

- Handling Capacity : 105,000 TEU/year
- Operation Type : Various

b) Today the modern container terminal should be designed as one of important facilities in the concept of the integrated multimodal transportation and the Logistics, in which the following factors should be taken into consideration ;

- ① To accommodate Post-Panamax containership
- ② To provide sufficient equipments and the service with the productivity of 30 units/hour crane or more
- ③ To minimize the staying hours of trucks up to the level of less than 30 minutes at the container yard
- ④ To handle big lot of shipment per vessel
- ⑤ To provide the service enabling the shipping companies to maintain their ship's schedule
- ⑥ To have the most efficient operation system considering the local requirements such as ICTF connection, hot cargo delivery, etc
- ⑦ To respond so quickly to any enquiries from customers

e) Now for references to consider the future container terminal, we would like to review and observe the development of container terminal at each generation by some statistics and informations ;

- |  |          |                |
|--|----------|----------------|
| ① Efficiency & Quality of Container Terminal<br>v.s. Type of Operation .....     | Attached | R - ①<br>R - ② |
| ② Modern Marine Terminal Operations and<br>Management (By Port of Oakland) ..... |          | S              |
| ③ Gantry Crane Evolution (1st generation - 3rd generation) .                     |          | T              |
| ④ Comparison of Terminal Operation System .....                                  |          | U              |

d) The container terminal in the 4th generation and in the future

As we observed in the item 2 of page 5, the shipping companies are planning to place more Post-Panamax full-containerships.

And as we again observed in the item 3 of page 7, the function of container terminal has become very important and indispensable in the highly integrated multimodal transportation system.

To meet the requirements of both shipping companies and customers, and considering the above factors, the main specifications, equipments, operation system, etc., should be considered in the 4th generation of container terminal.

< Main Items of the 4th generation Container Terminal >

- Wharf of Length : 350 ~ 400 m
- Depth of yard : 500 m
- Water Depth : (-) 14 m
- Gantry Crane : 3 or 4 units of Post Panamax type \*(1)
- Gate : Pre-gate system \*(2)
- Yard Operation : ◦ Highly computerized yard operation  
◦ On-chassis, Rubber-Mount Transtainer or Straddle Carrier
- Railway Connection : ICTF system or On-Dock Railway system
- Container Pick-up/Delivery Time : less than 30 minutes

\* (1) Main specification of Post-Panamax type of Gantry Crane

- Out-reach : 141 feet (43m) or more to handle 16 rows of containers on ship's deck
- Rail-Gauge : 100 feet (30m)
- Lift Height : 100 ~ 120 feet (30 ~ 36m)
- Hoist Speed : ◦ Safety Weight Load : 160 ~ 220 feet/minute  
◦ Empty : 360 ~ 420 feet/minute
- Trolley Speed : 500 ~ 700 feet/minute

\* (2) Pre-Gate System

At the gate of our terminals, there are microphones (so-called as "INTERCOM") to talk with terminal clerks. Truck drivers are only required to say necessary information (container number to be picked-up and the driver's license number, etc. ... attached ① & ② )

to these microphones and then they can pick-up containers within a very short time. When the driver goes to the terminal IN-GATE (booth), EIR (Equipment Interchange Receipt) is immediately and automatically printed out according to the truckers' information, on which there are instruction for the driver together with containers location, next job for the driver, etc. The turn-round time from the driver's arrival to going out the terminal with container is only 20 minutes. This updated computer system is called as "Pre-gate System".

Our terminals also have other updated computer systems. Of course, they are ready for "Automated Manifest System" by U.S. customs and already interfaced with "Intermodal Container Transfer Facility" (ICTF)" of Southern Pacific at Los Angeles.

#### < Future Container Terminal >

##### (i) Gantry Crane

When the containership is enlarged to the size of 4,000 ~ 6,000 TEU type, we have to enlarge the gantry crane such as the out-reach to 140 ~ 150 feet, Lift Height to 100 ~ 120 feet.

But to minimize ship's stay at a port, we have to unload and load big lot of containers per vessel within limited hours, for which we assign four or five gantry cranes for loading/unloading operation.

But at the same time we have to consider the high speed of trolley, the minimum loss time and the short cycle pass for the gantry crane.

- High speed of trolley --- to power-up the motor and to introduce the automated speed control system
- Minimum Loss Time --- to equip "chassis loader" and computerized anti-sway system
- Short Cycle Pass --- to install Double Trolleys and traverse equipment

This Gantry Crane with Double Trolley system was first installed at Port of Rotterdam in 1984 and have been installed at Norfolk port, U.S.A, at La Spezia Port, Italy in 1987 and Baltimore, U.S.A in 1989.

This Double Trolley System with other equipments increased the terminal productivity to the level of 45 ~ 60 units/crane hour, which could contribute to minimizing ship's stay at port and smooth handling of such big lot of shipment per vessel.

(ii) Fully Automated Terminal Operation

It is said that Europe Combined Terminal decided to install "Fully Automated Operation System with robot-controlled chassis and gantry crane at Delta Terminal from 1993.

They lay under the ground of terminal yard many grid (transponders), by which Automated Guided Vehicle is moving.

And at the stacking area, Automated Stacking Crane are guided by Process Control System to stack containers by two tiers.

e) We would like to look at the various type of Gantry Crane with Double Trolley System

• Gantry Crane at Rotterdam .....	Attached	V
• Gantry Crane at La Spezia .....		W
• Gantry Crane at Norfolk .....		X
• Chassis Loader .....		Y

4. TraPac (Trans Pacific Container Service) - Los Angeles Terminal

As one of the most advanced, the highly computerized and the highly reputed container terminals at the U.S. West Coast, I would like to show you the operation and equipments - mainly Pre-Gate System by the photo slide, so that you can understand what is going at the container terminals functioning in the highly integrated multimodal container transportation.

**Now ladies and gentlemen, all audience here and all staffs working for this seminars,  
I thank you so much for listening to my speech under the subject of "Containerization  
in the World and Terminal Development.**

**- End -**

## World container port traffic by country/region\*

No.	Country/Region	1990 TEU	1989 TEU	(No.)	No.	Country/Region	1990 TEU	1989 TEU	(No.)
1	USA	15 278 162 <sup>1</sup>	14 632 763 <sup>2</sup>	(1)	33	Pakistan	330 391	342 946	(36)
2	Japan	7 851 608 <sup>3</sup>	7 539 316 <sup>4</sup>	(2)	34	Cyprus	384 279	369 291	(35)
3	Taiwan	5 430 039	5 278 227	(3)	35	Eire	380 208	379 332	(32)
4	Singapore	5 223 500	4 364 400	(5)	36	Denmark	358 949	378 680	(33)
5	Hong Kong	5 100 637	4 463 709	(4)	37	Egypt	316 314	195 447 <sup>20</sup>	(43)
6	UK	4 016 569 <sup>5</sup>	3 786 704 <sup>6</sup>	(6)	38	Finland	306 125	305 868	(37)
7	Netherlands	3 761 184	3 725 702	(7)	39	Mexico	228 182	185 929	(46)
8	Germany	3 265 747	3 092 829	(8)	40	Turkey	219 223 <sup>21</sup>	265 378 <sup>22</sup>	(38)
9	South Korea	2 348 475 <sup>7</sup>	2 158 828 <sup>8</sup>	(9)	41	Chile	217 457	200 264	(42)
10	Belgium	1 901 172	1 768 157	(= 10)	42	Argentina	209 150	218 312	(40)
11	Spain	1 859 057 <sup>9</sup>	1 768 157 <sup>9</sup>	(= 10)	43	Argentina	208 144	171 291	(48)
12	Italy	1 807 183 <sup>10</sup>	1 670 541 <sup>10</sup>	(13)	44	Honduras	190 253	193 432	(44)
13	Australia	1 636 359	1 727 611	(12)	45	Panama	176 639	149 992	(53)
14	France	1 567 511 <sup>11</sup>	1 605 792 <sup>11</sup>	(14)	46	Oman	168 465	165 723	(49)
15	UAE	1 563 277	1 366 741	(15)	47	Morocco	164 015 <sup>23</sup>	116 381	(59)
16	Canada	1 524 771	1 432 062 <sup>12</sup>	(15)	48	Iceland	159 832	151 740	(52)
17	Philippines	1 383 525	1 286 208	(18)	49	Norway	157 390	141 883	(57)
18	Puerto Rico	1 381 403 <sup>13</sup>	1 289 031 <sup>13</sup>	(17)	50	Canary Islands	150 306 <sup>24</sup>	158 394 <sup>24</sup>	(50)
19	PRC	1 143 898 <sup>14</sup>	968 860 <sup>14</sup>	(19)	51	Yugoslavia	150 181	144 685	(55)
20	Thailand	1 078 290	939 040	(20)	52	Poland	146 196	147 351	(54)
21	Indonesia	922 547	762 256	(22)	53	Jamaica	139 626	152 935	(51)
22	Malaysia	881 741	723 933	(25)	54	Kenya	136 406	129 666	(58)
23	Saudi Arabia	788 567 <sup>15</sup>	758 526 <sup>15</sup>	(23)	55	Malta	135 790	40 439	(80)
24	South Africa	774 106	770 466	(21)	56	USSR	135 580 <sup>25</sup>	207 000 <sup>25</sup>	(41)
25	India	696 255 <sup>16</sup>	632 101 <sup>16</sup>	(26)	57	Bangladesh	120 884	112 977	(60)
26	Sri Lanka	583 811	544 197	(27)	58	Guam	119 280	105 092	(62)
27	Brazil	569 186 <sup>17</sup>	743 840	(24)	59	Leeward Islands	114 907 <sup>26</sup>	110 259	(61)
28	Greece	479 854 <sup>18</sup>	433 948 <sup>18</sup>	(31)	60	Colombia	113 889 <sup>27</sup>	81 880 <sup>27</sup>	(68)
29	Sweden	471 929 <sup>19</sup>	453 789 <sup>19</sup>	(30)	<i>Other countries</i>				
30	New Zealand	466 097	463 459	(29)	1 909 573				
31	Israel	462 000	514 060	(28)	World total recorded				
32	Portugal	411 184	377 054	(34)	84 223 778				
					79 816 162				

1990 figures not available for Bahrain, Brunei, Congo, Cote d'Ivoire, Ecuador, Guinea, Iran, Lebanon, Liberia, Mauritania, Nicaragua, Peru, Sudan, Tunisia, US Virgin Islands, Vanuatu, Venezuela.

<sup>1</sup>excludes Stockholm; <sup>2</sup>excludes Detroit, Gloucester City, Guilford, Milwaukee, Stockton; <sup>3</sup>excludes Hakata, Tomakomai, Yokkaichi; <sup>4</sup>excludes Hakata; <sup>5</sup>excludes Lerne, Swensen; <sup>6</sup>excludes Lerne, Swensen, Thamasport; <sup>7</sup>excludes Inchon; <sup>8</sup>excludes Alicante, Santander; <sup>9</sup>excludes Alicante; <sup>10</sup>excludes Bari, Catania, Marina di Carrara; <sup>11</sup>excludes Cherbourg; <sup>12</sup>excludes Toronto, Vancouver; <sup>13</sup>excludes Ponce; <sup>14</sup>excludes Fuzhou; <sup>15</sup>excludes Jubail; <sup>16</sup>excludes Cochin, Visakhapatnam; <sup>17</sup>excludes Fortaleza, Manaus, Rio Grande, Salvador; <sup>18</sup>excludes Heraklion; <sup>19</sup>excludes Helsingborg; <sup>20</sup>excludes Damietta; <sup>21</sup>excludes Iskenderun, Izmir; <sup>22</sup>excludes Iskenderun; <sup>23</sup>excludes Tangier; <sup>24</sup>excludes Las Palmas; <sup>25</sup>excludes Nakhodka, Vostochny; <sup>26</sup>excludes Plymouth; <sup>27</sup>excludes Santa Marta.

\*excluding ports on inland waterways.

World container port traffic league

Attached B

World container port traffic league 1990					
No.	Port	1990 TEU	1989 TEU	(No.)	Country/Region
1	Singapore	5 223 500	4 364 400	(2)	Singapore
2	Hong Kong	5 100 637	4 463 709	(1)	Hong Kong
3	Rotterdam	3 665 955	3 617 295	(3)	Netherlands
4	Kaohsiung	3 494 631	3 382 512	(4)	Taiwan
5	Kobe	2 595 940	2 458 964	(5)	Japan
6	Busan	2 348 475	2 158 828	(6)	South Korea
7	Los Angeles	2 116 404	2 056 629	(7)	USA
8	Hamburg	1 968 986	1 727 609	(10)	Germany
9	New York/New Jersey	1 898 436	1 988 318	(8)	USA
10	Keelung	1 807 271†	1 787 067	(9)	Taiwan
11	Yokohama	1 647 891	1 506 338	(12)	Japan
12	Long Beach	1 598 078	1 575 117	(11)	USA
13	Tokyo	1 555 140	1 438 524	(14)	Japan
14	Antwerp	1 549 113	1 473 746	(13)	Belgium
15	Felixstowe	1 417 694	1 359 804	(15)	UK
16	San Juan	1 381 403	1 289 031	(16)	Puerto Rico
17	Seattle	1 171 091	1 040 890	(19)	USA
18	Bremen/Bremerhaven	1 183 347	1 203 955	(17)	Germany
19	Oakland	1 124 123	1 090 597	(18)	USA
20	Bangkok	1 018 290	924 040	(22)	Thailand
21	Manila	1 014 396	957 642	(20)	Philippines
22	Tacoma	937 691	924 974	(21)	USA
23	Nagoya	897 781	815 351	(24)	Japan
24	Le Havre	858 050	869 348	(23)	France
25	Charleston	794 100†	785 686	(25)	USA
26	Hampton Roads	788 777	685 371	(26)	USA
27	Honolulu	655 174†	636 091	(29)	USA
28	Tanjung Priok	643 963	559 617	(30)	Indonesia
29	Melbourne	623 788	647 440	(27)	Australia
30	Port Rashid	613 704	644 230	(28)	UAE
31	Colombo	583 811	544 197	(32)	Sri Lanka
32	Montreal	568 103	522 451	(35)	Canada
33	Jeddah	549 934	548 698	(31)	Saudi Arabia
34	Durban	511 634	488 965	(38)	South Africa
35	Houston	504 854	492 100	(37)	USA
36	Port Kelang	496 526	399 048	(46)	Malaysia
37	Marseille-Fos	481 710	475 547	(39)	France
38	Osaka	479 000†	513 658	(36)	Japan
39	Sydney	477 395	531 006	(34)	Australia
40	Baltimore	474 301	537 500	(33)	USA
41	Algeciras-La Linea	474 000	397 163	(47)	Spain
42	Halifax	485 000†	456 331	(40)	Canada
43	Shanghai	456 123	353 836	(51)	PRC
44	La Spezia	454 000*	413 317*	(45)	Italy
45	Kitakyushu	453 395	433 292	(43)	Japan
46	Barcelona	447 920	439 969	(42)	Spain
47	Piraeus	426 045	389 037	(50)	Greece
48	Santos	425 541†	444 961	(41)	Brazil
49	Savannah	422 635	392 609	(48)	USA
50	Leghorn	416 371	416 179	(44)	Italy
51	Fujairah	414 353	270 661	(63)	UAE
52	Karachi	390 391	342 946	(52)	Pakistan
53	Valencia	387 162	390 308	(49)	Spain
54	Tilbury	382 465	326 618	(55)	UK
55	Miami	373 850	337 962	(54)	USA
56	New Orleans	352 469	306 983	(57)	USA
57	Göteborg	351 633	340 579	(53)	Sweden
58	Southampton	343 087	282 951	(60)	UK
59	Zeebrugge	342 440	276 210	(61)	Belgium
60	Bombay	324 216	309 898	(56)	India
61	Vancouver	322 569	305 688	(58)	Canada
62	Genoa	310 217	238 205	(69)	Italy
63	Jebel Ali	302 659	268 545	(64)	UAE
64	Tianjin	286 000	265 500	(65)	PRC
65	Port Everglades	285 500	241 479	(67)	USA
66	Jacksonville	278 084	230 562	(70)	USA
67	Limassol	273 805	273 096	(82)	Cyprus
68	Anchorage	272 558	226 078	(71)	USA
69	Lisbon	263 559	238 324	(68)	Portugal
70	Helsinki	245 857	246 625	(66)	Finland
71	Haifa	237 000†	285 544	(59)	Israel
72	Dammam	232 456	204 059	(75)	Saudi Arabia
73	Penang	222 440	189 724	(78)	Malaysia
74	Auckland	221 103	213 708	(74)	New Zealand
75	Liverpool	219 364	143 961	(98)	UK
76	Dublin	215 488*	220 684	(72)	Ire
77	Buenos Aires	209 150	218 312	(73)	Argentina
78	Tanjung Perak	198 135	143 225	(99)	Indonesia
79	Bilbao	189 004	182 002	(81)	Spain
80	Harwich	186 450	189 090	(79)	UK
81	Cebu	185 299	165 208	(87)	Philippines
82	Lagos/Apapa	181 532	158 949	(88)	Nigeria
83	Ashdod	179 000*†	173 791	(82)	Israel

## Top 20 container ports in 1989 based on TEU throughput

1989 rank	Port	1989 TEU	1988 TEU	Gain (%) 1988/89	Estimated TEU 1990	Gain (%) 1989/90
1	Hong Kong	4 463 709	4 033 427	11	4 900 000	10
2	Singapore	4 364 400	3 375 100	29	5 200 000	19
3	Rotterdam	3 603 161	3 288 829	10	3 630 000	0
4	Kaohsiung	3 382 512	3 082 838	10	3 500 000	3
5	Kobe	2 458 964	2 263 214	9	—	—
6	Busan	2 158 828 <sup>1</sup>	2 065 462 <sup>1</sup>	5	2 267 000 <sup>1</sup>	5
7	Los Angeles	2 056 629	1 652 069	24	2 165 562	5
8	New York/ New Jersey	1 988 318	2 095 530	-5	—	—
9	Keelung	1 787 067	1 709 763	5	1 807 271	1
10	Hamburg	1 727 609	1 621 615	7	1 980 000	15
11	Long Beach	1 545 243	1 484 467	4	1 610 000	4
12	Yokohama	1 506 338	1 452 857	4	1 610 000	7
13	Antwerp	1 473 746	1 469 949	0	1 495 000	1
14	Tokyo	1 438 521	1 396 026	3	1 305 000	-9
15	Felixstowe	1 370 271	1 278 893	7	1 400 000	2
16	San Juan	1 289 001	1 245 311	4	1 380 000	7
17	Bremen/ Bremerhaven	1 203 955	1 121 454	7	1 167 836	-3
18	Oakland	1 090 597	1 031 776	6	—	—
19	Seattle	1 040 890	1 024 035	2	1 103 343	6
20	Tacoma	924 974	781 816	18	931 974	0

Notes: <sup>1</sup>excluding transshipment.



*Top 20 container ports in 1990 based on TEU throughput*

1990 rank	Port	1990 TEU	1989 TEU	Gain(%) 1989/90	Estimated 1991 TEU	Gain(%) 1990/91
1	Singapore	5 223 500	4 364 400	20	6 260 000	20
2	Hong Kong	5 100 637	4 463 709	14	—	—
3	Rotterdam	3 665 955	3 617 295	1	3 712 000	1
4	Kaohsiung	3 494 631	3 382 512	3	3 611 004	3
5	Kobe	2 595 940	2 458 964	6	2 780 000	7
6	Busan	2 348 475	2 158 828	9	2 465 200	25
7	Los Angeles	2 116 404	2 056 629	3	—	—
8	Hamburg	1 968 986	1 727 609	10	2 200 000	12
9	New York/ New Jersey	1 898 436	1 988 318	-5	—	—
10	Keelung	1 807 271	1 787 067	1	—	—
11	Yokohama	1 647 891	1 506 338	9	1 770 000	7
12	Long Beach	1 598 078	1 575 117	1	—	—
13	Tokyo	1 555 140	1 438 524	8	—	—
14	Antwerp	1 549 113	1 473 746	5	—	—
15	Felixstowe	1 417 694	1 359 804	4	—	—
16	San Juan	1 381 403	1 289 031	7	1 423 000	3
17	Seattle	1 171 091	1 040 890	13	—	—
18	Bremen/ Bremerhaven	1 163 347	1 203 955	-3	1 221 515	5
19	Oakland	1 124 123	1 090 597	3	—	—
20	Bangkok	1 018 290	924 040	10	1 084 000	6

*Far East and Asian ports*

No 1990	(1989)	Port	1990 TEU
1	(2)	Singapore	5 223 500
2	(1)	Hong Kong	5 100 637
3	(3)	Kaohsiung	3 494 631
4	(4)	Kobe	2 595 940
5	(5)	Busan	2 348 475
6	(6)	Keelung	1 807 271
7	(7)	Yokohama	1 647 891
8	(8)	Tokyo	1 555 140
9	(10)	Bangkok	1 018 290
10	(9)	Manila	1 014 396

Attached E

CONTAINERISATION INTERNATIONAL December 1991

*Import and export volumes (in TEU) moving between North America and Asia for period 1988/90*

Imports: Country	1988	1989	% change 1988/89	1st half 1990	% change 1st half 1989/90
Thailand	81 899	109 110	33.2%	61 267	21%
Philippines	72 413	83 152	14.8%	42 462	14%
Singapore	73 374	79 687	8.6%	40 283	12%
Indonesia	25 988	39 355	51.4%	23 275	40%
Malaysia	26 225	33 617	28.2%	20 424	38%
SE Asia Total	279 899	344 921	23.2%	187 711	21%
Rest of Far East	2 363 311	2 496 782	5.6%	1 189 912	0.1%
Total imports	2 643 210	2 841 703	7.5%	1 377 623	2.5%
Exports Far East	1 972 777	2 136 694	8.3%	1 108 452	3.3%
Total trade	4 615 987	4 978 397	7.9%	2 486 075	2.8%

Source: *US Liner Trade Review, Journal of Commerce*

CONTAINERISATION INTERNATIONAL December 1990

World Containership Fleets by Type &amp; Size(TEU) as of Nov. 1, 1990

Type	Items	under 500	500-999	1000-1499	1500-1999	2000-2499	2500+	Total
Fully Cellular	TEUs	121,019	154,039	266,420	290,775	150,438	663,370	1,646,061
	Share(TEUs)	7.4	9.4	16.2	17.7	9.1	40.3	100.0
	No. of VSL	413	211	221	165	68	221	1,299
Converted to Cellular	TEUs	8,197	40,336	48,037	4,736	8,000		109,306
	Share(TEUs)	7.5	36.9	43.9	4.3	7.3		100.0
	No. of VSL	34	55	40	3	4		136
Ro-ro/Container	TEUs	19,581	17,360	29,522	20,631	12,700	14,559	114,353
	Share(TEUs)	17.1	15.2	25.8	18.0	11.1	12.7	100.0
	No. of VSL	65	28	24	12	5	5	140
Ro-ro	TEUs	103,766	75,386	50,803	13,898	10,000	8,250	262,103
	Share(TEUs)	39.6	28.8	19.4	5.3	3.8	3.1	100.0
	No. of VSL	422	118	40	9	5	3	597
Semi-container	TEUs	416,574	203,970	13,962				634,506
	Share(TEUs)	65.7	32.1	2.2				100.0
	No. of VSL	1,577	314	13				1,904
Breakbulk	TEUs	58,466	3,293	4,376				66,135
	Share(TEUs)	88.4	5.0	6.6				100.0
	No. of VSL	311	5	4				320
Bulk/Container	TEUs	28,573	82,214	125,152	58,178	20,821		314,938
	Share(TEUs)	9.1	26.1	39.7	18.5	6.6		100.0
	No. of VSL	90	114	99	35	10		348
Barge Carrier	TEUs	1,981	10,044	5,763	3,104			20,892
	Share(TEUs)	9.5	48.1	27.6	14.9			100.0
	No. of VSL	6	16	4	2			28
Total	TEUs	758,157	586,642	544,035	391,322	201,959	686,179	3,168,294
	Share(TEUs)	23.9	18.5	17.2	12.4	6.4	21.7	100.0
	No. of VSL	2,918	861	445	226	93	229	4,772

