

2) Regional Forecast

The numbers of passenger at commercial ports by international travel and domestic travel is estimated using the correlation between the past passenger volume records (from 1988 to 1995) in each region and GRDP over the same period in the same area, time trend analysis or the average of the past data. (The same methods are employed in the domestic cargo volume forecast at commercial ports.) The number of passenger at commercial ports for international travel and domestic travel for scenario 1 and 2 in alternative-3 is shown in Tables 3.6.2.26 and 3.6.2.29.

3) National Forecast

The number of passenger at commercial ports in all Indonesia is forecast using the correlation between GDP and the past passenger volume record at IPC Ports. The result of the forecast is shown in Table 3.6.2.30.

4) Number of Passenger at Commercial Ports

There is no large difference between the result of the regional forecast at commercial ports in 2) and the result 3). Therefore, the passenger volume is estimated from the result 2).

The number of passengers at commercial ports in the target year in each province is calculated by the share of GRDP in the target years in each province, namely, the number of estimated passenger in each region is distributed to each province by the share of GRDP of each province in the region. The result of the calculation for scenario 1 and 2 in Alternative-3 are shown from Table 3.6.2.31 to 3.6.2.34. (See from Table A3.6.2.26 to Table A3.6.2.33)

5) Number of Passenger at Non-commercial Ports

Number of passenger at public non-commercial ports in each region in the target years is estimated by the following procedure:

Table 3.6.2.26 Number of Foreign Travel Passenger for Scenario 1 in Alternative 3

(Unit:1000Persons)

Area	2003			2008			2018		
	Get on	Get off	Total	Get on	Get off	Total	Get on	Get off	Total
	Number of Passenger Ratio	406.6	375.2	781.9	586.7	541.5	1128.2	1434.8	1324.1
Sumatra	0.520	0.480	1.000	0.520	0.480	1.000	0.520	0.480	1.000
Number of Passenger Ratio	168.2	197.7	365.9	222.9	261.9	484.8	332.2	390.4	722.6
Jawa	0.460	0.540	1.000	0.460	0.540	1.000	0.460	0.540	1.000
Number of Passenger Ratio	32.0	18.0	50.0	40.1	22.6	62.6	56.3	31.7	88.0
Kalimantan	0.640	0.360	1.000	0.640	0.360	1.000	0.640	0.360	1.000
Number of Passenger Ratio	6.7	6.7	13.4	6.7	6.7	13.4	6.7	6.7	13.4
Sulawesi	0.503	0.497	1.000	0.503	0.497	1.000	0.503	0.497	1.000
Number of Passenger Ratio	15.1	13.8	28.9	24.3	22.1	46.5	64.9	59.1	123.9
Oter Eeas	0.523	0.477	1.000	0.523	0.477	1.000	0.523	0.477	1.000
Total Indo	628.6	611.3	1240.0	880.7	854.7	1735.5	1894.9	1811.9	3706.8

Table 3.6.2.27 Number of Foreign Travel Passenger for Scenario2 in Alternative 3

(Unit:1000Persons)

Area	2003			2008			2018		
	Get on	Get off	Total	Get on	Get off	Total	Get on	Get off	Total
	Sumatra	428	395	824	659	608	1,267	1,758	1,622
Jawa	168	198	366	223	262	485	332	390	723
Kalimantan	32	18	50	40	23	63	56	32	88
Sulawesi	7	7	13	7	7	13	7	7	13
Oter Eeast Indonesia	15	14	29	25	22	47	69	63	132
Total Indonesia	650	631	1,282	953	922	1,875	2,222	2,114	4,336

Table 3.6.2.28 Number of Domestic Travel Passenger
(Alternative 3, Sconario 1)

(Unit:Million persons)

Year		2003	2008	2018
Get on	Sumatera	2.4	3.7	9.8
	Jawa	1.6	2.2	5.0
	Kalimantan	1.5	2.2	5.4
	Sulawesi	1.2	1.3	1.4
	Others	2.2	3.2	7.9
	Total	8.8	12.5	29.4
Get off	Sumatera	2.1	3.2	8.2
	Jawa	1.8	2.6	6.6
	Kalimantan	1.2	1.6	3.6
	Sulawesi	1.0	1.0	1.1
	Others	1.8	2.6	6.1
	Total	8.0	11.1	25.5

Table 3.6.2.29 Number of Domestic Travel Passenger
(Alternative 3, Scenario 2)

(Unit:Million persons)

Year		2003	2008	2018
Get on	Sumatera	2.5	4.2	12.1
	Jawa	1.6	2.0	4.4
	Kalimantan	1.6	2.6	7.3
	Sulawesi	1.2	1.3	1.4
	Others	2.2	3.3	8.3
	Total	9.0	13.3	33.4
Get off	Sumatera	2.3	3.6	10.1
	Jawa	1.8	2.5	5.7
	Kalimantan	1.3	1.8	4.7
	Sulawesi	1.0	1.0	1.1
	Others	1.9	2.7	6.5
	Total	8.2	11.6	28.0

Table 3.6.2.30 Total Number of Passenger at IPC ports
in the Target Years

(Unit:Million persons)

Year	2003	2008	2018
Alternative-1	24.2	39.7	83.9
Alternative-2	19.2	31.1	64.2
Alternative-3	20.7	32.6	74.4

Table 3.6.2.31 Number of Foreign Travel Passenger for Scenario2 in Alternative 3
(Unit:1000Persons)

Province	Percent of GRDP	2003			2008			2018		
		Get on	Get off	Total	Get on	Get off	Total	Get on	Get off	Total
Bengkulu	0.02	8.6	7.9	16.5	13.2	12.2	25.3	35.2	32.4	67.6
Aceh	0.13	55.7	51.4	107.1	85.7	79.1	164.7	228.5	210.9	439.4
Jambi	0.03	12.9	11.9	24.7	19.8	18.2	38.0	52.7	48.7	101.4
Lampung	0.08	34.3	31.6	65.9	52.7	48.6	101.4	140.6	129.8	270.4
North Sum	0.27	115.7	106.7	222.4	177.9	164.2	342.1	474.6	438.0	912.6
Reau	0.23	98.5	90.9	189.4	151.6	139.9	291.4	404.3	373.1	777.4
South Sum	0.15	64.3	59.3	123.5	98.8	91.2	190.1	263.7	243.3	507.0
West Sum	0.09	38.6	35.6	74.1	59.3	54.7	114.0	158.2	146.0	304.2
Sumatra T	1.00	428.4	395.3	823.7	659.0	608.1	1,267.1	1,757.9	1,622.2	3,380.1
Bali	0.03	5.0	5.9	11.0	6.7	7.9	14.5	10.0	11.7	21.7
Central Ja	0.17	28.6	33.6	62.2	37.9	44.5	82.4	56.5	66.4	122.8
DKI.Jakarta	0.27	45.4	53.4	98.8	60.2	70.7	130.9	89.7	105.4	195.1
East Jawa	0.25	42.0	49.4	91.5	55.7	65.5	121.2	83.0	97.6	180.6
West Jawa	0.28	47.1	55.3	102.4	62.4	73.3	135.7	93.0	109.3	202.3
T.Jawa	1.00	168.2	197.7	365.9	222.9	261.9	484.8	332.2	390.4	722.6
Central Ka	0.11	3.5	2.0	5.5	4.4	2.5	6.9	6.2	3.5	9.7
East Kalim	0.55	17.6	9.9	27.5	22.0	12.4	34.4	31.0	17.4	48.4
South Kali	0.16	5.1	2.9	8.0	6.4	3.6	10.0	9.0	5.1	14.1
West Kalir	0.18	5.8	3.2	9.0	7.2	4.1	11.3	10.1	5.7	16.8
Kalinantar	1.00	32.0	18.0	50.0	40.1	22.6	62.6	56.3	31.7	88.0
Central Su	0.13	0.9	0.9	1.7	0.9	0.9	1.7	0.9	0.9	1.7
North Sula	0.21	1.4	1.4	2.8	1.4	1.4	2.8	1.4	1.4	2.8
South Sula	0.57	3.8	3.8	7.6	3.8	3.8	7.6	3.8	3.8	7.6
South East	0.09	0.6	0.6	1.2	0.6	0.6	1.2	0.6	0.6	1.2
Sulawesi T	1.00	6.7	6.7	13.4	6.7	6.7	13.4	6.7	6.7	13.4
East Timu	0.04	0.6	0.6	1.2	1.0	0.9	1.9	2.8	2.5	5.3
Irian Jaya	0.42	6.4	5.8	12.2	10.4	9.4	19.8	28.9	26.3	55.3
Maluku	0.18	2.7	2.5	5.2	4.4	4.0	8.5	12.4	11.3	23.7
West Nusa	0.20	3.0	2.8	5.8	4.9	4.5	9.4	13.8	12.5	26.3
East Nusa	0.16	2.4	2.2	4.6	3.9	3.6	7.5	11.0	10.0	21.1
Total East	1.00	15.2	13.8	29.1	24.7	22.5	47.1	68.9	62.7	131.7
Total Indo	-	650.5	631.5	1,281.9	953.3	921.7	1,875.0	2,222.0	2,113.7	4,335.7

Table 3.6.2.32 Number of Foreign Travel Passenger for Scenario 1 in Alternative 3

(Unit: Persons)

Province	Percent of GRDP	2003			2008			2018		
		Get on	Get off	Total	Get on	Get off	Total	Get on	Get off	Total
Bengkulu	0.02	8.1	7.5	15.6	11.7	10.8	22.6	28.7	26.5	55.2
Aceh	0.13	52.9	48.8	101.6	76.3	70.4	146.7	186.5	172.1	358.7
Jambi	0.03	12.2	11.3	23.5	17.6	16.2	33.8	43.0	39.7	82.8
Lampung	0.08	32.5	30.0	62.5	46.9	43.3	90.3	114.8	105.9	220.7
North Sumatra	0.27	109.8	101.3	211.1	158.4	146.2	304.6	387.4	357.5	744.9
Reau	0.23	93.5	86.3	179.8	135.0	124.5	259.5	330.0	304.5	634.5
South Sumatra	0.15	61.0	56.3	117.3	88.0	81.2	169.2	215.2	198.6	413.8
West Sumara	0.09	36.6	33.8	70.4	52.8	48.7	101.5	129.1	119.2	248.3
Sumatra Total	1.00	406.6	375.2	781.9	586.7	541.5	1,128.2	1,434.8	1,324.1	2,758.9
Bali	0.03	5.0	5.9	11.0	6.7	7.9	14.5	10.0	11.7	21.7
Central Jawa	0.17	28.6	33.6	62.2	37.9	44.5	82.4	56.5	66.4	122.8
DKI Jakarta	0.27	45.4	53.4	98.8	60.2	70.7	130.9	89.7	105.4	195.1
East Jawa	0.26	42.0	49.4	91.5	55.7	65.5	121.2	83.0	97.6	180.6
West Jawa	0.28	47.1	55.3	102.4	62.4	73.3	135.7	93.0	109.3	202.3
T. Jawa	1.00	168.2	197.7	365.9	222.9	261.9	484.8	332.2	390.4	722.6
Central Kalimantan	0.11	3.5	2.0	5.5	4.4	2.5	6.9	6.2	3.5	9.7
East Kalimantan	0.55	17.6	9.9	27.5	22.0	12.4	34.4	31.0	17.4	48.4
South Kalimantan	0.16	5.1	2.9	8.0	6.4	3.6	10.0	9.0	5.1	14.1
West Kalimantan	0.18	5.8	3.2	9.0	7.2	4.1	11.3	10.1	5.7	15.8
Kalimantan Total	1.00	32.0	18.0	50.0	40.1	22.6	62.6	56.3	31.7	88.0
Central Sulawesi	0.13	0.9	0.9	1.7	0.9	0.9	1.7	0.9	0.9	1.7
North Sulawesi	0.21	1.4	1.4	2.8	1.4	1.4	2.8	1.4	1.4	2.8
South Sulawesi	0.57	3.8	3.8	7.6	3.8	3.8	7.6	3.8	3.8	7.6
South East Sulawe	0.09	0.6	0.6	1.2	0.6	0.6	1.2	0.6	0.6	1.2
Sulawesi Total	1.00	6.7	6.7	13.4	6.7	6.7	13.4	6.7	6.7	13.4
East Timur	0.04	0.6	0.6	1.2	1.0	0.9	1.9	2.6	2.4	5.0
Irian Jaya	0.42	6.3	5.8	12.1	10.2	9.3	19.5	27.2	24.8	52.1
Maluku	0.18	2.7	2.5	5.2	4.4	4.0	8.4	11.7	10.6	22.3
West Nusa Tenggara	0.20	3.0	2.8	5.8	4.9	4.4	9.3	13.0	11.8	24.8
East Nusa Tenggara	0.16	2.4	2.2	4.6	3.9	3.5	7.4	10.4	9.4	19.8
Total East Indones	1.00	15.1	13.8	28.9	24.3	22.1	46.5	64.9	59.1	123.9
Total Indonesia	-	628.6	611.3	1,240.0	880.7	854.7	1,735.5	1,894.9	1,811.9	3,706.8

Table 3.6.2.33 Number of Domestic Travel Passenger for Scenario 1 in Alternative 3

(Unit:1000persons)

Province	Percent of GRDP	2003			2008			2018		
		Get on	Get off	Total	Get on	Get off	Total	Get on	Get off	Total
		Bengkulu	0.02	47.41	42.72	90.13	73.30	63.86	137.15	195.17
Aceh	0.13	308.17	277.66	585.84	476.43	415.06	891.49	1,268.63	1,062.00	2,330.62
Jambi	0.03	71.12	64.08	135.19	109.94	95.78	205.73	292.76	245.08	537.84
Lampung	0.08	189.64	170.87	360.51	293.19	255.42	548.61	780.69	653.54	1,434.23
North Sum	0.27	640.05	576.69	1,216.74	989.50	862.06	1,851.56	2,634.84	2,205.69	4,840.53
Reau	0.23	545.23	491.25	1,036.48	842.91	734.35	1,577.25	2,244.49	1,878.92	4,123.41
South Sum	0.15	355.58	320.38	675.97	549.72	478.92	1,028.64	1,463.80	1,225.38	2,689.18
West Sum	0.09	213.35	192.23	405.58	329.83	287.35	617.19	878.28	735.23	1,613.51
Sumatra T	1.00	2,370.56	2,135.88	4,506.44	3,664.82	3,192.80	6,857.62	9,758.66	8,169.22	17,927.88
Bali	0.03	47.84	54.67	102.50	65.34	79.16	144.50	150.00	197.67	347.66
Central Ja	0.17	271.09	309.77	580.86	370.25	448.58	818.83	849.98	1,120.11	1,970.09
DKI.Jakar	0.27	430.55	491.99	922.54	588.04	712.45	1,300.49	1,349.97	1,778.99	3,128.96
East Jawa	0.25	398.66	455.55	854.20	544.48	659.67	1,204.16	1,249.97	1,647.22	2,897.19
West Jawa	0.28	446.50	510.21	956.71	609.82	738.83	1,348.66	1,399.97	1,844.88	3,244.85
T.Jawa	1.00	1,594.63	1,822.18	3,416.81	2,177.94	2,638.69	4,816.63	4,999.88	6,588.87	11,588.75
Central K	0.11	161.37	130.47	291.84	238.29	176.81	415.10	593.85	391.06	984.91
East Kalir	0.55	806.86	652.33	1,459.19	1,191.43	884.06	2,075.49	2,969.24	1,955.31	4,924.55
South Kali	0.16	234.72	189.77	424.49	346.60	257.18	603.78	863.78	568.82	1,432.60
West Kalir	0.18	264.06	213.49	477.55	389.92	289.33	679.25	971.75	639.92	1,611.67
Kalimanta	1.00	1,467.01	1,186.05	2,653.07	2,166.23	1,607.38	3,773.61	5,398.62	3,555.11	8,953.73
Central Su	0.13	153.11	132.10	285.21	163.25	134.82	298.08	183.55	140.27	323.82
North Sula	0.21	247.32	213.40	460.72	263.72	217.79	481.51	296.50	226.58	523.09
South Sula	0.57	671.31	579.22	1,250.53	715.80	591.15	1,306.95	804.79	615.01	1,419.81
South East	0.09	106.00	91.46	197.45	113.02	93.34	206.36	127.07	97.11	224.18
Sulawesi T	1.00	1,177.73	1,016.18	2,193.91	1,255.79	1,037.11	2,292.90	1,411.92	1,078.97	2,490.89
East Timu	0.04	86.82	73.83	160.65	128.93	105.64	234.57	314.13	245.55	559.69
Irian Jaya	0.42	911.61	775.24	1,686.85	1,353.73	1,109.23	2,462.96	3,298.41	2,578.29	5,876.70
Maluku	0.18	390.69	332.25	722.93	580.17	475.38	1,055.56	1,413.60	1,104.98	2,518.59
West Nusa	0.20	434.10	369.16	803.26	644.63	528.21	1,172.84	1,570.67	1,227.76	2,798.43
East Nusa	0.16	347.28	295.33	642.61	515.71	422.56	938.27	1,256.54	982.21	2,238.74
Total East	1.00	2,170.49	1,845.81	4,016.30	3,223.17	2,641.03	5,864.20	7,853.36	6,138.79	13,992.14
Total Indo	-	8,780.43	8,006.09	16,786.53	12,487.95	11,117.01	23,604.96	29,422.43	25,530.95	54,953.39

