

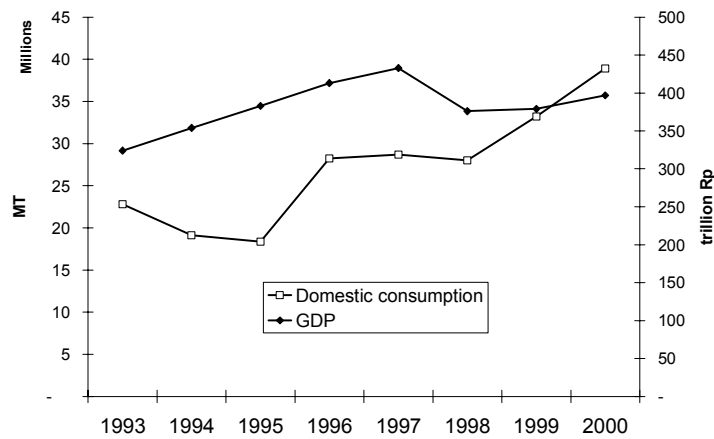
APPENDICES

APPENDIX OF CHAPTER 8

8.1 Models for Domestic Sea Freight Forecast by Commodity

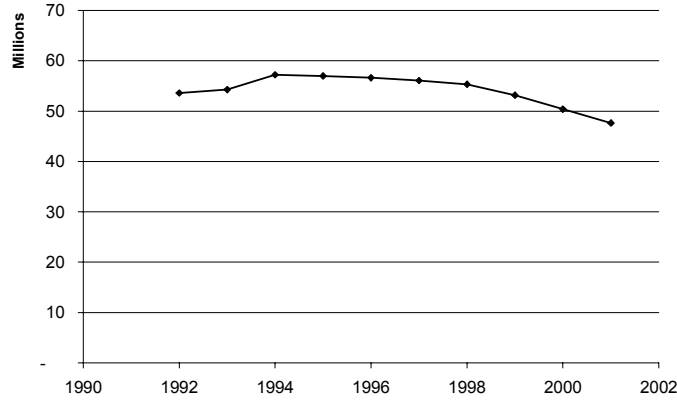
(1) Forecasted Petroleum Sea Traffic

Figure 8.1 Petroleum Domestic Consumption and GDP



Source: BPS

Figure 8.2 Trend in Domestic Production of Petroleum



Source: Directorate of Oil and Petroleum

Figure 8.3 Trend in Import and Export of Petroleum

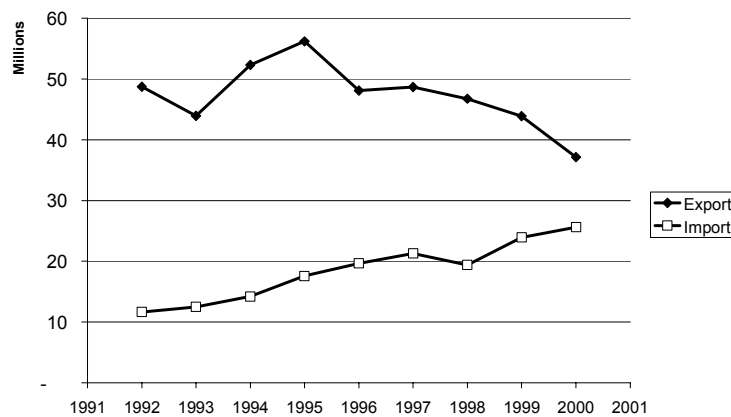


Table 8.1 Assumptions Used in the Forecast of Petroleum Sea Traffic

| ITEM | ASSUMPTION |
|-------------|--|
| Consumption | Consumption of petroleum has a elasticity of 1.33 with respect to GDP - calibrated from the data from 1993 to 2000 |
| Export | Share of exports of domestically produced petroleum decreases by 5% year on year - average rate of decline from 1996 to 2000 |
| Import | Import volume will adjust based on the deficit/surplus of production, consumption, and export |
| Production | Production from active reserves per province will naturally decline and is somewhere in the range of 3% to 15% per annum. There are three scenarios assumed for the opening of new major reserves: (1) no new reserves are found {low case}, (2) the rate of new reserve opening is the same as that of the period 1992 to 2001 {mid case}, the rate of new reserve opening is double that of the period 1992 to 2001 {mid case} |
| Sea traffic | Sea traffic increases by 0.2 times for every unit increase of domestically consumed oil production but decreases by 0.1 times for every unit increase of petroleum import – based on the trend from 1996 to 1997 |

Figure 8.4 Projected Demand and Production of Petroleum

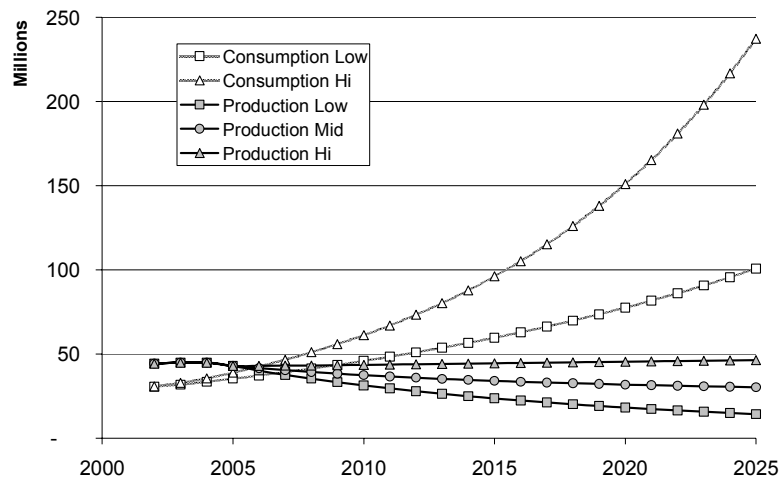
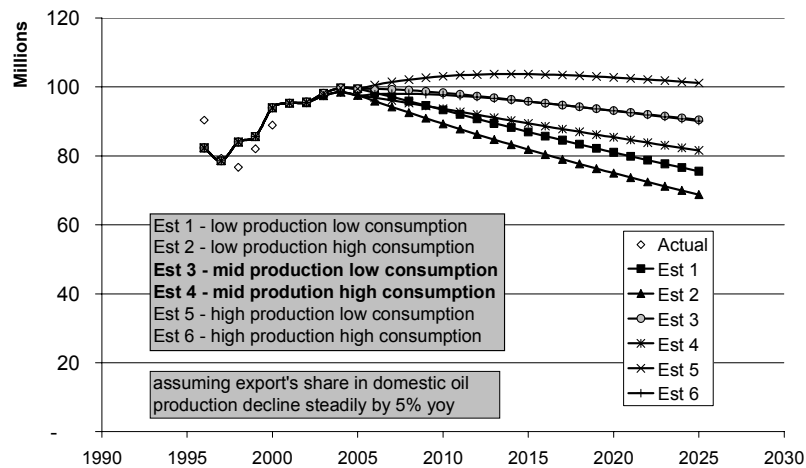


Figure 8.5 Projected Sea Traffic of Petroleum



(2) Forecasted General Cargo Sea Traffic

Figure 8.6 General Cargo and GDP Trend

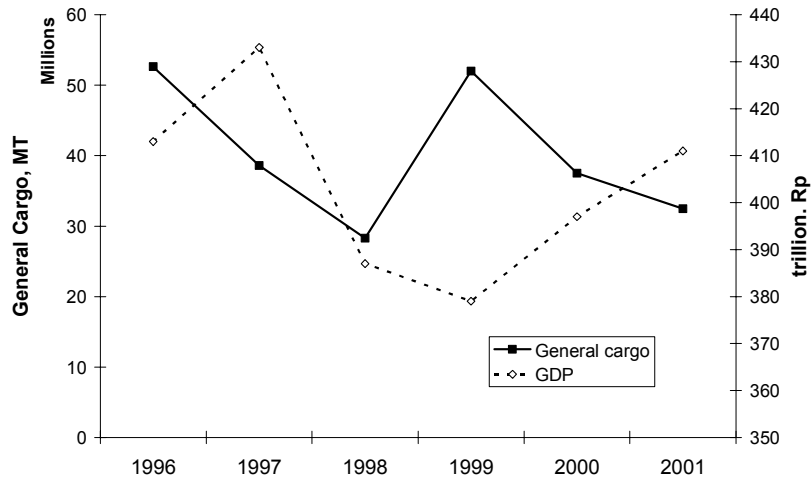
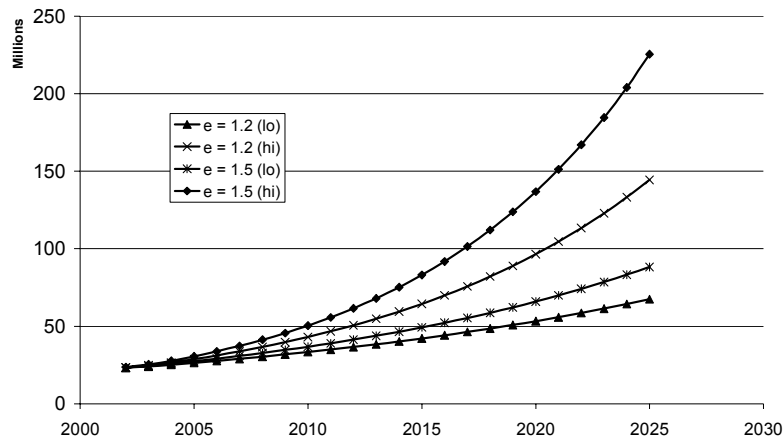


Table 8.2 Assumptions Used in the Forecast of General Cargo Sea Traffic

| ITEM | ASSUMPTION |
|-------------|--|
| Sea traffic | Based on trend from 1996 to 2001, the elasticity of general cargo sea traffic to GDP is 1.2. However, an independent assessment of DGSC, pegs the elasticity of general cargo sea traffic to GDP at 1.5. Both parameters are used to forecast General Cargo sea traffic based on the low GDP and high GDP growth scenario. |

Figure 8.7 Forecasted General Cargo Sea Traffic



(3) Forecasted Coal Sea Traffic

Figure 8.8 Trend in Production and Consumption of Coal

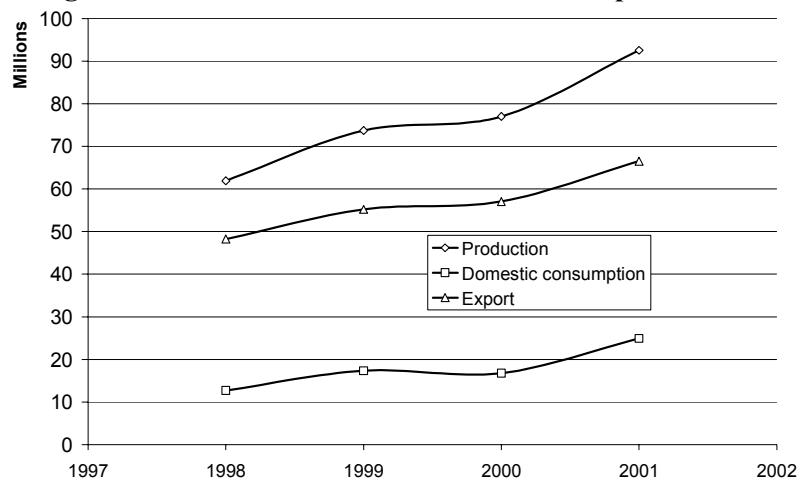


Table 8.3 Assumptions Used in the Forecast of Sea Traffic of Coal

| ITEM | ASSUMPTION |
|-------------|--|
| Consumption | Consumption will increase by 2,000,000 MT per year as the base case – adopted modified from government estimates. The growth however, is expected to slow down in the future by half starting from 2010 as a result of shifting to gas as the primary energy source. For the low case and high case scenario, the rate of increase is half and double of the mid-case rate respectively. |
| Export | Export will increase annually by 2,500,00 MT per year up to 2010. From thereon, the rate will slow down by 50%. |
| Import | No imports |
| Production | Production will follow demand (domestic consumption + export) – of which the control total is adjusted to conform to government estimates. |
| Sea traffic | In 2001, for every 1 MT of coal domestic demand results in 0.67 MT of coal sea traffic. This trend is assumed to continue in the future. |