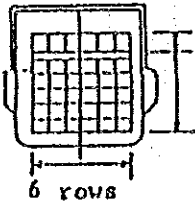
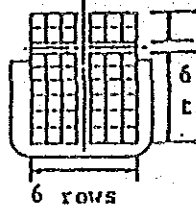
(Source: "Containerization International Yearbook")

Growth of two-way TEU capacity per year by operator for period 1988-1992, ranked as of November 1, 1990 (1990 figures for TSA members make allowance for voluntary capacity reduction)

Operator	1988	% change 1988/90	1990	% change 1990/92	1992
American President Lines*	818 511	-6.9	761 748	—	761 748
Evergreen Line*	612 664	12.1	687 067	—	687 067
Nippon Yusen Kaisha*	567 796	7.7	611 291	10.2	673 343
Sea-Land Service Inc*	590 242	-6.2	553 422	18.7	656 900
Maersk Line*	481 198	8.9	523 981	1.5	532 049
Mitsui OSK Lines*	469 609	10.1	516 916	10.2	569 624
Hanjin Shipping Co Ltd*	426 067	18.8	505 955	-1.1	500 319
Kawasaki Kisen Kaisha*	493 240	-0.8	489 421	—	489 421
Orient Overseas Container Line*	352 249	-0.8	349 558	—	349 558
Cosco Shanghai	204 981	51.4	310 271	30.0	403 510
Hyundai Merchant Marine*	279 180	3.2	288 191	—	288 191
Neptune Orient Lines*	256 399	2.0	261 475	—	261 475
Nippon Liner System Ltd*	244 039	1.8	248 380	—	248 380
Yangming Marine Transport Corp*	160 632	37.3	220 492	51.2	333 347
Zim Container Service	149 826	7.1	160 452	41.9	227 700
Transportacion Maritima Mexicana	128 671	2.3	131 668	—	131 668
Westwood Shipping Lines	89 129	—	89 129	—	89 129
Senator Linie	62 364	31.3	81 869	63.5	133 816
Gearbulk Container Service	77 978	—	77 978	—	77 978
Barber Blue Sea	54 744	3.7	56 758	—	56 758
National Shipping Corp Philippines	52 416	—	52 416	—	52 416
EAC Lines-TPS	46 923	—	46 923	—	46 923
Hoegh Lines	26 330	-3.2	25 469	—	25 469
Rickmers Linie	6 048	—	6 048	—	6 048
Lykes Lines	4 406	—	4 406	—	4 406
ABC Container Line	3 900	—	3 900	1 433	59 800
PM&O Line	3 612	—	3 612	—	3 612
Cho Yang Shipping Co	—	—	—	—	89 212
National Shipping Co Saudi Arabia	22 777	-100	—	—	22 777
Far Eastern Shipping Co	—	—	—	—	16 380
<b>Total capacity</b>	<b>6 685 931</b>	<b>5.7</b>	<b>7 068 796</b>	<b>10.3</b>	<b>7 799 024</b>

Notes: \*members of transpacific stabilisation †new service planned; ‡service is scheduled to restart once Gulf crisis resolved

PROGRESS OF CONTAINERISATION

The First Generation													
Chronology	Age of domestic coastal services before 1966												
Examples of services	Coastal services in U.S.A. and Australia												
Territories Containerised	U.S.A., Australia												
Containers	Pre-ISO Standard size ... 17', 24', 35' long												
Container-ships	<p>Mainly, converted ships with on-board cranes</p> <table border="0"> <tr> <td>"Gateway City"</td> <td>"Hawaiian Citizen"</td> </tr> <tr> <td>135.7m x 22m x 7.7m</td> <td>141.8m x 21.3m x 9m</td> </tr> <tr> <td>7.785 DWT</td> <td>10.282 DWT</td> </tr> </table> <p>on-board crane</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>6 rows 5 tiers</p> </div> <div style="text-align: center;">  <p>6 rows 6 tiers</p> </div> </div> <table border="0" style="width: 100%;"> <tr> <td>35'-60 (deck)+35'</td> <td>24'-112(d)+24'-296</td> </tr> <tr> <td>-166 (hold)</td> <td>24'-408 (h)</td> </tr> <tr> <td>total 35'-226</td> <td></td> </tr> </table> <p>Semi-containerships also engaged.</p>	"Gateway City"	"Hawaiian Citizen"	135.7m x 22m x 7.7m	141.8m x 21.3m x 9m	7.785 DWT	10.282 DWT	35'-60 (deck)+35'	24'-112(d)+24'-296	-166 (hold)	24'-408 (h)	total 35'-226	
"Gateway City"	"Hawaiian Citizen"												
135.7m x 22m x 7.7m	141.8m x 21.3m x 9m												
7.785 DWT	10.282 DWT												
35'-60 (deck)+35'	24'-112(d)+24'-296												
-166 (hold)	24'-408 (h)												
total 35'-226													
Quay-side container cranes	<p>Alameda, Mateon Terminal</p> <p>Rated capacity 25.4t, 30-5m/min (hoist) x 125m/min (traverse)</p> <p>Total weight 350t, 27.85m (outreach) x 10.37m (span) x 15.63m (clear lift)</p>												

PROGRESS OF CONTAINERISATION

The Second Generation											
Chronology	Age of short international service across one ocean since 1966										
Examples of services	Trans-Atlantic and trans-Pacific services										
Territories Containerised	Advanced countries such as U.S.A., Europe, Australia, Japan, etc.										
Containers	ISO Standard size ... 8/8'-6" x 8x20' / 40'										
Container-ships	<p>Purpose-built Ships of 700 - 1,500 TEU capacity</p> <table border="0"> <tr> <td>"America Maru"</td> <td>"Hakozaki Maru"</td> </tr> <tr> <td>175m x 25m x 9.5m</td> <td>200m x 30m x 9.5m</td> </tr> <tr> <td>15,440 DWT</td> <td>19,914 DWT</td> </tr> </table>  <table border="0"> <tr> <td>228 TEU(d)+408 TEU(h)</td> <td>354 TEU(d)+656 TEU(h)</td> </tr> <tr> <td>716 TEU</td> <td></td> </tr> </table> <p>Ro/Ro-ships also appeared      1010 TEU</p>	"America Maru"	"Hakozaki Maru"	175m x 25m x 9.5m	200m x 30m x 9.5m	15,440 DWT	19,914 DWT	228 TEU(d)+408 TEU(h)	354 TEU(d)+656 TEU(h)	716 TEU	
"America Maru"	"Hakozaki Maru"										
175m x 25m x 9.5m	200m x 30m x 9.5m										
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Quay-side container cranes	<table border="0"> <tr> <td>Kobe, Naya-Pier</td> <td>Yokohama, Hommoku</td> </tr> <tr> <td>25.4t, 30x130</td> <td>30.5t, 36x160</td> </tr> <tr> <td>464t, 33.5x16x19.5</td> <td>600t, 32x30x21</td> </tr> </table>	Kobe, Naya-Pier	Yokohama, Hommoku	25.4t, 30x130	30.5t, 36x160	464t, 33.5x16x19.5	600t, 32x30x21				
Kobe, Naya-Pier	Yokohama, Hommoku										
25.4t, 30x130	30.5t, 36x160										
464t, 33.5x16x19.5	600t, 32x30x21										

PROGRESS OF CONTAINERISATION

The Third Generation	
Chronology	Age of long international services through plural oceans since 1971
Examples of services	Services between Europe and Far East, and U.S. West Coast and Europe
Territories Containerised	Developing countries in South-East Asia, Middle-East, South America, etc.
Containers	High cube type ... 9', 9'-6" high
Container-ships	<p>Purpose-built ships over 2,000 TEU capacity (Panamax size)</p> <p>"Kuroba Maru"      "Frankfurt Express"</p> <p>242m x 32.2m x 10.5m      271m x 32.2m x 13.0m</p> <p>850 TEU(d)+979 TEU (h)      1105 TEU(d)+1940 TEU (h)</p> <p>1825 TEU      3045 TEU</p> <p>LASH and Seabee appeared and disappeared</p>
Quay-side container cranes	<p>Yokohama, Hommoku      Brisbane, BATI.</p> <p>30.5t, 49x152      36t, 40x152</p> <p>640t, 36.1x30x27      850t, 37.3x25.3x29</p> <p>Telescopic spreader      Telescopic spreader</p>



PROGRESS OF CONTAINERISATION

The Fourth Generation			
Chronology	Age of round-the-world services since 1984		
Examples of services	Round-the-world services by U.S.L. and Evergreen		
Territories Containerised	World-wide including China, India and Countries in Africa		
Containers	Deviation from ISO Standard size ... 45', 48' long		
Container-ships	<p>Purpose-built ships over 3,000 TEU capacity                      (Possibility of over-Panamax size)                      "ECONOSHIPS" "Over-Panamax"                      279m x 32.2m x 11.65m (Planned)                      57,800 DWT 39.6m (Breadth)</p> <p>996 FEU (d) + 1232 FEU (h)                      2228 FEU                      about 5500 TEU</p>		
Quay-side container cranes	<table border="0"> <tr> <td>Rotterdam, ECT 55t, 50x210 1250t, 50x35x30 with 2nd trolley 60 cont/hour</td> <td>Tacoma, Sea-Land 40.6t (48.8t in future) 1000t, 39.9x30.5x27</td> </tr> </table>	Rotterdam, ECT 55t, 50x210 1250t, 50x35x30 with 2nd trolley 60 cont/hour	Tacoma, Sea-Land 40.6t (48.8t in future) 1000t, 39.9x30.5x27
Rotterdam, ECT 55t, 50x210 1250t, 50x35x30 with 2nd trolley 60 cont/hour	Tacoma, Sea-Land 40.6t (48.8t in future) 1000t, 39.9x30.5x27		



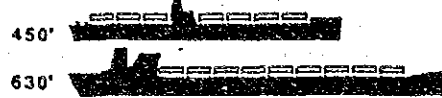
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## Containership Evolution

### Length

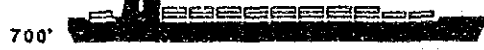
#### 1ST GENERATION

- Converted Dry Cargo Vessel (Pre-1960) (16 KTS)
- Converted Oil Tanker (1960-1970) (16 KTS)



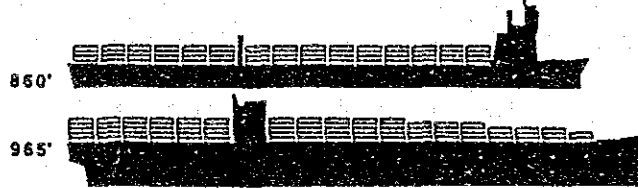
#### 2ND GENERATION

- Cellular Containership (1970-1980) (23 KTS)



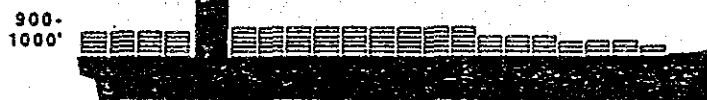
#### 3RD GENERATION

- Cellular Containership Panamax Class (1980-1990) (23 KTS)



#### 4TH GENERATION

- Post Panamax (1988-1995) (23 KTS)



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## Containership Evolution

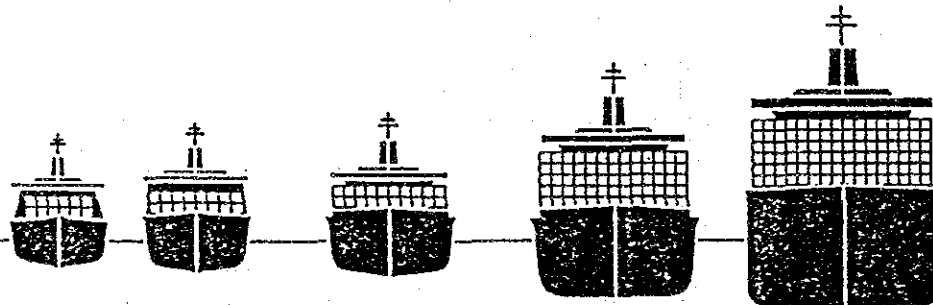
### Beam Size and Draft

Converted to Containerships

Cellular Containership

Panamax

Post Panamax



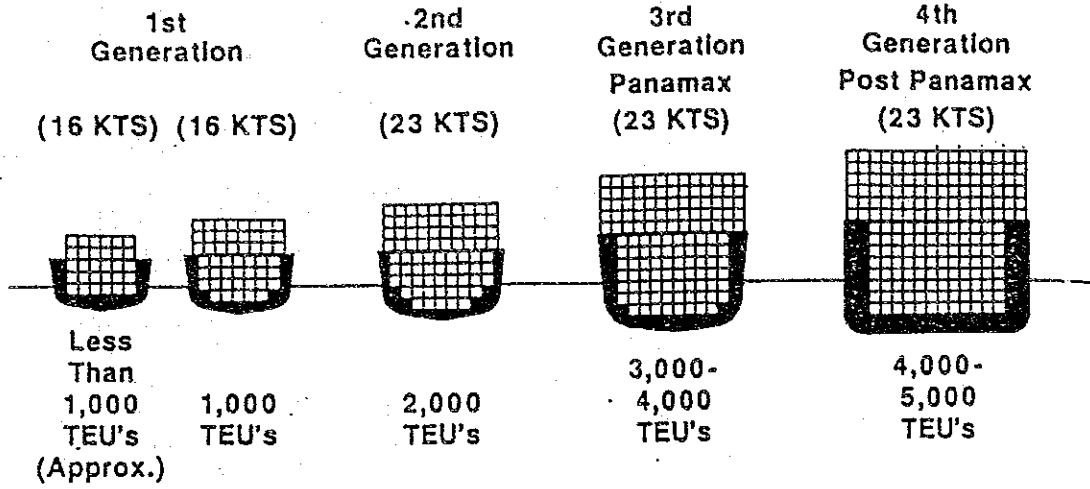
	Converted to Containerships	Cellular Containership	Panamax	Post Panamax
Beam	76'	90'	90'	105'
Draft	Less Than 30'	30'	33'	38'-41'
				38'-42'

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# Containership Evolution

## Capacity



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**Table 2: Top 20 container service operators as of July 1, 1992, analysed on the basis of vessel size according to total TEU and number of ships (in italics)**

Operator	Less than 1 000	1 000- 1 499	1 500- 1 999	2 000- 2 499	2 500- 2 999	3 000- 3 499	Over 3 500	Total
Sea-Land Service	17 474 (28)	25 966 (21)	6 965 (4)	14 732 (7)	30 120 (12)	41 472 (12)	—	136 729 (84)
Evergreen Line/Unigloy	16 938 (21)	12 320 (10)	10 860 (6)	—	54 560 (20)	37 708 (11)	—	132 386 (68)
Maersk Line	9 830 (17)	9 600 (8)	5 400 (3)	12 264 (6)	5 100 (2)	27 000 (9)	48 000 (12)	117 194 (57)
NYK Line/TSK Line	13 502 (24)	13 716 (11)	18 910 (10)	15 506 (6)	21 881 (8)	12 216 (4)	14 467 (4)	110 198 (67)
Mitsui OSK Lines	16 907 (29)	10 175 (9)	8 963 (5)	8 912 (4)	36 248 (13)	—	14 559 (4)	95 764 (64)
Nedlloyd Lines	11 250 (17)	9 552 (8)	17 924 (11)	4 569 (2)	8 293 (3)	9 353 (3)	17 840 (5)	78 781 (49)
OOCL	5 000 (8)	1 061 (1)	8 259 (5)	8 612 (4)	18 593 (7)	26 011 (8)	—	67 536 (33)
Zim Israel Navigation	13 763 (25)	10 587 (9)	10 692 (6)	7 174 (3)	5 620 (2)	18 174 (6)	—	66 010 (51)
American President Lines	6 752 (12)	4 086 (3)	—	8 000 (4)	25 300 (9)	—	21 500 (5)	65 638 (33)
K Line	8 865 (17)	5 570 (5)	5 944 (3)	17 787 (8)	17 055 (6)	10 368 (3)	—	65 589 (42)
Hanjin Shipping	1 162 (2)	6 958 (6)	4 982 (3)	—	48 332 (18)	—	4 024 (1)	65 458 (30)
P&O Containers	3 123 (6)	5 402 (4)	8 558 (5)	15 289 (7)	11 252 (4)	12 224 (4)	7 622 (2)	63 470 (32)
Cosco Shanghai	13 882 (28)	19 258 (15)	8 435 (5)	—	18 951 (7)	—	—	60 256 (55)
Hapag-Lloyd	1 116 (5)	4 179 (3)	3 267 (2)	4 251 (2)	22 038 (8)	3 430 (1)	22 000 (5)	60 281 (26)
Yangming Marine Transport	880 (2)	—	21 824 (11)	—	—	26 128 (8)	10 812 (3)	59 644 (24)
Compagnie Generale Maritime	6 274 (17)	7 636 (6)	15 606 (10)	—	8 190 (3)	—	4 427 (1)	42 133 (37)
United Arab Shipping Co	8 508 (17)	3 720 (3)	8 112 (5)	20 722 (10)	—	—	—	41 062 (35)
Baltic Shipping Co	25 928 (53)	10 522 (8)	3 090 (2)	—	—	—	—	39 540 (63)
Neptune Orient Lines	3 854 (7)	1 414 (1)	11 069 (6)	6 938 (3)	5 932 (2)	9 981 (3)	—	39 188 (22)
Scac-Deimos-Vieljeux	17 436 (32)	9 259 (8)	9 960 (6)	—	—	—	—	36 655 (46)
<b>Total (TEU)</b>	<b>202 444</b>	<b>170 981</b>	<b>188 550</b>	<b>144 756</b>	<b>337 465</b>	<b>234 065</b>	<b>165 251</b>	<b>1 433 782</b>
<i>Total (No of ships)</i>	<i>(367)</i>	<i>(139)</i>	<i>(108)</i>	<i>(66)</i>	<i>(124)</i>	<i>(72)</i>	<i>(42)</i>	<i>(918)</i>
<b>WORLD TOTAL (TEU)</b>	<b>1 382 780</b>	<b>582 317</b>	<b>393 448</b>	<b>234 667</b>	<b>450 221</b>	<b>234 065</b>	<b>169 720</b>	<b>3 447 218</b>
<i>World total (No of ships)</i>	<i>(3 920)</i>	<i>(479)</i>	<i>(226)</i>	<i>(109)</i>	<i>(165)</i>	<i>(72)</i>	<i>(43)</i>	<i>(5 016)</i>
<b>Top 20 share (TEU)</b>	<b>14.6%</b>	<b>29.4%</b>	<b>47.9%</b>	<b>61.7%</b>	<b>75.0%</b>	<b>100.0%</b>	<b>97.4%</b>	<b>41.9%</b>
<i>Top 20 share (No of ships)</i>	<i>9.4%</i>	<i>29.0%</i>	<i>47.4%</i>	<i>60.6%</i>	<i>75.2%</i>	<i>100.0%</i>	<i>97.7%</i>	<i>18.3%</i>

Notes: OOCL = Orient Overseas Container Line

Source: Carriers and Containershipping International

**Table 6: Top 20 operators of contracted newbuildings tonnage (TEU) capacity as of July 1, 1992**

No./size Operator	Capacity of ships	(TEU)	Intended route deployment
Cosco Shanghai <sup>1</sup>	4 × 3 490	13 960	Europe/Far East; US/Far East
	3 × 3 800	11 400	Europe/Far East; US/Far East
		25 360	
Hyundai Merchant Marine	5 × 4 400	22 000	USWC/Far East
Hanjin Shipping	5 × 4 024	20 120	USWC/Far East/Europe
K Line	5 × 3 500	17 500	USWC/Far East
P&O Containers	4 × 4 002	16 008	Europe/Far East
Evergreen Line <sup>2</sup> /Uniglorv	3 × 3 950	11 850	RTW
	4 × 998	3 992	Far East/Mid-East
		15 842	
DSR-Lines	5 × 2 674	13 370	RTW
Hapag-Lloyd	3 × 4 400	13 200	Europe/Far East
Senator Unie	2 × 2 668	5 336	RTW
	2 × 3 000	6 000	RTW
		11 336	
Neptune Orient Lines	3 × 3 600	10 800	USWC/Far East
	1 × 445	445	South East Asia coastal
		11 245	
TMM	5 × 2 200	11 000	Europe/Mexico/USGC
Scac-Delmas-Vieljeux	5 × 2 200	11 000	Europe/West Africa; USWC/ANZ
NYK Line	2 × 3 808	7 616	Europe/Far East
	1 × 1 304	1 304	Far East/WCSA
		8 920	
Nedlloyd Lines	3 × 3 950	7 900	Europe/Far East
Polish Ocean Lines	6 × 1 100	6 600	Europe/South East Asia
Transroll Navegacao	3 × 2 135	6 405	Europe/ECSA
Lloyd Triestino	2 × 3 000	6 000	Mediterranean/Far East
A/S Ivarans Rederi	1 × 1 731	1 731	USEC/ECSA
	3 × 1 400	4 200	Europe/ECSA
		5 931	
CMA	2 × 2 700	5 400	Europe/Mid-East/Far East
Alanca	2 × 2 000	4 000	Europe/ECSA
<b>Total</b>		<b>239 137</b>	
<b>% of World Total</b>		<b>77.0%</b>	

Notes: <sup>1</sup>Cosco has subsequently ordered 4 × 3,800TEU vessels from German yards; <sup>2</sup>Evergreen vessels being built at Onomichi Dockyard, Kobe at rating of 3,388TEU. On delivery, ships will be jumbalzed in Taiwan to 3,950TEU loading capacity; TMM = Transportacion Maritima Mexicana; CMA = Compagnie Maritime d'Affretement; USWC = US West Coast; USGC = US Gulf Coast; ANZ = Australia, New Zealand; WCSA = West Coast South America; USEC = US East Coast; ECSA = East Coast South America

Source: Carriers and Containerisation International Yearbook databank

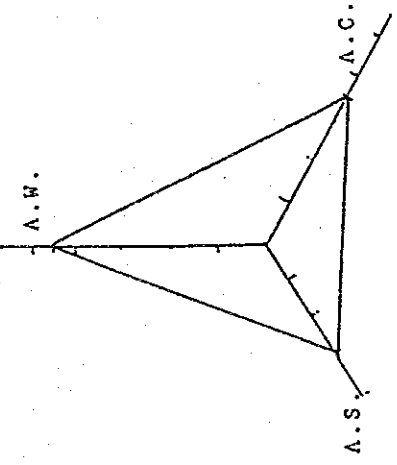
EFFICIENCY & QUALITY OF CONTAINER TERMINAL  
VS TYPE OF OPERATION

Item	Standard Terminal in Japan	New terminal in Japan	HongKong (Modern Terminal)
(A.W) Average Thruput per Wharf Length (TEU/m/year)	350	629	1,641
(A.C) Average Thruput per Gantry Crane (TEU/Crane/year)	52,500	73,333	141,639
(A.S) Average Thruput per Yard Sapce (TEU/ha/year)	10,000	12,571	30,351

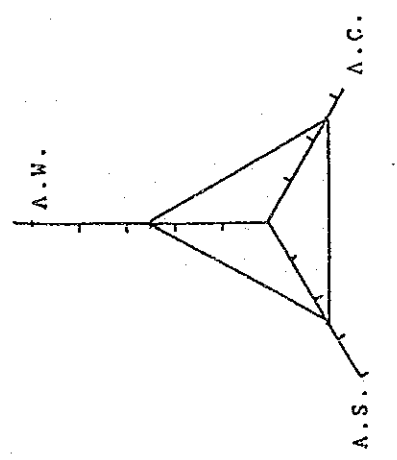
Item	Kaohsiung Port Terminal	Long Beach Port Terminal	Rotterdam Port Terminal
(A.W) Average Thruput per Wharf Length (TEU/m/year)	722	304	450
(A.C) Average Thruput per Gantry Crane (TEU/Crane/year)	110,101	40,192	80,439
(A.S) Average Thruput per	20,552	5,544	6,952

EFFICIENCY & QUALITY OF CONTAINER  
TERMINAL VS TYPE OF OPERATION

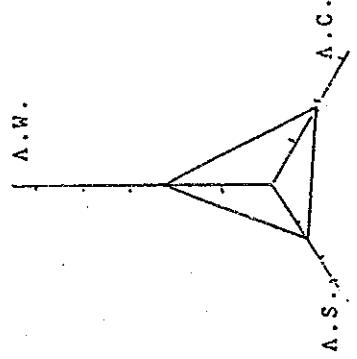
o A.W.	-- Average Thruput per Wharf Length / Year.
o A.C.	-- Average Thruput per Gantry Crane / Year
o A.S.	-- Average Thruput per Space / Year.



