

## 1.8 Micro Approach to Future Port Demand for the Port of Cortes

109. The micro approach will be carried out under the following conditions.

- (1) Future population which was estimated in chapter 1.3 part II will be used.
- (2) GDP of Scenario 1 will be used because that consists of GDP of each sector.

### 1.8.1 Import Cargo Volume

#### (1) Wheat

110. Production of wheat is very small in Honduras and the almost all domestic consumption is imported at port of Cortes and later processed and powdered at San Pedro Sula. In future, with completion of the new road between port of Cortes and San Pedro Sula, it is expected that all imported wheat will continue to be imported through the port of Cortes and will be processed at San Pedro Sula. Imported volume of wheat will be equal to the domestic consumption but in short term import volume fluctuates because of the influence of international market price and intention of importer. As consumption of wheat is related to the population, so future import volume will in the long term be estimated by its relation with population. The correlation between the import volume and population from 1982 to 1992 is expressed in the following equation.

$$Y = 27.656 X + 14,899 \quad ( R=0.898 )$$

Where, Y : Import volume of wheat ( ton )  
x : Total population (Thousand)

111. Based on the above equation, the import volume of wheat is estimated and the results are shown in Table 1-8-1 and Fig.1-8-1, a summary of which is given below.

(Unit : Thousand MT)

In 1991	161
In 1992	107
In 2000	168
In 2010	219

#### (2) Other Foodstuffs

112. Other foodstuffs consists of flour, beans, rice, corn, crushed soybean, rejected banana and others. From 30 % to 80 % of it is imported as dry bulk cargo. Per capita import

volume of this category tends to increase but the government is adopting a policy to increase the domestic production of grains except wheat for raising the rate of self-sufficiency. Therefore, per capita import volume of other foodstuffs is not expected to increase. The average per capita import volume over the past 5 years is 30 kg and this level will be expected to continue. 97 % of import volume is handled through the port of Cortes and this trend will also be expected to continue.

113. Based on the above condition, the import volume of other foodstuffs is estimated and the results are shown in Table 1-8-2, a summary of which is given below

(Unit : Thousand MT)

In 1991	216
In 1992	103
In 2000	192
In 2010	246

### (3) Fertilizer

114. Based on the interviews, consumption volume of fertilizer is less than other neighboring countries because the soil of cultivated area in Honduras is better than in neighboring countries. But, the import volume is gradually increasing. In future it is expected that fertilizer will be exported by land transportation in conjunction with the improved road system. The correlation between the import volume and GDP of agriculture sector from 1982 to 1992 is expressed in the following equation.

$$Y = 160.092 X + 90,751 \quad ( R=0.884 )$$

Where, Y : Import volume of fertilizer ( ton )  
 x : GDP of agriculture sector (Million Lempiras)

115. According to the above, the import volume is estimated and major importing ports are the ports of Cortes, Castilla and San Lorenzo. Based on the statistics of past 5 years, 81% of import volume is handled through the port of Cortes and future import volume through the port of Cortes will be estimated using this rate. The results are shown in Table 1-8-3 and Fig.1-8-2, a summary of which is given below.

(Unit : Thousand MT)

In 1992	89
In 2000	146
In 2010	202

#### (4) Iron and Steel

116. All domestic consumption of iron and steel is imported and this tendency will continue up to the target date. Generally speaking, the consumption volume has a close relation with the GDP. Thus the import volume is forecasted by its correlation with GDP. The correlation between the import volume and GDP from 1982 to 1992 is expressed in the following equation.

$$Y = 33.007 X + 83,807 \quad ( R=0.898 )$$

Where, Y : Import volume of iron and steel ( ton )  
x : GDP (Million Lempiras)

117. According to the above, the import volume is estimated and major importing ports are the ports of Cortes and San Lorenzo. Based on the statistics of past 5 years, 62% of import volume is handled through the port of Cortes and future import volume through the port of Cortes will be estimated using this rate. The results are shown in Table 1-8-4 and Fig.1-8-3, a summary of which is given below.

(Unit : Thousand MT)

In 1992	53
In 2000	69
In 2010	116

#### (5) Machine and Transport Equipment

118. Almost all transport equipment, for example, second hand cars, is imported by land, but some new cars are imported through the port of Cortes and San Lorenzo. On the others hand, almost all machines are imported through the ports. The import volume has a certain relation with the GDP. Thus the import volume is forecasted by its

correlation with GDP. The correlation between the import volume and GDP from 1982 to 1992 is expressed in the following equation.

$$Y = 8.843 X - 16,636 \quad ( R=0.735 )$$

Where, Y : Import volume of machine and transport equipment ( ton )  
 x : GDP (Million Lempiras)

119. According to the above, the import volume is estimated and major importing ports are the ports of Cortes, Castilla and San Lorenzo. Based on the statistics of past 5 years, 62% of import volume is handled through the port of Cortes and future import volume through the port of Cortes will be estimated using this rate. The results are shown in Table 1-8-5 and Fig.1-8-4, a summary of which is given below.

(Unit : Thousand MT)

In 1992	22
In 2000	25
In 2010	40

#### (6) Chemicals

120. In Honduras there are no chemical industries and all chemical materials are imported. Chemicals are imported for private consumption as well as industry and agriculture. Thus the import volume of chemicals has a close relation with the GDP. The import volume is forecasted by its correlation with GDP. The correlation between the import volume and GDP from 1982 to 1992 is expressed in the following equation.

$$Y = 7.758 X + 16,246 \quad ( R=0.801 )$$

Where, Y : Import volume of chemicals ( ton )  
 x : GDP (Million Lempiras)

121. Based on the above equation, the import volume is estimated and major importing ports are the ports of Cortes, Castilla and San Lorenzo. The import volume through the port of Cortes is forecasted by its correlation with total import volume. The correlation between the import volume through the port of Cortes and total import volume from 1982 to 1992 is expressed in the following equation.

$$Y = 0.660 X + 7,149 \quad ( R=0.767 )$$

Where, Y : Import volume through the port of Cortes ( ton )  
 x : Total import volume of chemicals ( ton )

122. According to the above equation, the import volume through the port is estimated and the results are shown in Table 1-8-6, Fig.1-8-5 and Fig.1-8-6, a summary of which is given below.

(Unit : Thousand MT)

In 1992	49
In 2000	51
In 2010	65

#### (7) Petroleum

123. Import petroleum consists of gasoline, kerosene, diesel oil, fuel oil, AV-JET, LPG and asphalt. After 1992 crude oil is no longer imported because the refinery at the port of Cortes stops operation.

124. Gasoline is mainly used for cars and demand of gasoline will increase according to the number of cars. Kerosene and LPG are mainly used for private consumption such as cooking and consumption volume steadily increased. Diesel oil and fuel oil are used for transport such as truck, trailer and ship, industry, agriculture and other economic sectors. Up to 1985 diesel oil and fuel oil were consumed for generation of electric power in large quantities but it dramatically decreased when operations commenced at El Cajon plant. Since El Cajon no.2 plant is under planning, it is not expected that consumption of petroleum for electric power generation will increase in future.

##### a. Gasoline

125. Import volume of gasoline will be estimated by the number of registered cars except truck and trailer. Future number of registered cars is estimated using the following method. In 1992, the car / population ratio was one car for 35 persons and the number of registered cars was approximately 145,000 in Honduras. Taking into consideration the size of families, the first plateau is assumed to be reached when there is one car for 10 persons. Based on the above, the number of registered cars will be estimated by using the logistic curve. The results are shown in Table 1-8-7 and Fig.1-8-7,

a summary of which is given below.

(Unit : Numbers)

In 1992	145,000
In 2000	311,000
In 2010	599,000

126. The import volume of gasoline is forecasted by its correlation with number of registered cars. The correlation between the import volume of gasoline and number of the cars from 1986 to 1991 is expressed in the following equation.

$$Y = 0.815 X + 94,685 \quad ( R=0.942 )$$

Where, Y : Import volume of gasoline ( KL )  
x : Number of cars

127. According to the above, the import volume of gasoline is estimated and the results are shown in Table 1-8-8 and Fig.1-8-8, a summary of which is given below.

(Unit : Thousand MT)

In 1992	182
In 2000	299
In 2010	500

b. Other petroleum ( Except gasoline )

128. Based on paragraph 124, the import volume is forecasted by its correlation with GDP. The correlation between the import volume of other petroleum and GDP from 1982 to 1992 is expressed in the following equation.

$$Y = 170.409 X + 205,531 \quad ( R=0.915 )$$

Where, Y : Import volume of other petroleum ( ton )  
x : GDP (Million Lempiras)

129. According to the above equation, the import volume is estimated and the results are shown in Table 1-8-8 and Fig.1-8-9, a summary of which is given below.

(Unit : Thousand MT)

In 1992	634
In 2000	898
In 2010	1,354

130. The ports for import petroleum are the ports of Cortes, Tela and San Lorenzo. Based on the interviews, 50% of import volume will be handled through the port of Cortes and future import volume through the port of Cortes will be estimated using this rate. The results are shown in Table 1-8-8, a summary of which is given below.

(Unit : Thousand MT)

In 1992	596
In 2000	598
In 2010	927

(8) Others

131. Others consist of weight of containers, domestic transit cargo(for inland deposit and for cabotage), international transit cargo, paper and carton for banana container, grease and oil of animal & vegetable, drinks, tobacco and others. The import volume of others is forecasted by its correlation with GDP. The correlation between the import volume of Others through the port of Cortes and GDP from 1982 to 1992 is expressed in the following equation.

$$Y = 7.758 X + 16,246 \quad ( R=0.811 )$$

Where, Y : Import volume of others ( ton )  
x : GDP (Million Lempiras)

132. According to the above equation, the import volume is estimated and the results are shown in Table 1-8-9 and Fig.1-8-10, a summary of which is given below.

(Unit : Thousand MT)

In 1992	511
In 2000	649
In 2010	1,043

## 1.8.2 Export Cargo Volume

### (1) Banana

133. Based on the world market data of banana which was prepared by FAO, increase rate of consumption of banana for U.S.A and West Europe was estimated at 0.7 % because the per capita consumption per annum reached 9 to 10 kg which was near saturation, but Russia and East Europe are expected to become new markets for banana and increase rate is assumed at 2.4 %; Middle East is also expected to increase consumption. Based on the above situation, export volume of banana in Honduras is expected to increase a little.

#### a. Production of banana

134. Production of banana reached 1,190,000 MT in 1971 and recently it recorded 1,150,000 MT in 1987, but production in 1992 fell to 960,000MT. The production volume of banana is forecasted by its correlation with GDP of agriculture sector. The correlation between the production volume of banana and GDP of agriculture sector from 1982 to 1992 is expressed in the following equation.

$$Y = 372.846 X + 593,973 \quad ( R=0.801 )$$

Where, Y : Production volume of banana ( ton )  
x : GDP of agriculture sector (Million Lempiras)

135. According to the above equation, the production volume is estimated and the results are shown in Table 1-8-10 and Fig.1-8-11.

#### b. Domestic consumption of banana

136. Based on the data of FAO, per capita consumption of bananas in Latin and Central America has reached 100 kg, which includes plantains. In Honduras, average per capita consumption volume of banana from 1982 to 1992 is 49 kg, but this figure may include spoiled bananas or bananas lost during transport, therefore per capita consumption is estimated as 40 kg. Based on the above, future domestic consumption volume of banana is forecasted by estimated per capita consumption and future population, results of which are shown in Table 1-8-10.

#### c. Export volume of banana

137. Export volume is estimated by deducting the domestic consumption volume from the production volume. Major hinterland of port of Cortes for banana is Cortes, Yoro and Atlantida and major hinterland of port of Castilla is Atlantida and Colon. According to the statistics of export, 2/3 of the export volume of banana has been handled through the port of Cortes. Based on the above, future export volume of banana through the port



of Cortes is estimated, the results of which are shown in Table 1-8-10 and a summary of which is given below.

(Unit : Thousand MT)

In 1992	529
In 2000	637
In 2010	694

(2) Coffee

138. Based on the data of FAO, it was estimated that while annual increase rate of consumption of coffee in North America and West Europe will be 0.7 to 0.9 %, it will become higher in Russia, East Europe and Japan. Therefore, it is expected that the export volume of coffee in Honduras will increase gradually in the future.

a. Production of Coffee

139. From 1970 to 1992, production volume of coffee has been increasing favorably at a 6.2 % annual increase rate, but it is assumed that annual increase rate will be down a little. The production volume of coffee is forecasted by its correlation with GDP of agriculture sector. The correlation between the production volume of coffee and GDP of agriculture sector from 1982 to 1992 is expressed in the following equation.

$$Y = 100.861 X + 28,588 \quad ( R=0.853 )$$

Where, Y : Production volume of coffee ( ton )  
 x : GDP of agriculture sector (Million Lempiras)

140. According to the above equation, the production volume is estimated and the results are shown in Table 1-8-11 and Fig.1-8-12.

b. Export volume of coffee

141. The export volume of coffee is forecasted by its correlation with production volume. The correlation between the export volume of coffee and production volume from 1982 to 1992 is expressed in the following equation.

$$Y = 0.843 X + 8,048 \quad ( R=0.892 )$$

Where, Y : Export volume of coffee ( ton )  
 x : Production volume of coffee ( ton )

142. According to the above equation, the export volume is estimated and 92 % of export volume is handled through the port of Cortes. Results are shown in Table 1-8-11 and Fig.1-8-13, a summary of which is given below.

(Unit : Thousand MT)

In 1992	106
In 2000	119
In 2010	150

### (3) Melon

143. Though melon is not a traditional product, a great increase can be seen in the production and export volume. Melon is a promising product for export that is expected to increase greatly.

#### a. Production of melon

144. Production volume of melon was less than 1,000 MT up to 1978, but in 1979 production volume tripled to more than 3,000 MT; in 1986 it again tripled to more than 17,000 MT and in 1989 it increased to 49,000 MT. This increasing tendency is similar to the past increase in the production of pineapple; therefore, production of melon will be estimated based on the past trends of pineapple. The following table is a comparison of the production histories of pineapple and melon.

	Pineapple		Melon	
0 - 1,000t			1970 - 1978	8 years
1,000 - 10,000t	- 1972		1979 - 1985	6 years
10,000 -100,000t	1973 - 1979	7 years	1986 -(1994)	8 years
100,000-200,000t	1980 - 1985	6 years	(1995)-	
200,000-300,000t	1986 - (1995)	( 9 years)		

145. Based on the above table, it is expected that production volume will exceed 100,000 MT in 1995. Taking into consideration the above, production volume of melon will be estimated by using the logistic curve. The results are shown in Table 1-8-12 and Fig.1-8-14.

b. Export volume

146. Through the port of Cortes, 90 % of production volume of melon has been exported and this tendency will continue in the future. Based on the above, the export volume of melon through the port of Cortes is estimated and the results are shown in Table 1-8-12 and Fig.1-8-14, a summary of which is given below.

(Unit : Thousand MT)

In 1992	58
In 2000	145
In 2010	177

(4) Timber

147. Timber is a traditional export material but production volume is decreasing because of the deterioration of the forest zone and the increased awareness of the need to protect the environment. In line with the decreased production, export volume is decreasing. Based on interviews with personnel concerned, production volume will be expected to further decrease, but taking into consideration the policy for the protection of forests, depletion of forest areas will stop and production volume will stabilize around 150,000 MT. Export volume of timber is estimated at 70,000 MT and the remainder will be consumed for domestic use and/or later exported as furniture.

148. Taking into consideration the above, production volume and export volume of timber will be estimated by using the logistic curve. The export volume of timber through the port of Cortes is forecasted by its correlation with the export volume. The correlation between the export volume of timber through the port of Cortes and the export volume from 1982 to 1992 is expressed in the following equation.

$$Y = 0.668 X - 7,338 \quad ( R=0.959 )$$

Where, Y : Export volume of timber through the port of Cortes ( ton )  
x : Export volume of timber ( ton )

149. According to the above equation, the results are shown in Table 1-8-13 and Fig.1-8-15, 1-8-16 and 1-8-17 a summary of which is given below.

(Unit : Thousand MT)

In 1992	81
In 2000	46
In 2010	41

(5) Pineapple

a. Production

150. From 1970 to 1992, production volume of pineapple has increased favorably, especially in 1973 when it doubled and in 1980 when it showed a fourfold increase; since then it has increased at a 5.8 % annual increase rate, but it is expected that the annual increase rate will be down a little. The production volume of pineapple is forecasted by its correlation with GDP of agriculture sector. The correlation between the production volume of pineapple and GDP of agriculture sector from 1982 to 1992 is expressed in the following equation.

$$Y = 233.131 X - 56,952 \quad ( R=0.921 )$$

Where, Y : Production volume of pineapple ( ton )  
x : GDP of agriculture sector (Million Lempiras)

151. According to the above equation, the results are shown in Table 1-8-14, and Fig.1-8-18.

b. Domestic consumption

152. Per capita domestic consumption is obtained by deducting export volume from production volume and then dividing by the population. The estimated volume is 41.79 kg and this level is expected to continue so that per capita annual consumption will be around 42 kg. According to above, domestic consumption is forecast as in Table 1-8-14.

c. Export volume of pineapple through the port of Cortes

153. Export volume will be estimated by deducting the domestic consumption from the production volume. 15 % of the export volume has been handled at port of Cortes and 85 % at port of Castilla. Taking into consideration the hinterland of production and consumption for pineapple, it is expected that these proportions will be maintained. According to the above, export volume of pineapple through the port of Cortes is estimated and the results are shown in Table 1-8-14, a summary of which is given below.