Figure 8.9 Projected Demand and Supply of Coal

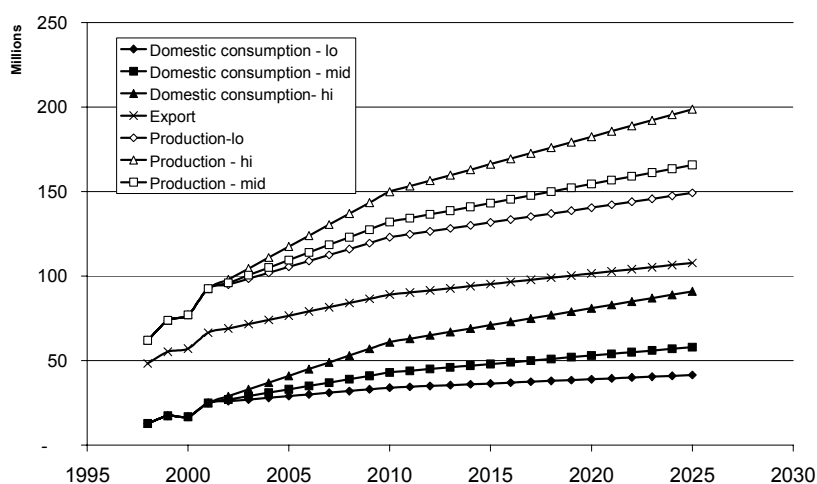
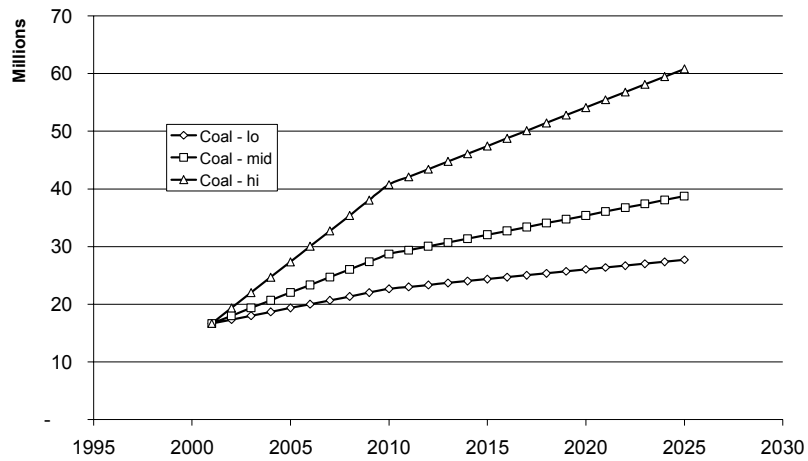


Figure 8.10 Projected Coal Sea Traffic



(4) Forecasted Wood Sea Traffic

Figure 8.11 Trend in Wood Production

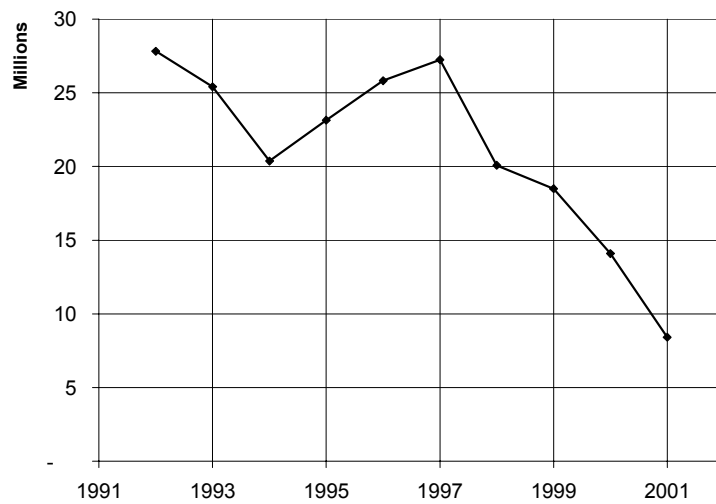


Figure 8.12 Trend in Wood Products Export

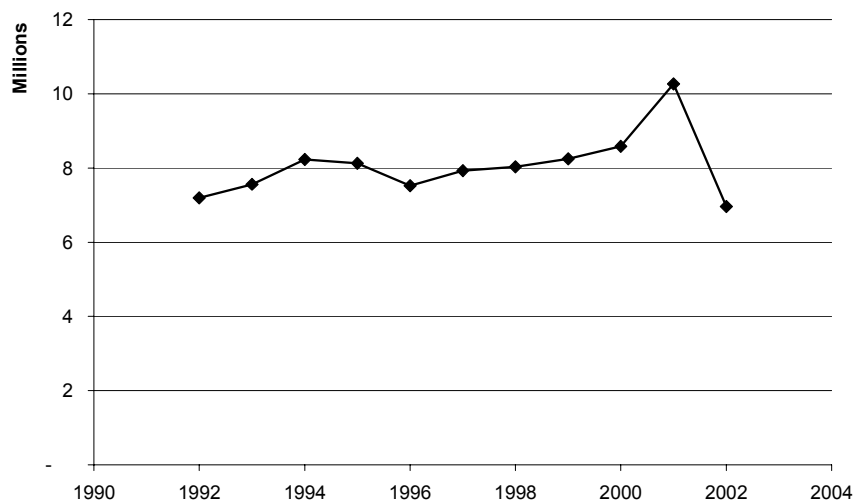


Table 8.4 Assumptions Used in the Forecast of Future Sea Traffic of Wood

| ITEM | ASSUMPTION |
|-------------|---|
| Consumption | Consumption will be constrained by supply |
| Export | Production is assumed to be maintained at the current level |
| Imports | No imports |
| Production | In 2002, production is 12 million cubic meter (\approx 8 million MT). Based on government regulation, annual production is constrained at 7 million MT (\approx 5 million MT). At the high case, it is assumed that the current levels are maintained and at the low case, the government regulation is reached. The mid-case is taken as the average of the low and high case. |
| Sea Traffic | In 2001, for every 1 MT of wood domestic demand results in 1.24 MT of wood sea traffic. This trend is assumed to continue in the future. |

Figure 8.13 Forecasted Wood Production

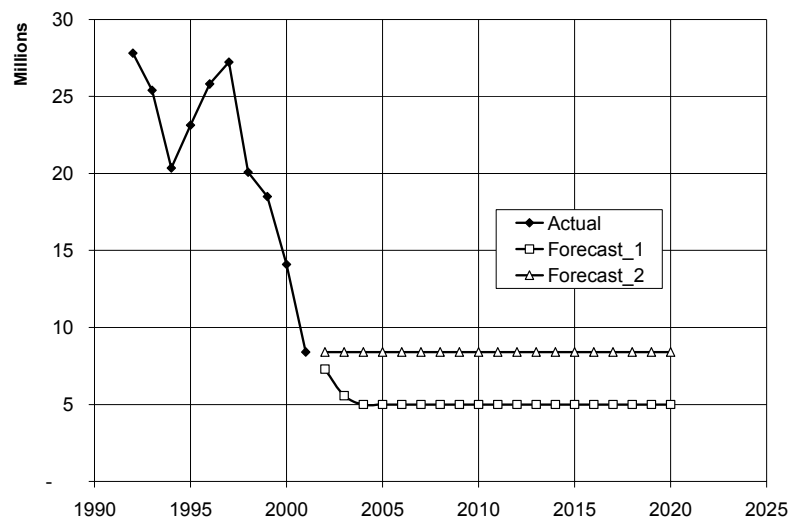
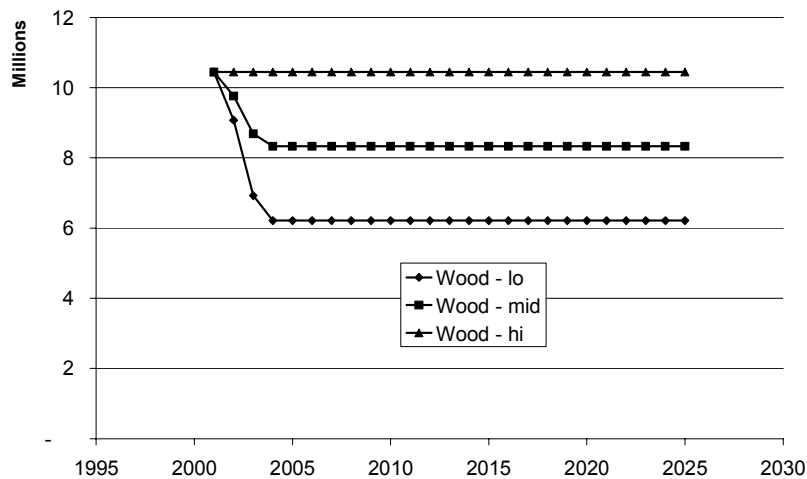


Figure 8.14 Forecasted Forestry Products Sea Traffic



(5) Forecasted Fertilizer Sea Traffic

Figure 8.15 Trend in Demand and Supply of Fertilizer

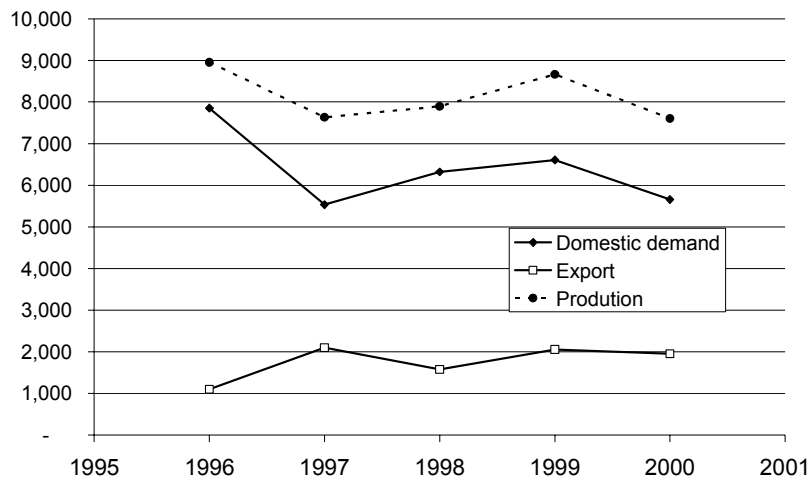


Table 8.5 Assumptions Used in the Forecast of Sea Traffic of Fertilizer

| ITEM | ASSUMPTION |
|-------------|--|
| Consumption | Consumption will follow the growth in agricultural production (with rice as the benchmark). As a base case, it is assumed that agricultural production will be constrained by land and that self-sufficiency will not be reached. At the high case (1), Urea, SP-36 and Amsul fertilizer utilization rate will continue to decrease as the trend from 1996 to 2001 and other types of fertilizers continue it 5-year declining trend. As upper mid-case (2), Urea, SP-36 and Amsul fertilizer utilization rate will remain as it is and other types of fertilizers continue decline. As lower mid-case (3), Urea, SP-36 and Amsul fertilizer utilization rate will remain as it is and other types of fertilizers remain at current levels. For discussion purposes, it is also assumed that self-sufficiency will be attained – which will result in much higher consumption of |
| Export | Export has remained stable for the last four years and is assumed to continue this trend. |
| Imports | No imports |
| Production | Production level can be able to cope with domestic and export demands |
| Sea Traffic | In 2001, for every 1 MT of domestic demand results in 1.07 MT of sea traffic. This trend is assumed to continue in the future. |

Figure 8.16 Forecasted Demand of Fertilizer ('000 MT)

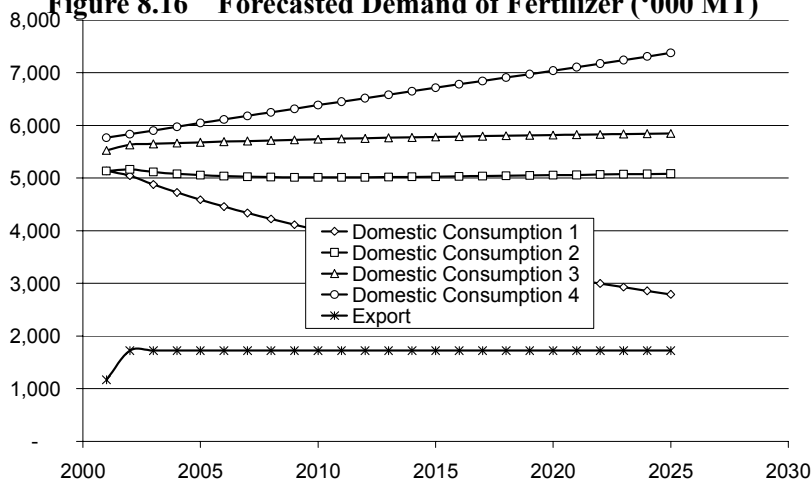
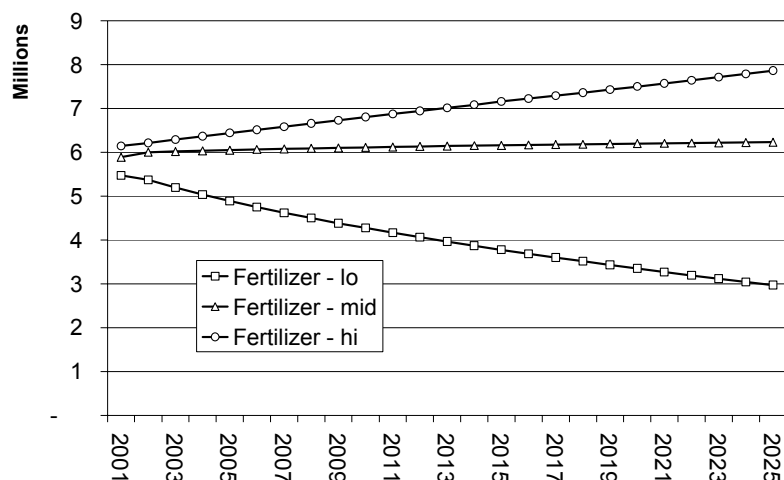