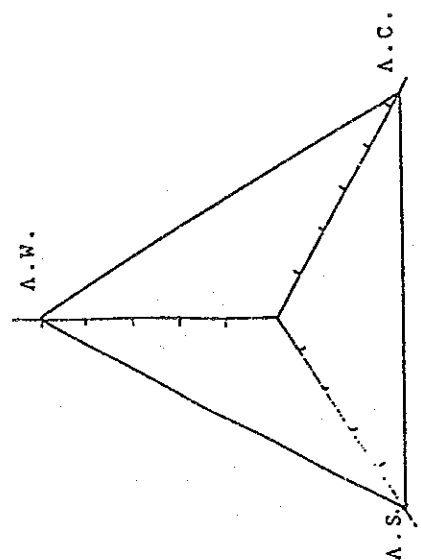
( JPN NEW TERMINAL )



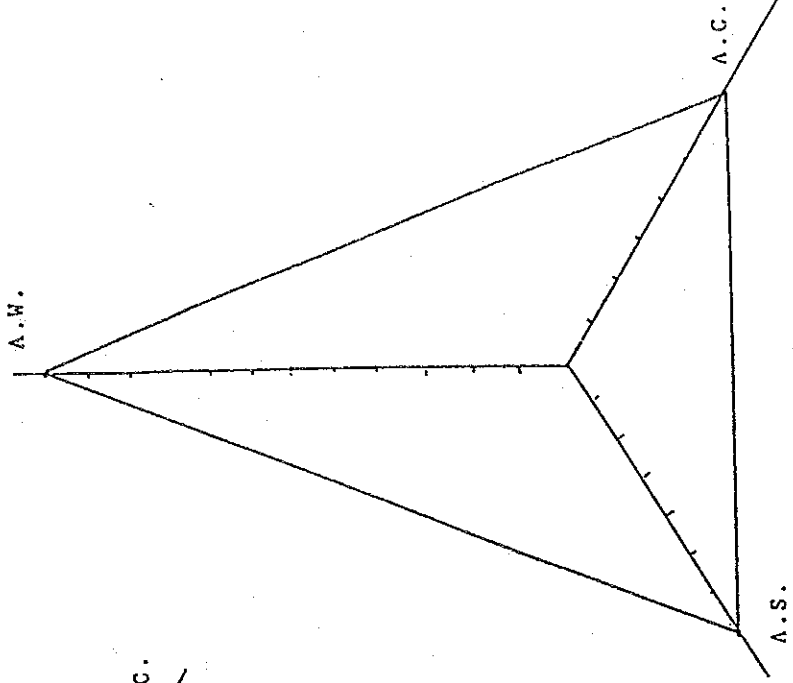
( JPN STANDARD TERMINAL )  
( PLAN )



( LONGBEACH PORT )



( KAOHSIUNG PORT )



( HONG KONG PORT )

"Modern Marine Terminal Operations and Management"  
(By Port of Oakland)

Area of Comparison	Chassis System	Straddle Carrier	Yard Gantry Crane	Front-End Top Pick Loader
Land Utilization	Very poor 70 TEUs per acre 173 per hectare	Good 168 TEUs per acre 413 per hectare	Very Good 325 TEUs per acre 802 per hectare	Good 240 TEUs per acre 590 per hectare
Terminal Development costs	Very low	Medium	High	Medium to high
Equipment costs <sup>2</sup>	Tractor \$40,000 Chassis \$ 7,000	\$560,000	\$800,000	\$375,000
Equipment service factor per container crane <sup>3</sup>	4 to 5 tractors; 1 chassis per container	3 to 4	1 to 2 cranes 5 tractors and chassis	2
Operating labor	Low	Low	Medium to high	Medium
Equipment maintenance	Low	High	Low	Medium
Container damage	Low	High	Low	Low
Operators control	Good, but frequent yard checks required	Good, yard checks required	Very good	Good
Advantages	High accessibility, low cost, by user's chassis	Versatility	Low upkeep, good control, expandable system	Versatility, low maintenance
Disadvantages	High land requirements, large chassis requirements	High damage and maintenance costs	Initial equipment and land preparation costs	Poor selectivity

Notes: <sup>1</sup> This table is intended only as a general guideline. Local conditions and work rules can cause considerable variation from the data shown.

<sup>2</sup> Approximate prices at U.S. 1982 levels.

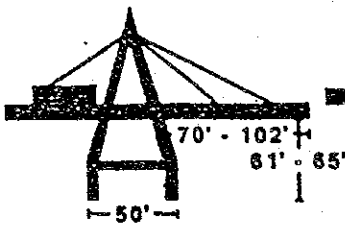
<sup>3</sup> Varies considerably depending upon local working rules and trade routes serviced.



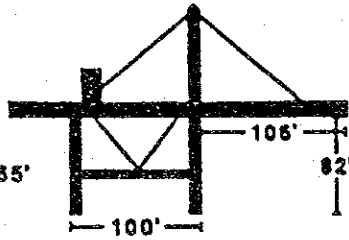


# Crane Evolution

1st  
Generation  
(1960's)



2nd  
Generation  
(1970's)



3rd  
Generation  
(Panamax)  
(1986)

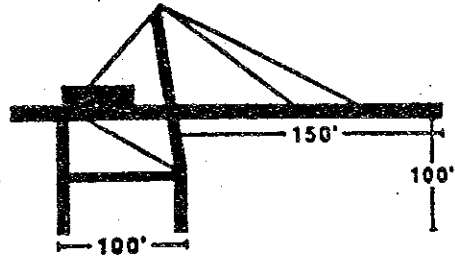
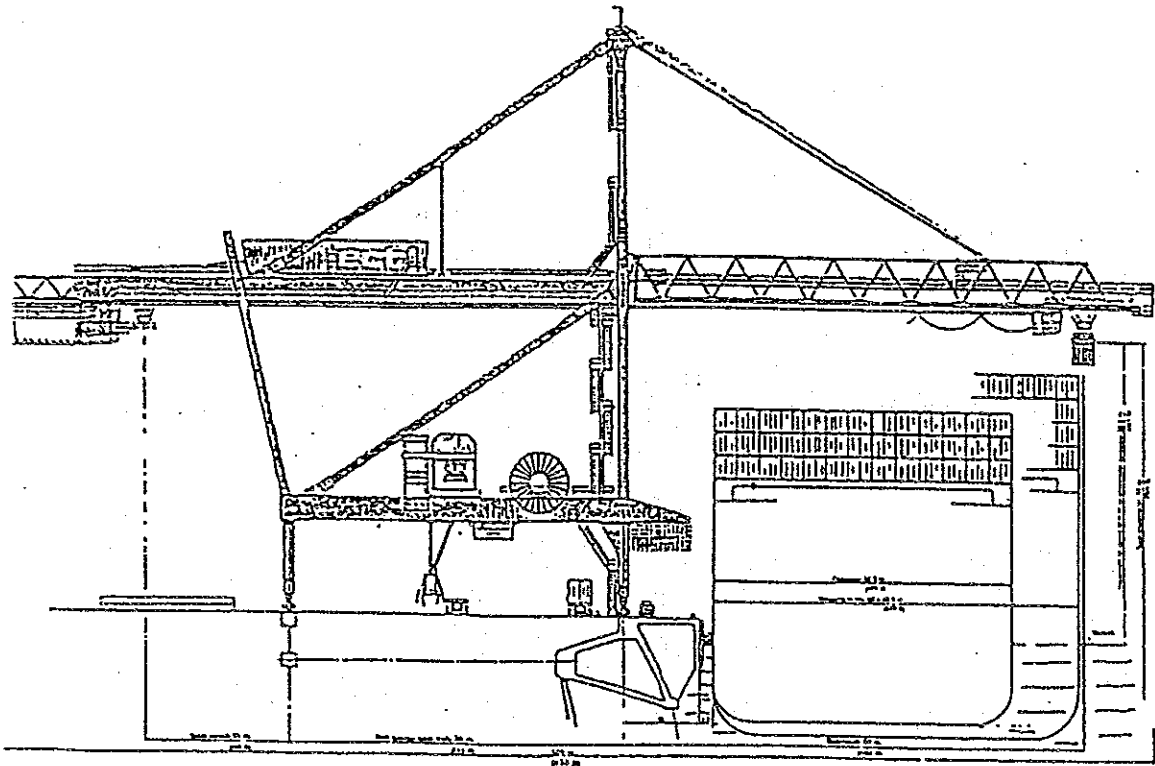


Table Comparison of Terminal Operation Systems

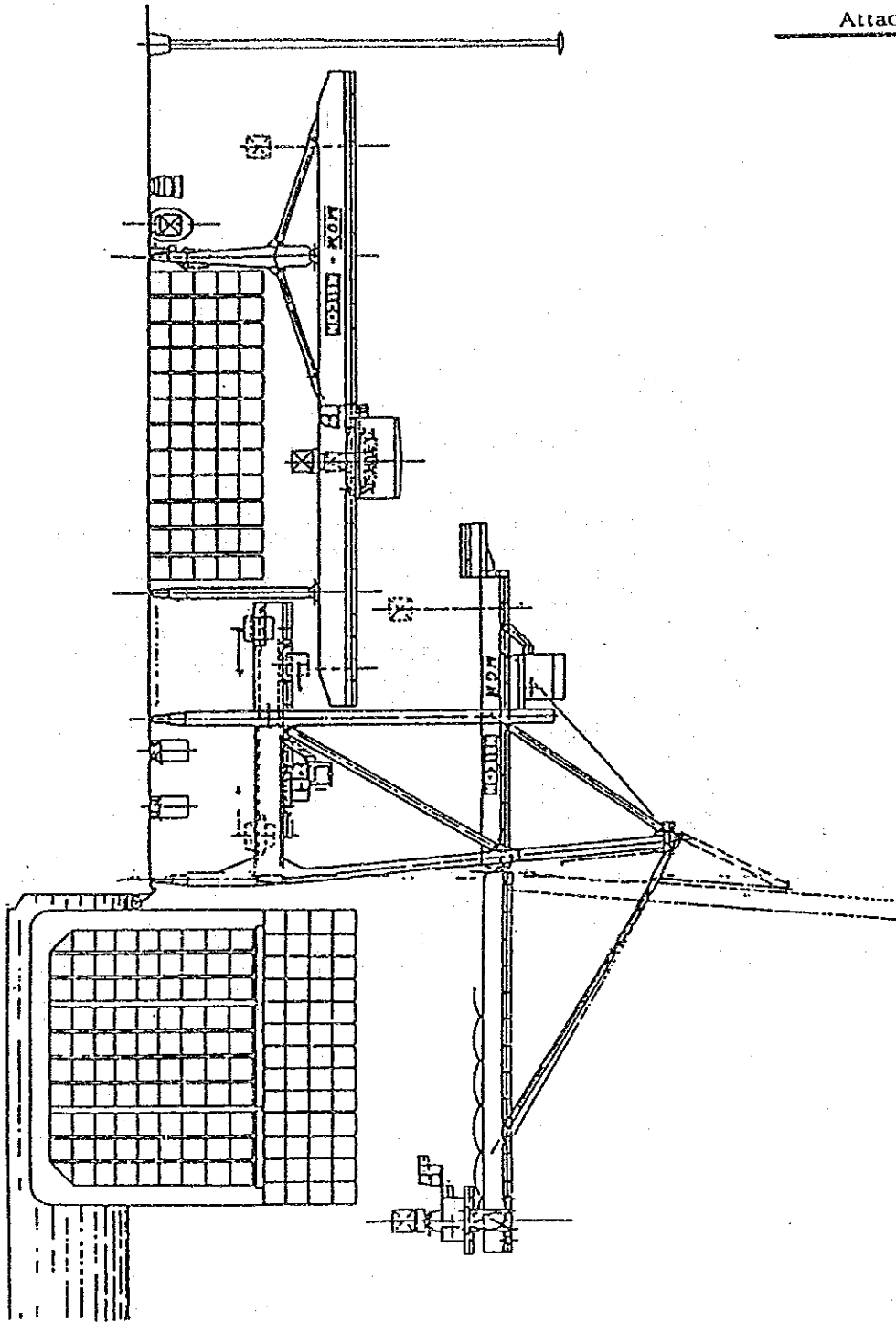
Item	System	Chassis	Straddle Carrier	Tyre-Mounted Transfer Crane	Rail-Mounted Transfer Crane
Storage Capacity		△	○	◎	◎
Initial Cost		△	○	◎	◎
System Simplicity		◎	○	△	△
Handling Efficiency		◎	○	△	○
Wharf Efficiency		△	◎	△	△
Mobility of Operation		◎	○	△	△
Container Damage		◎	△	○	○
Maintenance Cost		○	△	◎	◎
Flexibility of Operation		◎	◎	△	△
Expandability		◎	○	△	△
Adaptability of Automation		△	△	○	◎
Loading to Railway		△	△	○	◎

◎ excellent, ○ good, △ questionable



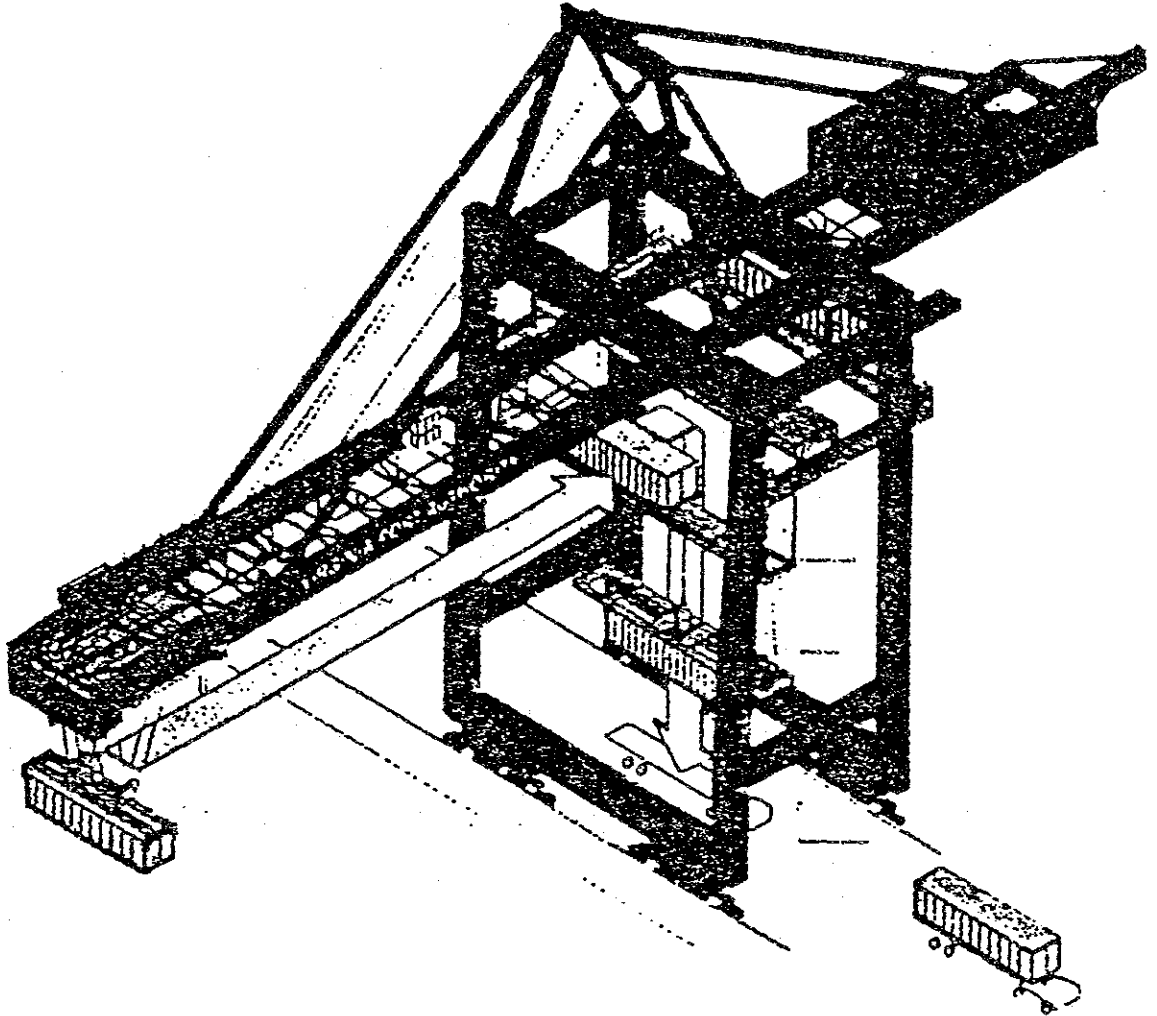
Gantry Crane at Rotterdam

Attached W



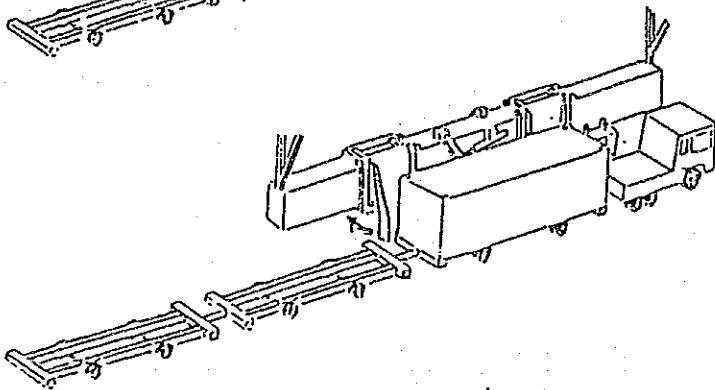
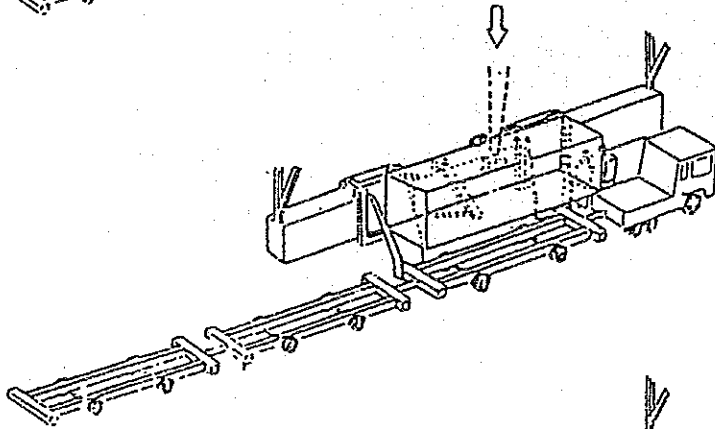
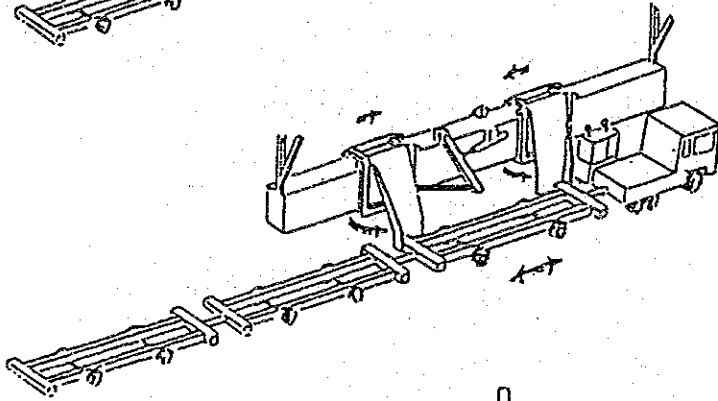
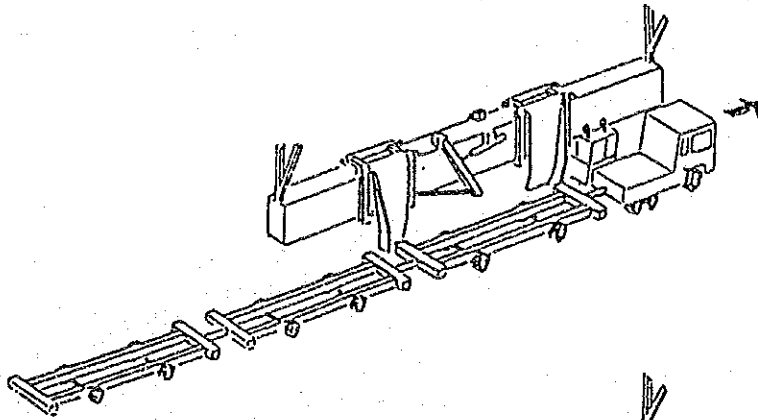
Gantry Crane at La Spezia

Attached X



Gantry Crane at Norfolk

Attached Y

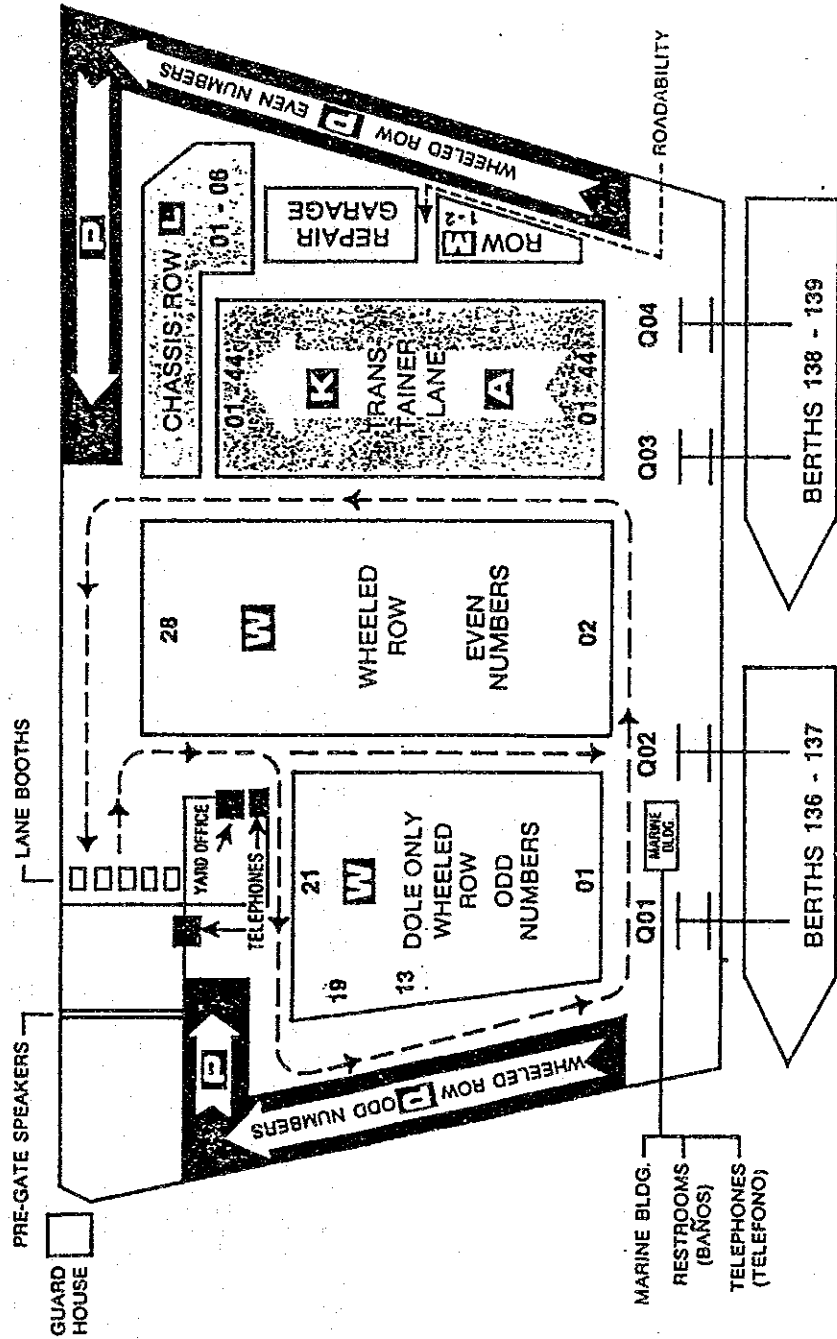


Chassis Loader



TRANS PACIFIC CONTAINER SERVICE CORPORATION

YARD MAP AND TRAFFIC FLOW CHART



10 MPH SPEED LIMIT

ATTACHED ①



# TRANS PACIFIC CONTAINER SERVICE CORPORATION

BERTHS 135 - 139, PORT OF LOS ANGELES **SECURITY GUARD/PASS**

U0553

You will be asked the following information:  
(Se le pedirá la siguiente información.)