(Unit : Thousand MT)

In 1992	8
In 2000	9
In 2010	12

#### (6) African Palm Oil

##### a. Production

154. Recently, annual increase rate of demand for african palm oil has been decreasing in the world market, but it is expected that the increase rate will continue at about 2%; major demand is for use with cooking and for items such as soap and detergent. Cultivated area for african palm in Honduras has been increasing favorably, and though the increase rate shows a tendency to decrease, an increase rate of at least 2% is expected, therefore it is expected that the cultivated area will be 41,600 ha in 2010. Productivity of african palm has been improved and in 2010 productivity will be estimated 20t/ha the same as the world level. Production weight of african palm oil is 20% of the african palm. Based on the above, production volume of african palm oil will be estimated at about 166,000t in 2010.

##### b. Domestic consumption

155. The domestic consumption is conjectured to increase because while export volume has been decreasing, the production volume has been increasing. Based on the production and export volume of the past 5 years, per capita consumption is 13.59kg; it is assumed that the per capita consumption has almost reached its saturation and will stabilize at about 15kg. Based on the above, the domestic consumption is estimated as in Table 1-8-15.

##### c. Export volume through the port of Cortes

156. Export volume will be estimated by deducting the domestic consumption volume from the production volume. According to the statistics of export, 1/3 of the export volume is exported through the port of Cortes, and this tendency will be expected to continue. Based on the above, the export volume through the port of Cortes is estimated as in Table 1-8-15, a summary of which is given below.

(Unit : Thousand MT)

In 1992	2
In 2000	5
In 2010	13

(7) Sugar

157. Demand for sugar from major consumption countries has been stagnant since 1980, and demand is not expected to increase significantly in the world market. Domestic consumption will be expected to increase along with the population growth as well as improvement of living standards, therefore export volume will not be expected to increase significantly.

a. Production of sugar cane

158. Cultivated area for sugar cane in Honduras peaked in 1982 but it has been stagnant since then. The future cultivated area will be expected to increase according to the population of the agriculture sector but the annual increase rate will be only about 0.2%, therefore it is expected that the cultivated area will be 46,000 ha in 2010, the same as in 1982. The production volume of sugar cane is forecasted by its correlation with cultivated area. The correlation between the production volume of sugar cane and cultivated area from 1982 to 1992 is expressed in the following equation.

$$Y = 87.303 X - 797,931 \quad ( R=0.989 )$$

Where, Y : Production volume of sugar cane ( ton )  
x : Cultivated area ( ha )

b. Production of sugar

159. The production volume of sugar is forecasted by its correlation with sugar cane. The correlation between the production volume of sugar and sugar cane from 1982 to 1992 is expressed in the following equation.

$$Y = 0.097 X - 86,027 \quad ( R=0.909 )$$

Where, Y : Production volume of sugar ( ton )  
x : Production volume of sugar cane ( ton )

c. Domestic consumption

160. The domestic consumption is conjectured to increase, because while the export

volume has been decreasing, the production volume has been stable. Based on the past 10 years production and export volume, annual domestic consumption was calculated by deducting the export volume from the production volume. The domestic consumption is classified into private consumption and others such as industrial consumption. According to Table 1-1-13, the annual private per capita consumption was 14kg (38.6g/day) in 1987 and it will be expected to increase to 16kg (45g/day) by 2000 and then remain stable. The average annual consumption of others was about 68,000t in the past 10 years and it will be expected to continue at the same level. Based on the above, the domestic consumption is estimated as in Table 1-8-16.

d. Export volume of sugar through the port of Cortes

161. Export volume will be estimated by deducting the consumption volume from production volume. According to the export statistics, 80 % of export volume has been handled at the port of Cortes and this trend will continue. Based on the above, the export volume through the port of Cortes is estimated as in Table 1-8-16, a summary of which is given below.

(Unit : Thousand MT)

In 1992	12
In 2000	24
In 2010	13

(8) Molasses

a. Production

162. Molasses is produced from sugar cane like sugar. There is no data for production of molasses, therefore export volume is regarded as production volume. Total volume of sugar and molasses will be estimated by correlation with sugar cane and production volume of molasses is calculated by deducting the estimated sugar volume from estimated total volume of sugar and molasses. The correlation between the total production volume of sugar and molasses and sugar cane from 1982 to 1992 is expressed in the following equation.

$$Y = 0.138 X - 167,616 \quad ( R=0.794 )$$

Where, Y : Total production volume of sugar and molasses ( ton )  
 x : Production volume of sugar cane ( ton )

163. According to the above equation, the results are shown in Table 1-8-17.

b. Export volume

164. Comparing the actual export volume and estimated production volume from 1982 to 1992, 90.6% of the estimated production volume has been exported, therefore future export volume will be estimated as 90% of future estimated production volume. The export volume through the port of Cortes is forecasted by its correlation with total export volume. The correlation between the export volume through the port of Cortes and total export volume from 1982 to 1992 is expressed in the following equation.

$$Y = 0.610 X + 1,167 \quad ( R=0.982 )$$

Where, Y : Export volume through the port of Cortes ( ton )  
 x : Total export volume ( ton )

165. According to the above equation, the export volume through the port of Cortes is estimated and the results are shown in Table 1-8-17, a summary of which is given below.

(Unit : Thousand MT)

In 1992	24
In 2000	25
In 2010	28

(9) Cement

a. Production

166. Production volume of cement has been increasing gradually but it fell down in 1985, since then it has been increasing favorably. Based on the interviews, there are two cement companies and their capacities of production are 1,100,000 MT and major export destinations are Caribbean countries. The production volume of cement is forecasted by its correlation with GDP of industrial sector. The correlation between the production volume of cement and GDP of industrial sector from 1982 to 1992 is expressed in the following equation.

$$Y = 1,852.825 X - 661,461 \quad ( R=0.921 )$$

Where, Y : Production volume of cement ( ton )  
 x : GDP of industrial sector ( Million Lempiras )

167. According to the above equation, the production volume of cement is estimated in



Table 1-8-18 and Fig.1-8-19, a summary of which is given below. However, the cement plant will require new investment to expand its capacity by 2000.

(Unit : Thousand MT)

In 1992	760
In 2000	1,168
In 2010	1,975

b. Domestic consumption

168. The domestic consumption is conjectured to increase because while the export volume has been decreasing, the production volume has been increasing. Based on the production and export volume of the past 10 years, domestic consumption is obtained by deducting export volume from production volume. The domestic consumption volume of cement is forecasted by its correlation with GDP of construction sector. The correlation between the domestic consumption volume of cement and GDP of construction sector from 1982 to 1992 is expressed in the following equation.

$$Y = 3,311.703 X - 268,094 \quad ( R=0.734 )$$

Where, Y : Domestic consumption volume of cement ( ton )  
 x : GDP of construction sector ( million lempiras )

169. According to the above equation, the domestic consumption volume of cement is estimated in Table 1-8-18 and Fig.1-8-19, a summary of which is given below.

(Unit : Thousand MT)

In 1992	731
In 2000	1,001
In 2010	1,675

c. Export volume of cement through the port of Cortes

170. Export volume will be estimated by deducting domestic consumption volume from production volume. It will be expected that all of the export volume will be exported through the port of Cortes. Based on the above, the export volume of cement through the port of Cortes is estimated in Table 1-8-18 and Fig.1-8-19, a summary of which is given below.

(Unit : Thousand MT)

In 1992	29
In 2000	167
In 2010	300

(10) Minerals

171. There is no data for production minerals in Honduras but as minerals are not consumed in Honduras the production volume is assumed to be the same as export volume. Production minerals were increasing gradually up to 1985, but because of the bankruptcy of the mining company, the volume decreased in 1987. In 1987 a new company was established and the volume has been increasing favorably. Major minerals are zinc and lead. Recently world demand for the metals has reached its saturation point and it is expected to remain unchanged, therefore it is hard to anticipate great progress in the mining sector. The production volume of minerals is forecasted by its correlation with GDP of mining sector. The correlation between the production volume of minerals and mining sector from 1982 to 1992 is expressed in the following equation.

$$Y = 1,834.286 X - 55,482 \quad ( R=0.757 )$$

Where, Y : Production volume of minerals ( ton )  
x : GDP of mining sector ( Million Lempiras )

172. According to the above equation, the production volume of minerals is estimated in Table 1-8-19 and Fig.1-8-20, a summary of which is given below.

(Unit : Thousand MT)

In 1992	87
In 2000	121
In 2010	127

173. Export volume of minerals through the port of Cortes will be estimated the same as production volume, therefore the above volume represents export volume.

(11) Others

174. Others consist of weight of containers, textile, meat, plantain, domestic transit cargo, international transit cargo and others. The export volume of others through the port of Cortes is forecasted by its correlation with GDP. The correlation between the export volume of others through the port of Cortes and GDP from 1982 to 1992 is expressed in the following equation.

$$Y = 75.874 X + 37,868 \quad ( R=0.868 )$$

Where, Y : Export volume of others through the port of Cortes( ton )  
x : GDP (Million Lempiras)

175. According to the above equation, the import volume is estimated and the results are shown in Table 1-8-20 and Fig.1-8-21, a summary of which is given below.

(Unit : Thousand MT)

In 1992	356
In 2000	446
In 2010	657

### 1.8.3 Comparison with Macro Method

176. Import cargo volume which was estimated by the above micro method is compared with import cargo volume which estimated by the macro method and results is shown in Fig. 1-8-22 and as follows;

( Unit: Thousand MT )

	Scenario 1	Scenario 2	Micro method
In 1992	1,530	1,530	1,530
In 2000	1,720	2,108	1,898
In 2010	2,436	3,486	2,856

177. Export cargo volume which was estimated by the above micro method is compared with export cargo volume which was estimated by the macro method and result is shown in Fig. 1-8-23 and as follows;

( Unit: Thousand MT )

	Scenario 1	Scenario 2	Micro method
In 1992	1,279	1,279	1,279
In 2000	1,533	1,710	1,732
In 2010	1,877	2,328	2,211

### 1.9 Cargo-wise Port Demand for the Port of Cortes

178. Above estimated cargo volume of each commodity at the port is classified into packing type. The cargo consists of liquid bulk cargo, dry bulk cargo, unit cargo and general cargo. Based on the statistics and interviews, conditions for classification are supposed as follows.

- (1) Import liquid bulk cargo consists of petroleum and 1/2 volume of chemicals and export liquid bulk cargo consists of molasses and african palm oil.
- (2) Import dry bulk cargo consists of wheat, fertilizers and 40% of other foodstuffs and export dry bulk cargo consists of cement, bulk minerals and sugar.
- (3) Unit cargo means containerized cargo, Ro-Ro cargo and weight of containers. Import unit cargo consists of 60% of iron & steel, 60% of transportation equipment & machine, 1/2 volume of chemicals and 60% of other foodstuffs, weight of containers and others. Export unit cargo consists of containerized banana, coffee, melon, pineapple, weight of containers and others. Based on the above, unit cargo and quantity of container will be calculated according to the following conditions; weight of container is 2.1 MT/TEU and containerized cargo weight is 9.0 MT/TEU. The annual export number of containers will be equal to imports. The result of which is shown in Table 1-9-1.
- (4) General cargo is unsuitable for unit cargo such as timber, some metal products, others and so on. Import general cargo consists of 40% of iron & steel, 40% of transportation equipment & machine and others. Export general cargo consists of approximate 250,000 MT of banana, timber and others.

179. Based on the above, the cargo volume by packing type through the port of Cortes will be estimated and the results are shown in Table 1-9-2, 1-9-3 and 1-9-4, a summary of which is given below.

(Unit : Thousand MT)

	Liquid bulk	Dry bulk	Unit cargo	General cargo	Total
In 1992	646	353	1,301	509	2,809
In 2000	653	703	1,841	443	3,630
In 2010	1,001	958	2,515	595	5,069

## Chapter 2 Port Sector in Future

### 2.1 Basic Direction of Future Port Development

180. Major roles of ports are to support national economy through providing means to take in various commodities necessary to people and various industries, and to send out various goods produced in the country. Port also contributes to the national economy through providing a large number of employment opportunities and generating revenues through its activities. In some cases, a port is considered as a very effective tool for regional development, good examples of which are shown in Japan.

181. ENP has several functions such as port operator, administrator, land owner, policy planner/advisor and national port investor. ENP employs numbers of workers for cargo handling as well as terminal operation. For the operational function, efficiency and security are the key words. Issuing licenses and allocating berths are examples of administrative/managerial function. Administrative/managerial function should be based on fairness and transparency and has by nature a non-profitable character. ENP owns quite a large area of land. Some of the Free Zones also belong to ENP. Investing function constitutes various processes including planning and designing. It should be well prepared from the view point of a rational national land development plan to support the economic development. The differences of these functions should be clarified.

#### Functions of ENP

- 1) Port Operation, Cargo Handling
- 2) Port Administration/Management
- 3) Land Owner (Free Zone)
- 4) Policy Planner/Advisor
- 5) Port Investor

182. As a port strategy, the very basic necessity is to realize better port service; in other words, a method to provide the ship owner as well as cargo-owner with "fast", "cheap" and "reliable" service. Currently, the promotion of export is the most important target of the national economy in Honduras. The port sector, thus, is expected to support the promotion of export through providing better port service.

183. There are lots more factors to be borne in mind when establishing a port strategy. One of the factors is how to ensure sound management of the ENP. From the view point of land use and regional development planning, the balanced deployment of port function is important. In other words, people should have easy access to necessary goods and have a communication means including transportation wherever they live. Another

factor which should not be overlooked is that ports and port related industries can provide job opportunities. Free Zones should be counted not only as a major origin/destination of cargoes but also as one of the major employers.

184. Environmental consideration is becoming more and more important. Port activities and port related activities should be carefully checked and preventive measures should be taken beforehand if any serious change is expected. There also is a need to take steps to mitigate the effect which accompanies a port development project.

185. Some of the above factors are incompatible. Therefore, prioritization of each factor is necessary. Priority varies from port to port. For instance, priority for the port of Cortes would differ from the port of Lempira where the port is practically the only gate to the people living in its hinterland. For the ports of international trade such as Cortes, the priority should be placed on achieving "better port service". Other factors should be treated as factors which supplement the first priority and the priority among these factors should be decided case by case.

## **2.2 Expected Roles and Functions of Each Port**

186. Port of Cortes, the leading port of Honduras, is situated on the north-south Corridor and playing strategically very important roles. The port faces the Caribbean Sea which brings big benefits of geographical proximity to the United States by shipping. In Central American countries, population centers are located along the Pacific side and, thus, sea gates gather along the Pacific. However, trade of these countries is concentrated along the Gulf Coast and Western Coast of the United States. This brings another big advantage to the port. The port is 50km from San Pedro Sula, the commercial center of Honduras. The time to San Pedro Sula and to Tegucigalpa will be shortened after completion of the road expansion project. At the port of Cortes and San Pedro Sula region, commercial as well as trade functions have been accumulated. In and around San Pedro Sula region as well as the port of Cortes, Zona Libres and other similar areas were established and have remarkably grown to a certain scale. It takes a very long time to achieve a certain level of commercial functions, therefore, the port of Cortes will remain at its leading position for a considerable period of time, presumably to the targeted year of the masterplan (2010). The port needs various functions from container terminal to liquid bulk terminal. This is the port which requires high competitiveness and efficient cargo handling. In this report, therefore, the port of Cortes is treated as such.

187. Port of San Lorenzo is situated on the other end of the north-south corridor. It is actually the only port which can be utilized for international trade in the Pacific Ocean. Currently, the port is suffering from a decrease in cargo volume, however, the

strategic importance of the port can not be overlooked because the Pacific Rim region seems to be the world's development locomotive for the near future. Another advantage for the port is the fact that the port gives the shortest access to the capital where the largest population in Honduras is found. From the view point of import of heavy or large cargoes, the port has the biggest advantage. Of course, cost of import not only depends on the inland transport distance but also other various factors. On the other hand, the port has certain disadvantages. For instance, the 50 km waterway to the port from the Fonseca Bay increases the voyage time by another half day and this breeds hesitation (on the part of shippers). However, the proximity of the port to Tegucigalpa is too advantageous to be overlooked. From this point of view, the port of San Lorenzo is expected to be the gate to Tegucigalpa, especially for bulky cargoes, as well as local areas including Cholteca.

188. Port of Castilla has been developing very rapidly in the past decade. The port has a huge hinterland in Aguan Valley. A large scale development project is foreseen in Paulaya Vally which will also be connected to the port of Castilla. The port is also regarded as a core of regional development. The development of the eastern part of Honduras will be supported mainly by the port of Castilla. The necessary functions at the port will be loading of agricultural products including fruits and discharging of various necessities for agriculture such as fertilizer, pesticides and machines.

