7.2.3 Base Case Scenario: Forecasts by *Controlaría General de la Republica*

The *Controlaría General de la Republica* is the official statistics bureau of Panama and is hereafter referred to as the "Statistics Bureau". The Statistics Bureau has also forecasted population for the next 25 years. Their forecast is provided in next Table 7.2.7.

Table 7.2.7 Population Forecasts by the *Controlaría General de la Republica* (2005 – 2025)

Population	2003	2005	2010	2015	2020	2025
Total	3,116,277	3,228,186	3,504,483	3,764,166	4,011,084	4,238,907
Female	1,543,427	1,599,466	1,738,749	1,870,534	1,996,531	2,113,988
Male	1,572,850	1,628,720	1,765,734	1,893,632	2,014,553	2,124,919
% distribution						
Female	49.53	49.55	49.61	49.69	49.78	49.87
Male	50.47	50.45	50.39	50.31	50.22	50.13

Source: Controlaría General de la Republica

According to the forecasts made by the Statistics Bureau, the gender distribution of the Panamanian population remains stable over the next 20 years although it shows a very small increase of the female population (+0.34%) over the period between 2003 and 2025. While this distribution is similar to the World Bank forecasts, the UN Population Division estimates the difference to be slightly larger. However, the distribution trend remains stable in all forecasts.

The distribution per age category, presented in Table 7.2.8 demonstrates that also the Statistics Bureau foresees a gradual aging of the population and that the number of people over 65 years increases much stronger than the other categories. It can also be noted that the number of children as share of the total population declines over the period.

Table 7.2.8 Distribution of Population per Age Group (2005-2025)

	2005	**2010**	**2015**	**2020**	**2025**
Total	3,228,186	3,504,483	3,764,166	4,011,084	4,238,907
0-4	342,945	351,221	345,504	344,452	342,587
5-9	329,740	341,709	350,010	344,435	343,276
10-14	308,399	329,340	341,283	349,617	343,914
15-19	299,900	307,769	328,640	340,622	348,811
20-24	278,838	298,800	306,646	327,537	339,264
25-29	264,873	277,505	297,361	305,298	325,820
30-34	261,717	263,334	275,887	295,745	303,393
35-39	239,252	259,755	261,398	273,990	293,528
40-44	204,698	236,952	257,313	259,088	271,452
45-49	168,713	201,998	233,898	254,152	255,902
50-54	137,910	165,538	198,298	229,785	249,740
55-59	111,329	134,094	161,103	193,183	223,990
60-64	89,590	106,753	128,771	154,943	185,981
65-69	67,335	84,013	100,323	121,300	146,202
70-74	51,565	60,678	75,981	91,066	110,480
75-79	36,887	43,317	51,321	64,692	77,987
+80	34,495	41,707	50,429	61,179	76,580

Source: Controlaría General de la Republica

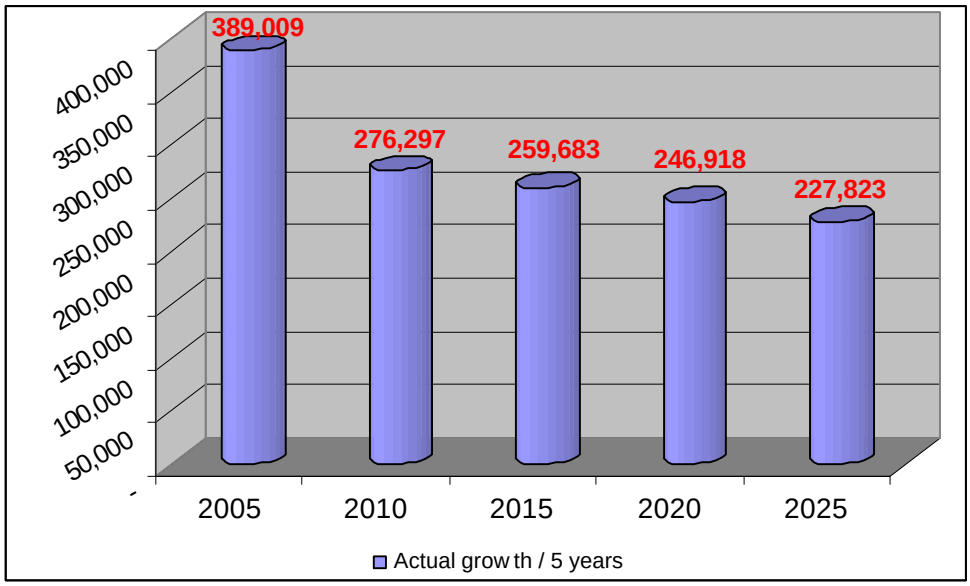
The percentage distribution of the relevant 3 age groups is visualized in next Table 7.2.9.

Table 7.2.9 Absolute and % Distribution per Major Age Group (2005-2025)

ABSOLUTE	2005	2010	2015	2020	2025
0-14	981,084	1,022,270	1,036,797	1,038,504	1,029,777
15-64	2,056,820	2,252,498	2,449,315	2,634,343	2,797,881
+65	190,282	229,715	278,054	338,237	411,249
TOTAL	3,228,186	3,504,483	3,764,166	4,011,084	4,238,907
% DISTRIBUTION					
0-14	30.39	29.17	27.54	25.89	24.29
15-64	63.71	64.27	65.07	65.68	66.00
+65	5.89	6.55	7.39	8.43	9.70

Source: Controlaría General de la Republica

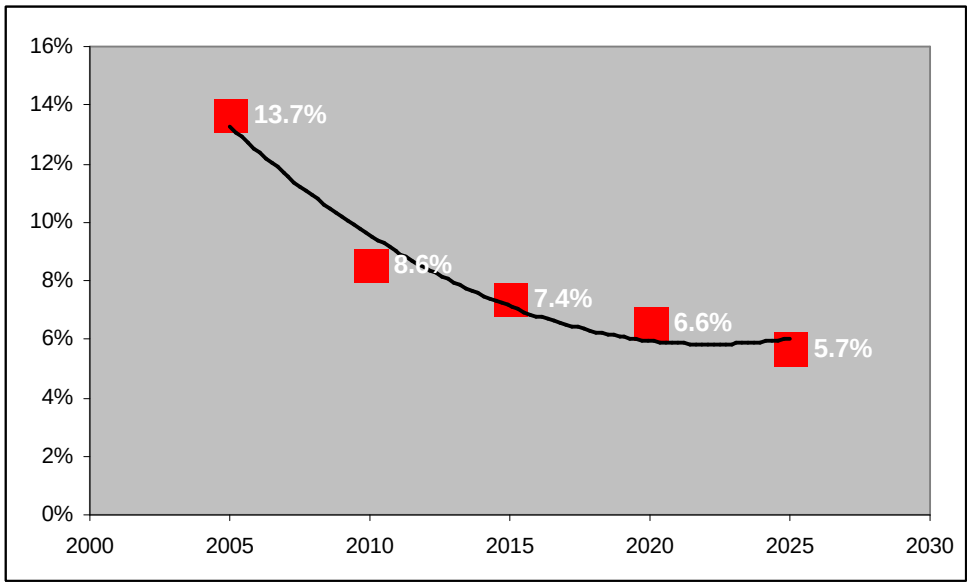
Table 7.2.9 also demonstrates an interesting phenomenon that was also observed in the forecasts made by the World Bank, and that is the increase in the economic active population over the next 20 years. While the share is at present 63.7% of total population, this share will grow to 66% in the year 2025. According to the long-term forecasts by the World Bank, this share will start declining from that point on.



Source: JICA Study Team on the basis of Controlaría General de la Republica

Figure 7.2.3 Actual Growth Population (5 Year Periods; 2005 - 2025)

The population increased with 13.7% between 2000 and 2005 but the growth started to decrease from 2005 on. Between 2005 and 2010, the growth of the population was 8.6% to further decline to a growth of 5.7% between 2020 and 2025. See Figure 7.2.4. The average growth over the entire period was equal to 7.1% but the trend line clearly demonstrates the strong decline of the growth rate of the population over the next 20 years.



Source: JICA Study Team on the basis of Controlaría General de la Republica

Figure 7.2.4 % Growth of Population (2005-2025)

The distribution of the future population over the provinces is provided in next Table 7.2.10.

Table 7.2.10 Population Forecast per Province and Gender (2005 – 2025)

Year	Gender	Total Republic	Provinces									Comarcas		
			Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Kuna Yala	Emberá	Ngöbe Buglé
2005	**Total**	**3,228,186**	**105,521**	**224,278**	**230,389**	**404,914**	**44,198**	**110,013**	**89,007**	**1,618,577**	**223,337**	**36,387**	**9,189**	**132,376**
	Male	1,628,720	54,293	115,785	117,000	205,803	24,376	55,820	45,242	805,999	117,674	17,021	4,818	64,889
	Female	1,599,466	51,228	108,493	113,389	199,111	19,822	54,193	43,765	812,578	105,663	19,366	4,371	67,487
2010	**Total**	**3,504,483**	**118,405**	**237,840**	**249,512**	**426,790**	**46,011**	**112,538**	**90,984**	**1,798,471**	**226,847**	**37,245**	**9,290**	**150,550**
	Male	1,765,734	60,160	122,787	126,427	216,114	25,153	57,069	45,982	896,763	119,436	17,518	4,853	73,472
	Female	1,738,749	58,245	115,053	123,085	210,676	20,858	55,469	45,002	901,708	107,411	19,727	4,437	77,078
2015	**Total**	**3,764,166**	**131,581**	**249,748**	**267,540**	**443,114**	**47,350**	**114,097**	**92,156**	**1,973,451**	**229,254**	**37,765**	**9,370**	**168,740**
	Male	1,893,632	66,154	128,642	135,284	224,187	25,688	57,737	46,400	983,978	120,457	17,908	4,883	82,314
	Female	1,870,534	65,427	121,106	132,256	218,927	21,662	56,360	45,756	989,473	108,797	19,857	4,487	86,426
2020	**Total**	**4,011,084**	**144,599**	**260,717**	**284,252**	**455,563**	**48,899**	**114,441**	**92,519**	**2,144,956**	**230,719**	**37,968**	**9,436**	**187,015**
	Male	2,014,553	72,488	133,987	143,432	230,315	26,360	57,975	46,392	1,068,593	120,741	18,019	4,903	91,348
	Female	1,996,531	72,111	126,730	140,820	225,248	22,539	56,466	46,127	1,076,363	109,978	19,949	4,533	95,667
2025	**Total**	**4,238,907**	**157,416**	**270,366**	**299,789**	**465,280**	**50,227**	**114,146**	**92,298**	**2,305,685**	**230,695**	**38,038**	**9,490**	**205,477**
	Male	2,124,919	78,714	138,658	150,947	235,073	26,904	57,850	46,118	1,146,944	120,424	18,033	4,882	100,372
	Female	2,113,988	78,702	131,708	148,842	230,207	23,323	56,296	46,180	1,158,741	110,271	20,005	4,608	105,105

Source: Controlaría General de la Republica

The absolute growth of population for the different provinces is represented in Table 7.2.11 hereafter.

Table 7.2.11 Absolute Population Growth per Province (2005 – 2025)

Year	Growth Total country	Provinces									Comarcas		
		Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Kuna Yala	Emberá	Ngöbe Buglé
2005	389,009	16,252	21,817	26,181	36,124	3,914	7,548	5,512	230,220	14,261	3,941	943	22,296
2010	276,297	12,884	13,562	19,123	21,876	1,813	2,525	1,977	179,894	3,510	858	101	18,174
2015	259,683	13,176	11,908	18,028	16,324	1,339	1,559	1,172	174,980	2,407	520	80	18,190
2020	246,918	13,018	10,969	16,712	12,449	1,549	344	363	171,505	1,465	203	66	18,275
2025	227,823	12,817	9,649	15,537	9,717	1,328	-295	-221	160,729	-24	70	54	18,462
Total period	1,399,730	68,147	67,905	95,581	96,490	9,943	11,681	8,803	917,328	21,619	5,592	1,244	95,397

Source: JICA Study Team on the basis of Controlaría General de la Republica

Table 7.2.11 demonstrates that the annual level of absolute population growth for the total of Panama will decline over the next 25 years. Still showing an absolute 5 year growth of 389,009 persons in 2005, this 5-year growth is reduced to 227,823 persons in 2025.

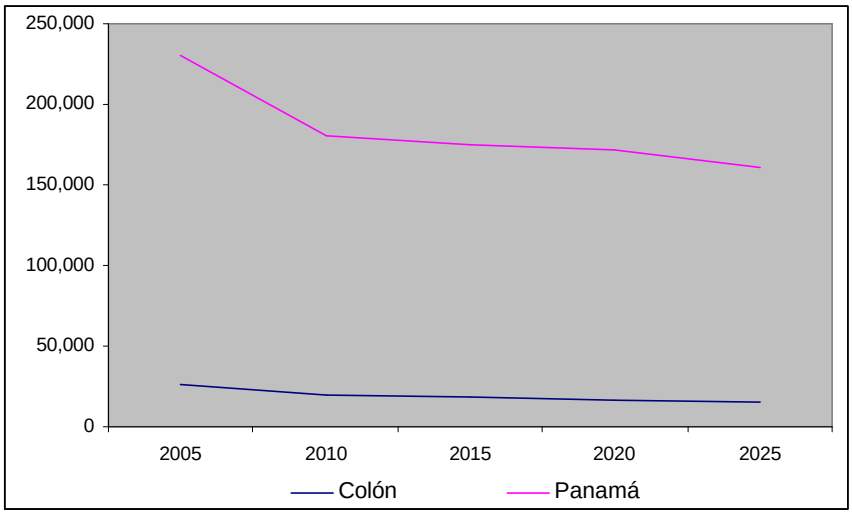
This decline is notable over all provinces, some of which will have negative growth by 2025. Bocas del Toro and Panama are two exceptions, be-it for different reasons. Bocas del Toro demonstrates the most stable long-term population increase, and the absolute number of population increase in 2025 is of all provinces the closest to the one registered in 2005. Together with the Indian Reservation of Ngöbe Buglé, Bocas del Toro is the only province in Panama where the growth level rises between the period 2010 and 2020. the absolute increase of the population in Panama will drop with approximately 50% over the next 25 years, but in spite of this decline, the province (and in particular Panama City) will have to accommodate for the largest share of the increase in population. See Table 7.2.12.

Table 7.2.12 % Population Growth per Province (2005 – 2025)

Year	Total country	Provincias									Comarcas		
		Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Kuna Yala	Emberá	Ngöbe Buglé
2005	13.7%	18.2%	10.8%	12.8%	9.8%	9.7%	7.4%	6.6%	16.6%	6.8%	12.1%	11.4%	20.3%
2010	8.6%	12.2%	6.0%	8.3%	5.4%	4.1%	2.3%	2.2%	11.1%	1.6%	2.4%	1.1%	13.7%
2015	7.4%	11.1%	5.0%	7.2%	3.8%	2.9%	1.4%	1.3%	9.7%	1.1%	1.4%	0.9%	12.1%
2020	6.6%	9.9%	4.4%	6.2%	2.8%	3.3%	0.3%	0.4%	8.7%	0.6%	0.5%	0.7%	10.8%
2025	5.7%	8.9%	3.7%	5.5%	2.1%	2.7%	-0.3%	-0.2%	7.5%	0.0%	0.2%	0.6%	9.9%
Average	7.1%	10.5%	4.8%	6.8%	3.5%	3.2%	0.9%	0.9%	9.3%	0.8%	1.1%	0.8%	11.6%

Source: JICA Study Team on the basis of Controlaría General de la Republica

As can be seen in Figure 7.2.5 and 7.2.6, there are particular growth patterns that can be identified for the different provinces. Figure 7.2.5 shows the growth provinces for the Metropolitan Area (Colón and Panama) and Figure 7.2.6 shows the population growth patterns for the Interior Area (other provinces and reservations).

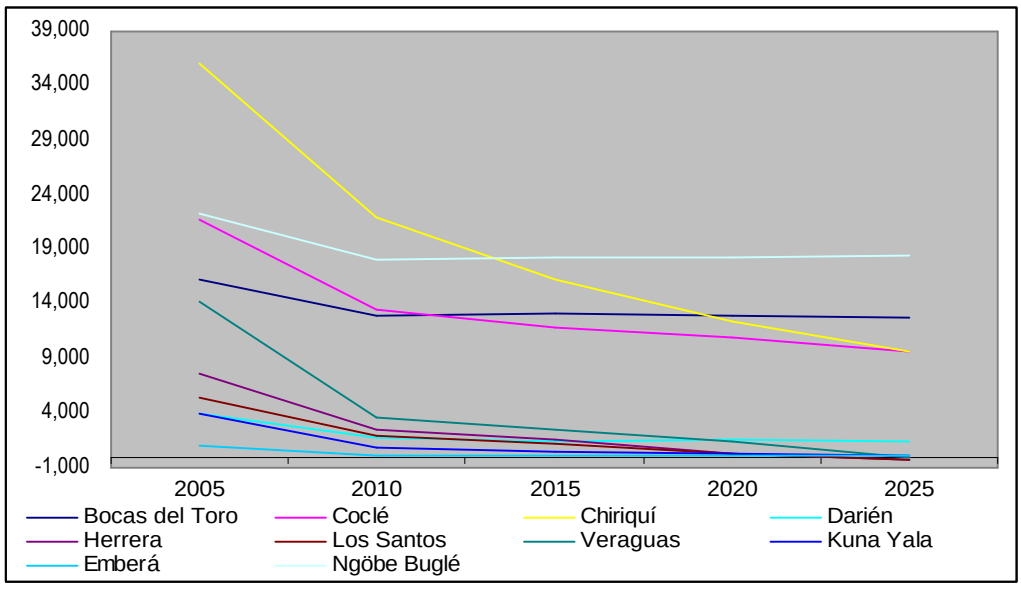


Source: JICA Study Team on the basis of Controlaría General de la Republica

Figure 7.2.5 Population Patterns Metropolitan Area (2005 – 2025)

For Panama, the growth in population decreases strongly between 2005 and 2010 to become relatively stable between 2010 and 2025. This pattern is different from the growth pattern for Colón province that remains relatively stable over the entire period.

After a rapid decline in growth during the period 2005 2010 for all provinces, the same two patterns are notable for the Interior Area. On the one hand, there are provinces for which the level of growth continues to decrease strongly, while for other provinces, that decrease is less explicit and the growth levels remain more stable.



Source: JICA Study Team on the basis of Controlaría General de la Republica

Figure 7.2.6 Population patterns Interior Area (2005 – 2025)

The Chiriqui province is the province where the decline in growth is the most explicit. After a first dramatic decrease between 2005 and 2010, that level of decrease continues, be-it somewhat less strongly. Similar patterns can be noted for most other provinces and reservations, although the decline in periodic growth is not as strong as for Chiriqui province.

Two clear exceptions are identifiable, namely Bocas del Toro and the Indian Reservation of Ngöbe Buglé where the level of growth increases. Darien shows a volatile growth, with one period an increase in growth level and the next period a moderate decline. Overall however, this is the third province where the growth level of the population remains stable over the entire 25 year period.

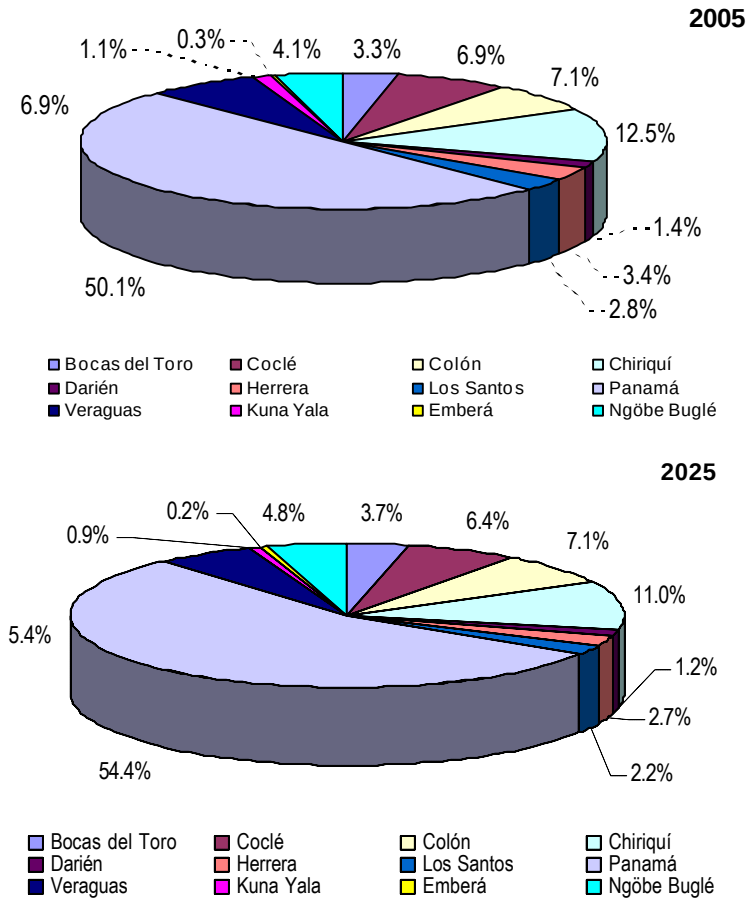
During the period 2000 – 2005, total population will increase with 13.7%. Panama, Bocas del Toro and Ngöbe Buglé show a higher growth than the population growth at the country level; Colón and the two other Indian Reservations have a growth that is close to the national growth while the level of growth in all other provinces is below the growth at country level. This situation does not change over time. In 2025, population increase in Bocas del Toro, Panama and Ngöbe Buglé remains higher than the increase at country level. Colón remains close to the national level while all other provinces and reservations have growth levels which are far below the country level. Los Santos and Herrera even demonstrate an absolute decrease in its population.

The province of Panama, and more particular Panama City, is and will remain a major attraction pole and its share in total population will continue to grow over the next 25 years. In 2005, the province will account for 50% of total population, a share that will increase to 54.4% in 2025. See Figure 7.2.7.

A final indicator that is essential in the economic forecasts is the Economic Active Population (EAP). Two different methods can be applied to estimate the EAP for Panama over the next 20 years:

- The EAP is equal to the age group 15 – 64 years with the necessary corrections to account for students, non-working persons, etc…The EAP forecasts are then equal to the population forecasts for that particular age group, taking into account the corrections for non-economic active persons in that age group.

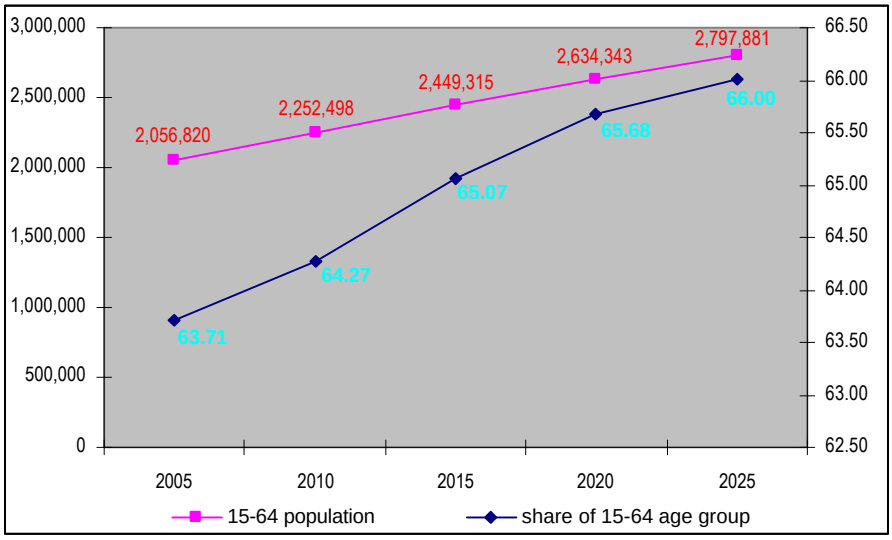
- The EAP is calculated on the basis of the latest available statistics of the Statistics Bureau and frequently updated. The EAP forecasts are then calculated on the basis of the forecasted population increase, starting from the latest available data that counted the EAP in Panama. The latest data available are the EAP estimates for 2002.



Source: JICA Study Team on the basis of Controlaría General de la Republica

Figure 7.2.7 % Share of Population per Province (2005 and 2025)

According to the first method, the EAP in Panama has to be calculated on the basis of the performance of the age group 15 – 64 years. This age group will grow with a higher rate than the total population. In other words and after having made the necessary adjustments, the share of the EAP (age group 15-64 years) could be increasing over the next 20 years. See Figure 7.2.8.



Source: JICA Study Team on the basis of Controlaría General de la Republica

Figure 7.2.8 % Growth and Absolute Population of 15-64 Age Group (2005-2025)

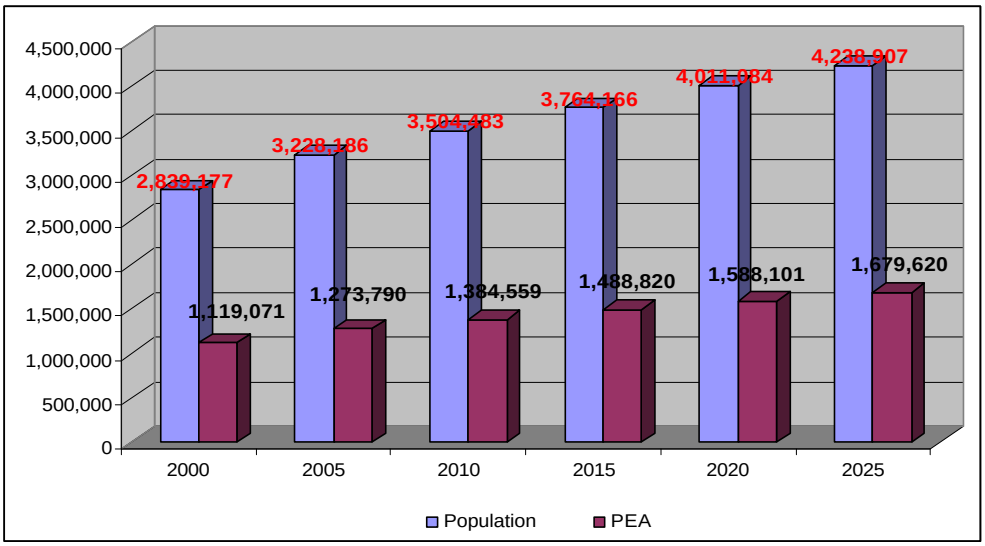
Figure 7.2.8 demonstrates the strong increase of the age group 15 – 64 years during the period 2005 to 2020, growing with an average of 200,000 persons (male and female combined) per 5 year period. But from 2020 on, this growth is reduced to approximately 150,000 persons. The trend is clearly reflected in the percentage growth over that period. After a slow start with a 0.56% growth between 2005 and 2010, the growth is 0.8% and 0.61% in the periods 2010-2015 and 2015-2020 respectively. The decline of the percentage growth is much stronger in the final period, when growth is 0.32%. This trend is corroborated by the forecasts made by the World Bank that indicated a growth of the age group 15-64 years over the next 20 years.

To estimate the EAP as share of the age group 15 – 64 years, the total number needs to be reduced with a percentage that reflects the share of non economic active persons. To estimate this share, the latest available absolute numbers of population in Panama were taken (year 2000 statistics of the Statistics Bureau) and compared to the actual number of economic active persons. On a total population of 2,839,177 persons in the year 2000, 62% were in the age group between 15 and 64 years (1,846,670 persons). The total registered economic active population in that year was equal to 1,119,071 persons. The difference between both numbers is 39.4%. This means that according to this method, the future economic active population will be approximately 39% of the total population between 15 and 64 years. If the forecasts of the EAP using the second method have a similar difference with the future population in the age group between 15 and 64 years, either method can be used.

