line transportation including traditional shipping

Among others, feeder line shipping operators including pioneer shipping operated by small vessels or traditional motor-sailing vessels are at present having difficulty in developing their businesses in spite the high priority given to them under government policy. Feeder line shipping is usually operated by small shipowners and they cannot obtain the high interest domestic loan due to insufficient collateral. And even if they can borrow, it is difficult for them to profitably operate tertiary shipping because of the high interest. Actually, small or traditional shipowners only obtain loans for down payment from the bank and repay it immediately after finishing the cargo transport contract with the client (maturity of the loan is approximately 6 months).

(5) Finance for ship buildings

There are two different types of finance provided for shipbuilding sectors. The first type is for shipbuilding and the second is for shipbuilding facilities. For shipbuilding, Japanese ODA has already been provided twice. However, these ODA are more than 20 years ago and since then, no Japanese ODA fund has been provided. For shipbuilding facilities, fairly large amount of Japanese ODA has been provided. Also considered as old loans, they are for Surabaya dry dock, Pelita Bahari shipyard and Ujung Pandang shipyard (ES only). For Pelita Bahari shipyard, several technical assistance funds were provided for technical support services.

GOI has been giving very high priority to develop shipbuilding industries and has provided government fund for shipbuilding at several domestic shipyards. The schemes include Cakara Jaya and Minan Jaya plan. Unfortunately, they have been suspended with only limited success. GOI has also provided its own fund for the construction of shipyards. However, these shipyards are mostly not functioning well. They are not manufacturing ships in the quality and quantity it was originally intended. If they are left as they are, it may not be possible for them to manufacture ships competitively against foreign shipbuilders. In order for them to be commercially viable, it is necessary to provide them with financial, technical and managerial support.

There are many small scale privately owned shipyards, throughout the country. Some of them are solely for transport vessels and some of them are for both transport and fishing vessels. They are used both for building new vessels and for repairing. There are also

many traditional shipyards located at South and South East Sulawesi and South Kalimantan. For these shipyards, institutional loans have been rarely provided.

12.4. Problems of Ship Finance

(1) Resource mobilization

In order to develop the shipping sector, mobilization of finance is very important. In Indonesia, the type, size, purpose, or ownership of ships varies and so is the type of funds to be mobilized, as follows:

(a) ODA fund

This is used to provide either for shipping SOEs to procure foreign made vessels or for government-owned shipyards to manufacture vessels domestically. At present, not only is there no fund provided to procure ships but there is also no plan to acquire ODA fund for ships in the future. ODA fund can also be used as TSL for private shipping companies to procure vessels. However, there is no scheme to provide ODA fund for this purpose so far. (Refer to (e))

Although, it has not been materialized, even some of ODA fund is expected to be provided not by the government guarantee but by the quasi government entities, SOEs, government banks or by the provincial governments. Under the situation where national government guarantee on sovereign guarantee were at stake, this method could expand the target of ODA to highly credit worthy organization in heavily indebted countries even though due attention should be paid to country risk. It means that as for shipping, ODA fund can be provided for credit worthy SOEs or their subsidiaries, state owned banks or local governments to re-lend sub loan to private shipping companies. (So far, GOI does not want ODA to be provided directly to SOEs or to local government.)

(b) Foreign export credit or OOF

For most overseas suppliers, export credit (or ODA funds) is prerequisite for them to export goods. Export credit is only available when export credit is insured. Unfortunately the credit insurance charge to Indonesia is very high by the decision of OECD. It means that it is not easy for the business from OECD countries to get credit insurance and therefore export credit.

So far export credit to Indonesia is mostly being suspended due to rescheduling arrangement. Even if export credit were resumed if the rate of export credit insurance were as high as present level, the amount of export credit would be limited. It means, as far as Japanese export credit is concerned, credit line which can be provided for ship export from Japan may not be sufficient even after resumption of export credit insurance. Under such a situation, suppliers would be hesitant to export ships to Indonesia, unless otherwise there is a reliable guarantee.

Unlike in the past, the GOI will no longer guarantee loans for SOEs for their ship import. Except for those which are creditworthy, SOEs can not borrow export credit from foreign banks.

In the case of Pertamina, it once borrowed loan from Korean Exim Bank without government guarantee so as to procure their vessels. However despite its financial strength, Pertamina can not introduce foreign loans as much as they like without government guarantee. The measures to strengthen introduction of OOF should also be worked out also for Pertamina and other SOEs.

Under such a situation, financially capable private domestic shipping operators have no other means but to get foreign private loans by themselves, mostly through Singaporean banks.

(c) National budget

GOI used to provide a substantial amount of national budget for the provision of government fleet. The funds from SOEs have been provided also to strengthen their own fleet. However, due to the insufficiency of the government budget, especially that of development budget and also in accordance to the new government budgetary policy which promotes privatization of SOEs to the maximum extent and to limit the role of the government, the provision of government fund to procure or manufacture ships for various sectors is no longer possible except for those under very important strategic scheme. There is a scheme to procure locally-manufactured ships for feeder line shipping including pioneer shipping using government scheme. However, the fund for this plan is limited and is still far from satisfactory level. Provincial government fund is also expected mainly for pioneer shipping. However, provincial budget is usually tighter than the national budget that it cannot effectively supplement insufficiency of fund for pioneer shipping.

(d) Loans from domestic banks

Although major Indonesian banks have not yet been privatized, all of them are required to operate autonomously without getting any government support. Some of them have made their shares traded at the stock exchange. Whereas majority of shares are held by the government, their charter, organization and management are exactly the same as those of private banks. At present, prime bank rate has recently dropped sharply to 8-10% from the 13-15% level, but this is still considered to be too high. Under the present situation, interest rate for a 5-year loan which is common to ship financing remains high at 15-17%. If this level will be sustained, the demand for loan by shipping companies may remain at a very low level. For example, the largest local bank of Indonesia, Bank Mandiri Indonesia (BMI) provided an amount worth US$ 20 million to the shipping sector during 2002. This is a quarter of loans for transport sector but this is only less than a quarter of one percent (0.25%) of the bank's total lending. Unlike the commercial or industrial sector, transport sector is not profitable because of the nature of infrastructures. If the present situation will not be altered drastically (i.e., a substantial decrease of long-term loan interest) domestic bank loans will not be a major stay for shipping sector.

(e) ODA-based TSL through domestic banks

In case if TSL was provided for domestic shipping by JBIC, like in the case of Shipping TSL for the Philippines, the loan might be conduit through BMI (formerly Development Bank of Indonesia: BAPINDO, now one component of BMI) or through Bank Rakyat Indonesia (BRI) which specializes in micro finance – currently engaging in TSL of ADB and IFAD fund and Bank Tabungan Negara (BTN) which is conceived to operate one of institutional loans of the country – housing loan. (Refer to Appendix 12-2, 12-3, 12-4, respectively)

At present, foreign exchange cost is very high, in the case of Rupiah to Yen, it is said to be approximately 5%. This means that even if a very low interest Japanese ODA loan is provided, when this fund is credited to banks, the interest rate will be going up to approximately 10% without any other charges such as the usual 2-3% bank handling charge, 1-2% credit insurance and further consulting services charge of 1-2%, thereby final interest rate shall be 12-14% per year. Such a loan may not attract borrowers although amortization period can be prolonged to beyond 6 years. In order to reduce interest rate accrued by swap cost-foreign exchange risk (FER) cost, if borrowers are allowed to borrow Yen or US dollar, the interest rate will go down to reasonable level. Although not prohibited by regulation, there is no assurance that this method is feasible.

(2) Amortization period

Domestic banks are offering up to five years amortization period loan. This meets the requirement of shipping companies although for most companies, the longer the term, the better. However, given the fact that majority of ships procured by shipping companies are aged and second-hand vessels, a five-year term may be reasonable. On the other hand, in cases when shipping companies are to procure brand new vessels, shipping companies may need longer term loan because brand new vessels are costly, the capital cannot be recovered within a short period and also because the ship life is longer than second-hand vessels. Under ODA-based TSL, sub loan amortization period can be substantially longer, i.e. not only 5 years but also 10, 15 years or more, as long as the benefit of ODA will not be limited to a selected few (e.g. when a loan period of seed capital is 25 years and sub loan period is 25 years, there is only one beneficiary and this is not desirable).

(3) Collateral, credit guarantee scheme

At present, those who buy ships cannot make the purchased ship as collateral. Under such a situation only the very rich who have sufficient assets other than the ship to be purchased and thus can offer collateral can have access to ship finance. Sometimes, a paternal company, that is, a holding company, guarantees the loan for the shipping company. If the paternal company is a foreign-based company, the domestic shipping company can obtain foreign loan. Although it is not common, there is also a commercial practice that shipping companies obtain loans by mortgaging long-term contract using the purchased ship. This means that there are only very limited shipping companies which can obtain loans at present. Consequently, the number of shipping companies and operational vessels are therefore limited and does not effectively meet the demand of the country. One of the most effective ways to supply ships is probably the lease purchase

scheme. However, if the ship to be lease purchased cannot be mortgaged, the lease purchase scheme is irrelevant.

At present, GOI is planning to promulgate the ship-mortgage and arrest laws by which ship owners can mortgage the to be purchased ships. It is expected that more ships will be provided for domestic shipping through the enactment of such law. If it is not possible to mortgage ships to be purchased, loan guarantee is very important. On the other hand, because of the new government monetary policy, the government shall strictly refrain from guaranteeing loans, be it for SOEs or for private sector. This policy may be one of the reasons that domestic fleet has been weakened these days. For most overseas suppliers, export credit is indispensable for them to export goods. Export credit is only available when export credit is insured. Unfortunately, based on the OECD decision, the credit insurance charge to Indonesia is very high, meaning, it is not easy for businesses from OECD countries to get credit insurance and therefore export credit even after the present rescheduling is completed.

So far, the only possible way to procure foreign vessels is to pay by cash or to buy by getting foreign bank loan with personal guarantee.

(4) Finance for feeder line ships including traditional ships

There are various problems confronting feeder line shipping, as follows:

(a) Insufficient, unstable and unpredictable passenger and cargo demand

One of the most serious obstacles in the development of feeder line shipping is the insufficient, unstable and unpredictable demand of both passenger and cargo to be handled. Under such a situation, it is very difficult for shipping companies in charge of feeder line shipping to balance their income and expenditure.

(b) Huge amount of subsidies necessary for pioneer shipping

In order to fill the gap, GOI is providing subsidies to each pioneer shipping operator. The subsidies are provided to cover the deficit of each pioneer shipping operation and are decided route by route. The amount of subsidies is decided based upon public bidding among candidate operators. Those who submitted the cheapest proposal for subsidies is awarded as the pioneer shipping operator for the proposed route.

(c) The system is considered to be fair but the amount of subsidies used for pioneer shipping operation is not small and what is considered to be undesirable is that rate of subsidies among the total income of operator is too high i.e., 92.6% in 2002 on the average. All the more, under the present modality, sufficient services with which most remote islands-localities are benefited cannot be attained. There are too many localities to be served, compared with the amount of subsidies and number of available ships. Although more important roles should be played by local governments, due to budgetary as well as organizational constraint, most of them have not taken remarkable initiatives.

(d) Provision of feeder line shipping services by traditional shipping

One of the important players in providing feeder services is traditional shipping. They are not expecting pioneer shipping status for most cases; instead, they expect that through pioneer shipping operation, cargo transport shall be generated even at feeder line shipping. The role however of traditional ships for feeder line cargo transport is very large. They rarely obtain any support from the government, may it be in the form of subsidies, institutional loans or investment. As a result, they are still ineffective, unreliable, unsafe, and have very limited capacity. Thus, there is still a big room for improvement. In order to improve their activities, from the Pelra association's view, the support from local chamber of commerce (CC) may be inevitable, although this is rarely taking place.

(5) Finance for ship builders and locally manufactured vessel

A relatively large fund has been provided for the shipbuilding sector in Indonesia both for shipbuilding facilities and locally-manufactured vessels. However, this policy has not been successful and locally-manufactured vessels have the following problems:

a. Quality of ship is generally poor. Ship durability is unsatisfactory and its deterioration is fast due mainly to low level of shipyard technology. Intensive maintenance and rehabilitation (M & R) is required to ensure smooth shipping operation.

b. M & R of low quality ships is difficult. They often require staying for long periods of time at the repair shipyard. Most of the time, M & R cannot be completed within schedule and this paralyzes the shipping schedule as a whole.

c. Delivery of ship is slow and unpredictable, due mainly to the limited capacity of shipyard.

d. Ship design does not always meet the requirement of the shipping companies because they are quite often designed without paying due attention to the condition of ship operation. In the case of standard ships under Caraka Jaya project in particular, manufactured ship did not satisfy the need of ship owners due to their incompatibility to the actual method of use.

e. Quality of installed equipment, engine, generator, operation control equipment, telecom equipment, or other ancillary equipment and facilities are sometimes inadequate or unbalanced and are sometimes insufficient or non-existent due to

limited supply.

f. Ship procurement market is insufficient and limited. The shipping company has no other option but to buy ships from very small domestic market and from a very short limited number of vessel brokers, which, sometimes has only one ship available and shipping companies are forced to buy inappropriate ships or ships not to the specifications they require.

g. Ship class is not authorized and therefore ships cannot be insured properly. It is also not feasible to make the ship as loan-collateral.

h. Maintenance and rehabilitation guarantee is not always effective. If necessary parts or materials are not supplied, shipyards cannot maintain or rehabilitate ships properly.

i. Safety standard is not sufficient. Though it exists, it is not strictly enforced. Therefore, even newly manufactured ships have potential danger of accidents and if accidents do occur, damage tend to be serious, not to mention the cases of insufficiently maintained old ships. At present, accident rate of Indonesian ships is much higher than international standards. But Indonesian sea is basically a calm tropical sea, thus, there is no reason for the very high rate of ship-accidents since there is no natural factors causing accidents. Therefore, accidents could be attributed only to human factor and poor seaworthiness of vessels; and, utmost efforts should be made to reduce these accidents.

j. Energy consumption of ships is high. There may be two factors to excessive consumption of fuel. One is inappropriate engine (deteriorated or miss fitting) and the other is insufficient maintenance. Even though fuel cost is cheap in Indonesia, it is not desirable if shipping is energy-inefficient, especially, for tertiary shipping services where profitability of shipping is marginal.

k. Due to abovementioned reasons, locally manufactured vessels are not welcomed by domestic shipping companies, including public sector shipping companies.

The situation has become worse due to the recent economic crisis. The price of vessels become almost twice expensive as it used to be and currently sales have been low. At present, local shipbuilding by public sector shipyard is almost suspended and there is no government fund, foreign loans included, have been provided so far. On the other hand, the government is faced with difficulty of repaying foreign debts and debts are being rescheduled.

(6) Funding policy

The funding policy for the shipping sector has not been well established yet. The basic funding policy however should be a very simple one that commercially viable sector should be based upon private fund and commercially unviable but socially and economically important sector for the country should be supported by public fund. However, due to insufficient government resources including ODA loans and grants and too much demand for shipping in both commercially viable and unviable sector, the basic funding policy has not been well established yet. What is unfortunate though is that, while shipping demand has steadily been growing, funding resource has not been increasing accordingly. Sometimes, there is an available fund but sometimes there is none. The condition of fund has also been changing all the time. Though this is a common

problem of over-reliance to external resources, this has been constraining the establishment of a stable funding policy and has been jeopardizing the development of the shipping sector.

(7) Funding procedures

With regard to government fund, including ODA fund, the procedures are established. Funding procedures of ODA varies from one country to the other. Although there has been a move to make the procedures or regulations common to for all borrower countries, this has not been successfully implemented. Instead, ODA procedures from one country has been changing every year which causes difficulties in the effective use of the fund, slowing in the fund disbursement and repayment difficulties in some key projects such as the Caraka Jaya project. In the case of private fund, the funding procedures differ on a case-to-case basis. However, there is that common problem that Indonesian shipping companies cannot offer sufficient collateral to the banks. This is due to the absence of ship mortgage law and insufficient assets of the companies. In order to deal with this problem, some shipping companies are guaranteed by paternal companies, including foreign companies, by making the ship as foreign flag ships, thus enabling the vessel to be mortgaged. However, the fund which private shipping company can borrow from the bank is limited and therefore, affording only the shipping company to purchase heavily discounted and very old ships.

12.5. Rationales to Strengthen Ship Finance

The government needs to develop a set of comprehensive ship finance policies and programs in order not only to promote domestic shipping development but also to guide balanced national development where various local resources are optimized. Therefore, rationales to do so must cover a wide range including (1) rationalizing and restructuring shipping industry, (2) promoting privatization of shipping SOEs, (3) modernization of fleet and the industry, (4) improving shipping operation and company management, (5) supporting non- and less commercial tertiary shipping, (6) enhancement of ship safety, and (7) minimizing environmental degradation.

(1) Rationalizing and restructuring of shipping

Over aged fleet held by Indonesian shipping companies is unusual. Overaged vessels are not only ineffective, unreliable and uneconomical but also dangerous. As long as most vessels are overaged, reliable ship transport is impossible. It seriously affects the development of industry as a whole and development of the shipping sector can not be expected.

One of the most important reasons of the prevalence of over aged vessels is too low cargo transport fare caused by excessive and unregulated competition. In order to keep the cargo transport fare at reasonable level and orderly, restructuring of shipping sector through rationalization of shipping regulation or licensing is necessary.

Another important reason for the over aged vessels is the difficult access to finance. Measures should be taken for shipping companies to have easy access for finance.

One important task in restructuring the shipping sector is to review the function of domestic shipping, especially passenger traffic. At present, passenger traffic by ship is facing serious competition from airplane.

Unfortunately it is predicted that future competition with air plane will be more serious because air transport is rapidly growing throughout the country and the fare is constantly decreasing and convenience for users (frequency) is being upgraded because of increasing demand. On the other hand, ships have no room to offer more convenience for users with reduced price. Passenger traffic had better be limited only to routes where there is no alternative traffic means.

Unlike passenger traffic, cargo traffic will not loose its commercial grounds. There will be no substitutes for shipping, especially considering the topographical condition of Indonesia. Thus parallel to the development of the country, cargo traffic will grow year by year.

In order to make shipping business viable in the future, financial support for shipping companies to adjust themselves to the changing situation is indispensable.

(2) Promotion of privatization of shipping SOEs

For the support of privatization of shipping SOEs, financial support is necessary in many cases. Without support, some SOEs may have a danger to go bankrupt after the companies are privatized because preparation by the SOEs to deal with possible competition is not easy. Even in case SOEs are do not go bankrupt, service levels are quite often degraded and not improved against expectation.

Degradation of services of SOEs usually gives serious negative impact to people's lives as well as to industrial development economy because SOEs are mostly established so as to serve for the people and the industry of the country.

In order to expect successful transition from SOEs to private companies, institutional support is necessary.

Note:
In case Japan and China, for the privatization of SOEs, institutional support has been provided for SOEs for their preparation for privatization. On the other hand, in East Europe and Russia, there has not been any institutional support provided for privatizing SOEs. The consequence is clearly shown that in the former countries, most privatizations has been accomplished smoothly and in the latter countries only a few have succeeded and worse, it took quite a long time most of them to complete. This shows that for privatization a "carrot-approach" is also necessary apart from the "stick-approach".

(3) Modernization of fleet and the industry

Modernization of fleet is crucial for Indonesia; however, without provision of institutional support, it is impossible.

It shows that, it is necessary to provide shipping companies easy access to finance. Considering the magnitude of fund to modernize the fleet of Indonesia, all possible resources should be materialized. Among others, ODA is necessary considering its piloting function. With the provision of ODA, many other finances may follow and only by this multiplier effect, required amount of fund can be mobilized.

If ODA loan is provided as TSL, with the amount of fund for one ship it is possible to procure 3~4 ships throughout the loan period. (In case loan Period is 25 years and sub loan period is 5 years). This impact is really large.

Along with the modernization of ships, operation and management should also be improved, in order to use the ship effectively and economically and to decrease maintenance and repair cost and time. Technical support services are thus necessary.
Technical assistance for operation and management is only effective when the facilities are newly built or improved. Measures should be taken to integrate funding and technical assistance.

(4) Supporting of non- and less commercial tertiary shipping

A well-designed ship finance program is also necessary to less commercial feeder line shipping. In order to achieve balanced development of the country, even if some of feeder line shipping is commercially not viable, government cannot stop their operation only from a commercial point of view. Some places, mostly remote islands, with the stop of shipping services, the places will not only cease to develop but at many places, residents either will return to subsistence living or will have to abandon to island. Social structure destruction will be serious throughout remote places of the country.

At least minimum support from the government, in the form of granting or leasing ships to small tertiary companies is necessary from a social point of view. Provision of ODA loan may be one of most effective way to sustain these tertiary shipping.

It is considered that one of the most important reasons of underdevelopment of East Indonesia is that the development of the area has been fully reliant upon shipping services. Only with the development of maritime transport can the development of the area be attained. Coordinated efforts are of great importance for local shipping companies to support and stimulate local economic development. These shipping companies basically have no information on the situation and potential of the area, i.e., what industries actually exist there, what industries can additionally be developed, what should be done to support them or what problems exist on land transport, whether, how, when the land transport will be improved, what should be done for it etc.

From present shipping classification, non- and less commercial tertiary shipping can be grouped into three with different ODA funding requirements:

a. Services provided by shipping SOE: With assessment of the present PELNI fleet, particularly numerous passenger ships, adequate ship design for capturing middle to long-term demand and suitable ship assignment for serving current demand are essential.

b. Traditional shipping: Vessels and shipyards are both important to sustain local economies. Both also have modernization needs which are depicted in the "Roadmap for Modernization of Traditional Shipping" (refer to Figure 10.5.4) where technical and financial supports are required.

c. Pioneer shipping: While ODA will be provided for pioneer ships, the measures to increase utilization is necessary both for making the operation more commercially profitable and for increasing the impact of pioneer shipping to the areas.

(5) Enhancement of ship safety with minimizing adverse environment impact

Safety and security and further getting rid of piracy or other miscellaneous irregularities are of vital importance for the development of shipping in Indonesia.

Indonesian domestic shipping is not sufficiently safe. In order to make it safer and more reliable, together with modernization of fleet, installation of modern safety equipment, mostly telecommunications equipment is necessary.

Through the installation of these equipments, not only safety will be increased and reliability will be recovered, piracy as well as other wrong doing or irregularities will be suppressed.

In order to make these equipments more effective and keep vessels away from danger, the system as a whole should be improved.

Aging fleet threatens the environment that is for example, wasteful energy consumption and oil spills. It means that they are environmentally hazardous. Through the modernization of vessels, those problems will be solved. In case of oil tankers, eventually all of them should be installed with double hulls. A plan should be made on how to remodel existing single hull tankers with an adequate ship finance program.

12.6. Proposed Ship Finance Schemes

In order to satisfy the above-mentioned programs, various ship finance schemes need to be established and swiftly mobilized. The Study proposes the schemes in relation with (1) ODA loans, (2) OOF arrangements, (3) foreign banks, (4) local banks, and (5) FDI.

(1) Provision of ODA loan

Since ODA funding is a policy-oriented strategic tool, the Study proposes to tap ODA fund into several important elements such as procurement of future model vessels, improvement of existing vessels, procurement of tertiary shipping vessels and installation of additional equipment, installation of cargo handling equipment at ports, and modernization of traditional shipyards. Funding methods are either loan to the government or TSL.

(a) Procurement of highly efficient-high quality model vessels which will can be the standard vessel of the country. (TSL)

There are many too old ships actually being operated in Indonesia. According to DGSC, the average ship age is 23 years old and vessels over 30 years old account for 16.5%. For the purpose of changing this situation, operation of too old ships should either be restricted or banned through government regulation. However, the maritime transport administration has a traumatic experience in imposing ship scrapping policy in the 1980s.

In order to make it possible to restrict or ban operation of too old ship and to modernize fleet, compensatory measures are also necessary together with regulation. It means that it is necessary to establish compensatory arrangement with which shipping companies can buy new or relatively young second-hand vessels.

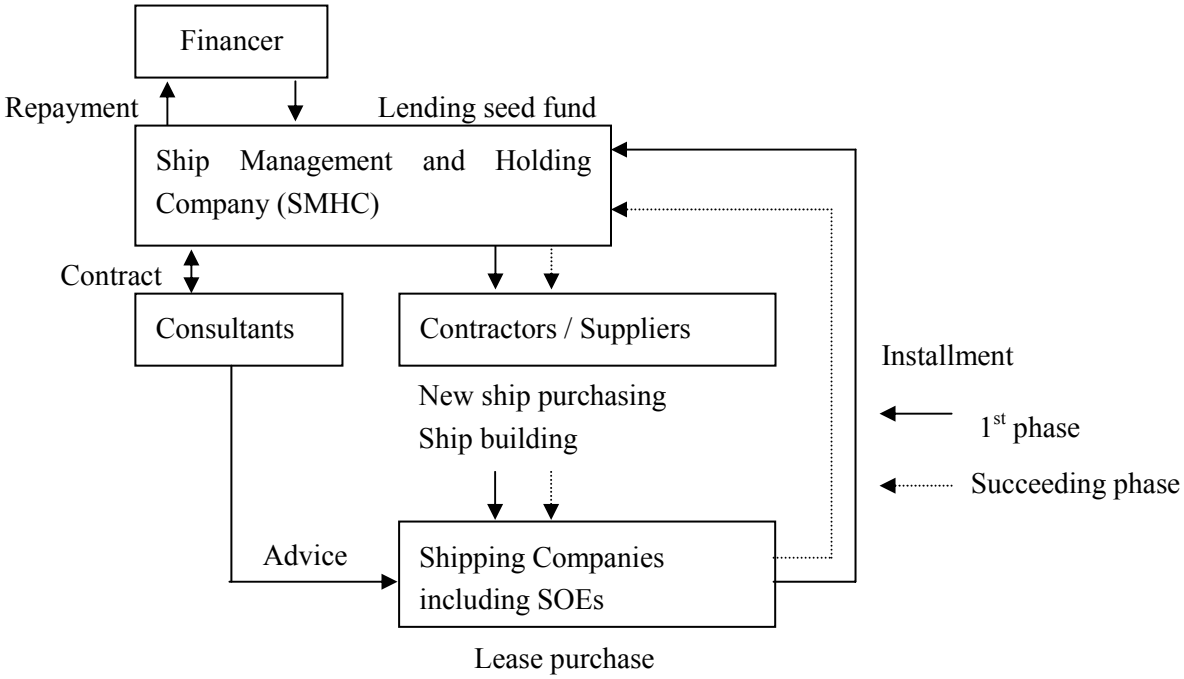
In case of new vessels the government should prepare the scheme through which shipping companies can actually procure them. A realistic way may be that the government procure vessels through some government agency i.e., ship management and holding company like PT. PANN and resell them to shipping company through installment payments (lease purchase).