189. Port of Tela is located on a very beautiful beach. Currently the port facility is utilized only for unloading petroleum. The pier at the deep part is out of service because it was burnt down by fire. For the moment, ENP has no reconstruction plan, however, Petro-Tela intends to build a new pier mainly for unloading petroleum and for passenger ship. There is an on-going project of large scale touristic development on the west part of the present pier. Keen conflict is reported between the port development group and the tourism development group. The future of the port of the Tela should be decided in the course of discussions and negotiations among them, with a view to finding a way in which the function of the port and the unhindered touristic quality of the area are compatible.

190. Port of La Ceiba used to function as a banana export base before the construction of the port of Castilla. There is an accumulation of commercial and industrial functions which relates to the banana industry. Since the shift of banana export to the port of Castilla, the Municipality of La Ceiba has been trying to pursue another course of regional promotion. One such effort is Zona Libre. ENP has begun to privatize the Zona Libres through selling out. The hinterland farmers are trying to shift to melon and coco to survive. However, none of these measures seems to have a big impact on port function. The most probable role which the port is expected to play is as a logistic base to the Bay Islands. The more the island attract tourists, the more the role of the port as



a logistic base increases. There might be a necessity to introduce a regular ferry line between La Ceiba and French Harbor, Roatan. A private initiative has already been commenced.

191. Port of Lempira is located in the Caratasca lagoon. The port facility at the port is a small scale wooden pier only. The pier must undergo extension every year to maintain the depth because of the sedimentation. The width of the pier is so narrow that there is no room for mechanical cargo handling. There is very limited road access to the region, thus the water transportation is very important. When planning the development of this area, the port of Lempira should play a very important role. All necessary equipment and materials would be transported through the port and the development of the port itself gives large impact on the region.

192. Port of Amapala is located in the Isla de Tigre in the Fonseca Bay and has no land transport means. The port is a life line for the limited number of people living in the island. There is a potential of development for touristic purpose, however, without the development of infrastructure such as an airport, the realization of such development is not easy.

193. The scale of the economy of the Bay Islands is very large compared to its population as well as the dimension of the land. The scale of the economy is far beyond that of the average Honduran economy. The Islands have large potential for touristic development and also for industrial development such as fishing. Thus, the trade between the Islands and the mainland will be strengthened. An increase in international trade is also foreseen in the future. At the moment, practically speaking, there is no public port facility in the Islands.

194. Table 2-1-1 summarizes roles of each port. In the table, the first column gives the names of the ports and the second column and thereafter give the expected roles. In the table, \*\* means strong necessity and \* means fair necessity. Blanks indicate that the role is not expected for the objective port.

Table 2-1-1 Roles of Each Honduran Port

Port	Int'l (A)	Int'l (B)	Cabotage	Tourism	Rgnl
Cortes	**	**	**	*	*
San Lorenzo	**	**			*
Castilla	**		**	*	**
Tela		**		**	
La Ceiba			**		
Lempira			**	*	**
Amapala				*	**
Roatan	*		**	**	

Remarks: 1) Int'l(A) means international trade of various goods and commodities.  
 2) Int'l(B) means international trade of specific goods such as petroleum.  
 3) Rgnl means regional development

## 2.3 Forecast of Vessel Size

### 2.3.1 Present Condition of Calling Vessel Size

195. Table 2-3-1 shows the classification of all calling vessel sizes by type at major Honduran ports of Cortes, Tela, La Ceiba, Castilla and San Lorenzo.

196. According to the table, the share of large size conventional break bulk vessels and lumber carriers (more than 8,001 tons) has remained fairly stable. For the liquid bulk vessels (except oil tankers), reefer container vessels and ordinary container vessels (including ro/ro vessels), it is noted that vessel size tends to increase. But large dry bulk carriers show a declining tendency.

### 2.3.2 Forecast of Vessel Size

197. In this Study, all of the berths in major Honduran Ports, except No.2 berth at Cortes, are regarded as multipurpose berths. Thus, the forecast of vessel size is carried out for the largest calling vessel among all types at each major port in 1992.

198. According to Table 2-3-2, the largest calling vessels in 1992 at Ports of Tela, La Ceiba and Castilla are liquid bulk carriers. At ports of Cortes and San Lorenzo, container (including Ro/Ro vessels) vessels are largest.

199. Although liquid tankers are the largest calling vessels at above three ports (Tela, La Ceiba and Castilla), liquid bulk tanker does not need to be moored at the quay wall. In

addition, the size of oil tanker in near future has been forecasted by the oil companies. For the port of Tela, the size of new jetty and largest calling vessels have already been decided by Petrotela. In this study, the port of La Ceiba is assumed to function as a domestic port and the size of liquid bulk carriers is assumed to be small. For Port of Castilla, since oil companies do not have a plan to handle the oil products, oil carriers need not be included in the Study.

200. At the port of Cortes, Castilla and San Lorenzo, the container vessel (including Ro/Ro vessel) is the largest vessel for the design purpose of the port facilities. Thus, for the planning purpose of the future port facilities, maximum dimensions are derived from the forecast of the future calling container(including Ro/Ro vessel) vessel size.

201. Fig.2-3-1 shows the number of large(more than 8,001 GRT) calling container vessels(including Ro/Ro vessels) at major Honduran ports from 1989 to 1992, and indicates that the number of large calling container vessels(including Ro/Ro vessels) has tended to increase. From Fig.2-3-2, the average size of full container vessels on international routes around Central America also tends to increase.

202. The progress of container vessels can be classified into four generations(see Table 2-3-3). At present, the size of the large container vessels calling Honduran ports represents first or second generation container vessels. Considering the tendency of the number of large container vessels calling Honduran ports and the average size of container vessels on the international routes around Central America, the third generation container vessels, of which capacity is about 2,000 TEUs, will call Honduran ports in the planning period of this project.

203. Based on the above, the maximum sized vessels calling Honduran ports during the planning period of this project are assumed to be of the following dimensions:

DWT: 40,000

LOA: 230 m

Draught: 12 m

(also see Appendix 2)

Table 2-3-1 Rate of Vessel Size to Vessel Type

Year	G.R.T. (ton)	Conventional break bulk	Ro/Ro	Dry Bulk		Liquid Bulk		Lumber Carrier	Refrigerating vessels		(Unit:Percent)
				Ro/Ro	Conventional	Oil Tanker	Others		Container	Conventional	
1989	- 3000	44.5	8.5	32.8	9.0	17.4	60.8	0.0	30.2	19.6	
	3001-8000	13.5	76.4	45.9	23.9	78.3	19.6	10.5	23.8	47.5	
	8001-15000	38.6	8.0	9.8	35.8	0.0	19.6	89.5	46.0	23.2	
	15001-	3.4	7.0	11.5	31.3	4.3	0.0	0.0	0.0	9.7	
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
1990	- 3000	46.1	39.0	29.4	17.2	20.0	60.5	0.0	27.5	39.1	
	3001-8000	19.2	38.6	45.1	17.2	76.7	31.6	21.8	38.2	27.0	
	8001-15000	31.6	5.4	17.6	28.1	0.0	7.9	78.2	34.3	17.1	
	15001-	3.0	16.9	7.8	37.5	3.3	0.0	0.0	0.0	16.7	
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
1991	- 3000	30.9	23.6	27.3	11.5	19.2	60.6	0.4	22.2	34.0	
	3001-8000	27.8	39.1	54.5	13.5	80.8	12.1	9.4	35.5	31.6	
	8001-15000	38.6	5.3	18.2	25.0	0.0	21.2	71.1	42.3	10.7	
	15001-	2.7	32.0	0.0	50.0	0.0	6.1	19.2	0.0	23.7	
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
1992	- 3000	32.8	4.6	29.8	23.9	20.5	73.5	0.0	26.6	23.9	
	3001-8000	24.1	45.6	53.2	16.4	61.5	8.8	0.3	29.6	38.8	
	8001-15000	40.2	5.8	10.6	14.9	7.7	17.6	74.6	43.8	11.3	
	15001-	2.9	44.0	6.4	44.8	10.3	0.0	25.1	0.0	26.0	
	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Source: Data from ENP

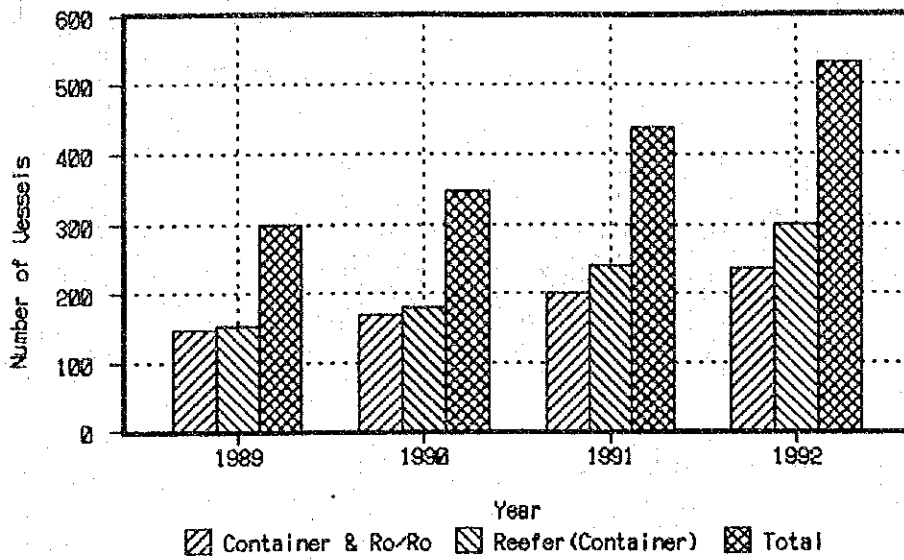
Table 2-3-2 Largest Vessels by Vessel Type at Major Honduran Ports in 1992

PORT	TYPE OF VESSEL	NAME OF VESSEL	GRT (TONS)	NT (TONS)
CORTES	CONVENTIONAL CARRIER	KOLPIO	15893	9209
	DRY BULK CARRIER	ESCORPO	6042	4111
	CRUDE OIL TANKER	DESTINY	23333	8420
	REFRIGERATED BANANA	SNOW DRIFT	14222	5053
	BANANA LO-LO	COURNEY I.	19595	5878
	TIMBER VESSEL	FANTASTICO	986	541
	CONTAINER VESSEL	ROSA BLANCA	33047	-
	ROLL-ON AND ROLL-OFF	SEABOARD AMERICA	15375	6022
TELA	CRUDE OIL TANKER	LIVER EXPLOREP	22733	13783
	OIL TANKER	FUJI BRAVES	6401	3607
	REFRIGERATED BANANA	AKADEMIK BOCHVAR	8960	3339
LA CEIBA	CONVENTIONAL CARRIER	RAVENS	1536	810
	OIL TANKER	FUJI BRAVES	6401	3607
	CHEMICAL TANKER	GOLDEN WORLD	4409	2286
	PASSENGER VESSEL	POLARIS	2214	1049
	BALLAST VESSEL	HIBISCUS	30	25
CASTILLA	CONVENTIONAL CARRIER	STELLA LIKES	15949	11559
	DRY BULK CARRIER	KRISTIANIAF JORD	17188	10486
	CRUDE OIL TANKER	DESTINY	23333	8420
	OIL TANKER	PERSEVERANCE	22607	13117
	REFRIGERATED BANANA	SNOW DRIFT	14222	5053
	BANANA LO-LO	FRANCIS L.	19595	5878
	CHEMICAL TANKER	GOLDEN WORLD	4409	2286
	PASSENGER VESSEL	POLARIS	2214	1049
SAN LORENZO	CONVENTIONAL CARRIER	SUNNY OCEAN	17150	9913
	DRY BULK CARRIER	AQUARIO	6597	4357
	MOLASSES TANKER	FUJIHOSHI	8457	5466
	TIMBER VESSELS	RADOM	11572	6179
	CONTAINER VESSEL	NEDLLOYD BARCELONA	13176	8674
	ROLL-ON AND ROLL-OFF	KENTOCKY HIGHWAY	50320	15781

Source: Data from ENP

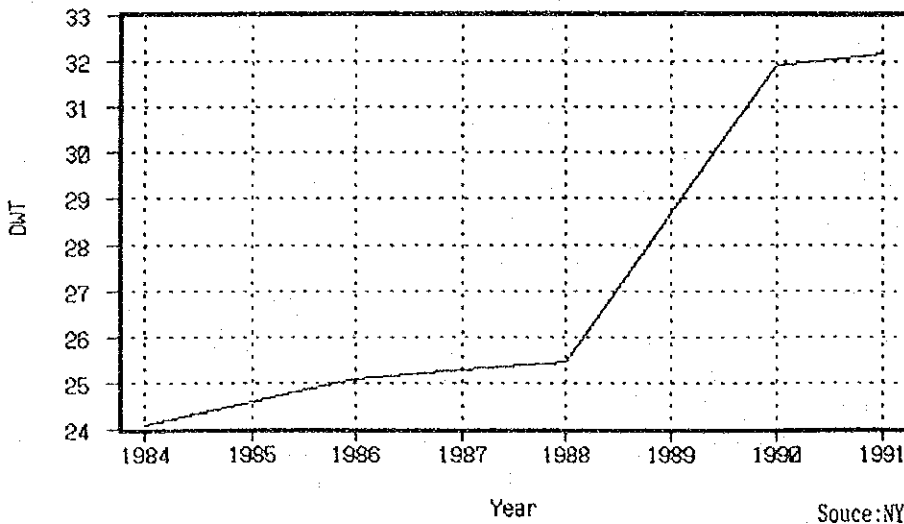
Table 2-3-3 Progress of Container Vessels

Generation	First Generation	Second Generation	Third Generation	Fourth Generation
Container Vessel	Mainly converted ships with on-board cranes.  Up to about 15,000DWT.	Purpose-built ships 700-1,500 TEU capacity.  15,000DWT - 35,000DWT	Purpose-built ships over 2,000 TEU Capacity.  35,000DWT - 45,000DWT	Purpose-built ships over 3000 TEU Capacity.  45,000-DWT-55,000-DWT



Source: Data from ENP

Fig. 2-3-1 Number of Large Container Vessels (more than 8001 GRT) at Honduran Ports



Source: NYK

Fig. 2-3-2 Average Size of Full Container Vessels on International Routes around Central America

## 2.4 Evaluation of Current Port Capacities and its Implications

204. Capacity of a port terminal is determined by several factors such as facilities, equipment and cargo handling operations and thus, varies from terminal to terminal. In this Chapter, capacities of present port terminal and degree of congestion at each port are evaluated through port statistics, the Study Team's own observation and other relevant data.

205. Conditions of current port facilities are summarized in Chapter 2, PART I and items to be improved are outlined in Chapter 1, PART III. In Chapter 1, PART III, reconstruction of the pier at the port of Tela and wharf No. 2 of the port of Cortes are mentioned. Petro Tela has a plan to construct a new pier for their oil handling and this replaces the present pier at the port of Tela. Concerning wharf No. 2 of the port of Cortes, several private companies are showing an interest in constructing a new terminal at the same location for dry bulk cargoes such as cement, fertilizer and grain.

206. There are some other on-going or planned port projects in Honduras. They are;

- 1) Construction of new terminal mainly for domestic shipping at La Ceiba (under construction).
- 2) Installation of petroleum import facilities at San Lorenzo (private initiative by Petro Sur)
- 3) Construction of new port at Coxen Hole, Roatan Island.

207. There is another project necessary to realize the port strategy described in 2.1. It is;

- 1) New jetty with cargo handling equipment at Lempira for domestic shipping.

208. Possible future obstacles are foreseen at the port of Cortes. They are;

- 1) Areal limitation curbs the smooth flow of cargo movement. The areal consideration should be borne in mind when establishing future port development plan.
- 2) The capacity of road access to/from the port is reaching its limit. The access road should be widened or another access should be constructed. The solution of this problem does not rest solely with ENP; close coordination with the municipalities is needed.

209. In addition to the items mentioned above, there may be some other problems based on an analysis of the port statistics. Table 2-4-1 shows the statistics of large vessels

which called at the port of Cortes in 1992. In the table, No. means the number of vessels which belong to the vessel class of GRT larger than 15,001 ton. GRT and LOA are obtained by averaging all vessel sizes and vessel lengths belonging to the class. The draughts are calculated by using the Team's study result for container vessels and Technical Standard for Port and Harbor Facilities in Japan. From the table, the followings are noted;

- 1) Although wharves No.4 and No.5 are counted as two berths each for this study, the wharves are at times unable to accommodate two large vessels (especially, container vessel and Ro-Ro Vessel) simultaneously because of insufficient length.
- 2) Some of the reefer container vessels and dry bulk vessels which berth at wharf No.4 can not enter the port with full draught. The possible enlargement of the vessels of these types in the future may require the deepening of the berth.
- 3) Wharf No.1 may be a little shallow to accommodate oil tankers.