The second method to estimate the future EAP starts from the year 2002 estimates of the EAP by the Statistics Bureau of Panama[144]. These statistics give an actual count of the economic active population in the age group 15-64 years. The statistics also take into account unemployment and

[144] « Resultados Preliminares de la Encuesta de Hogares : Agosto 2002 » ; Dirección de Estadística y Censo; Boletín nº 8/2002, 1 de noviembre de 2002

non-working persons in that age group. The 2002 percentage of EAP to total population is used over the 25 year period to estimate future EAP on the basis of the forecasted future population. The results are presented in next Figure 7.2.9.



Source: JICA Study Team on the basis of "Panama en Cifras 1998 -2002", November 2003 and "Boletin 8/2002 des Estadistica Panameña: Avance de Cifras" November 2002; Direction de Estadistica y Censo del Contraloria General de la Republica

Figure 7.2.9 EAP forecasts on the basis of year 2002 EAP (2005 -2025)

The difference between the EAP forecasts using year 2002 numbers and using estimated growth of 15 – 64 years age group is approximately 40% (38% in 2005, and 39% in 2010 and 2015).

7.2.4 Development Generated Scenarios

Table 7.2.13 hereafter resumes the expected total population according to the different institutes that made the forecasts.

Table 7.2.13 Population forecasts for Panama from various organizations (2005 – 2025)

In '000 of persons	2005*	2010	2015	2020	2025
World Bank	3,072	3,260	3,456	3,652	3,838
Populations Reference Bureau	3,000	-	-	-	4,200
UN Population Division: High Variant	3 243	3 545	3 852	4 163	-
UN Population Division : Medium Variant	3 235	3 520	3 790	4 047	-
UN Population Division : Low Variant	3 204	3 434	3 635	3 818	-
Controlariá General de la Republica	3,228	3,505	3,764	4,011	4,238

* The estimate for the PRB is the 2003 estimate

Based upon the above Table 7.2.6, it is acceptable to consider the population forecasts, made by the Controlaria General de la Republica, as very accurate and they are corroborated by the forecasts of the UN Population Division Medium and High Variant and the Populations Reference Bureau. The World Bank forecasts and the UN Low Variant are below the estimates made by the Controlaria General, but it is obvious that these forecasts are very conservative

projections and the preliminary results of the population forecasts for 2003, made by the Controlaria General already suggest that these forecasts are below actual growth figures.

It is therefore acceptable to use the data produced by the Statistics Bureau for the purpose of further socio-economic forecasts. These forecasts include the estimate of the economic active population, the regional distribution of the economic active population and economic indicators such as the (R)GDP and sector productivity.

As regards the estimated future EAP, year 2002 statistics data will be used to assess the future situation.

For all following socio-economic forecasts, accurate data from the Statistics Bureau will be used as a basis of the calculations and as far as possible, the results will be compared to other data in order to find corroborating values.

7.2.5 Sector Distribution of Economic Active Population

As a starting point to assess the distribution of the EAP over the different sectors, year 2000 and year 2002 data were used. These data have recently been published and allowed to clearly determine the EAP over the different sectors. See Table 7.2.14.

Table 7.2.14 EAP per Sector year 2000 – 2002

SECTOR	2000	2002	2000-2002 average	% average
Agriculture, cattle, hunting and silviculture	204,150	176,883	190,517	16.50
Fishing	12,810	10,700	11,755	1.02
Quarries and mines exploitation	2,000	1,799	1,900	0.16
Manufacturing and industries	104,345	108,448	106,397	9.22
Electricity, gas and water supply	9,110	11,198	10,154	0.88
Construction	90,272	93,175	91,724	7.95
Wholesale and retail commerce	201,511	228,636	215,074	18.63
Hotels and restaurants	49,124	56,023	52,574	4.55
Transport, storage and communications	78,239	88,059	83,149	7.20
Intermediate financing	26,501	25,968	26,235	2.27
Real estate	45,788	47,804	46,796	4.05
Public administration & defense, social security	70,111	75,894	73,003	6.32
Teaching	56,814	63,945	60,380	5.23
Social health services	36,822	41,066	38,944	3.37
Other activities, public & private services	48,603	82,350	65,477	5.67
Private homes with domestic services	65,596	76,037	70,817	6.13
Organizations	1,478	495	987	0.09
Non-specified activities	15,797	1,213	8,505	0.74
Total	**1,119,071**	**1,189,693**	**1,154,382**	**100.00**

Source: JICA Study Team on the basis of “Panama en Cifras 1998 -2002”, November 2003 and “Boletin 8/2002 des Estadistica Panameña: Avance de Cifras” November 2002; Direction de Estadistica y Censo del Contraloria General de la Republica

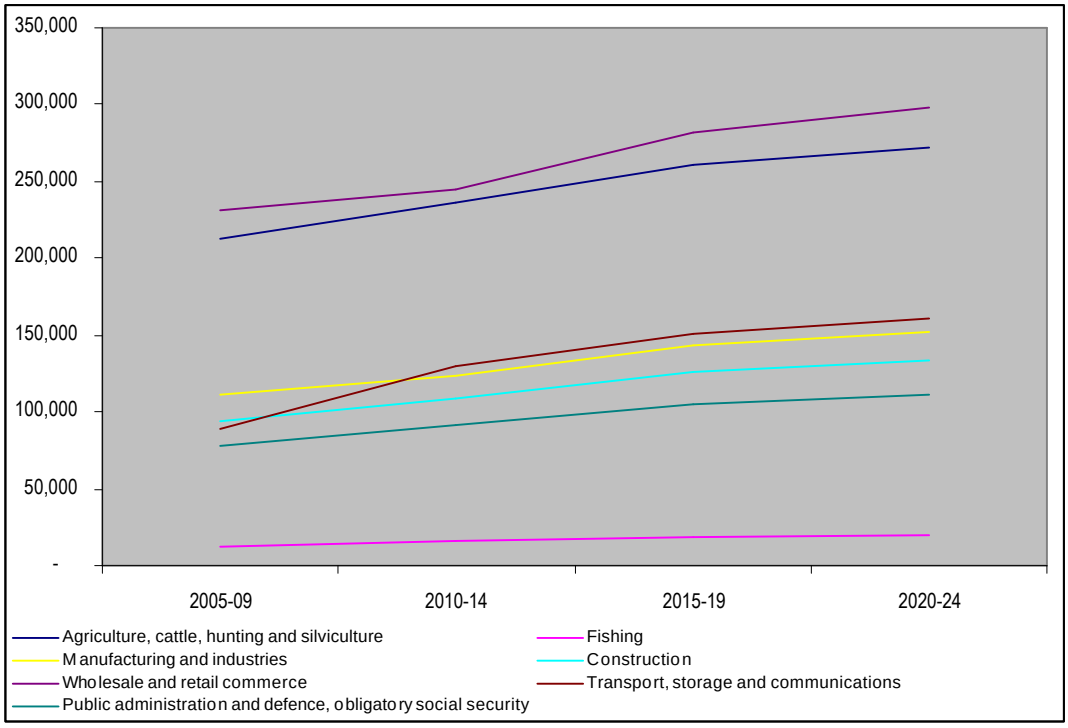
Using the expected population growth and transposing this growth on the different sectors provides the following estimated PEA per sector for the period 2005 – 2025. See Table 7.2.15.

Table 7.2.15 EAP per sector year 2005 – 2024

Sectors	2005-09	2010-14	2015-19	2020-24	average
Agriculture, cattle, hunting and silviculture	212,853	235,946	261,016	272,105	245,480
Fishing	12,091	16,592	18,896	19,684	16,816
Quarries and mines exploitation	1,804	3,007	3,447	3,643	2,975
Manufacturing and industries	111,698	124,100	143,012	151,532	132,585
Electricity, gas and water supply	11,343	11,987	13,809	14,629	12,942
Construction	94,316	108,933	125,690	133,401	115,585
Wholesale and retail commerce	230,940	244,419	281,437	298,075	263,718
Hotels and restaurants	56,824	59,577	68,940	73,174	64,629
Transport, storage and communications	89,092	129,412	151,133	161,042	132,670
Intermediate financing	26,388	30,436	35,622	37,990	32,609
Real estate	48,791	50,252	58,850	62,780	55,168
Public administration and defense, obligatory social security	78,385	91,074	105,403	111,899	96,690
Teaching	65,782	71,844	82,256	86,919	76,700
Social health services	41,820	45,626	52,709	55,906	49,015
Other activities, various public & private services	83,275	69,260	80,241	85,210	79,496
Private homes with domestic services	76,704	82,159	94,693	100,334	88,472
Organizations	507	1,411	1,658	1,771	1,337
Non-specified activities	29,967	8,530	9,293	9,517	14,327
Total	**1,272,580**	**1,384,559**	**1,588,101**	**1,679,620**	**1,481,215**

Source: JICA Study Team

Agriculture and wholesale both have substantially more people employed than the other sectors, followed by the manufacturing sector and transport, storage and communications. All sectors see a logical increase in economic active population over the entire period. Following Figure 7.2.10 visualizes the evolution of the most representative sectors.



Source: JICA Study Team

Figure 7.2.10 Evolution of EAP for Selected Sectors (2005 – 2024)

The EAP of the wholesale sector will see a continued growth over the next 25 years. After a relatively moderate start, the level of growth increases during the next five years (2010 – 2014) after which the speed of growth notably decreases for several sectors.

The EAP of the agriculture sector grows stable until 2019, after which the level of increase becomes more moderate. The population, active in the transport, storage and communications sector demonstrates the most explicit growth line. After a strong growth between 2005 and 2015, the speed of growth reduces to flatten out in the last five years (2020-2024). All other sectors see a constant moderate growth of the economic active population, a growth that is in line with the overall increase in population. The growth of the EAP in the wholesale and retail sector demonstrates exactly the opposite evolution. After a moderate start between 2005 and 2010, the growth becomes more explicit until 2019, after which the level of growth falls again in the pattern of the period 2005-2010. The growth of the economic active population for the other sectors demonstrates constant but overall moderate growth patterns, in line with the overall growth of the population and the growing share of the age group 15-64 years in that population.

Table 7.2.16 visualizes the share of each sector in the total EAP for the period 2005-2024.

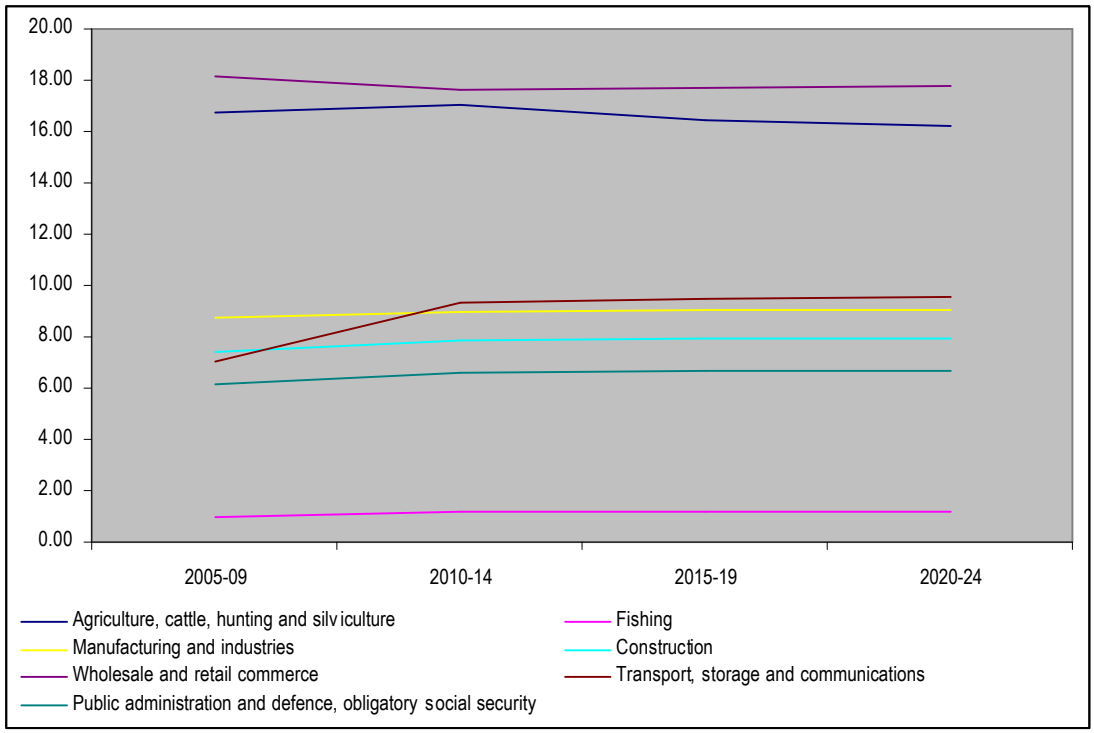
Table 7.2.16 % EAP per sector year 2005 – 2024

Economic Sector	2005-09	2010-14	2015-19	2020-24	AV
Agriculture, cattle, hunting and silviculture	16.73	17.04	16.44	16.20	16.57
Fishing	0.95	1.20	1.19	1.17	1.14
Quarries and mines exploitation	0.14	0.22	0.22	0.22	0.20
Manufacturing and industries	8.78	8.96	9.01	9.02	8.95
Electricity, gas and water supply	0.89	0.87	0.87	0.87	0.87
Construction	7.41	7.87	7.91	7.94	7.80
Wholesale and retail commerce	18.15	17.65	17.72	17.75	17.80
Hotels and restaurants	4.47	4.30	4.34	4.36	4.36
Transport, storage and communications	7.00	9.35	9.52	9.59	8.96
Intermediate financing	2.07	2.20	2.24	2.26	2.20
Real estate	3.83	3.63	3.71	3.74	3.72
Public administration and defense, obligatory social security	6.16	6.58	6.64	6.66	6.53
Teaching	5.17	5.19	5.18	5.17	5.18
Social health services	3.29	3.30	3.32	3.33	3.31
Other activities, various public & private services	6.54	5.00	5.05	5.07	5.37
Private homes with domestic services	6.03	5.93	5.96	5.97	5.97
Organizations	0.04	0.10	0.10	0.11	0.09
non-specified activities	2.35	0.62	0.59	0.57	0.97
Total	100	100	100	100	100

Source: JICA Study Team

The average distribution over the sectors remains in line with the one calculated during the years 2000 – 2002 (Table 7.2.14), which should be, given that the year 2002 distribution was used for the estimates. The similarity suggests that the forecasts are stable and could be considered a trustworthy reflection of the future population that exercises an economic activity. The agriculture and the wholesale and retail sectors are the ones with the highest share of EAP, with an average share of 16.6% and 17.8% respectively. Manufacturing, construction and Transport is the second largest group, closely followed by public administration and other private and public services.

The next Figure 7.2.11 visualizes the evolution of the share in total EAP of selected economic sectors.



Source: JICA Study Team

Figure 7.2.11 Evolution of % Share in EAP for Selected Sectors (2005 – 2024)

While the fluctuations for most sectors are minimal, three sectors demonstrate a more notable trend. These three sectors are the agricultural sector, the wholesale and retail sector and the transport and communications sector. The agricultural sector demonstrates a moderate growth between 2005 and 2014 with the share of the EAP increasing from 16.7% to 17.1%, after which the share gradually decreases to a 2024-level 0.5% lower than the year-2005 level (16.2%). The wholesale and retail sector demonstrates the opposite evolution. After first decreasing between 2005 and 2014 from 18.2% in 2005 to 17.7% in 2014, the share of the sector shows a constant but moderate growth during the rest of the period, reaching 17.8% in 2024. The transport, storage and communications sector illustrates the most remarkable fluctuation. In 2005, the share of transport was 7%. After a strong rise with almost 2.4% between 2005 and 2014, the growth of the sector is stopped and its increase until 2024 is only 0.2%, from 9.35% in 2014 to 9.59% in 2024.

7.2.6 Regional Distribution of Economic Active Population

The year 2000 and 2002 absolute data have been used to estimate the distribution of the economic active population for the different provinces.

The share of the EAP in total population (PEA/POP) for each of the provinces for the year 2000 was used as basis to estimate the future EAP per province and per sector.

The forecasted EAP per province is visualized in the Table 7.2.17 hereafter.

Table 7.2.17 EAP per Region (2005 – 2024)

	Year 2000			2005	2010	2015	2020	2025
PROVINCE	POP	PEA	PEA/ POP	PEA	PEA	PEA	PEA	PEA
Bocas del Toro	89,269	25,575	28.6	30,231	33,922	37,697	41,427	45,099
Coclé	202,461	70,655	34.9	78,269	83,002	87,157	90,985	94,353
Colón	204,208	74,277	36.4	83,800	90,756	97,313	103,392	109,043
Chiriquí	368,790	140,072	38.0	153,792	162,101	168,301	173,030	176,720
Darién	40,284	14,092	35.0	15,461	16,095	16,564	17,106	17,570
Herrera	102,465	40,270	39.3	43,236	44,229	44,842	44,977	44,861
Los Santos	83,495	34,428	41.2	36,701	37,516	37,999	38,149	38,058
Panamá	1,388,357	603,729	43.5	703,840	782,068	858,158	932,737	1,002,630
Veraguas	209,076	74,758	35.8	79,857	81,112	81,973	82,497	82,488
Comarca Kuna Yala	32,446	9,227	28.4	10,348	10,592	10,740	10,797	10,817
Comarca Emberá	8,246	2,415	29.3	2,691	2,721	2,744	2,764	2,779
Comarca Ngöbe Bugle	110,080	29,573	26.9	35,563	40,445	45,332	50,242	55,201
total	**2,839,177**	**1,119,071**	**39.4**	**1,273,790**	**1,384,559**	**1,488,820**	**1,588,101**	**1,679,620**

Source: JICA Study Team on the basis of Year 2000 Census Data

The national share of EAP in total population is 39.4%, but several provinces substantially divert from this national ration. A first group of provinces has a share that matches or exceeds the national average. The three provinces in this category are Panama (43.5%), Los Santos (41.2%) and Herrera (39.3%). Panama in particular will continue to be a pole of economic attraction and will have over 1 million economic active people in the year 2025. Chiriqui province is somewhere in the middle, with an economic active population that equals 38% of the total population, it is the only remaining province that is close to the national share. A second group of provinces has a share of EAP in total population that is 10% or more below the national level. These provinces are Bocas del Toro and the Comarcas that all have a share of EAP that is below 30% of total population. All other provinces are 3% or more below the national level.

Although many people are working in the service sector in all provinces, some remarkable differences can be noted. To evaluate in a general manner the future distribution of the EAP per sector in each province, the average percentage distribution of the EAP per sector and per province for the years 2000 and 2002 was used. This gave for the year 2025 EAP the results presented in Table 7.2.18.

Table 7.2.18 EAP for Primary, Secondary and Tertiary Sector per Province, Year 2055

sectors (Year 2025)	Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Comar-quas
Total	*45,099*	*94,353*	*109,043*	*176,720*	*17,570*	*44,861*	*38,058*	*1,002,630*	*82,488*	*68,798*
Primary sector	20,553	32,838	9,018	49,097	11,427	13,442	12,619	48,092	36,800	54,805
Secondary sector	4,437	17,636	14,151	25,968	1,197	7,959	5,910	195,485	9,159	4,148
Tertiary sector	20,106	43,878	85,873	101,655	4,946	23,460	19,529	759,054	36,529	9,845

Source: JICA Study Team on the basis of Year 2000 Census Data

Immediately, the high share of services in Panama can be noted in the above table. It has been stressed several times that the Panamanian economy is service oriented and given the economic and demographic concentration in Panama province, it is logical that in 2025, over 1 million people will be employed in the service sector in that province. Also in Colón, a high number of people will be active in the service sector, predominantly related to activities connected to Colón Free Zone. In many other provinces, there is a more balanced distribution between both the primary and secondary sector on the one hand and the service sector on the other hand.

Looking at the percentage distribution of EAP per province will make the above observations more explicit. See Table 7.2.19.

Table 7.2.19 % EAP for Primary, Secondary and Tertiary Sector per Province, Year 2025

% sectors (Year 2025)	Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarquas
Primary sector	45.57	34.80	8.27	27.78	65.04	29.96	33.16	4.80	44.61	79.66
secondary sector	9.84	18.69	12.98	14.69	6.81	17.74	15.53	19.50	11.10	6.03
Tertiary sector	44.58	46.50	78.75	57.52	28.15	52.30	51.31	75.71	44.28	14.31

Source: JICA Study Team on the basis of Year 2000 Census Data

Over 75% of the people working in the Metropolitan Area (Colón and Panama) in the year 2025 will be employed in the service sector. The percentage is 75.71% for Panama and 78.75% for Colón. The secondary sector will be the second largest employer, with nearly 20% of the people in Panama and 13% of the people in Colón working in the construction or manufacturing sector. The primary sector is relatively unimportant although in absolute numbers, Panama has more people working in the primary sector than any other province.

This distribution of the EAP is different in the Interior Area, where the service sector will "only" account for between 44% and 57% of employment in the year 2025. The primary and secondary sectors will remain also in the future very important and sometimes have more people working than the service sector. Provinces where in 2025 many people will be active in the secondary sector are Coclé (18.7%) and Herrera (17.7%). The secondary sector is also important in Los Santos (15.5%) and Chiriqui (14.7%) although in both provinces. The primary sector will also be strongly represented in these provinces, but it will not be as important as in the provinces of Bocas del Toro, Darién or the Indian Reservations, where people working in the primary sector will represent 45.6%, 65% and 79.7% respectively.

In order to estimate as accurately as possible the future EAP per sector and per province, the absolute distribution of the EAP per province and per sector has been calculated on the basis of EAP distribution in the year 2000 and 2002. For the period till 2009, the distribution per sector for the year 2002 was used to reflect the recent evolutions per sector. From 2010 on, year 2000 distributions were applied in order to take into account the positive results of the various national and regional development plans which in particular will stimulate the development of the primary and the secondary sector.

This forecast thus assumes that over the next 10 years, the primary and secondary sector will regain some importance as compared to the service sector. Such supposition is plausible and can be argued on the basis of the various national and regional development plans which have as primary objective to stimulate in the various provinces the economic performance of the primary and secondary sectors. The different provinces will gain more control over the economy and have an increased self-determination. Consequently, it can be argued that the decision-makers in the various provinces will focus on the sectors which at present are strong and which employ many people. It can also be argued that the development of new economic sectors will be stimulated in the future, but that these sectors will directly or indirectly be related to economic activities already strongly represented in the various provinces. Based upon the EAP data for the year 2000 – 2002, it can be argued that future economic development of the Interior Area will focus on non-service related activities, given that a continued concentration of services will be seen in the Metropolitan Area.

The evolution in absolute values over the next 20 years is presented in the Tables 7.2.20 through 7.2.23 and the percentage evolution is presented in the Tables 7.2.24 through 7.2.27.

The results of these forecasts allow a more detailed observation related to the strength of particular sectors in the various provinces.

Table 7.2.20 EAP per Sector and per Province Year 2005 - 2009

Sectors (Year 2005-2009) - Year 2002 distribution	Bocas del Toro	Coclé	Colón	Chiriqui	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture, cattle, hunting and silviculture	12,499	25,485	6,210	37,542	9,160	13,319	10,933	27,024	32,694	37,987
Fishing	114	1,364	214	909	467	448	547	5,140	1,399	1,488
Quarries and mines exploitation	45	360	24	81	-	79	96	1,092	26	3
Manufacturing and industries	1,220	8,731	4,120	11,231	498	4,633	3,210	71,102	4,333	2,619
Electricity, gas and water supply	147	396	885	1,181	155	310	405	7,262	529	72
Construction	1,667	5,247	5,833	10,754	744	2,787	2,293	60,724	3,942	325
Wholesale and retail commerce	3,429	10,335	23,666	31,627	1,172	7,128	5,671	137,124	9,725	1,063
Hotels and restaurants	997	2,213	3,440	5,342	640	1,688	1,665	37,998	2,541	299
Transport, storage and communications	1,857	2,717	11,566	9,757	349	1,617	1,412	57,031	2,557	229
Intermediate financing	201	487	1,036	1,567	46	591	320	21,530	589	22
Real estate	421	518	2,400	4,716	-	483	346	39,269	573	64
Public administration and defense, social security	1,244	3,905	3,181	6,992	533	1,725	2,291	53,171	3,561	1,782
Teaching	2,042	3,389	3,609	8,178	602	2,035	2,133	36,941	5,299	1,553
Social health services	1,247	1,998	3,098	4,124	259	1,525	1,243	25,830	2,041	455
Other activities, various public & private services	1,357	5,175	6,317	8,324	502	1,817	1,653	53,957	3,828	344
Private homes with domestic services	859	4,442	4,103	8,586	136	2,364	1,929	50,633	3,487	166
Organizations	-	-	79	-	35	25	37	321	-	9
non-specified activities	885	1,487	4,020	2,883	161	660	518	17,689	1,663	-
Total	30,231	78,248	83,800	153,792	15,461	43,236	36,701	703,840	78,789	48,480

Source: JICA Study Team on the basis of "Panama en Cifras 1998 - 2002", November 2003 and "Boletin 8/2002 des Estadistica Panameña: Avance de Cifras" November 2002; Direction de Estadistica y Censo del Contraloria General de la Republica

Table 7.2.21 EAP per Sector and per Province Year 2010 - 2014

Sectors (Year 2010-2014)	Bocas del Toro	Coclé	Colón	Chiriqui	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture, cattle, hunting and silviculture	16,337	27,106	7,560	47,844	10,381	11,673	11,874	26,350	34,804	42,017
Fishing	370	1,565	297	1,323	511	630	855	8,067	1,328	1,646
Quarries and mines exploitation	8	250	174	290	22	37	317	1,880	26	3
Manufacturing and industries	1,444	8,861	5,401	13,228	432	5,019	3,151	79,516	4,151	2,897
Electricity, gas and water supply	106	509	872	1,333	94	426	400	7,773	394	80
Construction	1,991	7,346	7,378	11,238	468	3,083	2,875	70,400	3,795	360
Wholesale and retail commerce	3,946	10,392	23,776	28,973	969	7,640	5,130	151,567	10,850	1,176
Hotels and restaurants	1,336	2,211	3,943	6,157	380	1,486	1,483	40,062	2,188	331
Transport, storage and communications	1,647	3,270	12,616	8,556	279	2,122	1,858	96,194	2,616	253
Intermediate financing	216	772	1,155	1,925	37	685	508	24,588	527	24
Real estate	554	1,362	4,109	3,605	30	652	404	38,856	609	70
Public administration and defense, obligatory social security	1,423	4,412	4,437	7,118	991	2,466	2,214	61,821	4,220	1,971
Teaching	1,759	3,682	4,322	8,867	718	2,503	2,006	41,217	5,053	1,718
Social health services	1,073	1,398	2,519	4,970	241	1,593	1,199	30,301	1,828	503
Other activities, various public & private services	777	2,850	3,872	6,703	326	1,820	1,604	48,554	2,374	380
Private homes with domestic services	919	6,758	4,674	8,191	154	2,287	1,563	53,469	3,961	184
Organizations	11	14	44	12	2	25	34	1,206	53	10
non-specified activities	4	244	3,609	1,768	62	81	40	235	2,352	134
Total	33,922	83,002	90,756	162,101	16,095	44,229	37,516	782,068	81,112	53,758

Source: JICA Study Team on the basis of "Panama en Cifras 1998 - 2002", November 2003 and "Boletin 8/2002 des Estadistica Panameña: Avance de Cifras" November 2002; Direction de Estadistica y Censo del Contraloria General de la Republica