Table 3.6.2.34 Number of Domestic Travel Passenger for Scenario 2 in Alternative 3

(Unit: 1000persons)

Province	Percent of GRDP	2003			2008			2018		
		Get on	Get off	Total	Get on	Get off	Total	Get on	Get off	Total
Bengkulu	0.02	50.53	45.27	95.80	83.67	72.33	156.00	241.60	201.30	442.91
Aceh	0.13	328.47	294.24	622.71	543.88	470.15	1,014.03	1,570.43	1,308.46	2,878.89
Jambi	0.03	75.80	67.90	143.70	123.51	108.50	234.01	362.41	301.95	664.36
Lampung	0.08	202.14	181.07	383.20	334.70	289.32	624.02	966.42	805.21	1,771.62
North Sumatra	0.27	682.21	611.11	1,293.32	1,129.60	976.47	2,106.07	3,261.66	2,717.57	5,979.23
Reau	0.23	581.14	520.58	1,101.71	962.25	831.81	1,794.06	2,778.45	2,314.97	5,093.42
South Sumatra	0.15	379.00	339.51	718.51	627.56	542.48	1,170.04	1,812.03	1,509.76	3,321.80
West Sumara	0.09	227.40	203.70	431.11	376.53	325.49	702.02	1,087.22	905.86	1,993.08
Sumatra Total	1.00	2,526.69	2,263.37	4,790.06	4,183.70	3,616.54	7,800.25	12,080.22	10,065.08	22,145.31
Bali	0.03	46.66	53.01	99.67	61.31	73.52	134.83	130.51	170.39	300.90
Central Jawa	0.17	264.39	300.40	564.79	347.42	416.62	764.05	739.57	965.55	1,705.12
DKI.Jakarta	0.27	419.91	477.10	897.01	551.79	661.70	1,213.48	1,174.61	1,533.53	2,708.13
East Jawa	0.25	388.81	441.76	830.57	510.91	612.68	1,123.60	1,087.60	1,419.93	2,507.53
West Jawa	0.28	435.47	494.77	930.24	572.22	686.20	1,258.43	1,218.11	1,590.32	2,808.44
T. Jawa	1.00	1,555.24	1,767.04	3,322.28	2,043.66	2,450.73	4,494.39	4,350.40	5,679.72	10,030.13
Central Kalimantan	0.11	174.43	138.34	312.77	281.87	203.07	484.94	799.36	514.89	1,314.25
East Kalimantan	0.55	872.17	691.68	1,563.86	1,409.35	1,015.37	2,424.72	3,996.78	2,574.47	6,571.24
South Kalimantan	0.16	253.72	201.22	454.94	409.99	295.38	705.37	1,162.70	748.94	1,911.63
West Kalimantan	0.18	285.44	226.37	511.81	461.24	332.30	793.54	1,308.04	842.55	2,150.59
Kalimantan Total	1.00	1,585.77	1,257.61	2,843.38	2,562.45	1,846.13	4,408.58	7,266.87	4,680.85	11,947.72
Central Sulawesi	0.13	153.11	132.10	285.21	163.25	134.82	298.08	183.55	140.27	323.82
North Sulawesi	0.21	247.32	213.40	460.72	263.72	217.79	481.51	296.50	226.58	523.09
South Sulawesi	0.57	671.31	579.22	1,250.53	715.80	591.15	1,306.95	804.79	615.01	1,419.81
South East Sulawesi	0.09	106.00	91.46	197.45	113.02	93.34	206.36	127.07	97.11	224.18
Sulawesi Total	1.00	1,177.73	1,016.18	2,193.91	1,255.79	1,037.11	2,292.90	1,411.92	1,078.97	2,490.89
East Timor	0.04	87.29	74.18	161.47	130.46	106.80	237.26	332.60	259.50	592.10
Irian Jaya	0.42	916.51	778.94	1,695.44	1,369.86	1,121.42	2,491.28	3,492.30	2,724.76	6,217.07
Maluku	0.18	392.79	333.83	726.62	587.08	480.61	1,067.69	1,496.70	1,167.76	2,664.46
West Nusa Tenggara	0.20	436.43	370.92	807.35	652.32	534.01	1,186.32	1,663.00	1,297.51	2,960.51
East Nusa Tenggara	0.16	349.15	296.74	645.88	521.85	427.21	949.06	1,330.40	1,038.00	2,368.41
Total East Indonesia	1.00	2,182.16	1,854.62	4,036.77	3,261.58	2,670.04	5,931.61	8,315.01	6,487.53	14,802.54
Total Indonesia	-	9,027.58	8,158.81	17,186.40	13,307.19	11,620.55	24,927.73	33,424.42	27,992.16	61,416.58

①The number of passengers at non-commercial ports(including special ports) for domestic travel in each region in the target years is estimated using correlation between the past data of number of passengers at non-commercial ports(from 1988 to 1995) and population in the same area over the same period.

②Number of passengers at special ports in each region in the target years is estimated using the ratio between the number of passengers at special ports and the number of passengers at non-commercial public ports.

③Number of passenger at non-commercial public ports in each region in the target years is calculated by deducting the estimated number of passenger at special ports(Result of ②) from the estimated number of passenger at non-commercial ports(Result of ①).

Part of statistic data for number of passengers at non-commercial public ports in 1995, which was prepared by DGSC, is not distinguish between public ports and special port. Therefore, it is assumed that the special ports account for 50% of total passengers at non-commercial ports in those parts.

The number of passengers at non-commercial ports in the target years in each province is distributed by the rate of the estimated population in each province.

Result of the estimation is shown in Table 3.6.2.35.

3.6.3 Sensitivity Analysis

Indonesia is still in the midst of an economic crisis, and thus the growth rate of GDP will likely be unstable for the next few years. Accordingly, the study team conducted a sensitivity analysis for the demand forecast as follows.

Alternative-2 is the lowest case of economic growth of the three alternatives, in which the growth rate of GDP in 1998 is assumed at -5.4% . In the sensitivity analysis, the study team assumed an even lower growth case, namely, where this value is -14.2% . In addition, regarding the growth rate of GDP in the recovery stage from the economic crisis, the study team analyzed three alternative cases. (Sensitivity-1, 2 and 3)

The growth rate of GDP is shown in Table 3.6.3.1, and estimated GDP from 1994 to 2018 is shown in Figure 3.6.3.1.

Table 3.6.2.35 Number of Passengers at Non-Commercial Ports

Province	Ratio of Population	2003	2008	2018
ACEH	0.09	715,033	919,222	1,255,402
SUMATERA UTARA	0.26	1,958,036	2,517,182	3,437,773
SUMATERA BARAT	0.10	759,432	976,299	1,333,354
RIAU	0.10	785,601	1,009,941	1,379,299
JAMBI	0.06	470,376	604,698	825,850
SUMATERA SELATAN	0.18	1,366,207	1,756,348	2,398,685
BENGKULU	0.04	284,984	366,366	500,354
LAMPUNG	0.16	1,210,441	1,556,101	2,125,202
TOTAL	1.00	7,550,110	9,706,155	13,255,919
DAERAH JAKARTA	0.08	51,691	66,815	93,605
JAWA BARAT	0.35	222,212	287,228	402,395
JAWA TENGAH	0.24	152,204	196,736	275,620
DAERAH YOGYAKARTA	0.02	13,991	18,085	25,336
JAWA TIMUR	0.28	174,416	225,447	315,842
BALI	0.02	15,007	19,398	27,176
TOTAL	1.00	629,522	813,709	1,139,974
KALIMANTAN BARAT	0.33	87,549	106,449	139,326
KALIMANTAN TENGAH	0.16	41,309	50,227	65,741
KALIMANTAN SELATAN	0.26	68,885	83,756	109,625
KALIMANTAN TIMUR	0.24	63,622	77,357	101,250
TOTAL	1.00	261,366	317,790	415,942
SULAWESI UTARA	0.19	708,046	874,124	1,143,190
SULAWESI TENGAH	0.15	567,733	700,899	916,644
SULAWESI TENGGARA	0.13	482,079	595,154	778,350
SULAWESI SELATAN	0.54	2,058,386	2,541,198	3,323,409
TOTAL	1.00	3,816,244	4,711,375	6,161,593
NUSATENGGARA BARAT	0.29	958,496	1,219,537	1,696,740
NUSATENGGARA TIMUR	0.29	951,460	1,210,584	1,684,284
TIMOR TIMUR	0.07	229,381	291,852	406,053
MALUKU	0.18	580,784	738,956	1,028,109
IRIANJAYA	0.18	581,631	740,034	1,029,609
TOTAL	1.00	3,301,752	4,200,964	5,844,794
GRAND TOTAL		15,558,993	19,749,993	26,818,222

Table 3.6.3.1 The growth rate of GDP in Sensitivity Cases

(Unit: %)

Year	Alternative-2	Sensitivity-1	Sensitivity-2	Sensitivity-3
1997	5.8	5.8	5.8	5.8
1998	-5.4	-14.2	-14.2	-14.2
1999	0.0	-6.9	0.0	0.0
2000	0.0	0.0	0.0	0.0
2001	6.0	3.0	6.0	10.0
2002	6.0	3.0	6.0	10.0
2003	6.0	3.0	6.0	10.0
2004	7.1	3.0	6.0	10.0
2005	7.1	7.1	7.1	7.1
2006	7.1	7.1	7.1	7.1
2007	7.1	7.1	7.1	7.1
2008	7.1	7.1	7.1	7.1
2009	7.8	7.8	7.8	7.8
2010	7.8	7.8	7.8	7.8
2011	7.8	7.8	7.8	7.8
2012	7.8	7.8	7.8	7.8
2013	7.8	7.8	7.8	7.8
2014	8.7	8.7	8.7	8.7
2015	8.7	8.7	8.7	8.7
2016	8.7	8.7	8.7	8.7
2017	8.7	8.7	8.7	8.7
2018	8.7	8.7	8.7	8.7

In each sensitivity case, the foreign and domestic cargo volume, and the numbers of passenger for domestic travel are forecast by using the correlation between GDP and the past cargo volume, and between GDP and the past passenger volume. The ratios of the volume of cargo and passenger in each sensitivity case to that in Alternative-2 are shown in Table 3.6.3.2.

Figure 3.6.3.1 Estimated GDP from 1994 to 2018 in Sensitivity Cases

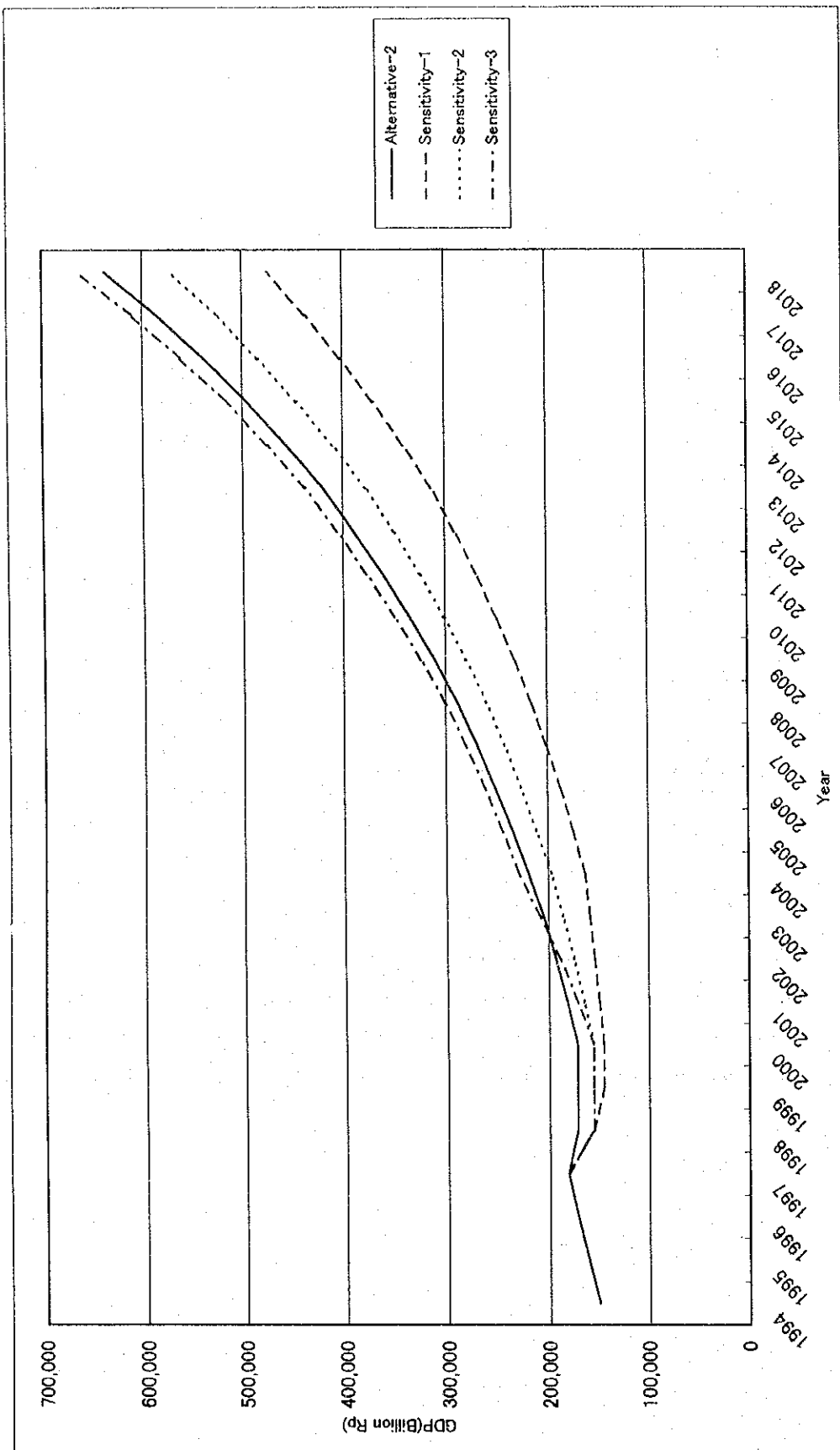


Table 3.6.3.2 Ratios of the Volume of Cargo/Passenger
in Sensitivity Cases to that in Alternative-2

(GDP)

Year	Alternative-2	Sensitivity-1	Sensitivity-2	Sensitivity-3
2003	100%	77%	91%	101%
2008	100%	74%	90%	104%
2018	100%	74%	90%	104%

(Export Cargo)

Year	Alternative-2	Sensitivity-1	Sensitivity-2	Sensitivity-3
2003	100%	62%	84%	102%
2008	100%	64%	85%	106%
2018	100%	71%	88%	105%

(Import Cargo)

Year	Alternative-2	Sensitivity-1	Sensitivity-2	Sensitivity-3
2003	100%	65%	86%	102%
2008	100%	66%	86%	105%
2018	100%	71%	88%	105%

(Domestic Cargo)

Year	Alternative-2	Sensitivity-1	Sensitivity-2	Sensitivity-3
2003	100%	73%	89%	102%
2008	100%	71%	88%	105%
2018	100%	73%	89%	104%

(Passenger for Domestic Travel)

Year	Alternative-2	Sensitivity-1	Sensitivity-2	Sensitivity-3
2003	100%	67%	86%	102%
2008	100%	67%	87%	105%
2018	100%	72%	89%	105%

Chapter 4 FABRIC OF THE PORT DEVELOPMENT STRATEGY

4.1 Recent Trend Surrounding Ports

(1) High potentiality for socio-economic development and the recent severe economic situation in Indonesia

It is said that Asia will assert itself as a leading region in the world in the 21st century. Similar to the remarkable economic development achieved in some other Asian countries, Indonesia had been also achieving steady economic development. The socio-economic indices in Indonesia, such as GDP and population, have shown rapid growth. Moreover Indonesia given its large land area, rich national resources and large population, is one of the countries with a high potential for development.