1. TRUCK COMPANY
2. IN MISSION  
What you are bringing in.  
(Lo que Ud. entra.)
3. OUT MISSION  
What you are taking out.  
(Lo que Ud. saca.)

In addition, the following information will be asked for transaction type:  
(Además, se le pedirá que proporcione la siguiente información por cada clase de trámite.)

LOAD IN	EMPTY IN	LOAD OUT	EMPTY OUT	CHASSIS IN	CHASSIS OUT
1. STEAMSHIP LINE 2. BOOKING NO. 3. CONTAINER NO 4. CHASSIS NO 5. TRACTOR WEIGHT	1. CONTAINER NO. 2. CHASSIS NO.	1. CONTAINER NO. OR BILL OF LADING NO.	1. LINE 2. BOOKING NO./ RELEASE NO.	1. CHASSIS NO. 2. LINE 3. SIZE	1. LINE 2. RELEASE NO.
USE FOR DOLE FRESH FRUIT CO.					
1. HUBOMETER MILEAGE	1. HUBOMETER MILEAGE				
2. GENSET HOURS	2. GENSET HOURS				

### ATTENTION ALL DRIVERS IN ACCEPTING THIS PASS, THE RECIPIENT AGREES TO THE FOLLOWING TERMS AND CONDITIONS:

1. Failure to follow instructions of security personnel, will result in driver being banned from the terminal.
2. All drivers must have, in their possession, a valid California Truck Driver's license and vehicle registration ready for examination by Security/ Law enforcement officers, if they should request.
3. NO SPEEDING in the yard, 10 M.P.H. speed limit.
4. No pedestrian traffic permitted.
5. Stop at all stop signs.
6. All truck cabs, bodies or trailers are subject to inspection and/or count by security officers while on these premises.
7. NO pets allowed on this facility.
8. Turn engine off at speakers and while being checked in or out.
9. Do not park or leave vehicles in unauthorized areas.
10. Remain in your truck at all staging areas. You may only get out of your truck when you are checked in or out.
11. NO passengers are allowed.

YARD MAP ON BACK

ATTACHED (2)

DP0010



# **FOR THE ACCELERATION OF TECHNICAL INDEPENDENCE OF DEVELOPING PORTS**

**Japan's International Cooperation Policy  
in The Field of Ports and Harbours**

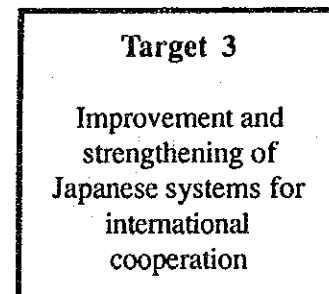
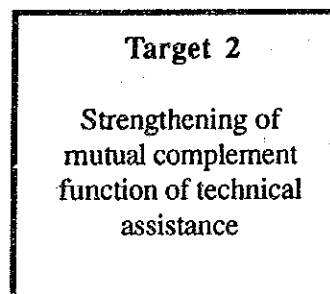
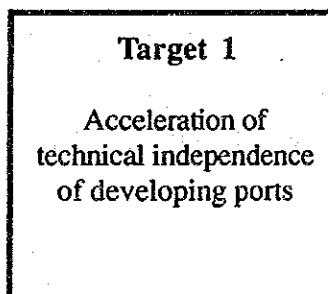
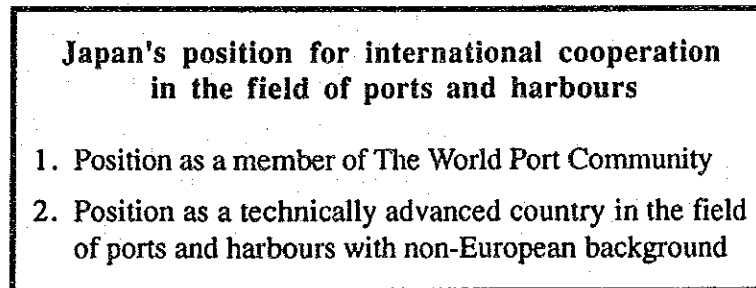
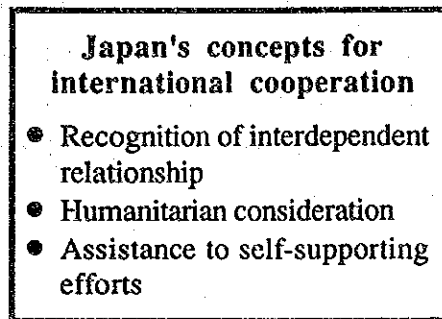
**Ports and Harbours Bureau  
Ministry of Transport  
Japanese Government**

# FOR THE ACCELERATION OF TECHNICAL INDEPENDENCE OF DEVELOPING PORTS

## C O N T E N T S

TARGETS OF INTERNATIONAL COOPERATION IN THE FIELD OF PORTS AND HARBOURS .....	1
I. ACCELERATION OF TECHNICAL INDEPENDENCE OF DEVELOPING PORTS .....	7
1. Up-grading of Project Formulation ability in Developing Countries .....	7
2. Improvement of Training Programs for Personnels in Developing Countries .....	8
3. Integrated Promotion of Assistance Programs .....	10
II. STRENGTHENING OF MUTUAL COMPLEMENT FUNCTION OF TECHNICAL ASSISTANCE .....	13
1. Cooperation with International Organizations .....	14
2. Support of Sister-Port Relationship and NGO's Cooperative Activities .....	16
3. Promoting Bilateral and Multilateral Information Exchange .....	17
4. Promoting Formulation of International Projects such as Global Super-Projects (GSP) .....	18
III. IMPROVEMENT AND STRENGTHENING OF JAPANESE SYSTEMS FOR INTERNATIONAL COOPERATION .....	19
1. Training Personnels and Improving Foreign Assignment Conditions for International Cooperation .....	21
2. Improving of Private Enterprises's Ability .....	23
3. Improving Assistance Know How .....	24
4. Enhancing of Semi-Governmental Organizations .....	25
5. Making Assistance Plans for Individual Country, Selecting and Executing Projects, and Improving Evaluation Systems .....	26

**TARGETS OF INTERNATIONAL COOPERATION  
IN THE FIELD OF PORTS AND HARBOURS**



Japan's assistance is given to support "the self-supporting effort" of developing countries based on her fundamental concept of "recognition of interdependent relationship," and "humanitarian consideration".

The primary significance of development in developing countries is to overcome the poverty of people and offer them a variety of opportunities to choose from. For this purpose, it is necessary to maintain an adequate economic growth rate in developing countries. It is widely recognized that any action taken to renovate their society is deterred if no economic growth is realized. However, in some developing countries, their national resources are not utilized to a substantial degree because of the deficiency in their purchase power to import materials needed for domestic development, and their inability in the transportation of national resources needed for domestic development due to insufficient domestic infrastructures.

As the Official Development Assistance, Japan's international cooperation in the field of ports and harbours has been promoted to cooperate with the development of developing countries through the development of their ports and harbours as the core of their international trade, domestic traffic of people and commodities, and the regional and industrial development. However, because many of the developing countries have experience in colonization in the past, some of the port facilities in such countries are inherited from the colonial governments, and some of developing countries have not sufficient experience in policy making, port planning, construction, administration, management, operation, and so on. This facts present a bottleneck for the implementation of financial and technical assistance.

Despite this situation, the rapid technological development regarding ports and shipping is remarkable these days, particularly in respect of containerization, and the gap between the advanced ports and the developing ports is spreading wider. Additionally, in many developing countries, the Governments are going to change their port and harbour policy in view of the aggravation of their macro-economic situation, and they are relaxing its control, introducing privatization, reducing its spending, and requiring the port management bodies in their countries to be self-sustaining.

Japan first adopted the Western port construction technologies after her opening to foreign intercourse, and then made technical improvements and finally overcame all adverse natural conditions such as deep water, high waves, tsunami, poor ground condition, earthquakes and littoral drift. As the result of the above-mention efforts on

construction of more than 1,100 ports nationwide, Japan is now one of the most technologically advanced countries in the world having superb technical know how about port construction and development.

Further, Japan has accomplished a miraculous economic growth in a period of only half a century after World War II for the first time in the world history under the non-Western background and despite the shortage of natural resources. This is mainly attributable to the successful development of ports and harbours together with unique systems adopted for development.

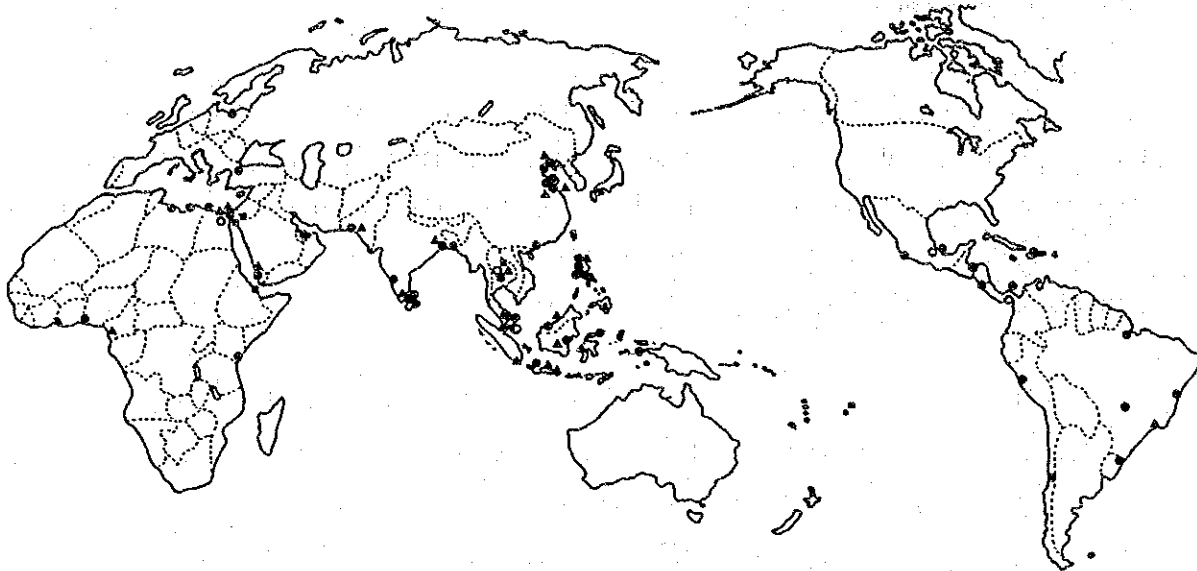
In this age of borderless economic society, to develop and maintain steady international trade is indispensable in supporting the stability of international economy, and it can be said that all the ports in the world belong to a community of common destiny. The ports in the world differ in capacity from one to another, of course. However, it is intolerable from a viewpoint of The World Port Community that an undeveloped port poses as a barrier in the marine traffic and international trade and cancels out the efforts of other developing ports.

In this sense, it is expected that each of the developing countries is to make a more self-supporting effort in improving the ports in her country and, at the same time, it is necessary for each of the advanced countries in the world to extend more cooperation to such efforts.

Japan, who is one of the most technically advanced countries in the field of ports and harbours under the non-Western background, considers it most appropriate to extend international cooperation in the field of port and harbours, and for the purpose of more efficient and effective assistance to render, Japan has established the following targets and arranged major policies to achieve these targets.

1. Acceleration of technical independence of developing ports
2. Strengthening of mutual complement function of technical assistance
3. Improvement and strengthening of Japanese systems for international cooperation

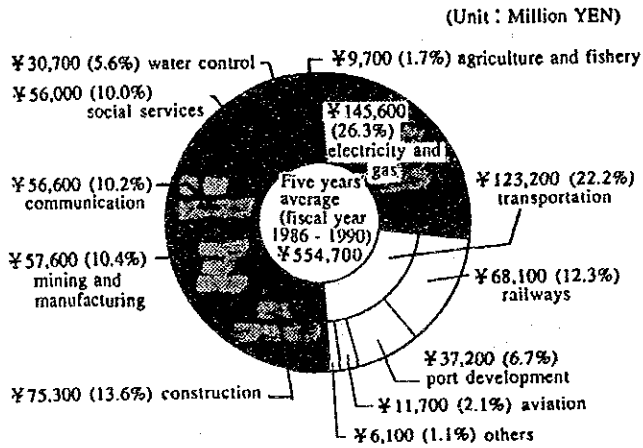
## Distribution Worldwide of Japan's International Cooperation in The Field of Port and Harbours



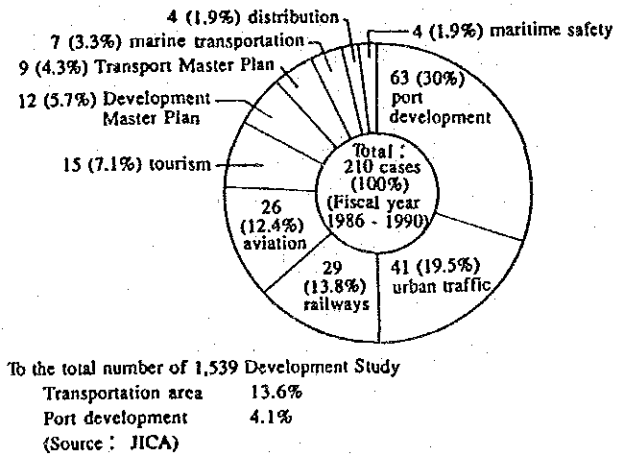
**Legend**

- Dispatch (long period) of experts as of 1991
- Implementation of development study (until 1991)
- ▲ Implementation of loan assistance (until 1991)
- Implementation of grant aid (until 1991)

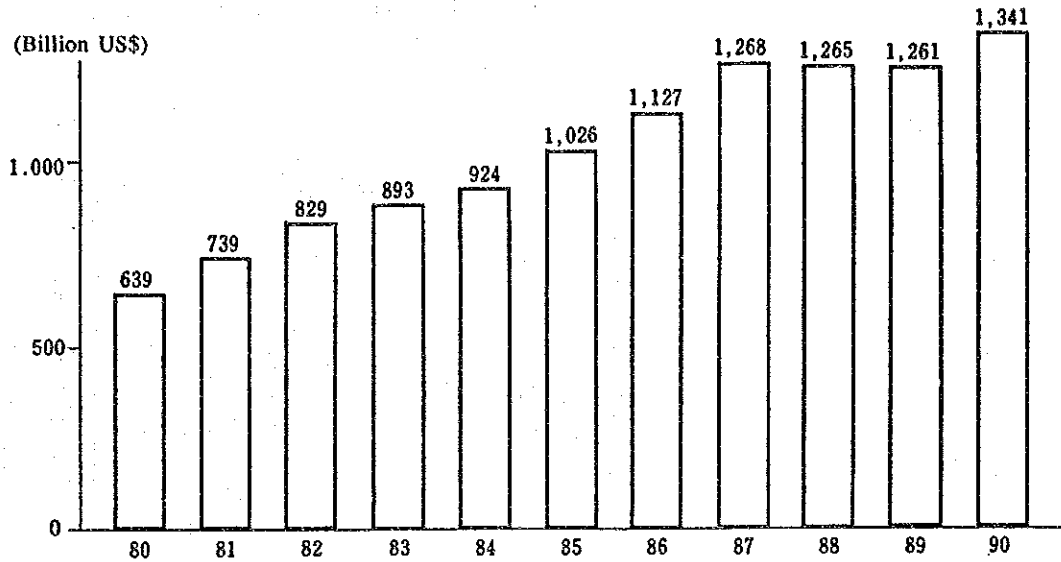
### Area of Loan Assistance (L/A Base)



### Area of Development Study in The Field of Transportation



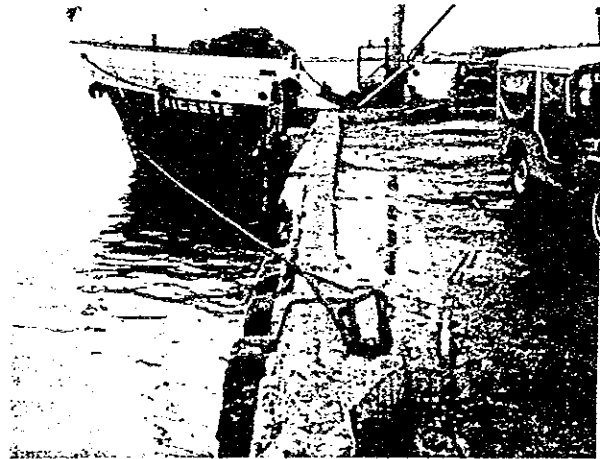
### Total Cumulative Debt Balance of Developing Countries (1980 to 1990)



Note : The 1990 debt is an estimate  
(from the World Debt Table of the World Bank 1990 to 1991)  
(Source : Japan's Official Development Assistance in 1991,  
Economic Cooperation Bureau, Ministry of Foreign Affairs)

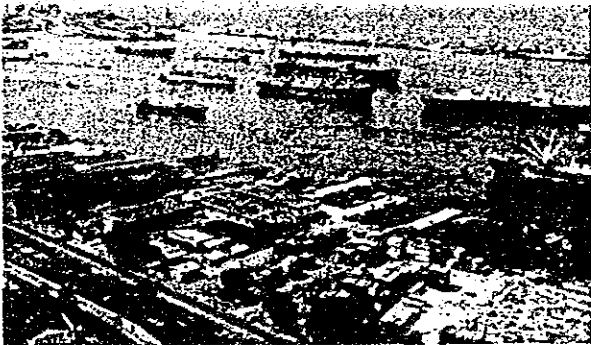
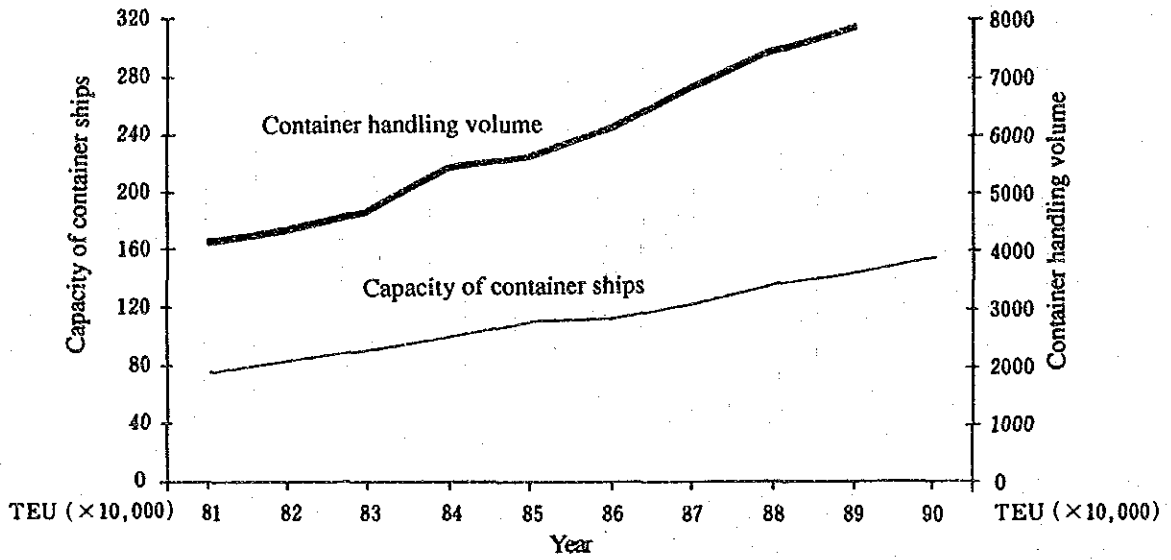