Table 2-4-1 Calling Vessel Size at the Port of Cortes

Ship type	No.	GRT(t)	LOA(m)	Draught(m)
Conventional	3	21,462	185	10.3
Dry Bulk	2	16,522	186	9.5
Oil Tanker	28	23,318	216	9.9
Other Liquid	3	17,654	174	9.0
Lumber Carrier	1	10,946	167	8.3
Reefer(Container)	75	19,595	203	9.5
Reefer(Convetional)	71	9,943	152	8.3
Container	49	27,668	200	11.0
Ro-Ro	103	15,528	185	Approx. 8.5

210. Table 2-4-2 shows the typical large calling vessel size at the ports of Castilla and San Lorenzo in 1991. From the table, it is noted that the berth dimensions both at the ports of Castilla and San Lorenzo are sufficient to accommodate calling vessels except RO-RO vessel at the port of San Lorenzo. (The draughts of RO-RO vessels, in general, considerably scatter and it is rather difficult to predict the draughts of the RO-RO vessels from GRT or LOA. However, the Team didn't hear of a depth problem at the port)



Table 2-4-2 Calling Vessel Size at the Port of Castilla and San Lorenzo

Ship type	No.	GRT(t)	LOA(m)	Draught(m)
---Castilla---				
Reefer (Container)	56	8,368	144	7.0
Reefer (Conventional)	24	10,185	153	8.3
---San Lorenzo---				
Conventional	6	15,300	161	9.3
RO-RO	7	35,680	166	7.9

211. There is no wharf exclusively used for domestic shipping except the port of Trujillo. Especially, in the port of Cortes, domestic vessels are using small niches of wharves between large ocean-going vessels, thereby hindering the efficiency of the port. The port seems to be much busier than it appears in the port statistics.

212. Apart from the above examination of port capacity, the following is a trial to quantify the maximum capacity of port terminals and present port congestion.

The premises for evaluation of maximum port capacity are as follows;

- 1) The port of Cortes
  - a. Liquid bulk cargoes are evaluated separately.
  - b. Wharves No.4 and 5 are counted as two berths each.
  - c. Wharves No.3, 4 and 5 accommodate all types of cargoes except liquid bulk.
- 2) Other ports
  - a. Castilla has only one berth.
  - b. San Lorenzo has two berths.
  - c. Major use of the port of Tela is for petroleum with limited and occasional use by various ships.
  - d. The port of La Ceiba has almost stopped operation in so far as sizable vessels are concerned.
- 3) General
  - a. The cargo handling efficiency is assumed constant at the current level.

213. Table 2-4-3 shows the ship berthing time at each port. In the table, total berth time means the yearly total time which ships occupy berths. Then occupancy rates are

calculated while the ports are assumed to operate 350 days, 24 hours a day. Table 2-4-4 lists the recommended maximum berth occupancy rate calculated by UNCTAD, at which rate no significant congestion takes place in ports (Port Development, A handbook for planners in developing countries; United Nations Conference on Trade and Development).

214. From these tables, it is noted that occupancy rate for the port of Cortes is 71% which exceeds the recommended maximum rate of 65% for five berths. This implies that the port is operating at its full capacity. It may be a slight exaggeration to say that the cargoes in the port of Cortes are not very time-conscious, but it is more or less based on fact. Time-conscious cargoes such as containers of fruits and meat are given priorities, and thus the port evades the potential complaints from shipper's side.

The rate for Castilla (54%) also exceeds the maximum rate for one berth (40%). The majority of calling ships at the port of Castilla belong to United Fruits Company and arranging the calling schedule is rather easy, which keeps the occupancy rate high.

The port of San Lorenzo shows a low occupancy rate and is judged to have little more spare capacity.

In short, the ports of Cortes and Castilla are operating beyond their full capacities and the port of San Lorenzo has extra capacity.

Table 2-4-3 Total Ship Berthing Time at Each Port

Ports	berth No.	Total berth time(h)	Occupancy rate(%)
Cortes	5	29,680	71
Castilla	1	4,553	54
San Lorenzo	2	3,191	19
La Ceiba	-	335	4
Tela	-	1,449	17

Note: excluding liquid cargo terminal.

Source: ENP, modified by the Study Team

Table 2-4-4 Recommended Maximum Berth Occupancy

Number of Berths in the Group	Recommended Maximum Berth Occupancy (%)
1	40
2	50
3	55
4	60
5	65
6	70

Note: Costs for ship and port are assumed to be 4 to 1.

Source: UNCTAD

215. Another method to evaluate the port capacity is to apply standard cargo volume handled annually per unit quay length. For break bulk cargo, 1,000 tons per one meter is commonly used. From Table 2-5-10 on page 2-101, Chapter 2, PART I, the efficiency of dry bulk cargo handling in the port of Cortes is higher than that of general cargoes. Thus, 1,500 tons per meter is assumed for the handling efficiency of dry bulk cargoes. For unit cargoes (container and RO-RO cargoes), 4,500 tons per one meter would be adopted after a similar consideration. From the 1992 port statistics, the cargoes handled at each port are summarized as in Table 2-4-5. In Table 2-4-6, the required berth lengths are calculated. For the port of Cortes, 1,038m of berth length is needed while the actual berth length is 849m. Here, again, the berth length is a little less than ideal. For the port of Castilla, 191m for total berth length is obtained while the actual length is 150m. The port of San Lorenzo still has considerable receiving capacity.

216. In total, it can be said that the ports of Cortes and Castilla are operating at their full capacities. It should also be borne in mind that wharf No. 3 of the port of Cortes was constructed in 1955, and by the year 2010 it will become superannuated.

Table 2-4-5 Cargo Volume Handled at Each Port

Unit: 1,000ton

Port	General	Liquid	Dry bulk	Unit
Cortes	530,605	621,731	313,696	1,343,281
Castilla	82,939	8,532	430,545	430,545
San Lorenzo	75,913	7,720	29,362	29,362

Note: 1) Liquid cargoes include petroleum and molasses.

2) Dry bulk cargoes include wheat, fertilizers, cement and bulk minerals

3) Unit cargoes include container and RO-RO cargoes.

Source: ENP, modified by the Study Team

Table 2-4-6 Calculated Wharf Length

	General	Dry bulk	Unit	Total	Actual
Cortes	530m	209m	299m	1,038m	849m
Castilla	83m	12m	96m	191m	150m
San Lorenzo	76m	12m	7m	95m	295m

(Conversion 1,000t/m 1,500t/m 4,500m/t)

## 2.5 Required Berths and their Dimensions at Each Port in 2010

217. The results in this section are obtained very roughly for the purpose of berth length and water depth requirements. The volume of unitized cargoes will be almost doubled even under Scenario 1, and this reveals the shortage of land area in the port and justifies constructing a new terminal with sufficient land area for unitized cargoes. The detailed evaluation on this matter is mentioned in Chapter 3 of PART III.

218. Table 2-5-1 and Table 2-5-2, which are simplified from Table 1-7-8 and 1-7-9, Chapter 2, PART II, list the future cargo volume by Scenario 1 and Scenario 2, respectively, for the ports of Cortes, Castilla and San Lorenzo. By applying the standard cargo volumes per unit berth length, required berth lengths are roughly calculated as shown in Table 2-5-3.

219. By comparing Table 2-5-3 with present berth length, it is understood that the ports of Cortes and Castilla will be short in berth length under both Scenario 1 and Scenario 2. The shortage is most remarkable for the port of Castilla where the berth length should be doubled for Scenario 1 and almost tripled for Scenario 2. For the port of Cortes, a drastic change in cargo handling practice would occur such as exclusive use of some types of cargoes. Through these changes in terminal operation, the efficiency improvement would somewhat contribute to ease the berth shortage, however, the calculation results indicate that these ports need further investment in facilities by the year of 2010.

220. For the planning purpose, the change in the dimensions of calling vessel sizes should be taken into consideration. As mentioned in paragraph 203, the maximum calling vessel size at Honduran ports is expected to be 40,000 GRT. Taking into consideration the frequency of ship calls of this vessel, it is reasonable to use this vessel type only for planning of the port of Cortes.

221. For the port of Cortes, the cargo volume may reach a certain level at which it is prudent to consider the possibility of terminals for exclusive use, say, a unit cargoes terminal and dry bulk terminal. Two alternatives are shown in the paragraphs below.

222. The first alternative is to add a new dolphin to the dry bulk terminal. The port of Cortes handles various bulky cargoes such as wheat and fertilizer for import and sugar and minerals for export. With the increase in volume of these dry bulk cargoes as well as the intensification of demand for more efficient cargo handling operation, the construction of a new bulky terminal will be justified (case 1).

223. Another alternative is to assume that the new terminal is not realized. The total wharf length is obtained by simply summing up each necessary length for general cargo, unitized cargo and dry bulk cargo. This is the cargo handling practice similar to the present one. (case-2).

224. The domestic cargo volume handled at the ports of Cortes and Castilla will reach the level of 100 thousand tons: This requires additional length of wharves at the ports.

225. As mentioned above, many of the Honduran ports need a certain amount of investment by the year 2010. The required berth lengths are calculated based on the forecasted cargo volume for 2010, by utilizing the standard cargo volume handled per unit berth length.

226. The following is a summary of the investment required for Honduran ports by the year of 2010. The dimensions of each berth are assumed, only for rough cost estimation

purpose from the future calling ship size in 2. 3 as follows;

- 1) At the port of Cortes, unit cargo terminals with water depth of minus 13m are needed. A berth with this depth requires a berth length of 250m. (For the moment, however, the water depth can be minus 12m) The other multi-purpose terminals need water depth of minus 10m. The corresponding berth length should be 185m.
- 2) The dry bulk terminal at the port of Cortes is expected to be a dolphin type structure with water depth of minus 10m.
- 3) The water depth of the expanded wharf at the port of Castilla will be minus 10m and the berth length will be 185m.
- 4) The water depth of the domestic terminal at the ports of Cortes and Castilla is assumed as minus 4.5m. The necessary length was obtained by applying the same standard cargo volume handled per unit length, 1,000 ton/m.

----- The port of Tela -----

1) Construction of a new jetty (Probably private investment)

Note: The site might be transferred to the vicinity of Pier No.1 (Texaco Berth), the Port of Cortes. <sup>1/</sup>The cost shown in Section 2.3 is a tentative one.

----- The port of La Ceiba -----

1) Construction of the new domestic terminal

----- The port of Castilla -----

1) Expansion of wharf

Cargo Demand	Facility	Quantity	Dimensions	Remarks
Scenario 1	Multi Purpose	1	-10m x 185m	
Scenario 2	Multi Purpose	2	-10m x 185m x2	

2) Construction of a new domestic terminal ( -4.5m x 100m )

----- The port of Lempira -----

1) Construction of new jetty for domestic trade

----- Roatan -----

1) Construction of new terminal at Coxen Hole

----- The port of San Lorenzo ---

No new terminal needed

---

<sup>1/</sup>Due to the excellent circumstance of the beach suitable for sight-seeing spot, installation of port facilities is controversial in the community. Since there are some projects on going to attract tourists, transferring to Texaco Berth might be a solution.

----- The port of Amapala -----

No new terminal needed

----- The port of Cortes -----

1) Improvement/maintaining of present facilities

Facilities	Items	Quantities	Dimensions	Remarks
Wharf No.4	Deepening	1	-10.0m x 347m	depth -8.6m

2) Construction of new facilities

[ Scenario 1 ]

Option	Items	Quantity	Dimensions	Remarks
Case-1	Unit Cargo	1	-12m x 250m	
	Dolphin	1	-10m	
Case-2	Unit Cargo	1	-12m x 250m	
	Multi purpose	2	-10m x 185m x 2	

[ Scenario 2 ]

Options	Items	Quantity	Dimensions	Remarks
Case-1	Unit Cargo	2	-12m x 250m x 2	
	Multi purpose	1	-10m x 185m	
	Dolphin	1	-10m	
Case-2	Unit Cargo	2	-12m x 250m x 2	
	Multi purpose	3	-10m x 185m x 3	

3) Construction of a new domestic terminal ( -4.5m x 200m )

4) Construction of a new by-pass road to/from the port.

5) Construction of a new port road in NO.5 terminal.

\* The areal limitation could hinder the port efficiency and another measures including a construction of new terminal might be needed to solve this problem.



Table 2-5-1 Future Cargo Volume at Each Port in 2010 (Scenario 1)

unit: 1,000ton

	Total	General	Liquid	Dry bulk	Unit
Cortes	4,400	400	950	750	2,300
Castilla	900	120	30	60	690
San Lorenzo	750	50	560	20	120

Table 2-5-2 Future Cargo Volume at Each Port in 2010 (Scenario 2)

unit: 1,000ton

	Total	General	Liquid	Dry bulk	Unit
Cortes	5,900	550	1,400	1,100	2,950
Castilla	1,250	180	50	110	910
San Lorenzo	1,050	70	770	40	170

Table 2-5-3 Necessary Berth Length at Each Port

unit: 1,000ton

	Present (m)	In 2010 Total (m)	General	Dry bulk	Unit
Cortes	849	1,411-1,873	400-550	500-667	511-656
Castilla	150	313- 455	120-180	40- 73	153-202
San Lorenzo	295	90- 135	50- 70	27	27- 38

## 2.6 Amount of Investment in Major Facilities by 2010

### 2.6.1 Preconditions

227. In this section, the amount of investment in major port facilities by 2010 is roughly estimated. The preconditions of estimation are as follows:

- 1) The costs of civil works are estimated based on past similar projects. The relevant reference data obtained from ENP are:

Cortes: Apron Widening Project of the Wharf No. 3 in 1984  
Construction Project of the Wharf No. 5 in 1975  
Improvement of the Yard No. 11 in 1993  
Extension Project of the Wharf No. 5 in 1993

La Ceiba: New Port under construction in 1991

Roatan: New Jetty under construction in 1992

- 2) Prices of the above projects are converted to the 1993 price level based on price indexes calculated by the Central Bank of Honduras. Price indexes of civil works are calculated as follows:

1993/1975=3 times

1993/1984=2 times

- 3) Rents or compensation for land and/or fishing activities are excluded.
- 4) Inflation factor is excluded from the estimation.
- 5) Exchange rate of US\$ against Honduran Lempira (LP) is 1 US\$=5.85Lps.
- 6) The following ratios of utilities for each facility are adopted:

Facilities	Utilities
Wharf/Dolphin	4%
Dredging/Reclamation	0%
Container Yard	6%
Yard/Road	4%
C.F.S/Warehouse	8%

- 7) Engineering and site survey fees are estimated at 5% of the total cost.
- 8) Physical contingency is excluded from the estimate.
- 9) As for La Ceiba and Roatan, the new ports are under construction and their costs are based on the costs of constructions under progress.

## 2.6.2 Dimensions of the Facilities

228. Dimensions of the facilities are as follows:

[New Facilities]

- 1) Cortes
  - a. Unit Cargo Berth 12m (Depth) x 250m (Length)
  - b. Dry Bulk Terminal
    - Loading Dolphin 10m (Depth) x 73m (Length)
    - Trestle 150m (Length) x 12m (Width)
  - c. Multi Purpose Terminal 10m (Depth) x 15m (Length)
- 2) Tela/Cortes (New jetty for oil)
  - a. Loading Platform with Two Mooring Dolphins 12m (Depth) x 100m (Length)
  - b. Trestle 680m (Length) x 12m (Width)
- 3) La Ceiba (under construction)
  - a. Wharf 6m (Depth) x 207m (Length)
  - b. Two Breakwaters 900m (Length)
  - c. Dredging 575,000 cu.m
- 4) Castilla
  - a. Multi Purpose Wharf 10m (Depth) x 185m (Length)
  - b. Domestic Cargo Wharf 4.5m (Depth) x 100m (Length)
- 5) Lempira
  - Jetty 4.5m (Depth) x 50m (Length)
- 6) Roatan (under construction)
  - Jetty 11m (Depth) x 90m (Length)

[Buildings and Yards]

Cortes

- a. Container Freight Station 40m (Length) x 100m (Width)
- b. Container Yard 40,000sq.m
- c. Warehouse 30m x 160m

[Others]

Cortes

- a. Domestic Cargo Terminal 4.5m (Depth) x 200m (Length)
- b. By-Pass Road (Length = 1,350m)
- c. Port Road (Length = 550m)
- d. Dredging of Wharf No. 4 up to 10m depth 27,000 m<sup>3</sup>

229. Alternative plans for the Port of Cortes by 2010 are prepared as described in Section 2.5, Chapter 2, and scenarios and cases of the Port of Cortes are summarized as below:

	Senario 1 Case 1	Senario 1 Case 2	Senario 2 Case 1	Senario 2 Case 2
Unit Cargo Wharf (-12)	(1B) 250m	(1B) 250m	(2B) 500m	(2B) 500m
Dry Bulk Terminal (-10)	(1B) Dolphin 73m	-	(1B) 73m	-
Multi-Purpose Wharf (-10mx185m)	-	(2B) 370m	(1B) 185m	(3B) 555m
Buildings and Yards	Container Freight 4,000m <sup>2</sup> Station/Container Yard 8,000m <sup>2</sup>	ditto	ditto	ditto
	-	Warehouse 4,800m <sup>2</sup>	ditto	ditto
Others	Domestic Cargo Terminal By-Pass Road (L=1,350m) Port Road (L=550m) Dredging of Wharf No.4	ditto	ditto	ditto

230. The scenarios for the Port of Castilla are as follows:

	Senario 1	Senario 2
Multi-Purpose Wharf (-10m)	(1B) 185m	(2B) 370m
Others	Domestic Cargo Wharf (-4.5m) (L=100m)	ditto

### 2.6.3 Cost Estimate

231. The construction cost of each item is calculated based on the previous data, and the results are as follows:

[New Facilities]

(Unit: 1000 Lps)

1) Cortes	
a. Unit Cargo Wharf (1 Berth Length = 250m)	95,034
b. Dry Bulk Terminal (1 Berth Length = 73m)	28,175
c. Multi Purpose Terminal (1 Berth Length = 185m)	57,269
d. Domestic Cargo Terminal (Wharf Length = 200m)	15,257
2) Tela (new jetty for oil)	
Loading Platform and Dolphins	25,774
Trestle	18,360
3) La. Ceiba (under construction)	48,000
4) Castilla	
Multi Purpose Terminal (1 Berth Length = 185m)	41,766
Domestic Cargo Wharf (Wharf Length = 100m)	4,887
5) Lempira	2,444
6) Roatan (under construction)	15,000

[Buildings and yards] (unit: 1,000 Lps)

Cortes

a. Container Freight Station	8,000
b. Container Yard	5,200
c. Warehouse	8,640

[Others]

Cortes

(unit: 1,000 Lps)

a. Domestic Cargo Terminal	15,257
b. By Pass Road	8,233
c. Port Road	486
d. Dredging of Wharf No.4	351

Total of Others 24,327

2.6.4 Amount of Investment by 2010

232. Based on the estimation results, the investment amount for port is summarized as follows (Refer to Appendix-A, Volume II, for further details)

(Unit: 1000 Lps)

a. Cortes	Scenario 1	Case 1	161,000
		Case 2	256,000
	Scenario 2	Case 1	322,000
		Case 2	419,000
b. Tela			49,000
c. La Ceiba			48,000
d. Castilla	Scenario 1		51,000
	Scenario 2		97,000
e. Lempira			3,000
f. Roatan			15,000

233. From the above calculation results, it is noted that the total amount of investment for major port facilities is in the range of 330 - 630 million Lempiras.