Figure 8.17 Forecast Seaborne Traffic of Fertilizer



(6) Forecasted Cement Traffic

Figure 8.18 Trend in Demand and Supply of Cement

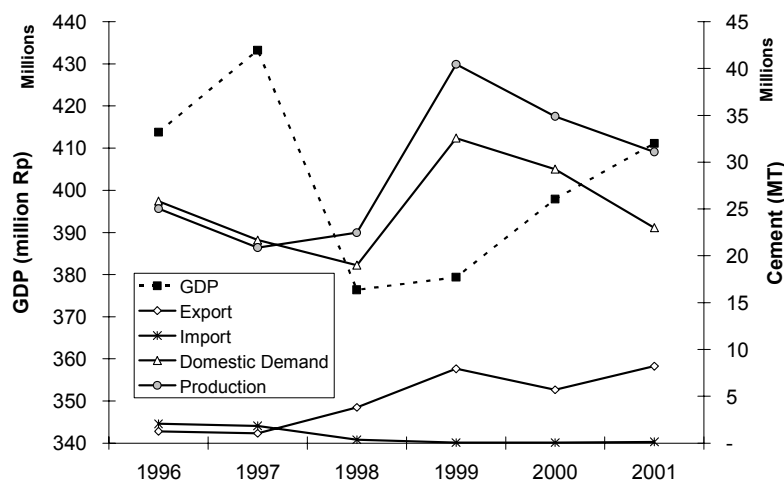


Table 8.6 Assumptions Used in the Forecast of Sea Traffic of Cement

| ITEM | ASSUMPTION |
|-------------|---|
| Consumption | Based on the trend from 1996 to 2001, the elasticity of consumption to GDP is 0.9 (model 1). According to an Indonesian Cement Association estimate, the elasticity of demand to GDP is 1.4 (Model 2). Based on this two models – two scenarios are assumed, low GDP growth and high GDP growth |
| Export | Exports have remained stable since 1999 and is assumed to remain stable at 7 million MT |
| Import | No imports |
| Production | Production can cope with both domestic demand and exports |
| Sea Traffic | In 2001, for every 1 MT of domestic demand results in 0.22 MT of sea traffic. This trend is assumed to continue in the future. |

Figure 8.19 Forecasted Demand of Cement

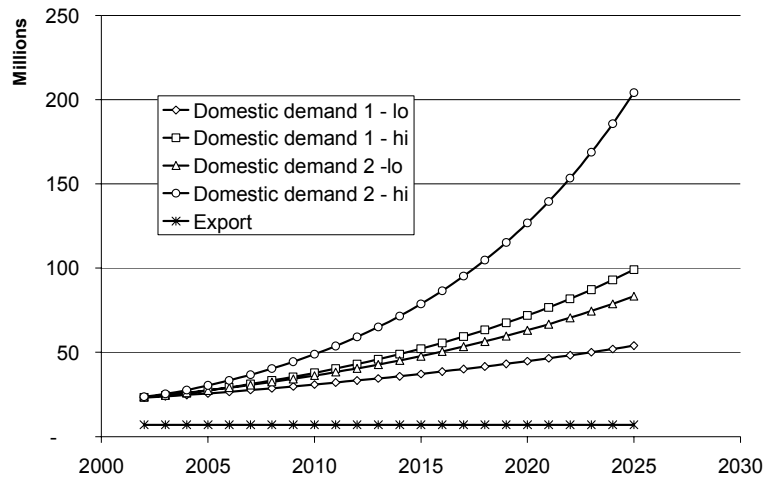
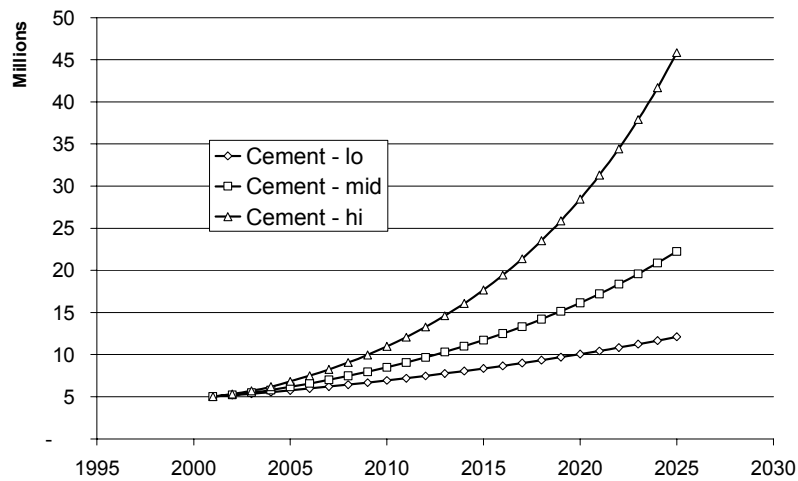


Figure 8.20 Forecasted Seaborne Cement Traffic



(7) Forecasted CPO Sea Traffic

Figure 8.21 Trend in CPO Demand and Supply

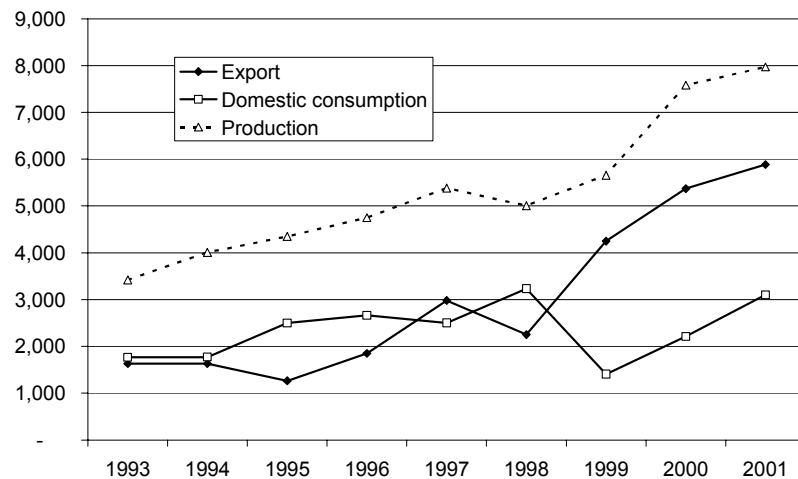


Table 8.7 Assumptions Used in the Forecast of Sea Traffic of CPO

| ITEM | ASSUMPTION |
|-------------|---|
| Consumption | CPO Consumption rate per capita has an elasticity of 0.97 to GDP per capita – based on the trend from 1993 to 1998. Both the low GDP growth and high GDP growth scenario is assumed |
| Export | Export will increase at a constant rate of 400,000 MT per year – based on the average rate of growth from 1990 to 2001 |
| Import | No imports |
| Production | Production can cope with domestic demand and export |
| Sea Traffic | In 2001, for every 1 MT of domestic demand results in 0.86 MT of sea traffic. This trend is assumed to continue in the future. |

Figure 8.22 Figure 22 Forecasted Demand of CPO

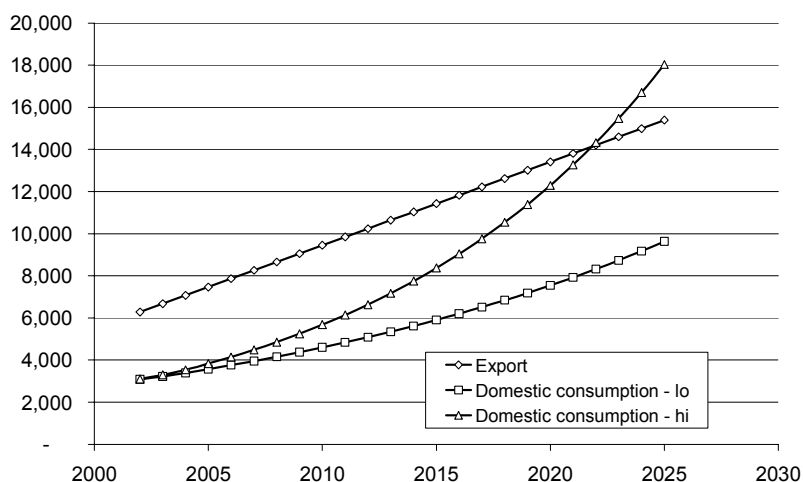
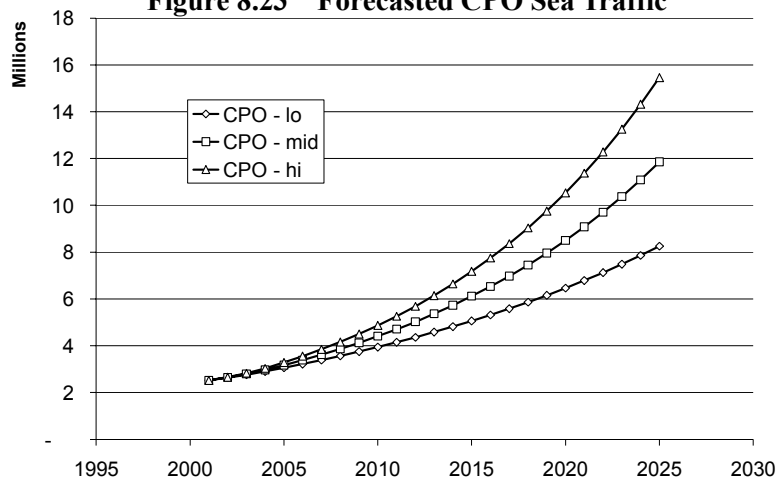


Figure 8.23 Forecasted CPO Sea Traffic



(8) Forecasted Rice Sea Traffic

Figure 8.24 Trend in Demand and Supply of Rice

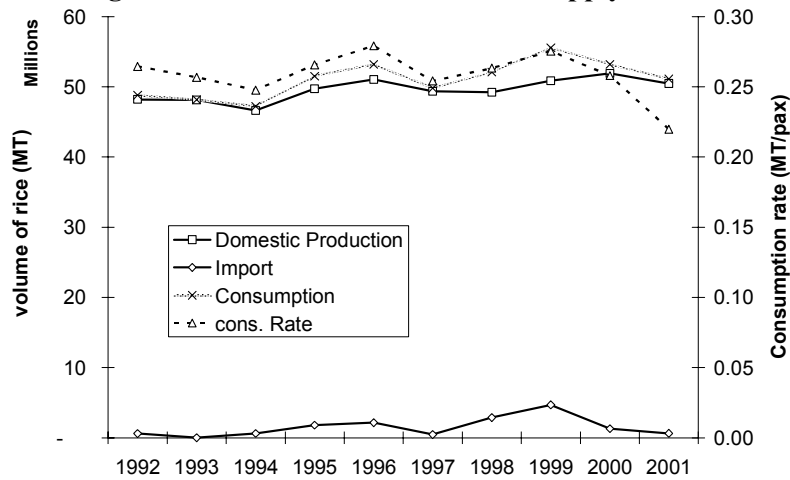


Table 8.8 Assumptions Used in the Forecast of Future Demand and Supply of Rice

| ITEM | ASSUMPTION |
|-------------|--|
| Consumption | Consumption per capita is 250 kg per annum – based on average for the period 1993 to 2001 |
| Export | No export |
| Import | Import would be able to cover the slack between demand and domestic production |
| Production | Low estimate - production is constrained by land; Mid estimate – time-series trend from 1991 to 2001 will be sustained; High estimate – self-sufficiency can be attained |
| Sea Traffic | In 2001, for every 1 MT of domestic demand results in 0.03 MT of sea traffic. This trend is assumed to continue in the future. |

Figure 8.25 Forecasted Production for Rice

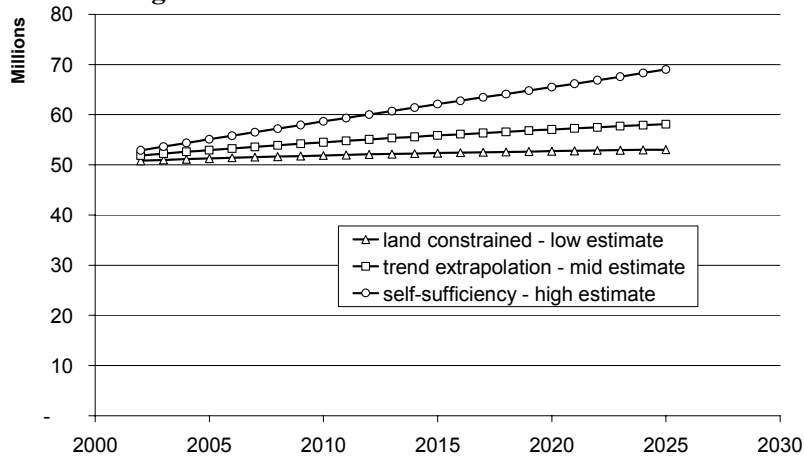
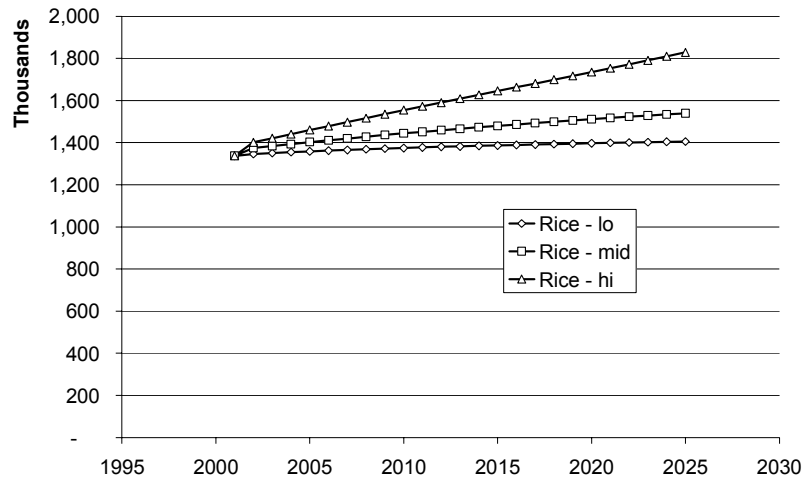