Many ships laid up in the Port of Alexandria, Egypt

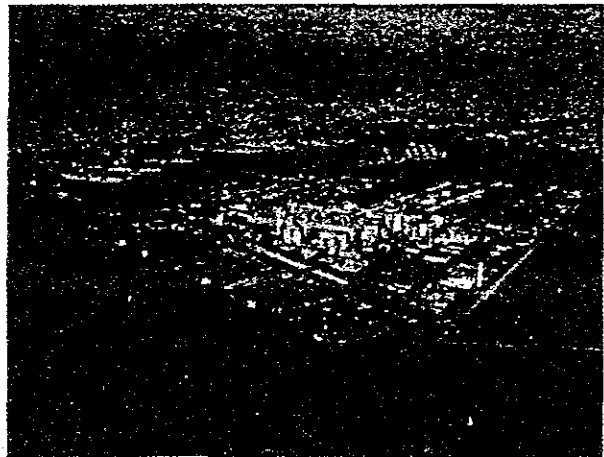


A superannuated wharf in the Port of Manila, the Philippines

### Container Handling Volume and Total Capacity of Container Ships in the World



Congestion in the Port of Colombo, Sri Lanka

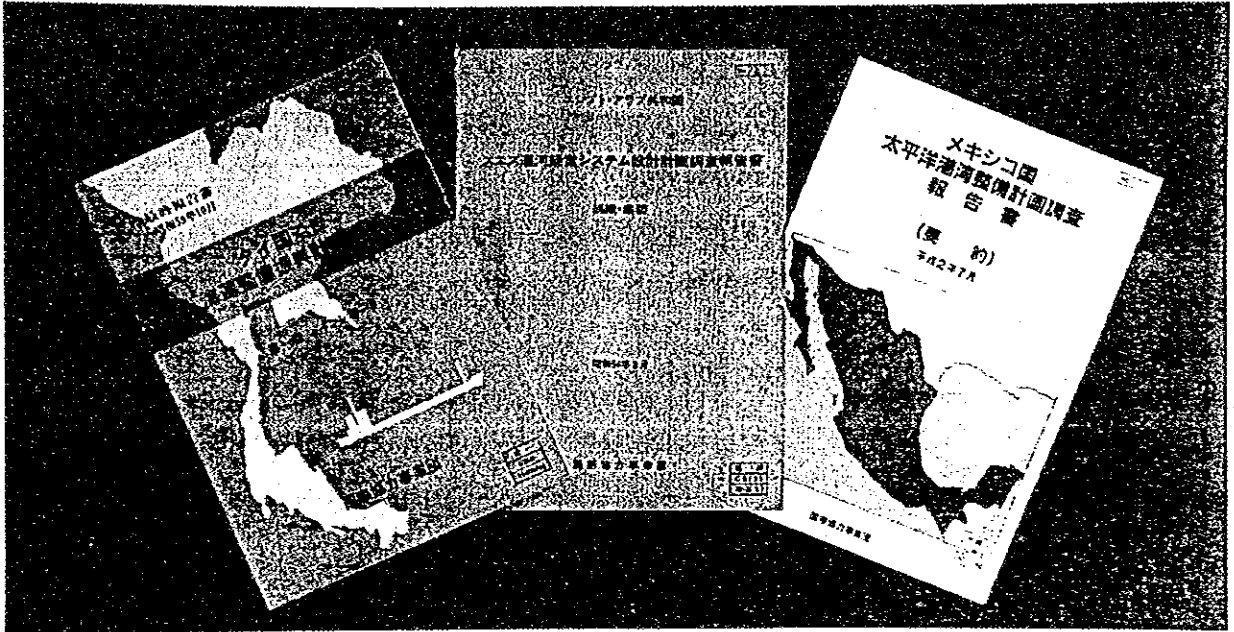


Port Island in the Port of Kobe, a Typical Example of Waterfront Development in Japan



## I. ACCELERATION OF TECHNICAL INDEPENDENCE OF DEVELOPING PORTS

### 1. Up-grading of Project Formulation Ability in Developing Countries



Development study reports with proposals for implementation of port development projects and for improvement of systems and organizations in developing countries - Egypt, Mexico and Thailand

Any port developing project is closely related to the development of the national and regional economy as well as the international trade. And, the project is affected considerably by the capacity of the traffic mode concerned. Therefore, for the formulation of port development projects, it is necessary to have a large stock of useful information and accurate statistics and an ability to analyze such data before drawing up a port development plan.

Accordingly, in the implementation of development study, we will attach great importance to the study on transportation sector and master plan, and such data base and statistics needed for policy-making. Also, we will promote the regional study including neighboring countries by Japan itself or by the joint study with international organizations such as the United Nations Development Plan (UNDP) and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP).

## 2. Improvement of Training Programs for Personnels in Developing Countries

### Group Training Course in the Field of Ports and Harbours

Course	Fiscal Year																															Total Participants (Person)
	1961	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	
Seminar on Port Administration and Management (Seminar on Ports and Harbours until 1989)	[Shaded]																															541
Port and Harbour Engineering Course II (Port and Harbour Engineering Courses until 1989)	[Shaded]																															396
Container Terminal Development Course	[Shaded]																															59
Senior Port and Harbour Engineering Course	[Shaded]																															44
Industrial Port Development Course	[Shaded]																															35
Cargo Handling Course (Adhoc Course)	[Shaded]																															10



Group Training at Port and Harbour Research Institute

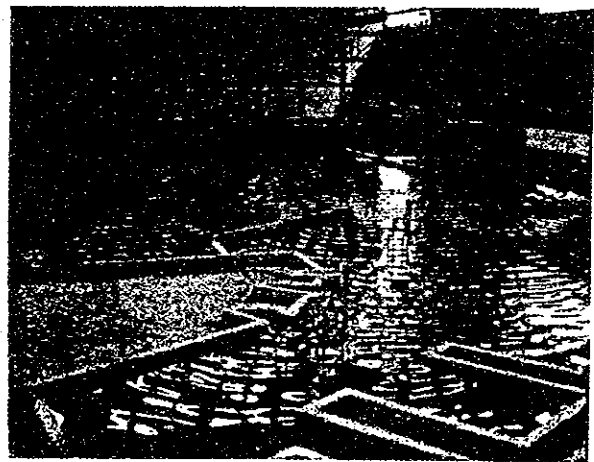
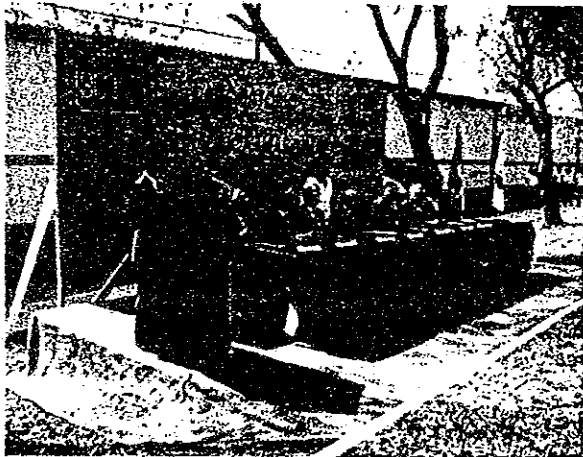
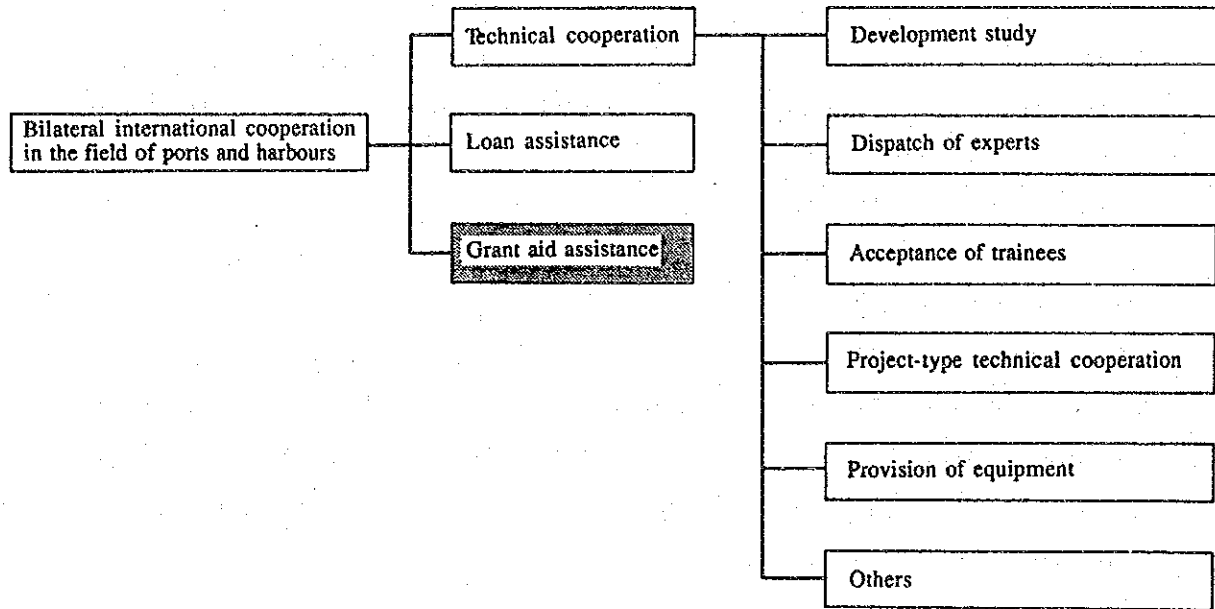


Trainees visiting Japan from Malaysia under her "Look East policy"

For the technical independence of developing port, it is essential to train personnels who are engaged in many kinds of port and harbour activities in developing countries. For the improvement of training courses which we are presently offering we are rearranging the training programs for improvement such as rewriting textbooks and providing course leaders, while trying to expand the scope of the group training course such as cargo handling. Also, we will support and assist the training courses held by Non-Governmental Organizations (NGO) such as round seminars in developing countries. In order to accelerate self-supporting of the ports in developing countries, we consider it necessary to promote mutual technical cooperation among developing countries having a similar socio-economic conditions. In this connection, we will check the possibility of holding training course in a developing country together with experts in developing countries, and also check the possibility of establishment of a port and harbour research center in a developing country to study common problems in developing countries. Additionally, we will promote our project-type technical cooperation for the on-the-job training of personnel who are required to master the technology about port construction, cargo handling, and so on.

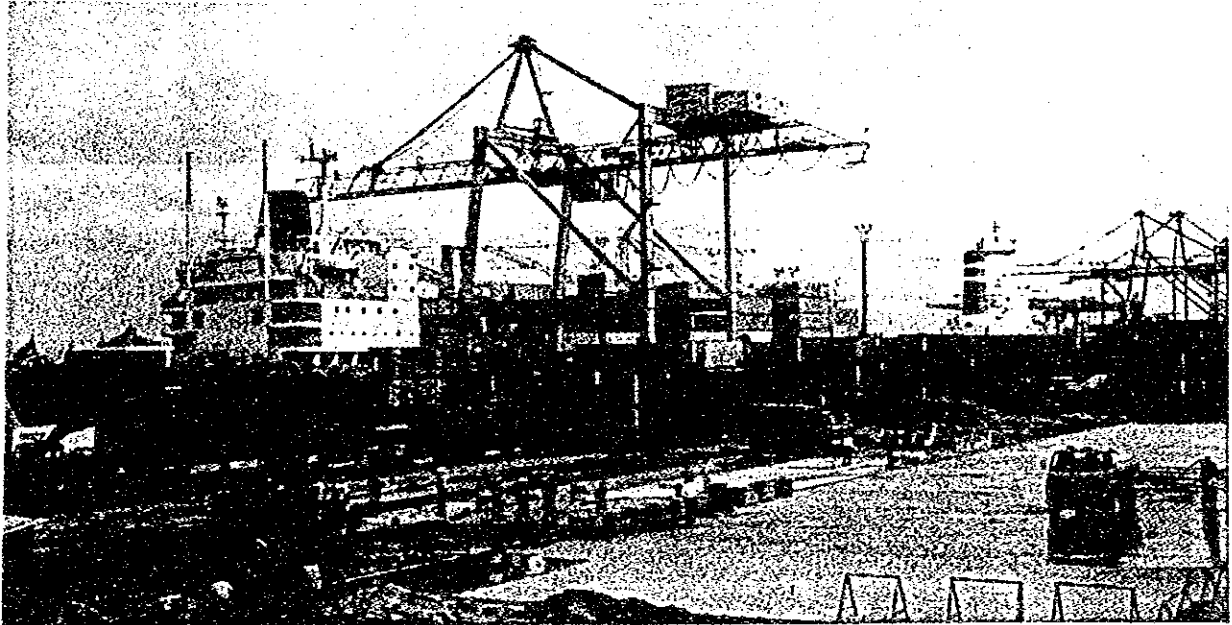
### 3. Integrated Promotion of Assistance Programs

#### Bilateral International Cooperation in the Field of Ports and Harbours (ODA)

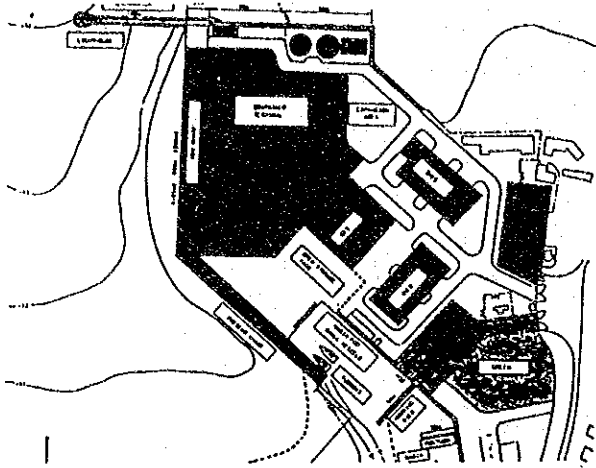


Port Hydraulics Center Project in Mexico (Project-type Technical Cooperation)

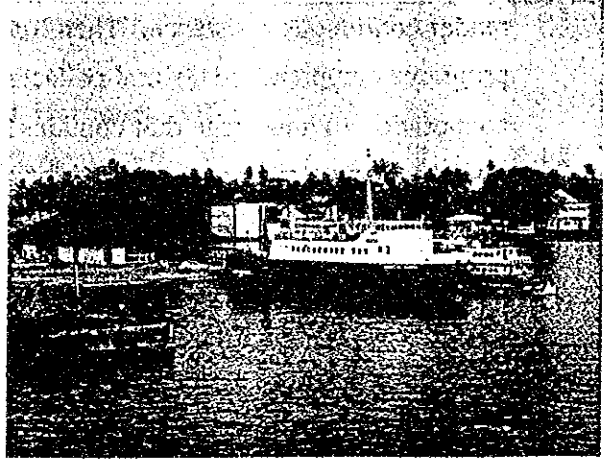
In order to accelerate the self-supporting of developing ports, it is necessary to render continuous assistance. Therefore, it is necessary to apply the Japan's assistance programs comprehensively and collectively. In this connection, we will extend our cooperation in a package that contains assortments of effective programs such as loan assistance, grant aid assistance, and the dispatch of experts.



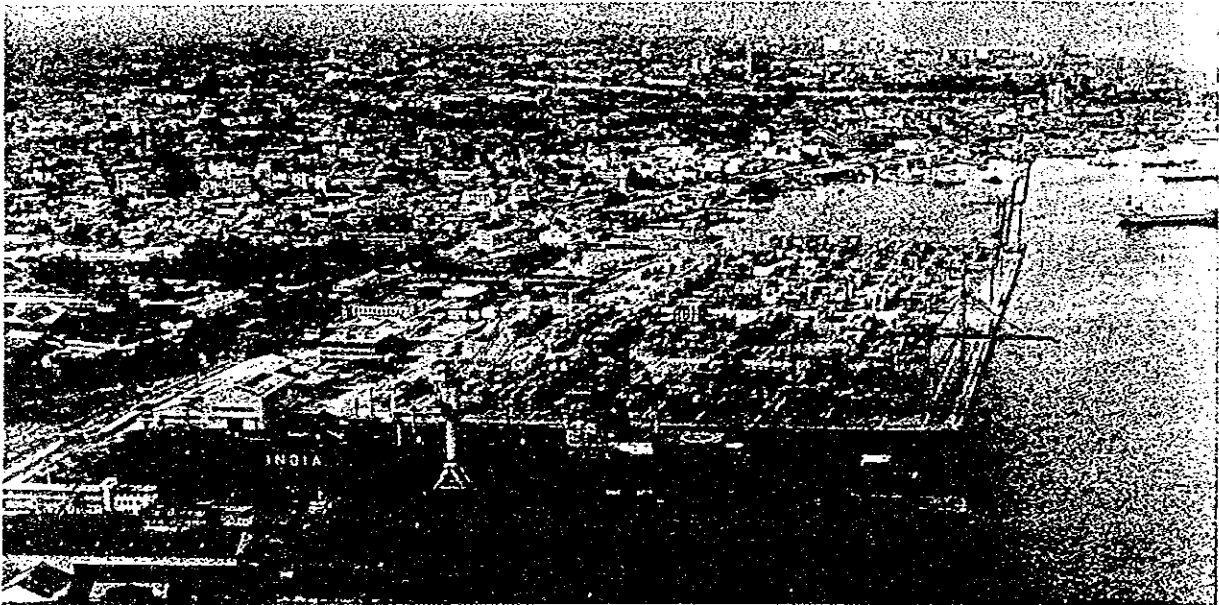
Example of Development Cooperation Project - Trial Pavement of Container Terminal in Port of Colombo, Sri Lanka



Example of Development Study - Master Plan of Port of Apia, Western Samoa

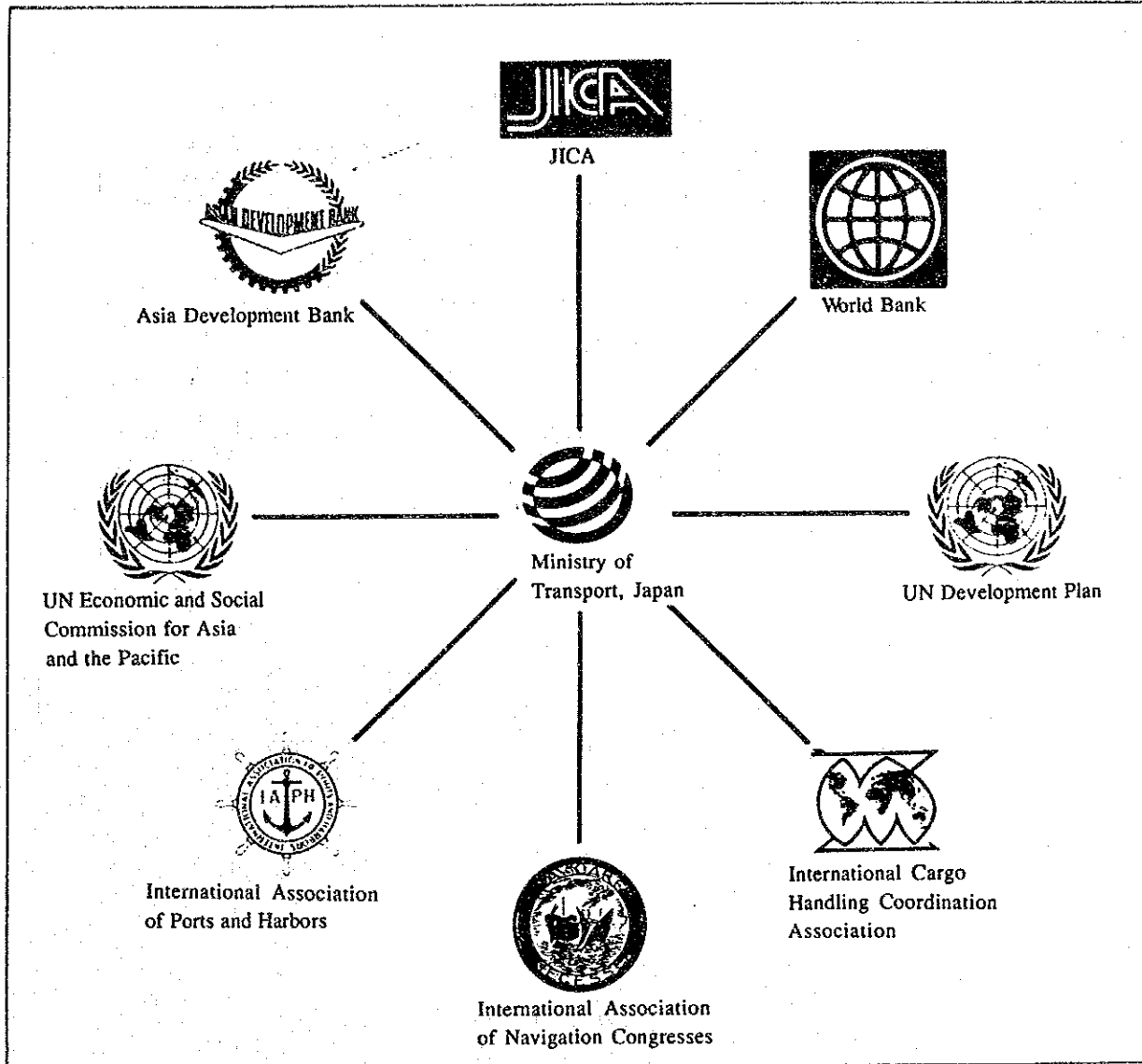


Example of Grant Aid Assistance - Port of Apia, Western Samoa



Example of Loan Assistance - Port of Colombo, Sri Lanka

## II. STRENGTHENING OF MUTUAL COMPLEMENT FUNCTION OF TECHNICAL ASSISTANCE



All the advanced countries should extend assistance to accelerate the self-supporting of developing ports in such a manner that the efforts of each advanced country can be fill up the gap. For this purpose, all the channels between international organizations, advanced countries and developing countries should be used for strengthening of the mutual complement function. Also, it is important to make the know how and the scientific and technical achievements of the advanced countries available more widely.

In this connection, Japan will promote the following measures in her international cooperation in the field of ports and harbours.

## 1. Cooperation with International Organizations

### International Organizations on Ports and Harbours

<p>International Association of Ports and Harbours (IAPH)</p>	<ul style="list-style-type: none"> <li>○ An international organization mainly composed of port management bodies</li> <li>○ The purpose is to develop and promote good relationship and cooperation among ports in the world and to exchange new technical information regarding development, organization, management and operation of ports.</li> <li>○ The present membership is 385 from 84 countries.</li> </ul>
<p>International Association of Navigation Congresses (PIANC)</p>	<ul style="list-style-type: none"> <li>○ Non-intergovernmental international organization to discuss technical problems regarding inland waterways, navigation and ports.</li> <li>○ Composed of persons and organizations under the support of the participating Governments.</li> <li>○ The present membership consists of 37 governments, 623 organizations and 1,855 persons.</li> </ul>
<p>International Cargo Handling Coordination Association (ICHCA)</p>	<ul style="list-style-type: none"> <li>○ An international organization to make investigations and researches and exchange information to improve efficiency and economy regarding cargo handling and transportation.</li> <li>○ Composed of organizations and persons concerned with cargo handling and port management.</li> <li>○ The present membership consists of 895 organizations and 515 persons from 84 countries.</li> </ul>



The 27th International Navigation Congress in Osaka, Japan, May 1990

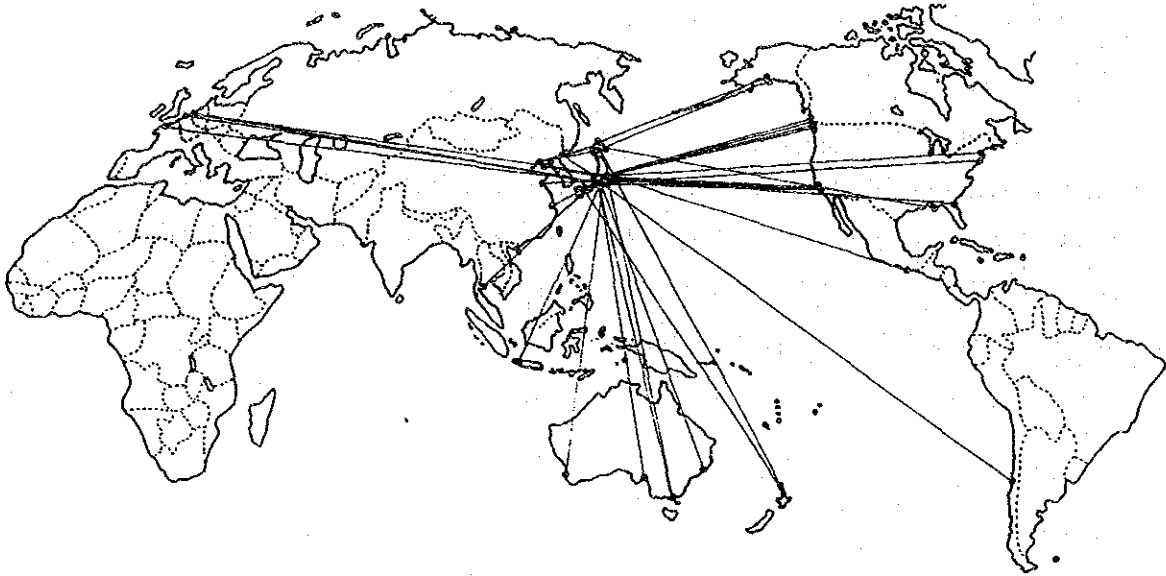


International organizations such as the Asia Development Bank (ADB), the World Bank (WB), the UN Economic and Social Commission for Asia and the Pacific (ESCAP), the UN Development Plan (UNDP) are playing an important role in international cooperation. We have promoted and will positively promote our cooperation with these organizations by personal participation and also promote joint programs with them.