## 2.7 Amount of Investment in Cargo Handling Equipment by 2010

234. In this report, necessary equipment and its capacity is calculated very roughly. Only basic equipment is treated here and its capacity is examined by utilizing similar cases in Japanese ports.

235. Necessary equipment is divided into two categories: renewal of present equipment and construction/purchase of new equipment. The following lists these categorized items:

### 1) Renewal of equipment

Inventory of cargo handling equipment is listed in Chapter 2, Part I (2. 5 Cargo handling System).

### 2) Installation of new facilities and/or purchase of new cargo handling equipment

#### [Port of Cortes]

#### a. Unit cargo terminal(per one berth)

Two gantry cranes, 5 straddle carriers, 10 trailer heads

#### b. Dolphin for dry bulk cargoes:

A crane with accessory equipment

#### c. Multi purpose terminal(per one berth):

Forklifts 4t x 4, 7t x 2

#### d. Domestic terminal:

Forklift 4t x 2

#### [Port of Tela/Cortes]

#### a. Petroleum pier:

Pipe line system

#### [La Ceiba]

#### a. Domestic terminal:

Mobile crane 50t x 1, Forklifts 2t x 1, 4t x 1

#### [Castilla]

#### a. Multi purpose terminal(per one berth):

Cranes 35 t x 1, Trailer heads x 5

#### b. Domestic terminal:

Forklift 4t x 1

#### [Lempira]

#### a. Domestic jetty:

Mobile crane 25t x 1, forklift 2t x 1



[Roatan]

a. T-type jetty

Mobile crane 25t x 1, forklifts 2t x 1, 4t x 1

236. Total amount of investment by the year 2010 is calculated separately for the renewal of present equipment and the purchase of new cargo handling equipment. The calculation process is shown in Table 2-7-1, Table 2-7-2, Table 2-7-3, and Table 2-7-4. The premises are as follows:

- 1) For the renewal of present fleet of cargo handling equipment, it is assumed that the life span for cranes, including gantry, is 15 years and 8 years for other equipment. Therefore, equipment is replaced every 15 years or 8 years.
- 2) Among the machines which have already exceeded their above mentioned service lives, half of them are replaced in 1994.
- 3) Equipment prices are expressed in 1993 constant price.
- 4) At this time, the schedule for purchase of new cargo handling equipment has not been drawn. Therefore, replacement of this equipment is not considered in this report.
- 5) The price of each item of equipment is based on interviews with Japanese makers and converted to Lps from yen ( conversion rate is assumed as 18.8 yen per lempira).

237. From Table 2-7-1, Table 2-7-2, Table 2-7-3 and Table 2-7-4, the following tables are obtained. From the following tables, it is noted that for renewal purposes, some 240 million Lps will be required and some 150 ~ 325 million Lps will be required for purchasing new equipment. In total, by the year 2010, Honduran port sector needs some 470 ~ 680 million Lps for cargo handling equipment, which includes various costs.

[Scenario 1]

(in thousand Lps)

Port	Option	Renewal	New Purchase	Total Investment
Cortes	Case 1	193,040	173,040	366,080
	Case 2	193,040	127,000	320,040
Castilla		14,230	5,870	20,000

[Scenario 2]

(in thousand Lps)

Port	Option	Renewal	New Purchase	Total Investment
Cortes	Case 1	193,040	297,520	490,560
	Case 2	193,040	251,480	444,520
Castilla		14,230	11,500	25,730

[All Ports]

1) Renewal Investment (in thousand Lps)

Cortes	:193,040
Castilla	: 14,230
San Lorenzo	: 29,320
<u>Total</u>	<u>:236,590 (rounded 240,000)</u>

2) New Investment (in thousand Lps)

Cortes	:127,000 ~ 297,520
Tela	: 8,200
La Ceiba	: 4,220
Castilla	: 5,870 ~ 11,470
Lempira	: 1,750
Roatan	: 2,020
<u>Total</u>	<u>:149,060 ~ 325,180 (rounded 150,000 ~ 325,000)</u>

3) Grand Total(assuming 20% for other costs)

:470 - 680 million Lps

Table 2-7-1 Renewal Investment for the Port of Cortes

Unit: 1,000Lps

[Port of Cortes]	Present No. Year	Reinvestment No. Year	Time	Quantity	Unit Price	Total Cost
Large Crane	1	1978		2	45,000	90,000
For Container						
Gantry Crane	1	1978		2	45,000	90,000
Toplifter	1	1992		2	2,300	4,600
Straddle carrier	1	1984	2010	3	4,700	14,100
Tractor head	7	1992	2008	2	700	9,800
Tractor head	2	1990	2006	2	700	2,800
Tractor head	4	1984	2002 2010	3	700	4,200
Tractor head	3	1980	2002 2010	3	700	4,200
Tractor head	9	1978	2002 2010	3	700	8,400
Chassis	35	-	2002 2010	3	100	10,500
Other Cranes						
Mobile crane 125t	1	1979		2	8,500	17,000
Mobile crane 22t	1	1990		1	1,300	1,300
Mobile crane 40t	1	1979	2009	2	2,600	5,200
Mobile crane 25t	1	1969		2	1,600	0
Mobile crane 15t	2	1974	2009	2	1,100	2,200
Others						
Forklift 1.5t	1	1970		0	100	0
Forklift 1.5t	4	1977	2002 2010	3	100	600
Forklift 1.5t	3	1980	2002 2010	3	100	600
Forklift 1.5t	7	1990	2006	2	100	1,400
Forklift 2.0t	1	1977		0	150	0
Forklift 3.0t	2	1980	2002 2010	3	200	600
Forklift 3.0t	6	1990	2006	2	200	2,400
Forklift 4.0t	4	1980	2002 2010	3	270	1,620
Forklift 4.0t	2	1985	2002 2010	3	270	810
Forklift 4.0t	11	1985	2002 2010	3	270	4,860
Forklift 7.5t	1	1969		0	350	0
Forklift 7.5t	1	1975	2002 2010	3	450	1,350
Forklift 7.5t	2	1980	2002 2010	3	450	1,350
Forklift 7.5t	2	1984	2002 2010	3	450	1,350
Forklift 7.5t	2	1990	2006	2	450	1,800
Total Amount						193,040

Table 2-7-2 Renewal Investment at the Port of Castilla

[Castilla]

Unit: 1000Lps

	Present		Reinvestment		Time	Quantity	Unit Price	Total Cost	
	No.	Year	No.	Year					
Wheel loader	1	1985	1	1994	2002	2010	3	1,600	4,800
Tractor head	1	1980	1	1994	2002	2010	3	730	2,190
Chassis	4	1985	4	1994	2002	2010	3	100	1,200
Chassis	1	1983	1	1994	2002	2010	3	100	300
Mobile crane 20t	1	1985	1	2000			1	1,300	1,300
Mobile crane 35t	1	1985	1	2000			1	2,100	2,100
Forklift 3.5t	1	1980	1	1994	2002	2010	3	240	720
Forklift 4.0t	2	1985	2	1994	2002	2010	3	270	1,620
<b>Total Amount</b>									<b>14,230</b>

Table 2-7-3 Renewal Investment at the Port of San Lorenzo

[San Lorenzo]

Unit: 1000Lps

	Present		Reinvestment		Time	Quantity	Unit Price	Total Cost	
	No.	Year	No.	Year					
Tractor head	2	1978	2	1994	2002	2010	3	730	4,380
Chassis	5	1978	5	1994	2002	2010	3	100	1,500
Top-lifter 40t	1	1984	1	1994	2002	2010	3	2,300	6,900
Forklift 3.0t	3	1978	3	1994	2002	2010	3	200	1,800
Forklift 4.0t	2	1985	2	1994	2002	2010	3	270	1,620
Forklift 7.5t	1	1978	1	1994	2002	2010	3	440	1,320
Mobile crane 30t	1	1973	1	1994	2009		2	1,900	3,800
Wheel loader 4t	1	1982	1	1994	2002	2010	3	1,600	4,800
Wheel loader 4t	1	1990	1	1998	2006		2	1,600	3,200
<b>Total Amount</b>									<b>29,320</b>

Table 2-7-4 Purchase Cost of New Cargo Handling Equipment

Ports	Terminal	Equipment	Unit: thousand Lps		Remarks
			Unit Price	Total Amount	
Cortes	Unit Cargoes	Gantry Crane	45,000	2	122,500 Per one berth
		Saddle Carrier	4,700	5	90,000
		Tractor head	700	10	23,500
		Chassis	100	20	7,000
	Dry Bulk	Bridge Type Crane	50,000	1	2,000
	Multi Purpose	Forklift 7.5t	450	2	50,000
	Domestic	Forklift 4t	270	4	1,980 Per one berth
		Forklift 4t	270	2	900
Tela		Pipe Line System	4,100	2	1,080
La Ceiba		Mobile Crane 50t	3,800	1	540
		Forklift 4t	270	1	270
		Forklift 2t	150	1	150
Castilla	Multi Purpose	Tractor Head	700	5	5,600 Per one berth
		Mobile Crane 35t	2,100	1	3,500
		Forklift 4t	270	1	2,100
		Forklift 2t	150	1	270
Lempira	Domestic	Forklift 4t	270	1	270
		Mobile Crane 25t	1,600	1	1,750
		Forklift 2t	150	1	1,600
Roatan	Domestic	Mobile Crane 25t	1,600	1	150
		Forklift 4t	270	1	2,020
		Forklift 2t	150	1	1,600

## 2.8 Investment Priority and Related Issues

238. Overall investment required for Honduran port sector is summarized as follows:

Unit: 1,000 Lps

	Major Facilities		Equipment		Total Rounded	
a. Cortes	161,000	256,000	439,296	384,048	600,300	640,000
	322,000	419,000	588,672	533,424	910,700	952,400
b. Tela	-	49,000	-	9,840	-	58,800
c. La Ceiba	-	48,000	-	5,064	-	53,100
d. Castilla	51,000	97,000	24,120	25,730	75,100	122,700
e. Lempira		3,000		2,100		5,100
f. Roatan		15,000		2,424		17,400

Note: The upper row for Cortes and Casitilla indicates Scenario 1 and the lower row Scenario 2.

The costs of equipment include 20% extra.

239. Future investment in Honduran ports is required for the following reasons:

- 1) Increase of cargo volume, especially import cargoes  
---> New berths (Cortes and Castilla)
- 2) Rapid progress of cargo unitization including container  
---> Unit cargo terminal (Cortes)
- 3) Increase of petroleum import (Cortes/Tela and San Lorenzo).  
---> Oil terminal (Tela and San Lorenzo)
- 4) Larger vessel size  
---> Deeper and/or longer terminal (Cortes)
- 5) Sea transport service to remote areas  
---> New terminal at remote and under-developed areas (Lempira)
- 6) Efficient port operation  
---> Installation of cargo handling facilities (Cortes, Castilla and San Lorenzo)  
---> Purchase of cargo handling equipment (Cortes, Castilla and San Lorenzo)  
---> Exclusive berths for domestic shipping (Cortes and Castilla)  
---> Streamlining of cargo movement in/around the port (Cortes)  
---> Construction of buffer silo and/or other facilities (Cortes)

240. Maintenance work should be carried out regularly and regular investment for this purpose is thus inevitable. Main maintenance works are;

a. dredging work at Pier No.1 at the port of Cortes (owned and operated by Texaco)

b. regular maintenance and periodical replacement of cargo handling equipment.

241. Although the priority of the other identified projects should be examined on the basis of future cargo demand, the following projects are considered to be realized at an early stage of the forecasted period.

1) On-going projects

---> a. New La Ceiba port for Cabotage

b. Expansion of wharf No.5 at Cortes

c. Refrigerated warehouse at Cortes

d. Installation for petroleum import at San Lorenzo

e. Coxen Hole, Roatan

2) Planned project

---> a. New oil terminal at Tela/Cortes

242. As far as following investment items are concerned, priority and order of investment should be determined after consideration of the issues listed below:

a. Bulk terminal at Cortes ---> Timing of its introduction and its scheme of financing, operation and management.

note: The above item should be studied in the context of whether private sector participates or not.

b. Exclusive container terminal at Cortes

---> Timing of its introduction and its scheme of financing, operation and management.

c. Expansion of wharf at Castilla

---> Timing of its introduction and its source of finance (private participation)

- d. New terminals for domestic shipping at Cortes and Castilla
  - > The location, layout, design, cost and the scheme of financing, operation and management
- e. Rehabilitation of wharf No. 3
  - > The timing of execution, the scheme of financing.
- f. Deepening of wharf No.4
  - > The timing of execution, the scheme of financing.
- g. New pier at Lempira
  - > The location, layout, design, cost and the scheme of financing, operation and management.
- h. Access road to/from Cortes
  - > This may be a responsibility of the municipality. Consultation between ENP and the municipality is required.

## 2.9 Private Sector Investment

243. Some of the port investment may be more attainable and appropriate in terms of construction and operation of the installations if they are conducted by the private sector. The table which appears on the next page shows the candidates of the investment by the private sector among those enumerated in 2.6 and 2.7 of this PART.

244. The table is divided into two alternatives. The first alternative envisages extensive private participation while second one implies minimum private participation. Neither alternative will be the ultimate solution; rather, the best approach to this issue will be found somewhere in the middle.

In the Section 4.4, major items of the candidate installations will be studied as to whether private sector should participate.



Table 2-9-1 Private Sector Investment

	In '000LPS			
	Alternative 1		Alternative 2	
	Snrio 1	Snrio 2	Snrio 1	Snrio 2
<b>CORTES</b>				
1) Unit Cargo Terminal				
Unit Cargo Wharf	72,210	144,420	-	-
CFS	8,000	12,000	-	-
CY	5,996	11,992	-	-
Dredging	4,940	9,000	-	-
Revetment	3,888	7,776	-	-
Gantry Crane	90,000	180,000	-	-
Straddle Carrier	23,500	47,000	23,500	47,000
Tractor Head	10,500	21,000	10,500	21,000
Chassis	3,000	6,000	3,000	6,000
Sub-total	222,034	439,188	37,000	74,000
2) Dry Bulk Terminal	28,176	28,176	-	-
3) Multi-purpose Terminal				
Yard	-	995	-	-
Warehouse	-	8,640	-	-
Bridge Type Crane	50,000	50,000	-	-
Sub-total	50,000	59,635	-	-
Total-Pto. Cortes	300,210	526,999	37,000	74,000
<b>TELA</b>				
Oil Terminal	49,000	49,000	49,000	49,000
<b>CASTILLA</b>				
Multi Purpose Birth	45,536	91,072	-	-
Tractor Head	3,500	7,000	3,500	7,000
Mobile Crane	2,100	4,200	2,100	4,200
Renewal	14,230	14,230	-	-
Total-Castilla	65,366	116,502	5,600	11,200
<b>Total</b>	<b>414,576</b>	<b>692,501</b>	<b>91,600</b>	<b>134,200</b>

Note:1) Case 1 only

2) excluding administration cost, engineering fee and survey which are normally 10% of construction cost.

Source: JICA Study team

## 2.10 Environmental Conservation Strategy in Port Sector

245. As stated in Chapter 2, PART I, present environmental situation in and around Honduran ports is in fairly good condition except the following matters;

1) The results of the water quality test indicate that some parts of the Bay of Cortes are somewhat anomalous possibly because contaminated water from hinterland are discharged into the Bay without any treatment and accidental spilling sometimes occurs during cargo handling operation.

2) Large-scale modification of natural condition by cabotage port construction work near La Ceiba may cause the following phenomena;

a. Change of river bed and accompanied amplification of the possibility of flood caused by the exploitation of rocks and stones for construction use.

b. Increased littoral drift along the new port construction site and change of coast line.