In order to make such a scheme really workable, ODA fund is necessary. For the modernization of too old domestic fleet, if re-lending term will be too short and interest rate will be too high, the scheme will not be appreciated by beneficiaries and therefore modernization of fleet will not take place. If ODA fund is provided, due to long amortization period, the fund will revolve 3-4 times and the effectiveness of fund is very large. Actually, provision of softer term loan will be an effective compensatory measure to ban too old ships. Without this, banning of too old ship itself will surely fail.

If new vessels will be supplied through ODA, it should be well designed ones to meet actual needs of domestic shipping. It should be the representing (model) ships which will be widely used for domestic shipping in the future. It is noted that the other section of the report maps out such future model ships (refer to Section 16.1).

In order to expect technology transfer to local shipyard, these vessels are partly to be procured from foreign manufactures and partly to be manufactured in local shipyard. Method of procurement is ICB, or ICB with the condition of manufacturing by local shipbuilding companies as subcontractors of foreign manufacturers. Consultants shall be employed for detail design and procurement assistance.

Figure 12.6.1 TSL for Procuring Future Model Ships



(b) Improvement or renewing of deteriorated or insufficiently functioning existing ships (TSL)

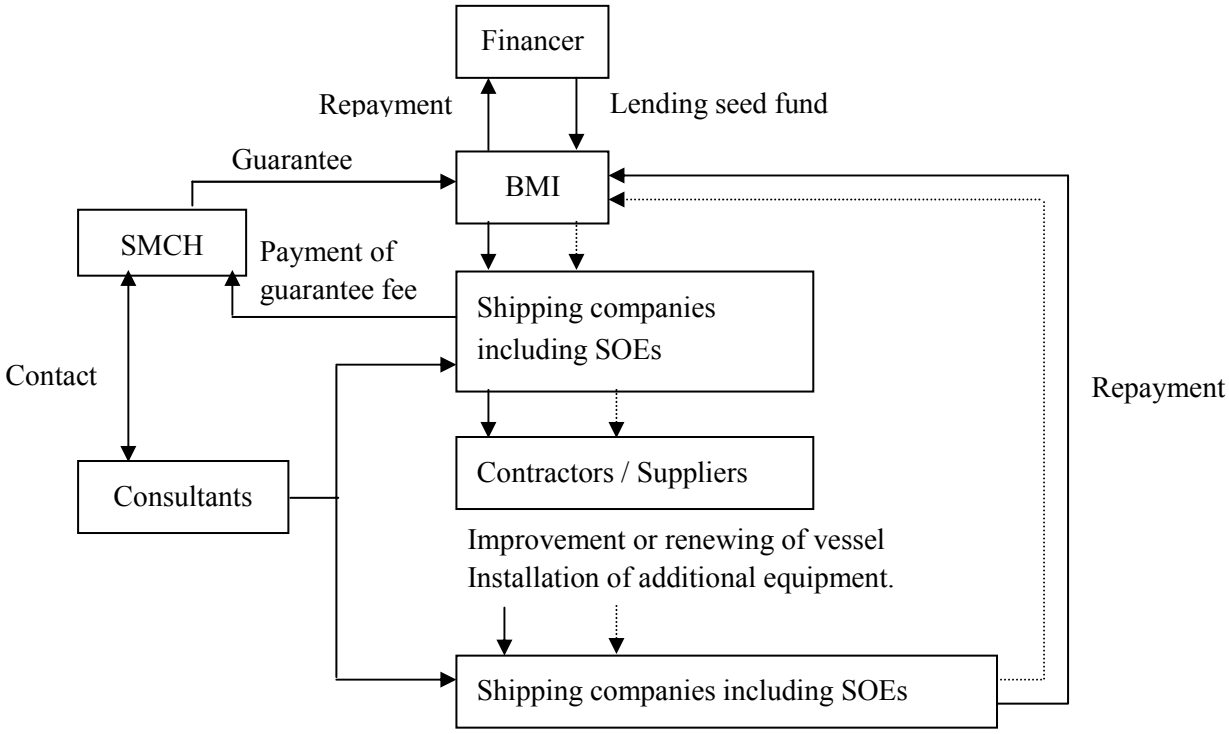
It is not realistic to modernize aged domestic fleet within limited time by only procuring new vessels. The fleet should be renewed step by step. It means the fleet needs improvement other than regular maintenance and rehabilitation while they are in use. Considering a large number of aged vessel, strong measures should be taken to maintain the fleet in good condition, i.e., safe, effective reliable and satisfactory to the users. It should not be a bottleneck in the way of developing the country.

In order to achieve this, ODA fund should also be provided for the improvement of vessels of unsatisfactory performance such as poor seaworthiness. Since it cannot be done by shipping companies alone, engineering services by consultants are necessary. If ODA fund were provided for the improvement of vessels, it could revolve more times than procurement of new vessels, because of the fact that sub loan term could be shorter, i.e., 2-3 years and therefore the fund would revolve almost 10 times during amortization period (25 years) of ODA seed fund. The fund would cover planned total project period of 20 years (2005-2024).

By providing this fund to shipping companies, compulsory improvement of vessels over 25 years will become a reality as an alternative policy. This fund should also be provided for the vessels under 25 years upon request by ship owners.

In regard to procurement method, direct order by the ship owners with consultancy services in ship improvement design and renovation work is recommended. BMI is considered as a suitable platform financial institution taking account of its cooperate banking capability and previous experiences during the period of BAPINDO (refer to Appendix 12-2).

Figure 12.6.2 TSL for Modernizing Existing Fleet



(c) Installation of privately owned loading and unloading equipment or the construction of cargo distribution centers, etc. (TSL)

Possible sub-loan projects subject to this finance scheme are distribution centers and loading and unloading equipments at ports. It is observed that there is a strong need for such facilities and equipments. According to INFA, there are plans to construct distribution centers in Jakarta [1] and Surabaya. At many feeder ports, their equipments are either insufficient or obsolete and the private sector is expected to improve port services.

Basically ICB is considered as a suitable procurement method. In the project, consultants shall be employed for reviewing design and for procurement assistance.

(d) Procurement of vessels for pioneer shipping (Loan for the government).

At present, there are approximately 50 pioneer routes set by the government and it needs 50 vessels to be used for pioneer shipping. Most routes are so far commercially not viable and for their operation, substantial amount of expenditure have to be covered by subsidies. In order to expand such activities in a more effective way, the government is constructing altogether 11 vessels through the state budget. The government has also a plan to procure 10 more vessels through ODA.

[1] In case of Jakarta, distribution center may be constructed at Tanjung Priok railway station. By the completion, cargos in and out of ports will effectively be transported by railway. This plan will give favorable impact both for railway and road system to Jakarta as well as to West Java.

Since pioneer shipping meets minor local needs, the ship size is relatively small: 500 – 1000DWT. The vessel shall be so designed as to satisfy various regional development projects which are implemented in relationship with pioneer shipping. In terms of procurement method, ICB is suitable with the condition of manufacturing by local shipbuilding companies as subcontractors of foreign manufacturers.

(e) Procurement of small vessels which are used for tertiary shipping. (TSL)

Tertiary shipping serves local demand by small fleet. Although ship size is small, there is a substantial need to replace and modernize it. For instance, many of traditional shipping operators are rather hesitant to shift their vessels from wooden hull to steel one due to higher procurement cost and no available fund. This sub-loan scheme intends to support private tertiary shipping operators including local traditional shipping industries.

In regard to this ship finance scheme, sub-loan term will be 5 years. Approximately 360 vessels are expected to be procured within a loan period of 25 years. Basically local CB is recommended as a procurement method. The consultants shall be employed for procurement assistance. BRI is considered as a suitable platform financial institution taking account of its capability to provide micro finance services throughout the country; particularly rural areas (refer to Appendix 12-3). Asset management of small vessels is in some sense more difficult than that of large vessels. To ensure effective asset management, the scheme includes SMHC for ordinary steel hull vessels and Pelra association for traditional motor-sailing vessels.

Figure 12.6.3 TSL for Procuring Steel-hull Vessels for Tertiary Shipping

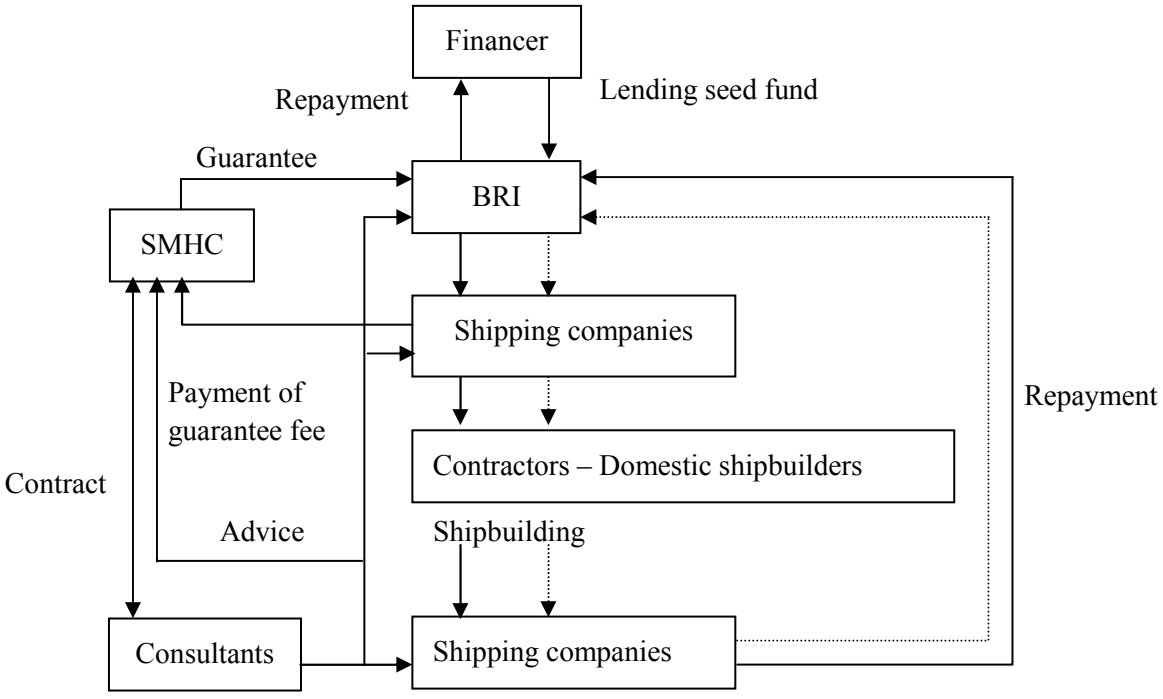
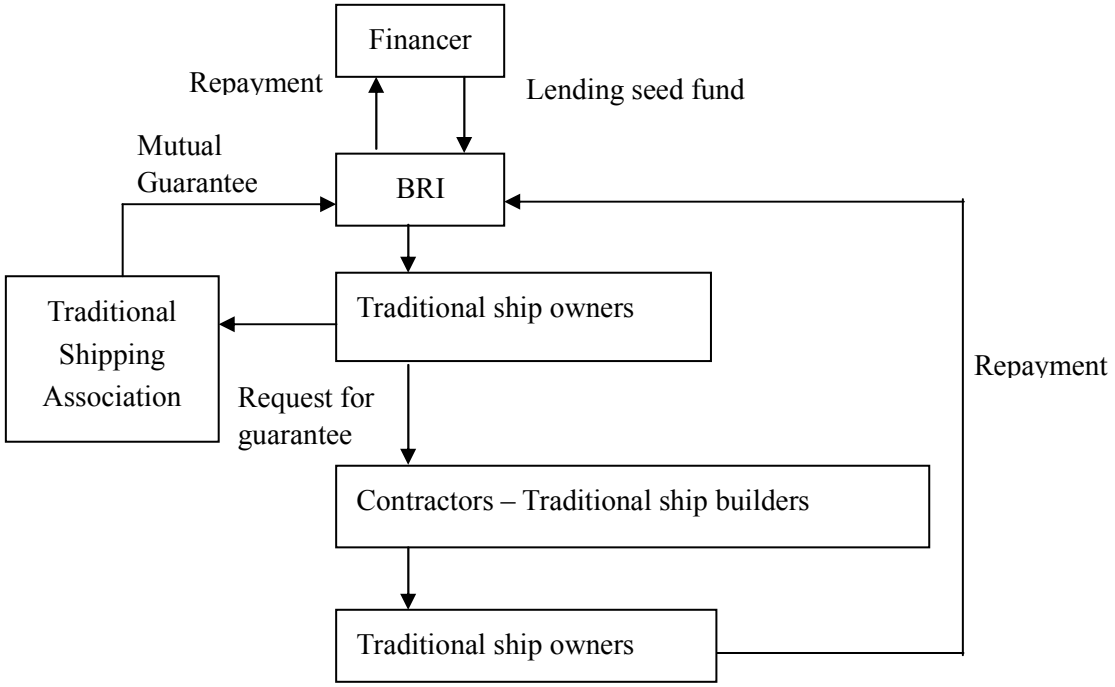


Figure 12.6.4 TSL for Procuring Motor-sailing Vessels for Tertiary Shipping



(f) Improvement or renewing of small vessels which are used for tertiary shipping (TSL)

Smaller vessels used for tertiary shipping including traditional vessels should also be improved or renewed for safe and effective operation. Several thousand vessels shall be improved or renewed compulsorily based upon regulation on operation and safety standard which will newly be promulgated.

Method of procurement is basically direct order where the consultants shall be employed for procurement assistance. Similar to the procurement case, two ship finance flowcharts are proposed for ordinary steel-hull vessels and traditional motor-sailing vessels.

Figure 12.6.5 TSL for Improving Steel-hull Vessels for Tertiary Shipping

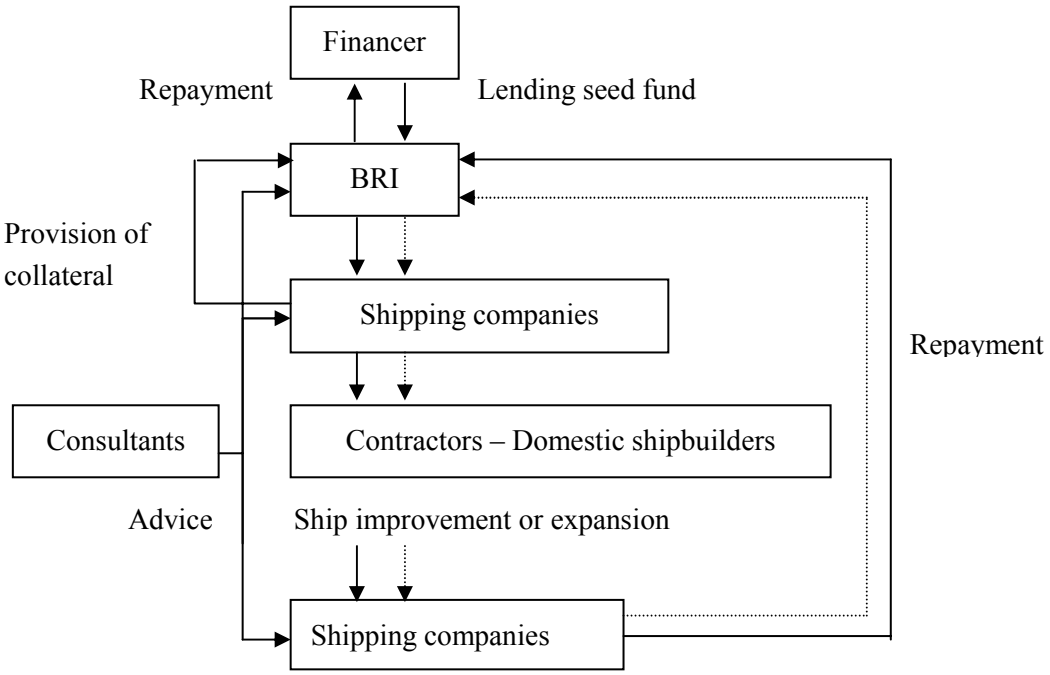
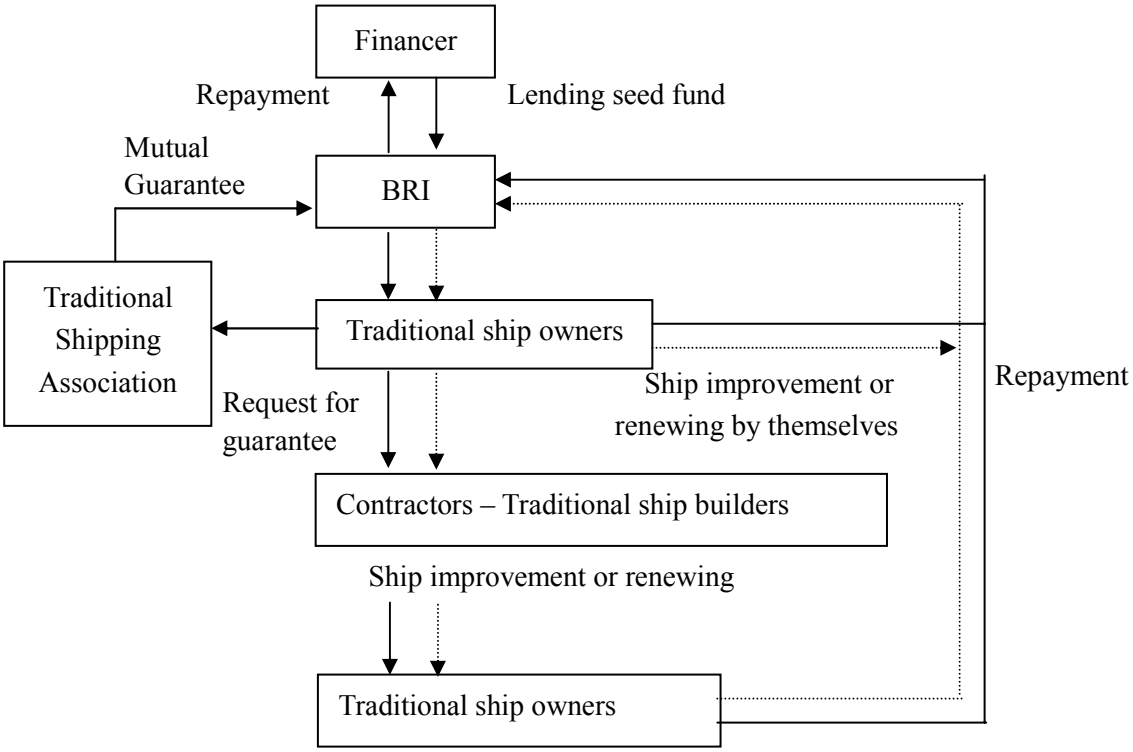


Figure 12.6.6 TSL for Improving Motor-sailing Vessels for Tertiary Shipping

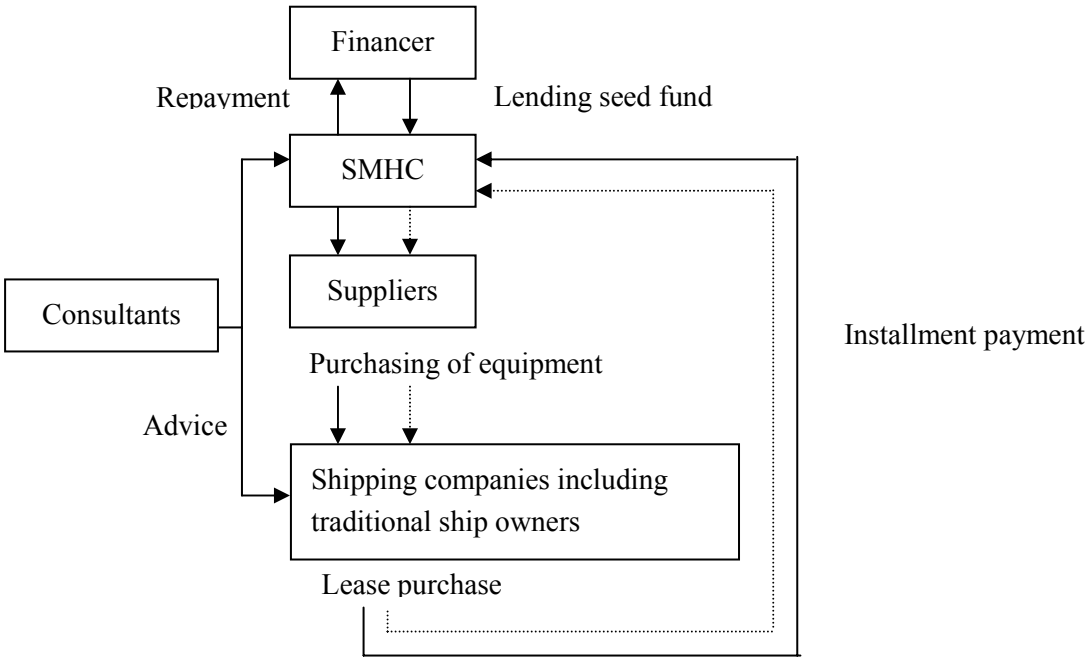


(g) Installation of additional equipment to existing vessels which are used for feeder line shipping (TSL)

By the promulgation of regulation on operation and safety standard, most of existing vessels will be required to install additional equipment, most notably telecom equipment. ODA loan fund is considered to be ideal for this purpose, partly due to the reason that although the equipment is vital for ship operation, they do not create any additional income and that most equipment is to be imported.

Procurement as well as installation and operation require technical know how and experience. Therefore, equipment should be procured by specialized agency i.e., SMHC (PT. PANN) and installed to each vessel by the agency upon request of each shipowner.

Figure 12.6.7 TSL for Installing Additional Equipment on Existing Vessels



(h) Improvement or expansion of traditional shipyard (TSL)

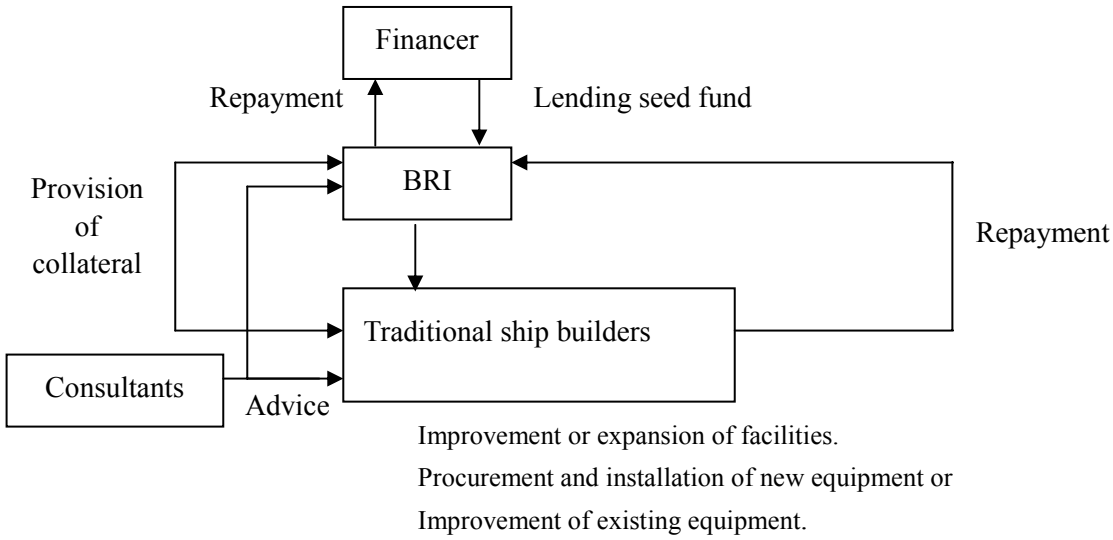
As explained, for the strengthening of ship building sector promotion of FDI is vital. However, it is not possible to introduce FDI for traditional shipyard. Consequently, for their development, government support is necessary. ODA loan can also be introduced for this purpose.

In case of traditional shipyards, the plan should be made to improve shipyards for fishing vessels. Both ships are manufactured or repaired quite often in the same shipyards. This measure will benefit also traditional shipping operators.

If ODA fund is provided to procure ships, ICB will be prerequisite including local CB for small ships in order to acquire the cheapest and the best vessels of the world. At the same time, as long as this procedure is implemented properly it will improve

the level of local ship building, by contracting majority of works by local ship building companies.

Figure 12.6.8 TSL for Improving Traditional Shipyards



(2) Provision of OOF, non-ODA institutional loan, i.e., buyers or suppliers credit.

Although some countries are currently providing these funds, some other countries do not, since rescheduling of past loans are being arranged. However, rescheduling arrangement will soon be completed, probably, before December of 2003. From 2004, buyers or export credit will be resumed from most countries including Japan. Indonesia has successfully achieved the conditions shown by IMF through tight monetary policy. It is expected that development borrowing will be resumed from next year.

On the other hand, due to prolonged tight budget for development, conditions of infrastructures are degraded everywhere and their insufficiency is creating bottlenecks against the betterment of people's lives and the development of economy. The government is now required to deal with this problem. It is apparent that tight government budget has been giving adverse impact for the improvement of shipping sector.

(3) Improvement of access to foreign banks

Through the deregulation policy of the government, private companies can also borrow loans from foreign banks. However, for most Indonesian shipping companies, it is very difficult to borrow from foreign banks because it is not possible to assign the vessels as collateral to the loan.

Indonesian flag vessels cannot be a collateral due to absence of ship mortgage and arrest laws in Indonesia. The law to make it possible for ship owners to mortgage ships to be procured is being planned and will soon be enacted in Indonesia. The way to arrest ship of default is also stipulated in the law. Through this, procurement of ships will become much easier.

At present, in order to procure ships, ship owners should use their own fund or borrow loans from the bank making their non-ship asset as collateral of the loan. Some of ship owners make the purchasing ship as foreign registered ship deliberately in order to mortgage ship. The banks (foreign banks) also require the vessel to be flagged-out in order to apply for international ship arrest law. Enacting of ship mortgage law is also expected to normalize this extraordinary and irregular situation.

(4) Utilization of more local bank loan

As explained, only very small amount of fund provided for shipping sector is from local banks, be it state owned bank or private bank. It is necessary to increase finance from local bank to shipping sector drastically in order to develop the sector.

The two most important constraints in the way of increasing finance to the sector are very high interest rate of the bank and absence of collateral from shipping company. Resolving these two issues are prerequisite for the banks to provide bigger fund for shipping company.

As is mentioned, at present, shipping companies are allowed to borrow low interest foreign currency loan even from local bank. In order to make foreign borrowing less risky, it is recommended that domestic shippers to undertake business from which foreign currency earning is possible on the top of pure local business from which only local currency earning is possible i.e., through transfer operation of export or import cargo, etc.

If shipping company is allowed to choose cheaper currency borrowing, either from local or from foreign currency market, eventually interest rate of very high local currency loan will be normalized through competition.

As for solving collateral insufficiently, enacting of ship mortgage and arrest law is expected. After this law will have been in effect, collateral insufficiency situation will substantially be improved.

On the top this, GOI is planning to establish a guarantee scheme using pension fund or other government controlled fund. For reference, in Japan, various guarantee schemes including those for ship finance have been materialized by relative institutions backed up by government investment and finance fund from Postal Savings Bank of Japan. This scheme has been playing a very important role in expanding finance for various development sectors in Japan.