Since the currency crisis of last year, Indonesia has been monitored by the IMF. Indonesian Government announced that GDP growth in 1998 would be approximately -15%. The unexpected and severe economic situation has resulted in the suspension of various new projects. Now, only ongoing projects and rehabilitation projects are being conducted. In such a severe situation, Indonesia has to make various efforts to realize a desirable situation in the 21st century.

(2) Regional disparity in development, especially that between the West and East

In order to keep pace with the other remarkably developing Asian countries, the Indonesia Government has given priority to the economic development of Java and Sumatra. This has resulted in various kinds of problems, such as excessive concentration of the population, traffic congestion, environmental pollution and so on, in the western region. On the other hand, in the eastern region, although 18% of Indonesia's population reside there, public and private investment has been scant. It is very important from the viewpoint of attaining well-balanced national and regional development to actively promote the development of the eastern region.

Manufacturing is one of the key sectors in this regard. Although the value of manufacturing product in proportion to total GRDP is increasing, it has not been sufficient to activate the development of related manufacturing business. And the eastern region's share of GRDP has been consistently lower than that of the western region, remaining at approximately 10%. If the manufacturing industry, which utilizes regional resources, is effectively developed, it will have a positive effect on the Indonesian economy as a whole

and particularly be beneficial for the eastern region.

(3) Age of Global Exchange and Great Competition

GDPs of advanced countries in 2010 are expected to be 1.5 times larger than at present. On the other hand, in Asian countries such as the countries of ASEAN and China, economic activity has flourished. In 2010 the GDPs of Asian countries are expected to be two or three times larger than their present levels. Indonesia, in particular, is expected to play an important role among those countries with a high potential for development in Asia. As industries begin to work more closely with one another, volume of cargo and passenger traffic inside Asia and between Asia and other areas will increase rapidly.

Moreover, among Indonesia and surrounding countries, international economic cooperation has become active, especially between Indonesia and other ASEAN countries and Australia.

It is important for future socio-economic development that Indonesia be competitive with these countries. In particular cargo and passenger traffic between Indonesia and these countries will become more activated than now.

4.2 Expected Scenario of National Development

Current national development and various kind of economic activities are concentrated on Java and Sumatra islands.

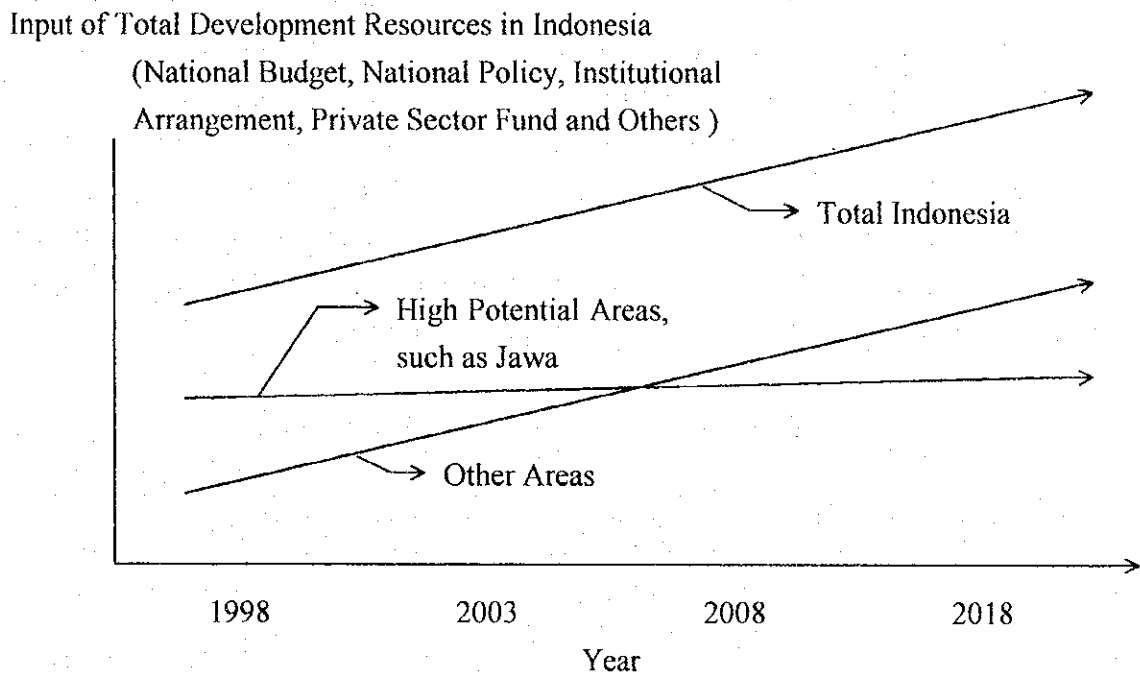
On the other hand, as shown in the various national development plans in Indonesia, the government policy is to achieve socio-economic development and to rectify regional disparity, especially between the east and west. However, swift recovery from the economic crisis shall be considered well. Therefore, it is also necessary to consider the best use of resources to promote economic development.

In this study, the following scenario can be recommended for future national development based on the discussion with the authorities of the government and relevant organizations.

- (a) Judging from the current economic situation of Indonesia, the first priority of the government efforts should be placed on economic recovery for at least the next several years. During this period, various kind of development resources such as national budget, institutional actions and private sector funds shall be utilized for the development of Java and other selected areas where more direct economic impacts can be expected compared to other areas.

- (b) After the national economy recovers, a long term national policy of realizing well-balanced nationwide development shall be pursued. During this period, various kinds of development resources, especially government budget shall be utilized predominantly for the development of East Indonesia which is a less advanced area. However, during this period, input efficiency of the development resources will be lower than in the earlier period.

Figure 4.2.1 Assumed Scenario of Development Policy in Indonesia



According to the future land development structure, Study team assumed that nationwide economic network will be shaped as shown in Chapter 3, 3.2.

As the basic concept, we consider that network will progress and enlarge as a chain-reaction in proportion to the progress of land development. Namely, in the short term, the network will be mainly well shaped in 'Jawa - Sumatra', and in the middle term, it will be extended toward "Jawa - West Kalimantan", "Jawa - South and East Kalimantan - North Sulawesi", "Jawa - South Sulawesi" and "Jawa - Bali - Lombok". Finally in the long term, it will be extended toward the remaining regions.

International regional economic cooperation with neighboring countries, such as IMT-GT, IMS-GT, BIMP-EAGA and AIDA, will also influence this network. In order to promote international economic cooperation, close contact shall be enhanced. In Sumatra and the eastern part of Indonesia, cooperation with neighboring countries will increase more and more. As a result, this cooperation will also contribute to regional development in those areas.

4.3 Roles of Ports

Based on the above background, basic roles of ports in this long term port development strategy are envisaged as follows.

(1) Supporting socio-economic development

Port is a node connecting sea and land transportation and one of the most important transportation infrastructures which contribute to socio-economic development. In Indonesia ports play an especially important role, because the transportation of daily goods and people mainly depends on sea transportation.

For instance, Kabupatins, which have public ports in their administrative area, have a 80% share of the total population and GRDP in all Indonesia (See Table 4.3.1, 4.3.2). In addition, 57% of all domestic cargoes relied on sea transportation during the REPELITA V period. (Based on P25 of the report; "Strategic Interventions for Planning for Transportation" prepared by MOC and ICAO in February 1998)

Table 4.3.1 Population of the Port Hinterland

(1995, thousand person)

Total Population in Indonesia A	Population of the local government areas where the public ports are located B	B/A
194,755	152,236	78.2%

Source : Prepared by OCDI based on the Kabupaten level population data in BPS

Table 4.3.2 GRDP of the Port Hinterland

(1995, billion Rupiah)

Total GRDP in Indonesia A	GRDP of the local government where the public ports are located B	B/A
380,833	332,779	87.4 %

Source : Prepared by OCDI based on the Kabupaten level GRDP data in BPS

The dependent rate of international trade to the total GDP is about 20%, which is rather high among Asian countries (See Figure A.4.3.1). And almost all the international cargo volume is transported by sea. From the above viewpoints, it can be said that sea transportation has played an important role in various kinds of socio-economic activities in Indonesia.

Because of the heavy reliance on sea transportation, ports will continue to play quite an important role in supporting the socio-economic development.

(2) Rectifying regional disparity

Insufficient infrastructure is also one of the serious factors which impedes development. Port infrastructure is particularly vital to Indonesia as the world's largest archipelago.

The Indonesian government is planning various development projects in order to rectify the regional disparity. Port is expected to play an important role in supporting these projects, especially those in the coastal area, because ports provide not only a transportation base but also an area for industrial activities which in turn provides people with jobs.

(3) Surviving in the Age of Global Exchange and Great Competition

Until 1986, one shipping company had made calls on Tanjung Priok Port and Tanjung Perak Port in the North America-Asia Liner Container Route as the first port or last port. At that time, the carrying capacity of the container vessels was about 1,500 TEUs and the volume of container cargo between North America and Indonesia was big enough to justify a direct call to Indonesia.

But in 1986, that route was suspended and the function of Indonesian ports has been limited to the status of feeder ports of Singapore port (which enjoyed rapid development thanks to the government's commitment to and investment in port development). Recently, in some countries, such as Thailand, Malaysia and the Philippines large scale container terminals are being constructed. But Indonesia does not have a sufficient container terminal, so even on the Intra Asia Route, fewer and fewer vessels are calling Indonesian ports.

In addition, in Asia various kinds of international economic cooperation are being planned. To survive in the Age of Global Exchange and Great Competition, Indonesian ports, as important gateways, must provide users with world class service and remain competitive with other Asian ports.

4.4 Strategy Framework

4.4.1 Identified Problems

On the basis of observations made on the historical, actual and future trend of the port administration and development in Indonesia, the most basic and serious problems in each field are identified as follows.

(1) Long-term nationwide port development policy

In 1984, DGSC formulated "Maritime Sector Development Program in Indonesia", which was the only long-term development policy in the port sector in Indonesia. Although a port development policy was included in the 25-year Long Term Development Plan and REPELITA, a nationwide port development policy has not been formulated since then.

Considering the recent drastic changes in port related activities, it is necessary to clarify the long-term port development policy.

(2) Port development for coping with rapid internationalization

Under the "Maritime Sector Development Program", the national port network had been formed on the basis of the so-called "Gate Way Port Policy" during the early 1980s. After losing its applicability to actual cargo flow and port functional requirements in the mid 1980s, when the presidential instruction (INPRES 4/1985) was issued, the Indonesian ports have been developed and improved mostly by utilizing various foreign aids which were implemented under a lack of consistent development policy.

As a result, international port function of Indonesia has gradually lost its competitive position among the other advanced ports in Asian countries, particularly in terms of container hub port function. It seems quite unlucky for Indonesia that it has missed a good chance, mainly due to budgetary constraints, to improve port sector capability to catch up with other Asian ports during the period. On the other hand, it can be said, however, that the current economic crisis has given the government another chance to restructure the port network as a legacy to future generations.

(3) Role of port development in eliminating regional disparity

With respect to the national and regional development in both PJP II and REPELITA VI, great emphasis is placed on the need for more equitable development, such as eliminating the gap between different regions, between the West and East Indonesia, between Java and

outside Java, between urban and rural areas.

The impact of port development extends to the entire region; in other words, port development can contribute to regional development. A port development strategy that supports regional development, will contribute to the national policy of eliminating regional disparity.

For example, there are vast natural resources in East Indonesia, but they have not yet been developed sufficiently. It is important to develop ports as means to transport necessary materials for regional development, to carry products from the producing area and to stimulate development of the related industries.

(4) Port system

In order for the port development to have a large impact on national and regional development all over Indonesia, it is very important to identify the role of the respective ports and to determine the priority for port development. Especially considering the limited government budget, port development investment should be prioritized in order to make the port development more effective and efficient.

However, an appropriate port system, which is comprised of the identification of roles of ports and selection of the strategically important ports, has not yet been determined. In order to make the port development more effective and efficient, appropriate port system should be established.

(5) Promoting private sector participation

The basic policy trend and efforts of the Indonesian government in promoting private participation in port sector development are considered appropriate so far. However, the negative effects of monopolistic privatization (including possible moral hazardous factors in port management and operation) of the government entities into state-owned companies such as IPCs, PELNI and ASDP are still considered serious mainly due to various difficulties under the current economic situations of the country as well as a lack of adequate counter measures taken by the government.

(6) Port administration

The fundamentals of legal, institutional and administrative system for overall port development of Indonesia is considered well established in general except for some domains. However, the actual administrative practice of DGSC conformable to the established legal and institutional system is not working well for various reasons including

absence of unified guidelines for proper application of relevant laws and regulations, inadequate provision of a clear job description for each level of personnel, and a lack of positive incentives under a sectionally oriented organization system.

(7) Port management and operation

1) Conventional terminal management at the port of Tanjung Priok

While the terminal operator (TO) system in which shipping companies have their own sister stevedoring companies assigned to a terminal may be considered convenient and economical, upgrading of overall productivity of the terminals could not fully be expected under the system. Because this may discourage free and flexible berthing of all calling vessels which shipping companies do not have their own stevedores at any terminal.

Stevedoring workers are supplied from a labor union through ADPEL-I. This system often jeopardizes timely and adequate provision of well trained workers for reliable and stable stevedoring activities.

2) Container terminal management at the port of Tanjung Priok

Container vessels can use their allocated berthing space on a contract basis according to fixed weekly berthing plan. Only vessels under contract can berth at the terminal in principle. This implies that full utilization of potential capacity of the terminal could not be expected under the system.

The CT-I and CT-II are operated directly by IPC-II, and the CT-III is operated by a private terminal operator, nearly half of which stock is held by IPC-II. While the original objective of privatization by PT.PELINDO was to realize a competitive market oriented system in port operation business, the current system is not considered successful in this regard, mainly because these three terminal are not working under full competitive conditions.

3) Conventional terminal management at the port of Tanjung Perak

The cargo handling operation at the conventional terminals in the port of Tanjung Perak is conducted by the private stevedoring companies designated by shippers or consignees. This system seems to be working well as free entry and competition of private stevedoring companies, are observed.

Stevedoring workers are supplied from the labor union through ADPEL-I. This system often jeopardizes timely and adequate provision of well trained workers for reliable and stable stevedoring activities

4) Container terminal management at the port of Tanjung Perak

The container terminals ICT-I and ICT-II of this port are generally well operated on a first come – first serve basis, which is considered appropriate for these terminals. Since construction of the second trestle bridge has been canceled, the narrow and long shape of the extended terminal with only one existing trestle bridge attached at its one end may jeopardize smooth and efficient transfer of containers. The operating system for a new combination terminal of ICT-II and ICT-III needs to be critically examined.

5) Procedure of documentation

A “One roof center” system is employed in major ports in Indonesia. But this system is not a “one window” system, and many users still have to visit two or three windows for document clearance.