In 10 to 20 years, however, people's attitude in Honduras will probably be more environment-conscious and environmental conservation strategy in port sector should take this possible change of people's attitude into account.

246. The basic idea toward environmental conservation strategy in relation to port should be as follows;

1) To prevent pollution and negative impact by the port activities to surrounding area including water area. The possibility of pollution will increase with the increase of cargo volume and with the intensified demand for speedy cargo handling. Typical causes of pollution and negative impact are:

a. Increase of possibility of spilling of fertilizers, oil and others.

b. Increase of traffic congestion, which causes accidents.

2) To systematize EIA(Environmental Impact Assessment) on port induced effect by port project and its counter-measure

247. Although the environmental issue in Honduras is at its inceptive stage, the basic direction to tackle the issue should be well prepared. Environmental issues cover a wide scope and the preparation of an environmental strategy should be comprehensive,

covering technical know-how and institutional frame. The following are some basic elements in realizing this end.

- 1) Clear understanding of what is happening/will happen.
  - a. Clear sketch of the nature of the phenomenon.
  - b. Identification of the area where the phenomenon takes place.
  - c. Severity level of the phenomenon.
  - d. Identification of the cause of the phenomenon.
  
- 2) Adoption of appropriate methodology to understand the phenomenon.

The methodology should be able to reproduce the phenomenon. At the same time, it should clearly depict the cause and the result of the phenomenon. The methodology can be utilized to forecast the future environment as well.
  
- 3) Possible countermeasure to prevent or mitigate the effect.

When planning a port development project, careful consideration should be given to the possible effects which may happen at the port construction stage as well as the operational stage. If degradation of environment is forecasted, countermeasure should be taken to prevent environmental burden or to mitigate the effect.
  
- 4) Need for social consensus.

Results of environmental analysis sometimes remain at the qualitative level. Therefore, the evaluation of the project is rather comparative and decisions should be made through social consensus.
  
- 5) Strengthening coordination with other organizations concerned  

Environmental issues cover a wide scope including geographic extension, thus, the countermeasures to the issues should be examined and carried out through coordinated efforts of related organizations. In the context of port activities, the municipality and port captain are the most important co-workers.
  
- 6) Initiation of necessary preparation for MARPOL '73  

The government of Honduras is planning to ratify the Treaty, which requires the Honduran ports to receive refuse and tainted oil from vessels. Honduras needs to have these new facilities at ports in future.

248. Table 2-10-1 can give the relation between Environmental Impact Element (Causal Factor) and Constituent of Environment (Affected Factor). This table provides a rough guideline to forecast possible environmental effect by a port and its activities.

249. The first concrete steps toward environmental consideration in Honduran port sector are;

1) To strengthen monitoring function of ENP

ENP has both administrative function as well as operational function. For the monitoring purpose, the administrative function should be highlighted and appointment of personnel to environmental patrol is worth investigating.

2) Vigilant monitoring of surrounding environment including water quality

As mentioned above, a clear understanding of what is happening is crucial for environmental issues. To this end, background information should be constantly studied.

3) To foster personnel competent in environment matters

Currently, there are no personnel in ENP with relevant knowledge of environment in ENP. He/she need not necessarily be an environmental specialist but should have basic knowledge.

4) To establish a control system on environmental matters

It may be prudent to apply a penal tariff to polluters, of which clause already exists in the tariff code.

Table 2-10-1 Relationship between Environment Impact Element (Causal Factor) and Constituent of Environment (Affected Factor)

Environment impact element		Constituent of environment								
		Air Quality	Water Quality, Water Bottom Material Quality	Noise, Vibration	Offensive Odor	Land Form	Water and Current	Animals and Plants	Land scape	Cultural Assets
Existence	Port Facilities		○			○	○	○	○	○
	Land		○			○	○	○	○	○
Utilization	Channels, anchorages and Basins	○						○		○
	Mooring Facilities	○						○		○
	Timber Handling Facilities	○	○		○			○		○
	Port Traffic Facilities	○		○				○		○
	Storage Facilities, Handling Facilities	○	○	○	○			○		○
	Facilities for Port-related enterprise	○		○				○		○
Construction	Industrial Estate	○	○	○	○	○		○		○
	Work type	○	○	○	○			○		○

## Chapter 3 Improvement of Port Activities

### 3.1 Outline of the issue to be Considered

250. ENP currently has several functions such as port operator, administrator, land owner, policy planner/advisor and national port investor. Among these functions, operational function is distributed among the superintendencias of the ports of Cortes, Castilla and San Lorenzo (The port of La Ceiba has no cargo handling equipment and the superintendencia actually has no operational function). The local administration/management function is delegated to the six branches of Cortes, Tela, La Ceiba, Castilla, San Lorenzo and Free Zone. Other functions including the national port administration/management function concentrate to the headquarter of ENP.

251. So far, there has been no participation from local government in port activities except for operation of Trujillo pier. Apart from ports in the Roatan where the private sector plays a large role, private participation is observed mainly in ship-side cargo handling operation. There are some examples of private berths which the private sector owns and operates such as the petroleum pier in the port of Cortes and several wharves in the Roatan Island. The scheme of private participation in port activities is being examined in Honduras and the private sector has been showing a certain interest. Together with the governmental policy of decentralization and privatization, various new schemes of port activities will be seen in future. Therefore, consideration should be given to the fundamental managerial frame; demarcation of the roles of public sector and private sector including the roles of national government/ENP.

252. One of the remarkable features of future Honduran port sector is that the cargo volume through Honduran ports will increase dramatically while cargo unitization and specialization of cargo handling will progress. Cargoes, by nature, look for the optimum transport route and, in future, international competition for cargoes will increase with neighboring countries. Keeping pace with these trends, the port will be required, more and more, to provide efficient and economic services. Efficient operation and management in ports should be pursued in the international context, especially in the ports for international trade.

253. Although the cargo volume is expected to increase considerably, the main increase will be in the items of unit cargoes and bulk cargoes. This forces a change in cargo handling practice, especially at the port of Cortes. The countermeasure to these trends should be not to simply increase the number of personnel but to increase the productivity through the introduction of new cargo handling practice as well as the deployment of competent operators.

254. One of the effective tools to improve the efficiency of management and operation of ENP is the introduction of computer, especially to container terminal operation. The computerization of container handling is vital for efficient terminal operation and it is commonly said that when the volume of containers handled at a port surpasses 50 thousand TEU, the terminal can not be operated efficiently without a computer.

255. To improve the quality of services, a fair promotion scheme and an extensive training/education program for port people should be highlighted. The objectives of these programs are to foster competent personnel at the managerial level as well as workers level. The subjects of the program may range from relevant information on modern port management/operation to appropriate skills/techniques which enables efficient port operation as well as relevant machine maintenance.

256. A new system which enables efficient and flexible cargo handling operation should be realized in the port of Cortes. For this end, preventive maintenance system should be improved and flexible allotment of various cargo handling machines should be realized as well. Fostering competent mechanics in modern cargo handling machines is another important issue.

257. The issue of pricing policy is rising in importance in relation to competitiveness of a port, financial soundness of the organ and incentive to the national/regional economy. This issue involves not only establishing a tariff which recovers the cost, but also such issues as improvement of pricing procedure and whether cross-subsidy scheme and incentive to major cargo should be maintained.

258. Currently, a national port plan which shows the basic direction of development, management and operation of all ports is not prepared in Honduras. The national port plan is very important and can be utilized as the guideline for port development as well as management of the ENP. Although port plan exists for some individual ports, the plans are not evaluated in the scope of the social and economic significance for the entire nation. The port people in Honduras should be well aware of the importance of the national port plan together with the individual port plan, and an institutional process to establish and revise these plans should be established.

259. In studying above issues, it should be borne in mind that matters relating to port administration and management including their institution vary from country to country, and even in same country differs from time to time. The study team tries to find a workable solution by looking into the specific features of the country and the time. Some of the observations are presented in the subsequent sections and Chapter 4.

### 3.2 Measures to Improve Cargo Handling Operation

260. Keeping pace with the increase of cargo volume with remarkable progress of cargo unitization, more efficient cargo handling in the port is required. One of the practical solutions is to have exclusive terminals such as dry bulk terminal and unit cargo terminal in ports. These terminals in the port of Cortes are roughly indicated. The optimum cargo handling method will be proposed in the later stage of this Study in which special attention is given to the possible change in cargo handling practices.

261. An appropriate gang shift system should be introduced not only to exclusive terminals but to general cargo terminal. As shown in 2.5 of Part I, there is no shift of gangs except forklift operator currently and a gang assigned to a ship (hatch) continues to work until the handling is complete. This may decrease productivity while increasing the possibility of accident. Shift system generally adopted in many ports is the twoshift (one gang works eight hours) system and two gangs are prepared for a crane. The most appropriate system will be decided through detailed discussion and analysis on various factors such as;

- 1) the length of time for which gangs would work efficiently
- 2) the length of time for which gangs concentrate on their work and minimize the possibility of danger
- 3) the rotation system of gang
- 4) the salary system
- 5) the scheme of smooth transition from the present system

262. The introduction of preventive maintenance is necessary to ensure efficient as well as secured cargo handling and to minimize the loss of working time due to the breakdown of machines. Every machine should be closely checked by observation before work and after work. The observation results should be recorded in a form which also includes basic information of machine operation such as start time, finish time, mileage, name of the operator and operator's remarks on the machine's condition. Besides the daily check-up, more precise check should be conducted regularly at an appropriate interval of time. This information should also be recorded for each machine. In total, working records of each machine should be kept all the time and the condition of the machine should be easily recognized no matter who operates it. Accumulation of these data gives optimum inventory of spare parts and could contribute to saving money. The data also gives the life-span of machines and appropriate information on the time of their replacement.

263. To realize the maximum use of each cargo handling machine and the economy of cargo handling practice, flexible assignment of machines should be pursued. Balanced use

of machines could expand their life span and minimize the expenditure for machines. First step to this purpose is to conduct a detailed analysis on the difference of current usage among the machines of same type and with same capacity. One of the examples is 40 ton crane and 50 ton crane. The usage of these two (2) cranes are almost the same, however, the difference of actual rates of utilization of these cranes is very large. We can point to some other examples such as the usages of 1.5 ton forklifts and 2 ton forklifts. It is observed that 3, 4 and 7.5 tons forklifts are working outside of warehouse and 1.5 ton forklifts are working inside the warehouse. Even though the cargo is lightweight, it is handled by these rather heavy forklifts. There are some under-utilized 1.5 ton forklifts. It may be worth investigating the adoptability of these 1.5 tons capacity forklift to outside cargo handling from the viewpoint of economy and workability.

264. The limited area and inadequate location of facilities in the port of Cortes hinder the efficient flow of cargoes as well as port traffic. The fundamental solution will be to expand the land area, however, the port borders a built-up area of the city and the expansion to the landward direction is, thus, impossible. The possible direction of expansion is to the seaward direction and the utilization of reclaimed land adjacent to the south of the port. An intermediate solution before the expansion might be to introduce traffic regulations inside the port area. Anything which may hinder smooth flow of port traffic should be restricted and removed. Traffic signs on port roads and zoning of terminal could help the port traffic flow more smoothly.

### 3.3 Introduction of Computer in Port Activities

#### 3.3.1 Outline of Computer System

265. The very basic necessity of port activities is, as already mentioned in Chapter 2 in Part I, to realize better port service. In other words, it is to provide the ship owner as well as cargo-owner with "fast", "cheap" and "secured" service. To obtain these services, it is necessary not only to improve and expand port facilities but to upgrade the quality of management/operation, which requires a constant effort to improve both hardware and software.

266. To cope with social and economic changes in a timely and flexible manner, it is required to handle port related information efficiently and to make the maximum use of it. This is why a computer system has been introduced to port management in many countries, in particular, in the area of container handling.

267. Through the introduction of a computer system, the sections concerned with container handling are connected with one another, providing ENP with an efficient and



accurate means of operation, management and administration of port activities. ENP's services are processed on an on-line, real-time basis to improve service level for port user.

268. It is commonly said that when the volume of containers handled at a port surpasses 50 thousand TEU, the terminal can not be operated properly without a computer. The introduction of a computer system helps improve the efficiency of container handling and, thus, corresponds with the demands of port users.

269. Computer systems currently adopted in advanced ports in the world are divided into two major systems. They are;

- (1) Port Administration System
- (2) Data Interchange System (This system connects related public organizations as well as private enterprises)

270. The services covered by Port Administration System are as follows:

- (1) Management of ships' entering and leaving the port

Services of this category include the processing of entering/leaving schedules, applications for the use of berths, and notifications of ships' movements. These information items are submitted to ENP by shipping companies or their agents. The information is used for various purposes;

- a. drawing up the order with which ships are admitted into the harbor and assigned to specific berth,
- b. identifying ships' current movements,
- c. building data-base by registering the berthing and mooring times of ships, and
- d. processing data for better port management.

- (2) Management of container handling

The basic object of this function is to identify the exact location of each container in the container yard and grasp container conditions after loading/unloading. This is a necessity for effective container handling.

- (3) Management of sheds and cargo handling areas

It is necessary for forwarders or agents to submit applications to ENP when cargoes are warehoused, retained, and transferred. These information items are used to manage sheds and cargo handling areas.

- (4) Management of cargo handling equipment

Services of this category consist of managing gantry cranes and other equipment

based on users' applications submitted to ENP.

(5) Fee collection

User fees, the entrance fee and other port-related charges resulting from the use of port facilities are calculated, accepted, and settled. ENP computer also submits invoices and issues receipts for payments. The information derived from these services is utilized to prepare management data.

(6) Preparation of statistics

ENP can prepare monthly reports and annual statistics by compiling above mentioned information.

(7) Reference and distribution of information

The information gained from the above-mentioned services is sorted, classified, and rearranged for the use of ENP and port users.

271. The services covered by Data Interchange system are as follows:

This system provides an on-line network to public organizations and private enterprises and enables them to interchange shipping cargo information efficiently. In the process of importing/exporting cargo, complicated and various information is interchanged between many port related organizations and companies. Establishment of the information exchange network system results in quick access to information, reduction of manpower by avoiding duplication of data input, prevention of mistypes and simplification of documentation. The expected participants in this network are public organizations such as ENP, customs, quarantine, immigration office and private companies such as shipping companies, agents, railroad, truck carriers and so on.

### 3.3.2 Benefits of Computer System

272. The system benefits both ENP and users. Advantages to ENP are as follows:

(1) Accurate and Effective Administration

Centralized control of information expedites administrative works. And services are offered with higher accuracy and quickness.

(2) Automatic Communication

Communication between sections is conducted by telephone or through exchange of documents. Computer system provides on-line communication between the central computer and its terminals. In this way, communication procedures are largely automated which saves time and money.

(3) Effective Management of Port Facilities

Real-time information is transmitted to the central computer. This realizes quick problem shooting and helps operation and management of port facilities become more efficient.

(4) Complete Statistical Information

Statistics are prepared quickly and accurately.

273. Advantages for users are speedy transaction of ENP and quick exchange of accurate information. Information includes ship movements, facility utilization, cargo handling status and other port activities. The information offered by a computer system allows users to conduct smoother and more efficient cargo handling and quick dispatch of vessels.

### 3.3.3 Basic Policy for Introduction of Computer

274. Though ENP has already introduced a computer system, it is mainly used for accounting and is not used efficiently in other sections. For the general concept of the container terminal, it is required that various sections such as gate, yard operation, loading/unloading operation function systematically as a whole. The efficiency of a container terminal entirely depends on the smooth information-exchange among the sections concerned. Establishing a unified container operation will be recommended in order to maximize utilization of port facilities. In other words, it is important to interchange information between sections.

275. For the first step in the introduction of computer to container handling, ENP has to reinforce functions from (1) to (4) of paragraph 270 in Port Administration System. This is because for strengthening the port competitiveness, improvement of container handling by connecting sections through on-line system is of prime importance. More precisely, by forming a systematic link between the following functions, container flow will be greatly improved.

- (1) Gate Operation : container receiving and delivering, damage check, weight check
- (2) CFS Operation : receiving/delivery of LCL cargo, stuffing/unstuffing
- (3) Yard Operation : container stacking, in-yard movement, empty space
- (4) Loading/Unloading Operation : stowage planning, equipment deployment

276. Container administration center where terminal operator looks over the whole container yard should be established. By checking actual container flow, he/she can find bottlenecks and will be able to quickly respond.

277. In the second step, Data Interchange System will be developed to improve service

level of port operation. This system, however, will need to be developed under the leadership of ENP as well as relevant government bodies, because it can not be developed without the joint work of various public organizations and private companies.

#### 3.3.4 Development of statistics system

278. To prepare accurate statistics is the first step in developing, operating and managing ports. At present, part of statistics is handled manually and they are said not to be arranged regularly or systematically. One of the urgent improvements should be regular and systematical filing of port statistics including domestic cargoes. Through the establishment of a statistics system, the port can be furnished with adequate future plans and thus become more attractive.

### 3.4 Deployment and Training of Personnel

#### 3.4.1 Deployment of Personnel

279. Since the establishment of ENP in 1965, ENP has accumulated technical know-how of construction, management and operation of port for 30 years. However, it is observed that ENP has not sufficiently caught up with recent developments in terms of maritime transport and managerial changes. This means that some sort of personnel allotment should be reformed.