Table 7.2.22 EAP per Sector and per Province Year 2015 - 2019

Sectors (Year 2015-2019)	Bocas del Toro	Coclé	Colón	Chiriqui	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture, cattle, hunting and silviculture	19,951	29,713	8,612	51,069	11,033	11,870	12,075	31,427	35,398	49,868
Fishing	452	1,715	338	1,412	543	641	870	9,621	1,351	1,953
Quarries and mines exploitation	10	274	198	310	23	38	322	2,242	26	4
Manufacturing and industries	1,764	9,713	6,153	14,119	459	5,104	3,205	94,835	4,222	3,438
Electricity, gas and water supply	130	558	994	1,423	100	433	407	9,270	401	95
Construction	2,431	8,052	8,405	11,996	498	3,135	2,923	83,963	3,860	427
Wholesale and retail commerce	4,819	11,391	27,086	30,927	1,029	7,769	5,217	180,767	11,035	1,396
Hotels and restaurants	1,631	2,424	4,492	6,572	404	1,511	1,508	47,780	2,225	393
Transport, storage and communications	2,012	3,585	14,372	9,133	296	2,158	1,889	114,727	2,661	301
Intermediate financing	264	846	1,315	2,054	39	697	516	29,325	536	29
Real estate	677	1,492	4,681	3,848	32	663	411	46,342	620	83
Public administration and defense, obligatory social security	1,738	4,837	5,054	7,598	1,054	2,507	2,252	73,731	4,292	2,339
Teaching	2,148	4,036	4,923	9,465	764	2,545	2,040	49,158	5,139	2,039
Social health services	1,310	1,532	2,870	5,306	256	1,619	1,219	36,138	1,860	597
Other activities, various public & private services	949	3,124	4,411	7,155	346	1,851	1,631	57,909	2,414	451
Private homes with domestic services	1,123	7,408	5,324	8,743	164	2,325	1,589	63,770	4,028	218
Organizations	13	15	50	12	2	26	34	1,438	54	12
non-specified activities	5	268	4,112	1,888	66	83	41	280	2,392	159
Total	41,427	90,985	103,392	173,030	17,106	44,977	38,149	932,737	82,497	63,802

Source: JICA Study Team on the basis of "Panama en Cifras 1998 - 2002", November 2003 and "Boletin 8/2002 des Estadistica Panameña: Avance de Cifras" November 2002; Direction de Estadistica y Censo del Contraloria General de la Republica

Table 7.2.23 EAP per Sector and per Province Year 2020 - 2024

Sectors (Year 2020-2024)	Bocas del Toro	Coclé	Colón	Chiriqui	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture, cattle, hunting and silviculture	21,720	30,813	9,083	52,159	11,332	11,840	12,046	33,782	35,394	53,938
Fishing	492	1,779	357	1,442	557	639	868	10,342	1,351	1,858
Quarries and mines exploitation	11	284	208	317	24	38	322	2,410	26	4
Manufacturing and industries	1,920	10,073	6,489	14,421	471	5,091	3,197	101,941	4,221	3,707
Electricity, gas and water supply	141	578	1,048	1,453	102	432	406	9,965	401	102
Construction	2,647	8,350	8,864	12,252	511	3,127	2,916	90,255	3,859	619
Wholesale and retail commerce	5,246	11,813	28,567	31,586	1,057	7,749	5,204	194,313	11,034	1,505
Hotels and restaurants	1,776	2,513	4,737	6,712	415	1,507	1,504	51,361	2,225	424
Transport, storage and communications	2,190	3,718	15,158	9,327	304	2,152	1,885	123,324	2,660	324
Intermediate financing	287	877	1,387	2,098	40	695	515	31,522	536	31
Real estate	737	1,548	4,937	3,930	32	662	410	49,814	620	90
Public administration and defense, obligatory social security	1,892	5,016	5,331	7,760	1,082	2,501	2,246	79,256	4,292	2,522
Teaching	2,338	4,185	5,193	9,667	784	2,539	2,035	52,841	5,139	2,198
Social health services	1,427	1,589	3,027	5,419	263	1,615	1,216	38,846	1,860	644
Other activities, various public & private services	1,033	3,240	4,652	7,307	355	1,846	1,627	62,248	2,414	487
Private homes with domestic services	1,222	7,683	5,615	8,930	168	2,319	1,585	68,548	4,028	235
Organizations	14	16	53	13	2	26	34	1,546	54	13
non-specified activities	5	278	4,337	1,928	67	82	41	301	2,392	86
Total	45,099	94,353	109,043	176,720	17,570	44,861	38,058	1,002,630	82,488	68,798

Source: JICA Study Team on the basis of "Panama en Cifras 1998 - 2002", November 2003 and "Boletin 8/2002 des Estadistica Panameña: Avance de Cifras" November 2002; Direction de Estadistica y Censo del Contraloria General de la Republica

Table 7.2.24 %EAP per Sector and per Province Year 2005 - 2009

Sectors (Year 2005-2009) - year 2002 distribution	Bocas del Toro	Coclé	Colón	Chiriqui	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture, cattle, hunting and silviculture	41.3	32.6	7.4	24.4	59.2	30.8	29.8	3.8	41.1	78.2
Fishing	0.4	1.7	0.3	0.6	3.0	1.0	1.5	0.7	1.8	3.1
Quarries and mines exploitation	0.1	0.5	0.0	0.1	-	0.2	0.3	0.2	0.0	0.0
Manufacturing and industries	4.0	11.2	4.9	7.3	3.2	10.7	8.7	10.1	5.6	5.4
Electricity, gas and water supply	0.5	0.5	1.1	0.8	1.0	0.7	1.1	1.0	0.7	0.1
Construction	5.5	6.7	7.0	7.0	4.8	6.4	6.2	8.6	4.9	0.7
Wholesale and retail commerce	11.3	13.2	28.2	20.6	7.6	16.5	15.5	19.5	12.2	2.2
Hotels and restaurants	3.3	2.8	4.1	3.5	4.1	3.9	4.5	5.4	3.2	0.6
Transport, storage and communications	6.1	3.5	13.8	6.3	2.3	3.7	3.8	8.1	3.2	0.5
Intermediate financing	0.7	0.6	1.2	1.0	0.3	1.4	0.9	3.1	0.7	0.0
Real estate	1.4	0.7	2.9	3.1	-	1.1	0.9	5.6	0.7	0.1
Public administration and defense, obligatory social security	4.1	5.0	3.8	4.5	3.4	4.0	6.2	7.6	4.5	3.7
Teaching	6.8	4.3	4.3	5.3	3.9	4.7	5.8	5.2	6.6	3.2
Social health services	4.1	2.6	3.7	2.7	1.7	3.5	3.4	3.7	2.6	0.9
Other activities, various public & private services	4.5	6.6	7.5	5.4	3.2	4.2	4.5	7.7	4.8	0.7
Private homes with domestic services	2.8	5.7	4.9	5.6	0.9	5.5	5.3	7.2	4.4	0.3
Organizations	-	-	0.1	-	0.2	0.1	0.1	0.0	-	0.0
non-specified activities	2.9	1.9	4.8	1.9	1.0	1.5	1.4	2.5	3.1	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: JICA Study Team on the basis of "Panama en Cifras 1998 - 2002", November 2003 and "Boletin 8/2002 des Estadistica Panameña: Avance de Cifras" November 2002; Direction de Estadistica y Censo del Contraloria General de la Republica

Table 7.2.25 %EAP per Sector and per Province Year 2010 - 2014

Sectors (Year 2010-2014)	Bocas del Toro	Coclé	Colón	Chiriqui	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture, cattle, hunting and silviculture	48.2	32.7	8.3	29.5	64.5	26.4	31.7	3.4	42.9	78.2
Fishing	1.1	1.9	0.3	0.8	3.2	1.4	2.3	1.0	1.6	3.1
Quarries and mines exploitation	0.0	0.3	0.2	0.2	0.1	0.1	0.8	0.2	0.0	0.0
Manufacturing and industries	4.3	10.7	6.0	8.2	2.7	11.3	8.4	10.2	5.1	5.4
Electricity, gas and water supply	0.3	0.6	1.0	0.8	0.6	1.0	1.1	1.0	0.5	0.1
Construction	5.9	8.9	8.1	6.9	2.9	7.0	7.7	9.0	4.7	0.7
Wholesale and retail commerce	11.6	12.5	26.2	17.9	6.0	17.3	13.7	19.4	13.4	2.2
Hotels and restaurants	3.9	2.7	4.3	3.8	2.4	3.4	4.0	5.1	2.7	0.6
Transport, storage and communications	4.9	3.9	13.9	5.3	1.7	4.8	5.0	12.3	3.2	0.5
Intermediate financing	0.6	0.9	1.3	1.2	0.2	1.5	1.4	3.1	0.6	0.0
Real estate	1.6	1.6	4.5	2.2	0.2	1.5	1.1	5.0	0.8	0.1
Public administration and defense, obligatory social security	4.2	5.3	4.9	4.4	6.2	5.6	5.9	7.9	5.2	3.7
Teaching	5.2	4.4	4.8	5.5	4.5	5.7	5.3	5.3	6.2	3.2
Social health services	3.2	1.7	2.8	3.1	1.5	3.6	3.2	3.9	2.3	0.9
Other activities, various public & private services	2.3	3.4	4.3	4.1	2.0	4.1	4.3	6.2	2.9	0.7
Private homes with domestic services	2.7	8.1	5.1	5.1	1.0	5.2	4.2	6.8	4.9	0.3
Organizations	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0
non-specified activities	0.0	0.3	4.0	1.1	0.4	0.2	0.1	0.0	2.9	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: JICA Study Team on the basis of "Panama en Cifras 1998 - 2002", November 2003 and "Boletin 8/2002 des Estadistica Panameña: Avance de Cifras" November 2002; Direction de Estadistica y Censo del Contraloria General de la Republica

Table 7.2.26 %EAP per Sector and per Province Year 2015 - 2019

Sectors (Year 2015-2019)	Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture, cattle, hunting and silviculture	48.2	32.7	8.3	29.5	64.5	26.4	31.7	3.4	42.9	78.2
Fishing	1.1	1.9	0.3	0.8	3.2	1.4	2.3	1.0	1.6	3.1
Quarries and mines exploitation	0.0	0.3	0.2	0.2	0.1	0.1	0.8	0.2	0.0	0.0
Manufacturing and industries	4.3	10.7	6.0	8.2	2.7	11.3	8.4	10.2	5.1	5.4
Electricity, gas and water supply	0.3	0.6	1.0	0.8	0.6	1.0	1.1	1.0	0.5	0.1
Construction	5.9	8.9	8.1	6.9	2.9	7.0	7.7	9.0	4.7	0.7
Wholesale and retail commerce	11.6	12.5	26.2	17.9	6.0	17.3	13.7	19.4	13.4	2.2
Hotels and restaurants	3.9	2.7	4.3	3.8	2.4	3.4	4.0	5.1	2.7	0.6
Transport, storage and communications	4.9	3.9	13.9	5.3	1.7	4.8	5.0	12.3	3.2	0.5
Intermediate financing	0.6	0.9	1.3	1.2	0.2	1.5	1.4	3.1	0.6	0.0
Real estate	1.6	1.6	4.5	2.2	0.2	1.5	1.1	5.0	0.8	0.1
Public administration and defense, obligatory social security	4.2	5.3	4.9	4.4	6.2	5.6	5.9	7.9	5.2	3.7
Teaching	5.2	4.4	4.8	5.5	4.5	5.7	5.3	5.3	6.2	3.2
Social health services	3.2	1.7	2.8	3.1	1.5	3.6	3.2	3.9	2.3	0.9
Other activities, various public & private services	2.3	3.4	4.3	4.1	2.0	4.1	4.3	6.2	2.9	0.7
Private homes with domestic services	2.7	8.1	5.1	5.1	1.0	5.2	4.2	6.8	4.9	0.3
Organizations	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0
non-specified activities	0.0	0.3	4.0	1.1	0.4	0.2	0.1	0.0	2.9	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

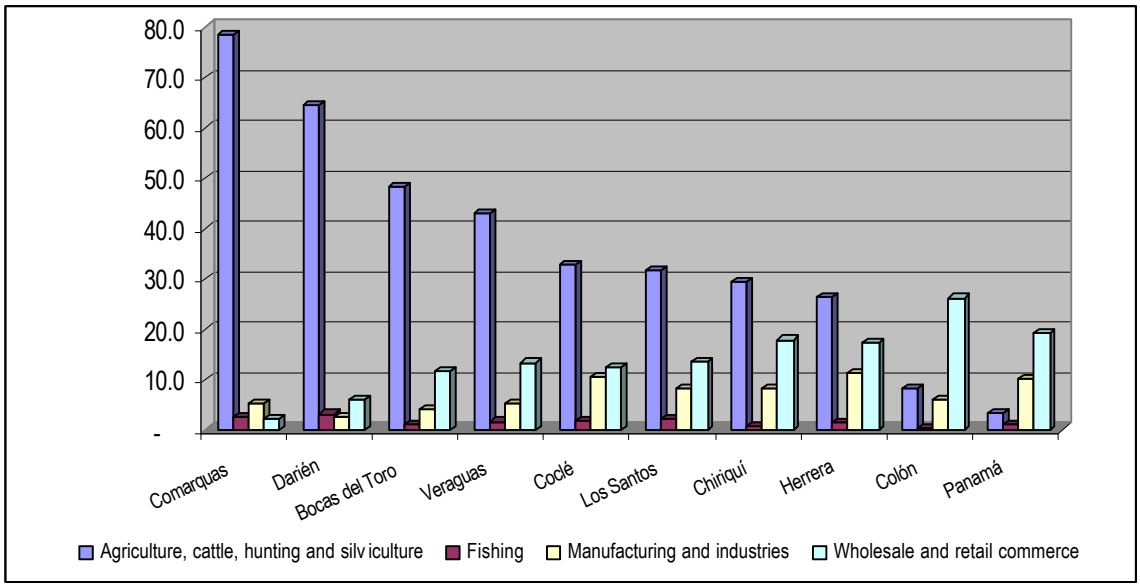
Source: JICA Study Team on the basis of "Panama en Cifras 1998 - 2002", November 2003 and "Boletin 8/2002 des Estadistica Panameña: Avance de Cifras" November 2002; Direction de Estadistica y Censo del Contraloria General de la Republica

Table 7.2.27 %EAP per Sector and per Province Year 2020 - 2024

Sectors (Year 2020-2024)	Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture, cattle, hunting and silviculture	48.2	32.7	8.3	29.5	64.5	26.4	31.7	3.4	42.9	78.4
Fishing	1.1	1.9	0.3	0.8	3.2	1.4	2.3	1.0	1.6	2.7
Quarries and mines exploitation	0.0	0.3	0.2	0.2	0.1	0.1	0.8	0.2	0.0	0.0
Manufacturing and industries	4.3	10.7	6.0	8.2	2.7	11.3	8.4	10.2	5.1	5.4
Electricity, gas and water supply	0.3	0.6	1.0	0.8	0.6	1.0	1.1	1.0	0.5	0.1
Construction	5.9	8.9	8.1	6.9	2.9	7.0	7.7	9.0	4.7	0.9
Wholesale and retail commerce	11.6	12.5	26.2	17.9	6.0	17.3	13.7	19.4	13.4	2.2
Hotels and restaurants	3.9	2.7	4.3	3.8	2.4	3.4	4.0	5.1	2.7	0.6
Transport, storage and communications	4.9	3.9	13.9	5.3	1.7	4.8	5.0	12.3	3.2	0.5
Intermediate financing	0.6	0.9	1.3	1.2	0.2	1.5	1.4	3.1	0.6	0.0
Real estate	1.6	1.6	4.5	2.2	0.2	1.5	1.1	5.0	0.8	0.1
Public administration and defense, obligatory social security	4.2	5.3	4.9	4.4	6.2	5.6	5.9	7.9	5.2	3.7
Teaching	5.2	4.4	4.8	5.5	4.5	5.7	5.3	5.3	6.2	3.2
Social health services	3.2	1.7	2.8	3.1	1.5	3.6	3.2	3.9	2.3	0.9
Other activities, various public & private services	2.3	3.4	4.3	4.1	2.0	4.1	4.3	6.2	2.9	0.7
Private homes with domestic services	2.7	8.1	5.1	5.1	1.0	5.2	4.2	6.8	4.9	0.3
Organizations	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0
non-specified activities	0.0	0.3	4.0	1.1	0.4	0.2	0.1	0.0	2.9	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: JICA Study Team on the basis of "Panama en Cifras 1998 - 2002", November 2003 and "Boletin 8/2002 des Estadistica Panameña: Avance de Cifras" November 2002; Direction de Estadistica y Censo del Contraloria General de la Republica

Agriculture and farming will also in the future be a very important source for employment in most of the provinces, as can be noted very clearly in Figure 7.2.12.



Source: JICA Study Team

Figure 7.2.12 % EAP for Selected Sectors per Province (Year 2019 - 2024)

The agricultural sector will also in the future remain the most important source of employment in the Interior Area. The year-2024 distribution of EAP clearly indicates that for all provinces, the sector will employ over 25% of the economic active population and in the Indian Reservations and Darien even more than 60%. In Bocas del Toro, Veraguas, Coclé and Los Santos, the share remains above 30% while in Chiriqui, 29.5% of the workforce will be employed in the agricultural sector. Wholesale and retail commerce demonstrates the opposite trend and is concentrated in the Metropolitan Area. Wholesale and retail commerce is a large source of employment in provinces where the level of employment in agriculture is distinctively lower. The manufacturing sector will continue to be an important source of employment in the province of Panama and the surrounding provinces (Coclé, Los Santos and Herrera). This concentration near the Metropolitan Area is undoubtedly stimulated by the need for efficient transport services, the latter being concentrated in Panama.

7.3 Economic Forecasts

7.3.1 Forecasts by International Organizations

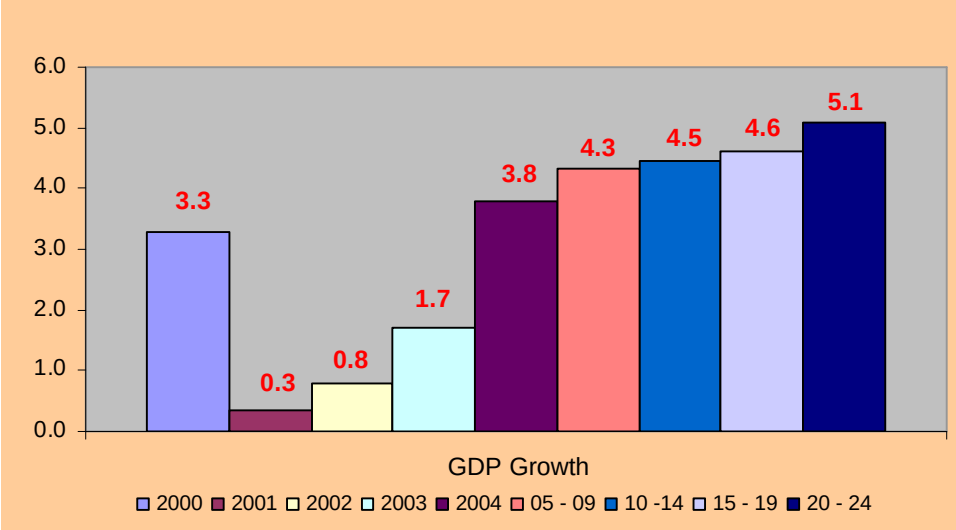
The World Bank and the Energy Institute of the United States, the EIA, both have made long-term forecasts for Panama. The forecasts made by the World Bank are over a period of 10 years, the forecasts of the EIA are until the year 2025. The former applies one single forecasting scenario while the energy watchdog forecasts future GDP on the basis of three scenarios, a low, a high and a base scenario. Their forecasts for Panama are provided in Table 7.3.1.

Table 7.3.1 Long-term GDP Forecasts for Panama (2000 – 2025, Various Sources)

1996 constant USD	2000	2001	2002	2003	2004	05 - 09	10 -14	15 - 19	20 - 24
World Bank									
% growth	3.3	0.34	1.90	2	3.4	3.8	3.8		
GDP ('000.000 US)	11,196.4	11,234.5	11,447.9	11,676.9	12,073.9	14,549.0	17,531.6		
EIA									
Low growth (%)				1.7	3.9	3.35	3.52	3.69	3.90
GDP ('000.000 US)	11,196.4	11,230.0	11,443.4	11,637.9	12,091.8	14,257.5	16,949.8	20,316.5	24,599.5
High growth (%)				1.7	3.9	5.7	5.9	6.1	6.3
GDP ('000.000 US)	11,196.4	11,230.0	11,443.4	11,637.9	12,091.8	15,953.8	21,249.3	28,570.8	38,778.2
Base growth (%)				1.7	3.9	4.5	4.7	4.9	5.1
GDP ('000.000 US)	11,196.4	11,230.0	11,443.4	11,637.9	12,091.8	15,068.6	18,958.5	24,081.4	30,881.3

Source: Global Insight, Inc.; World Economic Outlook Vol 1. (Lexington MA, Third Quarter, 2002) and Annual Energy Outlook 2003; DOE/EIA, Washington DC, January 2003

Taking the above forecasts as basis, a "consensus forecast" can be drawn, presented in the next Figure 7.3.1.



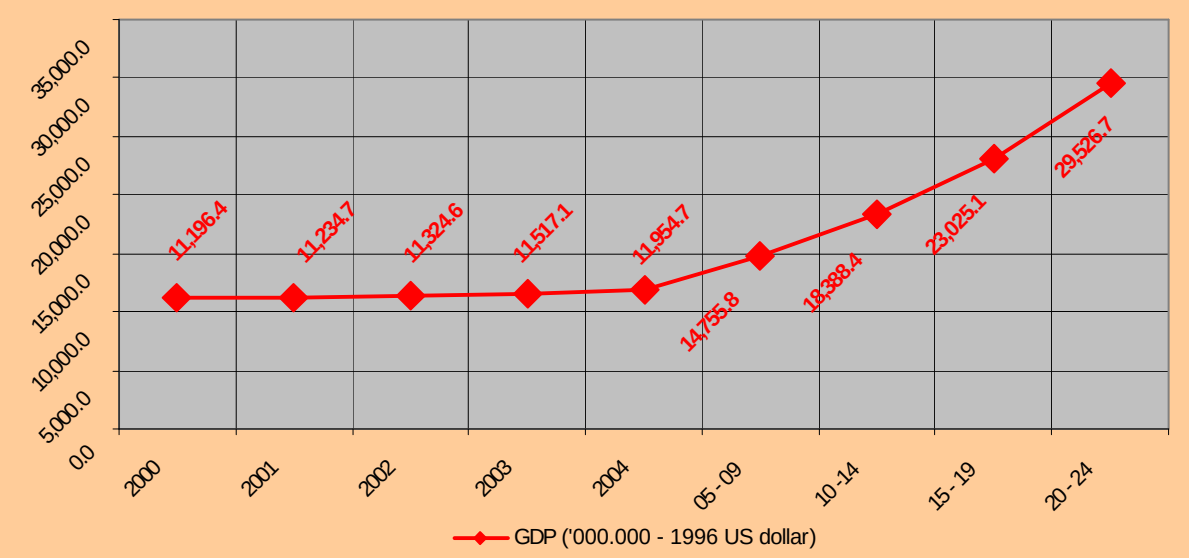
Source: JICA Study Team on the basis of : Global Insight, Inc.; World Economic Outlook Vol 1. (Lexington MA, Third Quarter, 2002) and Annual Energy Outlook 2003; DOE/EIA, Washington DC, January 2003

Figure 7.3.1 Long-term GDP Forecasts for Panama (2000 – 2025 in %)

The above forecast foresees a 1.7% growth in the year 2003, which is, according to the first estimates available, a conservative estimate. The statistics department of the Ministry of Economy and Finances estimates that growth will be around 2.4% for that year. Their assessment is based upon the economic performance during the first three quarters of 2003.

In order not to overestimate economic growth at the start and therewith extrapolating this error over the next 20 years, it was decided to maintain the 1.7% growth estimate for 2003. The forecasts by the two institutes and the estimates for year 2003 from the Ministry of Economy and Finances both portray the same message, namely that the economy of Panama is on the rebound and that it can be expected that future growth will return to the levels before the latest economic slowdown. As the forecasts in above Figure 7.3.1 suggest, the Panamanian economy will do just that. Growth for the year 2004 is expected to be at 3.8% which is back at the year 2000 level. And for the next 20 years, the economy of Panama will continue to perform well with the annual growth rate increasing from 4.3% in the period 2005 – 2000, to 4.5% and 4.6% respectively during the period 2010 – 2014 and the period 2015 – 2019 and to 5.1% for the last period till the year 2024.

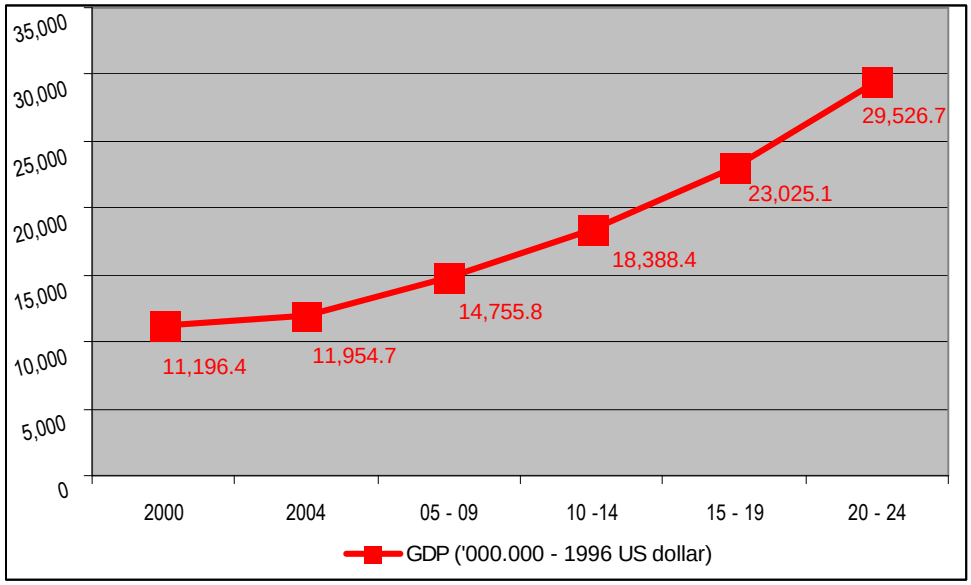
Taking the year 2000 as basis, this means that the GDP of Panama will grow as demonstrated in Figure 7.3.2.



Source: JICA Study Team on the basis of : Global Insight, Inc.; World Economic Outlook Vol 1. (Lexington MA, Third Quarter, 2002) and Annual Energy Outlook 2003; DOE/EIA, Washington DC, January 2003

Figure 7.3.2 Long-term GDP forecasts for Panama (2000 – 2025 in 1996 USD)

The Figure 7.3.2 clearly demonstrates the expected rebound of the Panamanian economy. After a very moderate growth during the period 2000-2004, the growth line is rising sharply after 2004 to continue growing with a strong incline. This sharp incline is not only as a consequence of shifting from a year by year growth till 2004 to a 5 year growth after 2004, as can be seen in Figure 7.3.3.



Source: JICA Study Team on the basis of : Global Insight, Inc.; World Economic Outlook Vol 1. (Lexington MA, Third Quarter, 2002) and Annual Energy Outlook 2003; DOE/EIA, Washington DC, January 2003

Figure 7.3.3 Long-term GDP Forecasts for Panama (2000 – 2024 in 1996 USD)

Taking the consensus growth and the actual GDP performance till 2002 as basis[145], the long-term economic performance in absolute numbers is recapitulated in the Table 7.3.2 hereafter.

Table 7.3.2 Long-term GDP for Panama (2000 – 2025, in '000.000 1996 USD)

	2000	2001	2002	2003	2004	05 - 09	10 -14	15 - 19	20 - 24
GDP (1996 USD)	11,196.4	11,234.7	11,324.6	11,517.1	11,954.7	14,755.8	18,388.4	23,025.1	29,526.7

Source: JICA Study Team on the basis of : Global Insight, Inc.; World Economic Outlook Vol 1. (Lexington MA, Third Quarter, 2002) and Annual Energy Outlook 2003; DOE/EIA, Washington DC, January 2003 and "Economic Statistics": MEF, Directorate of Analysis and Economic Policies, Economic and Statistical Information Department, June 2003

Using the "consensus GDP forecasts" as basis, the long-term economic performance of the various economic sectors as well as for the provinces can be estimated.