However, in order to establish the scheme, very cautious planning should be made to secure the pension fund. For the operation of pension fund “no risk” should be the basic policy always. Especially in Indonesia, the amount of pension fund is not large and it faces various risks from precarious currency situation.

12.7. Further Considerations for Effective Implementation

(1) Establishment of funding policy

Funding policy, criteria, priority for shipping sector should be established. The condition for funding should be transparent and accountable. This is not only a prerequisite for funding institution but also for the shipping sector to achieve optimum development through the funding. Commercially, funding priority shall be determined by the order of FIRR or CRF. Funding should be made to optimize profit and the target should be chosen from the highest FIRR or CRF projects.

However, as one of the most important infrastructures for the development of the country, even commercially not recoverable economical benefits should not always be discounted.

On the top of it, unquantifiable social benefits should also be taken into account. Especially, in case of feeder line shipping, this kind of benefits may frequently be much bigger than quantifiable economic benefits.

Criteria of funding should be established in this regard.

For the provision of government fund for these cases, be it in the form of government investment, subsidies or subsidized loans or loan guarantee to the shipping companies, benefit or impact should be scrutinized together with the cost, and based on it, the scheme should be evaluated.

A large amount of export credit has been provided by KFW for passenger ships owned by PT. Pelni. However, 93% of Pelni's operation is suffering losses. All the more by the stiff competition with airplane, the number of passengers is decreasing although heavy discounts are offered by shipping companies. Worse is that airline routes are increasing and fares are decreasing year by year. In case of Pelni, it has become difficult to maintain some of their routes. It means even in Indonesia, passenger ship will eventually be competitive only in limited area, where air transport cannot be applicable. Even in case of trunk line routes, profitability is declining. This is not only a tendency in Indonesia; the same scenarios have been seen in many other countries.

On the other hand, sea transport remains as a major player in cargo transport, whether land and air transport system is improved. Considering this fact, all the effort and funding should rationalize the industry structure with healthy modal competition and without laying bias in the market.

What is distinctive in domestic shipping is that certain international routes, i.e., Indonesia − Singapore, Sumatra − Malaysia, Sulawesi･Kalimantan − Philippines (Mindanao) can not be distinguished and divided from domestic route. Considering this fact, funding policy for domestic shipping should encompass these routes, i.e. tertiary international routes.

(2) Streamlining of funding procedures

In case ODA fund is used, transparency and impartiality is required for the use of funds. It may be same when the government fund is provided for the project.

Public bidding for the procurement of ships is a prerequisite if ODA fund is used. It means even for the procurement of second hand vessels, pubic bidding shall be the bases of procurement.

For which project the ODA fund shall be used or for which ship the ODA fund shall be provided, should be decided carefully. Criteria for funding should be established and appraisal should be made based upon FS. Pubic hearing to the decision is meaningful and monitoring the project after the completion of the project or the procurement of ships is recommended.

Funding procedures, appraisal, disbursement, repayment, etc. should be streamlined. If ODA loan is provided for the project, lending should be done based upon the guidelines of the lender and the regulation of the recipient country.

Japanese ODA is sometimes criticized that its procedure is too complicated; disbursement is too slow; excessive documentation is required; amount is insufficient; and, handling is bureaucratic and slow.

These problems used to be endemic but the situation has remarkably improved these days and a flexible approach is taken to meet the countries situation and therefore they can be used smoothly after the procedures are well understood by the related offices.

(3) Provision of technical assistance fund for related studies

At present various projects are going on throughout rural areas of Indonesia. They are;

a. Rural infrastructure development projects (WB, ADB, and JBIC)
b. Micro finance for rural livelihood creation projects (ADB, IFAD, etc)
c. Rural development projects of various sectors, agriculture, industry, education, health, etc. (Many donor agencies.)

The condition of tertiary shipping operation (feeder line shipping) is closely linked to these projects, for their planning, implementation and further operation and management after completion of the projects.

Especially in East Indonesia where shipping is the single most important infrastructure, it is impossible to implement any project without taking shipping, especially tertiary shipping, into account.

On the other hand, it is vital for tertiary shipping to be financially viable that the ships are well used for these projects. At present fairly large amount of subsidies are provided to strategically important tertiary route-feeder line shipping operation through pioneer shipping program, i.e., Rp 89 billion in 2003.

However, provision of subsidies is not sustainable even for very important projects. It means, however important the pioneer shipping route is, there is a danger that such shipping service will not be maintained.

Considering this, it is necessary to let tertiary shipping as a whole to contribute more to the development projects and in return let them obtain revenue from it.

For the promotion of coordination and cooperation/joint work with other development project more actively, it is necessary to conduct study.

Technical assistance fund should be allocated for this study. Following are the possible contents of the study.

a. Education promotion. Use the ships to distribute school materials, textbooks, experimental materials or equipment, and audio visual materials in each school. Invite teachers or students to hold seminars in the ship. It is also necessary to take maintenance persons for school facilities together with parts of school facilities.

b. Health services. Use the ships to distribute medicines, materials, tools, equipment, or other supplies to each hospital or aid post. Invite patients who cannot be properly diagnosed at local hospitals. The ship should install X-ray, ultra-sound or MRI facilities and clinical laboratory with lab-technicians. It is also necessary to take maintenance persons for hospital facilities together with parts of hospital equipment. For controlling epidemics, effective stocks of vaccine or other medicines at each locality is always necessary. The ship should always confirm the effectivity of the stock.

c. Planned parenthood activities. Use the ship for planned parenthood-family planning services. Supply pamphlet or commodities. Encourage the specialists-doctors or midwives to periodically hold seminars for local people onboard, at hospitals, or at schools.

d. Support for public works. Supply materials, equipment or their parts for construction or maintenance of public infrastructures. They are mainly for maintenance activities directly undertaken by the local government. In case of construction, most works are undertaken by private contractors and it may be useful for local government to arrange materials or parts and supplies for the contractors using the ship.

e. Agriculture and fishery development. More accurate and early information should be made available regarding agricultural products to be unloaded from the ship prior to its arrival. Timely supply of seeds, seedlings, fertilizer, or pesticide should be arranged for local dealers which are the foundation of stable agro-production. In order to develop livestock and fisheries together with their processing industries, ships should install cold chain facilities, freezer, ice plant, and cold storage room. In order to make these products commercially valuable, hygiene control is very important. The ship should install quarantine control facilities, inspection and eradication of pest, animal disease, etc.

f. Promotion of non-traditional industries (pre-boarding inspection). If quality control specialist is onboard and can visit and advice factories at each locality, it will

contribute to the improvement of the quality of local products and thus increase value. If it is possible for the specialist to inspect the products and to classify their level of industrial standard, it can avoid situations of transporting low quality goods which will later be rejected.

g. Mining industry development. For many mining sites, transportation of their products is of vital importance, and through the development of tertiary shipping, some of these mines will be revitalized.

h. Improvement of security and safety. If the ship is properly installed and staffed with security and safety measures, it can effectively support coast guard operation. GPS, satellite communication system, satellite TV, internet, etc. can relay communication among various offices. Availability of rescue boats and installed heliport may make it possible to effectively cooperate with the coast guard. Given these measures, the very high rate of maritime accident or crime can be lowered.

i. Forest and environmental protection. Reports show that excessive exploitation of forest or marine resources is critical in some parts of East Indonesia. Through the regular services of tertiary shipping, the government can collect necessary information to deal with these matters effectively.

In order to implement the abovementioned projects, funds from rural development projects, rural infrastructure development projects or micro-finance projects which have been supported by WB, ADB, JBIC, etc. or their extension projects should also be mobilized. At present, a relatively significant amount of subsidies has already been provided for pioneer shipping. However, this has not yet materialized for the development of remote areas of East Indonesia, particularly for the scattered small islands. Thus, through the promotion of abovementioned development projects by using ODA fund, the development of these areas can be expected.

Chapter 13

MARITIME RELATED INDUSTRIES DEVELOPMENT PROGRAMS

13. MARITIME RELATED INDUSTRIES DEVELOPMENT PROGRAMS

The Study identified that the most critical issue regarding maritime-related industries in support of the domestic shipping industry is lengthy ship repair time and firm delivery time for newly built ships.

It is estimated that the domestic shipping fleet will double in the coming two decades. Thus, without an adequate measure to shorten repair time, a huge investment will be necessary to build more shipyard capacity and additionally domestic shipping performance will be adversely affected. This chapter discusses how to shorten repair time and the necessary future investment for ship repair facilities and how to improve the capability of domestic shipbuilding industries.

13.1. Measures to Shorten Ship Repairing Period

The study has identified that Indonesian shipyards have long repair times, thus, they have lost international competitiveness despite lower rates. Worse, this issue is adversely affecting domestic shipping business viability. This section focuses on desirable measures to shorten ship repair time. To propose realistic and practical measures, the study carefully looks into both the shipyard side and the shipowner side of the issue.

13.1.1. Cause Analysis

The following details key causal factors affecting repair time from the shipyard and shipowner side.

(1) The Shipyard Side

(a) Lack of Technical Skills

At present, there are a limited number of shipyards with technicians competently capable of coping with the various services needed by vessels. In many cases, shipyards tend to operate beyond their capacities and capability, leading to longer repair times.

(b) Workers' Poor Motivation

The wages earned by shipyard workers only meets subsistence living. With their low educational background and their hand-to-mouth living condition, they are understandably not motivated to work with a sense of pride and responsibility nor are they motivated to upgrade their skills.

(c) Obsolete and deteriorated machine and equipment

At present, the lack of modern and good-working machines and equipments is a serious problem in many shipyards in Indonesia.

- Deterioration of machine and equipment is due to lack of maintenance. Thus machines and equipments used are unable to operate at their full capacity and consequently repair times are prolonged.

- Many shipyards still use old and obsolete machines and equipments, for instance machines and equipments made in the 1930s are still used in some shipyards.
- As a case in point, in one shipyard a crane which is designed with a capacity of 30 tons is at its current state only able to handle up to 20 tons. Operators therefore have to sacrifice work efficiency as a result by carrying heavy loads in two batches instead of one. Furthermore, the use of old and deteriorated equipments would adversely affect precision and accuracy leading to poor workmanship.

(d) Poor work scheduling

Shipyards are failing to meet repair deadlines. One of the causes is the gap between management and technical staff and in the lack of understanding of the technical matters pertaining to the order and scheduling of work. For instance, even though construction scheduling is being practiced at shipyards, the current practice is inefficient. The conditions at nighttime and daytime are very different; that at night, lighter works are generally assigned. Furthermore, workers need to understand how work items relate to other work items when work activities are being conducted simultaneously. It is important to consider which work items should be prioritized and that all necessary work items are factored in to get a better appreciation of the extent of resources needed to complete the task. Unfortunately, there was no visited shipyard that prepares work schedule charts which covers the considerations just described. Poor work management contributes to longer repair times.

(e) Problem with docking contract agreements

The payment terms are never changed after the signing of docking agreements with shipowners, even when the docking period is extended because of reasons due to the actions (or inaction) of the shipowners. Fees for extended docking and additional work are simply added. The current general terms of payment are as follows:

1) Before docking (30% to 40% of quotation as deposit)
2) At the time of undocking (40% of quotation)
3) After undocking (The balance is paid within 1-3 months after undocking.)

When undocking is delayed because of the shipowners, dock operation cost and the repair cost are difficult to recover. And in many cases, the lack of funds results in the lengthening of repair period.

Most Indonesian shipowners contract third party contractors apart from the shipyard and shipowners usually contract main repair works to third party contractors instead of the shipyards. There are cases when the only income accrued by the shipyards is from the cleaning of the outer hull (Sand Blasting and Sand Sweeping, and High Press Water Cleaning) and from yard rent. Income is therefore not enough for operation and is one of the factors prolonging repair periods.

In another case, many Indonesian shipyards agree to allow ship crews to conduct repair work on ships that are docking and this effectively cuts into the income of shipyards.

In Japan, the use of third party contractors for dock works or crews working on outer plant maintenance when the ship is docking is generally prohibited because of liability in case of accident.

(f) Fund shortage (shortage of working capital)

Lack of working capital leads to difficulties in procuring necessary parts and materials for repair. Poor track record on repair time lowers competitiveness and contracts can be attracted only through lowering of fees which then leads to further lowering of efficiency – thus a vicious cycle.

(2) The Shipowners' Side

(a) Insufficient preparation for docking

Most Indonesian shipping companies are not well aware of the repair needs to their ships before docking. The ship's condition is not fully known until after docking and only then are work orders prepared.

Typically, a modification or addition to the work order is negotiated between the shipowner and the shipyard. If the change order requires certain spare parts, it will take a lot of time (sometimes months) to order and receive the spare parts needed. Especially in the case of European made vessels, because of the frequent mergers of European equipment companies. Also, orders are often mishandled. All of these contribute to the lengthening of repair times.

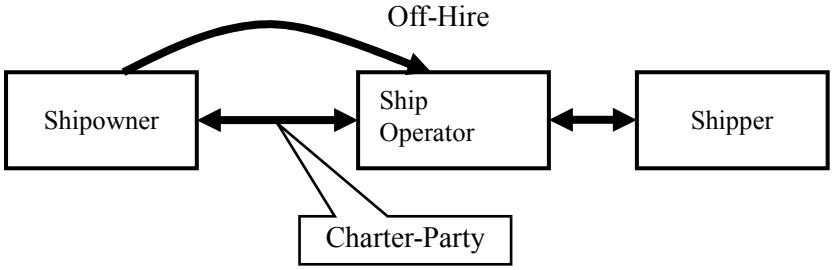
(b) Dominance of owner-operators

The owner-operator organizational structure of shipping companies is typical in Indonesia. This structure differs substantially from systems in Japan and other developed countries, where generally shipowners and charterers are separate entities. Therefore, because of off-hire (exemption of times the vessel is unoperable due to the fault of the shipowners from the specified charter period), shipowners prepare for docking including arranging necessary parts and equipment, about six months in advance in order to ensure the timeliness of docking.

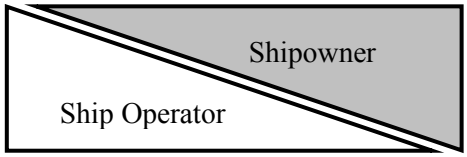
However, in Indonesia, due to the owner-operator system structure the costs of delays due to repair time is absorbed within the same entity and is not fully appreciated especially if a substitute ship is available, thus there is little incentive to prepare for docking to ensure that repairs are done within the specified schedule.

Figure 13.1.1 Relation between Shipowners and Operators, Japan and Indonesia Comparison

Japanese Typical Case



Indonesian Typical Case



13.1.2. Possible Measures

(1) The Shipyards Side

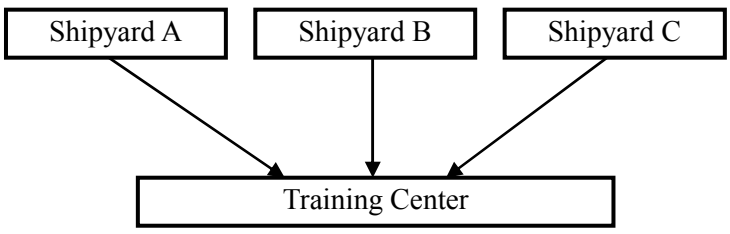
At present, most shipyards in Indonesia are in a state of chronic fund shortage. Without funds for operation, shipyards are struggling to find sources to cover costs for material procurement. The causes of lack of funds find it roots in the issue of lengthy repair periods. By shortening repair periods, funds can be recovered faster, and planned management may become possible.

From this standpoint, two possible measures are proposed at the shipyards side. They are upgrading technology and the use of well defined and rationale contracts with shipowners:

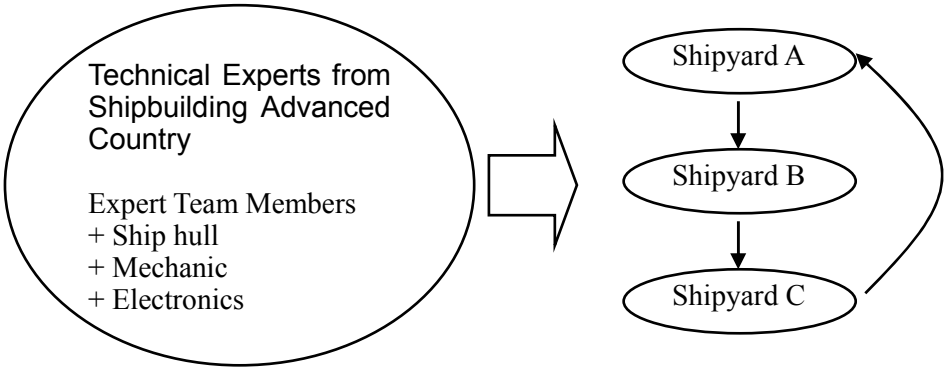
(a) Upgrading technology

Training is the only way to upgrade engineers' capability. Judging that available domestic resources are insufficient, it is recommended to utilize foreign experts through the following two schemes:

i: Establish a training center that will invite experts from countries with advanced ship repair technology to facilitate technology transfer to domestic shipyard technicians.



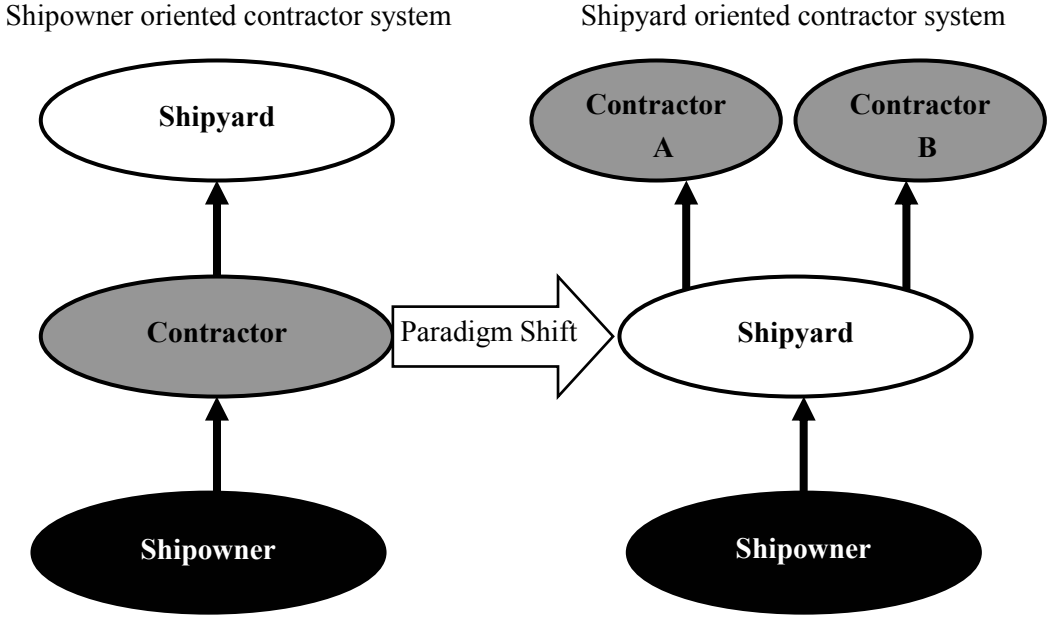
ii: Invite experts from countries with advanced ship repair technology for on-site guidance



(b) Enhancement of contracts with shipowners

Even though contractors are necessary during the process of ship repairing works, they must be placed under the supervision of the shipyard as a subcontractor. Similarly seafarers must be disallowed from conducting repair works while ships are within shipyards. Shipyards need to adopt such clauses in docking contracts to improve their conditions. It is advisable that IPERINDO prepare and disseminate a model contract among its member shipyards.

Figure 13.1.2 Paradigm Shift on the Third-Party Contractors



(2) The Shipowners Side

Most of the vessels owned by Indonesian shipping companies are old and are not properly maintained. Because of such conditions, there are frequent interruptions to service due to breakdowns resulting to delays in services and substantial repair costs. The

root of the situation is in the lack of understanding of maintenance costs and its underlying implications to safe navigation. The practice of good general maintenance (at regular time intervals) and on-board maintenance shortens the needed docking period and reduces incidence of breakdowns. The lack of good maintenance programs will lead to longer repair periods, large expenditures on repairs and spare parts, and lost opportunities during the repair period. Maintenance programs results in operation cost reductions and shipping companies need to understand and appreciate the value of preventive maintenance. It is proposed to establish ship management companies and to use SIs (Superintendents). Since details of the ship management company have already been discussed in another chapter, this section elaborates only on ship maintenance and repair aspects.

A vessel management company aims to ensure the smooth operation of vessels at all times and to prolong the service life of vessels through planned on-board maintenance. Dock planning, arrangement, monitoring and inspection are some of the major tasks of ship management. By assigning an experienced superintendent, dock plans are carefully prepared and implemented. The implementation plan shortens repair periods and improves profits.

The ship management company's functions centers on a SI who generally manages 3-4 vessels. The number of vessels to manage by one SI may be vary depending on the structure of the company.

Works of Superintendent

→ Study current conditions of vessels (daily maintenance)

→ Promote planned vessel repair work (life-prolonging measure)

→ Arrange for class inspection

→ Prepare and arrange dock plans

→ Crewman guidance

→ Insurance management

→ Arrange reserve stocks and consumables (inventory control)

→ Various record analyses; preparation of working plan and budget plan

13.1.3. Conclusion

Many experts perceive the issue of long ship repair times as attributable to problems at shipyards – but as determined by this Study, the issue goes beyond the scope of shipyards. The issue should be perceived in a much wider perspective covering problems in shipyards and shipowner. Polices and practices needs to be changed in order to improve ship repairing.

Three measures are proposed: (1) upgrading repair technology by foreign experts, (2) improving contracts between shipyards and shipowners, and (3) establishing ship management companies with competent superintendents. All are important but the establishment of ship management companies is considered as the most strategic. The

ship management company can coordinate shipyards or sometimes instill competition among shipyards to draw satisfactory services for the shipowner.

In regard to implementation modalities, the improvement of contracts and the formation of specialized ship management entities should be implemented urgently in association with the necessary institutional support. The technology upgrade program requires a mid to long-term perspective, of about 5 - 10 years, to benefit the shipbuilding industry due to the nature of human resources development.

13.2. Distribution Plan of Ship Repair Facilities

13.2.1. Existing Ship Repair Facilities

IPERINDO estimates the total annual ship repair capacity of 3,545,000 GT among 120 shipyards nationwide. Its regional distribution is indicated in Table 13.2.1

Table 13.2.1 Existing Ship Repair Capacity by Region

Region	Number of Shipyards *(unit)*	Annual Capacity *(GT)*	Share *(%)*
Sumatra	34	763,450	21.53
Batam	14	359,400	10.14
Kalimantan	16	95,100	2.68
Java	45	2,149,050	60.62
Sulawesi	7	126,800	3.57
Maluku	3	42,200	1.19
Papua	1	9,000	0.27
Total	**120**	**3,545,000**	**100.00**

Source: IPERINDO

The 120 shipyards are all capable of repairing steel-hull vessels of over 300 GT. For this Study, 25 shipyards were surveyed. The selected 25 shipyards have a combined repair capacity of 2,515,500 and accounts for 71% of the national capacity. The field surveys obtained the following findings: (refer to Table 13.2.2)

(a) The ships ranging from 35 GT to 27,500 GT can be docked.

(b) Total repaired ship tonnage comprises 85% of the shipyards annual capacity. However, utilization is not uniform as some shipyards have very low utilization rates while others exceed designed capacity.

(c) Poorly performing shipyards need a comprehensive rehabilitation program, including problems identification and listing of facilities subject to rehabilitation and scheduling.

(d) Some shipyards which repaired more ships than their designed capacities seems busy and congested when inspected. There is a need to examine investments in these shipyards to increase capacity, especially for bigger ship with breadth more than 30 meter.

(e) After the field survey, the Study Team attained enough perspective of the conditions of shipyards in Indonesia to be able to categorize the performance of a shipyard. Good shipyards generally have good management practices such as having regular clienteles, regular procurement channels of parts and materials, and remarkable marketing efforts. On the other hand, poor shipyards are likely to disregard good management practices and attribute poor performance to lack of working capital and obsolete facilities.

Table 13.2.2 Ship Repairing Activity at Selected 25 shipyards

Region	Selected Shipyards (unit)	Allowable Ship Size (GT)	Annual Repairing Capacity [A] (GT)	No. of Repaired Ships	Total Tonnage of Repaired Ships [B] (GT)	[B]/[A]	City
Sumatra	4	11,500	300,000	30	207,000*)	69	Dumai
		2,300	90,000	47	37,616	42	Palembang
		780	3,000	37	19,977	666	Palembang
		350	20,000	26	107,304 (floating only)	537	Palembang
Kalimantan	4	1,300	5,500	78	33,991	618	Balikpapan
		650	12,000	24	9,500**)	79	Balikpapan
		650	13,000	36	14,000**)	108	Samarinda
		1,500	12,000	12	10,800**)	90	Banjarmasin
Java	15	27,500	320,000	86	178,750	56	Surabaya
		6,500	150,000	120	343,500	229	Surabaya
		2,750	54,000	15	24,865	46	Surabaya
		3,120	0	28	20,978		Surabaya
		1,700	32,000	36	36,750**)	115	Surabaya
		5,200	140,000	41	81,011	58	Semarang
		422.50	35,000	60	15,210*)	43	Semarang
		400	12,000	50	12,000**)	100	Semarang
		2,600	3,600	28	43,680*)	121	Tegal
		3,200	16,500	33	63,360*)	384	Cirebon
		3,250	30,000	60	54,493	182	Jakarta
		19,500	1,000,000	120	487,414	49	Jakarta
		4,225 (dock) 11,700 (floating)	90,000	86	118,676	132	Jakarta
		500	60,000	60	18,000*)	30	Jakarta
		4,350	16,900	15	30,900	183	Jakarta
Sulawesi	2	2,700	100,000	87	140,940	149	Makassar
		520	(Incl.above)	37	7,757		Bitung
Total	**25**		**2,515,500**		**2,118,472**		

Note: *) Estimated from recent yearly records such as 2001 and 2003
**) Estimated from the field survey due to no shipyard records.
Source: STRAMINDO

(f) Ship Repair Performance of Selected Shipyard

As mentioned in Chapter 5, Volume 1, Shipyards are grouped into three types: Major Shipyard, Medium Shipyard and Minor Shipyard regardless if the shipyard is for Shipbuilding or for Ship repair.