280. ENP has 1,077 employees in 1993. In the last four years, the number of employees has remained at the same level. Some sections, however, seem to have excess employees, taking account of the present service level. According to the demand forecast, cargo volume is expected to increase considerably. The number of personnel, however, does not need to increase corresponding to the cargo volume. By transferring personnel among sections and fostering competent workers, ENP should aim for efficient deployment of personnel.

281. When formulating a transference scheme, future increase of private participation in port services should be borne in mind. A scheme of privatization will be dealt with in the next Chaptero redundancy accompanied by the reformation should be mitigated by the personnel transfer.

#### 3.4.2 Personnel Training

282. Effective container handling is completed by skilled workers. And operational employees will need continuous training to catch up with advanced port operation

technologies. Some staff members responsible for terminal operation should be sent to developed container terminals for on the job training. It is important to further improve their technical ability to cope with modernized container handling operation. ENP should investigate the operational systems of container terminals in developed ports and based on the investigation results, ENP should establish a training system to develop workers' ability to cope with more quick and effective cargo handling.

283. In addition to this, career development system should be adopted. For example, the exchange of personnel between divisions of ENP should be examined. To experience the work of other sections would be of great benefit to personnel. To realize better port management and operation, personnel of ENP should have knowledge of other sections.

284. All ENP's personnel should be well informed about the actual condition of their ports and at the same time they should all be highly qualified and aim toward better port services. It is necessary to raise morale of personnel for better port management. To realize this, personnel evaluation system might be introduced. Proper promotion and transfer of personnel based on ability will be possible through the system. The important point of this system is that evaluations should be conducted objectively. Promotions will stimulate personnel incentives and will greatly contribute in developing overall quality of ENP organization.

### 3.5 ENP's Conducting of Regulatory Functions

285. Legislative Decree No.40, 1965 clearly indicates that ENP has the power to coordinate the development of port activities in the country. This means that ENP has a responsibility to give its opinion on major port development works, whoever may be conducting them, and wherever they are taking place. In this sense, ENP should be and is being consulted by the entities within and outside the area where ENP has the jurisdiction.

286. However, whenever consultation takes place, a problem seems to arise. Since ENP does not have clear standard which is enough persuasive for whom applying consultation, the judgement of ENP tends to be dictated by the political or economic atmosphere of the time, and in case of major works, this might have a harmful effect on future port development.

287. As a clear standard for which judgements can be based, existence of the master plan of the port is firmly required. The plan forms a measure to decide the consultation in one way or another. The master plan should be formulated in the manner described in paragraph 259 of 3.1, and it should be reviewed periodically according to the socio-

economic changes. Otherwise, the master plan will lag behind current issues, and will not function well during the evaluation process.

288. ENP's regulatory function should be extended toward the water area. Water area is very important not only in terms of traffic safety and prevention of pollution, but also with respect to supplying space for future port expansion. The land area of the port of Cortes is terribly strained, and ENP should get involved in the matters of possible permanent change in the shape of water area such as reclamation, building of rigs, and so on.

289. ENP's role in terms of port planning, particularly for nation wide planning as well as regulating and controlling activities within ports should be reviewed with emphasis placed on the outstanding issue of port reformation. This aspect should be studied at a later stage. Customs, quarantine and port captain also have jurisdiction in port area. In particular port captain has power to regulate and police various activities in the water area. When ENP is conducting the above function, coordinating action is very important.

### 3.6 Restructuring the Tariff System

290. Generally speaking, tariff should be determined by taking into account the following points;

- (1) to cover all costs including, in particular, construction, maintenance and operation, <Concerning construction cost, the government will subsidize a part of the cost when it considers the port is of importance in terms of the country's public interest and national economy.>
- (2) to collect proper charges which reflect the services provided,
- (3) to be competitive vis-a-vis neighboring ports,
- (4) to be simple as possible in its price structure as well as in the method of collecting.

291. In Honduras, Section 27 of ENP Act, following the above general pricing principle, provides as its principle of the pricing that the charges, tariffs and rents should be so formulated that the revenue sufficiently covers the expense of management, operation and maintenance as well as depreciation cost, and further it may gain resources for renewal of equipment and future expansion of ports.

In light of the above principle and its implementation, such issues as (i) institutions and procedures of pricing, (ii) fair and square tariff system, (iii) competitive tariff level should be placed under particularly careful study.

### Pricing Procedure

292. All charges, tariffs and rents should be approved by the Board of Directors on the basis of the principle provided for in Sect. 27 of the Act. Draft tariff is sent to the National Commission of Public Utilities Supervision (CNSSP), which was created in June 1991 by the Law 85-91 as an independent body to examine the pricing of four parastatal entities (also see paragraphs 129 and 130 PART II). The Commission is obliged to conclude its examination within three months.

293. Creation of the supervisory institution is a significant step toward establishing a reasonable tariff system which may be acceptable to both parastatal body and client, since there have not existed the proper fora for parastatal bodies pricing where both parties discuss tariff matters. Board of Directors includes representatives from private industries and labor union, however, majority of the directors have a public sector background and may not sufficiently adjust the interest of suppliers and users.

294. An independent supervisory organ, if properly working, may supplement the lack of dialogue between suppliers and users and help to introduce a reasonable pricing scheme. However, the actual behavior of CNSSP causes some problems.

295. CNSSP has its own technical secretariat which is not attached to any government agency. While the Secretary of SECOPT is ex-officio president and the Vice Minister of SECOPT is responsible for conveying the decision of the Commission to the Congress and President to enact a law or to promulgate, the Commission and the Secretariat do not belong to SECOPT. The problem is that the secretariat consists of a representative and six (6) staffs who are knowledgeable in various fields but not experts on the specific subject of parastatal pricing. Because of this fact, the Commission is criticized that it does not have sufficient knowledge and information to verify if the pricing is reasonable in terms of the current economic circumstances and management situation of the entity.

296. The Commission, however, replies to this criticism by saying it hires a reliable consultant (including foreign consultants) to look into the issue whenever pricing problems occur. In light of the lack of human resources with sufficient knowledge of this issue in Honduras it is not possible to recruit enough experts to examine and analyze all the issues arising from pricing, and in the circumstances it is inevitable to hire consultants from without, nevertheless, its may be advisable to retain some more staffs even for selecting the consultants and evaluating the reports.

With a view to the Commission being acquainted with the port users' opinion, it is advisable that the Commission convenes the meeting to hear the statement of users.

297. As is proven in the port of Castilla case (see paragraph 132 of Appendix, PART I), the tariff decided by the Commission is not always enforced. As it happens, monopolistic clients or those with political connections tend to not implement the tariff and enjoy lower rates. One of the reasons of this non-enforcement lies in the half-measure nature of the Commission's power and responsibility. Although the Law delegates the power of final approval of tariffs etc., in reality, still CNSSP consults with the President and/or the Congress during its deliberation. This practice may have CNSSP swayed or influenced by political maneuvering.

298. With a view to establishing a fair and competitive fare scheme of parastatal entities, it is important to avoid getting involved in a power struggle. Nevertheless, it is a hard task to decide as to what steps are appropriate for keeping independence of fare evaluation. Furthermore, political and administrative system of a country has its own historical and social background, and it is thus not easy to change the system. In this situation, perhaps the only workable advice that the team can make is to enact legislation that gives explicitly the power for promulgating to the Commission its discretion and that puts the Congress and the President under obligation to observe the Commission's evaluation.

#### Cross Subsidy and Promotional Rate

299. Although ENP may have in mind that each port recovers the cost, its financial policy aims to take the a balance between revenue and expenditure ultimately through all the ports and facilities under its operation. Accordingly, the tariff has a cross subsidy nature; ie. the tariff is in general fixed at the same price through all the ports, and with some exception which will be mentioned later same cargoes and vessels are charged the same rate.

300. It is argued that in order to stimulate competition and thus improve the efficiency of the operation cross subsidy tariff should be abolished and tariff should be fixed port by port based on their own accounting schemes. This argument is based on the belief that only a competitive market can bring a viable port system with the best service for users, and the tariff should be such that a market-driven port system is encouraged.



301. The study team, however, considers the issue in a different light. Surely in so far as matured major ports are concerned, they can earn enough revenue for sustaining their activities. On the other hand, there are many ports which serve for scant trade, eg. ports in remote areas sparsely inhabited, newly constructed ports, and so on. In most cases these ports are not necessarily products of over investment. They are engaging in public services indispensable for the region. These ports are not always able to be nurtured by public money such as from the central government or municipality. This is particularly the case in developing countries, since the public institutions are generally suffering from a lack of monetary resources. In such an environment, it is inevitable and should be advocated that lucrative ports in the country support the lesser ports.

302. In Honduras, ENP operates newly developed San Lorenzo and Castilla, and furthermore it is constructing La Ceiba and Loatan (both for cabotage) and has constructed the ports of Lempira and Trujillo, and transferred them to the municipality for operation. These costs are, say, borne by the earning of Cortes port. It is unrealistic to consider that the government or the municipalities concerned bear the cost, or that these ports must sustain themselves with only their own revenue.

With these points in mind, the team considers for this moment the cross subsidy concept is inevitable for the tariff.

303. ENP adopts several promotional rates. The most remarkable is the rate reduction for banana export. This may be advocated by contending that promotion of banana export is of prime importance for raising foreign currency to sustain the economic growth, and reduced tariff acts as the substitution of export subsidy without taxation to the general public. However, the burden of the reduced revenue is after all falling upon the users other than banana exporting company. Fairness and equity is a general principle of pricing, and this measure may be criticized as running counter to that principle.

304. This measure may be discount for scale contract. If so, the spread between normal and discount rate should be determined measuring the cost saved by the large-scale transaction at the port. The calculation is not easy, but a 75% discount in Castilla which is five years old after inaugurating of container handling seems to be too much. Even a 50% reduction might be deemed unfair by other clients, since banana exporters enjoy monopolistic status, accordingly they have very strong bargaining power and political influence. Bearing this in mind, it is advisable to reduce the spread with ordinary cargoes.

305. Tariff is constituted favorably for cabotage vessels. This seems to be for two reasons; i) for the moment, cabotage vessels use no specific facility but anchor at available vacant space, and ii) it is worth protecting cabotage shipowners who are financially weak but carry goods necessary for the residents in isles or remote areas. This reasoning is understandable, but in future when cabotage berths are introduced like La Ceiba and Cortes, new tariff may become required for recovering a part of the construction cost.

## Chapter 4 Reformation of Port Sector Management

### 4.1 Action Taken toward Reformation

306. In the port sector, like other sectors in the country, management reform, in particular movement toward extension of private participation has been planned and is being implemented in some cases. This scheme forms a part of the Project of Transport Sector Rehabilitation in Honduras which is financed by IDA of the World Bank family.

Table 4-1-1 Profile of Port Activities in Honduras

Activity	Carried out by:
Ownership of Quaywall	ENP
Berth Assignment	ENP
Statistics	ENP
Port Dues	ENP/Customs/Private Companies
Water Traffic Control	Port Captain
Navigation Aid	ENP
Maintenance of Major Installations	ENP
Port Police	ENP/Ministry of Finance
Fire Protection and Firefighting	ENP/Fire Brigade
Permission of Shed & Heaping Yard Use	ENP
CY/CFS Operation	ENP
Stevedoring	Private companies
Longshoring	ENP (except Tela)
Warehousing	ENP
Truck Transportation	Private companies
Railway Transportation	Private company/Parastatal
Towage	ENP
Line Handling	ENP
Bunkering	Private companies
Water Supply	ENP
Pilotage	ENP
Tally & Measurement	ENP/Customs/Agents
Launch Service	Private companies
General Responsibility for Pollution Prevention	ENP/Government/Private companies

Source: ENP

307. In September 1992, the Committee of Implementation of Port Subsector was created with representatives from Ministry of Economy and Commerce, SECOPT and Ministry of Finance as members. The function of the committee includes analyzing the operation of certain ports and evaluating the port assets, formulating a master plan of each port which defines kinds of new investment and drafting the terms of reference for investment prescribed in the master plan, conducting feasibility study of the plan, and carrying out many related works including selection of consultants and convincing the labor sector of the benefit of private participation.

308. In December 1992, SECOPT and ENP concluded an interorganizational agreement stating:

(1) ENP declares that it will execute the action plan attached to the agreement which is reflected in the loan agreement with IDA.

(2) ENP also declares that its management is conducted according to sound administrative, financial, managerial and technical criteria. For this, qualified and experienced personnel should be designated as the heads of management and supporting staffs.

ENP designated in September 1992 members and assistants of Technical Working Group (G.T.T.) to look into the technical, legal, operational and financial aspects of leasing and concession.

309. In conformity with the policy of the Honduran government to reduce the role of the state and to increase private participation in public service, ENP prepared a document for consideration, which consists of A. the Scheme of the action plan, B. Legal framework and C. Harmonized labor relationship for realizing privatisation. The paper is included in PART II, Volume II of the report.

310. In A. Scheme of Action Plan, ENP enumerated sixteen (16) subject areas to be activated including, in particular, increase in private participation, together with its timing of decision and the institutional arrangements. In B. Legal framework, it is indicated that many port activities could be totally or partially transferred by means of contract within the frame of existing law. C. stresses the necessity of dialogue between employer and employees for achieving the reformation.

311. In addition to the above, loading and discharging of general cargo, liquid and solid bulk and banana are carried out by private sector. Some ancillary services, for example, fuel supply, ship chandling and laundry, launching, sanitary and cleaning service of facilities and miscellaneous works for containers are also in the hands of private companies.

312. It has been widely recognized among Central American states that the maritime laws in the region which have now become obsolete should be updated. In October 1991, for improving maritime legal structure in Central America, the Project "Technical Assistance in Central America for the Development of a Modern and Harmonized Maritime Legislation" (LEGISMAR) was started with the assistance and cooperation of IMO, UNCTAD, the Norwegian government and the Central American Commission of Maritime Transport (COCATRAM).

313. With a view to supporting the effort to attain the goal which is set out by LEGISMAR, and to integrating the views of relevant institutions, the Working Group of the Project LEGISMAR was created in February, 1992. Membership is comprised of one representative from each of the following institutions;

i) Marina Mercante Nacional, ii) SECOPT, iii) la Secretaria de Estado de Economia y Comercio, iv) SECPLAN, v) la Secretaria de Estado de Relaciones Exteriores, vi) ENP, vii) national shipping agencies, viii) Users of maritime transport, ix) maritime labor sector, x) the law faculty of the National University of Honduras, xi) Honduran Lawyers Association and xii) Central American Institute of Integrated Laws.

314. The group has achieved many works in the field of maritime laws and enforcement schemes, including inter alia, preparation for becoming a contracting party to conventions on maritime safety, prevention of pollution and regulation of maritime trade practices, and creation of an organization which is responsible for control and promotion of domestic maritime industries.

315. The group also studies the law governing ports in Honduras, however, it is said to be of the opinion so far that the Legislative Decree No.40 of 1965 which is now regulating ENP is still valid, and reformation of the enterprise is attainable within the framework of the existing legal instrument.

#### 4.2 Observations on the Issues of Reformation

316. The reformation policy, the primary tool of which is increasing private participation in the port activities, is not only in conformity with one of the major economic policies, but also in line with the global trend towards privatisation which began in the early 1980s. According to one renowned magazine, around 10 airlines and 30 telecommunication companies are up for sale or will be up for sale in a few years.

317. Among the broadly mentioned objectives in the recent tide of privatisation, the followings may pertain to port reformation;

(1) by discharging state enterprises from excessive governmental intervention and/or

support, and exposing them to the strain of market competition, the business efficiency will be improved and quality of their performance will be upgraded.

(2) by allowing the private sector to invest in state enterprises, additional resources are obtained, and

(3) funds raised by selling the assets of state owned enterprises improve the governments financial position.

The first objective benefits the state enterprise which is taking the steps, while the third one is derived from the fiscal motive. The second one serves for both business and fiscal benefits, since when private funds are spent for the promotion of services it is the benefit of the state enterprise, and if such private resources replace public money, the treasury would enjoy advantages.

318. As far as port sector in this country is concerned, action taken by the Honduran government is presumed to solely come from commercial interest of port management, and this approach seems sensible from the team's point of view.

319. The World Bank published in 1988 paper enumerating the worldwide privatisation of state owned enterprises. Around 1200 state enterprises were either sold (totally or partially), up for sale, or planning to be sold. It is notable that among those only 12 cases involved the port sector. Since then, while much progress has been made in port privatisation, the actual number is probably less than 50. Although much has been talked about port privatisation, the actual achievement is relatively small.

320. As is widely recognized, the term "privatisation" embraces a variety of definitions from sale of entire assets of state enterprise or its shares (ie. change of ownership) to leasing of a part of its facilities or management contract of fractional services. In case of port privatisation, radical means of privatisation such as change of ownership are exceptional (as far as the team observes, only Britain and New Zealand have adopted this means).

321. What is implied in the previous two paragraphs is that irrespective of the global trend of privatisation, port authorities try to pursue realistic solutions appropriate to the position which they are facing. In other words, in so far as port restructuring is concerned, it is motivated by port authorities' own commercial consideration, not by fiscal discretion.