The year 2000 – 2002 data on the economy and on the economic active population are used as a basis[146] and are combined with the forecasted economic active population per province and per sector (see previous paragraph).

[145] "Economic Statistics": MEF, Directorate of Analysis and Economic Policies, Economic and Statistical Information Department, June 2003

[146] Sources: "Economic Statistics": MEF, Directorate of Analysis and Economic Policies, Economic and Statistical Information Department, June 2003; "Panama en Cifras 1998 -2002": Direction de Estadistica y Censo del Contraloria General de la Republica, November 2003; "Boletin 8/2002 des Estadistica Panameña: Avance de Cifras" : Direction de Estadistica y Censo del Contraloria General de la Republica ,November 2002

As a starting point for the calculations, an average distribution per sector needed to be applied. To estimate the average share of each sector in total economic growth, the absolute performance of each sector was taken during the last 10 years, from the year 1993 till the year 2003. See Table 7.3.3 on next page. It should be noted here that the total GDP for the year 2002 and 2003 differs slightly from the absolute values in previous tables. This is due to the fact that the year 2002 and 2003 are still estimated values and an absolute value has not yet been established. However, the difference can be neglected for the purpose of establishing a long term sector-based economic performance.

In order to ensure stable forecasts, the following assumptions have been made:

- Distribution of the sectors is as follows
  - Primary sector includes Agriculture, cattle, hunting and silviculture, fishing and quarries and mining exploitation
  - Secondary sector includes manufacturing and industries, energy, gas and water supply and construction. However, given that the provision of public utilities is sometimes considered as a service, calculations will be made to estimate the impact of this activity on secondary sector performance whenever this is considered necessary.
  - Service sector: all other economic activities including public services.
- The share of each economic sector in the year 2003 has been taken as starting point for the preliminary long term forecasts.

Computer generated results can have errors, caused by extrapolations of small deviations at the beginning of the calculations or the multiple and cumulating effects by rounding of values. However, these minor deviations do at no time affect the overall trends and defining long-term trends is the most important. Objective of this chapter.

As was noted in point 2 before, the year 2003 sector performance was taken as a basis for forecasting future economic performance per sector. However, maintaining this level of performance over the entire period does not take into account prior sector performance or the possible positive impact of the various national and regional development plans which focus on stimulating the primary and secondary sector. For that reason, a development scenario will be used in addition to the base case scenario to estimate the future long-term economic performance per sector and per province.

Table 7.3.3 Long-term GDP for Panama (1993 – 2003)

sectors	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002 (e/f)	2003 (e/f)
Agriculture & cattle	437,814,000	457,704,000	409,716,000	533,300,000	548,500,000	551,500,000	592,600,000	593,100,000	544,200,000	542,600,000	540,372,200
Fishing	123,186,000	125,056,000	132,181,000	115,300,000	119,500,000	126,500,000	183,100,000	183,100,000	226,900,000	213,500,000	201,330,500
Quarries and mines	15,600,000	16,500,000	15,700,000	31,000,000	55,900,000	58,500,000	86,500,000	77,500,000	76,700,000	72,100,000	67,774,300
Manufacturing	611,100,000	665,200,000	591,200,000	966,300,000	1,037,200,000	1,051,200,000	1,011,800,000	938,100,000	863,100,000	820,500,000	780,255,500
Electricity, gas water	276,500,000	281,500,000	283,200,000	295,400,000	308,000,000	294,400,000	284,100,000	313,600,000	315,800,000	340,100,000	366,287,700
Construction	305,600,000	325,400,000	356,100,000	332,500,000	363,300,000	446,300,000	513,600,000	593,400,000	512,900,000	461,600,000	415,440,300
Wholesale and retail	766,305,000	785,545,000	810,738,000	874,130,000	914,695,000	1,012,565,000	1,048,910,000	1,035,540,000	1,011,158,000	1,011,157,899	1,015,217,162
Hotels & restaurants	40,375,000	41,555,000	42,670,000	47,570,000	49,705,000	53,254,000	55,190,000	65,430,000	64,542,000	64,541,899	65,671,382
Transport, storage and communications	459,800,000	537,300,000	590,800,000	674,700,000	762,300,000	956,400,000	1,153,600,000	1,297,100,000	1,359,300,000	1,406,200,000	1,454,367,500
Intermediate financing	537,600,000	751,800,000	835,100,000	811,700,000	867,200,000	948,400,000	1,002,900,000	1,165,500,000	1,144,500,000	1,156,800,000	1,125,842,400
Real estates, rent	837,600,000	951,000,000	1,019,100,000	1,492,500,000	1,519,300,000	1,591,500,000	1,621,400,000	1,685,100,000	1,657,100,000	1,662,200,000	1,690,565,300
Public administration and social security	865,600,000	920,000,000	947,500,000	1,022,100,000	1,014,000,000	1,038,700,000	991,700,000	1,063,900,000	1,128,700,000	1,171,300,000	1,215,829,400
Other social and personal services	371,700,000	401,400,000	415,700,000	458,900,000	500,400,000	557,100,000	477,900,000	561,100,000	554,800,000	601,600,000	606,417,500
Total	6,619,300,000	6,852,700,000	6,191,208,000	7,538,400,000	8,055,800,000	8,696,316,000	9,099,500,000	9,275,100,000	9,521,200,000	9,501,290,797	9,511,351,591
plus import taxes	281,400,000	257,600,000	301,200,000	654,700,000	696,400,000	835,300,000	874,200,000	851,500,000	847,100,000	853,100,000	838,764,300
less imputed banking services	(191,340,000)	(285,000,000)	(221,300,000)	(265,200,000)	(276,700,000)	(312,800,000)	(351,900,000)	(116,100,000)	(275,000,000)	(210,000,000)	(341,720,000)
Total	6,319,400,000	6,365,300,000	6,561,100,000	8,008,200,000	8,472,500,000	9,191,500,000	9,600,500,000	10,010,500,000	9,999,300,000	9,597,290,797	10,008,356,344
CFZ	673,100,000	855,600,000	789,300,000	688,200,000	627,600,000	731,500,000	782,100,000	707,000,000	775,800,000	765,714,000	755,760,310
Canal	470,200,000	485,000,000	555,700,000	457,200,000	473,700,000	500,100,000	509,500,000	479,000,000	459,600,000	475,300,000	477,086,400
GRAND TOTAL	7,252,700,000	7,723,900,000	7,906,100,000	9,153,600,000	9,570,800,000	10,506,100,000	10,901,300,000	11,136,500,000	11,234,700,000	11,236,114,397	11,241,275,354

All values in balboa: current prices till 1995, from 1996 in year-1996 constant prices

Source: JICA Study Team on the basis of ?Economic Statistics?: MEF, Directorate of Analysis and Economic Policies, Economic and Statistical Information Department, June 2003; “Panama en Cifras 1998 - 2002”: Direction de Estadistica y Censo del Contraloria General de la Republica, November 2003; “Boletin 8/2002 des Estadistica Panameña: Avance de Cifras”: Direction de Estadistica y Censo del Contraloria General de la Republica, November 2002

To estimate future sector performance according to the two scenarios, the economic impact per sector was calculated during the period 1993 till 2003. See Table 7.3.4.

Table 7.3.4 Economic Performance per Sector (%, Year 1993 – 2003)

Sectors	*average 1993-1999*	*average 2000-2003*	*% share 1993*	*% share 2003*
Agriculture, cattle, hunting and silviculture	4.17	-2.37	6.0%	4.8%
Fishing	4.20	2.09	1.7%	1.8%
Quarries and mines exploitation	19.12	-6.35	0.2%	0.6%
Manufacturing and industries	4.63	-6.72	8.8%	6.9%
Electricity, gas and water supply	1.56	6.12	3.8%	3.3%
Construction	8.57	-5.99	4.3%	3.7%
Wholesale and retail commerce, cars & motorcycles repair, personal effects and household equipment	4.02	-0.71	10.6%	9.1%
Hotels and restaurants	6.58	4.01	0.6%	0.6%
Transport, storage and communications	12.65	5.91	6.9%	12.9%
Intermediate financing	6.25	2.68	10.1%	10.0%
Real estates, business studies and rent	7.41	0.38	12.9%	14.7%
Public administration and defense, obligatory social security and affiliation plans	2.85	4.96	11.9%	10.8%
Other social and personal services	5.72	1.16	5.1%	5.4%
Total	6.34	1.07	83.0%	84.6%
plus import taxes	12.35	-1.04	3.9%	7.5%
less imputed banking services	9.27	-2.03	-2.6%	-3.0%
Total	6.68	1.00	84.2%	89.0%
CFZ	-0.33	-1.11	9.3%	6.7%
Panama Canal	-0.24	-1.71	6.5%	4.2%
GRAND TOTAL			100.0%	100%

Source: JICA Study Team

Given the above results, the year 2003 performance can be maintained as Base Case scenario but that it is imperative to include in the forecasts the expected positive effects of various development plans to "adjust" in particular the performance of agriculture, mining manufacturing and construction. The Base Case Scenario results will be discussed in section 7.3.2, the Development Adjusted Scenario in section 7.3.3 thereafter.

7.3.2 Economic Forecasts Base Case Scenario

In the Base Case Scenario, the economic performance in the year 2003 was taken as starting point for the calculations. The GDP value per sector was increased over the next 20 years with the forecasted periodic GDP growth of the nation. No adjustments were made to the individual sectors and the percentage share of each sector thus remains equal to the share in the year 2003. See Table 7.3.5.

The 5 year values were calculated as follows:

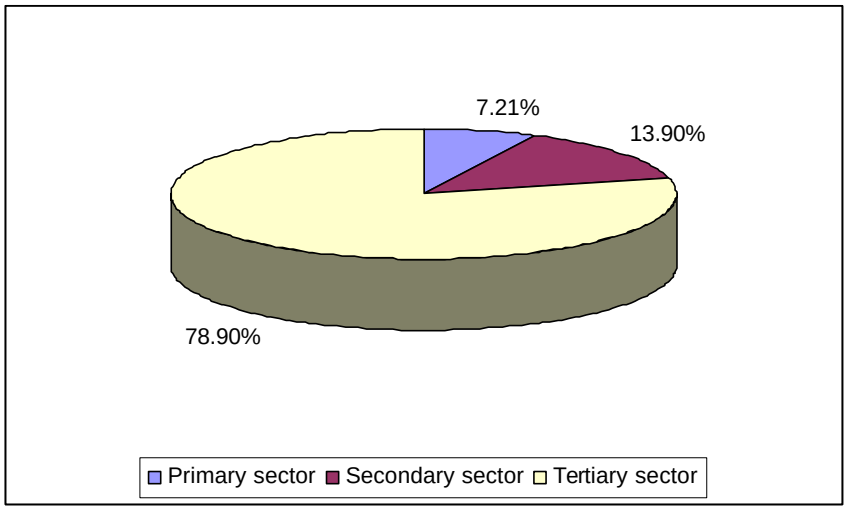
$V_x = V_{x-1} * G_x\text{^}5$ with V_x = the value in period "x"; G_x the Growth factor for period "x"

Table 7.3.5 Sector based absolute GDP (2003 – 2024; year 1996 constant Balboa)

	2003 (est)	2004	2005-2009	2010-2014	2015-2019	2020-2024
Agriculture, cattle, hunting & silviculture	540,972,200	561,529,144	693,096,720	863,724,613	1,081,517,916	1,386,906,867
Fishing	201,330,500	208,981,059	257,945,804	321,447,402	402,502,278	516,157,120
Quarries and mines	67,774,000	70,349,412	86,832,442	108,209,021	135,494,569	173,754,263
Manufacturing and industries	780,295,500	809,946,729	999,719,119	1,245,831,909	1,559,975,842	2,000,467,283
Electricity, gas and water supply	366,287,700	380,206,633	469,289,925	584,820,628	732,286,631	939,062,906
Construction	415,440,000	431,226,720	532,264,137	663,297,954	830,552,481	1,065,076,151
Wholesale and retail commerce, etc.	1,019,247,162	1,057,978,554	1,305,865,374	1,627,345,842	2,037,690,784	2,613,074,919
Hotels & restaurants	65,671,382	68,166,894	84,138,555	104,851,948	131,290,991	168,363,717
Transport, storage and communications	1,452,604,600	1,507,803,575	1,861,085,437	2,319,251,056	2,904,064,017	3,724,086,551
Intermediate financing	1,128,842,400	1,171,738,411	1,446,279,429	1,802,327,301	2,256,794,860	2,894,047,561
Real estates & rent	1,650,663,900	1,713,389,128	2,114,840,161	2,635,475,609	3,300,026,474	4,231,857,196
Public adm; social security etc	1,215,809,400	1,262,010,157	1,557,702,054	1,941,180,163	2,430,660,298	3,117,007,502
Other social and personal services	606,412,800	629,456,486	776,939,596	968,208,091	1,212,347,525	1,554,678,921
Total	**9,511,351,544**	**9,872,782,902**	**12,185,998,752**	**15,185,971,537**	**19,015,204,666**	**24,384,540,958**
plus import taxes	839,764,800	871,675,862	1,075,911,531	1,340,781,517	1,678,867,558	2,152,930,534
less imputed banking services	(342,720,000)	(355,743,360)	(439,094,851)	(547,192,073)	(685,169,811)	(878,641,678)
Total	**10,008,396,344**	**10,388,715,405**	**12,822,815,432**	**15,979,560,982**	**20,008,902,413**	**25,658,829,815**
CFZ	755,760,310	784,479,202	968,284,492	1,206,658,644	1,510,924,805	1,937,565,671
Panama Canal	477,086,400	495,215,683	611,245,862	761,723,553	953,796,682	1,223,120,900
GRAND TOTAL	**11,241,243,054**	**11,668,410,290**	**14,402,345,787**	**17,947,943,179**	**22,473,623,900**	**28,819,516,386**

Source: JICA Study Team

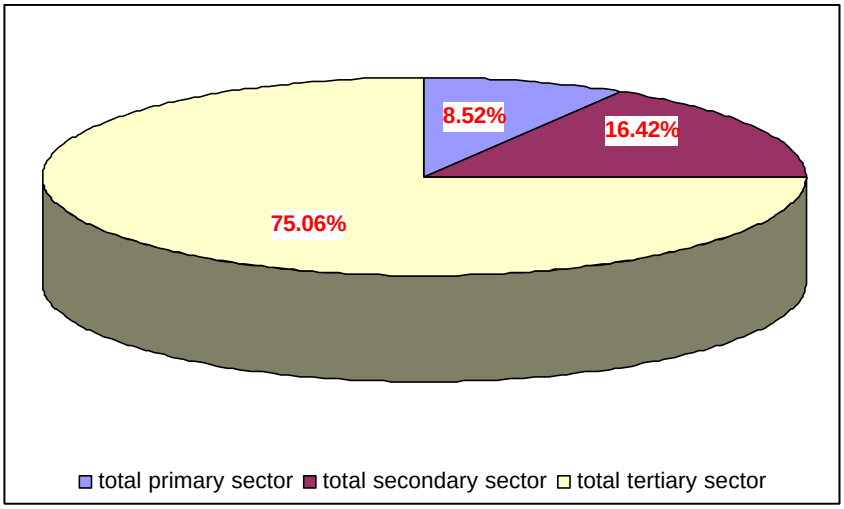
The share of the primary, secondary and tertiary sector remain constant during the entire period at the year 2003 distribution, represented in Figure 7.3.4. The details on the performance of the different sectors are presented in the Table 7.3.6.



Source: JICA Study Team

Figure 7.3.4 Constant % Distribution of the Sectors (Period 2003 – 2024)

The secondary sector includes electricity, gas and water supply. The impact of the energy supply sector is approximately 3%. The strong performance of the service sector is influenced by the 11% share in GDP of Colón Free Zone and the Panama Canal. When excluding both sectors from the evaluation, the secondary sector share in GDP increases with nearly 3%, while the share of the service sector decreases with nearly 4%. Also the primary sector benefits over 1% from that adjustment. See Figure 7.3.5.



Source: JICA Study Team

Figure 7.3.5 Adjusted % Distribution of the Sectors (Period 2003 – 2024)

Next Table 7.3.6 gives the detail per sector over the entire period as well as the percentage distribution and adjusted percentage distribution.

Table 7.3.6 Long-term GDP in Balboa and % (1996 Constant Prices - Equal Growth)

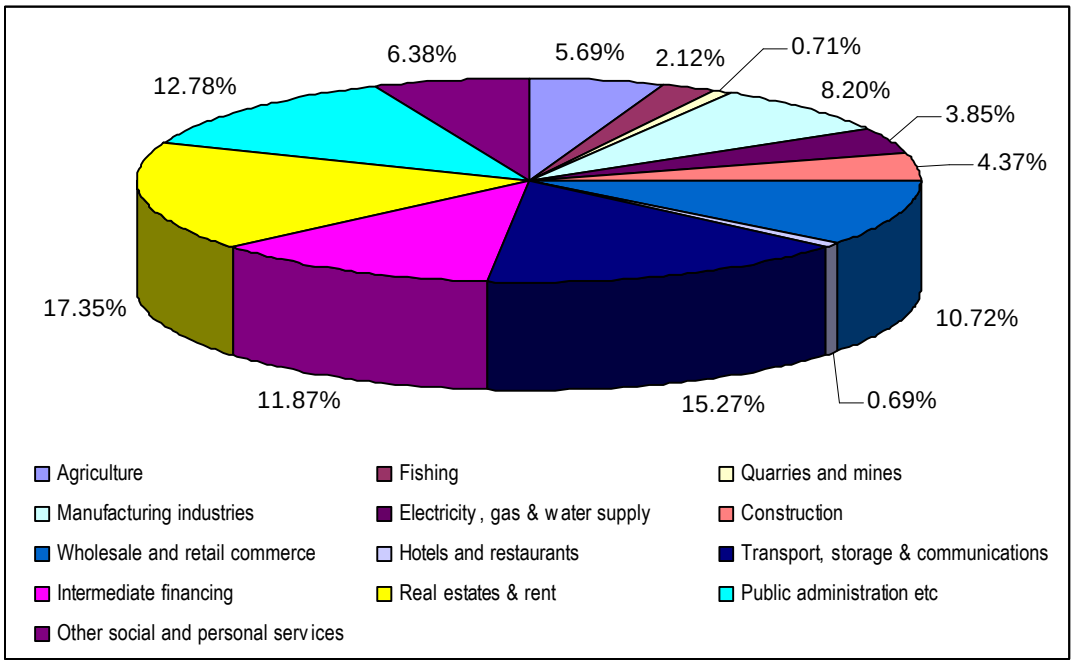
Sectors	2003 – 2024	%	Adjusted %
Agriculture, cattle, hunting and silviculture	5,127,747,459	4.81	5.69
Fishing	1,908,364,163	1.79	2.12
Quarries and mines exploitation	642,413,707	0.60	0.71
Manufacturing and industries	7,396,236,383	6.94	8.20
Electricity, gas and water supply	3,471,954,424	3.26	3.85
Construction	3,937,857,443	3.70	4.37
Wholesale and retail commerce, etc	9,661,202,635	9.07	10.72
Hotels and restaurants	622,483,487	0.58	0.69
Transport, storage and communications	13,768,895,235	12.92	15.27
Intermediate financing	10,700,029,962	10.04	11.87
Real estates, business studies and rent	15,646,252,468	14.68	17.35
Public administration, social security etc	11,524,369,574	10.82	12.78
Other activities, communities, social and personal services	5,748,043,420	5.39	6.38
Total	*90,155,850,360*	*84.61*	100
plus import taxes	7,959,931,804	7.47	
less imputed banking services	(3,248,561,773)	(3.05)	
Total	**94,867,220,390**	**89.03**	
CFZ	7,163,673,125	6.72	
Canal	4,522,189,080	4.24	
GRAND TOTAL	**106,553,082,595**	**100.00**	
Total primary sector	7,678,525,330	7.21	
Total secondary sector	14,439,760,550	13.55	
Total tertiary sector	84,434,796,716	79.24	

Source: JICA Study Team

Given the stable distribution per sector that was assumed for the Base Case Scenario, the relative share of each sector remains constant during the entire period. As can be noted in the Table 7.3.6, all sectors substantially increase their absolute GDP, which is logical given the GDP increase for that period that varies between 4.5% and 5%. However, comparing the percentage distribution per sector with the adjusted percentage distribution provides a clearer indication about the sectors that will perform particularly strong over the next 20 years.

Agriculture will contribute 5.1 billion Balboa to the national GDP over the next 20 years, which is equivalent to 4.8% or 5.7% of GDP whether the percentage or adjusted percentage is considered. This is almost 5 times more in absolute value as the fishing sector that will maintain a share in GDP between 1.8% and 2.1%. Manufacturing will contribute over 7 billion Balboa during that period, equal to 6.9% or 8.2% of national GDP. The service sector, even without considering the contribution of Colón Free Zone and the Panama Canal will continue to perform strongly. Transport, storage and communications intermediate financing and the real estate sector each will account for more than 10% of national GDP, closely followed by wholesale and retail commerce that will be produce around 10% of the national GDP, as is public administration.

Particularly notable is the expected strong performance of the transport and the real estate sector. Their contribution in absolute value is 13.7 and 15.4 billion Balboa respectively, making the first and second best performing sectors in Panama over the next 20 years. The distinction becomes even more visible when considering the adjusted percentage distribution, excluding the impact of taxes and imputed banking services, Colón Free Zone and the Panama Canal. See Figure 7.3.6 hereafter.



Source: JICA Study Team

Figure 7.3.6 Adjusted % Distribution per Sector (Period 2003 – 2024)

The importance of the various sectors is different depending upon the provinces. As was clearly demonstrated in previous paragraphs when discussing the economic active population forecasts per province, the service sector is particularly dominant in the Metropolitan Area, while the primary and secondary sectors are more important in the Interior Area with the primary sector being particularly important in provinces such as Darién and Bocas del Toro and the Indian Reservations. Using the estimated future employment per sector in the different provinces and the national GDP forecasts as a basis, the RGDP can now for each time period be calculated as follows:

$$RGDP_s = REAP_s * (GDP/EAP)_s$$

$RGDP_s$ = Absolute GDP per province for a particular sector "s"
$REAP_s$ = EAP at a given time period for a particular sector "s"
$(GDP/EAP)_s$ = The value for a particular sector "s" of the GDP over EAP

The results are given in the next Tables 7.3.7 till 7.3.10.

Table 7.3.7 RGDP per Sector, Absolute Values and Percentage (2005 – 2009; Year 1996 Balboa Prices)

year 2005-2009	PIB/EAP	PIB	Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture & cattle, etc	3,256	693,095,720	40,700,620	82,985,834	20,219,716	122,244,323	25,826,015	43,373,065	35,599,570	87,595,545	130,458,782	123,693,247
Fishing	21,334	237,945,834	2,439,368	29,036,253	4,555,572	19,402,052	9,971,962	9,559,095	11,568,759	109,663,173	25,848,075	31,745,479
Quarries and mines	40,128	86,832,442	2,153,251	17,319,406	1,126,855	3,925,154	0	[illegible]	4,590,589	52,536,644	1,225,459	86,832,442
Manufacturing & industries	8,550	[illegible]	10,993,548	78,110,313	36,874,892	100,523,989	4,155,061	[illegible]	28,728,860	626,282,189	58,782,21[illegible]	[illegible]
Electricity, gas water supply	41,273	469,184,925	6,067,586	16,395,327	36,028,440	48,845,237	6,430,084	12,833,951	16,755,395	300,451,514	21,903,419	2,981,175
Construction	5,643	532,264,137	9,465,640	29,629,520	32,515,525	60,687,921	4,206,782	15,729,083	12,942,579	342,692,265	22,246,217	1,834,599
Wholesale and retail commerce, etc	5,655	1,205,865,374	19,369,642	58,437,852	132,619,287	178,838,378	6,527,506	40,205,515	32,065,290	775,276,904	54,290,382	6,012,997
Hotels & restaurants	1,481	64,138,555	1,475,210	3,276,456	5,095,907	7,909,825	348,154	2,493,543	2,464,676	56,264,133	3,768,005	443,078
Transport	30,889	867,085,457	38,757,538	16,759,958	241,064,984	204,841,909	7,596,713	45,781,178	29,186,028	1,197,549,[illegible]	39,118,865	4,785,875
Financing	54,808	1,446,273,429	11,035,043	25,629,900	56,756,354	85,856,036	2,497,783	22,362,098	17,557,488	1,180,000,112	32,296,270	1,208,652
Real estate	[illegible]	[illegible]	[illegible]	22,413,315	[illegible]	201,723,114	0	20,955,943	14,590,608	1,702,150,400	21,890,520	[illegible]
Public administration, etc	19,874	557,702,058	34,735,757	77,600,517	69,270,750	138,945,454	10,585,908	34,784,763	45,521,391	1,156,687,341	70,757,335	[illegible]
Other activities	9,330	776,948,596	12,662,413	48,331,757	58,554,521	77,659,221	4,886,063	16,947,695	15,419,505	503,413,475	35,717,967	4,208,152
total (excluding CFZ, PCA and taxes)	9,567	12,185,998,752	158,026,511	547,044,502	755,766,214	1,253,063,693	87,535,877	307,9[illegible]7,686	267,758,655	7,594,505,841	436,265,055	324,553,556
Agriculture (%)			20.6	15.2	2.5	9.8	34.1	14.1	13.3	1.1	[illegible]	38.1
Fishing (%)			1.2	5.3	0.6	1.5	11.4	3.1	4.4	1.4	6.0	9.8
Quarries and mines (%)			1.1	3.2	0.1	0.3	0.0	1.2	1.7	0.7	0.2	26.3
Manufacturing & industries (%)			5.5	14.3	4.6	8.0	5.1	13.5	10.7	8.0	7.8	7.2
Electricity, gas water supply (%)			3.1	3.0	4.6	3.9	7.3	4.2	6.3	3.8	4.4	0.9
Construction (%)			4.7	5.4	4.1	4.8	4.8	5.1	4.8	4.5	4.5	0.5
Wholesale and retail commerce (%)			9.8	10.7	15.8	14.3	7.6	13.1	12.0	5.7	[illegible]	1.9
Hotels & restaurants (%)			0.9	0.6	0.6	0.6	[illegible]	0.8	0.9	0.7	0.8	0.1
Transport (%)			29.6	10.4	30.4	16.3	8.5	11.1	11.0	14.9	10.8	1.5
Financing (%)			7.6	4.9	7.5	6.9	2.9	10.5	6.6	14.8	6.5	0.4
Real estate (%)			9.2	4.1	13.1	16.3	0.0	6.8	5.6	21.3	5.0	0.8
Public administration (%)			21.5	17.2	7.9	11.1	12.1	11.1	17.0	15.2	16.2	10.9
Other activities (%)			8.4	8.8	7.4	6.2	5.4	5.5	5.8	6.6	7.2	1.3