An EDI system is employed in the port of Tanjung Priok and Tanjung Perak. The EDI system of the port of Tanjung Perak is connected with all organizations of IPC-III and banks, but it has not been connected with CIQ offices and other organizations related to maritime transportation.

(8) Dredging

Among the major Indonesian ports, channel maintenance requirements are considered critical at the six ports of Belawan, Palembang, Banjarmasin, Pontianak, Samarinda and Jambi. The total annual maintenance dredging volume and cost of the six ports recorded 9,000,000m³ and 9.8 billion Rupiah in the year of 1997, representing about 71% of the total dredging volume and cost of all ports.

Under severe budget constraints, the initial and maintenance dredging requirements (reportedly 50,000,000m³) of Indonesian ports are not fully satisfied, and maintenance of sound performance becomes difficult even in the most important ports in Indonesia.

(9) Navigational safety

The present legislation concerning navigation safety seems to be insufficient. The authority should formulate various important technical standards as amendments to shipping law 21 to prevent sea accidents in future.

In this connection, additional DGSC duties would be necessary to cope with the present international standards, and in turn expansion of the vessel inspection system, expansion of the search and rescue system, additional installation of navigational aids, and revision of pilotage system would be necessary.

(10) Environmental consideration to the ports

The rivers polluted by untreated living and industrial discharge are flowing into the sea from inland areas, which deteriorate the water and soil quality of ports. The EIA procedure in Indonesia is enforced just before the construction works. It needs to be fully discussed and reflected in formulating the port master plan. In the previous EIA reports reviewed in this study, many items were estimated only qualitatively. For instance, the future traffic demand of adjacent areas was not sufficiently treated. The EIA Guideline seems to be insufficient in the aspect of methods or standards for extraction, analysis and evaluation of the environmental impacts. Also, environmental monitoring system seems to be obscure in the aspects of obligation and responsibility to implementation, scope and publicity.

(11) Port development implementation process policy

In order to make the port development more effective and efficient, appropriate port development process policy should be established.

(12) Promoting port sector development

Port sector development can not be successfully realized without positive cooperation with quite wide range of its sub-sectors both in public and private entities including shippers, shipping lines, stevedores, warehousemen, truckers, forwarders, waterfront oriented industries and developers, and many other port related business owners. Effects or impacts of port sector promoting efforts simply by the government sector are quite limited. While there are some sub-sector wise associations such as INSA in Indonesia, they seem to be pursuing their own interests independently rather than working together to promote total port sector investment, activities and business chances.

4.4.2 Viewpoint of Strategy

Rapid socio-economic development is an aim of the 2nd National Development Plan (PJP II) covering the years between 1994 and 2018. The 7th Five Year National Development Plan (REPELITAVII) is now being prepared. In order to fulfill the aim of PJP II, REPELITAVII should be focused on the regional disparity problem and international sea transportation trends.

It is foreseen that the movement of cargoes/passenger by sea transportation will be greater both nationally/internationally in the future. Therefore, a huge amount of investment for port development shall be required compared to the past. It shall be important not only

to establish port development policy but also to clarify the total investment funds and schedules of the port development, and then to consider the national economic situation.

From this point of view, the 1st target of the study is to contribute to the realization of the goal of the PJP II and also to make recommendations on the port development strategy which shall be reflected in REPELITAVI.

The introduction of private funds/technologies into several fields of public infrastructures is a pre-dominant trend throughout world. Rapid increase in private participation can be expected in the near future in Indonesia, too.

The amount of investment in port development in the past was much lower than that of other infrastructure investment in Indonesia and other archipelago countries as shown in Table 7.2.1 of the Part 1 and Table A.4.4.1. It is crucial to increase the amount of port development investment. Therefore, it is important not only to utilize limited public funds efficiently and effectively but also to expand and employ more private funds/technologies in the future.

From this point of view, the 2nd target of this Study is to attain the desirable financial situation by appropriate role sharing between public and private sector and to propose some ideas on how to expand and use private funds.

Public ports in Indonesia are now owned by the state. DGSC administrates port affairs, such as safety matters, and coordinates with related plans / related organizations. IPCs manage/operate all commercial ports.

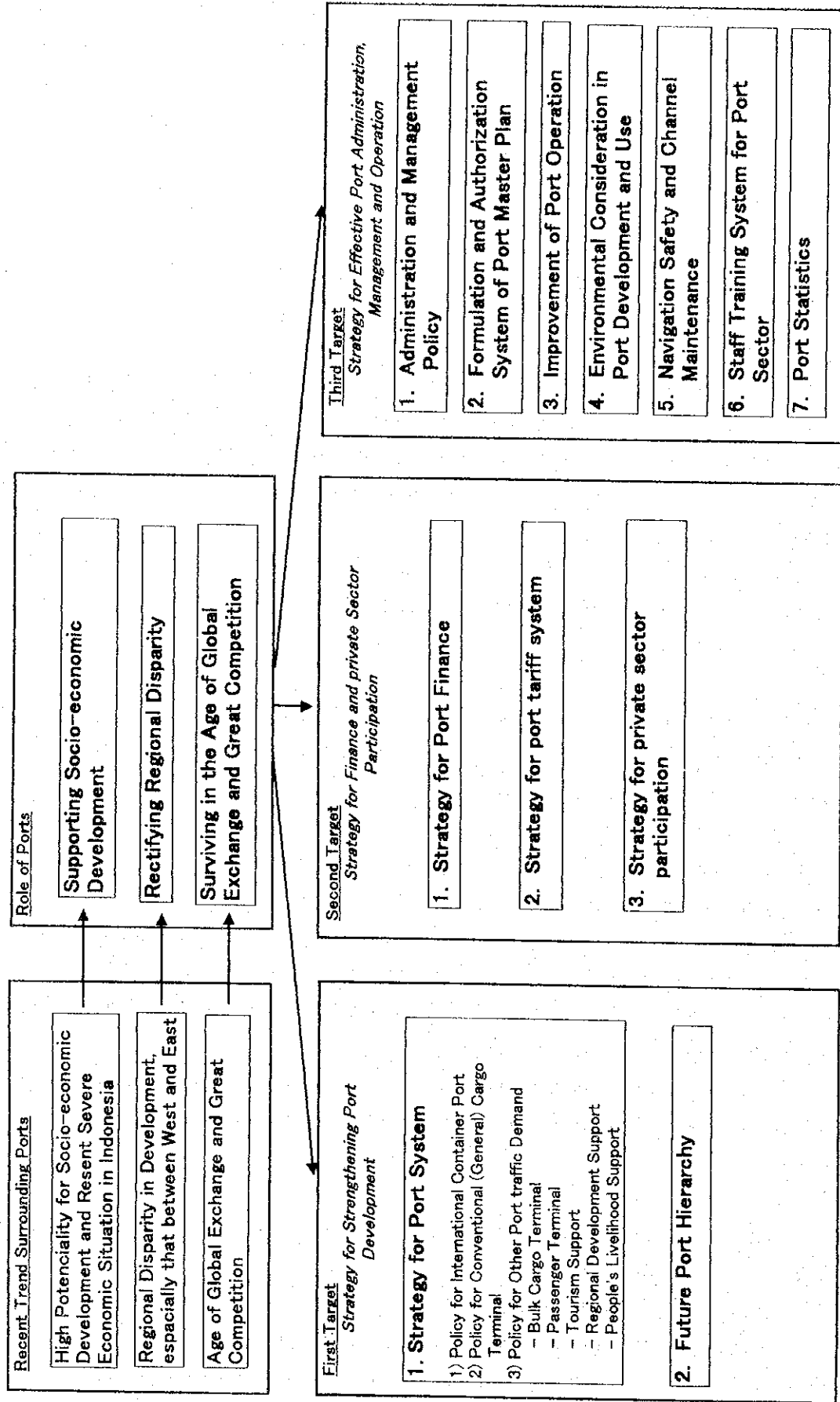
Generally, almost all port activities are commercial in nature except port administration and infrastructure development activities. From another point of view, it is important not only to develop new port facilities but also to improve the productivity of the existing port facilities. Therefore, through restructuring/deregulating port administration and management/operation activities of the public sector, it should be examined how to improve the public sector's performance and expand/employ the private sector's know how, especially in the port operation field.

In order to complement the above-mentioned 1st and 2nd targets of the Study, the 3rd one is to propose some ideas for effective port administration, management and operation affairs.

Based on the above, the main structure of the basic policy for this strategy is summarized below. (See Figure 4.4.1)

- I Strategy for Strengthening Port Development
- II Strategy for Port Finance and Private Sector Participation
- III Strategy for Effective Port Administration, Management and Operation

Figure 4.4.1 Structure of the Port Development Strategy



4.5 Main Strategies

4.5.1 Strategy for Strengthening Port Development

(1) General

In formulating the Strategy for Strengthening Port Development, necessary and prioritized port development plan shall be proposed by the Study Team based on the forecast of total cargoes/passengers in 2018 under several indices of social-economic development targets in the PJP II and the recent socio-economic changes.

As for the foreign trade container, development of port facilities with high-level productivity and international standards shall be aimed at. On the other side, as for the domestic container, other cargoes and passengers, the economic rationality of nation-wide sea transportation, close linkage with other transportation modes and differences of the socio-economic development among various regions shall be considered.

Generally, the port provides a space not only for transportation but also for industrial activities and people's livelihood. To rectify regional disparity, the development of the Eastern region shall be considered. And to ensure that people all over Indonesia have adequate transportation service, securing people's appropriate living standard by way of sea transportation, which is dominant means of transportation, shall be considered.

For realizing an efficient port system in the long term, a huge amount of investment with appropriate investment schedule shall be provided. Therefore, it might be necessary to establish middle and short term strategies and to adopt the concept of intensive investment.

Based on the above, the Strategy for Strengthening Port Development shall be comprised of the following items.

I -1 Strategy for Port System

I -1-1 Policy for International Container Port

I -1-2 Policy for Conventional (General) Cargo Terminal

I -1-3 Policy for Terminal for Other Port Traffic Demand

- 1) Bulk Cargo Terminal, 2) Passenger Terminal, 3) Tourism Support,
- 4) Regional Development Support, 5) People's Livelihood Support

I -2 Future Port Hierarchy

(2) Policy for international container port

Containerization is a worldwide trend that is expected to continue in the future. In Indonesia the volume of container cargo is rapidly increasing. In 1995 volume of container cargoes reached 2,600,000 TEUs, 4 times larger than that in 1988. The number of ports which handle container cargoes is also increasing. In 1995, 21 ports were handling containers, almost twice as many as in 1988.

But in Indonesia, international container cargoes have been handled at only a few ports, mainly Tg. Priok and Tg. Perak. And there are also very few direct calls of international container vessels to Indonesian ports. (See Figure A.4.5.1) In addition, at present the distribution of container cargo handling volume corresponding to the distribution of population/GRDP is quite imbalanced. The volume of container cargo handling in Java is quite large compared to other regions. Thus, in formulating a policy for international container port, balance among the regions should be also considered.

Table 4.5.1.1 Relation between Population/GRDP and Volume of Container Cargo in 1995

	Population (Thousand Person)		GRDP (Billion Rupiah)		Volume of Container Cargo Handling (TEU)	
	Volume	Share	Value	Share	Volume	Share
Sumatra	40,830	21.0%	68,244	18.3%	274,235	10.5%
Java	114,733	58.9%	237,642	63.6%	2,155,912	81.2%
Bali, Nusa Tenggara	10,958	5.6%	13,703	3.7%	0	0%
Kalimantan	10,471	5.4%	27,560	7.4%	86,461	3.3%
Sulawesi	13,732	7.1%	16,814	4.5%	126,101	4.8%
Meluku, Irian Jaya	4,029	2.1%	9,704	2.6%	4,389	0.2%
Total	194,755	100.0%	373,666	100.0%	2,607,098	100.0%

Source : BPS, DGSC

In order to deal with the rapid containerization and increase in container cargoes, efficient and effective future container handling port network, which will increase convenience for users, should be established. Especially, economical transportation cost is crucial for maintaining and increasing competitiveness of port users business.

For the development of an international hub port in Indonesia, volume of the OD containers in the hinterland (Originated and Destined Containers in the hinterland of the port), national development policy (such as policy for rectifying regional disparity) and geographical condition (such as closeness to the international container service route)

should be mainly considered.

The Study Team proposes to classify the container cargo handling ports into 3 categories; International Container Hub Port, Major Container Port and Feeder Container Port. The International Hub Port can be further categorized into two types; "Mother Port Type International Hub Port" and "Transshipment Port Type International Container Hub Port". The appropriateness of these two types in Indonesia is examined.

(3) Policy for conventional (general) cargo terminal

In order to improve financial condition of consignees, establishment of efficient and effective policy for conventional (general) cargo terminal is essential.

In Indonesia, almost 80% of general cargoes has been transported by tramper service and many cargoes are still transported by traditional rakyat shipping. Therefore, the Study Team proposes a modernized conventional (general) cargo port network system. Considering the recent trend of intensified diversity of cargo handling, such as unitization of general cargoes, intensified demand for frequent delivery of unitized cargoes, introduction of modernized domestic cargo handling system, such as unit load distribution system, shall be examined. In order to deal with above mentioned expectations for the major ports, port facilities which can accommodate various kinds of vessels, such as container vessel, Ro/Ro vessel and common cargo vessels, shall be developed for the specific major ports.

Appropriate conventional (general) cargo terminal network system also benefits the users related to trading activities, because they can enjoy reduced transportation cost for the domestic transportation of international container cargo.

In addition, the containerization rate of domestic containerizable general cargoes is quite lower than in the Philippines and other countries. To realize modernized and efficient domestic cargo distribution, it is necessary to promote the containerization of domestic general cargoes.

(4) Policy for other port traffic demand

1) Bulk cargo terminal

Indonesia mainly has depended on the export of natural resources, such as oil, woods, agricultural products and so on. This tendency will still continue because those resources are still key products from which lots of people earn their income. But it is also expected that transportation of half processed products of those raw materials will also become necessary as industrialization gradually progresses.

Many break bulk cargoes are currently transported by common cargo vessels in a form of break-bulk. But in order to deal with the above mentioned increase of processed products, some part of bulk cargo shall be containerized and the other part shall be transported by specialized vessels.

Therefore, role of the public sector in the bulk cargo terminal system should be clarified based on the nature of the bulk cargo. In addition, in Indonesia, special ports also play an important role for handling those cargoes. Therefore, based on the distribution pattern of those resources and distribution of special ports, a policy for bulk cargo terminal shall be examined.

2) Passenger terminal

Passenger terminal is crucial infrastructure for supporting the people and regional economies considering that Indonesia is the largest archipelago country in the world. Main ideas of the passenger terminal development policy are as follows.

- (a) Promotion of the efficient passenger terminal development
- (b) Promotion of various kind of international exchange
- (c) Strengthening the passenger transportation by cooperating with ferry system

3) Tourism Support

Tourism is one of the most effective measures for the acquisition of foreign currency. Therefore, the government places special emphasis on promoting foreign tourism.

At present, tourism is developed mainly in Bali, Java and some part of Sumatra/Sulawesi. There are also many tourism resources in other areas, but they are not yet sufficiently developed due to the lack of transportation infrastructure, capital for investment and so on.

In order to support tourism, port sector also should promote the development of tourism ports in potential tourism areas.

Study team defined specially important ports for foreign tourism as "Main Strategic Port", and the other high-potential port as "Internal Network Port". The development policy for two kinds of categorized ports are as follows.

"Main Strategic Port" should be sufficiently developed for tourism and play an important role as the front gate for foreign tourists.

"Internal Network Port" should be developed as aimed to more heighten the potential and shape the internal tourism network on the basis of the cooperation with the neighboring high-potential port, by means of making good use of the character of each tourism

resources.

4) Regional development support

Supporting regional development means to promote various regional industries in port surrounding area and the hinterland, on the basis of the port development and port activities. Of course, efficient and effective transportation of the products to markets and the reliable supply of materials are vital factors for the success of regional development.