- Performance or productivity of shipyards is determined based on the amount of repair performed (in terms of GT) and the manpower input (in terms of man-days). The performance indicator is calculated as man-days required per unit GT of vessel repaired. Repair works cover works for all types of vessels.
- Major Shipyards for Ship repair are:
  1. East Java Shipyard (A)
  2. East Java Shipyard (B)
  3. Central Java Shipyard (I)
  4. Jakarta Shipyard (K)
  5. Jakarta Shipyard (L)
  6. South Sulawesi Shipyard (D1)
- Medium Shipyards for Ship repair are:
  7. North Sulawesi Shipyard (D2)
  8. South Sumatra Shipyard (F)
  9. South Sumatra Shipyard (G)
  10. Jakarta Shipyard (J)
  11. Jakarta Shipyard (M)
- Minor Shipyards for Ship repair are:
  12. East Java Shipyard (C)
  13. East Kalimantan Shipyard (E)
  14. South Sumatra Shipyard (H)

From among Major Shipyards, Jakarta Shipyard (K) - has the lowest performance with 7.35 MD/GT, followed by East Java Shipyard (B) with 13.41 MD/GT. Jakarta Shipyard (K) main problem is the poor physical conditions of the shipyard. On the other hand, East Java Shipyard (B) poor performance is a result lack of capacity. (see Table 13.2.3)

For Medium Shipyards, Jakarta Shipyard (M) – has the worst performance with 4.60 MD/GT followed by Jakarta Shipyard (J) with 4.64 MD/GT. Productivity for Medium Shipyards is lower than that of Major Shipyards because most vessels handled at Medium Shipyards are smaller compared with vessels repaired at Major Shipyards.

For Minor Shipyards, East Kalimantan Shipyard (E) has the worst performance of 4.90 MD/GT followed by South Sumatra Shipyard (H) with 13.37 MD/GT. The Study Team found out that South Sumatra Shipyard (H) mostly carries out repair works without the use of facilities for dry-docking.

Table 13.2.3 Man.Day / Repaired GT of Shipyards

Major Shipyard	Shipyard A	Shipyard B	Shipyard I	Shipyard K	Shipyard L	Shipyard D1	Medium Shipyard	Shipyard D2	Shipyard F	Shipyard J	Shipyard M	Shipyard G	Minor Shipyard	Shipyard C	Shipyard E	Shipyard H
cargo	7.33	3.26	5.38	1.66	6.25	5.16	**cargo**	17.54	5.71	5.82	n.a.	4.71	cargo	7.13	n.a.	0.08
tanker	3.01	3.10	10.18	1.75	17.15	3.08	**tanker**	17.35	5.83	4.56	1.42	n.a.	tanker	n.a.	n.a.	0.95
container	5.23	2.89	n.a.	1.56	n.a.	n.a.	**container**	n.a	n.a.	n.a.	n.a.	n.a.	container	n.a.	n.a.	n.a.
passenger	3.11	1.22	4.18	0.44	3.05	n.a.	**passenger**	13.80	1.32	2.45	7.00	10.62	passenger	n.a.	n.a.	n.a.
ferry ro2	3.64	3.12	7.20	1.07	n.a.	28.57	**ferry ro2**	5.99	31.96	2.71	n.a.	n.a.	ferry ro2	8.91	0.80	14.77
tug boat	82.55	79.46	30.76	13.91	125.10	317.11	**tug boat**	68.25	3.44	9.18	4.36	20.45	tug boat	23.90	7.14	50.40
lct	37.97	23.72	5.33	17.10	42.97	n.a.	**lct**	22.10	n.a.	3.09	5.86	n.a.	lct	266.22	7.40	n.a.
barges	50.36	1.43	13.52	10.80	8.55	15.97	**barges**	5.90	2.72	n.a.	4.36	3.64	barges	3.20	4.24	0.67
fishing	30.69	n.a.	79.81	17.86	21.95	16.54	**fishing**	6.31	n.a.	n.a.	n.a.	n.a.	fishing	n.a.	n.a.	n.a.
bulk carr.	n.a.	2.46	n.a.	n.a.	n.a.	n.a.		n.a	n.a.	n.a.	n.a.	n.a.		n.a.	n.a.	n.a.
average	**24.88**	**13.41**	**19.55**	**7.35**	**32.15**	**64.41**	**average**	**19.66**	**8.50**	**4.64**	**4.60**	**9.86**	**average**	**61.87**	**4.90**	**13.37**

Table 13.2.4 Docking Days

Major Shipyard	Shipyard A	Shipyard B	Shipyard I	Shipyard K	Shipyard L	Shipyard D1	Medium Shipyard	Shipyard D2	Shipyard F	Shipyard J	Shipyard M	Shipyard G	Minor Shipyard	Shipyard C	Shipyard E	Shipyard H
cargo	25.53	18.52	55.26	10.83	34.79	16.78	**cargo**	17.54	55.63	5.82	n.a.	22.08	cargo	26.27	n.a.	5.46
tanker	40.75	18.86	50.00	12.05	59.71	10.00	**tanker**	18.50	39.36	4.56	27.00	n.a.	tanker	n.a.	n.a.	31.67
container	29.42	19.78	n.a.	12.81	n.a.	n.a.	**container**	n.a.	n.a.	n.a.	n.a.	n.a.	container	n.a.	n.a.	n.a.
passenger	13.41	9.58	31.50	9.14	31.49	n,a.	**passenger**	40.83	21.00	22.33	35.00	12.25	passenger	n.a.	n.a.	n.a.
ferry ro2	23.74	17.87	46.18	10.40	n.a.	28.57	**ferry ro2**	23.94	68.00	13.40	n.a.	n.a.	ferry ro2	26.00	16.00	27.33
tug boat	33.56	19.60	32.47	7.13	36.45	25.20	**tug boat**	27.05	18.00	20.14	10.14	20.25	tug boat	34.11	13.49	26.25
lct	17.67	17.67	22.00	12.36	16.68	n.a.	**lct**	32.29	n.a.	7.75	8.00	n.a.	lct	282.00	17.62	n.a.
barges	121.00	14.46	61.25	10.75	25.43	59.00	**barges**	31.67	24.46	n.a.	7.00	27.13	barges	50.63	23.57	1.78
fishing	16.90	n.a.	98.33	15.18	23.00	19.27	**fishing**	9.24	n.a.	n.a.	n.a.	n.a.	fishing	n.a.	n.a.	n.a.
bulk carr.	n.a.	20.00	n.a.	n.a.	n.a.	n.a.										
average	**35.78**	**17.37**	**49.62**	**11.18**	**32.51**	**26.47**	**average**	**25.13**	**37.74**	**12.33**	**17.43**	**20.43**	**average**	**83.80**	**17.67**	**18.50**

- Other performance indicators of ship repair yards have been lengthily discussed in Chapter 5, Volume 1; including, Repair Period or Ship Repairing Period for each kind of vessel. (Table 13.2.4)

From Table 13.2.4, for Major Shipyards, Jakarta Shipyard (K) has the shortest repair days - (11.18 days average) followed by East Java Shipyard (B) - (17.37 days average)

For Medium Shipyards, Jakarta Shipyard (J) has the shortest repair days – (12.33 days average) followed by Jakarta Shipyard (M) – (17.43 days average)

For Minor Shipyards, East Kalimantan Shipyard (E) has the shortest repair days – (17.67 days average) followed by South Sumatra Shipyard (H) – (18.50 days average).

(g) Improvement Measures on selected Shipyards:

Major Shipyards

Jakarta Shipyard (K) showed the lowest man.day/GT and shortest docking day, followed by East Java Shipyard (B). By rehabilitating the facilities at Jakarta Shipyard (K); especially the floating dock to restore it to its design capacity, the docking days and the productivity could be significantly improved. It is worth noting that Jakarta Shipyard (K) has much experience and has a better repair record compared to other shipyards. At present Jakarta Shipyard (K) operates the biggest floating Dock in the Java Region.

For East Java Shipyard (B), as they are now operating beyond design capacity, this shipyard needs a bigger capacity floating dock of up to 12,000 TLC with clear width bigger than 30 meters, supported by wharf crane with longer reach. Through these investments, they would be able to increase the number of ships repaired and improve their income.

The longest docking days is at Central Java Shipyard (I), where, ships are waiting for dock space, as they have only one graving dock of 8,000 DWT capacity with limited water front/quay and lifting equipments. Expansion of the shipyard is not possible at the current site, thus, development have to be made at an off-site location. Future developments include a new graving dock of 35,000 DWT capacity.

Other major shipyards have adequate facilities. Improvements needed are more in the managerial aspects, and the increase in the utilization of facilities.

Medium Shipyards

The performance of Medium Shipyards may actually be better than Major Shipyards considering that they service much smaller sized vessels. Also, docking days is also less than Major Shipyards. Since the number of shipyards for this category is bigger than the number of major shipyards, improvement in the efficiency in repair works and full utilization of facilities is necessary in order to increase competitiveness.

Minor Shipyards

Most of Minor Shipyards are equipped with less facilities and equipments; thereby the kind of vessels that can be serviced, the kinds of repair works possible and repair technology that can be adopted are limited. Consequently it results in a low efficiency and poor workmanship. Minor Shipyards are would be able to modernize if they specialize their services to a certain kind vessel only. Manpower training in financial management and repair technology are necessary to improve their performance and competitiveness.

(h) More detailed information regarding each Selected Shipyards are described in the Appendix to this Chapter and it includes:

1. Table of Major, Medium and Minor Shipyards;
2. Graphs of Man.day/GT per Kind of Vessel at Major, Medium and Minor Shipyards; and,
3. Graphs of Average Repairing Days per Kind of Vessel for Shipyards (A) to (M).

13.2.2. Dock Space Requirement Due to Domestic Fleet Expansion

(1) Assumptions

This section compares existing available dock space with future demand as a result of domestic fleet expansion. Although shipyards accommodate both international shipping vessels and domestic ones, the Study's scope is limited to domestic shipping only. Therefore, the ship repair requirements of international shipping vessels are not included in the analysis.

There are several assumptions for calculation:

- The country is divided into seven regions: Sumatra, Java, Bali and Nusa Tenggara, Kalimantan, Sulawesi, Maluku and Papua.
- The fleet development plan under Case 1 (under improved fleet conditions) is used (refer to chapter 8.7).
- Each ship is to be docked every 2.5 years with no irregular docking.

(2) Estimation Results

Fleet expansion estimate under improved fleet conditions and respective dock space demand is shown in Table 13.2.5 while dock space surplus and deficit per region is indicated in Table 13.2.6. Dock space surplus and deficit is calculated per ship type and size is indicated in Table 13.2.7.

In order to determine the dock space capacity for each size and type of ships, grouping of vessels is necessary and is done in the following manner.

Ship Type	Small	Middle	Large
1. Container	< 3,000	3,000 – 10,000	> 10,000
2. Conventional	< 1,000	1,000 – 5,000	> 5,000
3. Bulker & Barge	< 3,000	3,000 – 10,000	> 10,000
4. Tanker	< 2,000	2,000 – 10,000	> 10,000
5. Passenger	< 4,000	4,000 – 12,000	> 12,000
National Installed Capacity [GT/Y]	1,430,000	1,300,000	870,000

Source: MOIT (regrouped)

Table 13.2.5 Calculation of Required Dock Capacity

Container	2014					2024				
	Fleet Capacity [x 1,000 GT]			All	Dock Space Required	Fleet Capacity [x 1,000 GT]			All	Dock Space Required
Region	<3,000	3,000 – 10,000	> 10,000			<3,000	3,000 – 10,000	> 10,000		
Sumatra	67.60	31.85	135.85	235.30	94.12	61.75	11.05	343.20	416.00	166.40
Java	97.50	36.40	392.60	526.50	210.60	124.15	52.00	711.10	887.25	354.90
Bali and NT	9.10			9.10	3.64	26.00			26.00	10.40
Kalimantan	68.90		126.10	195.00	78.00	103.35		217.10	320.45	120.18
Sulawesi	31.85		137.80	169.65	67.86	40.30	12.35	248.30	300.95	128.38
Maluku	3.90	1.95		5.85	2.34	4.55	2.60		7.15	2.86
Papua	29.25	26.65		55.90	22.36	11.05	4.55	86.45	102.05	40.82
Indonesia	308.10	96.85	792.35	1,197.30	478.92	371.15	82.55	1,606.15	2,059.85	823.94

Conventional	2014					2024				
	Fleet Capacity [x 1,000 GT]			All	Dock Space Required	Fleet Capacity [x 1,000 GT]			All	Dock Space Required
Region	<1,000	1,000 – 5,000	> 5,000			<1,000	1,000 – 5,000	> 5,000		
Sumatra	98.80	482.95	134.55	716.30	286.52	163.15	781.95	153.40	1,098.50	439.40
Java	157.30	377.00	105.30	639.60	255.84	241.15	575.25	113.10	929.50	371.80
Bali and NT	81.25			81.25	32.50	113.10			113.10	45.24
Kalimantan	206.05	283.40	79.30	568.75	227.50	299.00	401.05	78.65	778.70	311.48
Sulawesi	218.40			218.40	87.36	314.60			314.60	125.84
Maluku	75.40			75.40	30.16	102.70			102.70	41.08
Papua	87.75			87.75	35.10	92.95	48.10	9.75	150.80	60.32
Indonesia	924.95	1,143.35	319.15	2,387.45	954.98	1,326.65	1,806.35	354.90	3,487.90	1,395.16

Bulker & Barge	2014					2024				
	Fleet Capacity [x 1,000 GT]			All	Dock Space Required	Fleet Capacity [x 1,000 GT]			All	Dock Space Required
Region	<3,000	3,000 – 10,000	> 10,000			<3,000	3,000 – 10,000	> 10,000		
Sumatra	159.25	167.70	169.00	495.95	198.38	161.20	239.20	218.40	618.80	247.52
Java	125.45	156.00	235.95	517.40	206.96	130.65	203.45	263.90	598.00	239.20
Bali and NT	1.95			1.95	0.78	2.60			2.60	1.04
Kalimantan	13.00	175.50	69.55	258.05	103.22	11.05	172.25	55.90	239.20	95.68
Sulawesi	10.40	18.20		28.60	11.44	11.05	29.25		40.30	16.12
Maluku	2.60			2.60	1.04	2.60			2.60	1.04
Papua	20.15			20.15	8.06	27.95			27.95	11.18
Indonesia	332.80	517.40	474.50	1324.70	529.88	347.10	644.15	538.20	1,529.45	611.78

Tanker	2014					2024				
	Fleet Capacity [x 1,000 GT]			All	Dock Space Required	Fleet Capacity [x 1,000 GT]			All	Dock Space Required
Region	<2,000	2,000 – 10,000	> 10,000			<2,000	2,000 – 10,000	> 10,000		
Sumatra	224.90	238.55	364.65	828.10	331.24	250.90	266.50	407.55	924.95	369.98
Java	120.25	127.40	194.35	442.00	176.80	115.05	122.20	186.55	423.80	169.52
Bali and NT	5.20	5.20	7.80	18.20	7.28	5.20	8.85	8.45	22.50	9.00
Kalimantan	139.75	148.20	226.85	514.80	205.92	143.65	152.10	232.70	528.45	211.38
Sulawesi	13.00	13.65	20.80	47.45	18.98	15.60	16.25	25.35	57.20	22.88
Maluku	0.65	0.65	0.65	1.95	0.78	0.65	0.65	0.65	1.95	0.78
Papua	0.65	0.65	1.30	2.60	1.04	0.65	0.65	1.30	2.60	1.04
Indonesia	504.40	534.30	816.40	1,855.10	742.04	531.70	567.20	862.55	1,961.45	784.58

Passenger	2014					2024				
	Fleet Capacity [x 1,000 GT]			All	Dock Space Required	Fleet Capacity [x 1,000 GT]			All	Dock Space Required
Region	<4,000	4,000 – 12,000	> 12,000			<4,000	4,000 – 12,000	> 12,000		
Sumatra	17.00	55.00	125.00	197.00	78.80	17.00	53.00	122.00	192.00	76.80
Java	11.00	37.00	85.00	133.00	53.20	11.00	36.00	83.00	130.00	52.00
Bali and NT	2.00	5.00	12.00	19.00	7.60	2.00	6.00	13.00	21.00	8.40
Kalimantan	9.00	29.00	66.00	104.00	41.60	9.00	29.00	67.00	105.00	42.00
Sulawesi	8.00	25.00	58.00	91.00	36.40	8.00	27.00	61.00	96.00	38.40
Maluku	1.00	4.00	9.00	14.00	5.60	1.00	4.00	9.00	14.00	5.60
Papua	3.00	10.00	22.00	35.00	14.00	3.00	11.00	25.00	39.00	15.60
Indonesia	51.00	165.00	377.00	593.00	237.20	51.00	166.00	380.00	597.00	238.80

Table 13.2.6 Balance of Dock Space by Region

Region	Existing Available Capacity	2014		2024	
		Required Capacity	Balance	Required Capacity	Balance
Sumatra	1,123	980	+143	1,300	-177
Java	2,149	893	+1,256	1,189	+960
Bali and Nusa Tenggara	0	52	-52	74	-74
Kalimantan	95	646	-551	788	-693
Sulawesi	127	221	-94	324	-197
Maluku	42	40	+2	51	-9
Papua	9	81	-72	129	-120
Indonesia	3,545	2,913	+632	3,835	-310

Unit: 1,000 GT
Source: STRAMINDO

Table 13.2.7 Balance of Dock space by size of the ships

Ship Size	Small		Middle		Large	
National Installed Capacity [GT/Y] */	1,430,000		1,300,000		870,000	
Year	2014	2024	2014	2024	2014	2024
Fleet Expansion **/	2,121,250	2,627,600	2,456,900	3,266,250	2,779,400	3,741,800
Dock Space Required	848,500	1,051,090	982,760	1,306,500	1,111,760	1,496,720
Balance	581,500	378,910	317,240	(6,500)	(241,760)	(626,700)

*/ source: MOIT
**/ source: Table 13.2.5.

Based on Table 13.2.6, for the year 2014 the balance of each region is as follows. The national capacity will still exceed demand by 631,880 GT.

Sumatra – capacity exceeds by 142,800 GT

Java – capacity exceeds by 1,256,310 GT

Bali and NT – capacity deficit of 52,060 GT, however this could be compensated by Java (Surabaya, Semarang)

Kalimantan – capacity deficit of 551,260 GT, this could also be compensated by Java (Jakarta, Semarang, Surabaya)

Sulawesi – capacity deficit of 94,460 GT but can be covered by facilities in Sulawesi (i.e. Makassar) and Java (Surabaya and Semarang)

Maluku – capacity exceeds by 2,280 GT

Papua – capacity deficit of 71,820 GT, again Surabaya and Semarang could be used as substitute

For the year 2024, ship repair capacity of Indonesia will be in deficit by about 309,260 GT. Only Java will continue to have surplus capacity of about 961,630 GT, assuming that all facilities will still be operating at 100% capacity.

From the survey carried out by the Study Team, it was recognized that shipyards outside of Java especially in the eastern parts of Indonesia are small/medium size shipyards. The increase of the capacity of existing shipyards in concert with the fleet expansion program should be considered from an economic perspective. Thus, it would be recommendable to build new facilities in regions outside of Java especially in the eastern regions or to improve the existing shipyards in Surabaya or Makassar, where capacity expansion is needed.

The situation for each region by 2024 is as follows:

Sumatra – deficit of 177,250 GT capacity. This could met by improving the existing shipyards located in Dumai in the central east coast of Sumatra Island, Palembang with limited expansion, or building a new shipyard at the southern west coast of Sumatra which has natural deep sea harbors.

Java – surplus of 961,630 GT capacity. Though there is surplus of capacity, conditions of facilities are very deteriorated and require rehabilitation especially shipyards located at Jakarta, and shipyards in Surabaya require investment for new facilities to increase existing facilities.

Bali and NT – capacity deficit of 74,080 GT. As Bali is more suitable for tourism than industrial estates; it is advisable to locate shipyards to other islands. Nusa Tenggara could be better a location for shipyards but only small/medium size facilities. Bigger vessels could be docked in Surabaya.

Kalimantan – capacity deficit of 693,620 GT. As there are no big shipyards in Kalimantan the dock space required for this region could be serviced in Semarang, Surabaya or Makassar. The development of shipyards in Kalimantan is limited by the location of most activities i.e. along the Mahakam and Barito River which have shallow depth and is dependent on tide.

Sulawesi – capacity deficit of 196,820 GT. Shipyard capacity in Makassar should be increased, also facilities in Bitung should be increased and improved as a strategic location for ship repair activities in the eastern part of Indonesia.

Maluku – capacity deficit of 9,160 GT. Existing facilities needs to be increased and upgraded to meet future demand.

Papua – capacity deficit of 119,960 GT. As the location of activities in this region is too far from shipyards in other islands, shipyards in this region is necessary. Currently, existing repair facilities belong to Pertamina and are for their exclusive use only.

The dock space requirements would be further analyzed based on size of the vessels as shown on Table 13.2.7.

For the Year 2014, dock space requirement is as follows:

All of Indonesia:

- Small Ships - capacity surplus of 581,500 GT
- Middle Ships - capacity surplus of 317,240 GT
- Large Ships - capacity deficit of 241,760 GT

Large Ships' additional dock space requirement is 241,760 GT; which mean that if no additional space is provided by domestic shipyards, large ships have to be docked outside of Indonesia. This estimate shows that in the year 2014 Indonesia requires additional facilities for large ships in the form of floating docks or graving docks complete with supporting lifting equipments.

There is a need to invest in providing new docking facilities or rehabilitate the existing docks with the corresponding provision or rehabilitation of lifting capacity. From the field survey carried out, the Study Team recognized that one shipyard in Surabaya which exceeded their design capacity for the last two years, would increase their docking facilities to cope with the needs for bigger ships which are now increasing becoming more prevalent.

For the Year 2024, dock space requirement is as follows:

All of Indonesia:

- Small Ships - capacity surplus of 378,910 GT
- Middle Ships - capacity deficit of 6,500 GT
- Large Ships - capacity deficit of 626,700 GT

This means that in the year 2024, middle ships would need additional dock space of 6,500 GT which is very marginal. But for large ship a deficit of 626,700 GT would further require new investments for shipyards with bigger capacity to support the fleet demand, located at regions where the deficit of dock space is highest (Table 13.2.6). The other alternative is to increase the capacity of shipyards in Java to substitute for the deficit of other adjacent regions.

(3) Investment Guidelines

Based on ship size, the simulation results show that additional dock space for small and middle sized vessels would not be required until the year 2014. But for large ships, additional dock space of 241,760 GT is to be required. As the data from MOIT are based on the National Installed Capacity, the simulations made were also based on the same. It means, during the first half of the M/P period 2005-2014, rehabilitation works will also be required especially for heavily deteriorated facilities. During the second half of the M/P period 2015-2024, however, new dock space capacity of 626,700 GT will be required. The estimated scale of investment is about US$ 1,000 million to US$ 1,300 million depending on the type of dock desired, i.e. floating dock or graving dock:

- Floating dock: 626,700 GT x US$ 1,600 = US$ 1,002,720,000
- Graving dock: 626.700 GT x US$ 2,100 = US$ 1,316,070,000

Kalimantan is the most desirable location for investments for new dock for small and middle size vessels since it is the region with the highest deficit in dock capacity. Such

new investment will benefit many shipowners in and around Kalimantan, and will reduce access time to shipyards. And for larger size ships, increase in the capacity of selected shipyards in Java (Surabaya, Semarang, Jakarta) or Sulawesi (Makassar) would be desirable.

13.3. Strengthening of Shipbuilding Capability

(1) Shipbuilding Capabilities

According to data from IPERINDO, the annual capacity of Indonesian Shipbuilding Industries is 170,750 GT, among 71 steel shipbuilders with annual capacity of over 300 GT. The distribution throughout Indonesia as summarized below:

Table 13.3.1 Existing Shipbuilding Capacity by Region

Region	Number of Shipbuilders [unit]	Annual Capacity [GT]	Share [%]
Sumatra	17	23,450	13.73
Batam	8	37,000	21.67
Java	29	94,600	55.40
Kalimantan	12	8,500	4.98
Sulawesi	3	5,200	3.04
Maluku	1	500	0.30
Papua	1	1,500	0.88
Total Indonesia	71	170,750	100

Source: IPERINDO

All kinds, types and sizes of ships up to 50,000 DWT could be built by Indonesian shipbuilding industries; from a simple Flat Top Barges, Conventional Cargoes, Tug Boats up to sophisticated LPG Carriers, Offshore Supply Vessels, Roll On-Roll Off, Trailer Ferry, Gas Tanker, Crude and Product Tankers, Dry Bulk Carriers and other Floating-equipments such as Floating Docks, Offshore Platforms, Jackets, etc.

Table 13.3.2 Current Shipbuilding Activities

Ship Owner	Ship's Type	Size	No. of unit
PERTAMINA	Oil Tanker	30,000 DWT	2 units
(Bare Boat Hire	Oil Tanker	6,500 DWT	2 units
Purchase)	Oil Tanker	3,500 DWT	2 units
Exported Ship	Dry Bulk Carrier	42,000 DWT	2 units
DGSC	Cargo-Passenger	750 DWT	2 units
(Pioneer	Cargo-Passenger	500 DWT	3 units
Shipping)	Cargo-Passenger	350 DWT	3 units
PELINDO	Tug Boat	3,200 HP	2 units
(Harbor	Tug Boat	2,400 HP	1 unit
Facilities)	Pilot Boat	2 x 550 HP	2 units
ASDP (Land Transportation)	Ro-Ro Ferry	400 GT	2 units
Regional	Ro-Ro Ferry	500 GT	1 unit
Government	Ro-Ro Ferry	350 GT	1 unit

Source: STRAMINDO

(2) Highlighted factors for the Shipbuilding Industry

Field survey carried out by the Study Team on the Shipbuilding Industry highlighted three factors; namely, marketing, technology and financing.

Marketing

Though demand-wise, there is potential for fleet expansion, companies are not yet in the position to order new ships as they could only afford second hand ships. Recently only State Owned Enterprises are awarding new-building orders to the shipyards mentioned above.

Technology

The main function of technology in the shipbuilding industry is design & engineering, procurement and construction. The bigger yards in Surabaya have a reliable design & engineering department supported by CAD/CAM system using the most complete Tribon soft-ware, for design and production of hull construction, piping, ducting and cable tray. And also they are able to integrate hull construction simultaneously with outfitting, for the implementation of integrated hull construction, outfitting and painting (IHOP). Construction wise, bigger yards have implemented QA/QC program to maintain dimensional accuracy and minimize reworks to keep production moving smoothly on schedule and in compliance of both classification society's and customer's requirements. On the other hand, smaller yards which have not implemented these systems appear to have some problems in meeting the owner's and classification society's requirements.

Since most machinery and equipments for newly built ships are still imported, the role of procurement engineers is indispensable in order to shorten procurement time. The current lack of effective procurement engineers is one of the factors the lead to delays. Assistance from foreign experts is required for some yards, could be considered.

Financing

Financing is the weakest aspect in most shipyards, as mentioned in the preceding sections. There are no funds available domestically at bearable cost. As much of the machineries and equipments have high foreign components, added costs are incurred in the payments for import agencies, shipping and transportation, inventory and warehousing; and this add to the high price of domestically built ship.