Source: JICA Study Team

Table 7.3.8 RGDP per Sector, Absolute Values and Percentage (2010 – 2014; Year 1996 Balboa Prices)

year 2010-2014	PIB/PEA	PIB	Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture & cattle, etc	3,651	858,724,513	56,805,631	59,226,989	27,673,380	175,341,873	38,042,187	42,730,562	43,468,524	56,460,702	127,405,182	153,813,196
Fishing	9,174	421,447,407	7,169,621	30,515,894	5,753,380	25,627,565	9,591,454	12,214,307	16,573,837	156,783,381	25,731,772	41,888,710
Quarries and mines	35,930	308,209,321	256,425	9,065,541	6,244,443	10,454,513	781,055	1,343,368	11,412,590	67,649,895	521,775	108,239,021
Manufacturing & industries	13,039	1,245,331,709	14,500,613	88,956,296	54,216,223	122,791,542	4,254,210	53,538,213	31,636,757	758,254,596	41,671,411	22,051,952
Electricity, gas water supply	48,750	584,820,528	5,177,660	24,817,259	42,563,850	65,644,625	4,569,483	13,791,182	19,511,069	379,222,389	19,234,527	3,888,555
Construction	6,059	663,297,934	12,132,668	44,728,668	44,522,088	68,450,104	2,871,419	18,772,158	17,502,603	438,669,876	23,168,314	2,139,435
Wholesale and retail commerce, etc	5,658	1,627,345,342	26,272,451	69,188,626	158,200,526	152,505,563	6,448,655	53,058,987	34,157,426	1,009,154,443	72,240,810	7,831,140
Hotels & restaurants	1,750	301,851,016	2,350,716	3,891,028	6,559,332	10,853,775	669,583	2,615,307	2,610,141	70,507,307	3,850,728	582,511
Transport	7,922	2,419,391,796	58,333,961	18,612,140	256,091,157	155,351,215	4,904,175	38,058,183	35,296,893	1,755,628,409	46,883,658	4,341,512
Financing	59,217	1,802,327,301	12,802,659	45,703,777	68,274,426	113,564,752	2,154,324	42,533,381	30,070,017	1,406,619,834	31,199,391	1,444,420
Real estate	52,115	2,635,175,909	26,077,188	71,405,835	215,502,394	189,060,105	1,557,452	34,215,323	21,202,409	2,037,819,554	31,949,595	3,685,874
Public administration, etc	21,314	1,943,180,163	30,334,710	94,045,899	54,561,792	151,723,057	21,130,977	52,554,902	47,195,529	1,517,668,255	89,955,720	42,039,424
Other activities	13,979	950,208,301	10,065,591	29,040,125	54,128,663	55,702,252	4,550,513	25,440,304	22,422,260	578,757,793	33,182,124	5,316,856
total (excluding CFZ, PCA and taxes)	13,958	15,365,271,537	240,268,492	679,737,561	1,005,271,235	1,383,012,061	101,945,557	390,943,781	331,061,473	10,220,397,237	547,534,497	304,479,995
Agriculture & cattle, etc			21.9	11.6	2.8	12.7	37.3	10.9	13.1	0.9	23.3	39.0
Fishing			3.0	4.5	3.6	1.9	5.7	3.1	5.0	1.5	4.7	8.1
Quarries and mines			0.1	1.3	0.6	0.8	0.8	0.3	3.4	0.7	0.2	27.4
Manufacturing & industries			5.9	13.1	5.4	9.5	4.3	12.9	9.6	7.5	7.6	7.3
Electricity, gas water supply			2.2	3.7	4.3	4.7	4.5	3.3	5.9	3.7	3.5	1.0
Construction			5.0	5.6	4.5	4.9	2.8	4.8	5.3	4.2	4.2	0.6
Wholesale and retail commerce, etc			10.9	10.2	15.7	13.2	6.3	15.0	10.3	9.9	13.2	2.0
Hotels & restaurants			1.0	0.6	0.7	0.8	0.7	0.7	0.8	0.7	0.7	0.1
Transport			24.3	3.6	22.5	11.1	4.9	9.7	10.1	15.9	8.6	1.2
Financing			5.3	6.7	6.8	8.2	2.1	10.4	9.1	14.2	5.7	0.4
Real estate			12.1	10.5	21.4	13.7	1.5	8.8	6.4	19.9	5.8	0.9
Public administration, etc			12.6	13.8	5.4	11.0	20.7	13.5	14.3	14.9	16.4	13.6
Other activities			4.3	3.9	5.4	6.3	4.5	6.5	6.8	5.6	6.1	1.3

Source: JICA Study Team

Table 7.3.9 RGDP per Sector, Absolute Values and Percentage (2015 – 2019; Year 1996 Balboa Prices)

year 2015-2019	PIB/PEA	PIB	Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture & cattle, etc	4,143	1,081,517,916	82,667,819	123,116,931	35,684,352	211,605,870	45,714,125	49,184,081	50,031,593	130,217,357	146,669,876	206,625,912
Fishing	21,301	402,502,278	9,626,536	36,537,046	7,205,071	30,075,771	11,557,826	13,655,865	18,528,547	204,930,380	28,773,892	41,611,343
Quarries and mines	39,312	135,494,569	382,068	10,782,816	7,770,407	12,188,988	906,662	1,492,828	12,676,171	88,129,242	1,024,032	135,494,569
Manufacturing & industries	10,908	1,559,975,842	19,241,516	105,954,366	67,111,945	154,014,750	5,005,022	55,676,135	34,955,501	1,034,461,336	46,051,314	37,503,959
Electricity, gas water supply	53,028	732,286,631	6,871,686	29,568,177	52,703,283	75,462,375	5,278,250	22,979,814	21,564,789	491,579,535	21,262,617	5,016,107
Construction	6,608	830,552,481	16,066,134	53,208,678	55,537,963	79,268,260	3,288,647	20,716,414	19,315,738	554,824,751	25,505,877	2,820,019
Wholesale and retail commerce, etc	7,240	2,037,690,784	34,890,588	82,476,763	196,113,727	223,919,002	7,452,808	56,249,980	37,771,446	1,308,809,455	79,899,742	10,107,274
Hotels & restaurants	1,904	131,290,991	3,106,398	4,615,414	8,554,464	12,515,378	769,794	2,877,842	2,872,048	90,993,607	4,237,942	748,104
Transport	19,215	2,904,064,017	38,657,466	68,888,127	276,164,600	175,483,862	5,691,207	41,462,969	36,302,958	2,204,507,358	51,126,253	5,779,217
Financing	63,354	2,256,794,860	16,727,401	53,600,590	83,337,183	130,148,087	2,460,898	44,153,682	32,713,922	1,857,869,804	33,949,194	1,834,099
Real estate	56,075	3,300,026,474	37,967,673	83,692,103	262,500,853	215,774,656	1,769,758	37,201,943	23,052,469	2,598,645,776	34,743,860	4,677,384
Public administration, etc	23,061	2,430,660,298	40,080,835	111,538,803	116,554,608	175,221,526	24,297,385	57,822,234	51,923,814	1,700,288,807	98,987,594	53,944,691
Other activities	14,739	1,212,347,525	13,990,081	46,044,394	65,014,618	105,452,252	5,098,827	27,276,372	24,040,100	853,495,815	35,581,653	6,653,092
total (excluding CFZ, PCA and taxes)			25.8	15.2	2.9	13.2	38.3	11.4	13.7	1.0	24.1	40.3
Agriculture & cattle, etc			3.0	4.5	0.6	1.9	9.7	3.2	5.1	1.6	4.7	8.1
Fishing			0.1	1.3	0.6	0.8	0.8	0.3	3.5	0.7	0.2	26.4
Quarries and mines			6.0	13.1	5.4	9.6	4.2	12.9	9.6	7.9	7.6	7.3
Manufacturing & industries			2.1	3.7	4.3	4.7	4.4	5.3	5.9	3.7	3.5	1.0
Electricity, gas water supply			5.0	6.6	4.5	5.0	2.8	4.8	5.3	4.2	4.2	0.5
Construction			10.9	10.2	15.9	14.0	6.2	13.1	10.3	10.0	13.1	2.0
Wholesale and retail commerce, etc			1.0	0.6	0.7	0.8	0.6	0.7	0.8	0.7	0.7	0.1
Hotels & restaurants			12.1	8.5	22.4	11.0	4.8	9.6	9.9	16.8	8.4	1.1
Transport			5.2	6.6	6.8	8.1	2.1	10.3	8.9	14.2	5.6	0.4
Financing			11.9	10.3	21.3	13.5	1.5	8.6	6.3	19.8	5.7	0.9
Real estate			12.5	13.8	9.4	10.9	20.4	13.4	14.2	13.0	16.3	10.5
Public administration, etc			4.4	5.7	5.3	6.6	4.3	6.3	6.6	6.5	5.9	1.3
Other activities			25.8	15.2	2.9	13.2	38.3	11.4	13.7	1.0	24.1	40.3

Source: JICA Study Team

Table 7.3.10 RGDP per Sector, Absolute Values and Percentage (2020 – 2024; Year 1996 Balboa Prices)

year 2020-2024	PIB/PEA	PIB	Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture & cattle, etc	5,097	1,886,906,867	167,705,663	137,652,050	46,291,895	263,810,655	57,596,472	60,347,711	67,597,155	175,152,547	185,426,965	274,917,170
Fishing	26,223	516,157,120	12,901,022	46,643,010	9,354,508	27,014,051	14,514,498	15,707,517	22,754,039	271,100,476	35,417,261	48,709,253
Quarries and mines	47,694	173,754,265	564,619	13,565,078	9,242,485	15,103,559	1,129,854	1,806,459	15,342,242	114,932,010	1,242,286	175,734,268
Manufacturing & industries	15,201	2,300,467,288	25,351,567	131,979,011	85,563,063	198,374,979	6,221,526	67,206,357	42,201,475	1,345,790,515	35,728,512	15,914,758
Electricity, gas water supply	64,193	989,062,906	5,055,779	37,118,210	67,286,628	95,298,645	6,563,656	27,786,262	26,012,660	638,667,558	18,736,558	6,517,663
Construction	7,984	1,307,056,131	28,177,486	66,668,151	70,778,572	97,813,448	4,761,404	24,369,009	16,282,475	776,397,771	15,811,177	2,525,565
Wholesale and retail commerce, etc	8,766	2,513,074,919	47,989,750	101,557,935	250,431,718	276,901,985	9,208,866	67,930,405	45,624,083	1,707,441,551	95,791,825	11,195,979
Hotels & restaurants	2,207	168,363,717	4,265,705	5,782,553	10,300,118	15,443,163	955,296	3,467,945	3,461,619	118,173,121	5,115,500	574,601
Transport	55,125	3,734,486,551	56,616,495	85,912,405	350,519,818	215,092,558	7,365,462	36,776,485	36,881,875	2,858,812,719	61,522,109	1,499,653
Financing	76,179	2,884,047,561	28,896,433	66,836,458	105,384,746	159,852,487	5,059,430	52,955,040	39,242,576	2,401,565,075	43,817,427	2,278,058
Real estate	67,408	4,231,857,195	45,085,553	104,358,536	332,790,529	264,912,395	2,187,179	44,604,055	27,644,840	3,357,875,593	41,790,758	6,462,855
Public administration, etc	27,856	3,117,007,502	52,706,164	139,717,196	148,485,022	216,169,522	36,146,567	53,965,055	62,573,412	2,207,726,890	112,557,453	78,263,239
Other activities	13,387	1,954,678,921	18,482,575	51,945,546	83,212,012	130,104,295	6,855,178	35,016,714	29,104,872	1,112,259,540	43,170,226	8,706,227
total (excluding CFZ, PCA and taxes)	14,518	21,981,579,958	422,112,867	1,018,166,579	1,571,313,959	1,979,956,115	148,557,591	520,252,661	442,255,958	17,018,176,722	736,026,112	664,896,180
Agriculture & cattle, etc			26.2	13.4	2.9	13.4	38.7	11.6	15.5	1.0	24.4	41.2
Fishing			3.0	4.6	0.6	1.0	9.8	3.0	5.1	1.6	4.8	7.3
Quarries and mines			0.1	1.3	0.6	0.8	0.8	0.3	3.5	0.7	0.2	26.1
Manufacturing & industries			5.9	13.1	5.5	9.5	4.2	12.9	9.5	7.9	5.6	2.4
Electricity, gas water supply			2.1	3.6	4.3	4.7	4.4	5.3	5.5	3.8	3.5	1.0
Construction			6.6	6.5	4.5	4.9	2.7	4.8	3.3	4.2	4.2	0.7
Wholesale and retail commerce, etc			10.9	10.2	15.9	14.0	6.2	13.1	10.3	10.0	13.1	1.7
Hotels & restaurants			1.0	0.6	0.7	0.8	0.6	0.7	0.8	0.7	0.7	0.1
Transport			13.4	8.4	22.3	10.9	4.7	9.6	9.5	16.8	8.3	1.1
Financing			6.8	6.6	6.7	8.1	3.4	10.2	8.9	14.1	5.5	0.3
Real estate			10.7	10.2	21.2	13.4	1.5	8.6	6.3	19.7	5.7	0.9
Public administration, etc			12.5	13.7	9.4	10.9	24.3	10.4	14.1	13.0	15.3	11.8
Other activities			4.4	5.1	5.3	6.6	4.6	6.7	6.6	6.5	5.9	1.3

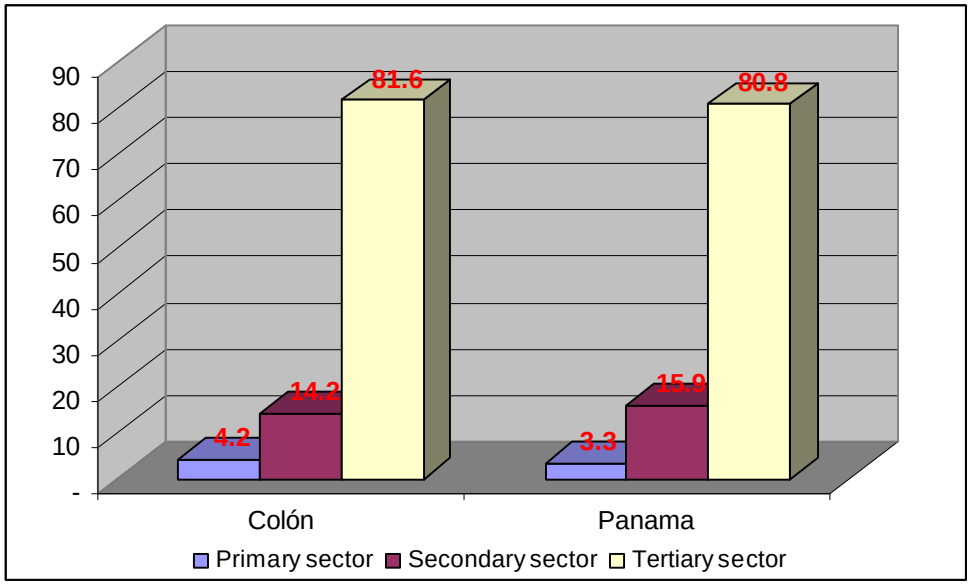
Source: JICA Study Team

The tables demonstrate a slight deviation between the absolute value of the total national GDP and the value of the sum of the absolute values of the individual provinces. This is caused by rounding-off during calculations, the exclusion of Colón Free Zone and Panama Canal and taxes from the calculations and because of the use of already previously calculated EAP. However, their impact was estimated and incorporated in the calculations of the EAP per province and per sector, therewith maintaining the variation between both absolute values within 99% of each other and can therefore be considered acceptable absolute values for the GDP per sector for the individual provinces. The relatively strong increase in the economic performance of the sectors between the periods 2005-2009 and 2010-2014 is caused by the EAP, which was calculated for the first period on the basis of year 2002 EAP distribution per sector and for the remaining years on year 2000 distributions. This was done to incorporate the expected recovery in particular of the primary sector of the diseases and natural disasters that negatively affected agriculture and fishing since the year 2000.

Furthermore, the absolute values might differ slightly but this difference does not affect the estimated shares of particular sectors in the provinces. The percentage distribution is much more important as value to estimate the importance in the future of certain economic activities for imports and exports of goods.

As can be noted from the above tables, the share of services in total RGDP for the Metropolitan Area (Colón and Panama provinces) will remain very high (above 80%), even without the inclusion of the future contribution of Colón Free Zone and Panama Canal. For Panama, this in particular due to the strong performance of following sectors: intermediate financing, real estate and rent, transport and communications and public administrations, each with a share of 13% or more of RGDP. The share of wholesale and retail commerce in Panama is around 10% of RGDP. The picture is different for Colón, where wholesale and retail commerce is around 15% of RGDP, transport accounts for 22% of RGDP and also the real estate sector accounts for over 20% of RGDP. See Figure 7.3.7 for the sector distribution for both provinces in the year 2024. It should be noted that the high share of the service sector is caused by the abstraction being made from several additional components that make up the service sector (taxes and imputed banking services, etc…)

The picture is substantially different in the provinces of the Interior Area where the impact of the services is less explicit and where agriculture and other primary and secondary sector activities have considerably more importance. Some clear patterns can be identified for the various provinces on the basis whether or not they are located nearby the Metropolitan Area or not.

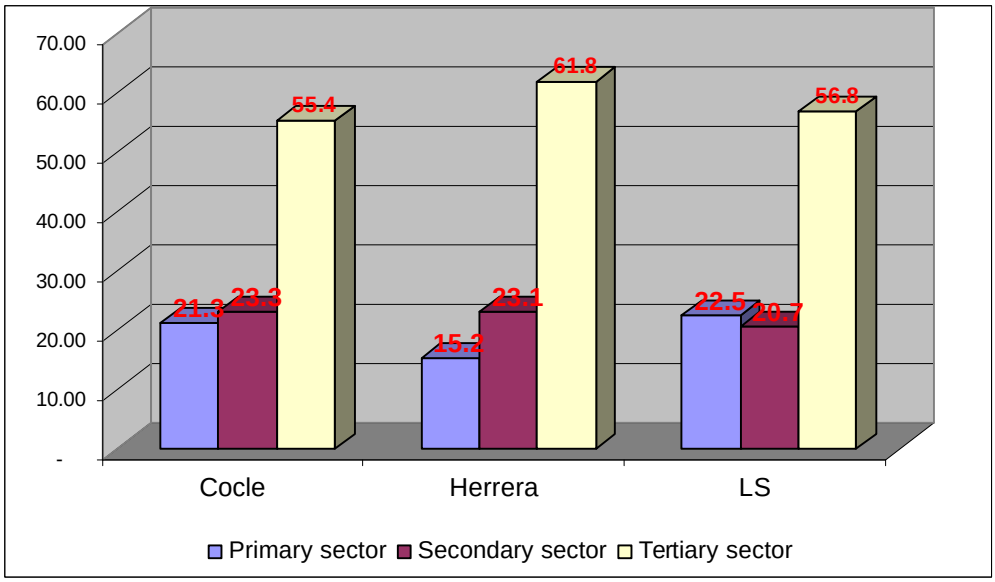


Source: JICA Study Team

Figure 7.3.7 Sector Distribution Metropolitan Area (year 2024)

Coclé, Herrera en Los Santos, three provinces that are connected to the Metropolitan Area, will see their manufacturing sector performing much stronger than in Panama and Colón in the year 2024. Already, this situation can be observed at present and the trend will become more explicit in the future. In the year 2024, the RGDP of manufacturing and industries in these three provinces will be around 13% for Coclé and Herrera and nearly 10% for Los Santos. This compared to a share of almost 8% in Panama and 5.5% in Colón. Labor cost, land prices and other factors probably influence many manufacturers to invest in these three provinces. But they do not wish to be to far a distance from the Metropolitan because of their need for efficient logistics services. The relatively strong scores on transport, storage and communications and on the wholesale and retail commerce as well as the more moderate scores on the real estate sector for the three provinces seem to corroborate these assumptions. The good performance of these three sectors in particular is also responsible for the strong share of the service sector in future GDP for these three provinces. The situation is clearly reflected in the following Figure 7.3.8.

In these provinces of Coclé, Herrera en Los Santos, the primary sector remains important, although not as dominant as in the other provinces of the Interior Area. Bocas del Toro, Darien, Herrera and the Indian Reservations have very high scores for primary sector activities and will continue to focus on these economies over the next 20 years.



Source: JICA Study Team

Figure 7.3.8 Sector Distribution in Selected Provinces (Year 2024)

Veraguas and Bocas del Toro demonstrate a similar pattern, while Darien and the Indian Reservations still strongly focus on primary sector activities. Agriculture and fishing are strong sectors in these provinces and their share will in most of these provinces increase over the next 20 years, as can be seen in the next Table 7.3.11 where the share in RGDP for selected sectors is compared between the year 2005 and the year 2024.

Table 7.3.11 RGDP for selected sectors, (% 2005 and 2024)

	Bocas del Toro		Darien		Veraguas		Reservations	
	2005	2024	2005	2024	2005	2024	2005	2024
Agriculture, cattle, hunting and silviculture	20.6	26.2	34.1	38.7	21.5	24.4	38.1	41.2
Fishing	1.2	3.0	11.4	9.8	6.0	4.8	9.8	7.3
Quarries and mines exploitation	1.1	0.1	0.0	0.8	0.2	0.2	26.8	26.1
Manufacturing and industries	5.5	6.0	5.1	4.2	7.8	7.6	7.2	7.3
Electricity, gas and water supply	3.1	2.1	7.3	4.4	4.4	3.5	0.9	1.0
Construction	4.7	5.0	4.8	2.7	4.5	4.2	0.6	0.7
Wholesale and retail commerce, cars & motorcycles repair, personal effects and household equipment	9.8	10.9	7.6	6.2	11.1	13.1	1.9	2.0
Hotels and restaurants	0.7	1.0	1.1	0.6	0.8	0.7	0.1	0.1
Transport, storage and communications	19.6	12.0	8.3	4.7	10.8	8.3	1.5	1.1
Intermediate financing	5.6	5.2	2.9	2.0	6.5	5.5	0.4	0.4
Real estates, business studies and rent	9.2	11.7	0.0	1.5	5.0	5.7	0.8	0.9
Public administration and defense, obligatory social security and affiliation plans	12.5	12.5	12.1	20.2	14.3	16.2	10.9	10.5
Other social and personal services	6.4	4.4	5.4	4.3	7.2	5.9	1.0	1.3

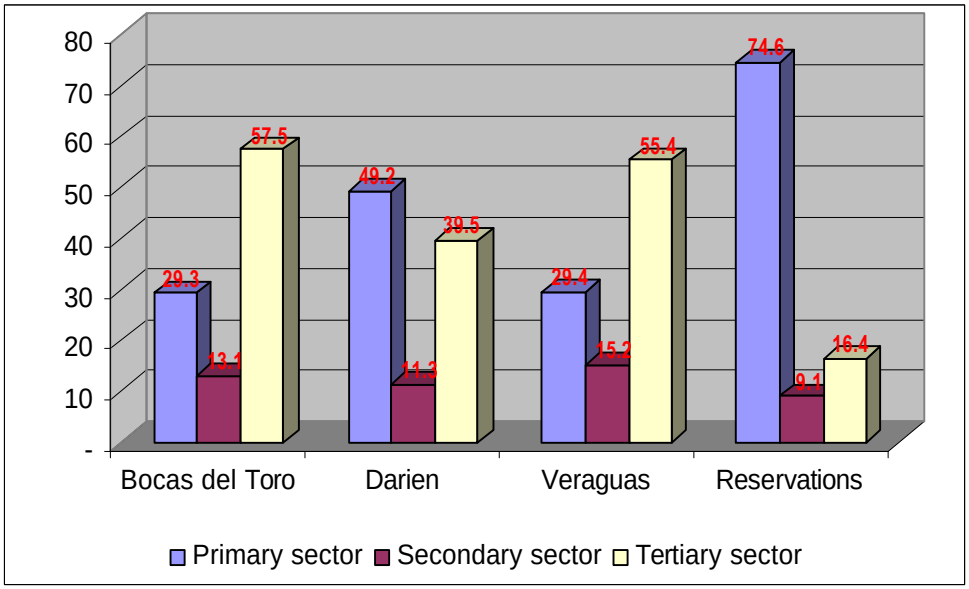
Source: JICA Study Team

Bocas del Toro demonstrates the strongest increase in the agricultural sector over the next 20 years. The sector will in 2024 be responsible for 1/4th of regional GDP. Fishing is the strongest growing sector in Bocas del Toro and will double its share in RGDP over the next 20 years.

However, in the total economy, fishing will only account for just over 3% of RGDP. But Bocas del Toro also observes an increase in real estates and rents, construction and wholesale and retail as well as hotels and restaurants, reflecting the expected growth of the tourism sector in that province.

Darién and the Indian Reservations remain primary sector oriented provinces for the next 20 years to come. Both observe a particular and joint trend. While the share of agriculture will increase over the next 20 years, the share in fishing will decrease although it will still account for nearly 10% of regional GDP in the year 2024 which is still substantially higher than in the other Interior Area provinces. Together with the share of agriculture and mining, the primary sector will be responsible for nearly 50% of RGDP in Darién and over 70% of RGDP in the Indian Reservations.

The overall GDP distribution per sector for the three provinces and the Indian Reservations in the year 2024 is visualized in next Figure 7.3.9.



Source: JICA Study Team

Figure 7.3.9 Sector Distribution in Selected Provinces (Year 2024)

Chiriqui province is more difficult to categorize. This province shows the most balanced distribution over the sectors of all provinces in Panama. This can be explained by its relative detachment from the Metropolitan Area, making it necessary for the province to be relatively "self reliant".

As can be noted in next Table 7.3.12, the agriculture and fishing sector will grow over the next 20 years with 3.6% and 0.4% respectively. At the same time, manufacturing and industries will see a growth with 1.6% and electricity, gas and water supply with 0.8%. Construction will remain stable at around 4.8% of RGDP. The increase of the primary and secondary sector is to the detriment of services, and in particular of transport, storage and communications, and the real

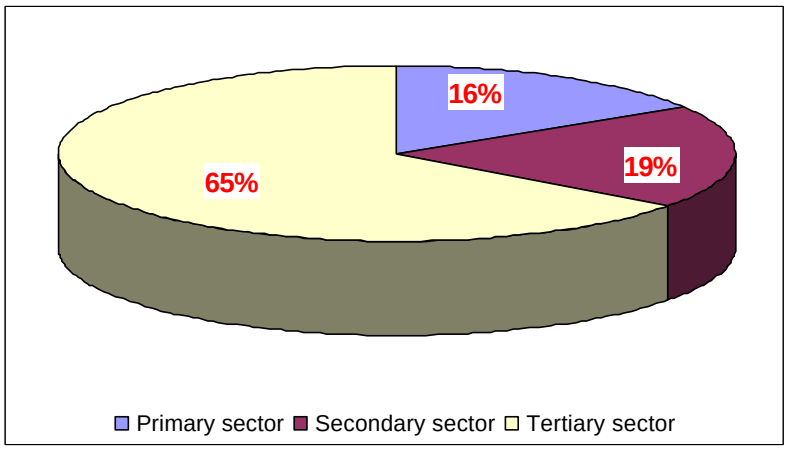
estate sector. Intermediate financing, on the contrary, sees a growth of around 1% while wholesale and retail commerce remains stable over the next 20 years.

Table 7.3.12 RGDP for Selected Sectors in Chiriqui Province (% 2005 and 2024)

	Chiriqui province	
	2005	2024
Agriculture, cattle, hunting and silviculture	9.8	13.4
Fishing	1.5	1.9
Quarries and mines exploitation	0.3	0.8
Manufacturing and industries	8.0	9.6
Electricity, gas and water supply	3.9	4.7
Construction	4.8	4.9
Wholesale and retail commerce, cars & motorcycles repair, personal effects and household equipment	14.3	14.0
Hotels and restaurants	0.6	0.8
Transport, storage and communications	16.3	10.9
Intermediate financing	6.9	8.1
Real estates, business studies and rent	16.3	13.4
Public administration and defense, obligatory social security and affiliation plans	11.1	10.9
Other activities, communities, social and personal services	6.2	6.6

Source: JICA Study Team

The stable relation between the primary and secondary sectors is clearly visualized in the next Figure 7.3.10. The importance of the service sector remains high as is the case in all other provinces except for Darién and the Indian Reservations.



Source: JICA Study Team

Figure 7.3.10 Sector Distribution in Chiriqui Province (year 2024)

7.3.3 Economic Forecasts Development Adjusted Scenario

The previous economic forecasts assumed a constant stable distribution between the various sectors, a distribution which does not change in percentage values over the next 20 years. The changes observed in previous section were a direct consequence of the changes in employment per sector (EAP) and the assumed growth in the GDP of Panama between 2004 and 2024.

All calculations were done using year-1996 Balboa.

However, in the Development Adjusted Scenario, it is assumed that there will over time be a positive impact from the various national and regional development plans and that this impact is in particular notable in the primary and secondary sector.