The role of port for promoting regional industries is different according to the progress of regional development. Namely, study team propose the policy for supporting regional development as follows.

- Supporting primary industries
- Supporting processing industries for primary products
- Supporting industrial complexes
(Support to formation of industrial complexes by accumulating manufacturing industries, heavy industries, etc.)

5) People's livelihood support

One of the very important tasks of government is securing an acceptable standard of living for citizens and supporting the various activities of citizens equally all over the country. The role of the public ports in Indonesia, which is comprised of more than 17,000 islands, is very important, as they form a lifeline for Indonesia's 200 million citizens.

But at present the number (656) of public ports is much smaller than in Japan (1,102) and the Philippines (851) in spite of the great importance of public ports in Indonesia. Moreover almost half of the public ports do not have any port facilities. Even in ports to which pioneer shipping vessels make calls, average length of mooring facilities is no more than 20m.

In ports called by inter-island, pioneer and passenger (PT. PELNI) liner shipping vessels, necessary port facility development should be given the first priority, because the hinterland population of those ports is larger than at the other ports which are not called by these liner shipping vessels. At the same time, in public ports which support the livelihood of people who live in isolated areas, minimum level of port facilities should be developed in order to attain an acceptable standard of living for citizens.

The following policy for supporting people's livelihood are proposed.

- (a) Developing and maintaining the port facilities for securing civil minimum

- (b) Strengthening the development of port facilities which accommodate pioneer and passenger liner shipping vessels
- (c) Construction of multipurpose port facilities
- (d) Playing a role as the central place and space for activities of the regional community
- (e) Utilization of rakyat shipping

(4) Future port hierarchy

In the National Transportation System, ports are classified into 5 types, based on their functions, namely primary trunk port, secondary trunk port, tertiary trunk port, regional feeder port and local feeder port. But the classification of ports remains somewhat vague.

For the future port hierarchy, not only the activity of ports but also contribution to socio-economic activity of the hinterland should be taken into account.

In this study we propose to categorize ports into six classes namely "Class AA", "Class A", "Class B", "Class C", "Class D" and "Class E". These classified ports play an important role as an international level center, a national level center, a regional level center, a provincial level center, a local level center and a daily life supporting place respectively (See Table 5.4.1.1 and 5.4.1.2).

Degree of the public sector's financial commitment such as investment in port development is different among those port categories. In the Class AA Port, degree of the public sector's financial commitment will be the lowest. On the other hand, in the Class E Port, it will be the highest. However, public sector has to be responsible for port planning and port space management/control in the higher class ports as well as the lower class ports.

4.5.2 Strategy for Port Finance and Private Sector Participation

(1) General

In examining the Strategy for Port Finance and Private Sector Participation, roles of the government, IPCs and private sectors shall be defined considering the nature of the task and the cost of port development.

In Indonesia, level of investment in port development compared to other major public infrastructure development investment is not high, even though Indonesia is the world's biggest archipelago country. It is not, however, easy for the government to increase the share of port development investment under the limited national budget.

Table 4.5.2.1 Projected Private Sector Investment in REPELITAVI

Sector	Spending Projections (US \$ millions)	Percentage (%)
1. Power	7,090	53
2. Toll roads	3,529	27
3. Telecommunication	960	7
4. Sea transport	640	5
5. Water supply	543	4
6. Land transport	417	3
7. Air transport	81	1
Total	13,260	100

Source : BAPPENAS

In public infrastructure development, throughout the world, private funds are being increasingly used. Along with the government private sector participation policy for public infrastructure development projects, the private sector participation of port development projects also must be promoted to compensate the lack of government funds.

In Indonesia, ports have historically been state owned, therefore, the introduction of private funds/technology has not been promoted so far. As stated before, actual port activities are commercial in nature. Therefore, measures on how to expand and employ private funds/technologies shall be introduced.

In addition, the tariff system also should be considered as a main tool for implementing the port finance strategy. In principle, the tariff system should be "flexible" in the determination process and "time-conscious" for users and "appropriate" to maintain competitiveness. Taking examples of other countries into consideration, we propose an

appropriate tariff system.

From the above-mentioned views, the detail of the Strategy for Port Finance and Private Sector Participation shall be as follows.

- II-1 Strategy for Port Finance
- II-2 Strategy for Port Tariff System
- II-3 Strategy for Private Sector Participation

(2) Strategy for port finance

1) Roles of Government, IPC and Private Sector

It is very important for the government to clearly confirm the roles of government, IPC and private sector to establish the long-term port development policy. This also has to match with the allocation policy of the national budget.

In this case, Japanese system can be a useful reference to Indonesia. Based on Japanese experience, the Study Team proposes appropriate roles of each sector.

2) Establishment of General Policy for National Budget

Owing to today's financial crisis, shortage of the national budget will be more serious. In order to make effective use of the limited national budget, the government should establish clear allocation policy of national budget. In principle, the national budget should be used for development of non-commercial ports. However, it is impractical to abolish the subsidy for IPC ports all at once. In the future, the government should phase out the national subsidy.

On the other hand, establishment of a "special account" for port development is also a valuable idea in order to increase the national budget. In principle, the "tax" and "tariff revenues" paid by IPC should be used for development of non-commercial ports.

In addition, making reference to the Japanese cost sharing system, the cost sharing system with "special beneficiary" also should be taken into consideration in order to cover the shortage of the budget.

Making reference to the experiences of the Japanese system, the Study Team proposes the allocation policy of the national budget and introduction of cost sharing system.

3) Establishment of General Policy for IPC Financial Sources

The study team is paying careful attention to the financial status of IPCs in the future. IPC II and III will be privatized in FY 1998, and other IPCs will follow suit. From the long term perspective, each IPC should not depend on the national subsidies, and thus they are

strongly required to strengthen their financial ability. IPC should seek appropriate financial sources in the market through borrowing of loan, issue of bond and sales of stock. Based on the examples of other countries, the Study Team introduces the strategy of IPCs for securing funds for port development.

(3) Strategy for port tariff system

1) Establishment of "Flexible" Tariff System

It is desirable that the tariff rates of IPC ports should be established by each IPC. This concept is consistent with the prime objectives of IPC, which are to provide financial accountability and operational autonomy for efficient and effective management and operation. The government should allow IPC to raise or reduce the tariff rates more flexibly according to the economic situation. For example, the tariff rates should be established taking into account the "increase of inflation rates".

A lack of "competitive theory" at ports justifies the government intervention. However, the government intervention should be limited to the necessary and minimum scope. In the future, increase of private sector participation in port services will require further deregulation.

On the other hand, the port tariff should be determined so that moderate income and the depreciation cost, and management and operational costs etc. can be recovered from operational revenues. Therefore, allowance of different tariff rates at major ports also shall be carefully considered.

Taking those matters into consideration, the Study Team proposes the establishment of a flexible tariff system.

2) Establishment of "Time-Conscious" Tariff System

It is very important for the government to establish a "time-conscious port system" in order to achieve a user-oriented port. This system enables a port management body to reduce the berthing time of ships and promotes quick turn-round of the cargoes for users. The tariff structure in Indonesia should put much more emphasis on "time" in order to increase the productivity.

Making reference to the example of Singapore, the establishment of time-conscious tariff structure and "Fast Connection Rebate System", which uses cost incentive to promote quick turnaround of transshipment containers, shall be proposed.

3) Establishment of "Appropriate" Tariff System in International Hub Port

Although government has to compete with neighboring competitive ports such as Singapore, it is eager to regain calls of international direct shipping line vessels. In order to

do so, a variety of conditions are required. The Study Team proposes the establishment of the appropriate system regarding the port tariff. For example, establishment of drastically lower tariff rate and setting of incentive tariff reduction for transshipment cargoes shall be considered.

(4) Strategy for private sector participation

1) General Philosophy for Promoting Private Sector Participation

It is very important for the government to clarify the general philosophy, issues of PSP, and basic requirements for promoting PSP. This will give good guidance to the public and private sectors. The Study Team will also explain the roles of public and private sectors regarding promotion of PSP.

2) Review and Reevaluation of the Present Legal Frameworks

“Presidential Decree No.7 of 1998” will provide good guidance on private sector participation to the government and private sector. However, the most important point is how to secure the implementation of projects according to the articles of the Decree. In this sense, the government should formulate the “executing regulations” as soon as possible so as not to deter PSP.

Furthermore, from the long term perspective, the government should make efforts to arrange the PSP-related legal frameworks in detail. These frameworks should be established based on actual experience in PSP projects.

The Study Team will also propose that the government should elaborate appropriate deregulatory measures in order to encourage private sector participation including foreign investment.

3) Expansion of Working Field of Port Services

The government or IPC should invite gradual private sector participation in port activities taking account of issues brought by PSP. Private sector involvement in port services will bring not only efficient and effective works with lower costs for the government but also a higher level of services for users. Therefore, the government should make every effort to create an environment in which the private sector will be able to take part in port operation as freely as possible. Furthermore, the government should gradually introduce “competitive theory” in port services so that each terminal operators and service providers can compete with each other. From the long term perspective, the government and IPC should carefully consider how to change from “operating port” system to “land-lord port” system in Indonesian ports.

Making reference to examples of Japanese port and major Asian Ports, the Study Team

will propose the expansion of working field of port activities such as stevedoring and tug services.

4) Review of Possible Forms for Port Development and Operation

The Study Team will propose the recommendable forms for port development and operation. On the other hand, port development projects based on BOT scheme are very important for Indonesia. At the same time there are a lot of risks for the private sector on the BOT scheme. Therefore, the Study Team will propose measures how to allocate, eliminate or minimize the risks of BOT projects in order to promote port development projects.

5) Establishment of Transparent Selection Procedure for PSP

The most important thing in the selection process of private sector is to choose the lowest and most effective bidder with fair competition. It enables the government or IPC to provide higher quality of service at lower prices. Based on "Presidential Decree No.7" the government and IPC should promote a competitive selection process.

In order to enhance the transparency of the whole system and ensure confidence from investors, the Study Team will propose establishment of "Internal Monitoring Committee" (neutral third sector), which unbiasedly assesses, monitors and reviews the overall procedure and release the related information to the public from the neutral position.

6) Incentive through Deregulation for "foreign investors" and "prioritized PSP projects"

Owing to lack of domestic capital and the current monetary problem in Indonesia, foreign investment for large-scale port projects will be inevitable. In order to attract more foreign capital or prioritized PSP projects, an appropriate tax incentive system for foreign investors and private sector should be taken into consideration. Simplification of "licensing procedure" for foreign investors should also be promoted.

In addition, participation of "100 % foreign-owned company" for "prioritized" port development projects and foreign capital into "forwarding business" also should be carefully considered.

4.5.3 Strategy for Effective Port Administration, Management and Operation

(1) General

In applying the above mentioned Strategies I and II successfully to the actual stage of port development of the country, it is most important that these strategies are strongly supported by the administration sector of DGSC and other agencies concerned. Without effective administration, management and operation of the ports, the proposed schemes for future port development can not be achieved. In this regard, this chapter focuses mainly on up grading administrative and management performance as well as suggestions on other important policy areas of port administration.

As the first subject of this chapter, overall administrative policy on major problem areas is discussed, which includes proposals on administration of commercial, non-commercial and special port sectors, followed by discussions on significance, role, contents and procedural policy of the port master plan.

After discussing improvement of port operations focusing on two major ports of Indonesia (the ports of Tanjung Priok and Tanjung Perak), proposals on environmental consideration in the port development are introduced. The natural environment such as flora/fauna, beach and forest in particular, shall be carefully treated in the planning process of port development. In addition, improvement of sea/river water quality in port area shall be considered accordingly.

Navigation safety and channel dredging, staff training affairs, port statistics administration, port engineering, research and survey, and supporting activities for port sector development are also the vital items to support the main strategies of the report, on which policies are discussed and proposed on the basis of the current and future situation of the port sector administration.

The Strategy for Effective Port Administration, Management and Operation contains the following components;

- III-1 Administration and Management Policy
- III-2 Formulation and Authorization System of Port Master Plan
- III-3 Improvement of Port Operation
- III-4 Environmental Consideration in Port Development and Use
- III-5 Navigation Safety and Channel Maintenance
- III-6 Staff Training System for Port Sector
- III-7 Port Statistics
- III-8 Port Engineering, Research and Survey
- III-9 Supporting Activities for Port Sector Development

(2) Administration and Management Policy

While it is understood that MOC/DGSC have a kind of rough criteria for designation of "Commercial Port" mostly on the basis of historical trend of cargo handling volume and future prospect, more reasonable concept or criteria need to be developed according to its potential function. Although the current administrative structure seems to function well in general, planning function and Government financing system, etc. need to be examined and improved for more efficient and effective administration. In addition, an effective coordination of port planning on ferry and other public port facilities should be identified.

In Indonesia, non commercial ports have been playing an important role to secure the livelihood of the people living in remote areas by distributing indispensable goods to the them. Taking into consideration the world trend of decentralization, management of minor non-commercial ports gradually should be transferred to the local government.

On the other hand, special ports also have been playing a crucial role to handle specific commodities for the industries. In Indonesia, effective utilization of special port & wharf also should carefully considered. For example, the development of "a special wharf" adjacent to "a public port" will be required in order to promote effective regional development. In order to do so, the government should strive to remove the obstacles which discourage the effective regional development.

The government should also establish clear and transparent criteria on how to draw the line between the "port working area" and "water safety area".

(3) Formulation and Authorization System of Port Master Plan

Port master plan should be composed with careful consideration on various relevant factors including potential expansion requirement, socio-economic activities in hinterland, natural conditions of areas in and around the development site, functional relation to surrounding ports, environmental conservation and so on, so that the proposed master plan could ensure sound future function of the target port. Provisions of port master plan should contain planning of special wharves, ferry port, navigational channel and other related facilities which would fall under the same port administrative area.

It is desirable in principle that the port master plan is originated by the individual port management body which is responsible in promoting regional prosperity through planning and developing ports in their region, and therefore be responsible in port planning as a port planning body. The national port master plan is normally formed referring to these

individual port master plans in accordance with the nationwide port policy and requirements as well.

(4) Improvement of Port Operation

International shipping lines are operated on extremely tight schedules under the hard competitive shipping market. Delay on the schedule causes a heavy cost burden to the shipping lines. As a result, the terminal operators are always requested to provide shipping lines with quick dispatching service for vessels arriving at the port. Berthing arrangements and preparatory actions for cargo handling operation (berthing plan, loading and unloading sequence, allocation of cargo handling equipment and stacking lots of containers, and so on) for the calling vessels should be completed well before their arriving at a port. Preparation of documents should also be done long before the vessels' arrival, and the terminal operators are required to provide shipping companies with punctual operations not to interfere with shipping schedule. In order to cope with above situation, the terminal operators should improve their management and operations in Indonesia.

(5) Environmental Consideration in Port Development and Use

Environmental consideration needs to be fully discussed and reflected in formulating the port master plan. To suitably grasp each environmental impact factor, the impacts should be analyzed quantitatively as much as possible. In addition, an EIA report must clarify how environmental information is assembled, analyzed and used in selecting, planning, designing and executing. And, it is very important to clearly indicate the basis of evaluation.

It is very important that an adequate monitoring system is established and implemented securely so that various data can be accumulated and reflected in other projects. The system of the post-EIA based on the monitoring results should be established also.

The necessity of public participation will be elevated accompanied with the progress in living and educational standards. Public participation may be time consuming and increase costs, but conflicts and delays can be minimized by gaining the public's acceptance.

Ports will need to contribute further to the creation of an environment where people can live and enjoy their lives by meeting other people and encountering other cultures. It is a direction which needs to be carefully looked at in coming years.

(6) Navigation Safety and Channel Maintenance

Although some port authorities have been formulating a set of sailing regulations, which are in force within their administrative water areas, a fundamental law stipulating common

essential provisions and covering entire Indonesian ports is desired. In addition to this, detailed regulations should be provided by the Minister of Communication to meet local circumstances. The existing pilotage system should be reviewed in terms of further establishment of pilotage districts and additional pilots, in particular, to cope with the increasing vessel traffic.