(3) Possible Measures

Consolidation of the capabilities among shipyards, to become a consortium or syndicate could be considered. Later the consortium could become the primary ship builder and repairer in Indonesia, and be able to provide improved services through its combined resources and synergistic relationships to provide services that is of quality, competitively priced, on-schedule and reliable. Ultimately, the consortium could not only service domestic needs but also venture into international markets.

Engineering approach could be tailored to individual yards as engineering is dependent on the availability of facilities, i.e. building berths, cranes, building systems, launching systems, water front and other supporting tools and equipments. How the construction of a ship is to be carried out will depend on the engineering approach used and may vary

between yards as it will depend on the supporting tools and equipments, lifting gear, workshops and finally how to launch the ship after completion. Most yards have good capacity in this regard.

To improve on-time delivery time, semi block system could be introduced in ship yards with limited facilities. Moreover, QA/QC system could be introduced to control production and to avoid reworks.

Procurement takes a dominant role in the building of ships, especially in relation with the building schedule. This activity should be carried out by trained personnel. In this respect, on the job training assisted by foreign experts is necessary.

Financial problems, is not a recent problems for the maritime industry. One of the main problems in the ship building and repair industry is where to get funds with affordable and workable terms. Without, access to capital, the ship building industry will stay in status quo.

(4) Shipbuilding Perspective in collaboration with FDI

The Indonesian shipbuilding industry has a long history starting from the Dutch colonial period in the mid-19th century. The government has been actively supporting the ship building industry for over quite a long time, and foreign aid agencies including those of Japan have been cooperating with this program. Unfortunately however, these efforts were not fully successful so far; for instance, .the Caraka Jaya project finished without fully satisfying Indonesian shipping companies. Japanese financial as well as technical cooperation has also not been satisfactorily materialized into maritime sector development. Today, its achievement standpoint is not far from its starting point. The country's annual building capability is modest at 170,750 GT and actual completion accounts for 20-30% at best. Due to marginal activities, the country does not publish even such basic statistics.

The comparison among selected Asian countries indicates that even countries which do not purposely promote a strong shipbuilding capacity have sufficient ship-repairing docks to serve their national tonnage. In terms of balance between shipbuilding and repairing, two extreme types can be found, i.e., the export oriented shipbuilding approach of Korea and the ship-repairing oriented approach of Thailand. Indonesia is currently very similar to that of Thailand. (Refer to Table 13.3.3)

Indonesia and Philippines share many similarities in many aspects. However their shipbuilding industries have divergent structures. In the Philippines, the top five shipbuilding yards are all joint ventures with foreign shipbuilders while in Indonesia, foreign investment is concentrated in ship-repairing at Batam. Today, the Philippines' annual shipbuilding capacity is 4.7 times bigger than that of Indonesia.

The reason why these past efforts were not so successful can be explained by the fact that past efforts were concentrated on supporting the supply side i.e., production of ships. This approach may be called a supply-push approach. This has commonly been seen in many socialist countries and almost without exception they have not been successful. Instead the demand-pull approach should be taken. The method is simple; and that is to provide sufficient fund for shipping companies to buy their desired ships from the open market, through ICB. Considering the present situation, under ICB, only foreign shipbuilding

companies will be awarded for the time being. Indonesian ship building companies will not be able to win contracts; worse, most of them will not be even pre-qualified. In order to provide a chance for Indonesian ship building companies to win contracts through ICB, FDI – joint venture companies with foreign shipbuilders are necessary. Unlike other industries, i.e., automobile industries, electro-mechanic industries, there is no FDI in the ship building sector, except for those in Batam Island.

Most important factor to encourage FDI is the existence of stable demand. As long as shipping companies tend to buy only very old vessels with scrap value, no FDI will be interested in investing in Indonesia. The Study has identified some local shipbuilding needs such as barges, small cargo/passenger vessels for tertiary shipping and the vessels which are suitable for domestic use are difficult to find in the second-hand markets abroad. From a domestic shipping viewpoint, the Thailand type industry structure, i.e. concentrating only on ship-repairing, is not favorable. The domestic shipping industry will need the shipbuilding industry to firmly support an entire ship life: building, repairing and breaking during the Master Plan period. A balanced development between shipping and shipbuilding should be pursued.

Table 13.3.3 Comparison of Shipbuilding Industries among Selected Countries

	Indonesia	Philippines	Thailand	China	Japan	Korea
Shipbuilding Actual Completion (‘000 gt in 2002)	(103)	231	3	2,207	11,732	12,967
Ship-repairing Actual Completion (‘000 gt in 2002)	2,118	3,658	1,620	n.a.	n.a.	n.a.
Employment (‘000)	25-30	15-20	n.a.	243	78	65
National Fleet Tonnage (‘000 gt)	3.6	6.0	1.8	16.7	14.6	6.4

Source: APSEM 2003, Lloyd’s Register of Shipping 2002
Note: ( ) Order books estimated by STRAMINDO

Chapter 14

EVALUATION OF MASTER PLAN

14. EVALUATION OF MASTER PLAN

Fleet is always centered on shipping industry development since it shares a dominant portion of the industry's investment. Shipping management, maritime personnel training and maritime- related services such as ship repair are all essential to optimize fleet utilization. Therefore, this chapter, which aims at evaluating the STRAMINDO Master Plan, starts from fleet procurement plan (Section 14.1) to estimate a necessary investment scale to realize the M/P. The implementation of the M/P is expected to create various essential benefits, such as more efficient ship operation including reduction of maritime transport cost, higher maritime transport safety and more development of shipbuilding and other related industries. The economic evaluation of the Master Plan is thus carried out taking those benefits into account. (Section 14.2). Section 14.3 focuses on the industries' interests through macroscopic approach. They are industry's affordability to the required fleet investment and the contribution of the shipping as well as the shipbuilding industries to the national economic development. Finally, short-term priority projects and programs which shall form the STRAMINDO Action Plan are selected in Section 14.4.

14.1. Fleet Procurement Plan

14.1.1. Total Fleet Requirement

As already explained in Chapter 8, the future fleet requirement has been estimated for the following three scenarios.

Case 0: Base case: No change in fleet specification

Case 1: Improved Fleet Case: Fleet conditions are improved by fleet renovation

Case 2: Improved Port Productivity: Port efficiency is improved in terms of waiting time and cargo handling.

Among the above scenarios, Case 1 will be the most practical scenario for the M/P since in Case 0 the fleet will be remaining at the same level as present without modernization and for Case2 additional port development will be required, which is not within the scope of this Study. Accordingly, the fleet requirement in Case 1 will be adopted for the M/P.

14.1.2. Fleet Procurement

As discussed in the previous chapter, the existing fleet is composed of considerably old vessels where approximately 20% of the total fleet is more than 30 years old. For instance, the average age is 21 yrs for containers, 23 years for conventional vessels and 25 years for tankers. The old vessels should be replaced because of their inefficiency in operation and problems in safety.

In replacing the vessels, the following factors have been taken into account.

- Cost minimum vessels have been selected in accordance with the cargo type characteristics such as transport volume, vessel specifications, cargo type, etc.
- Port conditions such as water depth, port waiting time, etc.

(1) Base Case Replacement Scenario

The vessels replacement is estimated by assuming the following conditions.

- The existing fleet age distribution is based on the DGSC inventory data in 2002.
- The fleet requirement is estimated for every five years period starting from 2005 to 2024, by extrapolation.
- For the cargo vessels, the vessel life is assumed to be 35 years for the period until 2014, 30 years for the period 2015 to 2019, and further reduced to 25 years for the last five years period of the M/P period. This assumption is made so as to gradually increase younger aged vessels while avoiding substantial investments at once. As for the passenger ships, the life is assumed to be 25 years for throughout the period until 2024, taking safety concerns into consideration.

Table 14.1.1 Vessel Life Assumption

	Until 2014	2014 - 2019	2019 – 2024
Cargo ships	35 yrs	30 yrs	25 yrs
Passenger ships	25 yrs	25 yrs	25 yrs

- Taking into account the current market conditions, the vessels to be acquired are assumed as shown in Table 14.1.2. The second hand vessels are assumed to be 10 years old.

Table 14.1.2 Share of New and Second Hand Vessels for Replacement

	Share of New and Second Hand Vessels			
	2004 - 2009	2009 – 2014	2014 - 2019	2019 – 2024
Cargo Ships	10% : 90%	10% : 90%	20% : 80%	30% : 70%
Passenger Ships	50% : 50%	50% : 50%	50% : 50%	50% : 50%

In addition to the replacements, additional vessels should be acquired in accordance with the future expansion of fleet requirement in the corresponding target years. These vessels are also assumed to be procured under the same conditions as the replacements.

The fleet to be procured is summarized in Table 14.1.3. The total fleet procurement will be 4,461 vessels (14.4 million DWT) for cargo and 175 vessels (0.6 million GT) for passengers during the coming two decades until 2024.

The total procurement cost of the above fleet is estimated to be 129,817 billion Rp during the years until 2024, of which 113,554 billion Rp. will be for cargo ships and 16,264 billion Rp. will be for passenger ships, as shown in Table 14.1.4.

Table 14.1.3 Fleet Procurement Scenario (Base Case)

(unit: ships)

No of Vessels		2004-2009			2009-2014			2014-2019			2019-2024			Total
	DWT/GT	New	S.H.	Total	New	S.H.	Total	New	S.H.	Total	New	S.H.	Total	
Conventional	0～1000	28	249	277	24	220	244	77	307	384	176	412	588	
	1000～2000	10	88	98	8	72	80	24	98	122	54	127	181	
	2000～4000	16	141	157	14	125	139	32	129	161	100	233	333	
	4000～8000	5	44	49	5	45	50	10	38	48	17	40	57	
	over 8000	1	9	10	2	15	17	5	18	23	4	8	12	
	Total	60	531	591	53	477	530	148	590	738	351	820	1,171	3,030
Container	1000～2000	0	0	0	0	1	1	0	0	0	0	0	0	
	2000～4000	1	6	7	1	6	7	1	4	5	3	6	9	
	4000～8000	1	11	12	2	15	17	5	20	25	7	17	24	
	8000～12000	0	3	3	1	5	6	1	2	3	1	3	4	
	12000～18000	2	21	23	4	36	40	7	26	33	18	43	61	
	over 18000	1	4	5	1	7	8	1	6	7	4	10	14	
	Total	5	45	50	9	70	79	15	58	73	33	79	112	314
Bulker	1000～4000	0	1	1	0	1	1	0	1	1	1	1	2	
	4000～8000	0	1	1	0	4	4	1	2	3	1	1	2	
	8000～15000	0	3	3	0	3	3	2	6	8	2	6	8	
	over 15000	1	6	7	1	8	9	1	6	7	2	6	8	
	Total	1	11	12	1	16	17	4	15	19	6	14	20	68
Barge	5000～10000	1	13	14	2	13	15	4	15	19	17	39	56	
	10000～15000	3	23	26	3	25	28	3	11	14	17	39	56	
	over 15000	0	2	2	0	2	2	0	0	0	1	1	2	
	Total	4	38	42	5	40	45	7	26	33	35	79	114	234
Tanker	0～1000	7	59	66	4	36	40	5	19	24	21	49	70	
	1000～4000	11	96	107	9	79	88	15	61	76	37	85	122	
	4000～8000	3	30	33	2	17	19	4	15	19	12	29	41	
	8000～15000	2	15	17	1	11	12	0	1	1	5	12	17	
	15000～25000	1	8	9	1	6	7	1	6	7	3	6	9	
	25000～35000	1	5	6	1	6	7	1	4	5	2	4	6	
	over 35000	0	1	1	0	2	2	1	2	3	0	1	1	
	Total	25	214	239	18	157	175	27	108	135	80	186	266	815
Sub Total		95	839	934	86	760	846	201	797	998	505	1,178	1,683	4,461
Passenger (GT)	1000～4000	0	0	0	0	0	0	9	8	17	13	12	25	
	4000～8000	12	11	23	9	9	18	2	1	3	6	6	12	
	8000～12000	9	8	17	5	4	9	3	2	5	5	5	10	
	over 12000	2	2	4	3	2	5	2	1	3	3	2	5	
	Total	23	21	44	17	15	32	16	12	28	27	25	51	156
Passenger Ro-ro (GT)	0～4000	2	1	3	2	1	3	1	0	1	1	0	1	
	over 4000	2	1	3	2	2	4	1	1	2	1	1	2	
	Total	4	2	6	4	3	7	2	1	3	2	1	3	19
Sub Total		27	23	50	21	18	39	18	14	32	29	25	54	175
Grand Total		122	862	984	107	778	885	219	811	1,030	534	1,203	1,737	4,636

Note: S.H.: Second Hand Fleet

Table 14.1.4 Procurement Cost for the Base Case

(unit: Billion Rp.)

No of Vessels		2004-2009			2009-2014			2014-2019			2019-2024			Total
	DWT/GT	New	S.H.	Total	New	S.H.	Total	New	S.H.	Total	New	S.H.	Total	
Conventional	0～1000	350	1,245	1,595	300	1,100	1,400	963	1,535	2,498	2,200	2,060	4,260	
	1000～2000	270	950	1,220	216	778	994	648	1,058	1,706	1,458	1,372	2,830	
	2000～4000	696	2,453	3,149	609	2,175	2,784	1,392	2,245	3,637	4,350	4,054	8,404	
	4000～8000	338	1,188	1,526	338	1,215	1,553	675	1,026	1,701	1,148	1,080	2,228	
	over 8000	125	450	575	250	750	1,000	625	900	1,525	500	400	900	
	Total	1,779	6,287	8,065	1,713	6,018	7,730	4,303	6,764	11,067	9,656	8,966	18,621	45,483
Container	0～4000	54	130	184	54	130	184	54	86	140	162	130	292	
	4000～8000	80	352	432	160	480	640	400	640	1,040	560	544	1,104	
	8000～12000	0	180	180	150	300	450	150	120	270	150	180	330	
	12000～18000	420	1,764	2,184	840	3,024	3,864	1,470	2,184	3,654	3,780	3,612	7,392	
	over 18000	260	416	676	260	728	988	260	624	884	1,040	1,040	2,080	
	Total	814	2,842	3,656	1,464	4,662	6,126	2,334	3,654	5,988	5,692	5,506	11,198	26,967
Bulker	1000～4000	0	7	7	0	7	7	0	7	7	18	7	25	
	4000～8000	0	13	13	0	52	52	33	26	59	33	13	46	
	8000～15000	0	72	72	0	72	72	120	144	264	120	144	264	
	over 15000	110	264	374	110	352	462	110	264	374	220	264	484	
	Total	110	356	466	110	483	593	263	441	704	390	428	818	2,581
Barge	5000～10000	12	62	74	24	62	86	48	72	120	204	187	391	
	10000～15000	56	173	229	56	188	244	56	83	139	319	293	611	
	over 15000	0	19	19	0	19	19	0	0	0	24	10	34	
	Total	68	254	322	80	269	349	104	155	259	547	489	1,036	1,967
Tanker	0～1000	123	413	536	70	252	322	88	133	221	368	343	711	
	1000～4000	825	2,880	3,705	675	2,370	3,045	1,125	1,830	2,955	2,775	2,550	5,325	
	4000～8000	330	1,320	1,650	220	748	968	440	660	1,100	1,320	1,276	2,596	
	8000～15000	374	1,122	1,496	187	823	1,010	0	75	75	935	898	1,833	
	15000～25000	250	800	1,050	250	600	850	250	600	850	750	600	1,350	
	25000～35000	300	600	900	300	720	1,020	300	480	780	600	480	1,080	
	over 35000	0	133	133	0	266	266	333	266	599	0	133	133	
	Total	2,202	7,268	9,470	1,702	5,779	7,481	2,535	4,044	6,579	6,748	6,280	13,027	36,556
Sub Total		4,972	17,007	21,979	5,069	17,210	22,279	9,538	15,058	24,596	23,032	21,668	44,700	113,554
Passenger (GT)	0～4000	0	0	0	0	0	0	126	44	170	181	65	246	
	4000～8000	1,560	572	2,132	1,170	468	1,638	260	52	312	780	312	1,092	
	8000～12000	1,350	480	1,830	750	240	990	450	120	570	750	300	1,050	
	over 12000	520	208	728	780	208	988	520	104	624	780	208	988	
	Total	3,430	1,260	4,690	2,700	916	3,616	1,356	320	1,676	2,491	885	3,376	13,358
Passenger Ro-ro (GT)	0～4000	370	74	444	370	74	444	185	0	185	185	0	185	
	over 4000	412	82	494	412	165	577	206	82	288	206	82	288	
	Total	782	156	938	782	239	1,021	391	82	473	391	82	473	2,906
Sub Total		4,212	1,416	5,628	3,482	1,155	4,637	1,747	402	2,149	2,882	968	3,849	16,264
Grand Total		9,184	18,423	27,607	8,551	18,365	26,916	11,285	15,460	26,745	25,913	22,636	48,549	129,817

Note: S.H.: Second Hand Fleet
The unit price of each vessel is shown in Attachment 14.1.

(2) Alternative Fleet Procurement Scenarios

The following alternative scenarios are examined by changing the conditions from the base case.

Alt 1: For the replacement, only second hand vessels are introduced for cargo transport,

therefore % share of new vessels during procurement will be zero. The assumptions for passenger ships are same as the base case.

Alt 2: The life of cargo ships is extended up to 40 years throughout the period until 2024, which is almost the same as the current condition. The assumptions for passenger ships do not change.

Alt 3: For the replacements, only new vessels are procured, therefore, the purchase of old vessels will be zero.

The simulation result is obtained as shown in Table 14.1.5, Table 14.1.6 and Table 14.1.7.

Alt 1: The total number of ships to be procured slightly increases, however, the procurement cost will be much lower compared to the base case.

Alt 2: Both the total number of ships to be procured and total cost will be drastically decreased; however, average ship age will be much higher compared to the base case.

Alt 3: The number of ships to be procured will decrease because the replaced ships will be available until 2024. The procurement cost, however, will be much higher compared to the base case.

Table 14.1.5 Total Fleet to be Procured

(unit: ships)

Scenario		2004-2014			2015-2024			Grand Total
		New	S.H.	Total	New	S.H.	Total	
Base Case	Conventional	113	1,008	1,121	499	1,410	1,909	3,030
	Container	14	115	129	48	137	185	314
	Bulker	2	27	29	10	29	39	68
	Barge	9	78	87	42	105	147	234
	Tanker	43	371	414	107	294	401	815
	Passenger	48	41	89	47	39	86	175
	Total	229	1,640	1,869	753	2,014	2,767	4,617
Second hand ship only Case	Conventional	0	1,121	1,121	0	1,969	1,969	3,090
	Container	0	129	129	0	190	190	319
	Bulker	0	27	27	0	37	37	64
	Barge	0	87	87	0	150	150	237
	Tanker	0	414	414	0	426	426	840
	Passenger	0	89	89	0	113	113	202
	Total	0	1,867	1,867	0	2,885	2,885	4,752
40 yrs Life Case (excl. passenger)	Conventional	82	732	814	357	1,061	1,418	2,232
	Container	11	87	98	39	114	153	250
	Bulker	2	15	17	8	23	31	47
	Barge	8	68	76	9	30	39	115
	Tanker	30	274	305	53	164	218	522
	Passenger	46	42	88	49	43	92	180
	Total	178	1,218	1,397	515	1,435	1,949	3,346
New Ship Only Case	Conventional	1,121	0	1,121	1,378	0	1,378	2,499
	Container	129	0	129	140	0	140	269
	Bulker	28	0	28	26	0	26	54
	Barge	87	0	87	108	0	108	195
	Tanker	414	0	414	187	0	187	601
	Passenger	85	0	85	67	0	67	152
	Total	1,864	0	1,864	1,906	0	1,906	3,770

Note: "Passenger" includes passenger ro-ro and passenger cargo ships

Table 14.1.6 Total Fleet Procurement Cost

(Billion Rp)

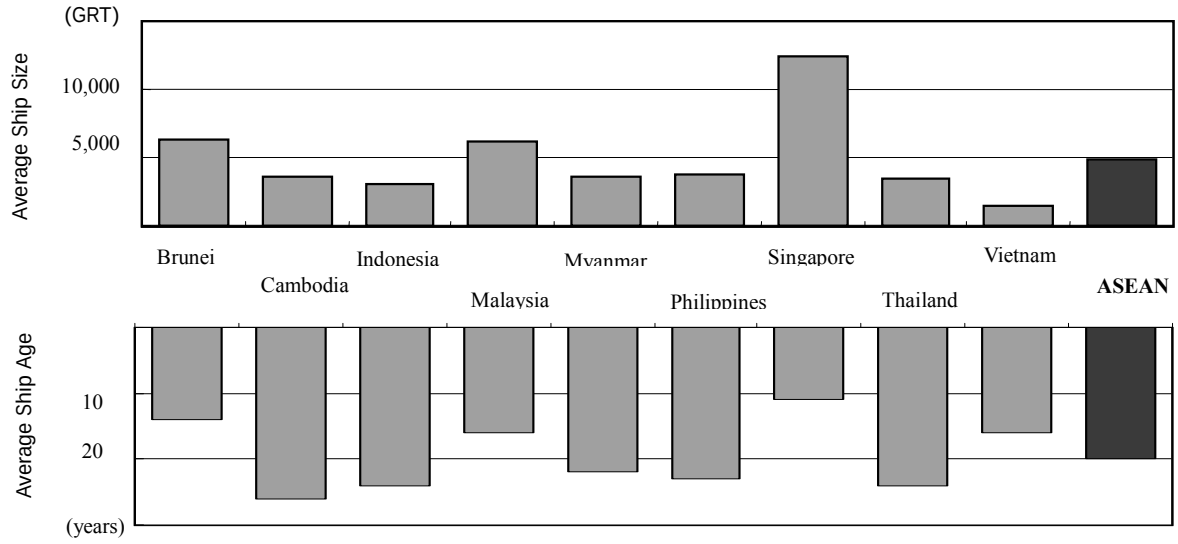
Scenario		2004-2014			2015-2024			Grand Total
		New	S.H.	Total	New	S.H.	Total	
Base Case	Conventional	3,491	12,304	15,795	13,958	15,730	29,688	45,483
	Container	2,278	7,503	9,781	8,026	9,160	17,186	26,967
	Bulker	220	839	1,059	653	869	1,522	2,581
	Barge	149	523	672	651	644	1,295	1,967
	Tanker	3,904	13,047	16,950	9,283	10,323	19,606	36,556
	Passenger	7,694	2,571	10,265	4,629	1,425	6,053	16,319
	Total	17,735	36,788	54,523	37,199	38,151	75,349	129,872
Second hand ship only Case	Conventional	0	13,701	13,701	0	22,024	22,024	35,725
	Container	0	8,414	8,414	0	12,696	12,696	21,110
	Bulker	0	927	927	0	1,050	1,050	1,977
	Barge	0	583	583	0	924	924	1,507
	Tanker	0	14,608	14,608	0	14,917	14,917	29,525
	Passenger	0	5,667	5,667	0	4,906	4,906	10,573
	Total	0	43,900	43,900	0	56,517	56,517	100,417
40 yrs Life Case (excl. passenger)	Conventional	2,423	8,462	10,885	10,388	12,367	22,755	33,641
	Container	1,872	6,308	8,180	6,482	7,541	14,023	22,202
	Bulker	177	575	752	561	650	1,211	1,963
	Barge	129	470	599	154	196	350	949
	Tanker	2,740	9,461	12,201	4,897	6,150	11,047	23,248
	Passenger	7,694	2,571	10,265	4,629	1,425	6,053	16,319
	Total	15,036	27,847	42,883	27,110	28,328	55,439	98,322
New Ship Only Case	Conventional	34,252	0	34,252	37,566	0	37,566	71,818
	Container	21,036	0	21,036	23,822	0	23,822	44,858
	Bulker	2,300	0	2,300	1,900	0	1,900	4,200
	Barge	1,457	0	1,457	1,607	0	1,607	3,063
	Tanker	36,521	0	36,521	16,921	0	16,921	53,442
	Passenger	26,671	0	26,671	7,127	0	7,127	33,798
	Total	122,236	0	122,236	88,942	0	88,942	211,178

Table 14.1.7 Average Age of Fleet by Alternative Scenario

Scenario		Ave. Fleet Age				
		2002	2009	2014	2019	2024
Base Case	Conventional	23.2	19.8	18.3	16.4	14.1
	Container	20.2	21.1	16.7	16.0	15.0
	Bulker	27.9	22.6	19.0	15.8	15.6
	Barge	11.0	15.4	17.6	19.2	14.6
	Tanker	24.7	19.5	18.1	17.7	14.8
	Passenger	18.5	15.8	16.3	16.7	12.3
	Total	22.5	19.5	18.1	16.8	14.4
Second hand ship only Case	Conventional	23.2	20.2	18.9	17.7	16.2
	Container	20.2	20.2	17.4	17.3	17.0
	Bulker	27.9	22.9	19.5	16.9	17.4
	Barge	11.0	15.6	18.0	20.0	16.6
	Tanker	24.7	20.0	18.8	18.8	16.6
	Passenger	18.5	17.5	21.8	21.6	16.5
	Total	22.5	19.9	18.8	18.0	16.4
40 yrs Life Case (excl. passenger)	Conventional	23.2	21.8	22.4	19.5	18.4
	Container	20.2	23.7	21.5	18.4	17.9
	Bulker	27.9	29.1	25.7	20.6	18.9
	Barge	71.0	16.2	18.8	22.5	25.1
	Tanker	24.7	24.4	22.3	20.9	21.3
	Passenger	18.5	15.7	16.3	14.9	12.9
	Total	22.5	22.2	22.1	19.9	19.3
New Ship Only Case	Conventional	23.2	15.1	12.2	8.7	9.8
	Container	20.2	16.4	10.3	8.2	10.0
	Bulker	27.9	20.0	13.2	7.6	10.7
	Barge	71.0	13.3	14.0	14.5	17.5
	Tanker	24.7	15.4	11.7	9.6	12.6
	Passenger	18.5	14.9	14.0	11.1	10.1
	Total	22.5	15.2	12.1	9.2	10.8

With applying the above-mentioned fleet replacement and procurement policies, the average fleet age will become younger from presently 22.5 years to 14.4 years in 2024 under the base case. Such a younger fleet composition could be comparable to a scenario in between Malaysia's case (16 years in 2000) and Singapore's case (11 years in 2000).

Figure 14.1.1 Countrywide Fleet Characteristics in ASEAN



Source: Lloyd's Register of Shipping, Statistical Tables (London) 2001, various issues.

14.2. Economic Evaluation of Master Plan

The proposed master plan is evaluated from the national economic viewpoint. For this purpose, the economic costs for implementing various projects/programs included in the master plan and the economic benefits accrued from the implementation are estimated.

14.2.1. Benefits of the Master Plan

The proposed M/P will bring about various benefits for the domestic maritime transport as well as the related industries by realizing higher efficiency of shipping service and reducing the operation cost as shown in Table 14.2.1.

These benefits are expected as a result of the simultaneous implementation of the M/P because the benefits are interrelated among the related industries. For instance, the capability of the ship repair industries should be enhanced in accordance with fleet expansion; otherwise the increase of commissionable days and reduction of repair cost will not be realized.