Also, we will continuously play a major role in international organizations on ports and harbours such as the International Association of Ports and Harbours (IAPH), the International Association of Navigation Congresses (PIANC), and the International Cargo Handling Coordination Association, and will try to transfer the know how of the advanced countries to the developing countries.

## 2. Support of Sister-Port Relationship and NGO's Cooperative Activities

### Expanding of Sister-Port Networks



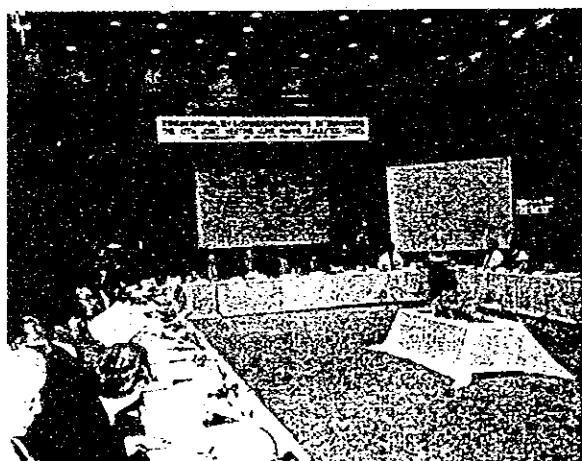
Port and Harbour Seminar held by The Overseas Coastal Area Development Institute of Japan  
(Held in Developing Countries every year)

Along with rapid internationalization, international interchange not only at the national level but also at the local and private levels is getting widespread. In this connection, we will provide information services and counseling to support the sister-port activities made by port management bodies and NGO's activities.

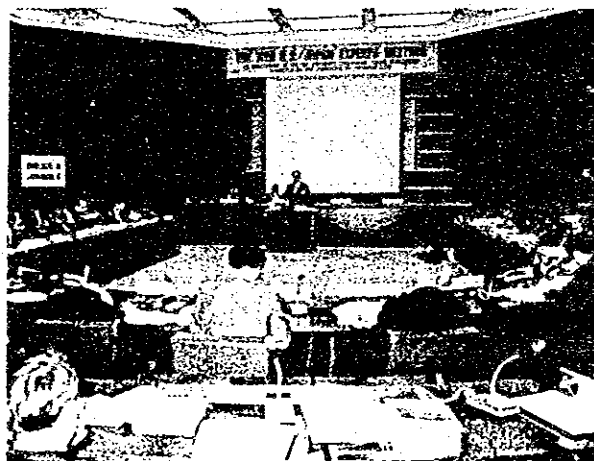
### 3. Promoting Bilateral and Multilateral Information Exchange



Symposium on Port Development in Developing Countries



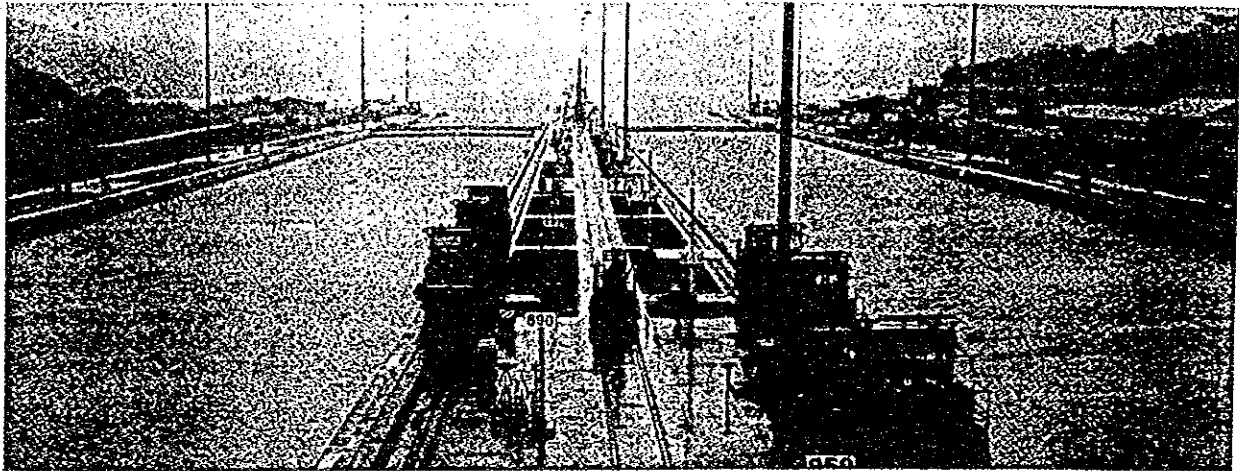
Japan-US Conference on Development and Utilization of Natural Resources



Japan-US Technical Conference on Treatment of Harmful Bottom Sediments

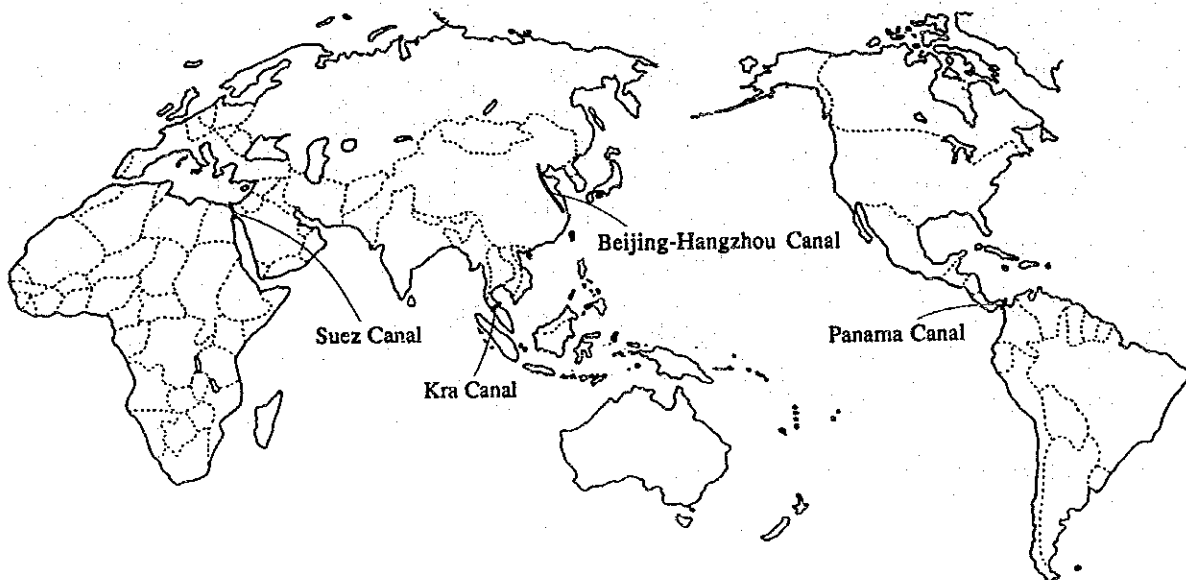
We will promote bilateral and multilateral information exchange to widen the access to the scientific and technical achievements, and also provide places of information exchange and dialog more frequently and continuously such as the symposiums and conferences as above.

**4. Promoting Formulation of International Projects such as Global Super-Projects (GSP)**



Panama Canal - Joint study on alternatives to the Panama Canal is now under way by Japan, USA and Panama.

**Global Super-Projects (GSP)**



We will positively participate in the formulation and execution of big international projects that need global attendance, such as a global super-infrastructure and a global environment protection system.

### III. IMPROVEMENT AND STRENGTHENING OF JAPANESE SYSTEMS FOR INTERNATIONAL COOPERATION



Acceptance of trainees - training at Port and Harbour Research Institute



Acceptance of trainees - technical guidance of Port Management Body



Acceptance of trainees - touring around port aboard a ship



A Japanese expert working in the Philippines

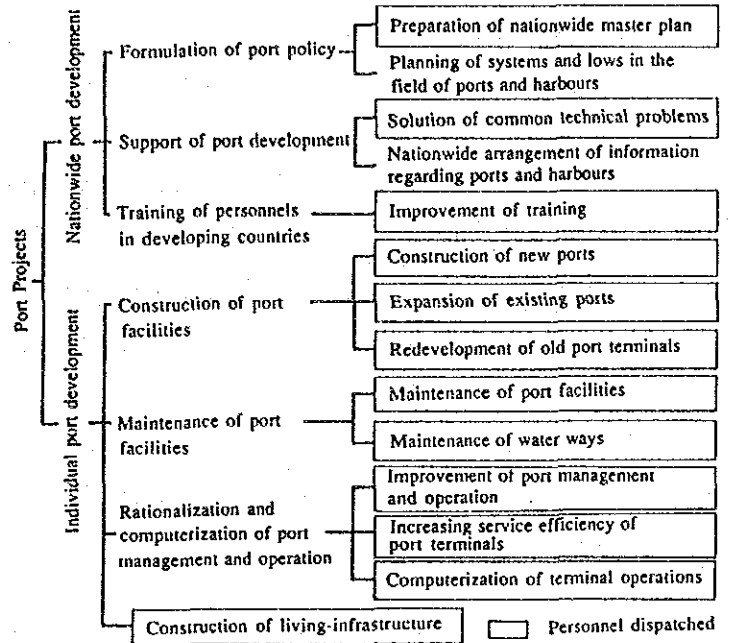
In order to render assistance smoothly and to obtain an expected result, it is necessary to train Japanese experts to acquire a high technical skills and an ability to adapt themselves to their assignments in developing countries, and also to provide workable systems there. Particularly in Japan, because the planning, construction and management of ports and harbours have been mainly undertaken by the State and local governments. The private sector's ability to render international cooperation is still insignificant, and lagging behind any of other advanced countries. Furthermore, unlike the international cooperation organizations in other countries, there are only a few experts being brought up as a specialist of international cooperation in individual technical fields even within foreign assistance organizations because of the Japanese employment system. On the other hand, Japan has advanced technology and unique experience under non-Western background. Accordingly, to promote our assistance more efficiently and effectively, we have to improve our ability to transfer our advanced technology and unique experience to developing countries. Therefore, we will promote the following measures to improve and strengthen our domestic systems for international cooperation.

# 1. Training Personnels and Improving Foreign Assignment Conditions for International Cooperation

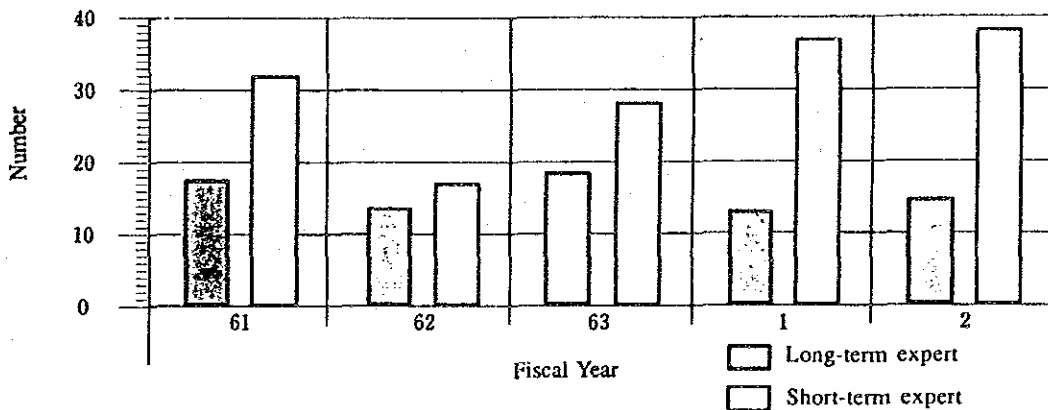
## Personnel Training Program for International Cooperation in the Field of Ports and Harbours

Purpose	To train personnels to acquire enough knowledge necessary for international cooperation in the field of ports and harbours
Organizer	The Overseas Coastal Development Institute of Japan
Participants	Personnels of port management bodies and private companies
Subjects	<ol style="list-style-type: none"> <li>1. Present situations of ports and harbours in developing countries (Port facilities and their utilization, port administrative system, etc.)</li> <li>2. Management and operation of ports in developing countries</li> <li>3. Present situation of ports and harbours in advanced countries</li> <li>4. Case study on examples of international cooperation in the field of ports and harbours</li> </ol>

## Port Projects and Personnel Assignment



Number of Experts Dispatched Overseas in the Field of Ports and Harbours



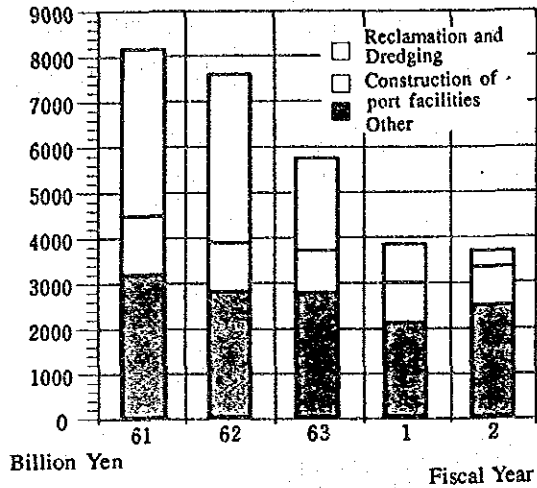
In order to obtain a sufficient number of able persons for overseas assignments, we will train those who are concerned with ports and harbours in Japan (personnel training program for international cooperation in the field of ports and harbours), and will use retired persons as well. Also, we will establish a manpower bank on such trainees, men of experience in overseas assignments, and those who have the skill or know how needed for international cooperation, and, thereupon, establish a system enabling the assignment of a number of such qualified persons effectively.

Further, it is necessary to establish a support system for such persons to work sufficiently on their assignment as experts in developing countries. In this regard, we will strengthen our backup structure, and study ways and means of extension of dispatch period and increasing of dispatch budget in order to make our assistance effective and continuous.

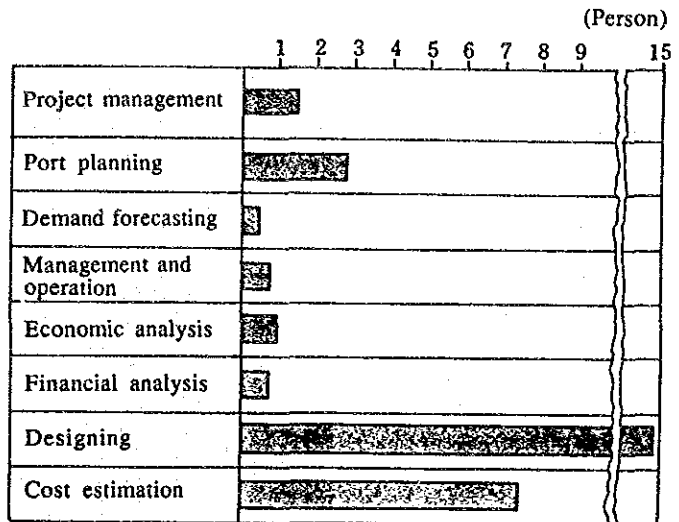


## 2. Improving of Private Enterprises's Ability

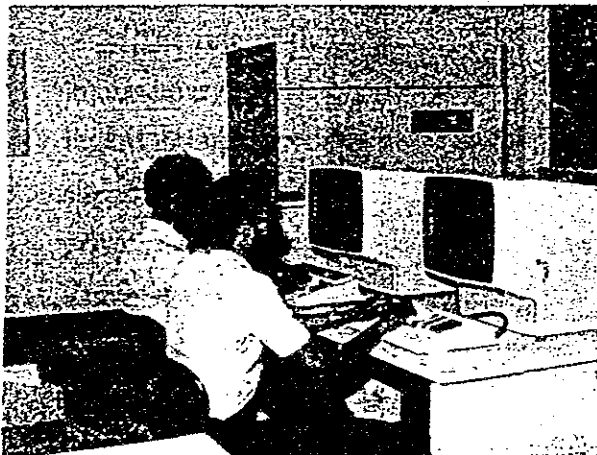
**Port Construction Works done by Japanese Enterprises in Foreign Countries**



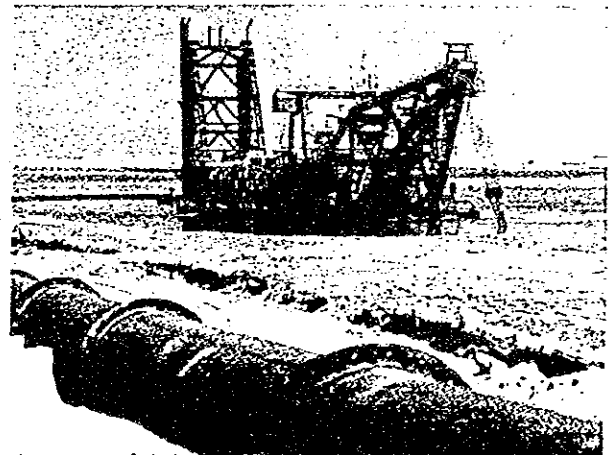
**Number of Specialists for Foreign Assignments in the Field of Ports and Harbours (Average Number of Persons per Private Consulting Company)**



(Source : Ports and Harbours Bureau, Ministry of Transport)



Example of Technological Transfer by Japanese Company - Computerized Terminal Operation



Example of Port Construction Work by Japanese Company - Widening Project of the Suez Canal

Not only in the phase of bilateral assistance but also in the phase of multilateral assistance which is rendered mainly through an international financial institution, we consider it necessary to transfer our port and harbour technology through the private sector in order to make our assistance really effective. However, the number of

consultants specializing in the field of port planning, management and operation is very small in Japan. So, it is important to improve the ability and expand the capacity of such consultants. Also, speaking of the Japanese port construction enterprises, their experience gained abroad is much smaller than that of other advanced countries. They are largely dependent upon the jobs offered from Japan relating to our foreign assistance programs. Accordingly, in order to make Japanese companies contribute more in the field of foreign assistance, we will endeavor to improve the business conditions by cultivating human resources, increasing the information collecting capability, forming a manpower network and developing technologies suitable for developing countries.

### **3. Improving Assistance Know How**

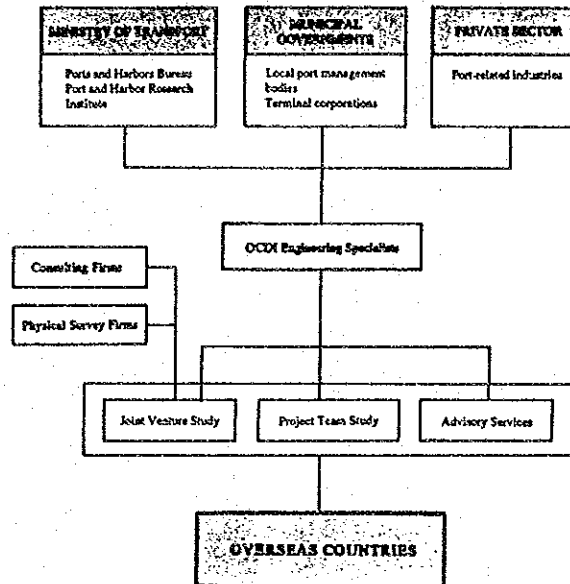


Siltation in the Port of Banjarmasin, Indonesia

It is significant that Japan, as one of the technically advanced countries, transfers her advanced technologies to developing countries. However, it is not always appropriate that developing countries apply Japanese technologies without modifications for their internal situation. Developing countries have common problems such as siltation, environment assessment, and computerization of management and operation in their ports. Therefore, we will develop technologies applicable to developing countries by joint efforts of the administrative and private sectors.

#### 4. Enhancing of Semi-Governmental Organizations

##### Role of The Overseas Coastal Area Development Institute of Japan

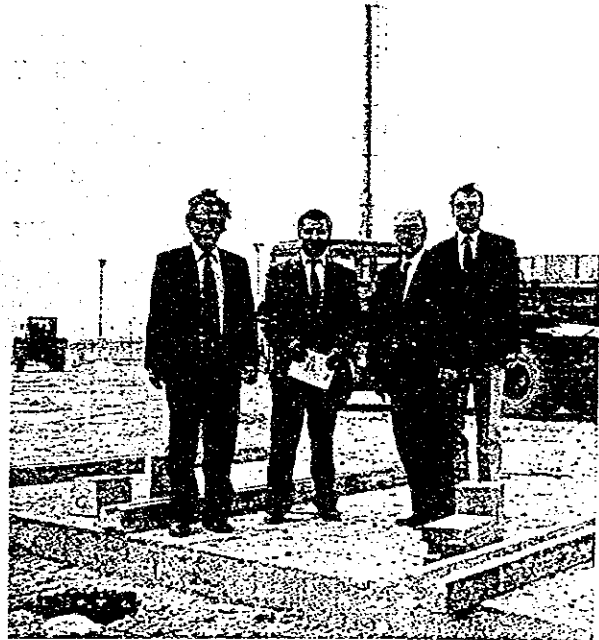


The role of the semi-governmental organization is increasingly important as an intermediary to effectively combine the administrative sector with the private one in regard to international cooperation. Realistically, the semi-governmental organization supports the project finding activities and information collecting activities which the private sector is making independently and transfers the port technologies which the administrative sector possesses exclusively to the private sector. The unique character which the semi-governmental organization inherently has the flexibility of the private sector, while maintaining its position as a public sector, must be utilized to a greater degree. As one of such semi-governmental organizations, The Overseas Coastal Area Development Institute of Japan was established in 1976. Since then, the Center has been working on technical cooperation in regard to the development and management in the waterfront area and ports. We will further strengthen and expand the Center's function.