The calculations for the Development Adjusted Scenario therefore started with the same share as the Base Case Scenario for the period 2005 – 2009, after which a changing share per sector at the level of national GDP was introduced for the sequential periods. All calculations were done over to assess the effects on the various sectors and on the various sectors per province.

The calculation method remains the same as for the Base Case Scenario, only the share of individual sectors in the national GDP is manually changed. The calculations show again some slight difference between the national total GDP and the sum of the individual totals for the different provinces. The difference remains also here below 1% except in the final table where the GDP and the sum of the regional GDP per province are compared and the difference is 2%.

As overall conclusion, it can also here be stated that the tables provide a strong indication about the future distribution of GDP over the provinces and of the distribution of the RGDP of the individual provinces over the different sectors.

The GDP per sector for the next 20 years is visualized in next Table 7.3.13. It demonstrates clearly the increase of agriculture, fishing and to a lesser extent of mining, manufacturing industries and transport. The impact of intermediate financing, the real estate sector and public administration slightly reduces, although their importance in absolute value remains very high.

The increase in the share in national GDP of particular sectors reflects the expected impact of national and regional development plans which will (hopefully) stimulate the development of agriculture, fishing and manufacturing. Also hotels and restaurants and construction are some of the sectors that could benefit from these development plans, either directly or indirectly. The Table 7.3.14 presents the percentages that have been used to calculate GDP over the next 20 years. As can be observed in Table 7.3.14, the growth rates have been kept moderate so that the risk is minimized of over-estimating the impact of these plans on a strongly service oriented economy. Electricity, water and gas supply are included in the secondary sector share.

Table 7.3.13 GDP per sector in absolute value (year 1996 Balboa; period 2005 - 2024)

Sectors	2005-09	2010-14	2015-19	2020-24
	PIB	PIB	PIB	PIB
Agriculture, cattle, hunting and silviculture	693,096,720	895,972,321	1,178,942,689	1,511,841,539
Fishing	257,945,804	364,463,317	494,395,321	682,767,147
Quarries and mines exploitation	86,832,442	121,487,772	133,106,433	195,076,328
Manufacturing and industries	999,719,119	1,260,435,638	1,578,261,987	2,097,070,522
Electricity, gas and water supply	469,289,925	561,880,947	741,592,982	975,381,638
Construction	532,264,137	698,554,691	874,699,415	1,194,842,507
Wholesale and retail commerce, cars & motorcycles repair, personal effects and household equipment	1,305,865,374	1,627,345,842	2,037,690,784	2,560,376,801
Hotels and restaurants	84,138,555	136,673,744	209,167,251	316,999,032
Transport, storage and communications	1,861,085,437	2,319,251,056	2,904,064,017	3,682,065,685
Intermediate financing	1,446,279,429	1,746,386,727	2,148,718,127	2,731,068,587
Real estates, business studies and rent	2,114,840,161	2,596,801,133	3,194,554,384	3,999,064,717
Public administration and defense, obligatory social security and affiliation plans	1,557,702,054	1,883,060,471	2,319,854,969	2,950,529,456
Other activities, communities, social and personal services	776,939,596	968,208,091	1,197,957,894	1,487,456,998
Total GDP	12,185,998,752	15,180,521,748	19,013,006,254	24,384,540,958

Source: JICA Study Team

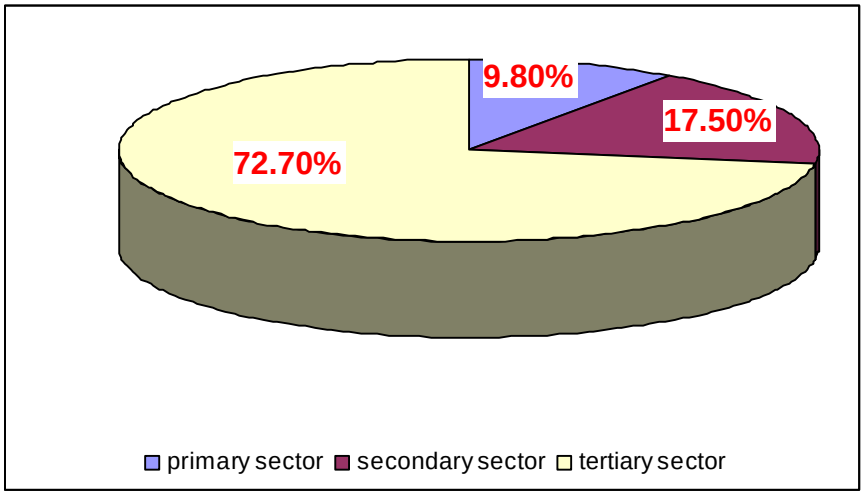
It is expected that in the structure of future GDP the primary and secondary sector will benefit the most from the possible effects of national and regional development efforts and that for the service sector, hotels and restaurants will show growth as a consequence of the efforts of increasing tourism. Most other service sectors will remain stable or experience a moderate decrease over the next 20 year period.

Table 7.3.14 GDP per Sector in Absolute Value (%; Period 2005 - 2024)

Sectors	2005-09	2010-14	2015-19	2020-24
	%	%	%	%
Agriculture, cattle, hunting and silviculture	5.7%	5.9%	6.2%	6.2%
Fishing	2.1%	2.4%	2.6%	2.8%
Quarries and mines exploitation	0.7%	0.8%	0.7%	0.8%
Manufacturing and industries	8.2%	8.3%	8.3%	8.6%
Electricity, gas and water supply	3.9%	3.7%	3.9%	4.0%
Construction	4.4%	4.6%	4.6%	4.9%
Wholesale and retail commerce, cars & motorcycles repair, personal effects and household equipment	10.7%	10.7%	10.7%	10.5%
Hotels and restaurants	0.7%	0.9%	1.1%	1.3%
Transport, storage and communications	15.3%	15.3%	15.3%	15.1%
Intermediate financing	11.9%	11.5%	11.3%	11.2%
Real estates, business studies and rent	17.4%	17.1%	16.8%	16.4%
Public administration and defense, obligatory social security and affiliation plans	12.8%	12.4%	12.2%	12.1%
Other activities, communities, social and personal services	6.4%	6.4%	6.3%	6.1%
Total	1	1	1	1

Source: JICA Study Team

The overall effects on the primary, secondary and tertiary sector distribution is notable over the entire period. While in the year 2003, the distribution over the three sectors was as visualized in Figure 7.3.4, the year 2024 distribution shows a notable increase in the shares of the primary and secondary sectors while the impact of the service sector decreases. However, it should be noted that the explicit service-oriented economy is maintained also in the Development Adjusted Scenario and the share of the service sector remains strongly above the 70%. See Figure 7.3.11.



Source: JICA Study Team

Figure 7.3.11 GDP Distribution per Sector (Year 2024)

Supposing that the various development plans actually produce positive results and that the effect is as estimated above, it can be concluded that the share of the secondary sector returns to the year 1993 level while the impact of the primary sector increases with almost 2% over the next 20 years. These assumptions are thus not unreasonable and could be achieved with the proper economic stimuli, foreseen in the various economic development plans for the regions, and in particular the plans drawn up for Bocas del Toro and Darién.

The real effects of the various development plans will be more visible at the level of the provinces. Starting with the new sector distributions as presented in the Table 7.3.14 above, the RGDP and the distribution per sector were calculated for each of the provinces. The results of the detailed calculations are proposed in Table 7.3.15 till 7.3.18 hereafter.

Table 7.3.15 RGDP per Sector, Absolute Values and Percentage (2005 – 2009; Year 1996 Balboa Prices)

year 2005-2009	Bocas del Toro	Coclé	Colón	Chiriqui	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture & cattle, etc	40,700,620	82,985,834	20,219,716	122,244,323	29,828,015	43,370,066	35,599,570	87,995,546	106,459,782	123,693,247
Fishing	2,439,368	29,096,263	4,555,572	19,402,062	9,971,962	9,559,096	11,668,759	109,663,170	29,843,073	31,746,479
Quarries and mines	2,153,351	17,319,409	1,136,835	3,915,154	0	3,810,777	4,598,989	52,536,644	1,229,459	86,832,442
Manufacturing & industries	10,923,548	78,140,313	36,870,892	100,523,939	4,455,464	41,470,593	28,728,860	636,382,189	38,782,214	23,441,108
Electricity, gas water supply	6,067,586	16,393,327	36,628,440	48,845,237	6,430,084	12,833,951	16,755,393	300,451,314	21,903,419	2,981,176
Construction	9,405,640	29,609,526	32,915,525	60,687,921	4,200,782	15,729,083	12,942,579	342,692,266	22,246,217	1,834,599
Wholesale and retail commerce, etc	19,389,642	58,437,852	133,819,287	178,838,398	6,627,506	40,306,516	32,065,390	775,376,904	54,990,882	6,012,997
Hotels & restaurants	1,475,910	3,276,469	5,093,907	7,909,825	948,194	2,499,343	2,464,676	56,264,150	3,763,005	443,078
Transport	38,787,758	56,759,989	241,604,984	203,811,999	7,298,715	33,781,273	29,486,048	1,191,349,931	53,418,863	4,785,876
Financing	11,035,043	26,699,900	56,756,354	85,856,036	2,497,783	32,369,091	17,557,488	1,180,000,112	32,298,970	1,208,652
Real estate	18,262,375	22,443,349	104,024,633	204,423,114	0	20,955,940	14,990,008	1,702,130,000	24,856,620	2,754,121
Public administration, etc	24,723,257	77,600,517	63,220,750	138,946,464	10,589,308	34,284,263	45,521,391	1,056,647,341	70,757,333	35,411,429
Other activities	12,662,413	48,281,755	58,939,321	77,659,221	4,688,063	16,947,696	15,419,503	503,415,475	35,717,997	3,208,152
total (excluding CFZ, PCA and taxes)	198,026,511	547,044,502	795,786,214	1,253,063,693	87,535,877	307,917,686	267,798,655	7,994,905,041	496,267,833	324,353,356
Agriculture & cattle, etc (%)	20.6	15.2	2.5	9.8	34.1	14.1	13.3	1.1	21.5	38.1
Fishing (%)	1.2	5.3	0.6	1.5	11.4	3.1	4.4	1.4	6.0	9.8
Quarries and mines (%)	1.1	3.2	0.1	0.3	0.0	1.2	1.7	0.7	0.2	26.8
Manufacturing & industries (%)	5.5	14.3	4.6	8.0	5.1	13.5	10.7	8.0	7.8	7.2
Electricity, gas water supply (%)	3.1	3.0	4.6	3.9	7.3	4.2	6.3	3.8	4.4	0.9
Construction (%)	4.7	5.4	4.1	4.8	4.8	5.1	4.8	4.3	4.5	0.6
Wholesale and retail commerce, etc (%)	9.8	10.7	16.8	14.3	7.6	13.1	12.0	9.7	11.1	1.9
Hotels & restaurants (%)	0.7	0.6	0.6	0.6	1.1	0.8	0.9	0.7	0.8	0.1
Transport (%)	19.6	10.4	30.4	16.3	8.3	11.0	11.0	14.9	10.8	1.5
Financing (%)	5.6	4.9	7.1	6.9	2.9	10.5	6.6	14.8	6.5	0.4
Real estate (%)	9.2	4.1	13.1	16.3	0.0	6.8	5.6	21.3	5.0	0.8
Public administration, etc (%)	12.5	14.2	7.9	11.1	12.1	11.1	17.0	13.2	14.3	10.9
Other activities (%)	6.4	8.8	7.4	6.2	5.4	5.5	5.8	6.3	7.2	1.0

Source: JICA Study Team

Table 7.3.16 RGDP per Sector, Absolute Values and Percentage (2010 – 2014; Year 1996 Balboa Prices)

Year 2010 2014	Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture & cattle, etc	57,637,806	100,371,692	38,705,587	181,989,906	29,421,773	44,335,334	45,061,451	130,362,133	82,167,935	139,332,78
Fishing	8,129,456	34,932,733	6,722,161	29,256,806	17,215,160	13,848,479	3,750,605	177,157,133	28,175,139	36,156,339
Quarries and mines	321,578	10,110,645	7,613,725	11,737,202	876,877	1,508,855	2,815,674	75,351,473	1,054,890	121,437,772
Manufacturing & industries	14,770,590	85,959,037	54,831,831	134,348,148	4,585,016	50,978,867	32,067,603	807,512,197	47,159,481	29,452,353
Electricity, gas water supply	4,973,589	23,845,875	40,894,257	62,453,235	4,530,241	19,975,045	13,746,521	564,547,531	18,480,050	3,756,204
Construction	12,567,057	47,103,525	47,309,862	72,067,415	3,002,363	19,769,368	13,455,586	451,453,257	24,336,817	2,505,345
Wholesale and retail commerce, etc	26,272,458	68,188,625	158,503,926	192,963,563	6,448,556	50,865,387	34,157,436	1,008,134,443	72,240,810	7,851,848
Hotels & restaurants	3,064,340	5,071,927	9,045,596	14,155,968	872,556	3,409,084	3,402,299	91,305,737	5,019,590	750,259
Transport	39,533,358	58,502,143	226,091,157	153,331,285	1,938,370	38,078,165	13,296,898	1,723,812,409	46,881,636	4,341,512
Financing	12,405,290	44,283,224	66,232,222	110,427,318	2,037,148	39,324,046	19,196,705	1,410,827,958	30,251,029	1,309,588
Real estate	28,750,497	70,377,985	212,343,087	186,283,747	1,544,578	33,712,932	17,851,773	2,007,913,808	31,480,467	3,641,785
Public administration, etc	29,456,477	91,290,133	91,713,377	147,186,409	20,408,367	50,981,367	45,782,582	1,278,216,752	87,262,411	40,752,733
Other activities	10,565,598	39,840,125	54,128,663	38,702,252	4,650,513	25,440,904	22,423,260	678,757,793	33,182,124	5,316,866
Total (excluding CFZ, PCA and taxes)	243,107,932	686,019,703	1,003,194,164	1,339,340,172	104,287,806	392,160,970	334,273,191	10,177,332,715	553,618,223	116,878,501
Agriculture & cattle, etc (%)	25.2	15.3	2.9	15.1	27.8	11.3	15.5	1.3	23.5	38.3
Fishing (%)	3.3	5.3	0.7	2.1	16.8	3.5	5.6	1.7	5.3	8.7
Quarries and mines (%)	0.1	1.5	0.7	0.8	0.5	0.4	3.8	0.7	0.2	29.1
Manufacturing & industries (%)	6.0	13.1	5.5	9.7	4.2	13.0	9.6	7.9	7.6	7.1
Electricity, gas water supply (%)	2.0	3.5	4.1	4.5	4.2	5.1	5.6	5.5	3.3	0.9
Construction (%)	5.2	6.9	4.7	5.2	2.9	5.0	5.5	4.4	4.4	0.6
Wholesale and retail commerce, etc (%)	10.8	10.1	15.8	13.9	6.2	13.0	10.2	9.9	13.0	1.9
Hotels & restaurants (%)	1.3	0.7	0.9	1.0	0.8	0.9	1.0	0.9	0.9	0.2
Transport (%)	16.1	8.5	22.5	11.0	1.8	9.7	9.9	16.9	8.5	1.1
Financing (%)	5.1	6.1	6.6	7.9	2.0	10.0	5.7	13.9	5.5	9.3
Real estate (%)	11.8	10.2	21.2	13.4	1.5	8.6	5.2	19.7	5.7	0.9
Public administration, etc (%)	12.1	13.3	9.1	10.5	19.7	13.0	13.7	12.5	15.8	9.8
Other activities (%)	4.3	5.8	5.4	6.7	4.4	6.5	5.7	6.7	6.0	1.5

Source: JICA Study Team

Table 7.3.17 RGDP per Sector, Absolute Values and Percentage (2015 – 2019; Year 1996 Balboa Prices)

Year 2015-2020	Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture & cattle, etc	90,114,667	134,207,451	38,893,857	236,667,647	49,832,733	33,684,658	54,398,515	141,947,334	136,882,121	225,259,088
Fishing	11,624,317	44,873,915	8,853,021	36,542,202	14,196,328	16,777,560	22,778,693	251,715,888	35,344,093	51,111,396
Quarries and mines	375,334	10,592,765	7,633,451	11,574,135	893,632	1,456,516	12,452,549	86,275,035	1,003,583	133,106,433
Manufacturing & industries	19,467,056	147,196,370	67,893,636	155,820,122	5,643,671	56,328,774	35,385,251	1,046,587,563	46,592,131	37,343,583
Electricity, gas, water supply	6,959,015	29,944,248	55,514,050	76,421,397	5,345,129	23,211,855	21,888,847	457,825,851	21,572,835	5,379,855
Construction	16,920,108	56,045,915	58,790,081	87,181,661	3,163,151	21,817,568	20,842,411	584,215,757	26,861,608	2,009,914
Wholesale and retail commerce, etc	37,890,538	82,175,763	196,113,727	223,012,002	7,132,808	56,215,680	37,771,116	1,308,809,455	75,899,742	10,107,274
Hotels & restaurants	4,948,982	7,555,062	15,623,610	19,558,971	1,226,434	4,584,856	4,575,625	144,567,164	6,752,709	1,191,848
Transport	38,657,466	68,888,127	276,164,630	173,483,862	5,691,337	41,457,569	35,377,558	2,264,567,558	51,156,713	5,779,217
Financing	15,926,334	51,033,686	79,515,230	123,815,363	2,343,017	43,038,185	31,147,269	1,768,297,585	32,373,385	1,746,265
Real estate	36,754,138	81,027,222	254,111,058	208,873,286	1,713,125	36,012,552	22,315,689	2,515,591,593	33,623,412	4,527,890
Public administration, etc	38,253,690	105,454,138	111,241,230	167,233,787	23,180,752	55,136,320	43,556,788	1,622,778,568	94,475,095	51,485,541
Other activities	13,821,030	25,197,883	67,212,911	101,209,615	5,038,338	26,952,622	23,751,162	843,245,877	35,129,326	6,551,125
Total (excluding CPA, PCA and taxes)	328,515,780	825,577,063	1,229,992,187	1,518,877,068	125,116,528	435,751,795	372,721,637	13,017,885,190	621,585,697	536,862,129
Agriculture & cattle, etc (%)	27.4	16.3	3.2	14.2	39.7	12.5	14.6	1.1	25.6	42.0
Fishing (%)	3.6	5.4	0.7	2.3	11.3	3.8	6.1	1.9	5.7	9.5
Quarries and mines (%)	0.1	1.3	0.6	0.7	0.7	0.3	3.3	0.7	0.2	24.8
Manufacturing & industries (%)	5.9	17.8	5.5	9.6	4.8	12.9	9.5	8.0	7.5	7.1
Electricity, gas, water supply (%)	2.1	3.6	4.3	4.7	4.3	5.3	5.9	3.8	3.4	0.9
Construction (%)	5.1	6.8	4.8	5.2	2.8	5.0	5.5	4.5	4.3	0.6
Wholesale and retail commerce, etc (%)	10.6	10.0	15.9	13.8	5.9	12.9	10.1	10.1	12.8	1.9
Hotels & restaurants (%)	1.5	0.9	1.1	1.2	1.0	1.1	1.2	1.1	1.1	0.2
Transport (%)	11.8	8.3	22.5	10.8	4.5	9.5	9.7	16.9	8.2	1.1
Financing (%)	4.8	6.2	6.5	7.7	1.9	9.6	8.4	13.6	5.2	0.3
Real estate (%)	11.2	9.8	20.7	13.9	1.4	8.3	6.0	19.3	5.4	0.8
Public administration, etc (%)	11.6	12.8	9.0	10.3	18.5	12.7	11.7	12.5	15.1	9.6
Other activities (%)	4.2	3.1	5.2	6.4	4.0	6.2	6.4	6.5	5.6	1.2

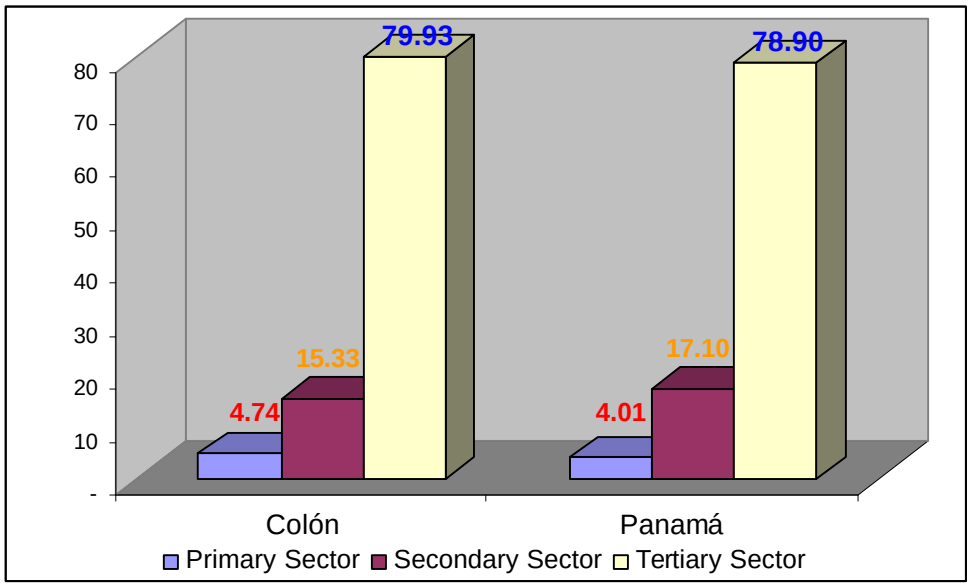
Source: JICA Study Team

Table 7.3.18 RGDP per Sector, Absolute Values and Percentage (2020 – 2024; Year 1996 Balboa Prices)

Year 2020-2024	Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas
Agriculture & cattle, etc.	120,675,344	171,199,537	50,465,207	295,798,231	62,961,630	65,781,752	65,927,388	187,694,938	156,651,754	259,682,126
Fishing	17,065,336	61,698,888	12,374,043	50,020,024	19,3[illegible],902	22,175,894	33,069,920	358,714,649	46,853,541	64,432,951
Quarries and mines	565,543	15,230,824	11,162,575	16,556,729	1,268,303	2,028,136	17,224,348	129,035,756	1,394,657	152,075,328
Manufacturing & industries	26,575,782	139,449,644	88,799,762	125,568,251	6,522,385	70,454,020	44,242,543	1,410,779,132	58,412,727	51,397,246
Electricity, gas water supply	9,405,016	58,555,705	68,888,912	98,507,013	6,816,858	28,815,363	27,049,884	564,407,039	26,731,942	6,803,863
Construction	23,707,211	74,791,238	75,394,988	105,756,415	[illegible],578,478	28,007,809	25,119,398	808,395,607	31,268,391	5,245,872
Wholesale and retail commerce, etc.	45,062,270	101,469,592	215,38[illegible]	271,317,675	9,08[illegible],935	65,561,827	11,703,978	1,569,087,896	57,781,021	12,950,355
Hotels & restaurants	7,692,657	10,887,522	20,522,993	25,076,732	1,798,434	6,528,526	3,517,514	222,409,037	9,630,296	1,835,000
Transport	50,075,024	85,002,421	346,364,734	213,258,975	6,933,780	49,208,898	45,063,383	2,819,665,858	60,827,922	74,[illegible],008
Financing	20,668,550	63,072,576	98,753,085	150,6[illegible],432	2,868,204	49,972,864	37,082,452	2,206,151,652	38,5[illegible],784	2,344,157
Real estate	46,952,735	98,589,472	314,489,543	250,359,633	2,064,973	42,151,012	25,124,148	3,173,160,240	39,463,550	5,729,542
Public administration, etc.	49,091,151	132,254,932	140,554,5[illegible]	204,024,030	28,556,452	65,944,274	50,228,551	2,359,813,138	115,171,941	66,5[illegible],536
Other activities	17,683,800	55,441,027	75,013,002	125,052,844	6,08[illegible],460	31,568,113	27,846,422	1,065,257,852	41,202,754	8,122,793
Total (excluding CFZ, PCA and taxes)	418,534,397	1,047,592,282	1,559,5[illegible],663	2,007,488,058	158,869,[illegible]31	529,225,029	455,210,512	16,864,638,938	1,026,085,617	727,838,115
Agriculture & cattle, etc (%)	27.7	16.3	3.2	14.1	39.6	12.4	14.7	1.1	25.8	41.2
Fishing (%)	3.5	5.9	0.8	2.5	12.2	4.2	6.6	2.1	6.1	8.6
Quarries and mines (%)	0.1	1.5	0.7	0.8	0.8	0.4	3.8	0.8	0.2	26.8
Manufacturing & industries (%)	6.1	13.3	5.8	5.9	4.1	13.3	9.7	8.4	7.7	7.0
Electricity, gas water supply (%)	2.2	5.7	4.5	4.8	4.3	5.4	5.9	3.9	3.5	0.5
Construction (%)	5.4	7.1	5.1	5.5	3.6	5.3	5.7	4.8	4.5	0.8
Wholesale and retail commerce, etc (%)	10.3	9.7	13.7	13.5	5.7	12.6	9.8	9.9	17.4	1.8
Hotels & restaurants (%)	1.8	1.0	1.3	1.4	1.1	1.2	1.4	1.3	1.3	0.3
Transport (%)	11.5	8.1	22.2	10.5	4.4	9.3	9.4	16.7	8.0	1.0
Financing (%)	4.7	6.0	6.4	7.5	1.8	9.4	8.1	12.4	5.1	0.3
Real estate (%)	10.8	9.4	20.2	12.5	1.3	8.0	5.7	18.8	5.2	0.8
Public administration, etc (%)	11.4	12.6	9.0	10.2	18.0	12.5	13.0	12.4	14.8	5.1
Other activities (%)	4.1	5.3	5.1	6.2	3.8	6.0	6.1	6.3	5.1	1.1

Source: JICA Study Team

As can be noted from the above tables, the share of services in total RGDP for the Metropolitan Area (Colón and Panama provinces) will remain also in the Development Adjusted Scenario very high (almost 80%), even without the inclusion of the future contribution of Colón Free Zone and Panama Canal. The overall distribution per sector for the Metropolitan Area for the year 2024 is represented in the following Figure 7.3.12.



Source: JICA Study Team

Figure 7.3.12 Sector Distribution Metropolitan Area (year 2024)

The effects of the various development programs have only a limited effect on the sector distribution in the Metropolitan Area. The only concrete effect in the Development Adjusted Scenario is an increase in particular for the secondary sector with approximately 1% as compared to the Base Case Scenario. The overall share of the primary sector only slightly increases with 0.5%. Comparing both scenarios clearly demonstrates the explicit impact of the tertiary sector on the RGDP in the Metropolitan Area. In spite of favoring at the national level the primary and secondary sector in the sector distribution over the various sectors, the share of the tertiary sector in RGDP in the Development Adjusted Period remains explicitly high as compared to the Base Case Scenario, see Table 7.3.19.

Table 7.3.19 % Distribution of RGDP per Sector, Metropolitan Area (Year 2024)

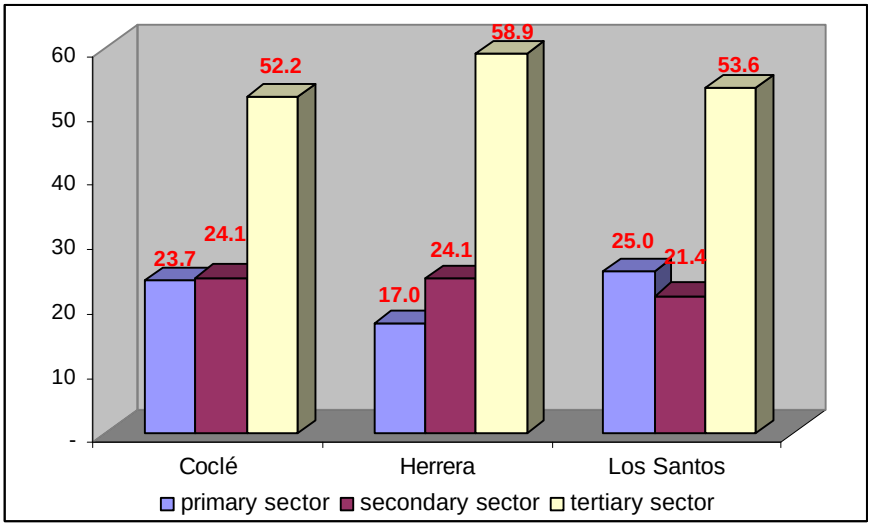
Development Adjusted Scenario	Colón	Panamá	**Base Case Scenario**	Colón	Panama
Primary Sector	4.74	4.01	Primary sector	4.17	3.28
Secondary Sector	15.33	17.10	Secondary sector	14.24	15.90
Tertiary Sector	79.93	78.90	Tertiary sector	81.59	80.82
Total	100	100	Total	100	100

Source: JICA Study Team

When looking at the individual sectors separately, the absolute effects of the development programs remain limited for the primary and secondary sector in the Metropolitan Area, with

most of the sectors increasing only with between 0.1% and 0.3% over 20 years. Similar decreases can be noted for some of the service sectors for which the importance at the national level has been reduced.