Table 14.2.1 Expected Benefits

	Expected Benefits
Progress of Containerization (Replacement into container ships)	Savings in transport cost through: ・ Higher efficiency in cargo handling ・ Reduction in required days at port
Enlargement of ship type	Savings in transport cost through: ・ Reduction in the Fixed Cost (Less capital cost per DWT) ・ Reduction in distance related cost per tonnage
Replacement to younger ships	Savings in transport cost through: ・ Higher operation speed ・ Increase of Commissionable days ・ Higher maritime transport safety
Expansion of Total Fleet	Expansion of shipping service related industries ・ Expansion and Modernization of ship building/ repair industry ・ Expansion of related services, insurance, finance, forwarders, etc.
Improvement of Passenger service routes/Allocation of suitable size ships	Savings in transport cost through; ・ More efficient passenger ship operation ・ Reduction in passenger time cost
Improvement of Ship Management System Expansion/modernization of ship building/repair industry	Savings in transport cost through; ・ Increase of commissionable days ・ Higher maritime transport safety ・ Less repair cost and less shipbuilding cost due to the competition

The following two cases are assumed to undertake the benefit and cost analysis.

Case0: The current shipping service condition will continue without high level of investment. This case assumes that the number of container fleet will be kept unchanged in the future; therefore, only conventional general cargo vessels will be increased whenever additional vessel is required due to the growth of demand.

Case1: The master plan elaborated in the preceding Chapters is implemented.

The economic cost for the master plan is expressed by the incremental cost of Case1 in comparison with Case 0. The additional maintenance cost of Case 1 is also taken into account. Likewise, the economic benefit is calculated from the transport cost savings in Case 1 compared to Case 0. Those benefits are mainly expressed as follows:

a. Cargo transport shipping cost savings due to ship modernization, increase of container ships and enlargement of ship size.

b. Passenger transport shipping cost savings due to the rearrangement of passenger service network and the allocation of better size ships to the each route.

c. Passenger time cost savings due to the rearrangement of service network

d. Reduction of marine accidents due to the improvement of ship maintenance by establishing the ship management company which includes the damage to ships, cargo loss and human life loss.

In order to simplify the analysis, the following assumptions are made.

- Though wide range of programs and recommendations are proposed in the master plan, the economic analysis is focused on the fleet renovation/expansion including the container ship increase, rearrangement of passenger shipping services and improvement of ship conditions through the better management/maintenance and increase in the repair capacity.
- The analysis period is assumed to be the period from 2005 to 2024, therefore all the investment in the master plan will be made in this period and the benefit accrued from the investment is also limited during the same period.
- As for the cargo ships in Case 0 (Without Master plan), the ship life is assumed as 40 years throughout the above period, the newly procured ships are assumed to be 15 years old. For passenger ships in Case 0, the total fleet requirement is firstly estimated assuming that the current passenger service network will be maintained until 2024, then, the fleet procurement cost is calculated under the condition that only new ships will be procured and the ship life will be 25 years for the sake of safety.
- For the purpose of economic evaluation, the economic costs are estimated by subtracting insurance, tax and duties or subsidies by cost item from the financial cost, since they are not deemed as real economic cost but rather as monetary transactions among different entities.

14.2.2. Investment Cost

(1) Fleet Cost

As mentioned above, the fleet cost for the economic evaluation is expressed by the incremental fleet procurement cost of Case 1 (Master plan case) compared to Case 0 (Without master plan).

The fleet procurement cost for the base case in the previous section is adopted as the cost for Case 1 (Master plan case). On the other hand, the fleet procurement cost for Case 0 is estimated based on the above assumptions.

Table 14.2.2 Fleet to be acquired

(Billion Rp)

	Ship Type	2004 – 2009	2009 – 2014	2014 – 2019	2019- 2024	Total
Case 0	Conventional	10,536	10,536	14,565	16,624	52,259
	Container	32	32	1,410	998	2,471
	Bulker	268	268	462	478	1,476
	Barge	262	262	144	98	765
	Tanker	4,752	4,752	4,639	3,520	17,664
	Passenger	3,752	2,941	1,960	3,913	12,566
	Total	19,601	18,791	23,179	25,630	87,201
Case 1	Conventional	8,065	7,730	11,067	18,621	45,483
	Container	3,656	6,126	5,988	11,198	26,967
	Bulker	466	593	704	818	2,581
	Barge	322	349	259	1,036	1,967
	Tanker	9,470	7,481	6,579	13,027	36,556
	Passenger	5,628	4,637	2,149	3,849	16,264
	Total	27,607	26,916	26,745	48,549	129,817
Additional Cost (Case1- Case0)		8,006	8,125	3,566	22,920	42,616

(2) Cost for Expansion of Dockyard

In case of "without Master plan"(Case 0), it is assumed that the dockyard will not be expanded in the future as well, while in the case of "with Master plan" (Case1), the capacity of the dockyard will be increased in accordance with the fleet increase.

The dockyard will be either floating dock or graving dock, therefore the investment cost for the dockyard development is assumed as the average cost. Assuming the tax and duties be 10%, the economic cost for the dockyard will be 8,694 billion Rp during the years from 2014 to 2024.

Table 14.2.3 Development Cost for Dockyard (2014-2024)

	Cost(million US$)	**Economic cost for Dockyard (Billion Rp)**
Floating dock	1,000	8,694
Graving dock	1,300	

Note: 1US$ = 8,400Rp

14.2.3. Benefit Estimation

(1) Transport Cost Savings for Cargo shipping

The cargo transport cost is expected to decrease owing to the various factors of the proposed Master plan: The fleet replacement to younger age ships will contribute to the higher average speed and the containerization will contribute to the reduction in cargo handling time. The fleet size expansion will result in capital cost reduction per DWT, better ship management will decrease docking days. All the factors above may reduce the transport cost in cargo shipping services. Table 14.2.4 shows the improvement scenario of container ship productivity, which is the most critical factor for fleet modernization.

Table 14.2.4 Improvement of Container Ship Productivity

	2002	2014	2024
Ave. DWT	7,700	8,900	11,000
Ave. Age	20.2	16.7	15.0
Ave. Speed (knot)	12.4	13.5	15.0
Commissionable days	346	353	359

The financial unit transport cost is converted to economic cost for the above mentioned reasons as shown in Table 14.2.5.

Table 14.2.5 Financial Unit Transport Cost

Ship Type	DWT/GT	Fixed Cost (mill.Rp/yr)	Dist.Cost (mill Rp/mile)	Cargo/passenger Cost (mill.Rp)	Call Cost (mill.Rp/Call)
Container	5000	12,900	0.04	0.12/TEU	3.56
	10000	14,500	0.06	0.12/TEU	5.08
Conventional	3000	9,000	0.04	0.002/MT	2.15
	10000	14,000	0.07	0.002/MT	6.16
Bulker	10000	10,800	0.04	0.002/MT	5.08
	20000	25,200	0.12	0.002/MT	7.50
Tanker	5000	16,000	0.07	0.004/MT	1.25
	30000	34,000	0.08	0.004/MT	4.15
Passenger	5000	17,580	0.05	0.024/pax	0.93
	10000	31,600	0.11	0.024/pax	2.74

Source: STRAMINDO surveys and interviews

Table 14.2.6 Economic Unit Transport Cost

Ship Type	DWT/GT	Fixed Cost (mill.Rp/yr)	Dist.Cost (mill Rp/mile)	Cargo/passenger Cost (mill.Rp)	Call Cost (mill.Rp/Call)
Container	5000	10,320	0.036	0.108/TEU	3.20
	10000	11,600	0.054	0.108/TEU	4.57
Conventional	3000	7,020	0.036	0.0018/MT	1.94
	10000	10,920	0.063	0.0018/MT	5.54
Bulker	10000	8,964	0.036	0.0018/MT	4.57
	20000	20,916	0.108	0.0018/MT	6.75
Tanker	5000	12,800	0.063	0.0036/MT	1.13
	30000	27,200	0.072	0.0036/MT	3.74
Passenger	5000	15,822	0.045	0.0216/pax	0.84
	10000	28,440	0.099	0.0216/pax	2.47

Note: Economic cost is obtained by deducting all the taxes and duties from the financial cost

Total transport cost is estimated by applying a cost minimization algorithm, since the packaging type of dry cargo is changeable either container or general cargo or bulk cargo depending on the commodity type, port condition and vessel type/size available etc. The actual transport system may differ from the idealistic cost minimum approach but will gradually become closer to the minimum cost in the future owing to the market

mechanism only if free competition is assured.[1]

The calculation procedure is as follows. Firstly the representative vessel for dry cargo that will minimize the transport cost is determined by each combination of OD. Then, the transport cost of cargo demand for an OD combination is calculated by using total cargo tonnage, the required number of voyages, required days per voyage and the unit transport cost of the selected representative vessel. The calculation is made for the cargo demand of all the OD pairs.

As for the liquid cargo, the current transport cost is expanded as much as the demand growth. Finally the total cost is obtained by summing up the transport costs of dry cargo demand as well as the liquid cargo demand for all the OD pairs.

By using above unit cost, the total transport cost for the above two cases are estimated in terms of economic cost as shown in Table 14.2.7. The transport cost in Case 1 is lower than that in Case0. The difference indicates the economic benefit stemming from the implementation of fleet renovation of Case1 instead of Case0. (Refer to Figure 14.2.1) The benefit in the cargo transport cost is estimated to be 4,240 billion Rp in 2014 and 5,184 billion Rp in 2024.

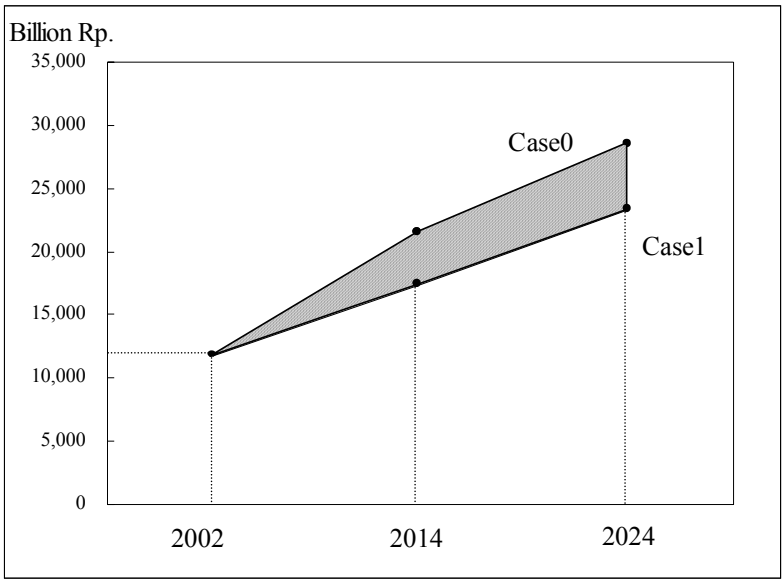
Table 14.2.7 Economic Cost for Cargo Shipping Service

(Billion Rp)

Cargo Transport Cost	2002	Case0		Case1	
		2014	2024	2014	2024
Fixed Cost	8,048	14,919	21,766	11,984	16,536
Fuel Cost	3,188	5,900	5,925	4,621	5,690
Cargo handling cost	410	713	726	721	1,005
Port call cost	81	158	157	124	158
Total	11,726	21,690	28,574	17,450	23,390

Note: Detailed transport costs by vessel type are indicated in Appendix 14.2.

Figure 14.2.1 Transport Cost for Two Cases



[1] The fleet cost minimization algorithm is shown in "4.6.1 Methodology and Key Parameters" of Technical Report 1.

(2) Transport Cost for Passenger Service

As for passenger services, the transport cost savings are estimated by comparing the two cases, the current network system and the proposed network system as elaborated in Chapter 10.

The total transport cost will be reduced by employing the proposed network system as shown in Table 14.2.8. The passenger demand grows about 50% from 2002 to 2014, while the growth from 2014 to 2024 is insignificant, therefore the total transport cost for passenger services will also remain at the same level after the year 2014.

Consequently the total economic benefit is calculated as 793 billion Rp for both years, 2014 and 2024.

Table 14.2.8 Passenger Transport Cost Savings

(Billion Rp)

	2002	2014	2024
Case0	3,400	4,270	4,270
Case1	3,400	3,477	3,477
Benefit	0	793	793

(3) Passenger Time Cost

The passenger time value is estimated from the per capita GDP of 7.59 million Rp / yr in 2002. Hence, the hourly value is estimated as 2600 Rp/person.

Table 14.2.9 Per Capita GDP in 2002

GDP (Billion Rp)	1,610,012
Population (million)	212
Per capita GDP (mil.Rp/yr)	7.59

Source: Statistical Yearbook of Indonesia 2002

The total passenger time is estimated from the passenger ship assignment results. Since the proposed network has been simplified compared to the present network, the total passenger time will slightly increase. Accordingly the incremental passenger time is accounted as a negative benefit, estimated at 41 billion Rp in 2014 as well as 2024.

(4) Maritime Accidents

The proposed ship management system elaborated in Chapter 11 will contribute to the reduction in maritime accidents and reduction in repair days. The latter is already included in the form of increase in commissionable days in estimating transport cost savings. Accordingly, the reduction of accidents is estimated as the economic benefit in this section.

According to the statistics from DGSC, the number of maritime accidents in the recent years ranges from 60 to 100 per year. Most of them are caused by human error or natural

disaster; however, some of them are caused by inadequate maintenance of ships, such as "mechanical trouble" and some which are classified as "sunken" in the Table 14.2.10, which will be reduced by establishing the proposed ship management system.

Table 14.2.10 Number of Marine Accidents

Cause	1996	1997	1998	1999	2000	Total
Mechanical trouble	2	2	5	1	2	12
Capsized	0	2	0	3	3	8
Collision	5	25	15	12	8	65
Fallen to sea	0	5	0	2	1	8
Fire	1	11	11	16	9	48
Flooding	1	1	4	4	4	14
Stranding	3	14	16	21	4	58
Sunken	9	38	41	38	26	152
Others	5	1	6	3	2	17
Total	26	99	98	100	59	382

Source: DGSC

The accident loss is estimated by applying the following formula:

- Ship cost: (Unit price of DWT by ship type at the average age of the corresponding ship type) x (DWT of the accident ship)
- Human life loss: (Number of victims) x (Per capita GDP)
- Cargo loss: (Loaded cargo tonnage) x (Unit cost of cargo tonnage)

Assuming that those classified as "mechanical trouble" and half of those classified as "sunken" will be avoidable if the proposed ship maintenance system is employed. The average loss avoidable during the years from 1998 to 2000 is estimated to be 37.7 billion Rp per year as shown in Table 14.2.11. The benefit expected from the reduction of accident is estimated to be 52 billion Rp in 2014 and 72 billion Rp in 2024 assuming the accident rate is proportional to the total fleet.

Table 14.2.11 Marine Accidents Cost

(million Rp)

	1998	1999	2000	Average
Ship cost	38,118	34,995	24,065	32,392
Human life loss	607	1,534	2,582	1,574
Cargo loss	1,800	3,317	5,969	3,695
Total	40,524	39,846	32,615	37,662

(5) Total Benefit

The above benefits are summarized in Table 14.2.12. The total economic benefit is estimated to be 4.2 trillion Rp in 2014 and 4.5 trillion Rp in 2024.

Table 14.2.12 Estimated Benefit

(Billion Rp)

	2014	2024
Cargo Transport Cost Savings	3,456	3,797
Pax. transport Cost Savings	673	669
Reduction of Maritime Accidents	52	72
Total	4,181	4,538

Note: Pax. transport cost savings include the passenger time cost

14.2.4. Cost Benefit Analysis

The cost benefit analysis is undertaken based on the following assumptions.

- The period for the analysis is assumed to be the years from 2004 to 2024.
- The annual investment is made uniformly every five years, since the investment cost is estimated by four five-year periods.
- The residual value of the additional investment for the fleet is estimated by assuming that the economic ship life be 30 years with scrap value of 5% of new ship cost.
- The discount rate is assumed as 12 % per annum.

As a result of the cost benefit analysis, the evaluation indicators are calculated as shown in Table 14.2.13. The detailed cost benefit stream is attached in Appendix 14.3.

Table 14.2.13 Evaluation Indicators

	Value
Benefit cost Ratio (B/C)	2.08
Net Present Value (Billion Rp)	11,172
Internal Rate of Return (IRR)	37.3 %

The overall internal rate of return of the Master plan is estimated to be 37.3% and the net present value is 11.2 trillion Rp. The above figures indicate that the proposed master plan is highly feasible from the viewpoint of national economy.

In relation to the cost benefit analysis, the Study does not calculate financial rate of return (FIRR) for the overall Master Plan which includes various projects and programs in the shipping and related industry. FIRR is usually calculated when it is implemented and operated by a specific entity as an income producing project and evaluated from the viewpoint of financial viability whether it is profitable or not for the entity. For the sake of Master Plan evaluation, however, its standpoint should be placed on nation or Indonesian people as a whole.

14.2.5. Sensitivity Analysis

As a sensitivity analysis of the economic evaluation, the following cases are identified.

1. Increase of Investment Cost
2. Improved port productivity
3. Unlimited Port Draft

(1) Increase of Investment Cost

The main portion of the investment cost for the master plan consists of the fleet procurement cost and the development cost of the ship dockyard.

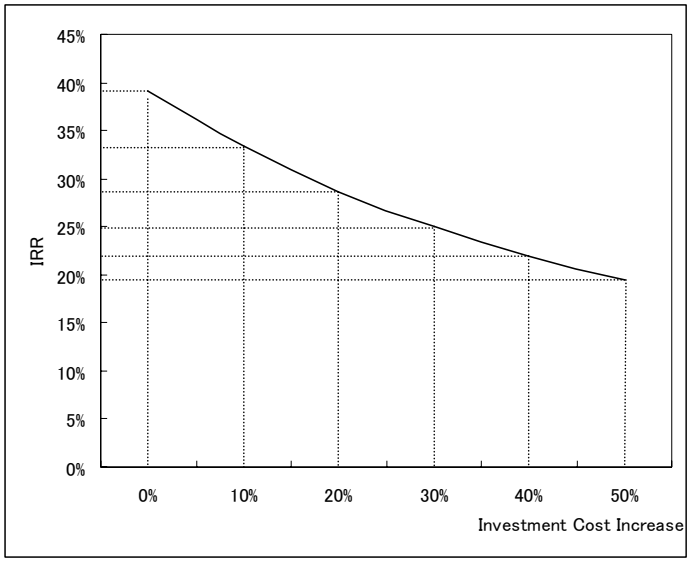
The ship price is sometimes influenced by the market condition or production efficiency of ship building industries. The development cost of dockyard is also including uncertain factors, therefore, the sensitivity of those investment cost to the economic feasibility is examined.

The following table shows the result of the evaluation indicators in the case of 20% increase of investment cost. The resulting EIRR is 28%, which indicates that the master plan is still economically feasible. Even if the investment cost increases as much as 50%, the EIRR will be remaining at nearly 20%.

Table 14.2.14 Evaluation Indicators in case of 20% Cost Increase

	Value
Benefit cost Ratio (B/C)	1.75
Net Present Value (Billion Rp)	9,207
Internal Rate of Return (IRR)	28.7 %

Figure 14.2.2 Relationship between Cost Increase and EIRR



(2) Improved Port Productivity Case (Case 2)

This case assumes that the port productivity is to be improved in terms of waiting time

and cargo handling speed as follows.

Table 14.2.15 Improved Port Productivity

	2002	2014	2024
Waiting Time (2002 = 1.0)	1.0	0.5	0.5
Cargo Handling Speed (2002 = 1.0)	1.0	1.2	1.2

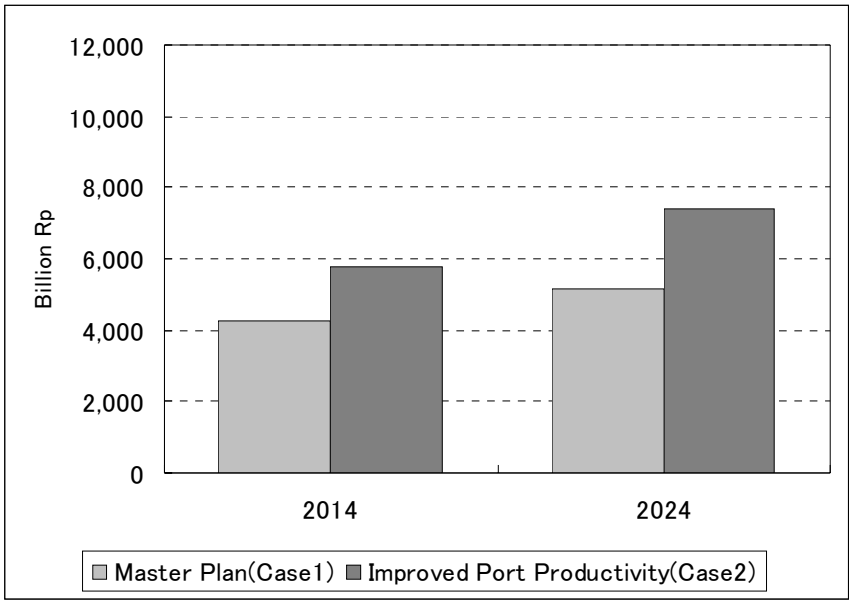
The resultant transport costs in this case are shown in Table 14.2.16 in comparison with the Master plan case (Case1). The transport cost in Case 2 will be further reduced from the master plan case as much as 1,521 billion Rp in 2014 and 2,232 billion Rp in 2024. Since the port improvement is out of scope in this study, the cost incurred by the port improvement has not been estimated, therefore, the evaluation factors such as EIRR, NPV etc. are not calculated in this case.

Table 14.2.16 Transport Cost Reduction in Improved Port Productivity Case (Case2)

(Unit: Rp Million)

	2014				2024			
	Master Plan (Case1)		Improved Port Productivity (Case2)		Master Plan (Case1)		Improved Port Productivity (Case2)	
	Total Cost	Expected Benefit	Total Cost	Expected Benefit	Total Cost	Expected Benefit	Total Cost	Expected Benefit
Container	2,846,947	-1,638,582	2,468,669	-1,260,304	4,888,525	-3,685,389	4,281,582	-3,078,446
General Cargo	6,535,017	5,827,590	5,639,525	6,723,082	9,754,273	8,764,005	8,412,439	10,105,839
Bulk	2,167,224	51,785	1,919,852	299,156	2,527,548	105,766	2,244,762	388,553
Total	11,549,188	4,240,793	10,028,046	5,761,934	17,170,346	5,184,382	14,938,783	7,415,945

Figure 14.2.3 Comparison of Expected Benefits (Case1 vs. Case2)



Note: The benefits include cargo transport cost savings, passenger transport cost savings, reduction of maritime accidents etc.

(3) Unlimited Draft Case (Case 3)

The cargo OD demand in this Study covers 130 ports as origin and/or destination. Most of the ports have constraints for accommodating large vessels requiring deep draft. Accordingly, only small ships are operated among those ports with shallow water depth. Even for the strategic ports, the port condition is not always sufficient for large vessels so that waiting loss time for high tide is required.

In order to figure out such transport cost due to the port constraint, the unlimited draft case, that all the ports would be able to accommodate large sized vessels if transport demand exists.

As shown in Table 14.2.17, if the port constraint is removed, all the cargo will be totally containerized and large size vessels are selected as the most economical type.

Table 14.2.17 Containerized Cargo Ratio by Case

	2002	2014	2024
Case0	28.1%	7.8%	8.5%
Case1	28.1%	39.8%	42.6%
Case2	28.1%	39.9%	42.6%
Case3	28.1%	86.6%	89.9%

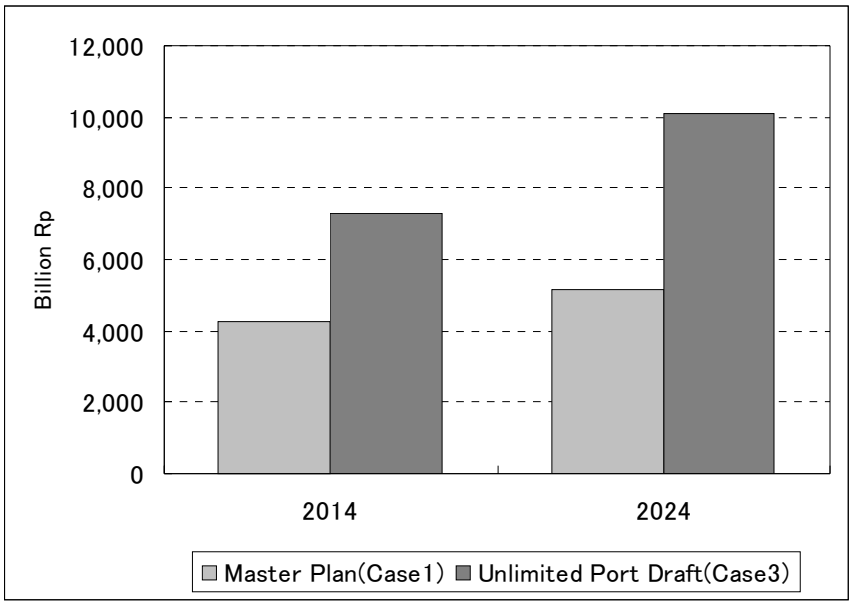
The transport cost in Case 3 will be drastically reduced further when compared to Case 1 (Master Plan Case) despite of increasing container shipping cost due to a drastic shift to further containerization. The total transport cost will decrease as much as 3.0 trillion Rp in 2014 and 4.9 trillion Rp in 2024 from the Case 1. It suggests that infrastructure development at ports will bring about great deal of benefits to the shipping service industry.

Table 14.2.18 Transport Cost Reduction in Unlimited Draft Case (Case1 vs. Case3)

(Unit: Rp million)

	2014				2024			
	Case1		Case3		Case1		Case3	
	Total Cost	Expected Benefit	Total Cost	Expected Benefit	Total Cost	Expected Benefit	Total Cost	Expected Benefit
Container	2,846,947	-1,638,582	5,090,847	-3,882,482	4,888,525	-3,685,389	8,390,955	-7,187,819
General Cargo	6,535,017	5,827,590	1,564,956	10,797,650	9,754,273	8,764,005	1,737,430	16,780,848
Bulk	2,167,224	51,785	1,850,367	368,642	2,527,548	105,766	2,151,377	481,938
Total	11,549,188	4,240,793	8,506,171	7,283,810	17,170,346	5,184,382	12,279,761	10,074,967

Figure 14.2.4 Comparison of Expected Benefits (Case1 vs. Case3)



Note: The benefits include cargo transport cost savings, passenger transport cost savings, reduction of maritime accidents etc.

14.3. Macroscopic Analysis of the Domestic Shipping Industry

14.3.1. Affordability of Fleet Procurement

(1) Cargo Ship

In order to realize fleet modernization, a substantial amount for procurement cost is required. In the Base Case, for instance, it is estimated to be approximately 114 trillion Rp for the period until 2024. Accordingly, the affordability of the shipping service industry is roughly examined in this section.