## 5. Making Assistance Plans for Individual Country, Selecting and Executing Projects, and Improving Evaluation Systems

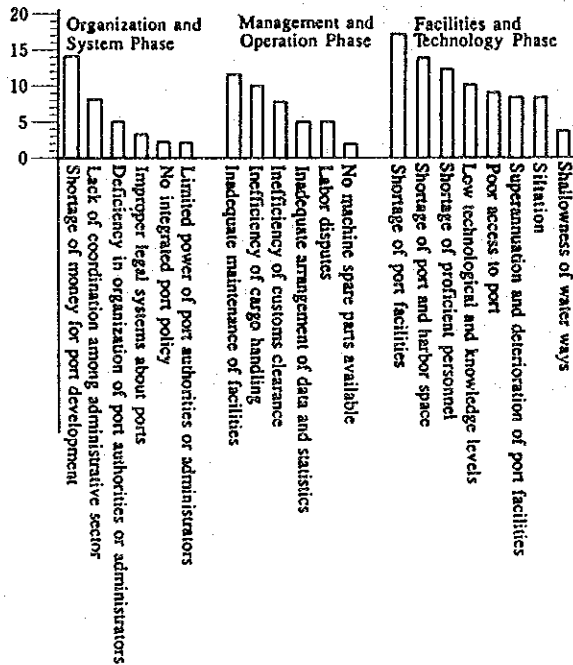


Development study team working abroad for technical cooperation

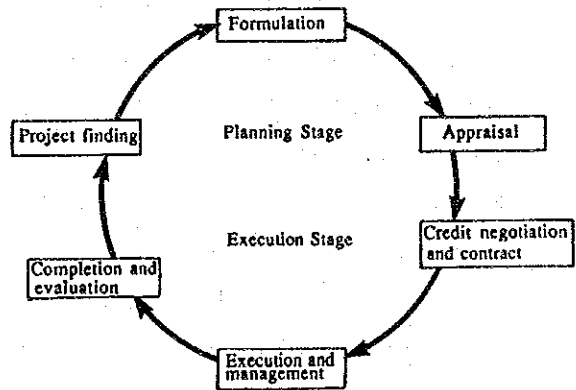


Investigation team working abroad for information collection

### List of Problems in Developing Ports



### Project Cycle



The port has a character of social-infrastructure in its locality as well as in the nation. And, it must be managed and operated by the people themselves living in that locality. Before rendering assistance, it is firstly necessary to analyze carefully any problems concerning ports and harbours, and secondly to make up a basis assistance policy from a specific as well as general point of view based on the socio-economic situation of the country concerned.

Furthermore, after the completion of assistance, it is necessary to see whether or not the executed project has achieved the set target, and whether or not it needs any modification depending on the subsequent development of the port. And it is also necessary to evaluate the project in order to make a better system for future cooperation.

Therefore, we will establish a solid system in each stage of project selection, execution and evaluation.

**PRESENT SITUATION AND PROBLEMS  
OF PORTS IN THE PHILIPPINES  
(HANDOUT)**

Prepared by:

**TAKASHI YAMADA**  
JICA Advisor

Oct. 30, 1992

## CONTENTS AND KEYWORDS

### I Introduction

- *personal viewpoint base on the knowledge/information obtained during my stay*

### II Port Administration System in the Philippines

- *Uncertainty of Total Figure*
- *Public Ports and Private Ports*
- *PPA Ports and so-called DOTC Ports*
- *Cebu Port Authority*
- *Involvement of Local Government Units*

### III Port Activities in the Philippines

- *Role of Private Ports in Cargo Traffic*
- *Role of Public Ports in Passenger Traffic*
- *Concentration to Manila Port Complex in Cargo Traffic*
- *Steady Increase of Containerized Cargo*

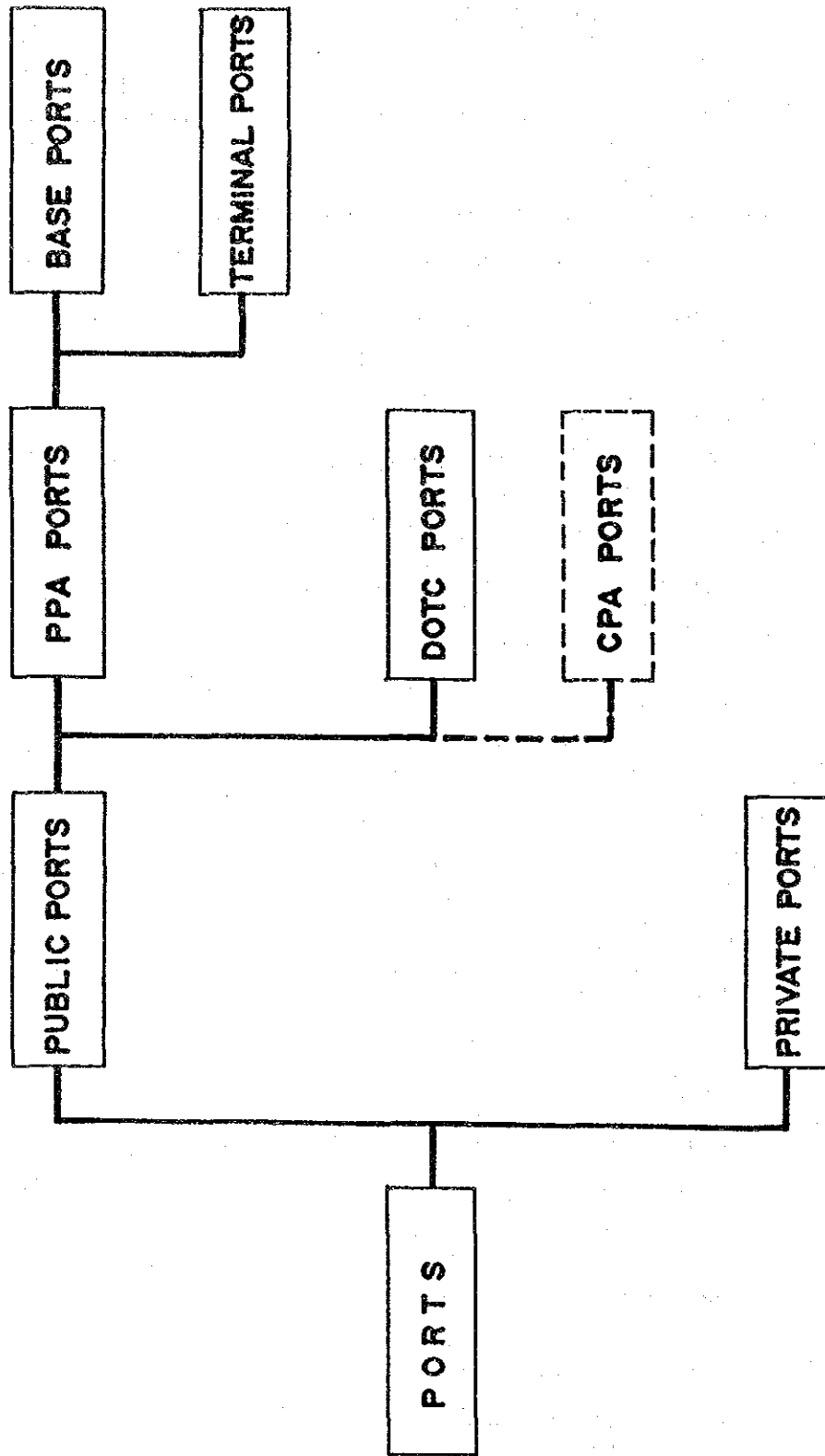
### IV Port Development in the Philippines

- *Foreign Assisted Projects & Locally Funded Projects*
- *Introduction of BOT/BT Scheme*
- *Completion of first stage development/rehabilitation for Base Ports*

### V Problem Areas for Port Development Planning in the Philippines

- *Vagueness and Contradiction of Institutional Framework*
- *Lack of Nationwide Port Development/Guideline*
- *Lack of Master Development Plan for each Individual Port*
- *Weakness of Nationwide Port Database and System to Maintain it*
- *Port Inventory Project*
- *Lack of Technical Standard and Manual for Port Development*

# CLASSIFICATION OF PORTS





## Port Activity in 1991

According to the Statistical Year Book 1991. The Nationwide Port Activity are as follows:

### Cargothroughput (Unit: Mil. metric ton)

Total	106
Foreign	47
Domestic	59

### Containerized Cargo (Unit: Mil. m/ton)

Total	19.6	(18.5%)
Foreign	5.6	(11.9%)
Domestic	14.0	(23.7%)

### Passengers (Unit: Million person)

Total	31.7
-------	------

### No. of Calling Vessels (Unit: 1000 vessels)

Total	172
Foreign	7
Domestic	165

### Gross Registered Tonnage (Unit: Mil. ton)

Total	173.2
Foreign	71.6
Domestic	101.6

## Comparison of Public Port and Private Port

	PUBLIC PORT	PRIVATE PORT	TOTAL
Cargothroughput	40.7%	59.3%	100%
Foreign	23.5%	76.5%	100%
Domestic	54.6%	45%	100%
No. of Passenger	92.5%	7.5%	100%
No. of Vessel	74.9%	25.1%	100%
G. R. T.	64.1%	35.9%	100%
Average GRT	862.6	1438.6	1007.3

PERFORMA COMPANY

### CARGO TRAFFIC

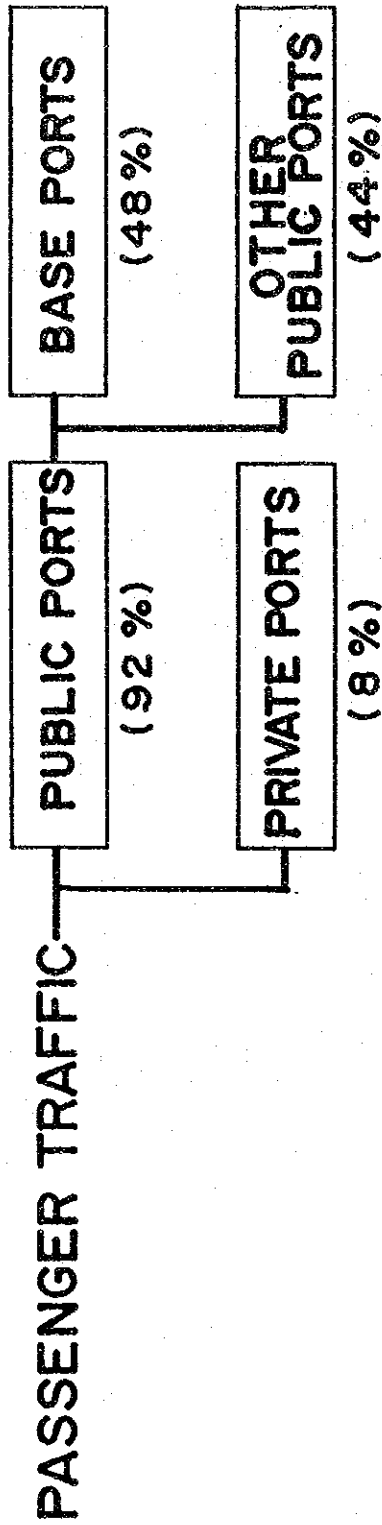
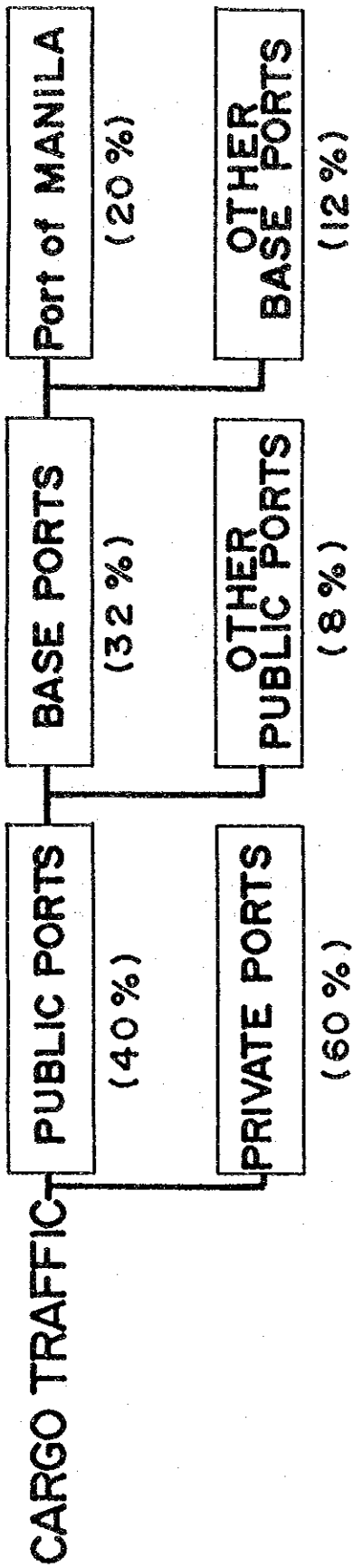
	Total	Foreign	Domestic
1	Manila N.H. (24.4%)	Manila S.H. (44.8%)	Manila N.H. (32.8%)
2	Manila S.H. (11.5%)	MICT (35.3%)	Cebu (13.2%)
3	Cebu (10.4%)	Iloilo (2.8%)	Iloilo (5.0%)
4	MICT (9.2%)	Cebu (2.4%)	Cag. de Oro (3.7%)
5	Iloilo (4.4%)	Cag. de Oro (2.2%)	Davao (3.7%)
Sub-Total	(59.9%)	(87.5%)	(58.4%)
( 5 ports)			
Sub-Total	(80.6%)	(93.4%)	(76.2%)
(All Base Ports)			

### CONTAINERIZED CARGO TRAFFIC

	Total	Foreign	Domestic
1	Manila N.H. (27.0%)	MICT (74.0%)	Manila N.H. (33.8%)
2	MICT (15.3%)	Manila S.H. (21.3%)	Cebu (9.6%)
3	Cebu (8.3%)	Cebu (3.3%)	Davao (4.4%)
4	Manila S.H. (4.4%)	Cag. de Oro (0.7%)	Cag. de Oro (3.0%)
5	Davao (4.4%)	Gen. Santos (0.6%)	Iloilo (2.5%)
Sub-Total	(58.5%)	(99.9%)	(53.3%)
Sub-Total	(94.7%)	(100%)	(91.9%)
(All Base Ports)			

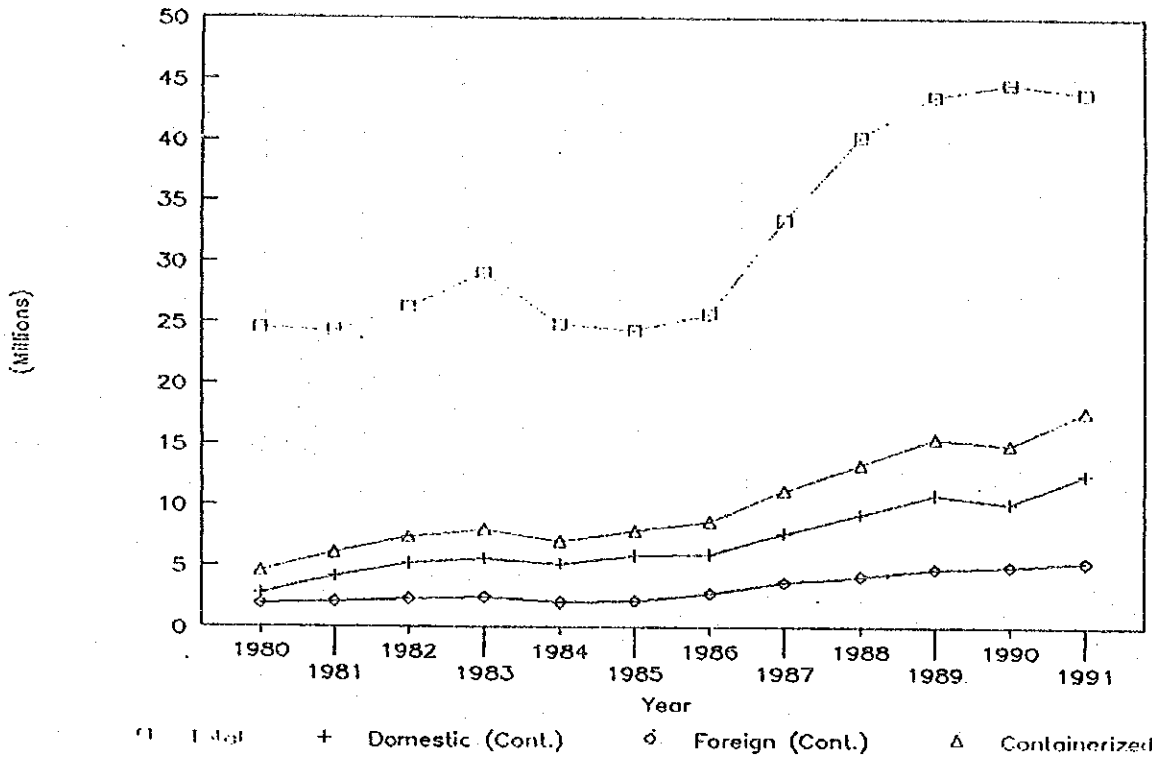
### PASSENGER TRAFFIC

1	Cebu	(13.3%)
2	Manila N.H.	(10.8%)
3	Iloilo	(7.2%)
4	Zamboanga	(4.5%)
5	Batangas	(4.1%)
Sub-Total	(5 ports)	(39.9%)
Sub-Total	(All Base Ports)	(51.2%)

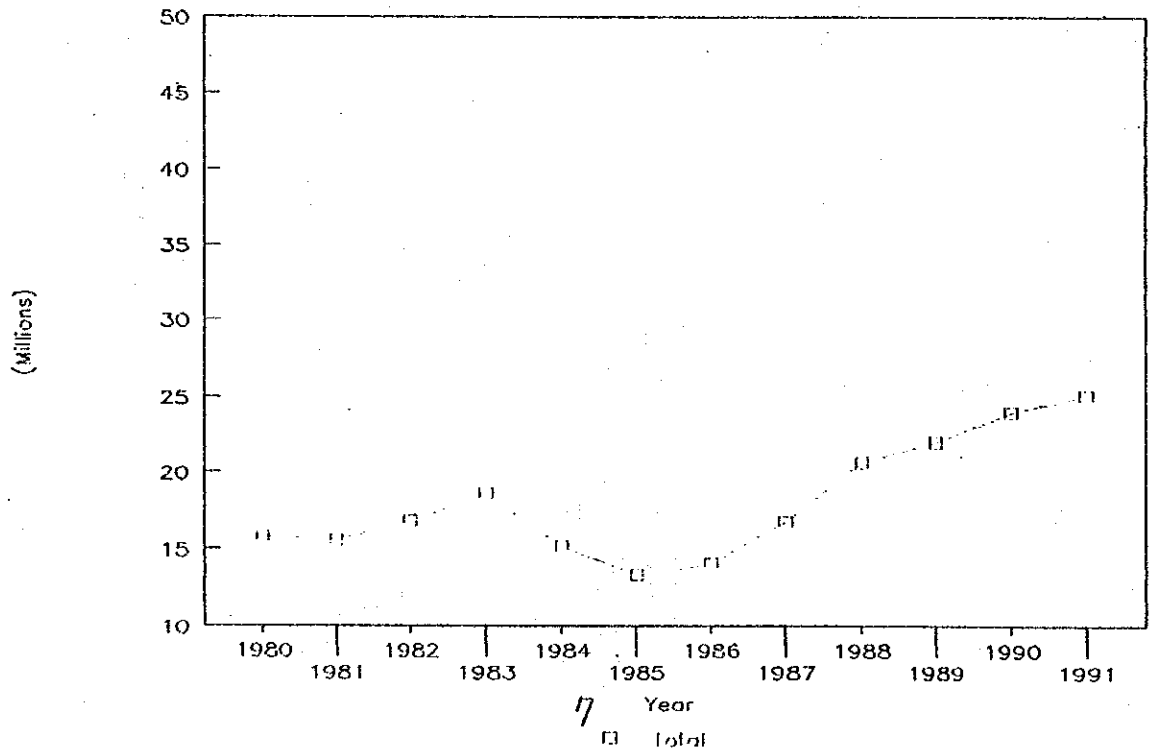


**FUNCTION OF PORTS IN THE CARGO AND PASSENGER TRAFFIC IN 1991**

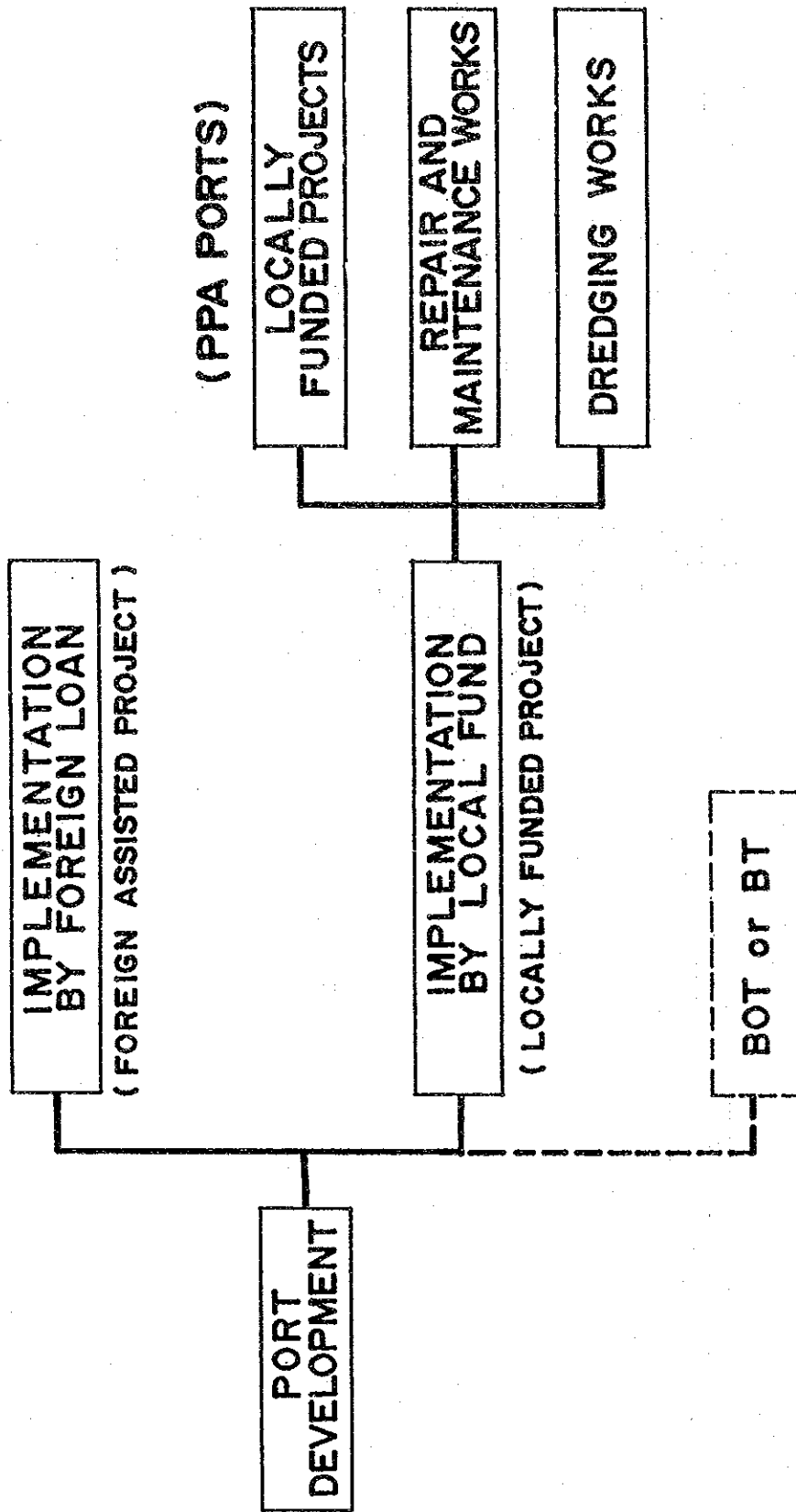
## CARGO THROUGHPUT



## PASSENGER TRAFFIC



# IMPLEMENTATION OF PORT DEVELOPMENT



	NAME OF PORTS	FOREIGN ASSISTED PROJECTS	LOCALLY FUNDED PROJECTS
1	BATANGAS	OECF	
2	CAGAYAN DE ORO	3rd & 4th IBRD, OECF	
3	CEBU	3rd IBRD, OECF	O
4	DAVAO	KEW*1	● O
5	DUMAGUETE	4th IBRD	●
6	GENERAL SANTOS	2nd IBRD	●
7	ILIGAN	KEW*1	●
8	ILOILO	3rd IBRD	● O
9	JOLO		● O
10	LEGASPI	4th IBRD	
11	MANILA-NORTH	ADB	●
12	MANILA-SOUTH	ADB, KEW*1	●
13	MICT	ADB, KEW*1	● ● ●
14	NASIPIT	4th IBRD	
15	POLLOC	ADB	
16	PUERTO PRINCESA	ADB(Palawan Intg'd Dev.)	
17	SAN FERNANDO		O O
18	SURIGAO	4th IBRD	
19	TACLOBAN	4th IBRD	O
20	ZAMBOANGA	3rd IBRD	O