The tug fleet at a port should accordingly be comprised of an appropriate composition of small, medium and large powers to meet the anticipated calling vessels. The operation of tugboats should be transferred to the private sector in order to produce effective services for users together with economical results for operators.

General performance of DGSC dredging administration is generally well and capacity of dredging fleet is evaluated enough. Under severe budget constraints, however, the initial and maintenance dredging requirements of Indonesian ports are not fully satisfied, and maintenance of sound performance of the ports become difficult and crucial even in the most important ports in Indonesia. Therefore how to use the limited budget effectively is the most important point in this regard.

While the most of current difficulties on dredging affairs in this country come from general shortage of available budget which can not be expected to increase instantly, suggestions are mainly focused on those for basic or long term policy oriented measures.

Cost and benefit evaluation is indispensable at port planning in the case of a port has siltation problems. To cope with shortage of budget for dredging, beneficiary-payment principle should be employed according to degree of their benefit such as number, size and draught of vessels operated, and cargo volume transported through the channel.

(7) Staff Training System for Port Sector

The port sector is composed of various sub-sectors including government organizations, public corporations or government owned companies, private business entities and many other port related organizations or associations which play their own roles to achieve their original assignment or business target. Although the required roles or functions of each sub-sector are different and diversified, overall capability or performance of the port sector of a country is largely controlled by quality of manpower which may be evaluated by level of morale, knowledge, skill, experience and mental/physical soundness of each individual staff of the organizations of the sector.

In this sense, staff training system for port sector should be designed and developed with comprehensive training program structure covering various training demands of all relevant sub-sectors so that effective improvement of total power or capability of port sector could be expected. In other words, staff training for each port sub-sector needs to be conducted

under well coordinated programs with constant exchange of relevant information, for instant, on new technologies for port operation or development, and recent trend of administrative or legal requirements.

(8) Port Statistics

Port statistics should be edited in a unified style so that they can be easily accessed and understood by all of the nation and concerned parties. Statistics should clarify at least the trend of cargo handling by lot and the origin/destination of each cargo which are indispensable to estimating future cargo demand, as well as number of calling vessels, number of passenger and situation of basin, warehouse and stock yard, etc. And, if possible, port statistics should be integrated with statistics system of land transportation which is closely related to the port activities. In that case, it will become very important to define the classification of individual cargo by categorizing into a couple of strata and unifying the survey period.

(9) Port Engineering, Research and Survey

In Indonesia investment funds for infrastructure development are limited due to the severe economic situation. In order to utilize the limited investment funds more efficiently, to secure safety of facilities and to envisage earlier materialization of the investment effects, more sophisticated technology shall be introduced in the port development field as well as port management and operation field.

In formulating a policy for port engineering, research and survey, the following four (4) items should be examined.

- 1) Arrangement and application of "Technical Standard for Port Facilities"
- 2) Accumulation and analysis of technical information for port development
- 3) Introduction of the new technology and promotion of technology development
- 4) Enhancement of total capability of port engineers

(10) Supporting Activities for Port Sector Development

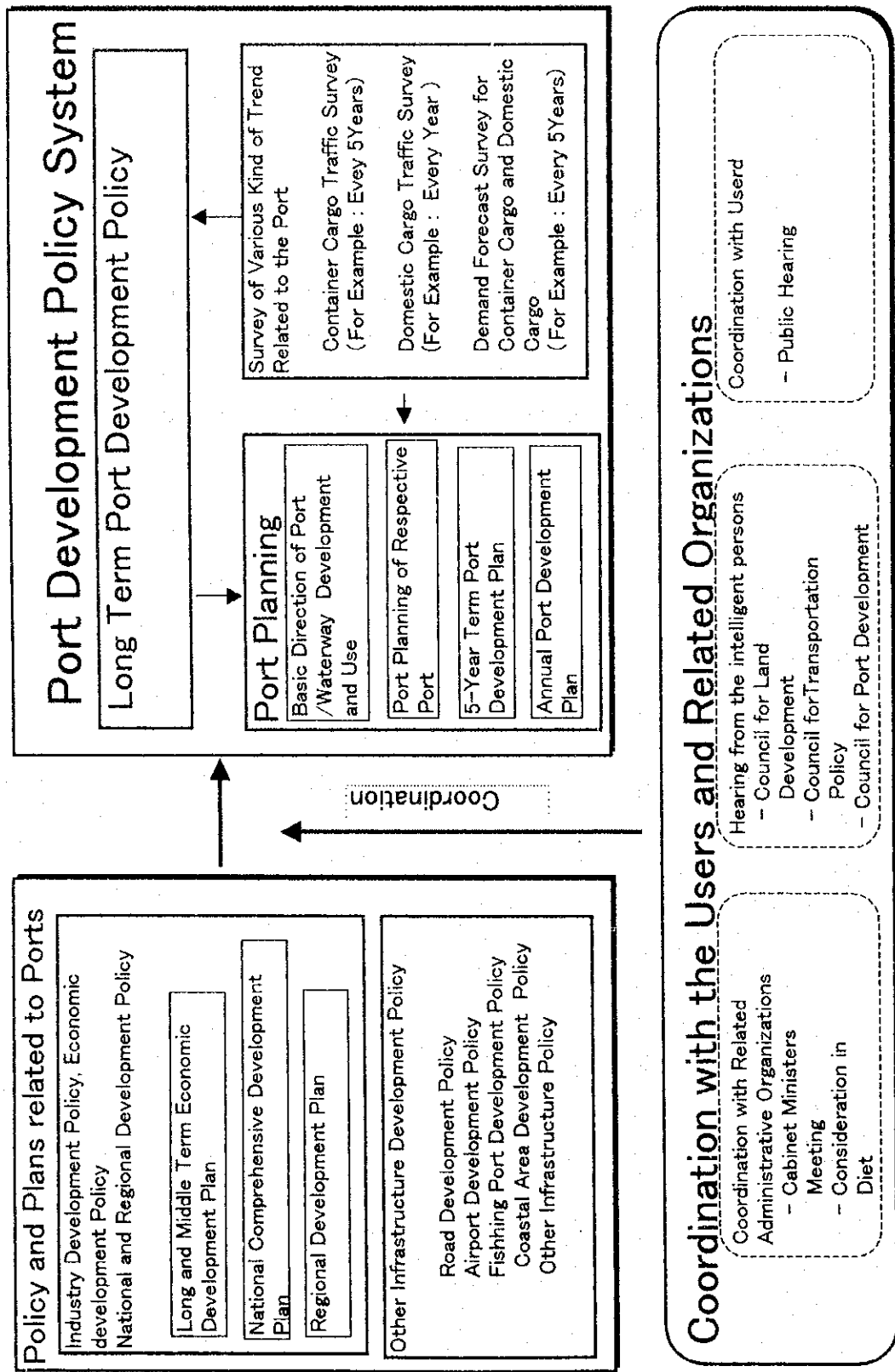
Under the severe conditions in promoting port development in Indonesia in particular, it is vital that the Indonesian port sector should become more powerful as a whole in its economic, administrative, and even political position. Therefore, to strengthen financial, institutional and theoretical foundation for promoting sound port development and management necessary port sector supporting activities shall be examined.

4.6 Procedure for Coordination and Monitoring

Port Development is closely related to the national land development, regional development and other infrastructure development. The consent of users and people in the hinterland is also required. Thus Port Development Strategy should be coordinated with those related plans and take account of requests of users by following an appropriate procedure. In addition, appropriate revision of the port development strategy is needed to cope with changes in the socio-economic situation. (See Figure 4.6.1)

At this stage of the study, certain assumptions must be made in drafting the strategy, because the future socio-economic situation and various plans related to the Study are still not clear. Thus, by monitoring the strategy periodically, conducting various studies and coordinating with other related plans, the strategy should be reviewed and revised periodically.

Figure 4.6.1 Procedures and Necessary Coordinations in Formulating and Monitoring the Port Development Strategy

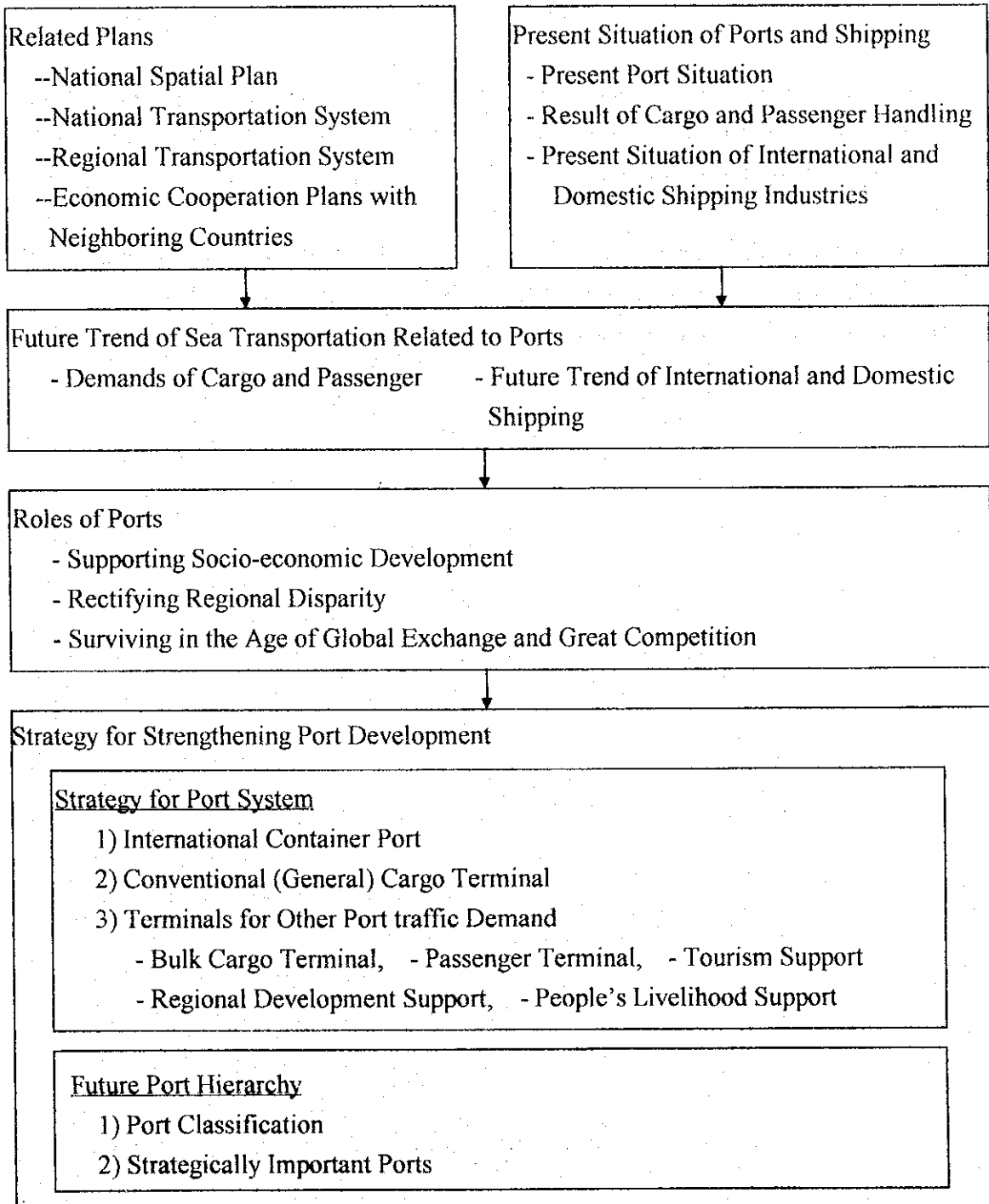


Chapter 5 STRATEGY FOR STRENGTHENING PORT DEVELOPMENT

5.1 General

In accordance with the procedure indicated in Figure 5.1.1, a strategy for strengthening port development will be presented in this chapter.

Figure 5.1.1 Procedure for Establishing Strategy for Strengthening Port Development



Regarding the "Related Plans", the National Transportation System describes the policy for comprehensive transportation system and the future prospect of the transportation up to the year 2018. In this plan, sea transportation is considered to continue to play a dominant role especially on cargo transportation. So in order to realize the policy of the National Transportation System, sea transportation network with ports as the nodes of it has to play an important role.

Considering the importance of ports in comprehensive transportation system, roles of the ports has to be clarified. In this procedures, not only review of the present port situation and analysis of the future trend, but also review of the following related plans shall be examined.

Especially, considering the enormous scale of the nation and the large differences in regional features, roles of the ports shall be examined based on these regional features, such as population and regional development situation.

- 1) National Spatial Plan [Formalized on 30 December, 1997]
- 2) National Transportation System (SISTRANAS) [Formalized in 1996]
- 3) Regional Transportation System (SISTRAREG) [Final Report in December 1996]
- 4) Regional Economic Cooperations Plans with neighboring countries

5.2 Clarification of the Function of Major Respective Ports

Actual situation of respective ports is basic information in formulating a port network system and port development policy in this study. Therefore, the Study Team reviewed the present situation of main commercial ports, which play an important role as the key nodes of sea transportation.

The Study Team selected 61 ports from the trunk and feeder ports which were designated in the National Transport System. Those trunk and feeder ports were selected by the Indonesian Government considering the regional balance, activity of the ports, importance of the hinterland and so on.

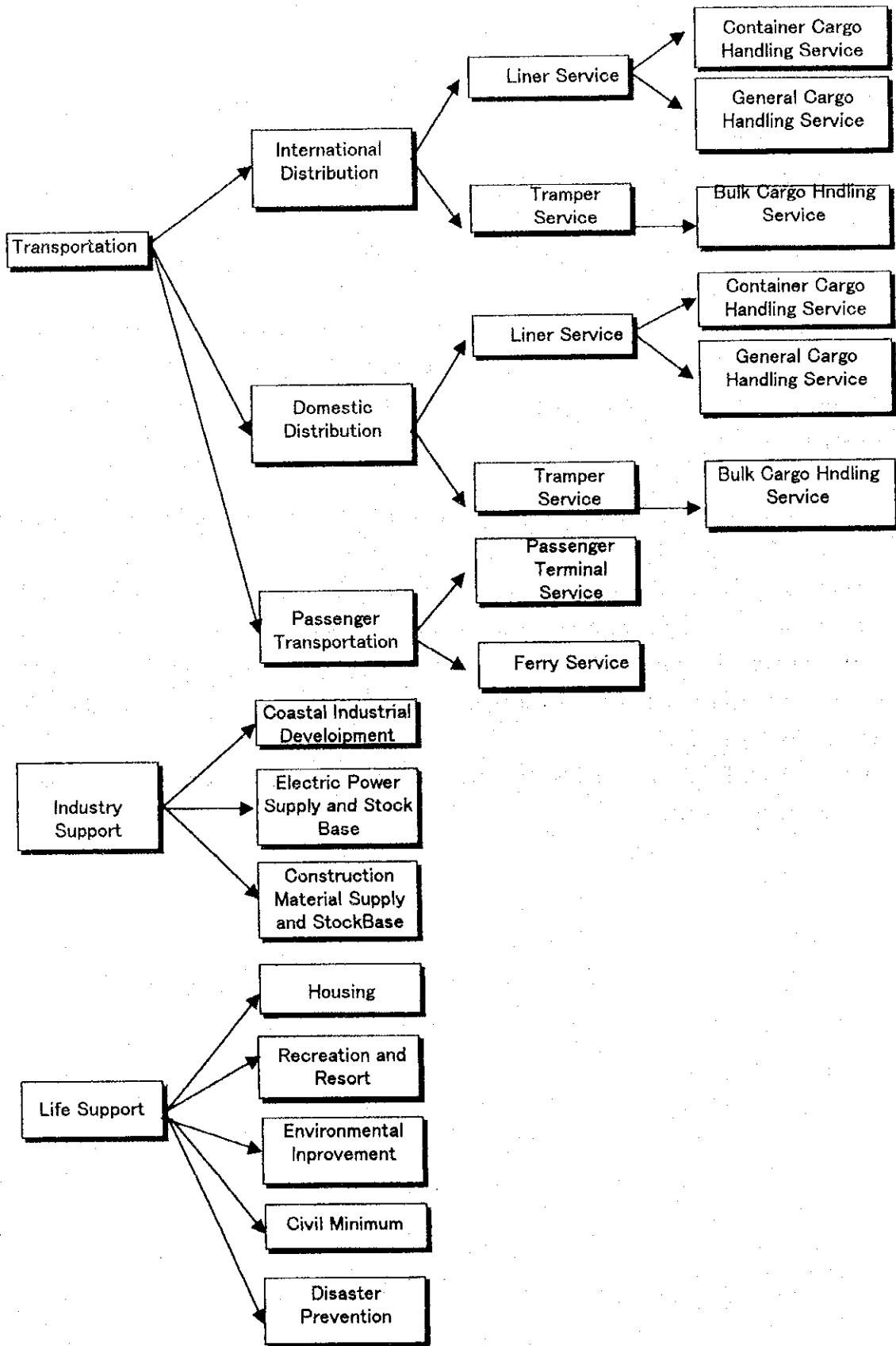
The Study Team reviewed the activity of the ports including the activities in the hinterland. In addition, the Study Team also conducted more a detailed review of various kinds of port activities for a certain port from port master plans and historical statistics data (See Appendix 5.1).