The cargo tariff system is still not clear until now, therefore, tariff assumption will be inevitable for the above purpose. Based on the sample company survey, the profit of shipping companies seems to be 5% to 10% of the total revenue. Assuming that the profit is 7.5% of the freight revenue in average, the total financial resources of the shipping industry is estimated as shown in Table 14.3.1.

The financial resources for vessel procurement consisting of the profit and depreciation cost will be 5.9 trillion Rp in 2014 and 8.0 trillion Rp in 2024. The total amount during the 20 years from 2005 to 2024 will be 120.7 trillion Rp, which will exceed the procurement cost. The lowest limit of the profit margin is estimated at around 5% of the freight revenue.

Accordingly, if the above profit level is maintained, the shipping service industry will be able to afford the fleet procurement in the base case.

Table 14.3.1 Financial Affordability of Shipping Industry

(billion Rp.)

	2002	2014	2024
Container	1,394.6	3,320.0	5,703.8
General Cargo	5,552.4	7,686.5	11,476.8
Bulker	1,590.3	2,513.5	2,933.3
Tanker	5,611.1	7,452.1	7,863.4
Total Freight	14,148.4	20,972.1	27,977.2
Profit (a)	1061.1	1,572.9	2,098.3
Depreciation (b)	2,924.2	4,345.3	5,949.1
Total (a) +(b)	3,985.4	5,918.2	8,047.4

Note: Depreciation cost is obtained by assuming 15 years for the depreciation period, which is normally used by shipping companies. (refer to Appendix 14.1 for more in detail)

(2) Passenger Ship

In case of passenger services, the fare-box ratio as a whole network is estimated to be less than 1.0 at present as well as in the future as explained in the previous section. The annual deficit in 2002 is estimated as about 500 billion Rp, however the operation is expected to become profitable if the master plan network service is adopted. The operating profit will be 130 billion Rp in 2014 and will remain at the same level until 2024. If Ro-ro passenger ship is introduced, the profit will further increase to 628 billion Rp in 2014 and thereafter. If assuming that the master plan network service is realized in 2014, the total financial resources during the 20 years till 2024 will be approximately 1.8 trillion Rp.

On the other hand the total procurement cost during the coming two decades will be 16.3 trillion Rp. therefore, the passenger service industry as a whole cannot afford to procure the required fleet.

However, if only the operation for the Primary and Secondary routes is selected, the financial resource consisting of profit and depreciation is estimated to be 735 billion Rp in 2014 and thereafter. Since the procurement needs for the primary and secondary routes are not known, further analysis will be required to assess affordability.

14.3.2. Impact of Master Plan to the National Economy

In this section, the impact of the Master plan to the GDP (Gross Domestic Products) in the domestic maritime transport is examined. GDP is the total value added brought about from all the economic activities including productions and services in the country.

The total value added is calculated by summing up the labor cost, interest and profit. As shown in Table 14.3.2, the value added in the domestic maritime transport industry in 2002 is estimated to be 4,977 billion Rp, which makes up approximately 50% of GDP in the Sea Transport Sector.

Table 14.3.2 Total Value Added by Domestic Sea Transport

(billion Rp)

		Container	Conventional	Bulker	Tanker	Passenger	Total
Crew Cost	2002	112	369	98	215	375	1,170
	2014	261	577	155	285	449	1,728
	2024	438	868	178	301	449	2,234
Profit	2002	105	416	119	421	-500	561
	2014	249	577	189	559	130	1,702
	2024	428	861	220	590	130	2,228
Interest	2002	348	1,428	381	768	321	3,245
	2014	806	1,920	600	1,019	385	4,730
	2024	1,357	2,830	687	1,076	385	6,334
Total Value Added by domestic sea transport	2002	565	2,214	598	1,403	197	4,977
	2014	1,316	2,993	943	1,864	964	8,079
	2024	2,223	4,422	1,085	1,966	964	10,660

Table 14.3.3 Contribution of Domestic Sea Transport to GDP in 2002

Total GDP (Billion Rp)	1,610,012
GDP Transport Sector (Billion Rp)	72,234
GDP Sea Transport (Billion Rp)	9,794
Domestic Sea Transport (Billion Rp)	4,977
Contribution to Total Sea Transport Sector	50.8%

Source: BPS, JICA Study Team

The value added by the domestic sea transport is expected to grow to 8,079 billion Rp in 2014 and 10,660 billion Rp in 2024. Accordingly the domestic sea transport will push up the GDP as much as 3,100 billion Rp by 2014 and 5,400 billion Rp by 2024.

In addition to the contribution to GDP, the Master plan will have further impacts to national economy by investing for fleet renovation and dockyard development. Those impacts are estimated by using the Input –Output (I-O) table of Indonesia. It is a statistical description in a matrix form that shows the transactions of goods and services and the interrelationship of the economic activities of various sectors of Indonesia. The source of main data for compiling the I-O table is same source as the data for calculating GDP. By using the inverse matrix, effects of the investment in the master plan are measured considering the sectors' backward and forward linkages.

The total multiplier effects to the production and services of domestic industries are estimated as shown in Table 14.3.4. The total impacts are estimated as 326 trillion Rp during the master plan period, witch is about 2.3 times higher than the direct investment cost.

Table 14.3.4 Total Multiplier Effects to Indonesian Economy

Investment	Description		Impacts (billion Rp)		
			Backward	Forward	Total
Fleet Procurement	Direct investment				129,817
	Impacts to domestic industries	Sea Transport Industry	0	1,671	1,671
		Petroleum Refinery	14,752	186	14,938
		Manufacturing Non-metalic products	183	4,132	4,315
		Manufaturing metal products	382	2,490	2,872
		Manufacturing Machinery	2,461	2,492	4,954
		Manufacturing Transport Equipments	5,482	116	5,599
		Trading	2,763	487	3,249
		Finance/business services	8,315	605	8,920
		Other Industries	57,296	57,043	114,339
	Sub-Total		91,634	69,222	290,673
Dockyard Development	Direct investment				9,660
	Impacts to domestic industries	Ship building industry	0	4,898	4,898
		Inland Transport Industry	418	1,429	1,847
		Sea Transport Industry	116	5,482	5,599
		Trading	521	41	562
		Manufacturing rubber,plastics	461	45	506
		Manufacturing iron and steel	1,078	37	1,115
		Finance/business services	769	102	870
		Other Industries	4,232	6,022	10,254
	Sub-Total		7,595	18,056	35,311
Total			99,229	87,278	325,984

Note: Estimated by JICA Study Team using Input-Output Table (BPS)

14.4. Selection of STRAMINDO Action Plan Components

According to the analysis of the previous sections in this chapter, implementation of the STRAMINDO Master Plan is highly feasible from a national economy viewpoint. Tangible benefits through cargo cost saving, passenger time and cost saving, and reduction in accident costs, alone, generate a high economic internal rate of return of 39%. Although the result encourages both domestic shipping industry and administration, the implementation must face with critical issues such as raising finance for procuring Rp 27.6 trillion worth of fleet until the year 2009.

Effective domestic shipping development with addressing such a representative issue is only possible if a number of interrelated individual projects are properly coordinated and implemented in an integral manner. In order to implement part of the Master Plan in the short-term, the Study also formulates Action Plan with paying attention on three priority areas: (1) expanding shipping investment channels towards Indonesian flagged vessels, (2) developing competitive domestic fleet through increasing investment and preventing the fleet from unfavorable asset devaluation, and (3) starting capacity building undertakings.

The Study put two criteria in selecting Action Plan components. They are (1) to sufficiently meet short-term development needs, and (2) to effectively guide subsequent Master Plan projects in the mid to long-term. After those selection procedures, seven projects/programs are selected with their narratives as follows:

For expanding shipping investment channels: (refer to Chapter 15)

(a) Urgent policy package of improving shipping investment environments

Considering a profit-making business nature, most of shipping investment must be done on a commercial basis. Shipping companies which have a good business plan and enough capability to accomplish it may access to favorable financial services. If not, there might be some institutional barriers and shortcomings between shipping companies and financial markets. Such negative elements should be removed immediately to avoid unfavorable fund shortage and further dependency on foreign chartered vessels.

(b) Strategic ODA loan package for Indonesian inter-island shipping development

ODA is a potent tool for developing countries in satisfying basic human needs as well as in facilitating socio-economic development. In this sense, domestic shipping is not exceptional from the areas where ODA can work well for the sake of public welfare. However careful and strategic considerations are necessary to identify ODA suitable areas in order to realize the future domestic shipping system as planned in the Master Plan.

For modernizing and maintaining domestic fleet: (refer to Chapter 16)

(c) Building and assignment of most suitable vessels on regular inter-island routes

The role of liner shipping will be increased as an inter-island infrastructure with addressing some specific issues such as larger fleet on wider network, bigger vessels with more economic competitiveness, and faster service and more efficient inter-modal connection. However the present fleet, which is mostly second-hand vessels when procured, hardly satisfies those issues. Since there is no country that requires such vast inter-island liner system other than Indonesia, it is worth designing the most suitable vessels originally.

(d) Introduction of ship-management company

The Study strongly recommends the introduction of a ship-management company concept in domestic shipping. It has a potential to become a significant breakthrough in balanced development between shipping and ship repairing industries. With a ship-management company, shipping and shipyard management could be modernized. Expected benefits are, among others, shorter ship repairing period and longer ship life. Thus, a workable ship-management company plan in Indonesia should be examined from a regulatory, organizational and financial viewpoint.

For capacity building of maritime transport: (refer to Chapter 17)

(e) Advanced education in shipping industry

Existing maritime education is mostly towards seafarers, with limited attention to shipping management. Attempt to modernize management should start from capacity building as proposed in the Master Plan. An implementable education program is desirable where excellent local resources are mobilized within a platform institution associated with international support.

(f) Maritime administration database center

The Master Plan advocates to building a new partnership between public and private sectors in domestic shipping development. At present, however, the maritime transport administration shows insufficient capability in decision-making and planning shipping routes and vessel space assignment so as to guide the industry. It is widely attributed to poor database management. All the necessary data should be stored in electronic files, reported in a coordinated format and utilized in decision-making and planning works with an effective network among the agencies concerned.

(g) Daily monitoring system for subsidized operation

The Study has confirmed that there is substantial be less or non-commercial shipping demand on Indonesian domestic waters; which are socially indispensable and could not be met by any other means. In this sense, government subsidy is justifiable but its procedure is questionable. For a long time, government had difficulty in controlling those subsidized operations at mostly remote areas. Today, advanced information and communication services such as satellite communication and internet enable real time monitoring and performance analysis. Such a state of the art technology should be examined for improved routine works.

Chapter 15

EXPANDING SHIP INVESTMENT CHANNELS

15. EXPANDING SHIP INVESTMENT CHANNELS

The Indonesian domestic shipping is the largest in the world. Its domestic fleet of 7 million DWT is the largest in the world. However, the domestic fleet is old with an average age of 23 years and is highly dependent on foreign flagged vessels. According to STRAMINDO estimates, the industry will need a considerable fund of Rp 27.6 trillion during the period 2005-09 assuming a scrapping age of 35 years and newly built tonnage covers only 10% of the total fleet procurement. Only by successfully tapping sufficient funds to cover such a big amount, and investing it to promote the national fleet can the country be able to reinforce its cabotage regime.

Available sources are, among others, commercial lending in both domestic and international financial markets, equity finance including FDI, OOF such as export credit, domestic public finance and ODA. Quick fund mobilization is important to avoid unfavorable fund shortage and further dependency on foreign flagged vessels. Each fund source has different characteristics. It is also important to select and arrange a suitable fund source to be best suit the ship type and vessel size. Section 15.1 gives a set of policy directions to facilitate commercial lending to fleet in the domestic financial market. Public finance is another alternative. Thus the way to allocate ODA funds to Indonesian domestic shipping is important and is discussed in Section 15.2. Finally, financial analysis is made on both commercial lending and ODA funding in the case of a model fleet procurement plan in Section 15.3.

15.1. Shipping Investment Environments

Taking account of the nature of shipping business, most of ship finance must be done on a commercial basis. Therefore favorable shipping investment environments are serious concerns among shipowners. In reality, however, interest rate for a 5-year loan which is common to ship financing remains as high as 15-17% although prime bank rate has recently dropped to 8-10%. If this level will be sustained, the demand for loan by shipping companies may remain at a very low level. For example, the largest local bank of Indonesia, Bank Mandiri Indonesia (BMI) provided an amount worth US$ 20 million to the shipping sector during 2002. This is a quarter of loans for transport sector but this is only less than a quarter of one percent (0.25%) of the bank's total lending.

This is a matter of creditability towards fleet asset and shipping business profitability and sustainability. If domestic financial institutions question shipping business, it is difficult to solve immediately. However, institutional arrangements could avoid that banks would be excessively cautious about fleet lending unlike real estates. The immediate arrangements required in Indonesia are ship mortgage and arrest of ships.

(1) Mortgage / hypothec law

The Government is now deliberating the ratification of the International Convention on Maritime Liens and Mortgages 1993, and is expected to be realized in very near future. In parallel with this, Indonesia needs to review the current law on mortgage/hypothec in the Indonesian Civil Code which was used to regulate mortgage on land (note: these provisions are no longer applicable for land mortgage since the enactment of Law No.4/1996 pertaining to security on land.) and other related laws and regulations pertaining to maritime claims and ship mortgage/hypothec.

The Draft Law on Preferential Maritime Claims and Ship Hypothecs prepared by INSA (Indonesian National Shipowners' Association) has been submitted to the Ministry of Communications through the Director General of Sea Communication, is now under discussion at the ministerial level.

The above enactment and ratification are both desired to be realized urgently as it is the first step in introducing international commercial shipping regime.

(2) Arrest of ships

To secure an effective and efficient enforcement procedures when a mortgagor is in default, it would be important for the Government to ratify the International Convention Relating to the Arrest of Sea-Going Ships of 1952 or the International Convention on Arrest of Ships of 1999, and to create a new law for civil procedures which provides a quick and reliable procedure in executing ship mortgages/hypothecs.

Main differences between 1952 Convention and 1999 Convention are summarized in Table 15.1.1. One option for the Government is to opt for the 1952 Convention which has already been ratified by 70 countries, and the other option is to ratify the 1999 Convention which covers broader range of claims including ones related with environmental damages, and is applicable to all vessels whether they are sea-going or not and, in addition, whether or not they are flying the flag of the States of parties to the Convention.

The 1999 Arrest Convention has produced a set of principles which are generally regarded as reasonably balanced, between the interest of legitimate claimants and those of shipping societies seeking to ensure freedom of world trade without undue interference. The 1952 Arrest Convention has achieved a widespread degree of acceptance, and there were those who argued that it was preferable to retain its well-tried principles rather than risk disruption while correcting its few deficiencies. The extension of the right of arrest to claims for environmental damage, wreck removal, insurance premiums, commissions, brokerage and agency fees, and ship sale contracts are all significant steps to correct those recognized deficiencies.

It might be preferable for the Government to ratify 1999 Convention which embodies the most recent trends and requirements of the international society. And in parallel with this, the procedures of foreclosure as provided in the Indonesian Law of Civil Procedure which is quite complicated in its implementation needs to be amended to make it attractive to domestic and foreign financing institutions.

In doing so, however, the Government and law makers may be required to be careful enough not to allow willful extension of the intent of the Convention(s). The Convention(s) stipulates that the arrest is done by court order, as tentative legal action preceding to the court's judgment on the civil case.

In Indonesia, it is said, that there is a general tendency in practice for the port administrator/harbor master or any other public authority to interfere and impose detention on ships (particularly on foreign ships), when the case in question is basically a matter of private law.

This confusing situation with respect to detaining or arresting of vessels may also need to be seriously addressed by the Government and the Parliament, in order to establish international confidence in the country's legal framework and procedures.

The regulatory framework on the arrest of ships needs to implemented and realized as soon as possible (within 3 years or so) to reinforce arrangements in mortgage / hypothec.

Table 15.1.1 Arrest of Ships: Main Differences between 1952 Convention and 1999 Convention

	1952 Convention	1999 Convention
Coverage of ship nationality	"A ship flying the flag of the contracting state" (Article 2)	"Any ship" (Article3-1) – i.e. irrespective of ship's flag, and irrespective of distinction between ocean-going or coastal (domestic use) ship.
The claims for which the arrest is permissible: "Maritime Claims"	16 Categories of "Maritime Claims" (Article1-1)	"Maritime Claim" category list has been made up to date, mainly by adding several obligatory rights stipulated by international Conventions of recent years. --- 22 categories (Article 1-1)
Ship(s) permissible for arrest, and relevant obligator.	"Either the particular ship in respect of which the Maritime Claim arose, ore any other ship which is owned by the person who was, at the time when the Maritime Claim arose, the owner of the particular ship" (Article3-1) --- i.e. so called 'arrest of sister ship' is permissible	(In addition to conditions stipulated in 1952 Convention) "The demise charterer of the ship at the time when the Maritime Claim arose is liable for the claim and is demise charterer or owner of the ship when the arrest is effected." (Article3-1 (a)&(b))
Jurisdiction over the suit	"The Courts of the country in which the arrest was made --- if the domestic law of the country --- gives jurisdiction to such Courts." (Article7-1)	"The Courts of the State in which an arrest has been effected (or security provided to obtain the release of the ship) shall have jurisdiction to determine the case upon its merits, unless the parties validly agree, or have validly agreed to submit the dispute to a Court of another State---" (Article7-2)

15.2. A Package of ODA Loans for Indonesia Inter-island Shipping Development

Public fund is an alternative as long as its mobilization in the domestic shipping sector can be justified economically and socially, and it may not negatively affect other non-publicly financed shipping activities. For example, DGSC has built 11 small vessels for pioneer shipping in recent two years. To accelerate this program the use of external fund sources such as ODA may be necessary and justifiable, owing to the nature of pioneer shipping. This section discusses the significance and desirable schemes of ODA funding.

(1) Necessity of Tapping ODA Fund into the Domestic Shipping Sector

Indonesian domestic shipping industry once experienced ODA-based ship finance service in the late 1970s. At that time PT. PANN purchased second-hand and new vessels built in domestic or foreign yards, in order to renew the then existing fleet, through ship financing, and owning and leasing. Priority was given to the development of the inter-island RLS shipping when it suffered from over tonnage and obsolete fleet. To enable PT. PANN to fund its programs, it got loans from the World Bank, and in addition got funds from BAPINDO and foreign countries in addition to PANN's equity.

Today, domestic shipping circumstances have drastically changed from those days. For instance, there is no strict government-controlled liner network like the inter-island RLS. However, significance of domestic shipping has remained the same under the national development context. The Study has identified the following contemporary needs to tap ODA fund into the sector:

- **Incentive to realize a comprehensive shipping policy framework through establishing a new partnership between public and private sectors**: After a drastic deregulation period, government now attempts again to regain ties with the domestic shipping industry. Under such circumstances, the Study is expected to help the government formulate a comprehensive shipping policy framework. However, more regulations without incentives may not work well. There is a need to identify desirable incentives in line with realizing a comprehensive shipping policy framework through establishing a new partnership between public and private sectors.
- **Development and advancement of inter-island liner shipping network as prime infrastructure of the national transportation system**: Indonesia must maintain a strong inter-island liner shipping network. However, shippers and passengers' satisfaction may differ from time to time. During the Master Plan period, multi-modalism will be permeating throughout the country and further severe competition with air transport is anticipated. Government needs to deliberately encourage the domestic shipping industry to further develop its inter-island liner shipping network.
- **Enhancement of domestic fleet competitiveness with due attention to liberal trade regime such as AFTA**: Besides liner shipping, bulk shipping also needs more competitiveness. ASEAN shipping, intra-regional international shipping, associated with competitive ASEAN products is a new threat to Indonesian domestic shipping under the new trade regime of AFTA. It is also an external threat to government to practice cabotage right. Both fulfilling cabotage and protecting domestic products

must be undertaken together in a market mechanism. For this purpose, beneficial fiscal support to fleet development should be considered as neighboring countries do.

- **Provision of socially indispensable shipping services with government support**: Most of local people residing in remote areas seriously require stable and affordable shipping services due to underdeveloped and agriculture dominated local economic conditions. However the deregulation policy forced a paradigm shift from liner shipping being considered as public utilities, to purely commercial services. As a result, it left little room for internal cross-subsidy among liner operators. Under such policy environment, government should be responsible for delivering socially indispensable shipping services.

- **Enhancement of ship safety and marine environment protection**: Every maritime country at least regulates aspects of safety and environment in conformity with IMO initiatives. Currently, Indonesia has problems related to fleet quality control, attested by PSC records at foreign ports as well as a result of the Study's onboard survey. Government needs to forge out a fleet quality improvement program. The program should not only include unilateral measures such as compulsory scrapping but also inducement measures are necessary. Within the proposed ODA loan package, there are lending opportunities to ship scrapping and replacement projects and fostering professional ship-management services.

- **Balanced development of both shipping and shipbuilding industries**: Shipping is an industry which needs wide supporting industries. Indonesia, as the biggest archipelago, particularly need to develop an effective ship life cycle, i.e., shipbuilding, repairing and breaking. Shipbuilding has a different demand segment from repairing since local shipyards do not build all the domestic shipping fleet. In order to make domestic fleet competitive, however, local shipyards must at least successfully deliver small vessels and some strategic vessels which are desirable in Indonesia but difficult to find in the international second-hand markets. But, the shipping industry may not allow repeating previous failures such as the government-supported shipbuilding project "Caraka Jaya" due to its disregard for local needs. Strategic ODA project is ideal to coordinate shipping and shipbuilding industries and improve local building capability through absorbing advanced foreign shipyard' technology and experience.

- **Increase in cabotage rate (national tonnage share) to a reasonable level**: As a whole, ODA projects are often implemented to show a strong government will in national development. If fulfilling cabotage right is a truly national policy, then the proposed package will work effectively, particularly with extending financial support to national bulk tonnage since Indonesia substantially depends on foreign chartered vessels in liquid and dry bulk shipping.

(2) Desirable ODA Funding Areas

As mentioned above, much is expected to ODA fund in domestic shipping. In reality, however, it may not be abundant and thus priority funding areas should be carefully determined. The Study has identified three priority areas: (1) renewing and conversion of existing idle fleet, (2) assignment of most suitable vessels on inter-island liner routes, and (3) maintaining and expanding socially indispensable tertiary shipping.

The Study suggests the Indonesian government to establish an ODA-based inter-island shipping development program which will meet 10% of domestic fleet investment during the period 2005-09 or Rp 2.8 trillion. Assuming that JBIC loan is available, methods to finance the fleets in the three priority areas are as follows:

(a) Renewal and Conversion of Existing Fleet

Based on the Study's observation, many domestic vessels are idling due to long waiting time for cargoes and spare parts. It is particularly it is true among dry bulkers and conventional vessels. It implies that Indonesian domestic shipping is in a complicated situation where over tonnage and fleet shortage concurrently exist. In other words, there are plenty of vessels but the vessels and services which shippers seek for are not sufficient. Such poorly performing fleet is a weak point in the national logistics chain. It is serious among domestic suppliers since they may be placed at a disadvantage against competitive ASEAN products associated with better regional shipping services under AFTA regime.

The most cost and time effective measure is to convert rehabilitate idle vessels as long as they are seaworthy. The second option is to replace existing obsolete vessels with young second-hand vessels with necessary modification. In this connection, vessel priority must be consistent with the government's cabotage policy, specifically pertaining to its plan to exercise cabotage right on several commodities in the short-term, including, coal, oil, CPO, fertilizer, wood, rice and rubber. Therefore priority should be given to vessels serving those cargoes.

Target Fleet

In the first phase, an existing fleet of 250,000 DWT will be renewed and converted. With a maximum sub-loan period of 5 years, it is designed that the fund will be re-lended by 5 times on the average during the program period. In total, this project will realize 1.25 million DWT of vessels through rehabilitating and remodeling idle vessels.

(b) Assignment of Most Suitable Vessels on Inter-island Liner Routes

Indonesian inter-island liner shipping carries passengers and non-bulk freight. In recent years, the inter-island fleet has changed its composition by assigning many container vessels and the introduction of RoRo vessels including RoRo passenger vessels. The inter-island liner shipping actually forms the primary infrastructure of the national transport system. Thus it is not exaggerated that the pace and service quality of inter-island liner shipping development must keep up with the pace and scale of economic development, particularly outside Java Island.

Indonesian domestic shipping has the largest industry in the world in terms of fleet tonnage and service coverage. Therefore it is not unusual for national shipping lines to face difficulty to purchase suitable second-hand vessel in the market. This project attempts to build newly designed vessels to meet the need of inter-island liner shipping in the future. It is recommendable to employ a package-deal method where Indonesian shipbuilder and a foreign shipbuilder of work together to deliver excellent vessels technically and economically.

Target Fleet

Firstly, two kinds of vessels will be selected for inter-island liner shipping. The vessels could be first built in a foreign shipyard, and then duplicated at local shipyards under the guidance and supervision of a foreign shipbuilder.

With a maximum sub-loan period of 15 years, it is designed that the fund will re-lent 2 times on the average during the program period. In total, this project will deliver 12 new vessels to Indonesian shipowners. The total built tonnage will range from 120,000 DWT to 180,000 DWT.

(c) Maintaining and Expanding Socially Indispensable Tertiary Shipping

The government of Indonesia must support much non-commercial and less commercial shipping needs of the country; due to severe and vast regional disparity thus such services are socially indispensable. So far, the state-owned shipping company, PT. PELNI, has provided nationwide services. Most of which may not be viable without government support. Government has also maintained a pioneer shipping network with a considerable amount of operation subsidy.

According to STRAMINDO's estimate, such none or less commercial shipping needs will remain at a substantial level in the Master Plan period. However, PT. PELNI will not be able to maintain the current nationwide shipping network due to adverse competition with civil aviation. Government has another problem in regard to accommodating new comers in pioneer shipping, resulting in inactive bidding and further government support from the government. Therefore this project intends to reorganize those none and less commercial feedering services into one common basket, so-called tertiary shipping. In the new scheme, the government, both central and local, is required to take more responsibility such as increasing government owning and co-owning vessels in line with improved services.

Target Fleet

Small cargo-passenger vessels ranging from several hundred to less than two thousand tons are subjects of the project. The Study has estimated that the necessary tertiary shipping fleet will be around 110,000 GT in the year 2024. The method of fleet development is conversion of existing small conventional vessels and new construction at local shipyards

Due to its compactness, a maximum sub-loan period of 10 years is required for newly built vessels. Thus it is designed that the fund will be re-lent by 3 times on the average during the program period. In total, this project will build or renew a fleet of 120,000 DWT.