\*1 -- Purchase of cargo handling equipment.

forms/1 - cred3 /sol

● -- Completed project as of Jun. 1992

O -- On-going project as of Jun. 1992

	NAME OF PORTS	FOREIGN ASSISTED PROJECTS	LOCALLY FUNDED PROJECTS
1	Calapan	4th IBRD	
2	San Jose, Mindoro Occ.		
3	Hondagua		
4	Balanacan		●
5	Bauan	4th IBRD	
6	Cotta		●
7	Dalahican		
8	Sta. Cruz	4th IBRD	
9	Mamburao		
10	Benoni		
11	Balingoan		
12	Tagbilaran	4th IBRD	
13	Talibon		
14	Tuburan		
15	Tubigon		
16	Jagna		
17	Argao		
18	Catagbacan		
19	Toledo		●
20	Sta. Fe		
21	Hagnaya		
22	Ubay		
23	Opon		
24	Samboan		
25	Sta. Ana		
26	Malalag		
27	Matl		
28	San Carlos		● ○
29	Danao (Escalante)		
30	Larena		
31	Tandayag		
32	Ozamis	4th IBRD	
33	Jimenez		
34	Tubod		
35	Kolambugan		
36	Pulupandan	4th IBRD	
37	Culasi		● ●
38	San Jose Buenavista	4th IBRD	
39	Dumagult		
40	Buenavista (Guimaras)		
41	Estancia		
42	Bongao		○
43	Siasi		●
44	Sitangkai		○
45	Matnog		
46	Masbate	4th IBRD	
47	Tabaco	4th IBRD	

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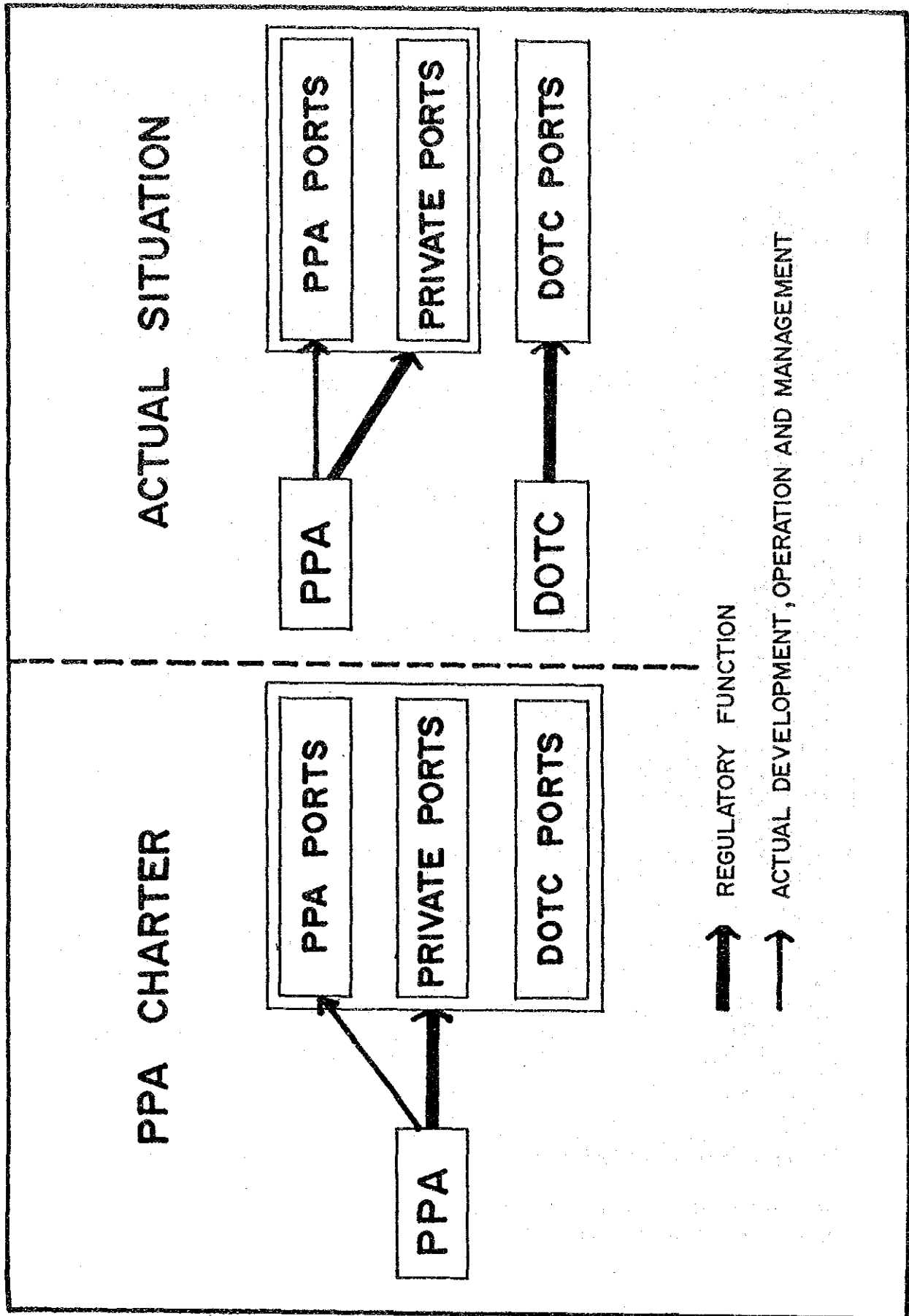
NAME OF PORTS		FOREIGN ASSISTED PROJECTS	LOCALLY FUNDED PROJECTS
48	Virac		● ●
49	Bulan		
50	Pasacao	4th IBRD	●
51	San Jose Panagniban		
52	Romblon		
53	Poctoy		
54	Pasig		
55	Masao		● ○
56	Butuan		
57	Cotabato		
58	Kalamansig		
59	Brooke's Point		
60	Coron		
61	Cuyo		●
62	Irene	OECE (E/S)	
63	Currimao		
64	Aparri		
65	Lipata		
66	Dapa		
67	Tandag		
68	San Jose, Dinagat		
69	Cantilan		
70	Ormoc	4th IBRD	●
71	Catbalogan		● ○
72	Calbayog	4th IBRD	
73	Maasin		
74	San Jose Caraingan		
75	San Isidro Ferry		
76	Baybay		
77	Palompon		
78	Liloan Ferry		
79	Hilongos		
80	Bato		
81	Borongan		○
82	Guiuan		○
83	Naval		
84	Calubian		
85	Basilan		
86	Pulauan	4th IBRD	
87	Pagadian		●
88	Lamitan		
89	Malangas		

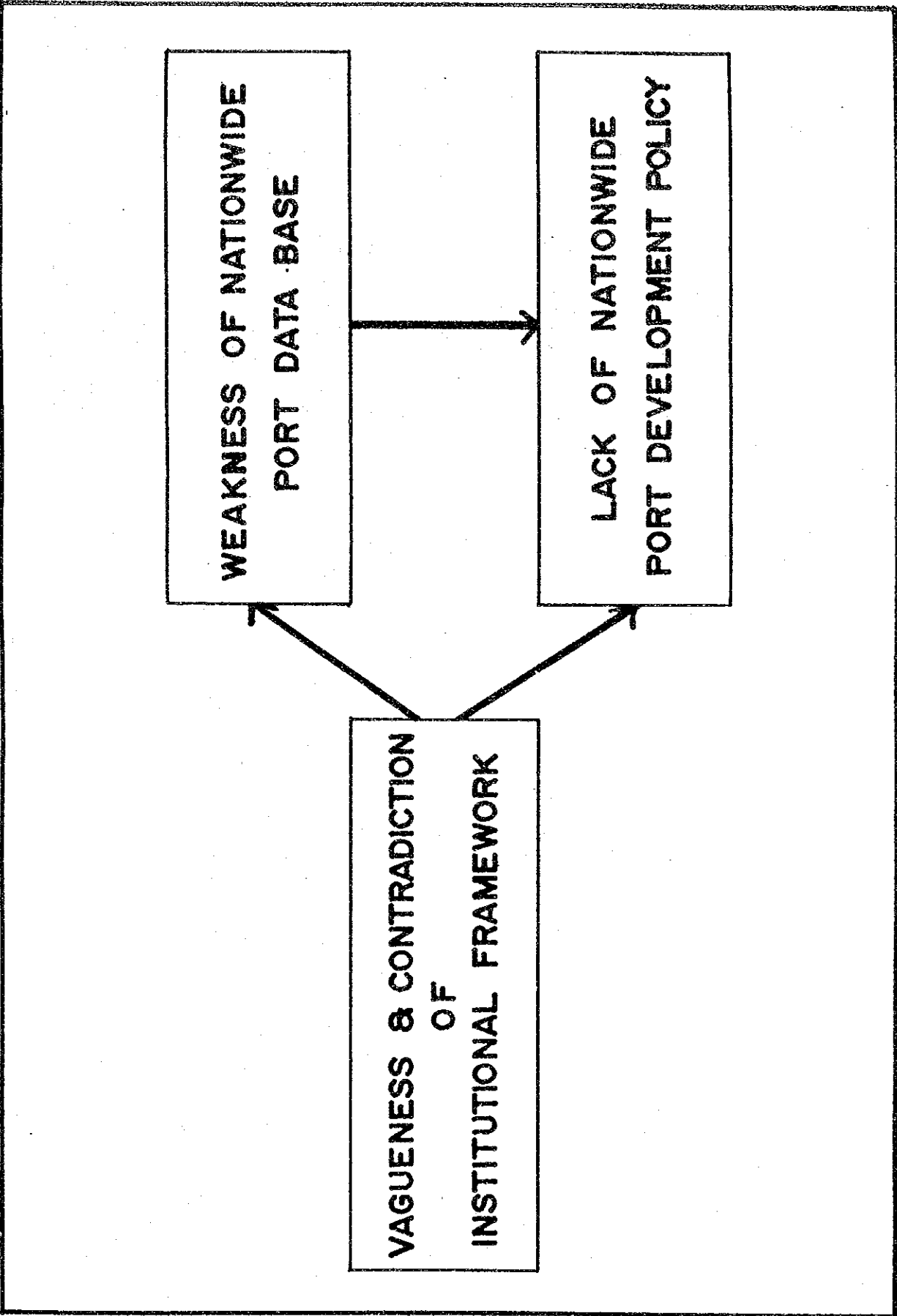
\*1 - Purchase of cargo handling equipment.

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● - Completed project as of Jun. 1992

○ - On-going project as of Jun. 1992





## Port Inventory Project

### Objective:

- 1) Consolidation/preparation of the data concerning all ports in the Philippines in the coordinated and comprehensive format that is indispensable for policy making and port planning activities.
- 2) Formulation of the system flow for maintenance and updating the PIP data.

### Objective Ports

- |         |                             |
|---------|-----------------------------|
| Phase 1 | Base Ports & Terminal Ports |
| Phase 2 | Private Ports               |
| Phase 3 | Municipal Ports             |

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)

PRESENT SITUATION AND PROBLEMS OF  
PORTS AND HARBOURS IN MALAYSIA

5 TEL NOVEMBER, 1992.

EQUATORIAL HOTEL, KUALA LUMPUR

PRESENT SITUATION AND PROBLEMS OF PORTS AND  
HARBOURS IN MALAYSIA

1. INTRODUCTION

1.1. Malaysia has been experiencing tremendous economic growth over the last few years due to rapid growth in the manufacturing, services, mining sectors and the high level foreign investment inflow into the country. Its GDP growth rate reached an all time high of 9.8% in 1990. Due to global economic slow down, its growth rate has slowed down to about 8.5% in 1992, but it is significant to note that economic growth in Malaysian continues to be on the positive side. As a result of the economic growth, particularly in the manufacturing sector, Malaysian trade is expected to expand in volume. Malaysian Ports therefore have to play a significant role in order to ensure that they provide efficient and cost effective services to promote and facilitate the growth in Malaysian seaborne trade.

1.2. In addition to the growth in Malaysian economy and growth in and port traffic, it must be noted that three major developments have significantly influenced the development and management of Ports in Malaysia, that is :-

1. Malaysian Government's Privatisation Policy relating to Ports.
2. Technological changes and changes commercial practices in shipping and port industry.
3. Increased competition amongst ports on regional and international basis.

1.3. These developments have created many challenges for the ports in terms of its organisation, role, development and commercial approach in managing the ports in Malaysia. These challenges must be addressed adequately in order to ensure that the ports are able to achieve its objective of providing efficient services and promote trade and development of the country.

## 2. TRAFFIC GROWTH AND DEVELOPMENT OF PORTS IN MALAYSIA

2.1. Along with the growth in Malaysian economy, port traffic passing through major ports has also recorded substantial growth over the years. Between 1990 and 1991 the total volume of Malaysian ports traffic increased from 77.8 million tonnes to 85.4 million tonnes registering 9.8% increase over 1990 throughput (Appendix 1). Similarly the total number of vessels handled by major Malaysian ports increased by 18.3% in 1991 over 1990. In 1990 Malaysian ports handled 31,631 vessels as compared to 37,434 vessels handled in 1991 (Appendix 2). Due to the rapid expansion of the manufacturing sector and domestic consumption in Malaysian container traffic also experienced substantial increase, especially via Peninsular Malaysian ports. Container traffic increased by 21% in 1991 over 1990 container throughput. Total container TEU traffic handled in 1990 was 893,269 TEU's as compared to 1,081,991 TEU's handled in 1991 (Appendix 3).

As a result of rapid growth in containerisation on world wide basis, coupled with the growth of Malaysian economy, container traffic is expected to grow at a substantial pace in the future as more and more break bulk cargo is containerised.

2.2. Commensurate with the growth in port traffic, Malaysian ports have over the years developed additional facilities to match the growth in port traffic. Malaysian ports generally attempt to match the requirements for additional port capacity by adopting a two prong strategy. Whilst additional port facilities are developed to cater for the growing traffic volume, Malaysian ports also concentrate on improving the productivity levels. Improvement in port productivity has to a great extent minimised the need to invest heavily on port facilities. Currently there are approximately 61 berths available in major Malaysian ports with a total length of 9,499 metres. In order to cope with the future port traffic, Malaysian ports will develop another 33 additional berths measuring approximately 6,900 metres between 1993 - 2000 period. By this estimate the total berth facilities in Malaysian ports is expected to increase by almost 72% by the year 2000 (Appendix 4).



2.3. As in the case of past development of port facilities, the future development programme will be influenced by the technological changes that are taking shape in the maritime sector. Development of future container terminal facilities will take into consideration the changing trends in ships sizes, and the type of back-up equipments that are necessary to match with the change in ship sizes. Currently Peninsular Malaysian ports are making provisions to handle post panamax container vessels. To date Malaysian ports have introduced 4 post panamax cranes, and more of the same will be acquired in the future commensurate development of additional container facilities. Besides this terminal operations will also be automated to improve the productivity and services rendered to the port users. These measures are necessary to ensure that Malaysian ports can attract main line vessels and keep abreast of competition generated by neighbouring ports in this region.

### 3. ORGANISATION OF PORTS IN MALAYSIA

3.1. In Malaysia there are a number of ports which are located along its coastline and major rivers systems. Ports in Malaysian are generally classified as either Major Ports or Minor Ports and secondly as Federal Ports and State Ports as reflected in Figure 1. Although there are numerous ports in Malaysia, about 23 ports can be considered as significant ports in terms of its operations and traffic volume (Appendix 5).

There are at present 5 Federal Ports directly under the purview of the Ministry of Transport. Ports in Sabah and Sarawak in East Malaysia are administered by the respective states and also report to the Ministry of Transport at Federal level. Besides this, the Federal Marine Department which falls directly under the Ministry of Transport administers the minor ports located in Peninsular Malaysia.

3.2. Up to 1986 the Government had through the Port Authorities maintained total management control of all the ports operating in the country. Following the privatisation policy adopted by the Government in the early eighties, selected ports have been earmarked for privatisation. Kelang Container Terminal was privatised in 1986, and the rest of Port Kelang's operational services are expected to be privatised by the end of 1992. Similarly Malacca Port will be privatised by end of 1992 as well. Eventually all other ports in Peninsular Malaysia will either be corporatised or privatised.

3.3. As a result of the privatisation policy the present organization and management structure of the ports will undergo radical changes in the future. The role of the ports as operator and regulator will eventually change, and the Ports Authority will finally concentrate on regulatory function only. This development poses a number of issues vis-a-vis :-

1. Future Port development responsibility will fall on the Port Authority and the Government as such investment costs will have to be borne by the Government sector.

2. There must be strong and effective central planning body which can oversee the future port planning requirements and development of port facilities.
3. Port Authorities have to play a new role as regulator effectively and its effectiveness can only be measured in the future, and it also requires certain common standard and procedures to be followed by the ports in general.
4. Must also ensure that the private port operators take into consideration the Government's objectives and strategies with regard the role of ports and its commercial achievements.

3.4. With the privatisation of operational activities, the Port Authorities will concentrate mainly on regulatory role, future port planning and development, port marketing activities and property management. The regulatory role would expand and the ports will have cover a wide range of regulatory activities, i.e.:-

- a) Port Tariff and Pricing
- b) Port Safety
- c) Environmental Safety and Pollution Control
- d) Navigational Aids and Control
- e) Trade Facilitation and Documentation Procedures.
- f) Development of EDI facilities etc.

#### 4. PROBLEMS AND ISSUES RELATED TO PORTS

4.1. The port sector in Malaysia is still a developing sector, some ports are more advanced than the others, nonetheless Malaysian ports in general experience similiar problems collectively as well as on individual basis. Some of the main issues faced by the ports in Malaysia area :-

##### a) National Port Plans for Malaysian Ports

As part of the development programme Malaysian Government has identified the port sector as an important service that is necessary for the over-all development and economic growth of the country. The Government has allocated substantial funds for the development of ports in Malaysia under the different 5 year development plans i.e:-

M\$ 1,484	million	-	Fourth Malaysian Plan
M\$ 657.6	million	-	Fifth Malaysian Plan
M\$ 2,725.6	million	-	Sixth Malaysian Plan

It is important that the heavy investment in ports lead to economic and effective usage of facilities, avoids duplication and competition amongst Malaysian Ports. This is vital in order to ensure that capital and port resources are utilized efficiently and prevent wasteful employment of scare resources. In this respect the Government and the Ministry of Transport must continue to play an important role in shaping the Malaysian Port Master Plans and guide the develop- of the ports.

It is also important that after privatisation private operators do not engage in unhealthy competition which might prove to be detrimental for Malaysian ports especially where container traffic load centering is concerned. The Government must provide broad strategies and guidelines which will become the basis for port development within the context of national requirements.

b) Trade Facilitation

Rapid developments are taking shape in international commercial practises related to cargo movements and handling via ports. The world is witnessing increasing usage of electronics and computers in trading, commerce, port and transport operations, particularly in developed countries. In an ever competitive environment Malaysian Government and the ports must quickly introduce EDI systems to facilitate trade and increase the competitive edge of Malaysian ports. Such an exercise is dependent on the initiative of the Government and all parties connected with international trade including the ports. As such speedy implementation of EDI system in Malaysia will enhance the development of ports and multimodal activities in tandem with the developments in the international area. The Government has already completed its plans to implement EDI services in stages, and its introduction will open a new chapter in the development ports and multimodalism in Malaysia.

Further development in multimodal activities is also dependent on improvements in the private sector commercial practices as well.

- \* Forwarding agents must expand their role to actively participate in freight forwarding activities and through transport services rather than limit themselves to customs clearance function.
- \* The banking institutions need to change their procedures in line with developments in multimodal practices and accept through bill of lading.
- \* Local insurance companies need to change their pricing policy covering the movement of containers in transit to facilitate the development of multimodalism.
- \* Container haulage operators also need to improve their services to facilitate speedy movements of containers and JIT services. The haulage companies also need to adapt their operations to facilitate multimodal operations in Malaysia.

In addition to the above speedy customs clearance is also vital to ensure that the total services provided by the port is efficient and cost effective. It must be emphasized that provision of port facilities and improvements in port services alone is not adequate enough to improve and facilitate the movement of cargo and containers. All other parties involved in the total transport chain must also improve and modernize their respective operations in order to ensure overall efficiency and encourage the development of multimodal operation in Malaysia.

c) Human Resource Development

As part of the overall strategy to develop and promote the efficiency of ports it is equally important to ensure that adequate training is provided for port personnel. This applies for all category of port personnel employed by the ports directly and those that are engaged in its supporting activities. In this respect the Government and the ports must plan and provide the necessary training facilities and programmes consistent with the requirements of the port industry and developments in the maritime sector. The leadership role must be provided by the Government by setting up training facilities and providing the necessary funds to ensure its success.

## 5. CONCLUSION

5.1. Ports in Malaysia have a vital role to play in the development of the country and also to promote and facilitate trade. This is collective responsibility that spans the Government, the port sector and other supporting elements. In order to achieve the objectives of Malaysian ports it is necessary to develop an effective central Authority such as the National Ports Authority, which can oversee the development needs of the ports in the country and also provide the policy and regulatory framework to ensure healthy development of the port sector. This is all the more significant taking into consideration that all the major ports are earmarked to be privatised in the near future. The Government has already started plans to establish the National Ports Authority and its implementation will take care of these issues. In addition to this adequate attention must be focussed on human resource development as an essential ingredient for the success of the ports. It is also of paramount importance that port related entities such as customs, forwarding agents, freight forwarders, shipping agents, banking institutions, insurance companies, haulage operators and government agencies perform their respective roles efficiently and in keeping with the commercial operating trends prevalent around the world so as to ensure the overall effectiveness and efficiency of the ports in Malaysia.

V. BALAKRISHNAN,  
Research and Development Dept.,  
Klang Port Authority.



FIGURE 1 - ORGANIZATION STRUCTURE OF PORTS IN MALAYSIA