Figure 8.26 Forecasted Rice Sea Traffic

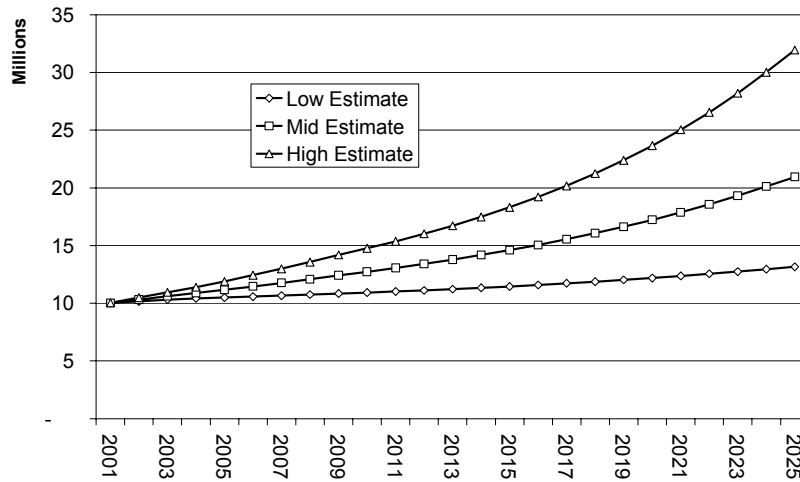


(9) Forecast of Non-key Commodities Sea Traffic

Table 8.9 Assumptions Used in the Forecast of Future Demand and Supply of Rice

| ITEM | ASSUMPTION |
|-------------|--|
| Sea Traffic | Non-key commodities sea traffic will increase in line with the weighted average of all key commodities – basically assuming that the key commodities growth is representative of all other commodities |

Figure 8.27 Forecasted Sea Traffic of Non-Key Commodities



8.2 Passenger Demand Forecast Models

Passenger Generation and Attraction Model

(1) Regional level air + inter island + ferry trip generation/attraction model

$$Trate_r = \exp(a)G^b D^c$$

$Trate_r$ = air + inter island + ferry trips per 100 population

G = Gross Domestic Product per capita

$$D = \begin{cases} 2 & \text{if Bali} \\ 0 & \text{otherwise} \end{cases}$$

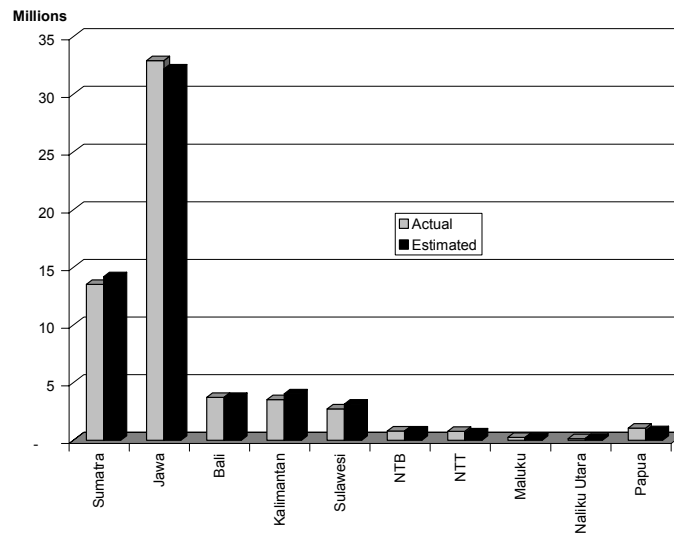
r = region

a, b, c = parameters

Table 8.10 Trip Generation/Attraction per Region Model Calibration Results

| | |
|----------------------|--|
| Calibration Data Set | Trips generated and attracted per region (2002) Population per region (2002) GDP per region (2002) |
| Observations | 10 |
| Model fitness | $R^2 = 0.95$ |
| Parameters | $a = 2.92$ t-stat = 40.8 $b = 0.51$ t-stat = 5.4 $c = 2.03$ t-stat = 8.4 |

Figure 8.28 Comparison of Estimated and Actual Trip Generation/Attraction per Region



(2) Zone level air + inter island trip generation/attraction model

$$Trate_t^z = Trate_{t=0}^z \left(\frac{Trest_t^z}{Trest_{t=0}^z} \right)$$

$$Trest = \text{Estimated trip per 100 population} \\ = a + b \ln(G) + c \ln(D1) + d \ln(D2)$$

$z = \text{zone}$

$t = \text{year}$

$G = \text{GDP/cap}$

$$D1 = \begin{cases} 1 & \text{if } z = \text{Riau or Papua} \\ 0 & \text{otherwise} \end{cases}$$

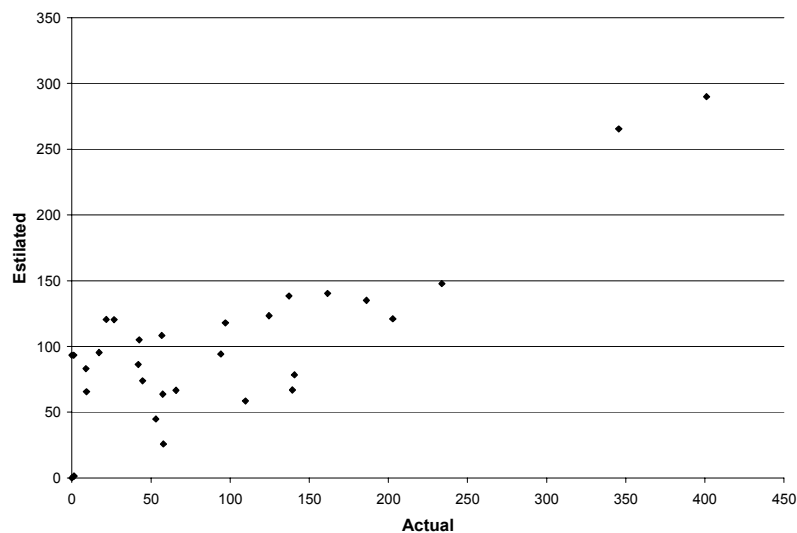
$$D2 = \begin{cases} 1 & \text{if } z = \text{NAD} \\ 0 & \text{otherwise} \end{cases}$$

$a, b, c, d = \text{parameter}$

Table 8.11 Trip Generation/Attraction per Zone Model Calibration Results

| | |
|----------------------|---|
| Calibration Data Set | Trips generated and attracted per zone (2002) Population per zone (2002) GDP per zone (2002) |
| Observations | 30 |
| Model fitness | $R^2 = 0.54$ |
| Parameters | a = 53.9 t-stat = 3.4 b = 107.8 t-stat = 5.4 c = -74.6 t-stat = -1.3 d = -153.3 t-stat = -2.1 |

Figure 8.29 Estimated and Actual Trip Generation/Attraction Rate per Zone



(3) Macroscopic Model

$$S_t = \exp(a)G^b GR^c P^d$$

S = share of inter-island trips vs. air trips

G = GDP per capita in millions

$GR = GDP_t / GDP_{t-1}$

P = population in million

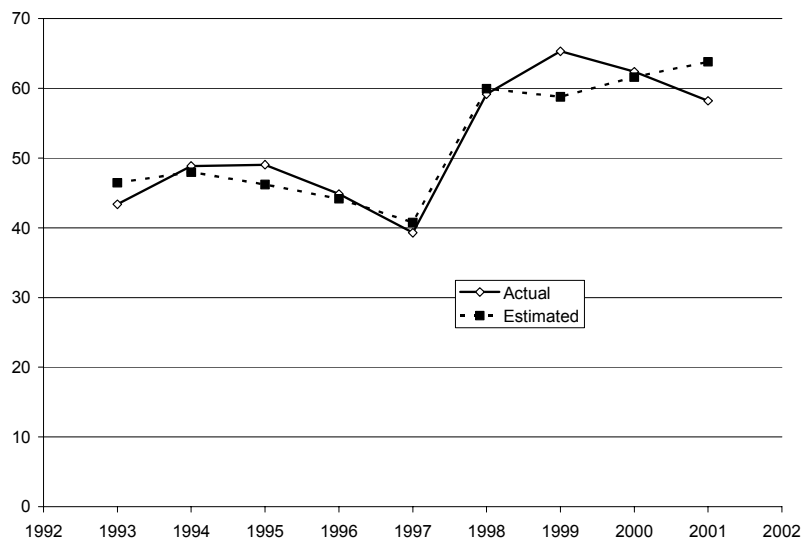
t = year

a, b, c, d = parameters

Table 8.12 Macroscopic Airline vs. Inter-island Modal Split Model Calibration Results

| | |
|----------------------|--|
| Calibration Data Set | Inter-island passengers and airline passengers from 1993 to 2001 GDP and population from 1992 to 2001 |
| Observations | 9 |
| Model fitness | 0.88 |
| Parameters | a = -15.0 t-stat = -3.5 b = -1.7 t-stat = -3.8 c = -0.5 t-stat = -1.3 d = 5.5 t-stat = 5.1 |

Figure 8.30 Comparison of Estimated and Actual Trip Share of Inter-island vs. Airline



8.3 Top 20 OD Pairs

(1) Dry Cargo

| 2002 | | | 2014 | | | 2024 | | |
|----------------|------------------|------------|----------------|------------------|-------------|-------------------|------------------|-------------|
| Port System | | MT/yr | Port System | | MT/yr | Port System | | MT/yr |
| Panjang | Banten | 903,975 | Panjang | Banten | 2,209,021 | Panjang | Banten | 2,308,268 |
| Banjarmasin | Kotabaru | 862,757 | Banjarmasin | Kotabaru | 1,467,941 | Banjarmasin | Kotabaru | 3,977,525 |
| Palembang | Cilacap | 1,417,777 | Surabaya | Ujung Pandang | 2,022,223 | Surabaya | Ujung Pandang | 2,339,134 |
| Surabaya | Kalimantan Timur | 1,429,335 | Teluk Bayur | Cilacap | 2,012,902 | Riau | Riau | 2,948,803 |
| Banten | Kotabaru | 1,580,186 | Teluk Bayur | Tanjung Priok | 2,861,062 | Teluk Bayur | Tanjung Priok | 2,862,101 |
| Surabaya | Ujung Pandang | 753,196 | Palembang | Cilacap | 3,472,719 | Teluk Bayur | Cilacap | 5,079,356 |
| Teluk Bayur | Cilacap | 2,686,111 | Riau | Riau | 1,612,581 | Tanjung Priok | Banjarmasin | 4,756,846 |
| Ujung Pandang | Kalimantan Timur | 7,303,149 | Surabaya | Banjarmasin | 2,837,074 | Tanjung Priok | Pontianak | 2,292,192 |
| Teluk Bayur | Tanjung Priok | 999,257 | Tanjung Priok | Banjarmasin | 14,489,898 | Belawan | Tanjung Priok | 2,850,909 |
| Tanjung Pinang | Batam | 1,128,378 | Belawan | Tanjung Priok | 2,106,994 | Surabaya | Banjarmasin | 19,835,086 |
| Surabaya | Banjarmasin | 798,435 | Banten | Kotabaru | 2,455,604 | Tanjung Priok | Ujung Pandang | 4,110,569 |
| Riau | Riau | 1,834,844 | Tanjung Priok | Pontianak | 1,869,686 | Belawan | Riau | 4,190,540 |
| Tanjung Priok | Banjarmasin | 882,037 | Ujung Pandang | Kalimantan Timur | 2,123,779 | Tanjung Pinang | Batam | 3,389,782 |
| Tanjung Priok | Cilacap | 1,297,378 | Belawan | Riau | 2,521,841 | Palembang | Cilacap | 3,808,944 |
| Samarinda | Kalimantan Timur | 1,649,381 | Tanjung Pinang | Batam | 4,257,912 | Ujung Pandang | Kalimantan Timur | 2,448,205 |
| Belawan | Tanjung Priok | 1,948,339 | Tanjung Priok | Ujung Pandang | 1,725,179 | Sulawesi Tenggara | Maluku | 6,931,547 |
| Semarang | Kalimantan Timur | 3,237,147 | Surabaya | Kalimantan Timur | 6,731,029 | Surabaya | Samarinda | 7,602,203 |
| Belawan | Riau | 943,631 | Samarinda | Kalimantan Timur | 1,617,090 | Belawan | Surabaya | 2,634,355 |
| Tanjung Priok | Ujung Pandang | 1,557,317 | Palembang | Banten | 2,058,365 | Belawan | Teluk Bayur | 5,168,709 |
| Palembang | Banten | 1,220,705 | Belawan | Surabaya | 2,809,336 | Palembang | Banten | 2,460,171 |
| | Top 20 | 34,433,335 | | Top 20 | 63,264,238 | | Top 20 | 91,995,224 |
| | All | 70,442,775 | | All | 129,718,412 | | All | 196,055,013 |