(3) Estimated Program Scale

Foreign Currency Portion: JPY 30 billion（repayment period: 30years, grace period: 10years）

Local Currency Portion: JPY 7 billion equivalent

Table 15.2.1 Program Scale

(unit: JPY billion equivalent)

Project Budget	FC	LC
(a) Renewing and Conversion of Existing Idle Fleet	10.0	2.5
(b) Assignment of Most Suitable Vessels on Inter-island Liner Routes		
• To be built in Foreign Yard	5.0	0
• To be built in Local Yard	8.0	2.0
(c) Maintaining and Expanding Socially Indispensable Tertiary Shipping	4.2	1.8
Consulting Fee	1.9	0.5
Contingency	0.9	0.2
Program Total	30.0	7.0

Note: Building unit cost: (a) JPY50,000/DWT, (b) JPY 200,000-300,000/GT, (c) JPY150,000/DWT

(4) Methods of Finance

(a) Renewing and Conversion of Existing Idle Fleet: Two-step loan of ODA fund will be provided through Bank Mandiri Indonesia (BMI) for loans to shipping companies with plans to improve or renew vessels.

(b) Assignment of Most Suitable Vessels on Inter-island Liner Routes: ODA fund will be provided to a Ship Management and Holding Company (SMHC). New vessels both imported and locally built should be procured through public bidding by SMHC and to be sold to the selected shipping companies. The sales contract could be either lease purchase or installment payment through BMI.

(c) Maintaining and Expanding Socially Indispensable Tertiary Shipping: In the case of government owning vessels, SMHC will manage the vessels. In the case of a two-step loan to shipping companies to finance either vessel conversion or new construction, a combination of BMI and SMHC or Bank Rakyat Indonesia (BRI) and SMHC funding will be arranged. BRI may be preferable when many small shipping companies apply to this finance facility.

Figure 15.2.1 Method of Finance for Renewing and Conversion of Existing Idle Fleet through Two-step Loan

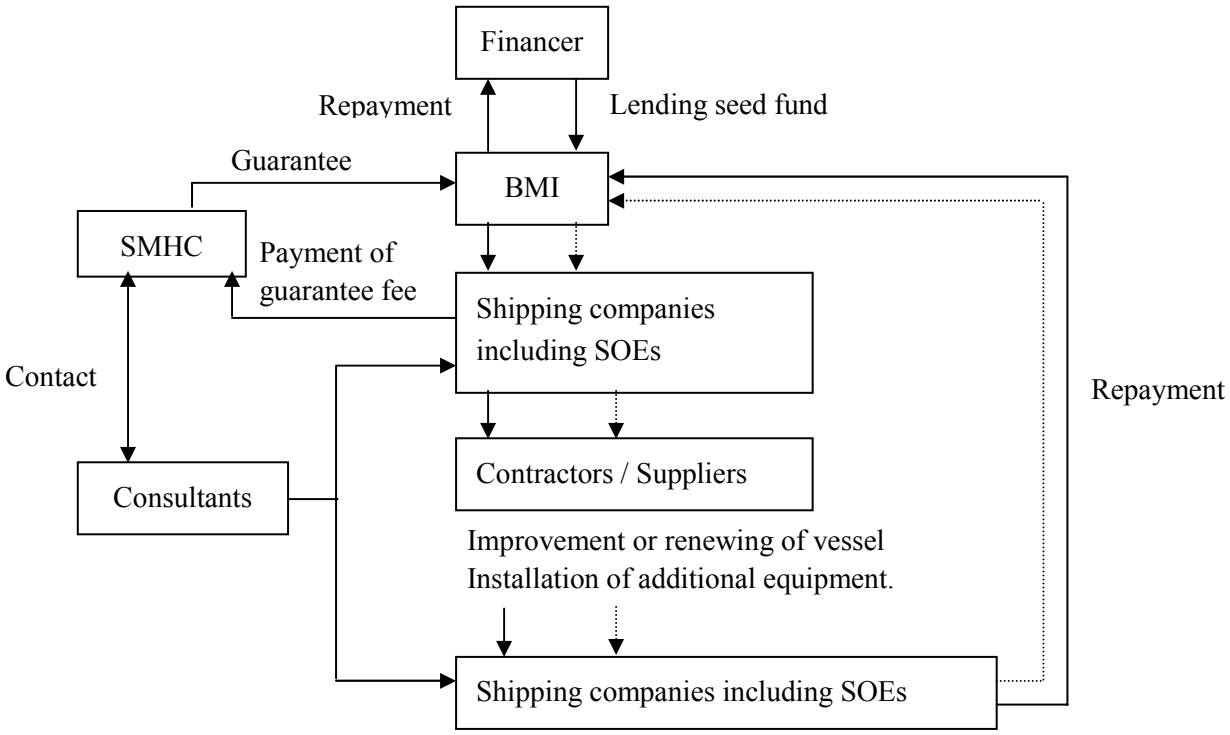
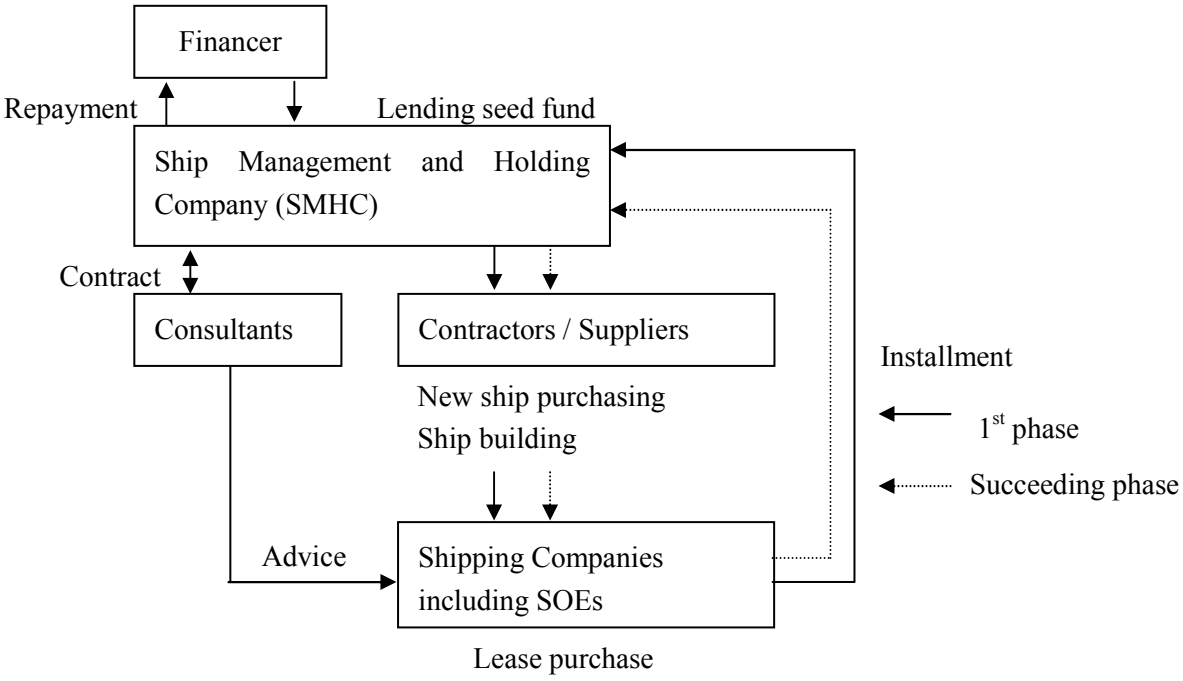


Figure 15.2.2 Method of Finance for Trunk Line Shipping through SMHC's Lease-Purchase



(5) Other Considerations for Effective Implementation

(a) Improvement and conversion of existing idle vessels

To prepare a cost-effective vessel improvement and conversion project, a team of consultants will take an important role to offset shipowners' limited capability and experiences in this regard. Their responsible works are, among others, conduct ship surveys and work out physical plans and financial plans, and supervise a contracted shipyard. SMHC will appoint consultants and supervise their services.

Conduct of ship survey

Candidate vessels will be surveyed to understand current physical and previous working conditions as well as possible business opportunities. Several important points to be examined during the survey are:

1. Operational record with reference to log book should be checked and confirmed,
2. Off-working days including dock-in days and waiting time of current operating vessel should be examined,
3. Equipment and manual should be checked,
4. Ship safety and environmental protection measures should be examined in compliance with MARPOL code.
5. Regular clients should be interviewed to identify their future cargo demand and service improvement needs

Preparation of vessel improvement or conversion project

Vessel improvement means to reinforce its originally intended purpose or use while vessel conversion is to change the vessel to meet a different purpose. Even basic hull structure is sufficiently strong for improvement or conversion. The choice will depend on the foreseen market conditions.

Based on the ship survey results, a vessel improvement or conversion project will be prepared. If a project is not financially feasibly due to costly improvement or conversion, procurement of a suitable second-hand vessel is another option.

1. Conduct of market study
2. Project policy setting (improvement or conversion, and other critical decisions)
3. Physical design
4. Reinforcement of safety and environmental protection in hull structure as well as installed equipment
5. Vessel operation improvement plan
6. Evaluation of financial project feasibility

Project implementation supports

Even after a highly feasible project plan could be prepared, shipowners would need consultancy service particularly in relation with a financial institution and a shipyard as follows:

1. Financial arrangement between shipowner and financer;
2. Contract of local shipyard through bidding;
3. Procurement of necessary ship equipment and parts;
4. Supervision of ship improvement/conversion works; and,
5. Final check and delivery of renewed vessel.

(b) Procurement of second-hand vessel with necessary modification

In order to infuse adequate second-hand vessels into the domestic shipping market through the proposed ODA package, it is important to prepare guidelines for the purchase of second-hand vessels. Within the guidelines, the age limitation of the second-hand vessels should be properly specified in relation to the cost of maintenance after procurement. Young second-hands, though they look expensive may be cost effective compared to old ones with large subsequent cost of maintenance. Importation of unsafe and obsolete vessels cannot justify mobilizing public funds including ODA.

The preparation of guidelines will be done within the proposed ODA package in consultation with DGSC. It may cover several elements for the suitability of vessel to Indonesia including:

- Selection criteria of proper type and size of vessel;
- Specification of necessary modification including operation and maintenance manual to be translated into Indonesian language and others.

Even with a second-hand vessel procurement project, shipowners will need consultancy service to prepare shipping operation and financial arrangement plans and others like a vessel improvement /conversion plans.

(c) Package deal

In order to compensate for the lack of shipbuilding capabilities of local shipyards, joint ventures between well experienced foreign shipyards and local shipyards are strongly recommended (Package deal). There exist many kinds of successful package deal projects in Indonesia. A typical one is to employ a well experienced foreign shipyard as the main contractor and a local shipyard as the sub contractor. The main contractor is responsible to all aspects of the shipbuilding including design, material procurements and construction management. They are also responsible for technology transfers to local shipyards through supervising the works in local shipyards. In a typical case, the package deal is employed for a series of constructions (i.e. multiple constructions of the same type of ship). The

shipbuilders choose the foreign shipyard as the construction site for the first ship, and select local shipyard for the second and thereafter.

The choice of construction site depends on both economical and technical conditions. If the technical capability of a local shipyard is sufficient, and local availability of some materials is adequate, ship builders would choose the local shipyard as the construction site. If the technical capability of local shipyard is not satisfactory, (for example, in the case of sophisticated types of vessels which require technical experiences of foreign shipyard's workers and engineers), ship builders would choose foreign shipyards as the construction site and invite local engineers for technology transfer. In the case of common or ordinary ships, ship builders will employ designs and construction managers (including material procurements) from foreign shipyards, but choose the local shipyard as the construction site. In this case, the main contractor who is responsible for all aspects of the construction must be from the local shipyard. Apart from these examples, there exist many conceivable modes of arrangements in the division of works between foreign and local shipyards in every package deal.

The difficulty is how to ensure successful technology transfer. It should cover not quality control but also to timely and expeditious completion of works and delivery. The SMHC will hire consultants to draw the basic design of ships and arrange the contracts for foreign and local shipyards through international bidding. There are logically two ways to match an experienced foreign builder with a competent local builder. One is SMHC will choose them through separate biddings. The other is SMHC will select one foreign and local joint-venture through international bidding where the prime contractor is the foreign firm. For technology transfer, the latter arrangement may provide more opportunities to local firms. In both cases, SMHC will hire consultants in advance to design vessels and arrange shipbuilders' bidding.

(d) Establishment of SMHC

SMHC is designed to literally perform ship-management functions. An optimal organization will be established to implement the proposed ODA loan package.

PT. PANN, established in 1974, has provided such shipping related non-banking services. In 1992, it expanded business coverage and was renamed as PT. PANN Multi Finance. Until 2002, PT. PANN Multi Finance procured 133 merchant vessels; while it owns and leases 51 vessels (3,300 DWT on the average) to 28 shipping operators. It has sufficient knowledge and experience to take a SMHC role. The negative point is company rating. Based on the criteria stated in the Minister of Finance Degree No. 826/KMK.013/1992, PT.PANN Multi Finance is rated "unhealthy" due to aggregated debt although it plans to generate a considerable profit margin of 38% on a yearly operation basis in 2003. (Refer to Appendix of Chapter 12)

Either PT. PANN Multi Finance or other financial institution will be appointed to be SMHC, PT. PANN's essential experiences, trials and errors in shipping financial service, should be thoroughly succeeded.

(e) Disbursement of low interest money

Of most serious concern to shipowners is the level of interest rate. As already mentioned in Chapter 12, given the very high interest rates which currently prevails in domestic capital market (i.e. 8-10% for short-term credit and 15-17% for long-term credit such as five years), almost all shipowners are not inclined to obtain domestic loan. Even if ODA-based TSL were provided, as long as this very high interest rate prevails, no shipping companies would obtain domestic loan. As explained by INSA representatives, during the TSL survey conducted by OECF in 1996, the survey team suggested that the present level of interest rate of sub loan (relent loan) would not be substantially lower than prevailing loan rate even under TSL. According to INSA, if so, ODA-based TSL would not be attractive to most shipping companies. It is true that sub loan of ODA-based TSL would be lower than prevailing loan; however the margin would be only 2-3% because the interest rate difference between Japanese ODA loan and commercial loan or export credit is so far very small and therefore the interest rate of sub loan of ODA-based TSL is only slightly lower than prime rate. If shipping companies can borrow loans in terms of Yen or US$, they can enjoy very low rate, i.e., 4-7% per annum in case of Yen borrowing, 5-8% per annum in case of US$ borrowing (swap cost between Yen and US$ may currently be less than 1%).

(f) Lending coverage

The proposed ODA loan package focuses on fleet development. To ensure modern shipping by competitive fleet, however, increasing investment in vessel is not sufficient. Domestic shipping system in its entirety must be improved. As long as domestic shipowners become direct beneficiaries, lending coverage may be expanded to logistics equipments (tractors and trailers for Ro-Ro operation, cargo handling equipment on land, etc.) and ship repairing equipment.

15.3. Project Assessment

In relation to the ship finance scheme described in the previous section, the fleet procurement plan is assessed from the financial viewpoint.

(1) Premises for the assessment

Fleet Procurement Plan

- The fleet procurement for the years for 2005-2009 as proposed in the master plan will be examined as an action plan.
- The fleet to be assessed is focused on the container, conventional ships and bulker/barges, since others are mainly used for specific state companies such as Pertamina or PT.Pelni.
- The total investment cost required for the fleet procurement is 12,502 billion Rp as summarized in Table 15.3.1, of which about 22% are new ships and 78% are second hand ships.

Table 15.3.1 Investment for the Fleet Procurement for 2005 - 2009

	Total Investment (billion Rp)	Average Annual Investment (billion Rp)
Container	3,656	731.2
Conventional	8,065	1,613.0
Bulker/ Barge	781	156.2
Total	12,502	2,500.4

- The vessel life is assumed to be 30 years. Therefore ships over 30 years will be scrapped. Scrap value is assumed as 5% of the new ship price.

Financial Sources

- As elaborated in the previous section, several financing schemes can be considered for as financial source. Among them, the following case is examined as a base case scenario.
- Stockholders' Equity and Commercial Bank Loan
- The main financial sources for the maritime industry might be reinvestment of accumulated profit and depreciation. However most of the shipping companies in Indonesia are small to medium scale and do not have sufficient funds for reinvestment. Commercial banks are not willing to offer loan for risky shipping business without sufficient collateral.
- Accordingly the above scheme assume that a ship holding and management company may be established and resell the ships to various shipping companies in order to facilitate the purchase of new or younger ships even for a small or medium shipping company with no specific mortgage other than the ships.
- For the sake of simplicity, the financial assessment is made as if shipping companies directly purchase vessels by themselves; since the profitability of the shipping services is the most important factor in order to make such system functional.
- Because of the large amount of investment, the equity share (equity to loan allocation ratio) is supposed to be comparatively low if exclusively prepared by the private sector. Hence, the equity loan ratio and loan conditions are assumed as follows.

	Equity and Loan	Loan Conditions
Base Case	Equity : 20% Commercial Bank Loan: 80%	Interest Rae: 15% p.a. Repayment period: 5 years Grace period: 1 yr

Efficiency of Newly Procured Ship

The new or younger ship may have higher efficiency compared to the domestic fleet currently in operation. The improved condition is assumed as follows.

Table 15.3.2 Efficiency of newly procured Ships

Vessel Type			Average Speed	Commissionable days
Container	Vessels currently in operation		11knot	346
	Newly procured	New	20knot	359
		10 yrs old	16knot	359
Conventional	Vessels currently in operation		10knot	338
	Newly procured	New	15knot	359
		10 yrs old	13knot	359
Bulker	Vessels currently in operation		10knot	350
	Newly procured	New	15knot	359
		10 yrs old	13knot	359

Operation Revenue and Cost

The unit operation costs by ship type and by size are already shown in Chapter 8. The total operation cost is estimated from the assignment results of transport demand. The freight tariff is tentatively calculated by assuming that the operating profit is 7.5% of the operation cost under the current fleet productivity conditions.

Other Conditions

(a) Inflation rate

Taking into account the recent inflation condition, the inflation rate is assumed as 6.5% per annum. The inflation rate is equally applied to all the costs including fleet procurement cost and the freight tariff.

(b) Corporation tax

Corporation tax is assumed to be 1.2% of total freight revenue.

(c) Residual value

The analysis period is assumed to be 20 years from 2005 to 2024. The residual value of the procured fleet is taken into account at the end of the above period.

(d) Interest rate for short term loan

The interest rate for the short term loan is assumed to be 10 % per annum.

(2) Financial Analysis for Base Case

The financial viability of the fleet renovation is evaluated from the following viewpoints:

- Fleet Renovation Project as a whole
- Investor

As for the evaluation indices from the viewpoint of the project as a whole, Financial Internal Rate of Return (FIRR), Financial Net Present Value, Financial Cost Benefit Ratio are used. On the other hand, Return on Equity (ROE) is used as the indicator from the investors' viewpoint.

FIRR shows the marginal interest rate with which the investment cost balances with the accumulated net profit. Therefore if the FIRR exceeds the interest rate of long term loan, the project is judged to be financially viable. Although the interest rate fluctuates from time to time, in this study, 15% is tentatively adopted considering the current financing condition. Likewise, ROE indicates the rate of return on the paid up equity from the fleet operation. Table 15.3.3 shows the evaluation indicators for the above two cases.

Table 15.3.3 Financial Evaluation Indicators for Base case

Financial Evaluation Indicators	Base Case
Financial Internal Rate of Return (FIRR)	26.4 %
B/C Ratio (discount rate: 15%)	1.90
Net Present Value (Trillion Rp)	8.46
Return on Equity (ROE)	18.1 %
Fair Box Ratio (FBR)	1.71
First Year of Operation Surplus	5-th
Maximum Short term loan (Trillion Rp)	3.04

From the results, the following findings are pointed out.

(a) The FIRR is estimated to be 26.4%, which is sufficiently high when compared with the interest rate of long term loan. The minimum fair box ratio of 1.7 also assures sound profitability.

(b) The ROE is 18.1%, which is also higher than the assumed interest rate of long term loan. However, it may not be sufficiently attractive return for the private investors when taking into account the inflation rate.

(c) In addition, the first year of the single year operation surplus comes in the 5th year from the first investment, indicating that the investor cannot expect any operation profit during the first four years because of loan payments.

(3) Financial Analysis for Alternative Case

In order to improve the above situation, the following alternative financing scheme is examined. In addition to the ordinary bank loan, a government support loan, which may be including a financing scheme of ODA, will be introduced for the sake of promoting shipping service modernization policy.

Table 15.3.4 Alternative Financing Scheme

	Equity and Loan	Loan Conditions
Alternative Scheme	Equity : 20% Commercial Bank Loan: 60% Government loan (ODA): 20%	Same conditions as above Interest Rate: 6.5 % p.a. Repayment period: 5years Grace period: 1 yr.

From the result of the Alternative financing case, following points are noted.

- The FIRR does not change from the base case, remaining 26.4%.
- The ROE jumps up to 24.1 %, which will be sufficiently high even taking the inflation rate into account; as the return in real terms will be more than 16%.
- The first year of operation surplus is on the 4th year from the first investment, therefore the period without profit will be reduced from 4 years to 3 years.
- Accordingly the above result will make the project much more attractive for private investors.

Table 15.3.5 Financial Evaluation Indicators for Alternative case

Financial Evaluation Indicators	**Alternative Case**
Financial Internal Rate of Return (FIRR)	24.8%
B/C Ratio (discount rate: 15%)	1.90
Net Present Value (Trillion Rp)	8.46
Return on Equity (ROE)	24.1%
Fair Box Ratio (FBR)	1.71
First Year of Operation Surplus	4-th
Maximum Short term loan (Trillion Rp)	1.89

(4) Sensitivity Analysis

Since the shipping service business involves various uncertain factors, a sensitivity analysis is undertaken for the following cases.

- Increase of Fleet Procurement Cost
- Increase and decrease of Freight Tariff

(a) Increase of Fleet Procurement Cost

This case assumes that the fleet procurement cost increases by 10%. Accordingly the investment cost for the years 2005 – 2009 will be 13,752.2 billion Rp.

In this case, the FIRR is estimated to be 23.9%, showing still high return as a project under the base case financing condition, however, the ROE will drop to only 10.9% as sown in Table 15.3.6.

Table 15.3.6 Financial Sensitivity in case of Procurement Cost Increase

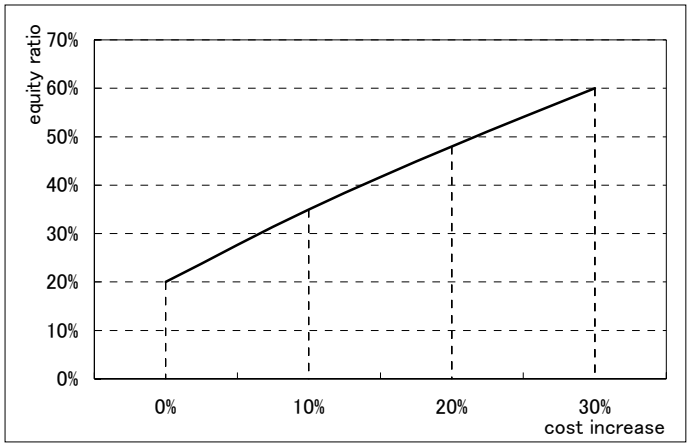
Financial Evaluation Indicators	10% cost increase case
Financial Internal Rate of Return (FIRR)	23.9%
Return on Equity (ROE)	10.9%

In order to attain at a sufficiently attractive level of return for investors, i.e. substantial return over 15% after taking the inflation into consideration, the bank loan amount must be reduced and equity share should be raised from 20% of total investment cost in the base case to 35% in this case. Even in the case that 20% of government support loan, above mentioned, is assumed, an equity share of 28% may be necessary.

Likewise, if the fleet procurement cost is much higher, more equity will be required: in case of 20% cost increase, required equity goes up to 37% of the total investment.

The relationship between the fleet procurement cost and the required equity share for making the project attractive for the investors is shown in Figure 15.3.1..

Figure 15.3.1 Relationship between Cost Increase and Required Equity Ratio



(b) Financial Sensitivity of Freight Tariff

Freight tariff may be financially one of the most sensitive factors for shipping industries. Due to harsh competition, the freight tariff is unstable and changeable depending on the route and timing.

In the above cases, the freight has been calculated by assuming profit ration to total revenue of 7.5%. In this section, two different freight tariff cases are examined: 10% and 5% of profit ratio cases instead of 7.5%.

As shown in Table 15.3.7, both the returns, FIRR and ROE, will increase when 10% of profit ratio is applied. ROE becomes sufficiently high to enable the project to be attractive for investors even for the base case financing scheme.

However, the project becomes much less attractive when the tariff level decreases to 5% of profit ratio, with ROE of only 13 %. In order to make fleet procurement more profitable for investors, the total loan amount should be reduced by increasing the equity ratio to more than 30% of total investment cost.

Table 15.3.7 Sensitivity of Freight Tariff Rate

Freight Tariff (profit ratio)		Base Case Financing Scheme	Alternative Financing Scheme Case
10%	FIRR	28.2 %	28.2 %
	ROE	24.3%	31.5 %
5%	FIRR	24.6 %	24.6 %
	ROE	13.0 %	18.1 %

(5) Concluding Remarks

The replacement and renovation of obsolete fleet may be one of the key issues for the modernization of the domestic maritime transport. The above financial analysis suggests the following points.

- If financial resources for fleet procurement are available, the fleet replacement/renovation can be a considerably profitable project.
- Provision of government support such as soft loan will be significantly important for increasing the attractiveness of the project under limited fund availability.
- However, the above analysis is based on the two preconditions: those are the establishment of a reliable ship holding/management body and average tariff level to bring about reasonable profit.

The main obstacle for fleet modernization lies in the financial constraints and the price disparity between old second hand ships and new or young second hand ships. It is apparent that new ships induce several financial advantages in terms of operation efficiency or reduction in mechanical problems. However, small and medium shipping companies could not afford to procure the new or young ships and have preferred to purchase old but inexpensive ships from overseas.

The small and medium shipping companies generally do not have adequate collaterals for getting bank loans required for new ship procurement. Accordingly it is important to establish a system that a ship holding/management company will procure new ships and resell or lease to individual shipping companies under reasonable price. In order to make the system functional, special government support in various forms such as enhancing bankability, providing soft loans, monitoring of the daily activities etc. for the ship holding company will be indispensable.

Another important issue is freight tariff. Currently shipping companies appear to be competing with each other through tariff rate while sacrificing other items in operation such as safety of ships and cargo. Under such circumstances, they have to rely on the low-cost ships irrespective of their efficiency, which may result in low quality of services and less competitiveness of new ships. The above financial analysis revealed that if the profit level drops to 5% of the freight or less, the fleet modernization will be quite difficult except for few companies with sufficient financial resources. The future domestic shipping market should be directed towards better services with higher freight tariff. Here, also some kind of indirect government intervention might be necessary so as to maintain the appropriate tariff range; for instance, by applying more strict inspections regarding the ship conditions and necessary equipments, very old and sub-standard ships may disappear, which will eventually result in avoiding extremely low freight tariff offered through using such old ships.