For the provinces of Coclé, Herrera en Los Santos, the impact of the development programs is more explicit over the next 20 years, as can be noted in Figure 7.3.13. The overall share of the primary sector will increase with an average 2.5% for each of the provinces, while the secondary sector increases with around 1%. The share of services decreases with the same level of around 3%.



Source: JICA Study Team

Figure 7.3.13 Sector Distribution in Selected Provinces (Year 2024)

A similar effect is visible in the three provinces where the primary sector is still very important, namely Bocas del Toro, Darien, Veraguas and the Indian Reservations. See next Table 7.3.20.

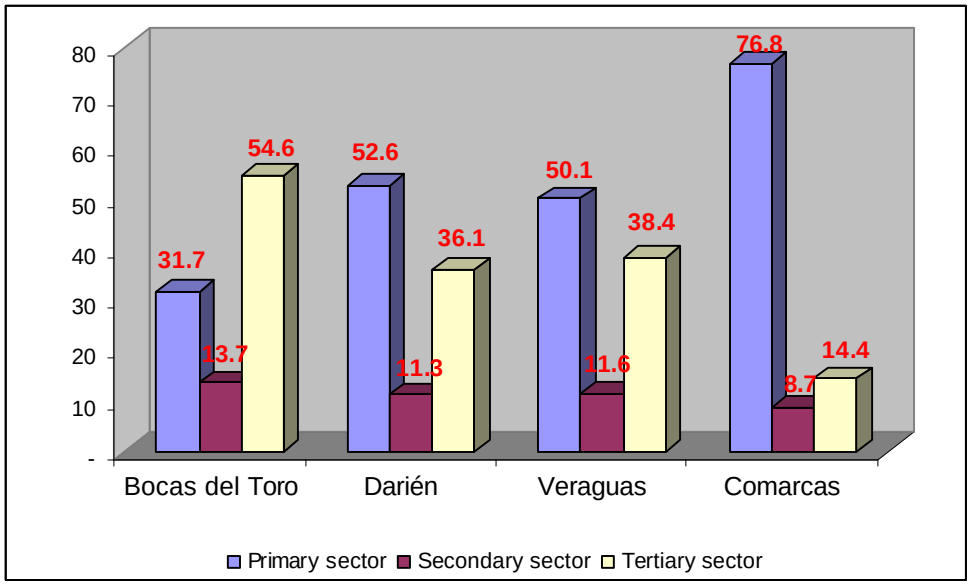
Table 7.3.20 % Distribution of RGDP per Sector, Selected Provinces (Year 2024)

Development Adjusted Scenario	Bocas del Toro	Darién	Veraguas	Comarcas	**Base Case Scenario**	Bocas del Toro	Darién	Veraguas	Comarcas
Primary sector	31.7	52.6	32.1	76.8	Primarysector	29.3	49.2	29.4	74.6
Secondary sector	13.7	11.3	15.7	8.8	Secondarysector	13.1	11.3	15.2	9.1
Tertiary sector	54.6	36.1	52.2	14.4	Tertiarysector	57.5	39.5	55.4	16.4
Total	100	100	100	100	Total	100.0	100.0	100.0	100.0

Source: JICA Study Team

As can be noted in Table 7.3.20, the primary sector will increase under the Development Adjusted Scenario with a share of approximately 2.5%. But contrary to the previous group of provinces, the impact of the various development programs will be almost not notable.

The sector shift will be between the primary sector and the tertiary sector, supposing that the development programs result in a positive impact as suggested in the Development Based Scenario. See Figure 7.3.14.



Source: JICA Study Team

Figure 7.3.14 Sector Distribution in Selected Provinces (Year 2024)

The sector distribution in the year 2024 will be very similar for Darién and Veraguas. In the uear 2024, the primary sector will still account for over 50% of RGDP for both provinces. The secondary sector performance will remain lower than in the other provinces and stay at around 11% of RGDP. The impact of the tertiary sector will remain at a level between 26% and 38%, which is after the Indian Reservations the lowest of all provinces in Panama. The impact of the tertiary sector in Bocas del Toro will reduce with the impact of the various development programs, but the share will stay above 50% of RGDP, placing Bocas del Toro at the same level as the other provinces in the Interior Area. The secondary sector is also stronger in that province as compared to Veraguas or Darién (+2%). But in spite of this, the primary sector, and in particular agriculture will remain a very important contributor to regional GDP, with a share in the year 2024 of 31.7%.

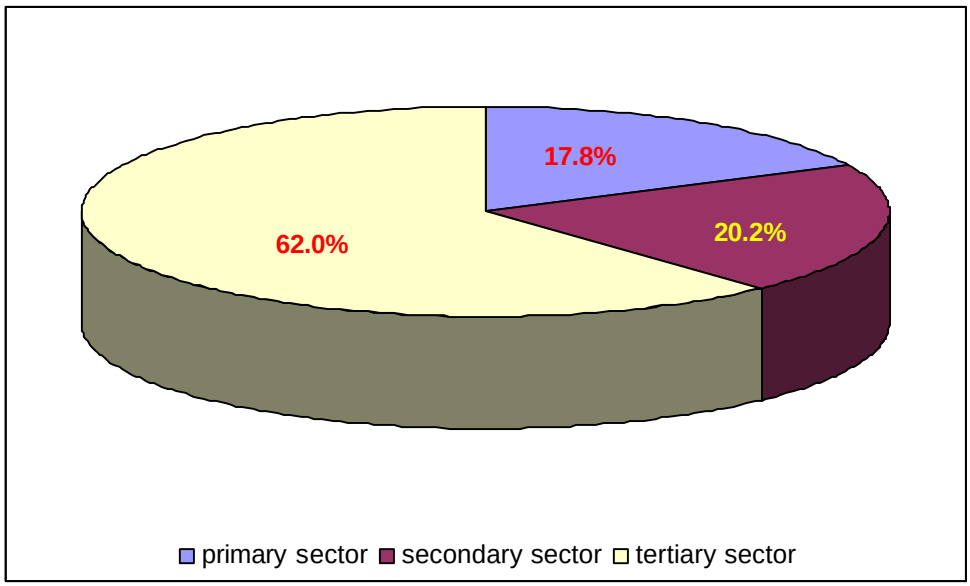
Finally, the impact of the various development scenarios on Chiriqui province is evaluated. The Table 7.3.21 presents the difference in share of RGDP between the Development Based Scenario and the Base Case Scenario for selected sectors in the province of Chiriqui. It can be noted that the strongest effect, a 1% increase, can be observed for the agriculture sector. The share of the fishing sector in regional GDP increases with 0.6%. Manufacturing and other sectors increase or decrease with approximately 0.5%. A particularly strong improvement can be observed for the hotel and restaurant sector, where the share increases from 0.8% to 1.4% according to the Base Case Scenario and the Development Adjusted Scenario respectively. This is undoubtedly a consequence of increased business activities and a stronger tourism sector.

Table 7.3.21 % Distribution of RGDP Selected Sectors, Chiriqui Province (Year 2024)

Chiriqui province year 2024	Development Adjusted Scenario	Base Case Scenario
Agriculture, cattle, hunting and silviculture	14.4	13.4
Fishing	2.5	1.9
Quarries and mines exploitation	0.8	0.8
Manufacturing and industries	9.9	9.6
Electricity, gas and water supply	4.8	4.7
Construction	5.5	4.9
Wholesale and retail commerce, cars & motorcycles repair, personal effects and household equipment	13.5	14.0
Hotels and restaurants	1.4	0.8
Transport, storage and communications	10.6	10.9
Intermediate financing	7.5	8.1
Real estates, business studies and rent	12.5	13.4
Public administration and defense, obligatory social security and affiliation plans	10.2	10.9
Other activities, communities, social and personal services	6.2	6.6
Total	100.00	100.00

Source: JICA Study Team

The overall distribution per sector for the year 2024 in the RGDP of Chiriqui province is visualized in Figure 7.3.15. The share of the primary sector will have increased with 2% in the year 2024 as compared to the Base Case Scenario, while the secondary sector growth is 1%. Consequently, the share of the tertiary sector in the Development Adjusted Scenario will demonstrate a decrease in the year 2024 with 3% as compared with the Base Case Scenario.



Source: JICA Study Team

Figure 7.3.15 Sector Distribution Chiriqui Province (Year 2024)

7.4 Summary Conclusions

The socio- economic evolution for the next 20 years has been estimated using the latest data available (year 2000 and year 2002). These data were used to determine the distribution of the economic active population in the future per province and sector and using the expected growth of the GDP of Panama, the RGDP could be calculated according to sectors and per province. To take into account possible effects of various national and regional development plans and the hoped-for positive impact on the primary and secondary sector, the year 2002 data have been used to estimate the distribution per sector until 2010, after which the year 2000 distribution was maintained for estimating the EAP over the next 15 years (until 2025). Also a Development Adjusted Scenario was developed where the impact of these programs was made more explicit by increasing particular sectors over the next 20 years.

It can thus be concluded that the forecasts are consistent and provide a clear indication about the expected growth of the population per province, gender, age group, the economic active population per sector and per province and the GDP growth per province and sector. Estimates remain however estimates and the absolute numbers might differ from the forecasted values. But it is unlikely that the observed trends will undergo any relevant change. Although the absolute numbers might differ, the percentage values are sufficiently clear to identify various trends per sector and per province. These trends are summarized hereafter.

The population of Panama over the next 25 years is expected to evolve as follows:

- The total population of Panama will increase with approximately 1 million persons to just above 4 million people;
- The strong concentration of the population in Panama will remain and it is expected that the share of people living in Panama province will continue to increase, from approximately 50% at present to around 54% in 2025.
- The relative distribution of the population over the other provinces will remain stable in the future. Chiriqui will remain the province with the second largest population with over 460,000 people in the year 2025. Although its growth rate decreases over time, it is together with Panama and Bocas del Toro the province with the highest average population growth over the entire period, in particular thanks to a strong double-digit population growth until 2010. Bocas del Toro is the province with the strongest population growth over the entire period and is only (slightly) surpassed by Ngöbe Buglé. The effect of this strong growth performance is reflected in the absolute increase in its population from around 90.000 people in 2005 to over 150,000 people in 2025 although it remains the fourth smallest province after Darién, Los Santos and Herrera.
- The speed of growth of the population decreases over time in all provinces and becomes negative for Herrera, Los Santos and Veraguas after 2020. Population growth in the

Indian Reservations will come to a near halt after 2015, with the exception of Ngöbe Buglé where the population continues to grow with a double digit rate, almost doubling its total population over the next 20 years.

- As many other countries in the world, the Panamanian population will grow older. But this effect is expected to have a real impact only after 2025. Life expectancy will increase and the rate of birth decrease. In the long-term, this will age the population and reduce the level of its natural increase. The economic effects will not be visible before 2025 as the share of the economic active population in total population will continue to grow during the entire period 2005 – 2025. The share of the EAP is expected to start shrinking only after the year 2025.

- In the Metropolitan Area (Panama and Colón), over 75% of the EAP will be employed in the service sector and in Panama, also manufacturing maintains a high level of employment. In the Interior Area, the agricultural sector will remain very important and a high share of the EAP will be working in crop cultivation and farming. The level of employment in the primary sector reduces in the provinces neighboring the Metropolitan Area. In these provinces, manufacturing is strong and will provide work to a large number of people.

The economic forecast allows formulating following conclusions:

- The Panamanian economy will see a strong growth over the next 20 years, with a growth of national GDP between 4.5% and 5.1%.

- The economic forecasts according to the Base Case Scenario and the Development Adjusted Scenario demonstrate the overall impact of the service sector on GDP and on regional GDP. The effect of adjusting selected sectors to take into account the hoped-for positive effects on the primary and secondary sector remain limited to a variation in favor of the primary and secondary sector between 1% and 3%, depending upon the sectors and the provinces.

- For each of the scenarios, a clear distinction between sectors can be observed between the Metropolitan Area and the Interior Area. In the Metropolitan Area, the share in GDP of the service sector will continue to increase to more than 80% of RGDP. The increase is slightly lower in the Development Adjusted Scenario, although the share remains higher than 78%. The share of the service sector is higher in Colón province as in Panama province as a consequence of the strong future performance of the wholesale and retail commerce and of the transport sector. In Panama, banking and real estate are stronger than in Colón.

- The provinces of the Interior Area can be divided into two groups. The first group consists of Coclé, Los Santos and Herrera, the second group consists of Bocas del Toro,

Darién, Veraguas and the Indian Reservations. The former have a strong primary and secondary sector which each have a share relatively equal to one another (combined accounting for almost 50% of RGDP). In these provinces, the future share of the tertiary sector will remain slightly above 50% or RGDP. The latter group of provinces has a clear dominance by the primary sector, where the share is over 30% in the Development Adjusted Scenario (and nearly 30% in the Base Case Scenario). The share of the secondary sector will remain below 15%. Combined, the primary and secondary sector will also account for around 50% of RGDP, although this share is explicitly lower for Darién, Herrera and the Indian Reservations.

- Chiriqui province shows a relatively exclusive sector distribution where the service sector will account for over 60% of the RGDP of the province in the year 2024. But the share of both the primary and secondary sector is relatively equal with approximately an 18% share for the primary sector and a 20% share for the secondary sector. Given that Chiriqui province has the second largest share in the GDP of Panama the two sectors represent a high absolute value (in year 1996 Balboa).

As final conclusion, it can be argued that the service sector will remain extremely strong in Panama and the duality of the Panamanian economy will be maintained during the next 20 years. This is a direct consequence of the existing duality in the economy and the strong focus of the economy and the population on the Metropolitan Area.

It can be expected that the various national and regional development programs will have a positive effect on the structure of the economy in various provinces and will stimulate the future development of the primary and secondary sector activities. The effect will be the strongest in the provinces where both sectors are strong and the impact of the tertiary sector relatively lower. For the provinces where the secondary sector is at present strong, the difference between the primary and secondary sector will reduce, while in the provinces where the primary sector is at present dominating, this sector will see a strong growth over the next 20 years, while the impact on the secondary sector will remain relatively low or there will be no explicit impact visible.

The economy of Chiriqui province is relatively different from the economic structure observed in the other provinces. Both the primary and secondary sectors have a strong economic impact and will account in the year 2024 for nearly 40% of the RGDP of the province. Services will in that year account for more than 60% of RGDP, depending upon the scenario applied. The variation between both scenarios is 3%.

It is, without any doubt, possible to stronger stimulate the primary and secondary sector in this province through the introduction of a “Chiriqui Regional Development Plan”, similar to the regional development plans for Bocas del Toro and Darién although adapted to the specific conditions of Chiriqui province.

With the right development program, in particular the manufacturing and industry sector could be stronger supported and also the share of the primary sector in regional GDP increased. The performance in particular of the manufacturing sector remains below the performance in many other provinces. It can be supposed that the difference of the manufacturing sector in Chiriqui province which is in the year 2024 only 0.3% depending upon the Development Adjusted Scenario and the Base Case Scenario, could be much higher and reach a level similar as Los Santos, Coclé or Herrera. In these provinces, the share of the secondary sector in regional GDP is on average 4% to 5% higher than in Chiriqui province.

Also the primary sector could be stimulated by the "Chiriqui Regional Development Plan". In Los Santos and Coclé, the share of the primary sector in RGDP is also 3.5% to 5% higher than in Chiriqui province, suggesting that also here, improvements are possible with the right incentives.

8. DEMAND FORECAST OF PORT TRAFFIC OF PANAMA

8.1 Forecast of Import/Export Cargo

Import/Export cargo is forecast by types of cargo: namely, bulk cargo (dry bulk and liquid bulk), break bulk cargo and container cargo.

8.1.1 Bulk Cargo

(1) Liquid Bulk Cargo

"PANAMA MARITIME HANDBOOK 2003/2004" is referred to for cargo forecast in general. The oil market in Panama substantially changed in 2003 following the closure of the oil refinery in the Bahia Las Minas Port at the end of 2002. The refinery owned by Chevron-Texaco had a four-decade-long monopoly to import crude oil and derivatives for the domestic market and also operated international sales. Since 1st January, 2003, another seven free fuel business entities have entered into the market.

According to Chevron-Texaco, there are three oil markets in Panama: namely, the domestic market, the canal market and the aviation market. Presently two companies have the sales permits in the domestic market in Panama: Chevron-Texaco having 78 % market share and Pimsa (Rodman-Araijan) having 16~17 % market share. Atlantic Pacific S.A. (APSA), which buys oil from traders like Glencore, Bahia Las Minas, CHEMOIL, CEPSA etc and supply oil to vessels using their own barges, is the only operator to supply diesel oil and fuel oil in the canal market.

The history of the liquid bulk cargo imports is summarized in Table 8.1.1

Table 8.1.1 Liquid Bulk Cargo Imports

(Unit: ton)

Year	1997	1998	1999	2000	2001	2002
(Import)						
Almirante	20,213	17,920	15,097	3,447	15,619	26,181
Bahia Las Minas	1,822,954	1,357,835	2,893,719	3,044,719	4,165,155	2,352,417
Charco Azul	150	672,128	409,120	267,232	1,588,768	459,331
Chiriqui Grande	0	49,909	0	242,684	71,121	491,442
*APSA	**1,166,721	1,495,177	1,006,351	1,215,761	1,484,718	1,403,450
Subtotal	3,010,038	3,592,969	4,324,287	4,773,843	7,325,381	4,732,821
(Export)						
Almirante	0	0	0	0	0	0
Bahia Las Minas	273,443	162,325	512,328	237,362	725,747	792,605
Charco Azul	0	516,907	462,349	261,394	1,196,209	546,856
Chiriqui Grande	0	1,798	4,283	258,481	94,072	915,598
*APSA	**1,106,690	1,517,629	1,286,849	1,017,221	1,464,608	1,526,111
Subtotal	1,380,133	2,198,659	2,265,809	1,774,458	3,480,636	3,781,170
Total	4,390,171	5,791,628	6,590,096	6,548,301	10,806,017	8,513,991

Source: Panama Maritime Authority (AMP)
*APSA: Atlantic Pacific S.A.
**Volume from January to September

1) Imported Liquid Bulk Cargo

Imported liquid bulk cargo in Panama is used for domestic consumption, export and bunkering services to Canal Transits. The forecast is made according to these uses. Bunkering services, however, are categorized into Transshipment cargo.

Domestic consumption of liquid bulk cargo in Panama is shown in Table 8.1.2.

Table 8.1.2 Domestic Consumption of Liquid Bulk Cargo in Panama

(Unit: ton)

Year	1997	1998	1999	2000	2001	2002
(Import)						
Almirante	20,213	17,920	15,097	3,447	15,619	26,181
Bahia Las Minas	1,822,954	1,357,835	2,893,719	3,044,719	4,165,155	2,352,417
(1)Sub-total	1,843,167	1,375,755	2,908,816	3,048,166	4,180,774	2,378,598
(Export)						
Almirante	0	0	0	0	0	0
Bahia Las Minas	273,443	162,325	512,328	237,362	725,747	792,605
(2)Sub-total	273,443	162,325	512,328	237,362	725,747	792,605
Domestic Consumption (1)-(2)	1,569,724	1,213,430	2,396,488	2,810,804	3,455,027	1,585,993

Source: Panama Maritime Authority (AMP)

Due to the drastic change of the oil market in 2003, imported liquid cargo in 2002 dropped remarkably. It is considered that domestic consumption volume was supplemented by other companies not listed in the table. Therefore the 2002 figures are not referred to in the forecast calculation.

The history of GDP in Panama and domestic consumption are summarized in Table 8.1.3.

Table 8.1.3 GDP in Panama and Domestic Consumption

Year	GDP at 1996 Price (Million USD)	Domestic Consumption (ton)
1997	8,874.3	1,569,724
1998	9,564.2	1,213,430
1999	9.966.0	2,396,488
2000	10,344.9	2,810,804
2001	10,387.6	3,455,027
2024	24,372.6	

Source: Contraloria General de la Republica, Direccion de Estadistica y Censo

The projected volume of domestic consumption is calculated based on the assumption that the volume will correlate with GDP in Panama.

Y = 1,208X – 9,581,948 (R = 0.833)
Where, X: GDP in Panama (Million USD)
Y: Domestic Consumption (ton)

Accordingly, the projected volume of domestic consumption is as follows:

Table 8.1.4 Projected Volume of Domestic Consumption

Year	Domestic Consumption (ton)	Annual Growth Rate (%) (2001-2024)
2001	3,455,027	
2024	19,860,000	7.9

The exported liquid bulk cargo volume is added to the volume of domestic consumption in estimating the imported liquid bulk cargo volume.

2) Exported Liquid Bulk Cargo

Approximately 90% of export values has been exported to USA, Venezuela, Honduras, Nicaragua, Guatemala and Costa Rica (hereafter called "object countries") according to "COMPENDIO ESTADISTICO MARITIMO 2001" by AMP. Therefore, the projected volume of exported bulk cargo is calculated based on the assumption that the volume will correlate with GDP in those countries.

The histiry of GDP in those countries and exported liquid bulk cargo are summarized in Table 8.1.5.

Table 8.1.5 GDP in the Object Countries and Exported Liquid Bulk Cargo

Year	GDP at 1995 Price (Million USD)	Exported Bulk Cargo (ton)
1997	8,059,712	273,443
1998	8,404,794	681,030
1999	8,742,346	978,960
2000	9,106,341	757,237
2001	9,136,319	2,016,028
2002	9,337,328	2,255,059
2024	15,639,500	

Source: World Bank (GDP) and Panama Maritime Authority (AMP)

Accordingly, the projected volume of exported liquid bulk cargo is calculated as follows:

Y = 1.3373X - 10,604,589 (R =0.827)
Where, X: GDP at 1995 Price in the Object Countries
Y: Exported Liquid Bulk Cargo (ton)

Table 8.1.6 Projected Volume of Exported Liquid Bulk Cargo

Year	Exported Liquid Bulk Cargo (ton)	Annual Growth Rate (%) (2002-2024)
2002	2,255,059	
2024	10,310,000	7.2

(2) Dry Bulk Cargo

1) Grain

Presently Balboa Port operated by the Panama Port Company (PPC) is the only terminal to discharge grains adjacent to the Panama City, where most of the grain factories are located, to discharge grains. According to Melo Group, which is the greatest grain distributor in Panama, Panamanian grain distributors are facing serious problems to lose grain discharge facilities in Balboa Port (Pier 6). As a result, Melo Group in cooperation with other distributors is planning to establish a grain discharge terminal in the Cristobal Port (Pier 16) on the Atlantic side of the Panama Canal. The grain terminal will replace the facilities in Balboa Port and will be serviced for all of the grain distributors in Panama. Cargoes to be handled at the terminal will be: ① Maize import for food and feed market, ② Soybean import for feed market, ③ Fertilizer import, and ④ Other bagged and/or bulk import. Melo Group emphasizes advantages of the terminal on the Atlantic side as follows: avoidance of canal tolls, location nearer to grain origins (mainly Atlantic side), advance into Caribbean market and so on.

The history of imported grains is shown in Table 8.1.7.

Table 8.1.7 Summary of Imported Grains 1993-2001

(Unit: ton)

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Maize	102,364	126,783	144,561	178,981	147,060	220,391	137,989	267,356	295,674
Soybean	53,167	65,684	75,511	75,540	88,400	98,700	92,779	107,248	123,292
Sub	155,531	192,467	220,072	254,521	235,460	319,091	230,768	374,604	418,966
Wheat	90,660	109,438	92,031	105,826	109,518	97,360	98,330	107,603	107,603
Total	246,191	301,905	312.103	360,347	344,978	416,451	329,098	482,207	526,569

Source: Melo Group

Panama has no domestic production of wheat so a11 wheat consumed in the country is imported. The average annual per capita consumption of wheat in Panama from 1997 to 2001 was approximately 40 kg/year according to “Food Balance Sheets 2003” by FAO (Food and Agriculture Organization of the United Nations). The principal foods of Panamanian are rice and wheat (50:50). The future consumption of wheat in Panama is calculated on the assumption that per capita consumption in Panama will increase by 1.3%/year up to 50kg/year based on the average growth rate from 1991 to 2001 and will remain at 50kg/year onwards.

The imported volume for wheat in Panama was estimated based on the future consumption of wheat in Panama and is calculated as 210,000 tons in 2024.

Maize and soybean are mainly used to feed livestock like chickens, roosters and hens, which are popular foodstuff in Panama. Therefore, the future consumption volumes of maize and soybean in Panama, which means imports, are calculated based on the assumption that future consumption will correlate with GDP in Panama, which is shown in Table 8.1.8.

Table 8.1.8 GDP in Panama and Imported Maize and Soybean

Year	GDP in Panama at 1996 Price (Million USD)	Imported Maize and Soybean (ton)
1993	6,109.4	155,531
1994	6,365.3	192,467
1995	6,561.1	220,072
1996	8,518.8	254,521
1997	8,874.3	235,460
1998	9,564.2	319,091
2000	10,344.9	374,604
2001	10,387.6	418,966
2024	24,372.6	

Source: Contraloria General de la Republica, Direccion de Estadistica y Censo and JICA Study Team

$Y = 47.62X - 125,843$ ($R = 0.924$)

Where, X: GDP in Panama (Million USD)

Y: Imported Maize and Soybean (ton)

Accordingly, the projected volume of imported maize and soybean is as follows:

Table 8.1.9 Projected Volume of Imported Maize and Soybean

Year	Imported Maize and Soybean (ton)	Annual Growth Rate (%) (2001-2024)
2001	418,966	
2024	1,035,000	4.0

2) Fertilizer

The following companies are the major fertilizer distributors in Panama:

Table 8.1.10 Major Fertilizer Distributors in Panama

Company Name	Plant/Office Location
Fertica	David
Fertizantes Superiores	Aguadulce
Fertitec	Almirante
Melo	Almirante
Biotecnica	Colombia
Agrofertil / Catesa / Abopac / Fertica CR	Costa Rica

Source: Fertilizantes de Centro America (Panama) S.A. (Fertica)

According to Fertica, which is one of the biggest distributors in Panama, Fertilizer has been imported at Aguadulce Port and Pedregal Port in bulk, at Almirante Port in bags and by trucks from Costa Rica. Fertica has mixing plants in David and Aguadulce, where consumption is large. Fertica David distributes to the Chiriqui, Veraguas and Bocas del Toro Provinces, and Fertica Aguadulce distributes to the remaining destinations.

The history of imported fertilizer is shown in Table 8.1.11.