(2) Liquid Cargo

| 2002 | | | 2014 | | | 2024 | | |
|-------------|---------------|------------|-------------|------------------|-------------|-------------|------------------|-------------|
| Port System | | MT/yr | Port System | | MT/yr | Port System | | MT/yr |
| Belawan | Dumai | 8,902,955 | Dumai | Tanjung Priok | 9,356,105 | Dumai | Tanjung Priok | 10,388,769 |
| Balikpapan | Tarakan | 1,522,397 | Balikpapan | Tarakan | 2,098,561 | Balikpapan | Tarakan | 2,323,812 |
| Riau | Riau | 1,716,447 | Belawan | Dumai | 9,839,558 | Belawan | Dumai | 13,321,552 |
| Dumai | Tanjung Priok | 4,982,877 | Surabaya | Balikpapan | 2,258,032 | Riau | Riau | 2,322,835 |
| Dumai | Riau | 2,358,342 | Riau | Riau | 1,530,475 | Dumai | Riau | 3,388,644 |
| Dumai | Balikpapan | 1,516,287 | Dumai | Riau | 5,067,154 | Balikpapan | Balikpapan | 4,444,861 |
| Balikpapan | Balikpapan | 2,119,751 | Dumai | Surabaya | 3,971,290 | Dumai | Balikpapan | 5,888,022 |
| Palembang | Panjang | 3,328,804 | Balikpapan | Jawa Timur | 5,261,675 | Surabaya | Balikpapan | 3,784,217 |
| Dumai | Semarang | 4,846,939 | Balikpapan | Balikpapan | 1,544,994 | Palembang | Tanjung Priok | 1,701,344 |
| Surabaya | Balikpapan | 2,743,181 | Dumai | Balikpapan | 2,660,911 | Dumai | Surabaya | 2,199,637 |
| Dumai | Surabaya | 2,089,537 | Palembang | Surabaya | 2,699,221 | Balikpapan | Jawa Timur | 4,167,633 |
| Palembang | Tanjung Priok | 1,716,442 | Palembang | Tanjung Priok | 2,045,041 | Belawan | Riau | 1,489,301 |
| Semarang | Balikpapan | 1,869,724 | Dumai | Semarang | 6,594,517 | Dumai | Semarang | 1,410,631 |
| Balikpapan | Ujung Pandang | 2,272,689 | Gresik | Kalimantan Timur | 2,189,449 | Balikpapan | Ujung Pandang | 1,724,461 |
| Belawan | Riau | 3,021,169 | Belawan | Riau | 1,691,945 | Semarang | Balikpapan | 4,461,697 |
| Palembang | Surabaya | 7,543,010 | Semarang | Balikpapan | 4,007,995 | Pontianak | Riau | 10,578,602 |
| Balikpapan | Jawa Timur | 1,452,997 | Balikpapan | Ujung Pandang | 9,452,768 | Palembang | Surabaya | 1,642,088 |
| Belawan | Palembang | 1,753,752 | Pontianak | Riau | 1,950,402 | Balikpapan | Bitung | 2,205,233 |
| Dumai | Cilacap | 1,641,012 | Palembang | Panjang | 4,120,950 | Gresik | Kalimantan Timur | 2,742,408 |
| Balikpapan | Bitung | 5,021,318 | Dumai | Cilacap | 5,955,859 | Benoa | Balikpapan | 6,553,027 |
| | Top 20 | 62,419,629 | | Top 20 | 84,296,902 | | Top 20 | 86,737,895 |
| | All | 86,316,406 | | All | 113,105,219 | | All | 120,430,694 |

(3) Passenger Traffic

| 2002 | | | 2014 - 2024 | | |
|---------------------|--------------------|------------|---------------------|--------------------|------------|
| Port System | | Pax/yr | Port System | | Pax/yr |
| Batam | Riau | 181,386 | Batam | Riau | 226,061 |
| Tanjung Pinang | Pangkal Balam | 410,707 | Surabaya | Banjarmasin | 609,338 |
| Palembang | Muntok | 279,344 | Tanjung Pinang | Pangkal Balam | 323,728 |
| Surabaya | Banjarmasin | 749,120 | Surabaya | Ujung Pandang | 838,543 |
| Surabaya | Ujung Pandang | 343,638 | Surabaya | Balikpapan | 398,237 |
| Batam | Tanjung Priok | 184,075 | Palembang | Muntok | 497,603 |
| Belawan | Tanjung Priok | 441,780 | Belawan | Tanjung Priok | 1,822,895 |
| Surabaya | Balikpapan | 1,573,059 | Batam | Tanjung Priok | 628,652 |
| Tanjung Balai Karir | Riau | 549,195 | Tanjung Priok | Ujung Pandang | 248,769 |
| Tanjung Pinang | Batam | 137,580 | Tanjung Balai Karir | Riau | 299,927 |
| Tanjung Priok | Ujung Pandang | 224,563 | Nunukan | Pare-pare | 286,841 |
| Nunukan | Pare-pare | 149,094 | Tanjung Pinang | Batam | 417,031 |
| Kijang | Tanjung Priok | 165,296 | Surabaya | Sampit | 247,086 |
| Belawan | Batam | 512,978 | Tanjung Priok | Surabaya | 313,089 |
| Surabaya | Sampit | 402,981 | Tanjung Priok | Pontianak | 881,452 |
| Surabaya | Kalimantan Selatan | 467,345 | Surabaya | Kalimantan Selatan | 631,234 |
| Samarinda | Pare-pare | 156,862 | Samarinda | Pare-pare | 699,888 |
| Riau | Riau | 156,729 | Pangkal Balam | Tanjung Priok | 278,450 |
| Semarang | Kumai | 213,921 | Semarang | Kumai | 277,087 |
| Tanjung Priok | Surabaya | 151,864 | Belawan | Batam | 379,042 |
| | Top 20 | 7,451,517 | | Top 20 | 10,305,062 |
| | All | 12,500,000 | | All | 18,714,597 |

APPENDIX OF CHAPTER 9

9.1 Comparison of Chartering Forms

(1) Time Charter

(a) Merits

- The charterer can make use of comparatively low interest rate and reliable ship-management available in overseas market.
- In ordinal cases, overseas shipowners would prefer chartering out in the form of time-charter to bareboat charter. So, time-charter is more easily available for domestic ship-charterer than bareboat charter.

(b) Demerits

- The flowing out of foreign exchange is much bigger than in the case of bareboat charter.
- Discrepancy with cabotage principle is evident.
- It is difficult to keep off evasions of the law confining ship-operation right to domestic shipping companies.

(2) Bareboat Charter

(a) Merits (of bareboat charter in general)

- Flowing out of foreign exchange for large part of ship's cost (other than capital expenses) can be saved.
- Domestic demands for employment of seamen and for ship-management increase.
- Government can establish effective period and renewal conditions of special permission for the use of foreign flag ships and of flag registration (in case relevant registration system is introduced), which system can be operated variably in line with development in actual Indonesian-flag tonnage.

(b) Merits (of bareboat charter registered in the charterer's country)

- Cabotage principle (i.e. "Indonesia flagged ships only") can be maintained.
- Clear-cut "genuine link" requisites for the flag-registration can be stipulated, and by doing so, governmental procedure can be implemented more simply (without sometimes vague administrative discretion) than in the case of special permission for the use of foreign ships on ordinal bareboat charter.
- By clear identification of flag-registration of ships, governmental supervision and management in cabotage implementation can avoid uncertainties which implementation of "special permission" might sometimes involve.

(c) Demerits (of bareboat charter in general)

- Domestic shipowners' real acquisition of ships might be hampered (because overseas capital cost is lower than domestic cost).
- Existent domestic shipowners and ships, which have borne domestic high capital cost so far, might be threatened.

(d) Demerits (of bareboat charter without flag-registration)

- "Case-by-case" special permission is required, and, thus, large room for administrative discretion is left. Accordingly, relevant charterer's burden is liable to become substantial.
- Adoption of this policy (promotion of bareboat charter-in without flag-registration) may not be persuasive enough as a comprehensive national policy, because, compared with the Government's strong claim that cabotage principle should be carried out strictly in cargo-wise transportation, ship-supply side would show little change from present status. (To introduce stricter "genuine link" requisites may well be one option to give the policy a new face, but in doing so, the above-said uncertainties in administrative discretion may arise as demerits.)

(3) Bareboat Charter with Purchase Option

(a) Merits

- For shipping companies: Charterers would be able to purchase, at comparatively low price (based on ship's depreciated value) even in strong market, relative ships of which performance they have confirmed through longstanding use and to which crew members have got accustomed.
- For the government / nation: Consecutive purchase of ships for years at cost lower than during the charter periods would bring consequential mid-term saving in foreign exchange payment, notwithstanding flowing out of foreign exchange on each occasion of the purchase.

(b) Demerits

Foreign shipowners and investors may be unable to be positive in chartering-out bareboats with purchase option, because this formula gives them little possibility of obtaining capital gain by selling out the ships in the future when the market is strong.

In the case of ocean-going ships, foreign shipowners may opt to charter back the ships on time-charter, after registering the bareboats in charterer's country, for their own use. But this cannot be the case in domestic shipping. Only one practical possibility may be the case that foreign shipowner/investor attempt tax saving utilizing investment promotion taxation of their country. At the end of previous century, however, the well-known tax incentives in Germany have been removed.

APPENDIX OF CHAPTER 10

10.1 Financial Analysis of PT.PELNI

The financial aspect of PELNI is characterized by a large proportion of fleet asset provided by the government as contribution of equity capital. PT. PELNI, a state-owned enterprise, is receiving vessels, operates them with reasonable fare and has been making profit until year 2001. The problems PELNI is facing now can be summarized as the recent drop of passenger revenue and increasing expense for operation.

(1) Characteristics of Financial Structure of PELNI

In the past 7 years, the asset amount increased from approximately 1.6 trillion Rp to 5.2 trillion Rp, an increase of more than 3.2 times and an annual rate of increase by 18%. The major item of assets is fleet which the government delivers in the form of equity capital in kind. As a result, equity ratio, which is the government capital to total assets, accounts for 86% in 2002 and has constantly been in the level of over 80%.

Increase of asset is a reflection of increase of fleet from 17 vessels in 1995 to 30 in 2002. The rate of increase in the number of vessels is only 1.7 over the past 8 years, but the price increase has increased the amount of asset more than 3 times.

Table 10.1 Fleet and Fixed Assets in Relation to Government Capital

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | Rate Incr |
|---|------------|------------|------------|------------|------------|------------|------------|------------|-----------|
| Number of Vessel | 17 | 18 | 19 | 25 | 27 | 28 | 29 | 30 | 1.76 |
| Governmental Capita | 1,465 | 1,675 | 1,889 | 2,959 | 3,208 | 3,208 | 3,846 | 4,492 | 3.07 |
| Total Liability & Equity (Total Assets) | 1,600 | 1,879 | 2,139 | 3,620 | 3,830 | 3,879 | 4,727 | 5,231 | 3.27 |
| Gov. Capital / Total Assets | 92% | 89% | 88% | 82% | 84% | 83% | 81% | 86% | 86% |
| Value of Fleet (Accumulated) | 1,463 | 1,750 | 1,986 | 3,425 | 3,667 | 3,843 | 4,484 | 5,128 | 3.51 |
| Fixed Asset (Accumulated) | 1,598 | 1,921 | 2,178 | 3,622 | 3,900 | 4,094 | 4,774 | 5,451 | 3.41 |
| Depreciation of Fixed Asset (Accumulated) | 288 | 354 | 433 | 549 | 694 | 861 | 1,038 | 1,255 | 4.36 |
| Fixed Asset Book Value | 1,310 | 1,568 | 1,745 | 3,073 | 3,205 | 3,233 | 3,736 | 4,196 | 3.20 |
| Fixed Asset Book Value /Total Asset | 82% | 83% | 82% | 85% | 84% | 83% | 79% | 80% | 82% |
| Fleet Book Value (Assumption) | 1,199 | 1,428 | 1,591 | 2,906 | 3,014 | 3,035 | 3,509 | 3,947 | 3.29 |
| Fleet to Total Asset (Book Value Assumption) | 92% | 91% | 91% | 95% | 94% | 94% | 94% | 94% | 93% |

Source: Annual Report and Financial Statement of PT. PELNI

Every year, fleet is depreciated by the rule of straight line over 25 years with 10% residual value. In the case of PELNI, the constant supply of new vessel keep the ratio of fixed assets book value to total asset being more than 80%. Vessels are all arranged by the program of the government's Official Development Assistance from Germany so that the PT. PELNI is intended to provide public service.

(2) Revenue and Assets

As the amount of fixed assets has increased, revenue has been increased to keep up to almost the same ratio as the fixed assets. In 1998, because of the supposed introduction of six vessels at once, the amount of fixed assets increased by 1.5 billion rupiah in addition to 2.1 billion rupiah in 1997. Revenue then did not increase at the same rate of the increase of the amount of fixed assets. But it soon caught up and recovered the ratio of 25% in the year 1999.

Table 10.2 Revenue and Fixed Assets

| | (Bil Rp) | | | | | | | |
|----------------------------------|----------|-------|-------|-------|-------|-------|-------|-------|
| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
| Total Operating Revenue | 397 | 458 | 499 | 736 | 987 | 1,139 | 1,358 | 1,417 |
| Fixed Assets Amount | 1,598 | 1,921 | 2,178 | 3,622 | 3,900 | 4,094 | 4,774 | 5,451 |
| Rate of Revenue Vs. Fixed Assets | 25% | 24% | 23% | 20% | 25% | 28% | 28% | 26% |

Source: Annual Report and Financial Statement of PT. PELNI

In general, until 2001, the revenue indicated healthy increase in relation to the increase of the fixed assets. But in 2002, there is an indication to worry about the decline of earning capacity being 26%, which is a downturn from the ratio of 28% in the previous years. The figure exhibits changes of these items with the left scale showing fixed assets and operating revenue in billion rupiah and the right scale showing ratio of revenue to fixed assets.