In Indonesia, which is the largest archipelago country in the world, function of ports of transporting cargoes and passengers is very important.

On the other hand, ports have various functions, such as transportation node, providing space for industry, supporting people's livelihood and so on. But now in Indonesia the main function of ports is considered only to transport cargoes and passengers. As for providing space for regional and industrial development, mainly special ports have played this role to date. (See Figure 5.2.1)

In the future, functions of ports should be diversified to meet the various demands of people in the hinterland.

Figure 5.2.1 Classification of the Port Function



5.3 Strategy for Port System

5.3.1 Policy for International Container Port

5.3.1.1 General

Today, international trade with container cargo transportation is one of the most important factors to support mutual cooperation among several countries under certain agreement and international competitiveness of industrial activity as described in Section 3.5.1. More than 80% of international container cargo of Indonesia is currently transported through Singapore Feeder service and the transshipment cost in Singapore is heavy burden of this transportation. In order to minimize transportation cost, a more efficient and effective container cargo transport system should be established in Indonesia, including direct calls by Intra-Asia Long Distance Container Service and International Trunk Container Service.

60 to 80% of the international trade volume of Indonesia is from/to eastern Asian countries and it is anticipated that the countries will be more closely related in the future. Cooperation with Asian countries is a key to economic recovery in Indonesia. The number of ports receiving Intra-Asia Long Distance direct call service, therefore, should be increased in the near future.

As of 1997, seventeen (17) Intra-Asia Long Distance Routes, which connect Indonesia through Tg.Priok, Tg.Perak, Tg.Emas and Belawan with the Far East Asia countries such as Japan and Korea, are in operation. But recently the number of direct ship calls to Indonesian ports by Intra-Asia Long Distance Route has been decreasing. Also as of 1997, fifteen (15) routes, which connect Indonesia and the eastern Asian countries not by direct call but by feeder vessel through transshipment ports in other countries, are in operation.

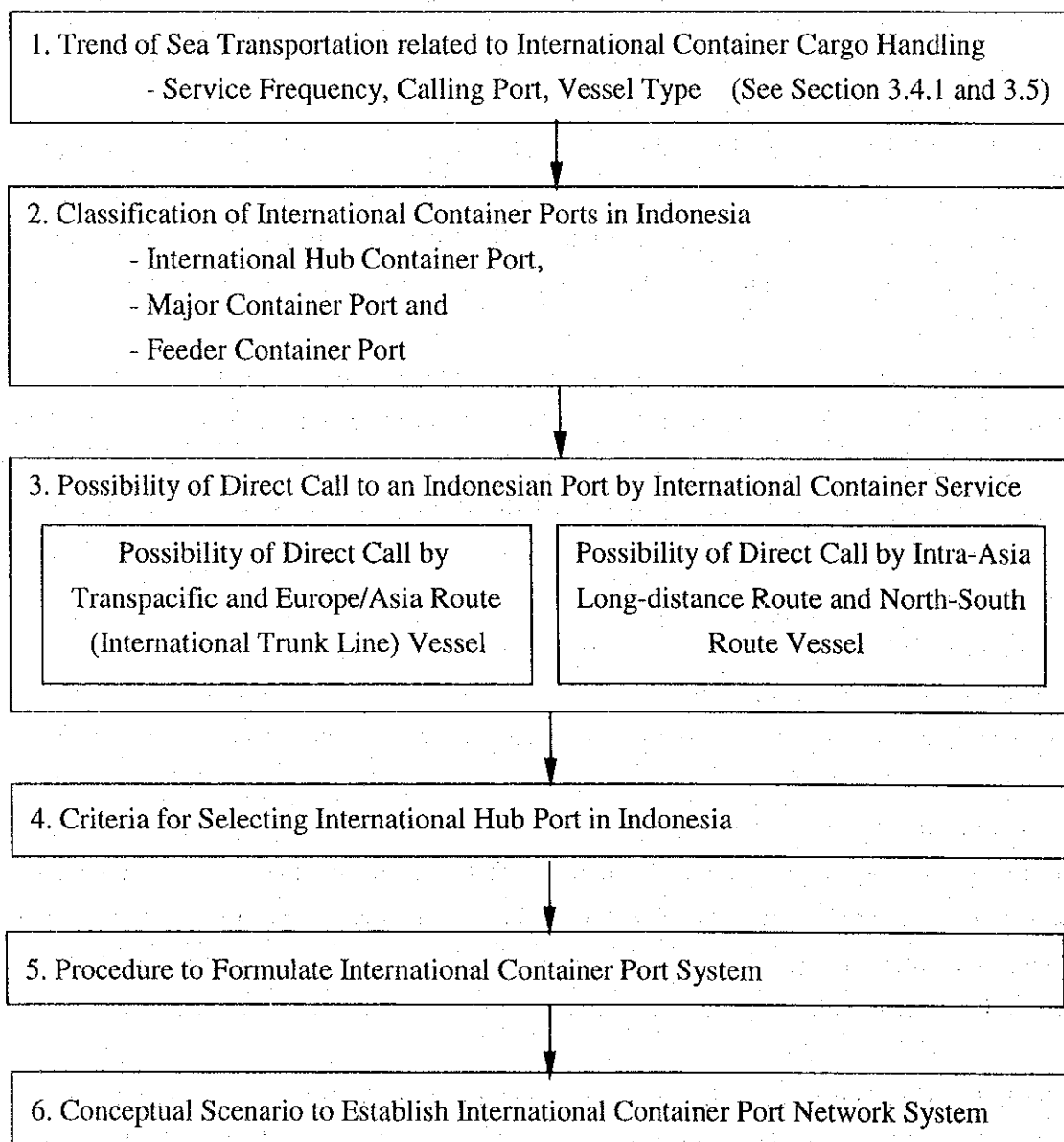
In the near future, Tg.Priok port and Bojonegara port (which is the supplementary port of Tg.Priok port) would be the candidates of direct calling port by the International Trunk Container Services, since these two ports are located at western part of Java where the demand for container cargo is and will continue to be the greatest in Indonesia. In addition, a study on construction and expansion plan of Bojonegara port has already been prepared and the port has a further advantage on geographical condition that it is facing the Sunda Strait which is designated a part of an international open sea-lane. If in the future, trade volume between African, Australia and Eastern Asian countries would increase, the potential of Bojonegara port will be intensified because such service route vessels would pass the Sunda Strait.

The Indonesian Government has already designated Batam port as a "primary trunk port", which is a candidate as an international container hub port directly called by the International Trunk Container Service vessels. The port has many potential advantages for handling

international container cargoes, such as its proximity to international trunk container sea-lane and the locations of many high quality industries, which is mainly invested by Singapore capital, in its hinterland that includes some free trade zones.

In this section, we introduce the procedure to establish a container port network system in Indonesia. In the second part, we estimate the container volume necessity for a port to be classified as International Hub Port and Major Container Port in Indonesia.

Figure 5.3.1.1 Procedure for Establishing International Container Port Network System



5.3.1.2 Classification of International Container Ports

In accordance with the present worldwide container transportation network system, which is likely to continue well into the future, the Study Team proposes to classify the container cargo handling ports in Indonesia into 3 categories; International Hub Port, Major Container Port and Feeder Container Port. The function of each classified port and required frequency of each service vessel calling at a port to satisfy minimum level of service are defined as follows.

Table 5.3.1.1 Classification of Container Cargo Handling Ports

Classification	Function of Port
International Container Hub Port	<p>Transpacific and Europe/East-Asia Route (International Trunk Container Route) vessels make calls more than twice a week.</p> <p>This port plays a supreme role as an international hub port for container cargo transportation including domestic and international transshipment of container cargo and a nation-wide distribution center of sea cargo transportation.</p>
Major Container Port	<p>North-South and Intra-Asia Long Distance Container Route vessels make calls more than twice a week.</p> <p>The port plays a principle role as a regional distribution center of container cargo transportation including domestic transshipment.</p>
Feeder Container Port	<p>Domestic feeder service vessels from international port in Indonesia or Singapore make calls more than twice a week.</p> <p>This port plays a role as a provincial/regional level distribution center for container cargo transportation</p>

Table 5.3.1.2 Required Minimum Frequency of Service Call to Classified Port

Classification	Service Route				
	Europe/Asia	Transpacific	North/South	Intra-Asia	Feeder
International Hub Port	Twice a week	Twice a week	Twice a week	Twice a week	Sufficient level of feeder system
Major Port	No	More than once a week	Twice a week by either or both service		Certain level of feeder system
Feeder Port	No	No	No	No	More than once a week*

Note : * Receiving feeder service from Singapore or port in Indonesia

5.3.1.3 Character of International Hub Port in East Asia and Indonesia

The character of international hub ports in East Asia is summarized in Table 5.3.1.4.

The share of transshipment container in major International Hub Ports in Asia except Singapore is not very high. For example, the share of transshipment volume in total cargo volume in Hong Kong, Busan and Kobe is 21.5%, 16.2% and 28.5% respectively in 1994. Those ports were developed in order to accommodate the containers of origin/destination from/to their hinterland (called "O/D Containers" hereinafter). And after the sufficient volume of O/D container cargo had handled in the port, those ports gradually started to accommodate the transshipment containers of the neighboring countries. This type of port can be labeled as "Mother Port Type".

In the case of Singapore, the share of transshipment container volume is more than 80% these days and the container terminal were developed to aim at handling transshipment container. In order to increase the volume of transshipment containers, the government has invested heavily in development and has taken various kinds of measures to improve the level of service in port and feeder service to neighboring ports. This type of port can be labeled as "Transshipment Type".

The Study Team proposes to categorize International Hub in Indonesia into these two types ;

- Mother Port Type International Hub Port, and
- Transshipment Port Type International Hub Port

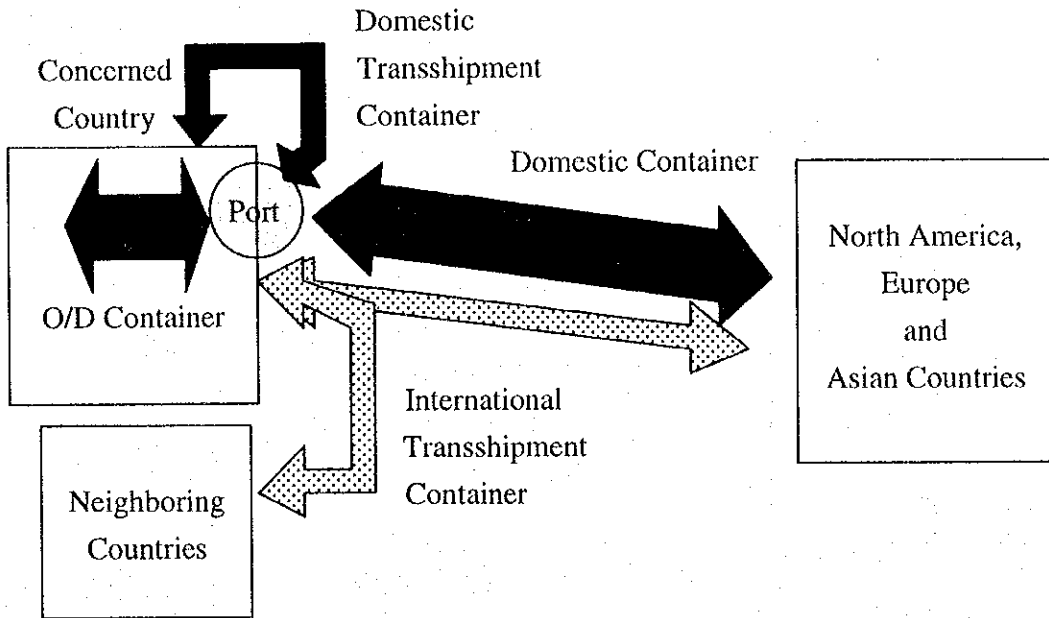
Characteristics of these types of international hub port are shown in Table 5.3.1.3 and Figure 5.3.1.2.

Table 5.3.1.3 Characteristics of International Hub Ports

Category	Characteristics
Mother Port Type International Container Hub Port	International Hub Port which mainly accommodates O/D container (Origin/Destination Container from/to the hinterland). The location of port is selected based on O/D cargo volume. Share of transshipment container from/to foreland to total volume is less than 40% in general.
Transshipment Port Type International Container Hub Port	International Hub Port which accommodates substantial volume of transshipment container from/to foreland. The location of port is selected based mainly on closeness to international sea-lane. Share of transshipment container to total volume is more than 40% in general.

Figure 5.3.1.2 Image of Two Types of International Hub Port

Mother Port Type International Hub Port
 (Share of Transshipment Container is less than 40%)



Transshipment Port Type International Hub Port
 (Share of Transshipment Container is more than 40%)

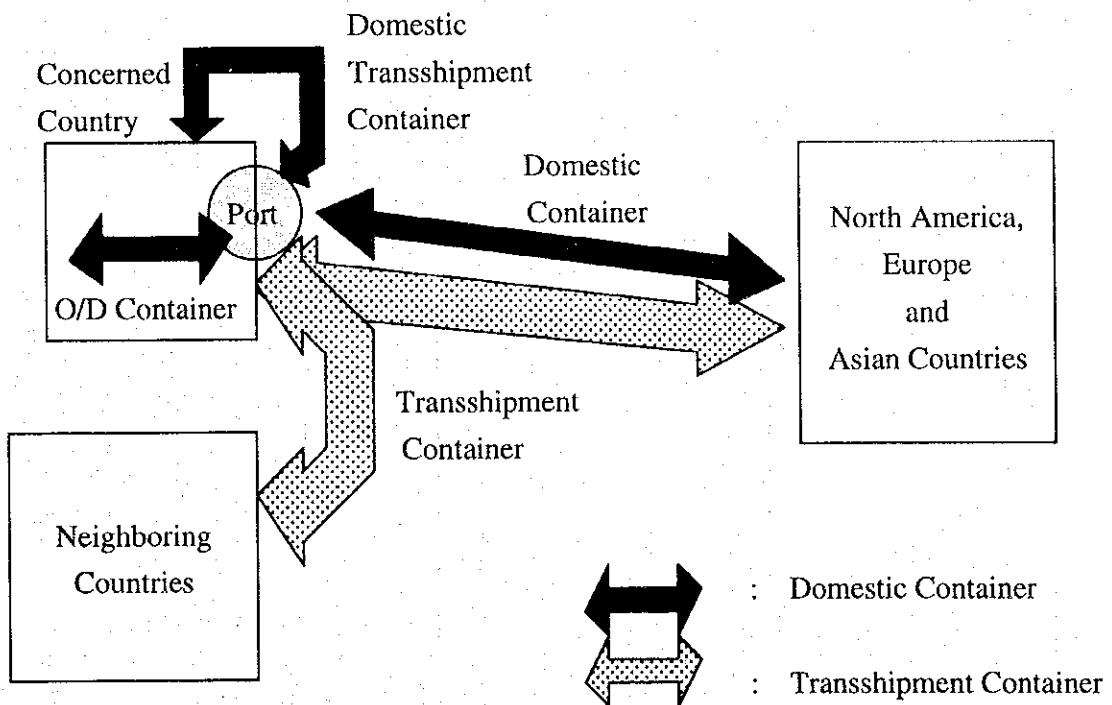


Table 5.3.1.4 Comparison of Characters of International Hub Ports in East Asia (As of 1994)

	Singapore	Hong Kong	Kaoshung	Busan	Kobe
Character of Container handled In the port	Transship	Local (China)	Local (Taiwan China)	Local (Korea) Transship (China, Japan)	Local (West Japan) Transship (China)
Share of Transship	84.9%	21.5%	42.1%	16.2%	28.5%
Volume of International Container	10,399,400	11,050,030	4,899,879	3,212,637	2,915,854
Hinterland Foreland	East Asia	China, Hong Kong East Asia	Taiwan Korea, China	Korea China, Japan	West Japan China
Port Service Level	24hr. 365days	24hr. 362days	24hr. 358days	24hr. 363days	(Provisionally) 24hr. 364days
Geographically privileged Condition for international hub port	Located in southern tip of South China sea Located in Malacca Strait Located in west tip of South East Asia	Located in northern tip of South China Sea Located in entrance of South China	Located in entrance of East China Sea and Yellow Sea Located in entrance of Central and Northern China	Located in center among East China Sea, Yellow Sea and Japan Sea Located in entrance of Northern China	Located in passing waterway between North America and Asia
Factor for becoming international hub port	Economic development of East West Asia	Economic Development of China	Economic development of Taiwan and China	Economic development of Korea and China	Economic Development of Japan

5.3.1.4 Possibility of Direct Call to Indonesia Port by International Container Service

(1) General

In this section, the possibility of direct call by Transpacific, Europe/East-Asia and Intra-Asia Long Distance Service to ports in Indonesia was examined considering several factors and showed the criteria of container volume in a port to be called by those services.