322. Table 4-2-1 enumerates the results of the survey conducted by OCDI in 1987-89 with respect to the profile of the responsible organ for port function at sixteen (16) world ports. It is noteworthy that many port authorities are carrying out by themselves functions which are considered to be more suitable for the private sector like stevedoring,

longshoring, CY, CFS operation; and even in the world's fast growing ports such functions are being largely conducted by the public sector. This signifies that paths toward a lucrative port are many, and something other than a mere change of ownership is required for achieving effective operation.

Table 4-2-1 Responsibility by Port Function

	Public	Public & Private	Private
Ownership	10	6	-
Permission of berth use	10	6	-
Fee/Charge	10	6	-
Water traffic control	6*		
CY operation	7	2	7
CFS operation	6	5	5
Stevedoring	7	4	5
Longshoring	6	5	5
Warehouse	9	1	6
Towage	7	1	8
Line handling	9	-	7
Bunker/Water supply	9	1	6
Pilot	8	-	8
Tally/Weighing	9	1	6
Pollution control	11*		

Note: \* Wholly or partially conducted by the port authority

Source: OCIDI Report of the Study of Port Management System for Developing Countries and others

Name of the ports: Yokohama, New York, London, Rotterdam, Sto. Tomas (Guatemala), Rio Haina (Dominica), Panama, Calcutta, Colombo, Port Kelang, Shigapore, Bangkok, Manila, Hongkong, Keelung (Taiwan), Dalian (China)

323. Looking at examples where the restructuring of port management brought about a fruitful outcome, in many cases the organization succeeded by fostering an environment in which executives and staffs work together on their own initiative toward the creation of a meaningful organization. This environment may be defined as a corporate culture. For instance, Port Kelang of Malaysia, after the creation of Kelang Container Terminal Co. which is owned by the port authority and a private company on a 50/50 basis, the management has tried to change the philosophy of staff who were transferred from the port authority, and the company now boasts a flexible operation, adequate management of human resources and improved productivity.

324. This means that any reformation policy, however logically or theoretically good-looking, may not be workable, if it fails to get the wholehearted consent of people concerned for one reason or another. In other words, if the persons who are responsible for realizing the policy feel hesitant in the light of their experience as professionals or it runs counter to their cultural heritage, the policy will not succeed. This aspect might be called the "human factor". When we draft a reformation scheme, this should be borne in mind, and at the enforcement stage, efforts to convince staff are vital.

325. When introducing a new scheme to developing countries, particularly replacing one which is now working without any significant problems, a more prudent approach is desirable than in the case of industrialized countries. Industrialized countries are more capable of absorbing the ill effects of reformation, even though unexpected, since their economy, their industry, their administration and their community have enough strength to endure the impact or to rescue those affected. In case of developing countries, however, where the economy is vulnerable, their industry fragile, their administration suffering from flaws and their community already hampered by many problems, damage caused by the impact of policy alteration can be so great that it would take many years to recover, even with immediate policy revision.

326. ENP has already experienced flaws accompanying the privatisation of certain works. It is said that operational efficiency of general cargo and liquid bulk handling has declined since operation has been transferred from ENP to private sector. ENP mentions several reasons such as:

- i) hiring temporary and unskilled labor,
- ii) low-leveled salary and lack of social security,
- iii) lack of investment for new equipment and maintenance for existing equipment, which caused obsolete and low-level operation,
- iv) lack of proper management scheme, which should in ENP's view, be placed under constant supervision of ENP,
- v) monopolistic operation by shipping agents and stevedores,
- vi) excessive pursuit of profit by private companies.

Although above reasons have yet to be verified conclusively, they advocate a prudent approach when discussing port reformation.

#### 4.3 Certain Issues included in the ENP Scheme

327. The study team will assess the issues included in the scheme by ENP (Appendix 1) in the context of port reformation. While assessing, two things which were mentioned in the previous section will be borne in mind; namely, the change in management should be motivated by the interest of the port itself but not by fiscal consideration, and the



human factor and a prudent approach are vital for getting workable steps.

328. While some of the issues included in the ENP scheme are dealt with in other chapters which may be more appropriate as those matters are closely connected with future investment, many of the subjects are discussed in this section, to wit, La Ceiba port issues, analyzing of individual port activities of Cortes, Castilla and San Lorenzo and examining privatization of free zone.

(1) La Ceiba-management transfer (the Scheme of Action Plan 5)

329. La Ceiba involves two issues of reformation; existing facilities and those under construction. Existing facilities of La Ceiba port are a wooden pier and a warehouse. Since the number of vessels calling the port has been diminishing after the port of Castilla became a major port of banana loading, only liquid cargo is passing through pipelines installed on the pier. Consequently, the warehouse is, for the purpose of customs inspection, storing cargoes to/from port of Castilla and to/from La Ceiba airport where no storage place exists. ENP is contemplating the transfer of the warehouse to the customs administration on the grounds that with no cargo for the port of La Ceiba it is costly, particularly in terms of personnel cost, to maintain the facility. The study team wishes to support the idea, and suggests that ENP initiates immediately the negotiation with the customs institution.<sup>1/ 2/</sup>

The existing pier can be left in the hands of ENP, however, personnel in La Ceiba Superintendencia should be reduced in conjunction with the discontinuation of warehouse management.

330. The second issue pertains to cabotage facilities now under construction at the Boca Vieja Mouth. For the facilities it was argued that the operation may be carried out by an entity composed by ENP, the municipality and La Ceiba Chamber of Commerce. This argument also involves the issue of whether ownership should be transferred to the municipality or the newly created entity. Laxer on, however, there became a new idea

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<sup>1/</sup>In many cases, port was originally under the control of customs administration, and later the management or jurisdiction was moved to an independent port authority. It is because a customs administration tends to aim at a higher revenue of the charge without paying attention to congestion of port and delay of cargo dispatch. Also, the administration lacks the technical expertise required for port improvement and development. However, this observation is not applied to this case, since the warehouse of La Ceiba is not employed for port activities for the moment.

<sup>2/</sup>The warehouse is a handsome-looking early 20th century building overlooking a beautiful beach. In future, it may be diverted to other purposes, say a restaurant, for example.

that the installation be sold out to be private sector.

331. Conceptually speaking, cabotage is an economic activity of a regional nature, unlike overseas shipping which is of a national or international nature. Ports for cabotage may well be operated under the region's interest. Having this in mind, the idea that a new tripartite entity manages the new cabotage port can be supported. Nevertheless, some thought should be given before making the final judgment.

332. The municipality of Trujillo is operating its own pier for cabotage constructed and donated by ENP. The 1990 Municipality Law enhanced the capability of municipalities for building and running public services at least as far as legal provisions are concerned. In La Ceiba, a beef processing company called "Procesadora de Carnes Municipal-La Ceiba" is successfully run by the central government, municipality and La Ceiba Chamber of Commerce. These facts also advocate the new entity operating the new port. With a new body running the port, there is the advantage that a renewed labor relationship and practices can be formulated for port management.

333. Followings points are causes for concern:

- The construction work is scheduled to be completed by the first quarter of 1994, however, no action for the management has yet been taken. Negotiation of three parties is envisaged to take considerable time, and the creation of a new managing body is a tough task. It is uncertain that preparation work for new management scheme will be finished by the time construction is completed.

- The personnel of the municipality seem unprepared to take over the port management without adequate information. Although the personnel of the Chamber of Commerce show eagerness to participate in port management, proper knowledge for shipping and port is lacking because main industry of the region is agriculture, stock breeding and tourism.

- It causes some apprehension that ENP is donating the port facilities to the municipality or new management body. While at this stage expansion of the port may not be envisaged, in the long run it may become necessary to develop or remodel. For the expansion or improvement works for which only ENP is qualified, ownership of the facility affects their advancement, and lack of ownership might impede the future development work.

334. All the points mentioned in paragraph 335 above, may be the background of the new idea that a private company should own and manage the installations. However, the costly purchase price may have possible buyers faltered, or the private sector may be attracted to utilize the facilities for overseas trade to recover the cost. The study team, therefore, recognizes the advantage of the original idea that the management of the facilities is carried out by the tripartite entity. It therefore suggests that ENP should

immediately formulate the transition scheme and initiate negotiation with the relevant municipality and chamber of commerce. In the transition scheme, following items should be included, inter alia;

- (1) work area of the entity, stevedoring may be carried out by the entity,
- (2) percentage of stocks owned by each party,
- (3) status of ENP as an advisor of the port in terms of operation, maintenance and repairing including dredging,
- (4) disposal of transitional period, ie. ENP should tentatively conduct business during this period.

335. Remaining issue is the ownership of the facilities. Assuming that ENP will take initiative for planning and construction work for development or improvement of the port which is probable in the long run, it is advisable that ENP retain rights to some extent. On the other hand, the main landlord of the site is the municipality, and ENP has no rights on the land. Under the circumstance, it is of the team's view that some arrangement is needed between ENP, the municipality (landlord) and the newly created entity for sharing the rights and making future development work possible.

- (2) Pilot and tug service (the scheme of Action Plan 8)

336. These services are ancillary activities of port operation. There are divergencies of responsibilities for those services throughout the world ports. While in some countries, particularly developing countries including Honduras, these services are carried out by a port authority, in many other countries private firms, associations, and in case of pilot service, guilds of pilots conduct these services. It signifies that there is no superior formula in terms of conducting these services.

337. In the port of Cortes, ENP delegates these affairs to the Oficina Servicio Maritimo of Operaciones which is also conducting line handling and pilot boat operation (in Castilla, a pilot boat is owned by a private firm). Number of employees in the office is thirty (30).

338. Pilots are required to be qualified marine officers and must apprentice for several months. For pilot activity, the management and work assignment need a headquarters, be it private or public. In 1983, the pilot activity was privatized, but a year and a half later, it was restored to ENP, since the cost hike required a tariff increase.

339. ENP is now building one tugboat and two pilot boats, each one for Cortes and one pilot boat for San Lorenzo, which will be launched in September 1993. The depreciation cost will press the management, and it is dubious whether any private firm will bear the burden to continue the activity.

340. With these observations in mind, the study team feels it advisable that ENP continue to carry out pilot and tug service as it is.

(3) Port police and navigation aid (Action plan 8)

341. Police and lighthouse are typical public services which, in the terminology of economics, means that since one person's use cannot exclude others', the services are for the benefit of all, thus unchargeable. This is the reason why governments are generally responsible for these services and are allocated for in the budget.

342. ENP is operating thirteen (13) lighthouses, buoys and radio. The section which is responsible for the navigation aid is also Oficina Servicio Mercante. There is no reason for privatization because of the public nature of the service.

343. Although police service has an equally public nature, some thought should be given before finally deciding the responsible organ. ENP employs 115 persons in Cortes, and 3 persons in Tela, 10 persons in La Ceiba, 28 persons in Castilla and 29 persons in San Lorenzo for three-shift police service. When hiring, ENP inspects the curricula vitae and selects persons with police or army experience. However, no specific training for police service is executed, and no arrangement with other agents which have the same function such as Hacienda or Municipality is made for emergency. Given this, the quality of the police corps may not be claimed to be of a high level, and the study team cannot but contend that only the calm social circumstances and people's mild characteristics can make it possible to work in this condition. Apart from the number of policemen in the port of Cortes, it seems that their capability is not superior to private guardsmen. With this in mind, port police in Tela, La Ceiba, Castilla and San Lorenzo can be substituted without large harm to private security firms if they are available.

344. If ENP wishes to retain its port police for one reason or another, improvement in terms of training, emergency arrangement etc. is required for upgrading its capability.

(4) Line handling (Action plan 8)

345. This activity in the port of Castilla is carried out by a private company, the Standard Fruits Company which hires persons from outside. In Cortes, ENP employs eight (8) persons to execute this service at a considerably high cost. Given this situation, line handling service may be transferred to the private sector, assuming that one single firm which works on port business intends to take all the line handling service in the port of Cortes, since fragmentation of work would complicate operation.

(5) Longshoring (excluding container, Action plan 8)

346. Longshoring is conducted by ENP except those relating to petroleum, banana and timber. Before the creation of ENP, cargo owners conducted this business in a rather disorderly manner. ENP tries to keep the labor's quality up by setting a specific training course.

347. In many ports, this kind of service is in the hands of the private sector, and in most cases high efficiency is observed as a result of being exposed to market competition. Nevertheless, in light of the past experience (see paragraph 328 of this Chapter), the port of Cortes may be an exception. Training and welfare system of ENP, which many of port related private sectors do not have, dictates the preference of the present arrangement.

348. Aside from the issue of who is carrying out the service, there is a problem regarding work in warehouses, particularly in Cortes. Since the container age has come, warehouses have become unutilized. However, there are as many as 128 personnel working for warehouses inclusive of office workers. This should be reviewed and the number should be reduced to a more reasonable level.

(6) Works in the port of Castilla (Action plan 8)

349. In Castilla, while ENP owns and operates a certain amount of cargo handling equipment (mainly for containers), Standard Fruits Co. also works using their own equipment. Repair and maintenance are done at their own shop. It is the team's observation that Standard Fruits works more extensively and actively than ENP in terms of cargo handling and repair. Fruits are treated very favorably for assignment of berth and labor arrangement.

350. Under these circumstances, the study team preliminarily feels that cargo handling, and repair and maintenance of handling equipment could be transferred to Standard Fruits Co. without changing the operation.

(7) Free zone

351. The government is urging ENP to sell Zona Libres run by ENP in Cortes, Tela and La Ceiba to the private sector, and ENP has already expressed its intention to sell two zones except Cortes, and the selling is now under way. These two free zones have not direct relation with port function.

352. The Cortes free zone is closely located to the area which is now under reclamation

work to serve for expand port activity. In near future, this area may well be a core of the port Cortes because the area will mainly handle unit cargo which is the most modernized maritime transport mode. The growth of this transport mode which is envisaged in the next decades surely requires more quays and land.

353. It is obvious that the western end of the existing port, which is at the mouth of the bay of Cortes, cannot properly accommodate a future expanded facility. This fact together with the likely development of modernized transport may require both land and waterfront line of the free zone. Bearing this in mind, it is suggested that the ownership of the land should be retained by ENP, even though operation of the zone is delegated to the private sector.

#### 4.4 Private Participation in the Facilities to Be Built

##### (1) Container terminal (Cortes)

354. It is almost unanimously agreed within the maritime circle that container terminals should be operated by the private sector with the view to bettering services for clients, to bettering public relations and thus realizing a competitive and prosperous terminal. There is more than one method by which the private sector can become involved in the container terminal operation, but without getting into detailed variations either of the following two methods are thought appropriate for the Cortes terminal:

Alternative 1 ---- a private sector borrows the quay, yards, gantry cranes and other installations which ENP furnishes, <sup>1/</sup>and it owns straddle carriers, tractor heads and other equipment, then conducts the terminal operation.

Alternative 2 --- a private sector owns all the assets including quays and land required for operation of the terminal.

355. Alternative 1 is a measure broadly taken in many countries for getting private skills in terms of terminal operation. Possible lessees are shipowners, terminal operators and in a few cases stevedoring firms. In many cases, the lease contract is awarded to a joint venture of an experienced foreign firm and a domestic company with a view to maintaining influence of the government. The period of lease is limited, say 10 to 20

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<sup>1/</sup> Installations which port authorities furnishes are varied in each port according to the port's policy and financial situation. In the port of Cortes, it should be noted when considering the lease term that one of two gantry cranes working at berth No.4 and 5 may be relocated when new container berth(s) become operational. Transferring of existing crane surely saves costs.

years with the option of renewal. Anyway, ENP plays the role of landlord, and some lessee's activities should obtain the approval of ENP in certain cases such as new installations on the leased terminal and determining the tariff.

356. Alternative 2 is normally referred as BOO (Building, Owning and Operating) or BOT (Build, Operate and Transfer) scheme. Difference between these two schemes is that while under the BOT scheme the investor transfers facilities which he operates to the relevant public sector management after he recovers his investment by the income earned by the operation, whereas under the BOO the investor owns the facilities outright. Under the schemes, the government stands save the construction expenditure more than with other schemes. Generally speaking, however, opportunity for success is very thin in unlucrative ports of developing countries, because foreign investors may not be attracted to the port investment by long pay-back period due to the low returns. High risk caused by the political uncertainty also diminishes a potential investors interest.

357. With the above observations in mind, the team recommends alternative 1. Also it is advisable that ENP hire a consultant knowledgeable in lease contract matters to draft a standard form of contract.

#### (2) Dry bulk terminal (Cortes)

358. A dry bulk terminal to be constructed in the Port of Cortes is suited for participation by private sector in terms of investment as well as operation. While the infrastructure as well as handling equipment are it is envisaged that furnished by the private sector who also operate the terminal. ENP should choose the method of privatization among BOO, BOT and so forth, but in any case, ENP should try to persuade the possible operator that it retains the overall planning and supervisory function.

#### (3) Cold Storage (Cortes)

359. Although ENP is carrying out cargo handling in the existing warehouse, the cold storage which is now planned to be built by ENP will be through by the concession of ENP operated by a private firm.

#### (4) Liquid bulk facilities (Tela and San Lorenzo)

360. For these facilities, Honduran petroleum importing firms have a plan to construct and operate with the concession of ENP which shows the agreement in broad terms. Since the interested parties agree, there is no reason to defy that.