Figure 10.1 Fixed Assets, Operating Revenue and its ratio

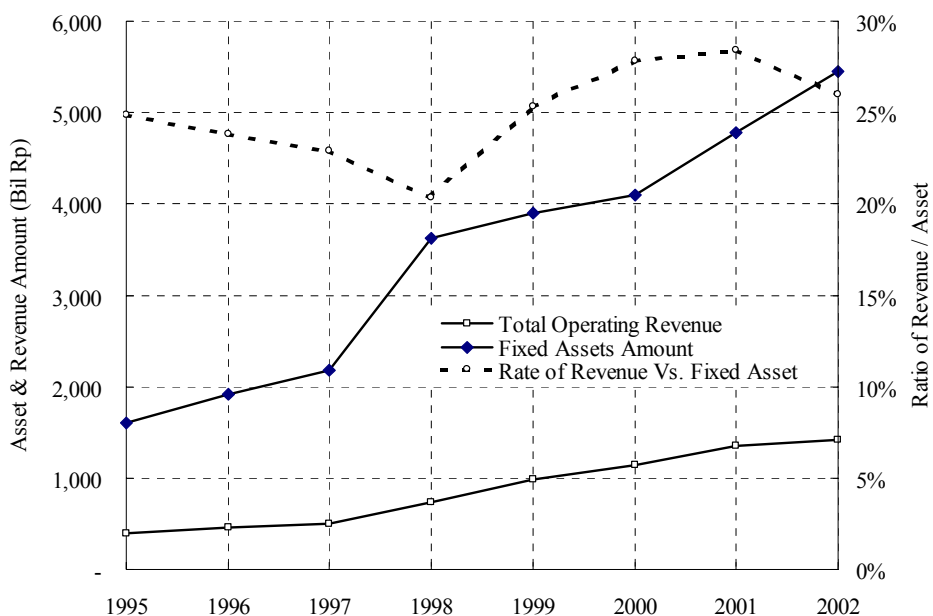


Table 10.3 Balance Sheet of PT. PELNI

| | (Million Rp) | | | | | | | |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Assets | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
| <i>Current Assets</i> | | | | | | | | |
| Cash on hand and in banks | 26,826 | 35,490 | 49,339 | 74,881 | 73,355 | 78,245 | 81,888 | 61,014 |
| Time Deposits | 59,207 | 66,433 | 131,013 | 237,718 | 284,530 | 208,940 | 228,135 | 169,752 |
| Marketable Securities | 15,205 | 15,598 | 0 | 0 | 73,452 | 107,141 | 85,296 | 40,826 |
| Account Receivables | 0 | 0 | 20,118 | 18,676 | 25,039 | 27,910 | 25,818 | 36,195 |
| Allowance for Account Receivable | (2,395) | (2,568) | (2,877) | (2,286) | (8,817) | (5,026) | (4,566) | (5,094) |
| Other Receivable | 2,272 | 1,917 | 719 | 1,269 | 3,259 | 1,986 | 1,403 | 1,746 |
| Allowance for Other Receivable | (698) | (846) | (528) | (593) | (258) | (480) | (453) | (672) |
| Employee Receivable | 577 | 826 | 779 | 767 | 457 | 428 | 395 | 608 |
| Allowance for Employee Receivable | (4) | (4) | | | | | | |
| Prepaid Tax | 0 | 0 | 1,271 | 0 | 0 | 0 | 11,756 | 11,662 |
| Prepaid Expenses | 1,300 | 1,961 | 6,052 | 33,019 | 15,731 | 12,363 | 14,224 | 17,525 |
| Current Accounts with Third Parties | 10,081 | 9,883 | 15,444 | 19,920 | 18,480 | 17,646 | 17,085 | 16,358 |
| Inventory | 47,197 | 42,353 | 57,442 | 62,373 | 83,501 | 106,659 | 130,501 | 181,546 |
| Accrued Expenses | 14,598 | 9,694 | 17,658 | 19,046 | 15,619 | 20,676 | 24,393 | 41,749 |
| Accrued Revenue | 0 | 0 | 0 | 9,273 | 7,036 | 15,774 | 16,392 | 31,870 |
| Total Current Assets | 174,167 | 180,735 | 296,429 | 474,062 | 591,385 | 592,262 | 632,268 | 605,085 |
| <i>Long Term Investment</i> | | | | | | | | |
| Obligation | 10,000 | 10,000 | 10,000 | 10,000 | 0 | 0 | 0 | 0 |
| Total Long Term Investment | 10,000 | 10,000 | 10,000 | 10,000 | 0 | 0 | 0 | 0 |
| <i>Fixed Assets Amount</i> | | | | | | | | |
| Fleet | 1,462,771 | 1,750,300 | 1,986,029 | 3,425,269 | 3,667,356 | 3,843,172 | 4,483,698 | 5,128,133 |
| Other Production Equipment | 14,310 | 23,590 | 26,159 | 28,919 | 30,044 | 33,782 | 41,217 | 58,041 |
| Land | 26,082 | 26,504 | 24,391 | 20,915 | 21,390 | 22,477 | 23,398 | 24,088 |
| Building | 72,458 | 94,875 | 110,092 | 112,351 | 125,474 | 126,055 | 134,734 | 145,808 |
| Tretes Guest House | 0 | 0 | 0 | 159 | 159 | 157 | 159 | 159 |
| Vehicles | 3,702 | 4,425 | 5,721 | 5,366 | 6,581 | 11,229 | 21,774 | 22,555 |
| Office equipment | 18,560 | 21,717 | 25,204 | 29,362 | 48,622 | 57,509 | 69,097 | 72,467 |
| <i>Fixed Assets Total</i> | 1,597,883 | 1,921,411 | 2,177,596 | 3,622,341 | 3,899,626 | 4,094,382 | 4,774,077 | 5,451,251 |
| Accumulated Depreciation of Fixed Assets | (287,817) | (353,660) | (432,900) | (548,935) | (694,362) | (861,419) | (1,037,635) | (1,255,167) |
| Book Value of Fixed Assets | 1,310,066 | 1,567,751 | 1,744,697 | 3,073,407 | 3,205,264 | 3,232,963 | 3,736,442 | 4,196,084 |
| <i>Lease Assets</i> | | | | | | | | |
| Accumulated Depreciation of Assets | 40,063 | 40,049 | 14,252 | 14,251 | 14,251 | 14,030 | 242,348 | 242,348 |
| | (12,038) | (15,362) | (5,970) | (6,706) | (7,433) | (7,993) | (15,540) | (25,368) |
| Net Book Value of Lease Assets | 28,024 | 24,687 | 8,282 | 7,546 | 6,818 | 6,037 | 226,809 | 216,980 |
| <i>Non-Performing Assets</i> | | | | | | | | |
| | 73,436 | 89,761 | 74,547 | 51,306 | 21,990 | 27,824 | 37,191 | 42,343 |
| <i>Other Assets</i> | | | | | | | | |
| Deferred Charges | 2,117 | 2,185 | 1,397 | 666 | 3,218 | 19,096 | 91,519 | 168,351 |
| Investment in PT. DSTP | 0 | 2,300 | 2,300 | 2,300 | | | | |
| Paid Guarantee | 1,526 | 1,523 | 262 | 284 | 782 | 281 | 476 | 376 |
| Land and Building Used by Third Party | 95 | 80 | 85 | 85 | 85 | 84 | 98 | 106 |
| Unused Assets | 276 | 263 | 257 | 884 | 341 | 329 | 2,200 | 2,196 |
| Accumld Depreciation of Unused Assets | (107) | (85) | (79) | (876) | (334) | (322) | (313) | (310) |
| Obsolete Assets | 1 | 1 | 2 | 2 | 3 | 25 | 25 | 553 |
| Total Other Assets | 3,908 | 6,268 | 4,223 | 3,343 | 4,095 | 19,493 | 94,005 | 171,273 |
| Total Assets | 1,599,602 | 1,879,201 | 2,138,177 | 3,619,663 | 3,829,552 | 3,878,578 | 4,726,715 | 5,231,766 |

(Continue)

| Liabilities And Owner's Equity | | (mil Rp) | | | | | | | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--|
| Description | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | |
| <i>Current Liability</i> | | | | | | | | | |
| Account Payable | 16,852 | 14,558 | 24,448 | 40,030 | 38,246 | 45,698 | 102,654 | 136,986 | |
| Taxes Payable | 133 | 5,079 | 2,795 | 2,856 | 3,237 | 2,064 | 7,186 | 6,793 | |
| Due Long Term Payable | 3,732 | 9,008 | 8,592 | 30,128 | 11,918 | 28,828 | 56,577 | 109,987 | |
| Other Payable | 2,824 | 2,865 | 23,330 | 33,427 | 10,459 | 15,689 | 38,108 | 34,836 | |
| Unearned Deposit & Guarantee | 4,104 | 6,478 | 6,405 | 16,649 | 26,737 | 25,635 | 11,117 | 16,240 | |
| Current Account with Third Parties | 3,888 | 2,282 | 2,651 | 3,439 | 5,644 | 4,722 | 5,510 | 5,951 | |
| Accrued Payables | 5,322 | 9,772 | 6,350 | 5,352 | 8,004 | 16,495 | 23,575 | 28,195 | |
| Unearned Income | 0 | 0 | 0 | 3,067 | 6,107 | 3,899 | 1,675 | 9,463 | |
| Total Short-Term Debt | 36,855 | 50,041 | 74,572 | 134,948 | 110,352 | 143,030 | 246,403 | 348,452 | |
| <i>Long Term Debt</i> | | | | | | | | | |
| Leasing Loan | 27,058 | 66,053 | 72,768 | 111,284 | 75,050 | 77,046 | 216,437 | 169,270 | |
| Spare-part Loan (KFW) | | 0 | 0 | 0 | 0 | 0 | 1,691 | 47,783 | |
| Long Term Debt | 27,058 | 66,053 | 72,768 | 111,284 | 75,050 | 77,046 | 218,129 | 246,425 | |
| <i>Equity</i> | | | | | | | | | |
| Issued and Paid-in Capital | 10,000 | 10,000 | 10,000 | 359,000 | 360,756 | 360,754 | 360,754 | 360,756 | |
| Reserve | 36,926 | 43,813 | 56,288 | 23,370 | 30,590 | 37,483 | 31,392 | 44,387 | |
| Account of Governmental Capital | 1,464,530 | 1,674,647 | 1,889,154 | 2,959,306 | 3,208,360 | 3,208,360 | 3,845,900 | 4,491,925 | |
| | 1,511,456 | 1,728,460 | 1,955,443 | 3,341,676 | 3,599,706 | 3,606,597 | 4,238,045 | 4,897,068 | |
| Deferred Tax Liabilities | 0 | 0 | 0 | 0 | 0 | 0 | 1,997 | | |
| <i>Retained Earnings</i> | | | | | | | | | |
| Income (loss) up to Last Year | 12,198 | 710 | 979 | (93) | (2,224) | (2,581) | (1,843) | (1,866) | |
| Income (loss) of the Current Year | 12,034 | 33,938 | 35,395 | 31,848 | 46,669 | 54,485 | 23,984 | (258,672) | |
| | 24,232 | 34,648 | 36,375 | 31,754 | 44,445 | 51,904 | 22,141 | (260,539) | |
| Total Equity | 1,535,689 | 1,763,108 | 1,991,817 | 3,373,430 | 3,644,151 | 3,658,502 | 4,260,186 | 4,636,530 | |
| Total Liability and Stockholder Equity | 1,599,602 | 1,879,201 | 2,139,157 | 3,619,663 | 3,829,552 | 3,878,578 | 4,726,715 | 5,231,407 | |

Source: Annual Report and Financial Statement of PT. PELNI

(3) Performance Review

The Profit and Loss statement indicates operational loss in 2002, the first indication in recent years. The revenue increases rapidly after 1997 as the fleet becomes nearly 20 vessels.

Average rate of increase over the past 8 years shows 20% for revenue and 24% for expense.

Profit margin kept the level of 5% in the years 1999 and 2000, and it declined to 2.2% in 2001, then eventually registered a deficit of -18.2% in 2002. The structure of operation by deficit seems to continue in 2002 so that the company is requesting subsidiary funding under the concept of Public service obligation.

Table 10.4 Operational Revenue, Expenses, Earning

(Bil. Rp)

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | Av.Rate |
|-------------------------------|------|------|------|------|------|-------|-------|--------|---------|
| Total Operating Revenue | 397 | 458 | 499 | 736 | 987 | 1,139 | 1,358 | 1,417 | 20% |
| Total Operating Expenses | 346 | 383 | 425 | 684 | 900 | 1,017 | 1,245 | 1,598 | 24% |
| Earning Before Tax | 13 | 35 | 35 | 34 | 49 | 57 | 30 | (258) | |
| Profitability: EBT/Op Revenue | 3.2% | 7.6% | 7.1% | 4.6% | 5.0% | 5.0% | 2.2% | -18.2% | |

Source: Annual Report and Financial Statement of PT. PELNI

Decline of passenger revenue is said to be caused by the move of passengers from ship to airplane. However, to address the real cause of the decline of revenue, cost reduction is a

necessary and urgent task for the survival of PT PELNI as a sustainable operational entity.