There are many factors to receive direct calls by International Container Service. As already mentioned in Section 3.5, the closeness to international sea-lanes, reduction of the shipping cost, provision of the appropriate port service and existence of national flag shipping company which operate the International Container Service are main factors to be considered. The Study Team used rough cost examination method to estimate the required container volume to receive direct call by those services from the viewpoint of ship operators.

In this estimation, we considered three factors; "Shipping Cost", "Delivery Time" and "Level of Service". That is because shippers select the ship operator in terms of transportation cost, door-to-door delivery time and reliability of service. We estimated the required container volume handled in an Indonesian port by comparing the container transportation cost by direct call to the Indonesian port with that of Singapore feeder service, which is the dominant service of container transportation at present. (See Appendix 5.3.1)

(2) Possibility of Direct Call by Transpacific and Europe/East-Asia Service

1) General

In future, it is anticipated that large over-panamax container vessels will increase on the Transpacific and Europe/East-Asia (International Trunk Container Route) Service with a service pattern on which the vessel calls only one end port in the origin/destination area. In such a case, however, the second and third generation panamax vessels will still be operated with flexible and frequent service pattern to respond to consignee's demand. Several ports in Indonesia have possibility to be called by these services.

In this examination, the maximum vessel size in Transpacific Service and Europe/East-Asia Service calling Singapore port, as shown in Section 3.4, is estimated to be 6,000TEU and 8,000TEU in respective target years. 3,000~4,500TEU vessels will be used to supplement this service route and Indonesian port will certainly have a possibility to receive such service.

A port, through which the majority of cargoes is directly transported to all over the world, is classified as International Hub Port and therefore the port is to be called by Transpacific, Europe/East-Asia and Intra-Asia Long Distance Service. International Hub Port could be further categorized into "Mother Port Type" and "Transshipment Port Type".

The required volume of container cargo handled in an International Container Hub Port is examined for these two categories. The volume of O/D container in a port was only considered for the former type and the volume of O/D and Transshipped container was considered for the latter type.

2) Mother Port Type

(a) Transpacific Service

In accordance with the result of the examination (See Appendix 5.3.1), the required volume of loaded O/D container to/from North America per year is at least 250,000 TEU in one port located northern part of Jawa Island. And assuming that the share of the container volume to/from North America in the total container transportation is the same as at present namely 17%, the required annual volume of loaded O/D container handled in a certain port is estimated at 1,500,000TEU.

(b) Europe/East-Asia Service

In accordance with the result of the examination, the required volume of loaded O/D container to/from Europe per year is at least 333,000 TEU in one port located at northern part of Jawa Island. Assuming that the share of the container volume to/from Europe in the total container transportation is the same as at present namely 12%, the required annual volume of loaded O/D container handled in a certain port is estimated at 3,000,000TEU.

3) Transshipment Port Type (Europe/East-Asia Service)

The required volume of loaded container to/from Europe per year is at least 500,000 TEU (share of transshipment container is assumed to be less than 60%) in an Eastern Indonesia port and 420,000TEU in the area facing Malacca Strait. Assuming that the share of the container volume to/from Europe in the total container transportation is the same as at present, namely 12%, the required annual volume of loaded container handled in a certain port is estimated at 4,200,000TEU and 3,500,000TEU, respectively.

(3) Possibility of Direct Call by Intra-Asia Long Distance Service

1) General

At present, Intra-Asia Long Distance Services are calling several ports with round trip pattern with 1,000~2,500TEU vessels. It is anticipated that similar round trip pattern will continue in future but the number of calling ports in a trip will be reduced to shorten round

trip period and operate effectively. The vessel size in service will be 1,500~3,500TEU in the target year as estimated in Section 3.4.1.

Considering the regional geographical condition in Indonesia and operating service pattern, we estimated required volume for direct call in the following two areas.

- The Northern part of Java and the area facing Makassar Strait (Tg.Priok, Makassar), and
- The Eastern part of Sumatra (Belawan and others)

In this study, we assumed that the share of Intra-Asia Long Distance Service for total volume of container from/to Indonesia in future is the same as the share at present. It is difficult to estimate the correct share in future, even though it is anticipated that the share will increase because the relation among Asian countries will be more tighten.

2) Northern part of Java or facing the Makassar Strait

In accordance with the result of the examination, the required volume of Intra-Asia Long Distance Container Service per year is at least 156,000TEU in one port located at northern part of Java or facing the Makassar Strait. This volume is almost equivalent to 50% of the annual slots of 3,000TEU mother ship under a twice-weekly calling frequency. Assuming the same share of the container volume of Intra-Asia Long Distance Service for the total volume (about 35%), consequently required annual volume of loaded container handled in a port is estimated at 450,000TEU.

3) Eastern Part of Sumatra

The required volume of Intra-Asia Long Distance Service per year is at least 104,000TEU in one port located at eastern part of Sumatra which is almost equivalent to 25% of the annual slots of 2,000 TEU mother ship under a twice-weekly calling frequency. Assuming the same share of the container volume of Intra-Asia Trunk Route for the total volume (about 35%), the required annual volume of loaded container is estimated at 300,000TEU.

5.3.1.5 Criteria for Selecting an International Container Hub Port in Indonesia

(1) General

The location of International Hub Port in Indonesia is essential to establish the container transportation network system, which is one of vital factor to support the international competitiveness of industrial product and promote economic activity in a certain region. The location of the port, therefore, should be selected considering port and economic activity in future as well as national and regional development policy.

(2) Criteria for Selecting an International Hub Port in Indonesia

“Mother Port Type International Hub Port” and “Transshipment Port Type International Hub port” is quite different in nature. The International Hub Port in Indonesia should be selected based on direct benefit and indirect benefit as well as its ability to promote economic recovery. The criteria are summarized in Table 5.3.1.6.

1) Direct Cost and Benefit

a) Total Investment of Port Facilities Development

The main function of “Transshipment Port Type International Hub port” is to transship containers at port which entail handling the containers twice (unloading and loading) in the terminal. While the container handling productivity with transshipment, in general, is more effective than O/D container handling, additional investment is required to satisfy the double handling of container volume.

Case 1 Transshipment Port Type International Hub port

Feeder port → Transshipment Type Port → International
(Loading, Handling 1time) (Loading and Unloading, Handling 2times) Trunk Line

Case 2 Mother Port Type International Hub Port

Mother Type Port → International
(Loading, Handling 1time) Trunk Line

b) Saving Transport Cost and Delivery Time

The transportation cost of O/D container from/to “Mother Port Type” and feeder cost would be substantially reduced and consequently total sea-borne container transportation cost in Indonesia could be reduced. (See Appendix 5.3.2)

“Transshipment Port Type” port, in general, handles a greater volume of container and

receives more frequent international trunk service than "Mother Port Type" port. The door-to-door delivery time through the former port, therefore, may be shorter than through the latter.

c) Improving Reliability of Transportation System

The "Mother Port Type" port development with suitable level of service can improve the reliability of transportation in hinterland, compared to "Transshipment Port Type" development. That is because feeder port with insufficient level of service still may have important role in "Transshipment Port Type" transportation system and damage of cargo often occur during transshipment in port.

2) Indirect Benefit

The indirect benefit derived from stimulating or making possible increase of national economic activities is often difficult to measure quantitatively, especially for nationwide development. Hereunder the indirect benefit of these two types of development is compared qualitatively.

a) Increasing Economic Activity in Hinterland

The port related industry and transportation sector would derive a lot of benefit from the transport cost saving with reliable port system. Productivity and producer's cost of other industry in hinterland would be also improved. Consequently, income tax would be increased.

The size of such benefit is deeply related to the scale of GRDP, population and capital in the hinterland area. In general, the hinterland of "Mother Port Type" port has larger socioeconomic indices compared to that of "Transshipment Port Type".

b) Rectifying Regional Disparity

The location of "Mother Port Type" port is decided based on the economic activity in hinterland, on the other hand the location of "Transshipment Port Type" port is decided based on closeness to the international trunk sea-lane. The activity of "Transshipment Port Type" port is rather satisfied by itself and the economic activity in the hinterland is not so crucial in deciding the location, hence "Transshipment Port Type" port could play a role in rectifying regional disparity.

c) Environmental Consideration

Rapid progress of a large-scale port development in a certain area, where sufficient social capital is not yet accumulated, would result in environmental deterioration around the development area. If total development program in the area could not be well coordinated with related facilities; sewerage drainage and air pollution control so on.

In areas where present excellent environmental condition is one of the important resources for regional economic activity such as marine tourism, sightseeing and so on, countermeasure to preserve the present environmental condition should be implemented considering not only the progress of port development but also hinterland activities.

3) Promotion of Economic Recovery

Considering the need to promote the recovery of the Indonesia economy, the Study Team recommends that development of international hub port should be undertaken in the following three phases.

a) Short Term

In order to secure social condition, public investment should focus on to maintaining and improving existing facilities which will promote private investment in turn.

b) Middle Term

After securing social condition, public investment to infrastructure development should be concentrated based on the efficiency of investment which is measured by total benefit (direct benefit + indirect benefit) to recover present economic condition.

c) Long Term

After securing economic activity, public investment should be distributed considering government and national policy, such as rectifying regional disparity.

4) Risks of Large Infrastructure Investment

The port infrastructure development requires a very large investment in the primary phase and the depreciation period is more than 20 years. Such development, generally, should be financed by the public sector or large shipping company. The public sector will receive indirect profit from the port and economic activity in the hinterland and while the shipping company will gain a considerable profit through the shipping service.

The Study Team classified investment in development and operation of international hub port according to the potential investor and the risk involved. (See Table 5.3.1.4)

If sufficient volume of container could be generated from the hinterland and foreland, the operation of international container hub port would be commercially successful. But considering the potential competitors in neighboring countries in the "Transshipment Port

Type” port field and the rather short life cycle of equipment, the risk of infrastructure investment by the public sector and private sector should be evaluated thoroughly.

Table 5.3.1.5 Potential Investor and Risk on International Hub Port Development

Items Of Investment	Potential Investor	Initial Investment	Operational Expenditure	Revenue and Depreciation Period	Investment Risks
Infrastructure	Public Private	Large (Fixed)	Small	Port due and Wharfage (30 years)	Large
Management	Private Public	Small (movable)	Small	Port due and Wharfage (short term)	Small
Shipping	Private	Large (movable)	Medium	Shipping Charge (More than 20 years)	Small
Equipment	Private Public	Large (movable)	Medium	Handling Charge (Less than 15 years)	Medium
Operation	Private	Small (movable)	Small	Handling Charge (short term)	Small

Source : Prepared by the Study Team

Table 5.3.1.6 Criteria for Selecting an International Hub Port

Criteria	Transshipment Port Type International Hub Port	Mother Port Type International Hub Port
1. (Direct-Cost and Benefit) Total Investment of Port Facilities Development	<p>Container from foreland is unloaded from feeder vessel and loaded to mother vessel in the port which has to operate with sufficient service level from the beginning.</p> <p>Additional large investment is required to develop these double handling facilities.</p>	<p>O/D Container is loaded to mother vessel in the port, mainly. Port development program is decided based on volume of container from hinterland and finally the port could be an international hub port with certain service level and increase volume of transshipment container with feeder service network.</p>
2. (Direct-Cost and Benefit) Saving Transport Cost and Delivery Time	<p>The port will receive more frequent international trunk service in general; hence door-to-door delivery time through the port may be shorter than through the others.</p>	<p>If sufficient volume of O/D container, which makes it possible to be called by direct international trunk service, is handled in the port, total nationwide sea-borne container transportation cost could be reduced.</p>
3. (Direct-Cost and Benefit) Improving Reliability of Transportation System	<p>If feeder ports with insufficient level of service still exist and have important role in this transportation system, the system will not be reliable.</p>	<p>The port with suitable level of service can directly improve the reliability of transportation system for the customers in the hinterland.</p>
4. (Indirect Benefit) Increasing Economic Activity in Hinterland	<p>The scale of GRDP, population and capital in the hinterland area is comparatively small. The activity of the port is not deeply dependent on the hinterland.</p> <p>The total benefit of investment is relatively small.</p>	<p>The scale of GRDP, population and capital in the hinterland area is comparatively large. The activity of the port is deeply dependent on hinterland.</p> <p>The total benefit of investment is relatively large.</p>

Table 5.3.1.6 Criteria for Selecting an International Hub Port (cont.)

Criteria	Transshipment Port Type International Hub Port	Mother Port Type International Hub Port
5. (Indirect Benefit) Rectifying Regional Disparity	<p>The location of the port is decided based on closeness to the international trunk sea-lane and the activity of the port is self-sustainable. The economic activity in the hinterland is not so important in deciding the location.</p>	<p>The location of the port is decided based on the economic activity in hinterland and the port have to be located relatively close to a well-developed hinterland.</p>
6. (Indirect Benefit) Environmental Consideration	<p>If present excellent environmental condition is one of the important resources for regional economic activity such as marine tourism and sightseeing, Rapid progress of a large-scale port development in the area, where sufficient social capital is not yet accumulated, would result in environmental deterioration</p>	<p>The port will be located near well-developed area, where sufficient social capital is accumulated. Such development will not have a large environmental impact.</p>
7. (Others) Recovery and Promotion of Socio-Economic Activity	<p>Efficiency of the port development investment is comparatively small considering direct profit and indirect profit to Indonesian economic activities.</p>	<p>Efficiency of the port development investment is comparatively large considering direct profit and indirect profit to Indonesia economic activities.</p>
8. (Others) Risks of Port Infrastructure Investment	<p>There are a lot of potential competitors in this type of port field, direct call port could be changed easily with decision by mother ship operator and the life cycle of equipment is relatively short. Therefore the risk of infrastructure investment should be evaluated thoroughly.</p>	<p>The development of port is based on O/D cargo and demand of port activities will increase steady. The volume of investment could be decided corresponding with the reliable demand.</p>