Figure 10.2 Operating Revenue and Expenses

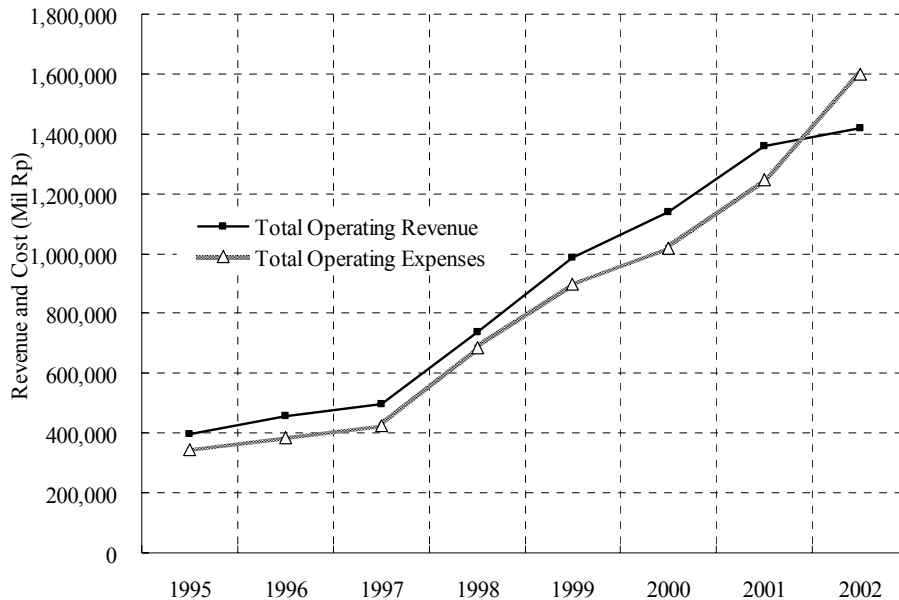


Table 10.5 Income Statement of PT. PELNI

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|----------------------------------|----------------|----------------|----------------|-----------------|----------------|------------------|------------------|------------------|
| (Mil Rp) | | | | | | | | |
| Operating Revenue | | | | | | | | |
| Shipping Business | 325,134 | 377,093 | 405,707 | 628,608 | 866,827 | 1,005,695 | 1,202,464 | 1,244,178 |
| Supporting Business | 15,701 | 17,484 | 21,903 | 20,308 | 18,820 | 17,043 | 18,970 | 17,135 |
| Side Business | 30,171 | 36,114 | 41,905 | 51,206 | 58,164 | 66,000 | 77,109 | 89,112 |
| Subsidiary Business | 26,402 | 27,526 | 29,481 | 35,919 | 43,379 | 50,473 | 59,333 | 66,740 |
| Total Operating Revenue | 397,408 | 458,217 | 498,996 | 736,041 | 987,191 | 1,139,212 | 1,357,876 | 1,417,164 |
| Operating Expenses | | | | | | | | |
| Shipping Business | 291,411 | 320,160 | 354,988 | 605,026 | 807,697 | 913,924 | 1,116,870 | 1,454,136 |
| Supporting Business | 7,705 | 10,038 | 11,510 | 7,529 | 7,874 | 8,975 | 10,910 | 9,075 |
| Side Business | 27,902 | 32,350 | 36,795 | 46,523 | 55,552 | 61,555 | 78,363 | 88,255 |
| Subsidiary Business | 19,164 | 20,338 | 22,007 | 24,627 | 28,732 | 32,437 | 38,641 | 46,491 |
| Total Operating Expenses | 346,182 | 382,885 | 425,299 | 683,705 | 899,855 | 1,016,891 | 1,244,785 | 1,597,956 |
| Gross Income | 51,226 | 75,332 | 73,697 | 52,335 | 87,336 | 122,321 | 113,091 | (180,792) |
| Indirect Operating Expenses | | | | | | | | |
| Overhead Expenses | 47,054 | 53,450 | 57,561 | 63,623 | 79,999 | 96,061 | 121,879 | 138,573 |
| Net Income | 4,172 | 21,882 | 16,136 | (11,288) | 7,337 | 26,260 | (8,788) | (319,365) |
| Other Income And Expenses | | | | | | | | |
| Other Income | 16,946 | 19,563 | 36,621 | 150,229 | 123,801 | 103,004 | 100,682 | 90,049 |
| Other Expenses | 8,471 | 6,775 | 17,477 | 105,218 | 81,936 | 71,913 | 62,166 | 28,393 |
| Other Operating Income | 8,475 | 12,788 | 19,144 | 45,011 | 41,865 | 31,090 | 38,516 | 61,656 |
| Profit Before Income Tax | 12,647 | 34,670 | 35,280 | 33,723 | 49,202 | 57,350 | 29,728 | (257,709) |
| Income Tax | | | | | | | | |
| Current Tax | 612 | 732 | 863 | 1,875 | 2,534 | 2,865 | 2,927 | 2,850 |
| Deferred Tax Expenses | 0 | 0 | 0 | 0 | 0 | 1,319 | 2,817 | (1,887) |
| Profit After Income Tax | 12,034 | 33,938 | 34,416 | 31,848 | 46,669 | 53,167 | 23,984 | (258,672) |

Source: Annual Report and Financial Statement of PT. PELNI

10.2 Financial Profitability Analysis of Passenger Shipping

10.2.1. General

The passenger services by current system and proposed system are financially analyzed in this section.

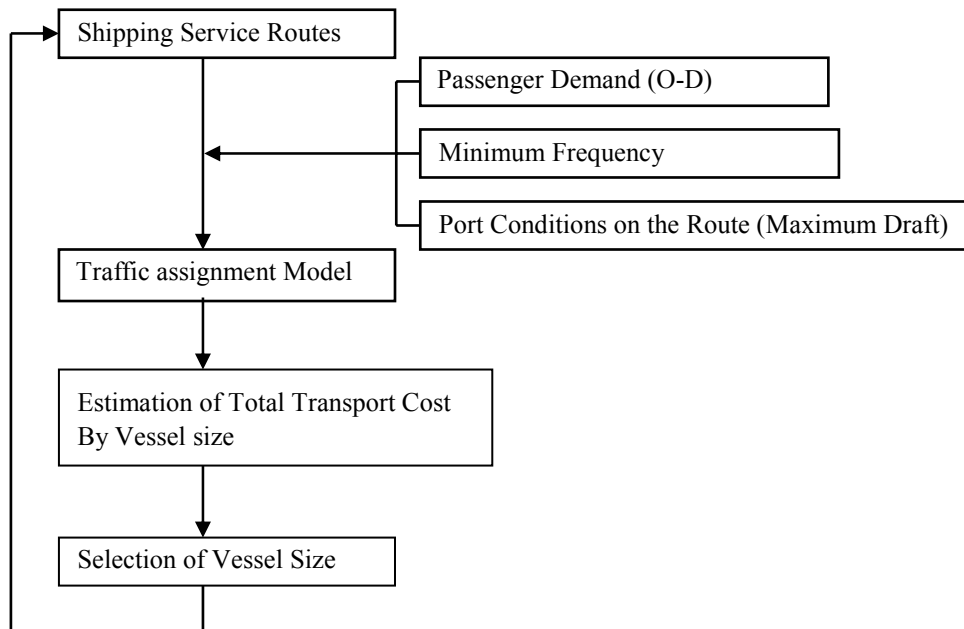
Currently, the passenger services are operated by PT. Pelni, PT.Prima Vista, PT.Dharma Lautan, PT.ASDT, and other small operators. On the other hand, a new network system consisting of trunk routes, local routes and feeder routes is proposed as elaborated in the previous chapter.

Both network cases are financially examined by employing the minimum transportation cost approach, which simulates the present as well as future vessel operation under several assumptions.

Assuming several vessel sizes applicable and the minimum frequency, the passenger demand as well as the required number of vessels for each operation route is estimated by using the simulation model. As a result of the traffic assignment, the total transport cost is estimated by vessel size by operation route. The most economical vessel is selected on that route.

The ship selection procedure is expressed in the following figure.

Figure 10.3 Procedure of Ship Size Selection



(1) Basic Assumptions for the Cost Minimum Approach

(a) Operation Cost of Passenger Ships

For estimating the transport cost, the unit operation cost data by typical size of passenger ships are required. The ship operation cost is composed of the following items.

- Fixed cost: Annually fixed cost including capital cost, repair, dockage, crew wage and food expenses, insurance, lubricant oil cost, etc.
- Distance-related cost: Cost depending on the operation mileage such as fuel cost
- Call-related cost: Cost required for every port visit including berth, anchorage and pilotage cost, etc.
- Passenger expense: Cost depending on the number of passengers on board

These costs are summarized in Table 10.6.

Table 10.6 Cost Parameters for Passenger Ships

| Description | GT <i>(ton)</i> | Capacity <i>(passengers)</i> | Fixed Capital Cost <i>(mil. Rp./yr)</i> | Fixed Operation Cost <i>(mil. Rp./yr)</i> | Distance Related Cost <i>(mil. Rp./mile)</i> | Passenger Related <i>(mil. Rp./pax.)</i> | Call (GT) Related <i>(mil. Rp./call)</i> |
|--------------------|---------------------------|--|---|---|--|--|--|
| Passenger 1 | 2,600 | 500 | 4,500 | 7,000 | 0.031 | 0.021 | 0.50 |
| Passenger 2 | 9,500 | 1,000 | 5,300 | 12,280 | 0.046 | 0.024 | 0.93 |
| Passenger 3 | 12,000 | 2,000 | 9,400 | 22,200 | 0.114 | 0.030 | 2.74 |

(b) Port Conditions

The port conditions are already elaborated in the previous chapter. The most influential factor on the port condition for the cost minimization approach is the maximum draft, which is the decisive factor for accommodating different sizes of vessels.

(c) Vessel Specifications

In order to apply the cost minimum approach, the vessel specification by size is required. The following characteristics shown in Table 10.7 are assumed for the typical size.

Table 10.7 Vessel Specification

| Ship Size | GT | Draft | Speed |
|------------------|-----------|--------------|--------------|
| 500 pax. | 2600 ton | 2.9 m | 14 knot |
| 1000 pax | 6000 ton | 4.2 m | 14 knot |
| 2000 pax | 15000 ton | 5.9 m | 20 knot |

(d) Revenue

Since the largest portion of the passenger service is served by PT Pelni, the tariff system of PT Pelni is applied. Accordingly, Rp 334 per passenger mile is the basis for the revenue estimation.

10.2.2. Result of Financial Analysis

(1) Present Network

By applying the minimum cost approach, the profitability of the existing network is examined. Table 10.8 shows the summary of the whole network.

The total operation cost is estimated to be 3.3 trillion Rp in 2002, 4.4 trillion Rp in 2014 and 4.6 trillion Rp in 2024, while the revenue is estimated as 1.9 trillion Rp in 2002, 2.8 trillion Rp in 2014 and 2.9 trillion Rp in 2024. As a result, passenger service as a whole is receiving only about 60% of the operation cost. Even in 2024, the profitability will not be much improved.

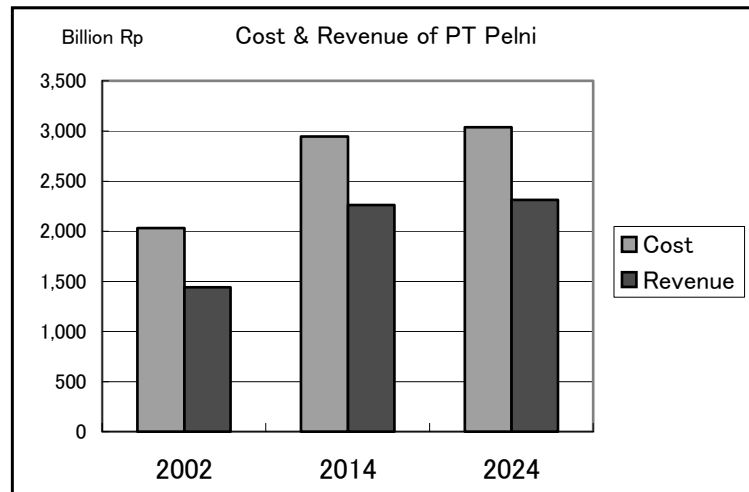
Table 10.8 Summary of Present Network

| Item | Unit | Present Network | | | |
|------------------------|---------------------|-----------------|---------|---------|-----|
| | | 2002 | 2014 | 2024 | |
| Number of Effective | Line | 57 | | | |
| Total Operation Route | N-mile | 174,353 | | | |
| Total Annual Passenger | Million Person | 14.67 | 21.76 | 21.91 | |
| Passenger-N.mile | Million Person-mile | 5,582.8 | 8,443.9 | 8,588.6 | |
| Total Vessel-N.mile | Million Person-mile | 11.63 | 16.21 | 16.87 | |
| Total Operating Cost | Billion Rp. | 3,272.6 | 4,494.0 | 4,599.1 | |
| Total Revenue | Billion Rp. | 1,864.6 | 2,820.2 | 2,868.6 | |
| Fare Box Ratio | | 0.570 | 0.628 | 0.624 | |
| Necessary Fleet | 500 pax | Unit | 111 | 138 | 146 |
| | 1,000 pax | | 19 | 30 | 28 |
| | 2,000 pax | | 44 | 58 | 60 |
| | Total | | 174 | 226 | 234 |

When taking only the PT.Pelni routes, the total operating cost and revenue are estimated as shown in Fig. 10.4. The average fare-box ratio increases from 0.71 at present to 0.76 in 2024, while the total deficit is expected to be expanded from 591 billion Rp in 2002 to 690 billion Rp in 2014 and 727 billion Rp in 2024 (refer to Table 10.9).

Table 10.9 Estimated Farebox Ratio and Deficit of PT Pelni

| | Cost | Revenue | Farebox Ratio | Deficit |
|------|-------|---------|---------------|---------|
| 2002 | 2,031 | 1,440 | 0.709 | -591 |
| 2014 | 2,949 | 2,259 | 0.766 | -690 |
| 2024 | 3,039 | 2,313 | 0.761 | -727 |

Figure 10.4 Estimated Operation Cost and Revenue of PT Pelni

As a result of the financial analysis, it is found that some routes are profitable but many of the routes are not profitable under the current operation system.

Figure 10.5 shows the relationship between the passenger-mile and profitability of the existing routes. Fare-box ratio is defined by the revenue divided by total operation cost.

It is exceeding 1.0 for only few routes, and others are mostly unprofitable. Figure 10.5 shows the simulation result of the present condition. In accordance with the passenger growth in the future, the profitability will be slightly improved; however, most of the routes are still unprofitable even for the demand in 2024.

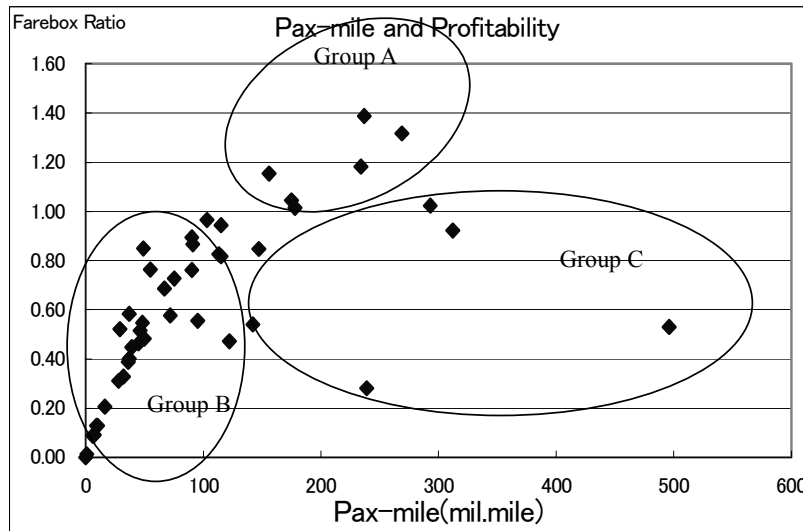
It is generally considered that the larger the passenger-mile, the higher the profitability. The figure also shows this tendency. The passenger service routes are classified into three groups, as follows:

- Group A: The route with large passenger-mile and is profitable.
- Group B: The route with low passenger-mile and has low profitability
- Group C: The route with large passenger-mile but is unprofitable

The first group consists of the routes which are financially sustainable.

The second group is regarded as some sort of pioneer shipping type. The third group is considered as the routes having possibility to improve the profitability by reducing the transport cost.

Figure 10.5 Passenger-mile and Profitability of Existing Route (2002)

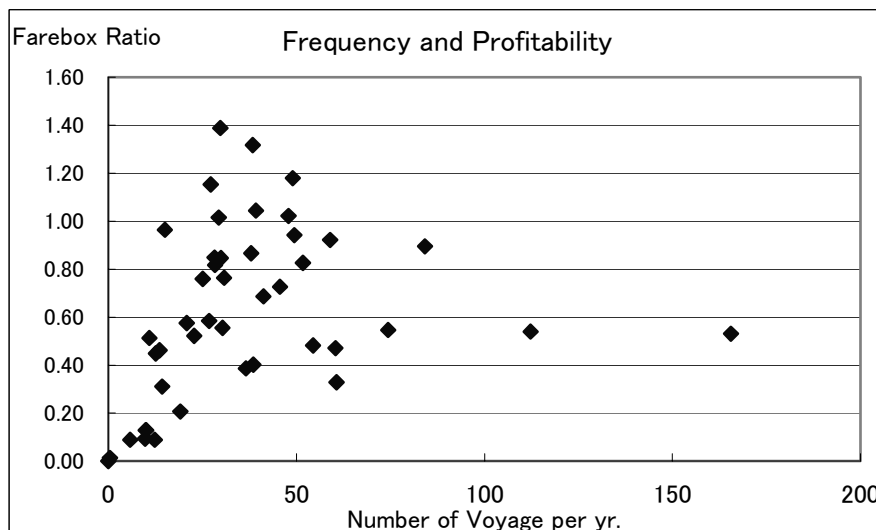


The routes in this group have more than 150 million passenger-miles, while the fare-box ratios do not reach at 1.0. The following reasons can be identified.

- The operation route is too long and the difference in the passenger demand by section (between specific ports) is considerably high. Therefore, the ship operation accommodating the highest demand section becomes inefficient, thus the average load factor as a whole route becomes low.
- There are sufficiently large numbers of passenger demand on the route; however, large ships cannot be operated because of the restriction of a certain port on the service route. Accordingly, frequent services by small ships are required along the route. Such types are also found in Fig.10.6, which illustrates the relationship between the service frequency and profitability.

It suggests that there is a high possibility to improve the profitability by modifying the operation route and enabling the operation of different size of ships for certain sections.

Figure 10.6 Service Frequency and Profitability of Existing Route



10.3 Port Scale

Table 10.10 Port Scale Study of 25 Strategic Ports in Indonesia

| No. | Name of Port Sea/River Port (Channel length) | 1. Channel 1) Length 2) Min.width 3) Min.depth 4) Tide | 2. Berth Length/Depth 1) Container / RORO 2) Multi-purpose 3) Dry Bulk 4) Liquid (Tanker) | 3. Max. size at this stage 1) Container / RORO 2) Multi-purpose 3) Dry Bulk 4) Liquid (Tanker) |
|------|--|--|---|--|
| P-1 | Batam Channel Port | No restriction | 1) N/A 2) 1,250m (-10.5m) 3) N/A 4) CPO 420m (-13m) | 1) 20,000 DWT (9.2m) 2) 15,000 DWT (9.2m) 3) 20,000 DWT (9.3m) 4) 40,000 DWT (11.8m) |
| P-2 | Lhokseumawe Sea Port | 1) 600m 2) 200m 3) -10m | 1) N/A 2) 567m (-9.5m) 3) N/A 4) 195m (-4.5m) | 1) 15,000 DWT (8.5m) 2) 10,000 DWT (8.0m) 3) 10,000 DWT (7.5m) 4) 1,000 DWT (4.0 m) |
| P-3 | Belawan River Port | 1) 7.5 miles 2) 75m 3) -8.5m 4) HHWS 3.3m LLWS 1.8m | 1) 850m (-8m) 2) 1,880m (-7m) 3) 200m (-7m) 4) Oyhers 1,800m (-9m) | 1) 15,000 DWT (8.5m) 2) 10,000 DWT (8.0m) 3) 10,000 DWT (7.5m) 4) 10,000 DWT (7.8m) |
| P-4 | Tj.Pinang Sea Port | 1) 16' (West), 11'(East) 2) 183m / 100m 3) -9m / -5m 4) HHWS 2.1m | 1) - 2) 440m (120+150+170) Sri Payung Batu Anam Port | 1) 5,000 DWT (5.4m) 2) 1,200 DWT 3) - 4) - |
| P-5 | Dumai PELINDO 1 River Port (60 miles) | 1) 61 miles 2) 225m 3) -6m | 1) - 2) 893m (-8m) 3) - 4) - | 1) 5,000 DWT (5.4m) 2) 2,500 DWT (5.0m) 3) - 4) - |
| P-6 | Pekanbaru Siak River Port (85 miles) | 1) 80 miles 2) 60-100 m 3) -5 m | 1) - 2) 210 m (-5m) 3) - 4) - | 1) - 2) 1,000 DWT 3) - 4) - |
| P-7 | Teluk Bayur (Ciwandan) Sea Port | 1) 1.8 km 2) 150m 3) -10m | 1) 150m (-9.5m) 2) 953m (-9.5m) 3) 248m (-9.5m) 4) - | 1) 15,000 DWT (8.5m) 2) 10,000 DWT (8.0m) 3) 10,000 DWT (7.5m) 4) - |
| P-8 | Palembang Musi River Port (58 miles) | 1) 55 miles 2) 120m 3) -8m | 1) 265m (-9.2m) 2) 475m (-7m) | 1) LOA 185m with Draft 6.5m (5,000 - 6,000 DWT) 2) 3) 4) same |
| P-9 | Panjang Sea Port | No restriction | 1) 400m (-12m) 2) 1,016m (-10m) 3) Grain 300m (-15m) | 1) LOA 200m 40,000 DWT (10.5m) 2) same as above 3) 60,000 DWT (13m) |
| P-10 | Tj.Priok Sea Port | 1) 4.5 miles 2) 95m 3) -11.7m 4) HHWS 86 cm LLWS 26 cm | 1) JICT, KOJA (-14m) 2) 7,737m (-12m) | 1) 25,000 DWT (10.1m) 2) 20,000 DWT (10.0m) 3) 30,000 DWT (10.5m) 4) 30,000 DWT (10.8m) |
| P-11 | Bojonegara (Cigading) Sea Port | No restriction | 1) - 2) 475.5m (-10m) | 1) 15,000 DWT (8.5m) 2) 10,000 DWT (8.0m) 3) 10,000 DWT (7.5m) 4) - |
| P-12 | Pontianak Kapuas River Port (17 miles) | 1) 17 miles 2) 70m 3) -5m to 5.5m | 1) Semi-cont. 100m (-5.5m) 2) 607m (-5.5m) 3) - 4) 140m (-5.5m) | 1) 5,000 DWT (5.4m) 2) 2,500 DWT (5.0m) 3) - 4) 2,500 DWT (5.0m) |

Continue

| No. | Name of Port | 1. Channel | 2. Berth Length/Depth | 3. Max. size at this stage |
|------|--|---|--|--|
| P-13 | Tj.Emas Sea Port | 1) 18 miles 2) 150m 3) -9m | 1) 350 m (-10m) 2) 880 m (-9m) 3) Ferti. 1,017m (-6m) | 1) 15,000 DWT (8.5m) 2) 10,000 DWT (8.0m) 3) 10,000 DWT (7.5m) 4) 10,000 DWT (7.8m) |
| P-14 | Tj.Perak Sea Port | 1) 25 miles 2) 100m 3) -10m 4) HHWS 2.5m | 1) 3,320 m (-10.5 m) 2) 1,870 m (-10.5 m) 3) 849 m (-9 m) Others 3,900m (-9.7 m) | 1) 25,000 DWT (10.1m) 2) 20,000 DWT (10.0m) 3) 10,000 DWT (7.5m) 4) 10,000 DWT (7.8m) |
| P-15 | Benoa Sea Port | 1) 2 miles 2) 150m 3) -9m | 1) - 2) 496m (-6 to -9m) (Inc. 290m with-9 m, Passenger) | 1) 15,000 DWT (8.5m) 2) 10,000 DWT (8.0m) 3) - 4) - |
| P-16 | Tenau/Kupang Sea Port | No restriction | 1) - 2) 223m (-8m) * 240m (-10m) (under construction) | 1) 20,000 DWT (9.1m) 2) 15,000 DWT (9.2m) 3) - 4) - |
| P-17 | Banjarmasin River Port (22 miles) | 1) 22 miles 2) 60 m 3) -3.2 to -4m 4) LLWS 1.6 m | 1) Semicon 200 m(-9m) 2) 590 m (-9m) 3) Cement 40m (-7m) Others 500m (-9m) | 1) 5,000 DWT with Draft max.4.3m (Max. 4,000 DWT loadable) 2) 3) 4) same |
| P-18 | Samarinda River Port (37 miles) | 1) 37 miles 2) 80 m 3) -6 m 4) HHWS 2.6m LLWS 0.4m | 1) - 2) 827 m (-7m) (inc. passenger) | 1) 5,000 DWT (5.4m) 2) 2,500 DWT (5.0m) 3) - 4) - |
| P-19 | Balikpapan River Port (12 miles) | 1) 12 miles 2) 150m 3) -13m 4) LLWS 1.2 m | 1) - 2) 489 m (-7m) 3) - 4) Tanker Berth | 1) 5,000 DWT (5.4m) 2) 2,500 DWT (5.0m) 3) - 4) 40,000 DWT (11.8m) |
| P-20 | Bitung Sea Port | 1) 9 miles 2) 600m 3) -17m 4) LLWS 1.2 m | 1) - 2) 1,311m (-9m) inc. passenger | 1) 15,000 DWT (8.5m) 2) 10,000 DWT (8.0m) 3) - 4) - |
| v21 | Makassar Sea Port | 1) 2 miles 2) 150m 3) -13m 4) HHWS 1.4 m LLWS 5 cm | 1) 850 m (-12m) RORO 150m (-5m) 2) 1,360 m (-9m) | 1) 25,000 DWT (10.1m) 2) 20,000 DWT (10.0m) 3) 20,000 DWT (9.3m) 4) - |
| P-22 | Ambon Sea Port | 1) 15 miles 2) 1,000 m 3) -10 m | 1) - 2) 576 m (-10m) inc. passenger | 1) 15,000 DWT (8.5m) 2) 15,000 DWT (9.2m) 3) - 4) - |
| P-23 | Jayapura Sea Port | 1) 1.62 miles 2) 500m 3) -27 m 4) HHWS 1.5m LLWS 1.0 m | 1) - 2) 133+33+82m (-11m) 3) - 4) - | 1) 20,000 DWT (9.2m) 2) 15,000 DWT (9.2m) 3) - 4) - |
| P-24 | Biak Sea Port | 1) 1.5 miles 2) 360 m 3) -10 m to -16 m 4) HHWS 1.3m LLWS 1.0 m | 1) - 2) 262 m (-10m) inc. passenger | 1) 15,000 DWT (8.5m) 2) 15,000 DWT (9.2m) 3) - 4) - |
| P-25 | Sorong Sea Port | 1) 3.5 miles 2) 926m 3) -20m HHWS 1.8 m LLWS 0.1 m | 1) - 2) 280 m including passenger (-9 m) | 1) 15,000 DWT (8.5m) 2) 10,000 DWT (8.0m) 3) - 4) - |