Table 8.1.11 Imported Fertilizer Volume in Panama

(Unit:ton)

	1998	1999	2000	2001	2002
Aguadulce	15,401	30,184	47,623	49,476	48,809
Pedregal	15,186	21,882	12,747	8,224	9,249
Almirante	0	0	0	934	3,749
Sub	30,587	52,066	60,370	58,634	61,807
*Costa Rica	26,274	39,348	23,989	14,375	15,610
Total	56,861	91,414	84,359	73,009	77,417

Source: Panama Maritime Authority (AMP)
* Contraloria General de la Republica, Direccion de Estadistica y Censo

The imported fertilizer volume has been fluctuating with a trend of decrease for the last decade (by Fertica). Therefore, the future volume of imported fertilizer is estimated using an elastic value which is calculated based on the difference of the growth rate between the imported fertilizer volume and the GDP Agriculture Sector in Panama. It is assumed that the elastic value is one because the imported fertilizer volume has been declining for the last decade. Growth rate of the GDP Agriculture Sector in Panama is estimated as 4.7 %/year from 2002 to 2024.

Accordingly, the future volume of imported fertilizer is calculated as 213,000 tons in 2024.

3) Clinker

Cement was previously produced by Empresa Estatal de Cementos Bayano at Calzada Larga and by Cement Panama S.A., at Quebrancha. In 1994, the government sold its 95 % share in Cementos Bayano to Mexico's Cementos Mexicanos S.A. A 5 % share was sold to employees as

part of the country's new pension plan. In 2000, Cement Panama S.A. was brought by the Joint Venture of Holcin Limited (Switzerland based company) and Cementos del Caribe de Colombia. Market share of cement in Panama is nearly 50:50 between these two shareholder companies according to Cement Panama S.A. and clinker has been imported only by Cement Panama S.A.

The history of cement consumption and imported clinker volume is shown in Table 8.1.12.

Table 8.1.12 Cement Consumption and Clinker Import in Panama

Year	Cement Consumption (ton)	Imported Volume (ton)
1994	615,000	
1995	615,000	
1996	647,000	
1997	700,000	
1998	750,000	
1999	970,000	318,208
2000	830,000	177,939
2001	720,000	103,329
2002	770,000	207,158
2003	870,000	181,704*

Source: Contraloria General de la Republica, Direccion de Estadistica y Censo, The Mineral Industry of Panama 1998 and Cement Panama S.A.
* Volume from January to June 2003

According to Cement Panama S.A., cement consumption rate in Panama has increased with growth rate of approximately 4 %/year for the last decade due to the active infrastructure developments; however the trend is declining due to lack of prospective infrastructure developments in near future. Therefore, it is assumed that future imported volume of clinker will be stable with the recorded maximum quantity of 300,000 tons in 1999 and 2003.

4) Sugar

The history of sugar export is shown in Table 8.1.13.

Table 8.1.13 Sugar Exports in Panama

(ton)

	1995	1996	1997	1998	1999	2000	2001	2002
Sugar	44,215	46,645	62,451	66,160	33,638	66,765	36,480	37,904

Source: Ministry of Agricultural Development (MIDA)

Traditional products such as sugar and coffee have shown a constant decline over the last years. Expectations are that this trend will continue, which is confirmed by the latest report for this sector released by the Panamanian statistics bureau. It is assumed, therefore, that the future sugar export volume will be stable with a maximum quantity of 50,000 tons.

8.1.2 Breakbulk Cargo (General Cargo)

(1) Import

The history of imported breakbulk cargo is shown in Table 8.1.14

Table 8.1.14 Imported Breakbulk Cargo (General Cargo)

(ton)

	1996	1997	1998	1999	2000	2001	2002
Breakbulk	291,104	313,186	415,575	503,496	232,516	196,084	179,083

Source: Panama Maritime Authority (AMP)

Commodities imported as breakbulk cargo are cars, construction materials, fish, palette etc. Althrough a considerable part of breakbulk cargoes is containerizable, cargoes like cars and construction materials will remain as non-containerizable cargoes. Therefore, it is assumed that the future volume of breakbulk cargo (non-containerizable cargoes) will be stable with a maximum volume of 200,000 tons due to the stable market for cars and infrastructure developments in future.

(2) Export

The history of exported breakbulk cargo is shown in Table 8.1.15.

Table 8.1.15 Exported Breakbulk Cargo

(ton)

	1996	1997	1998	1999	2000	2001	2002
Breakbulk	719,112	686,169	628,161	586,027	726,209	629,531	517,517

Source: Panama Maritime Authority (AMP)

The main commodity exported as breakbulk cargo is banana, which had a 90% share of cargoes in 2002. Bananas have demonstrated a serious drop in export volume for the last decade. Therefore, it is assumed that the future volume of exported breakbulk cargo will be stable with maximum volume of 400,000 tons.

8.1.3 Container Cargo

(1) Import

The history of GDP in Panama and the imported container cargo are shown in Table 8.1.16.

Table 8.1.16 Imported Container Cargo

Year	GDP at 1996 Price (Million USD)	Imported Container Cargo (ton)
1996	8,518.8	244,162
1997	8,874.3	281,442
1998	9,564.2	231,952
1999	9,966.0	290,799
2000	10,344.9	323,408
2001	10,387.6	429,177
2002	10,486.0	451,640
2024	24,372.6	

Source: Contraloria General de la Republica, Direccion de Estadistica y Censo and JICA Study Team

The projected volume of imported container cargo is calculated based on the assumption that the volume will correlate with GDP in Panama.

$Y = 83.483X – 490,868$ ($R = 0.753$)

Where, X: GDP in Panama
Y: Imported Container Cargo (ton)

Accordingly, the projected volume of imported container cargo is as follows:

Table 8.1.17 Projected Volume of Imported Container Cargo

Year	Imported Container Cargo (ton)	Annual Growth Rate (%) (2002-2024)
2002	451,640	
2024	1,544,000	5.7

(2) Export

Major exported commodities in Panama are agricultural products and agro-processing products. The exported volume is rather small compared with a scale of the overseas market. Therefore, the projected volume of exported container cargo is calculated based on the assumption that the volume will correlate with GDP in Panama.

The history of GDP in Panama and exported container cargo are shown in Table 8.1.18.

Table 8.1.18 GDP in Panama and Exported Container Cargo

Year	GDP at 1996 Price (Million USD)	Container (ton)
1996	8,518.8	103,271
1997	8,874.3	149,511
1998	9,564.2	165,922
1999	9,966.0	424,981
2000	10,344.9	301,262
2001	10,387.6	274,240
2002	10,486.0	349,708
2024	24,372.6	

Source: Contraloria General de la Republica, Direccion de Estadistica y Censo and JICA Study Team

Accordingly, the projected volume of exported containerizable cargo shown in the table below is calculated as follows:

Y = 120.54X - 920,694 (R = 0.804)

Where, X: GDP in Panama

Y: Exported Container Cargo (ton)

Table 8.1.19 Projected Volume of Exported Container Cargo

Year	Exported Container Cargo (ton)	Annual Growth Rate (%) (2001-2024)
2002	349,708	
2024	2,017,000	5.8

8.2 Forecast of Transshipment Cargo

8.2.1 Liquid Bulk Cargo

The history of the transshipment liquid bulk cargo is shown in Table 8.2.1. The liquid bulk cargo handled at the ports of Balboa and Cristobal was mainly for bunkering service to Canal transits.

Table 8.2.1 Transshipment Liquid Bulk Cargo

Year	Transshipment Liquid Bulk Cargo (ton)
1997	1,106,690*
1998	1,517,629
1999	1,286,849
2000	1,017,221
2001	1,464,608
2002	1,526,111
2003	1,730,891

Source: Panama Maritime Authority (AMP)
* Volume from January to September, 1997

Reference is made to "THE STUDY ON THE DEVELOPMENT PLAN OF BALBOA IN THE REBUBLIC OF PANAMA" in 1997 by JICA.

Based on the above report, bunkering at the port of Balboa to the Canal transits is forecast as follows:

Table 8.2.2 Forecast of Bunkering Service at the Port of Balboa

Year	2005	2015
Canal Transits (ship)	12,000*	13,000*
Ship Call of Bunkering (ship)	1,400 (12 %)	2,600 (20%)
Cargo Volume (Barrel)	14,000,000	26,000,000
Cargo Volume (ton)	2,000,000	3,900,000

* Large vessel only

8.2.2 Container Cargo

Origins and destinations of the transshipment container cargo in the area of Latin America and Caribbean Sea are shown in Table 8.2.3. Shares of cargo volume are also indicated in the table.

Table 8.2.3 Origin & Destination of Transshipment Container Cargo

(Unit: %)

Country	2000 (Shares of Cargo Volume)	2001 (Shares of Cargo Volume)
Argentina	7.9	0.4
Brazil	2.8	5.1
Chile	3.8	10.0
Colombia	19.5	43.1
Costa Rica	7.8	6.5
Peru	1.8	5.8
Trinidad and Tobago	14.4	0.1
Venezuela	19.4	13.0
Others	22.6	16.0

Source: Panama Maritime Authority (AMP)

The projected volume of the transshipment container cargo is calculated based on the assumption that the volume will correlate with GDP in those Central and South American countries.

The history of GDP in those countries and the transshipment container cargo are shown in Table 8.2.4.

Table 8.2.4 GDP in the Object Countries and Transshipment Container Cargo

Year	GDP at 1995 Price (Million USD)	Transshipment Container Cargo (ton)
1996	1,309,466	2,465,954
1997	1,373,419	3,859,667
1998	1,390,274	5,573,303
1999	1,377,956	6,337,413
2000	1,419,632	6,733,652
2001	1,424,442	8,726,640
2002	1,405,664	9,517,493
2024	2,064,133	

Source: World Bank (GDP) and Panama Maritime Authority (AMP)

Accordingly, the projected volume of the transshipment container cargo shown in the table below is calculated as follows:

Y = 54.071X - 68,759,542 (R =0.842)

Where, X: GDP at 1995 Price in the Object Countries

Y: Transshipment Container Cargo (ton)

Table 8.2.5 Projected Volume of Transshipment Container Cargo

Year	Transshipment Container Cargo (ton)	Annual Growth Rate (%) (2002-2024)
2002	9,517,493	
2024	42,850,000	7.1

8.2.3 Transshipment Cargo through Colon Free Zone

The history of cargo volume transshipping through Colon Free Zone is shown in Table 8.2.6.

Table 8.2.6 Transshipment Cargo through Colon Free Zone

(Unit: ton)

Year	Import	Re-export	Total
1996	515,996	244,974	760,970
1997	633,995	368,326	1,002,322
1998	797,642	578,647	1,376,288
1999	855,316	758,282	1,613,597
2000	886,132	778,228	1,664,361
2001	604,028	694,351	1,298,379
2002	670,170	653,903	1,324,074

Source: Panama Port Authority (AMP)

Reference is made to container transshipment cargo.

The projected volume of the transshipment cargo through Colon Free Zone is calculated based on the assumption that the volume will correlate with GDP in the same Central and South American countries that are selected for projection of container transshipment cargo.

The history of GDP in those countries and the transshipment cargo through Colon Free Zone are shown in Table 8.2.7.

Table 8.2.7 Transshipment Cargo through Colon Free Zone

Year	GDP at 1995 Price (Million USD)	Cargo through Colon Free Zone (ton)
1996	1,309,466	760,970
1997	1,373,419	1,002,322
1998	1,390,274	1,376,288
1999	1,377,956	1,613,597
2000	1,419,632	1,664,361
2001	1,424,442	1,298,379
2002	1,405,664	1,324,074
2024	2,064,133	

Source: World Bank (GDP) and Panama Maritime Authority (AMP)

Accordingly, the projected volume of the transshipment cargo through Colon Free Zone shown in the table below is calculated as follows:

Y = 6.0983X - 7,159,760 (R =0.741)
Where, X: GDP at 1995 Price in the Object Countries
Y: Cargo through Free Zone (ton)

Table 8.2.8 Projected Volume of the Transshipment Cargo through Colon Free Zone

Year	Cargo through Colon Free Zone (tons)	Annual Growth Rate (%) (2002-2024)
2002	1,324,074	
2024	5,428,000	6.6

8.3 Summary

Total Import/Export Cargo Volume and Transshipment Cargo Volume in Panama are shown in Table 8.3.1 and 8.3.2, respectively.

Table 8.3.1 Import/Export Cargo in Panama

(Unit: x 1,000 ton)

Year	1997	1998	1999	2000	2001	2002		2024
(Import Cargo)								
1.Bulk Cargo								
(1) Liquid Bulk	1,843	2,098	3,318	3,558	5,841	3,329		30,170
(2) Dry Bulk	345	475	738	745	703	281		1,758
Wheat	110	97	98	108	108	-		210
Maize & Soybean	235	319	231	375	419	-		1,035
Fertilizer	-	59	91	84	73	74		213
Clinker	-	-	318	178	103	207		300

Year	1997	1998	1999	2000	2001	2002		2024
2.Breakbulk	313	416	503	233	196	179		200
3.Container	281	232	291	323	429	452		1,544
Sub Total	2,782	3,221	4,850	4,859	7,169	4,241		33,692
(Export Cargo)								
1.Bulk Cargo								
(1) Liquid Bulk	273	681	979	757	2,016	2,255		10,310
(2) Dry Bulk	62	66	34	67	36	38		50
Sugar	62	66	34	67	36	38		50
2.Breakbulk	686	628	586	726	630	518		400
3.Container	150	166	425	301	274	350		2,362
Sub Total	1,171	1,541	2,024	1,851	2,956	3,161		13,122
Total	3,953	4,762	6,874	6,710	10,125	7,402		46,814

Note: Transshipment Cargoes (Bulk & Container) excluded

Table 8.3.2 Transshipment Cargo in Panama

(Unit: x 1,000 ton)

Year	1996	1997	1998	1999	2000	2001	2002		2024
(Transshipment Cargo)									
Liquid Bulk Cargo	-	1,178	1,518	1,209	1,017	1,454	1,552		3,900
Container Cargo	2,466	3,860	5,573	6,337	6,734	8,727	9,517		42,850
(Cargo through Free Zone)									
Container Cargo	761	1,002	1,376	1,614	1,664	1,298	1,324		5,428

8.4 Detailed Traffic Forecast of Each Port

8.4.1 La Palma Port

(1) Overview

The communities in the Darien province are located along the rivers and transportation system is principally based on aquatic routes. There is no regular aquatic transportation service in the areas but commercial products are transported to the communities by small cargo boats. Transportation profiles by major ports in the Darien province are as follows:

Jaque: It is located at the Pacific Coast. There is a mooring facility for small boats and an air transportation service to the Panama City.

Garachine: It is located in the San Miguel gulf and there is a mooring facility for small fishing boats. Many fishing boats operate regularly in those areas and catch shrimp and fish. The catches are transported to the Panama City using regular commercial flights.

La Palma: It is the capital in the Darien province and the biggest community, which has approx. 2,000 inhabitants. La Palma and communities nearby are regularly supplied with commercial products through Quimba Port. It has regular passenger flights to the Panama City. There are great amounts of valuable tropical forest resources in those areas

Quimba: It is located along the Sabana River and has a road access to Meteti on the Pan-American Highway. It is a small terminal, which serves various commercial products for La Palma and communities nearby.

Tocuti: It is located along the Balsas River and an agricultural community, which produces corn, bananas, chestnut tree, white rice, yam etc. It has an airport and there are over 600 inhabitants.

Yaviza: It is located at the end of the Pan-American Highway and the port has a wharf for ships which have been put in service to Panama City. There are regular passenger flights and bus services to Panama City.

(2) Major Commodities handled in La Palma Port

The history of the major commodities handled in La Palma Port is shown in Table 8.4.1.

Major unloading commodities are consumer goods for a daily living and the volume handled shows a decreasing trend. The major loading commodities are logs/woods and their volume has dropped remarkably for the last five years. According to AMP, the volume of logs/woods handled in the Darien province should be constant for the last decade, but recently the majority have been handled in other ports, which are not under AMP control. Other loaded commodities include agro-products such as maize, plantain and yam.

Table 8.4.1 Major Commodities handed in La Palma Port

(Unit: ton)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(Coastal Shipping)										
1. Unloading										
Fuel	723	717	1,024	938	717	601	896	624	797	383
Commercial Products	2,386	2,863	3,620	2,725	1,899	1,224	1,019	1,631	1,529	1,585
Subtotal	3,109	3,580	4,644	3,663	2,616	1,825	1,915	2,255	2,346	1,968
2. Loading										
Logs/Woods	59,347	46,031	83,445				17,850	20,583	8,651	2,110
Others	94	1,636	1,764				123	1,198	122	113
Subtotal	59,441	47,667	85,209	70,067	66,049	50,131	17,973	21,781	8,773	2,223
Total	62,550	51,247	89,853	73,730	68,665	51,956	19,888	24,036	11,119	4,191

Source: Panama Maritime Authority (AMP)

(3) Cargo Forecast

1) Commercial Products

Majority of commercial products will be consumer goods. Therefore, it is assumed that the future volume of commercial products to be handled will increase with a growth rate equivalent to population in the Darien province (0.66%/year).

Table 8.4.2 Past and Future Volume of Commercial Products to be handled in La Palma Port

(Unit: ton)

Year	1998	1999	2000	2001	2002	Average (1998-2002)	2024
Commercial Products	1,825	1,915	2,255	2,346	1,968	2,100	2,500

2) Logs/Woods

Panama had a production area of 350,000 ha and the Darien province was the biggest holder of the production forest area with 43 % share in 1998 as shown in Table 8.4.3.

Table 8.4.3 Estimated Production Area by Province in 1998

Province	Area (ha)	Percent (%)
Darien	150,000	42.8
Bocas del Toro	50,000	14.2
Panama	60,000	17.2
Veraguas	60,000	17.2
Colon	30,000	8.6
Total	350,000	100

Source: National Environmental Authority (ANAM)

Forest products in Panama is shown in Table 8.4.4. According to the table, forest products of about 90 % have been used as wood fuel for the last years. This means that the use of firewood as fuel has prevailed among inhabitants in forestland.

Table 8.4.4 Forest Products in Panama

(Unit: x1000m^3)

	1993	1994	1995	1996	1997	1998	1999	2000	2001
Industrial Roundwood	120	120	120	92	97	5	48	47	73
Wood Fuel	1,349	1,339	1,333	1,326	1,315	1,301	1,290	1,280	1,264
Wood Residues	0	0	0	0	0	0	2	2	2
Sawnwood	37	37	37	19	17	8	46	48	42
Wood Panels	21	21	21	21	21	4	2	15	7
Total	1,527	1,517	1,511	1,458	1,450	1,318	1,388	1,390	1,388

Source: Food and Agriculture Organization of the United Nations (FAO)

The forest industry in Panama is made up of sawmills for the processing of the wood, plywood factories, furniture, paper and cardboard, which are mainly based on the Panama City. Almost all forest products logged in each province are delivered to the Panama City for processing.

Table 8.4.5 shows forest products in the Darien province recorded by ANAM. The person in charge said that the above volumes include products transported by trucks and vessels to Panama City. The table shows that forest products in the Darien province have been decreasing rapidly as well as logs/woods volumes in La Palma Port as shown in Table 8.4.1.

Table 8.4.5 Forest Products in the Darien Province

(Unit: m^3)

	2000	2001	2002	2003
Forest Products	30,090	22,693	18,167	9,480

Source: Office ANAM, Meteti

There is some difficulty to forecast future forest products due to lack of precise and continuous information of forest products in Panama and the recent trend of non forest products in the Darien province. Therefore, interviews with various organizations/persons concerned are referenced.

- ANAM (National Environmental Authority)
  ANAM owns re-plantation area and has a concession contract with private companies, presently three companies. Recently there are 300 ha available for concessions in the Darien province. Forest products currently are 125,000 m^3/year in Panama, while it was 300,000 m^3/year ten years ago. According to ANAM, future products will increase because concession contracts include terms of re-plantation.

- ANARAP (NGO for forestry plantation)
  50,000 trees have been planted during the last decade in Panama and these will be scheduled for logging as follows:

  ① 20,000 m^3 in 2005
  ② 100,000 m^3 in 2010
  ③ 400,000 m^3 in 2015

- Madeca (Sawmill in Melo Group)
  Madeca, which is one of the biggest sawmills in Panama, produces and exports wooden doors. Its net working rate as a sawmill is about 25 % and it is seeking new markets in the world. Forestry resources are located as follows: ① Darien 30 %, ② Bocas del Toro 30 %, ③ Chiriqui 20 % and ④ Colon 20 %.

- Mr. Virgilio Samtos (Wood supplier who knows wood resources in Panama very well)
  Forestry resources in the Darien province are located at Chati, Sucluti, Rio Tuquesa, Wala, Morti and Nurra. 90% of forest products logged are transported by trucks through the Pan-American Highway, while 10 % are transported by vessels to Panama City.

- Mr. Juan Carlos Brin (Wood supplier who owns land in the Darien province)
  Main forestry resources in the Darien province are self-governing areas along the Pan-American Highway and in the south of La Palma, where nature has been preserved for a long period. Forest products in the area along the Pan-American Highway are transported by trucks and products in the south of La Palma are collected at Camogati for ship loading. If a sawmill will be constructed in La Palma, forest products will be collected in La Palma and transported to Panama City by trucks using a ferry service between La Palma and Quimba.

A great amount of valuable forestry resources are located in the area nearby La Palma. According to the Sustained Development Program for Darien by IADB, river transport for forest products approx. 40,000 tons per year was expected. If the sustainable management of those resources including proper forest plantations is promoted by the Panamanian government, it is expected that the present forestry products in the Darien province will increase up to the volume at the middle of 1990s in the future.

3) Fishery Product

Cargo volume is still to be studied. However, as there 658 fishermen and 293 fishing boats based at Garachine and 178 fishermen and 79 fishing boats based at La Palma: a considerable volume of the fish will be transported from La Palma to Panama City once the ferry services open between La Palma and Quimba. La Palma is a prospective main shrimp landing port.

4) Passengers

Passenger forecast is still to be studied. There will be a considerable number of passengers who come from the coastal areas and use the ferry services to Quimba and vice versa.

8.4.2 Coquira Port

(1) Overview

Coquira Port is located at Bayano River, District of Chepo in the Panama province and functions as a local hub port, which is connected to small ports along the Pacific Coast. In addition, the port has been utilized as a transit port for cargoes/passengers to the Panama City/Chepo due to its geographical predominance.

(2) Major Commodities handled in Coquira Port

The history of the major commodities handled in Coquira Port is as follows:

Table 8.4.6 Major Commodities handled in Coquira Port

(Unit: ton)

Year	1995	1996	1997	1998	1999	2000	2001	2002
(Coastal Shipping)								
1. Unloading								
Logs/woods					2,162	941	345	340
Fishery Products					12	306	475	53
Livestock					151	123	628	510
Subtotal	561	1037	1,113	2,231	2,325	1,370	1,448	903
2. Loading								
Miscellaneous					10	76	25	3
Subtotal	573	47	2	79	10	76	25	3
Total	1,134	1,084	1,115	2,310	2,335	1,446	1,473	906

Source: Panama Maritime Authority (AMP)

Major unloaded commodities are logs/woods, fishery products and livestock from mainly Darien province. Logs/woods volume shows a trend to decrease since 2000. According to AMP, majority of logs/woods have been unloaded at private mooring facilities nearby Coquira Port. Other unloaded commodities fluctuate much. There is no major loaded commodity in the port. Its miscellaneous cargoes include construction materials, which are transported to reachable areas only by sea along the Pacific Coast.

(3) Present Passenger Movement

The history of passenger movement is shown in Table 8.4.7.

Table 8.4.7 Passenger Movements in Coquira Port

(Unit: trip)

Place to/from	1997	1998	1999	2000	2001	2002	2003
(Opposite bank)							
Embark	2,518	4,601	*	6,194	7,101	6,236	6,151
Disembark	2,533	4,651	*	6,296	7,114	5,914	6,028
Subtotal	5,051	9,252	*	12,490	14,215	12,150	12,179
(Upstream)							
Embark	5,698	5,530	*	6,988	8,758	5,548	6,836
Disembark	5,595	5,659	*	7,640	8,674	5,526	6,902
Subtotal	11,293	11,189	*	14,628	17,432	11,064	13,738
(Downstream)							
Embark	4,045	1,867	*	2,569	3,018	982	1,183
Disembark	4,194	1,823	*	2,353	2,950	1,031	1,190
Subtotal	8,239	3,690	*	4,922	5,968	2,013	2,373
(Government)							
Embark	493	691	*	718	1,275	598	843
Disembark	530	690	*	669	1,247	597	856
	1,023	1,381	*	1,387	2,522	1,195	1,699
Total	25,606	25,512	31,799	33,427	40,137	26,432	29,989

Source: Panama Maritime Authority (AMP)
* No data available

According to AMP in Coquira Port, small boats with capacity for 10-20 passengers are operated for transportation of inhabitants living in remote area along the river. Passengers in Coquira Port are classified into three types:

a) Ferry service to opposite bank

There is a road to a community, namely Chinina, which is located in the hinterland with 30~40 km distance from the opposite bank: 3~5 boat taxis with capacities for 10 passengers are used by inhabitants along the road. Their purposes for visiting to Coquira Port are shopping, to see a doctor and to sell agricultural products. Passengers decrease in rainy season due to a poor road conditions.

b) Boat service to upstream

Inhabitants living in the upper reaches of the river are using for shopping, seeing doctor and selling agricultural products. Three to four boats with capacity for 20 passengers are operated once in the morning and afternoon.

c) Boat service to downstream

This boat service includes service to the Pacific Coast and Chepillo island. Number of calls is not small and boats are mainly private use. The purposes for visits are similar to the above.

Reasons why the number of trips increased in 2001 that services to upstream and boat use by the government increased are: as a result of more active agricultural production and more frequent investigation into the agricultural field by the government.

(4) Passenger Forecast

Boat services in Coquira Port are mainly used for dairy activity of inhabitants. Therefore, the future number of passengers is calculated based on the assumptions that: ① passenger movement will increase with growth rate of 1.83 %/year equivalent to that of population from 2003 to 2025 in the Panama province and ② some margin should be allowed in consideration of a case of sudden increase in number like year 2001.

Accordingly, the number of trips in Coquira Port is estimated to be 60,000 trips in 2024. In other words, nearly 30,000 passengers will use boat services in Coquira Port.

8.4.3 Panama Port (Fiscal Port of Panama)

(1) Overview

Panama Port is located in Panama City, on the Pacific Coast in the Bay of Panama. Major origins and destinations of the calling vessels in Panama Port are in Darien province and islands in the Bay of Panama: i.e., Taboga and San Miguel (Isla del Rey). Recently the Municipal Piers nearby Panama Port have been utilized in order to unload fishery products instead of Panama Port. In

addition, "Panama City Waterfront Renewal Project" including redevelopment of Panama Port, of which the initiative is taken by the Panamanian Government, is under planning.

(2) Major Commodities handled in Panama Port

The history of the major commodities handled in Panama Port is as follows:

Table 8.4.8 Major Commodities handled in Panama Port

(Unit: ton)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(Coastal)										
1. Unloading										
Logs/Woods	143	690	4,103			1,763		1,911	275	0
Fishery Product	423	419	687			503		1,932	2,028	876
Agricultural Product	93	130	2,358			599		1,455	230	0
Commercial Products	8,864	10,337	2,729			789		401	1,790	4,365
Sub-total	9,523	11,576	9,877	8,221	4,943	3,654	3,971	5,699	4,323	5,241
2. Loading										
Fuel	963	59	0			0	1,130	1,029	0	183
Commercial Products	8,071	10,286	11,770			7,788	9,730	8,862	8,483	10,265
Sub-total	9,034	10,345	11,770	8,692	8,357	7,788	10,860	9,891	8,483	10,448
Total	18,557	21,921	21,647	16,913	13,300	11,442	14,831	15,590	12,806	15,689

Source: Panama Maritime Authority (AMP)

Major unloaded commodities are logs/woods, fishery products, agricultural products and commercial goods. Volume of all the unloaded commodities fluctuates much. Major loaded commodities are commercial products, which are transported to the Darien province and islands, and this commodity has increased steadily for the last five years.

(3) Cargo Forecast

1) Unloaded Commercial Products

Majority of unloaded commercial products are empty bottles on empty vessels for diesel from mainly the Darien province and islands in the Panama province.

The future unloaded commercial products is estimated using an elastic value which is calculated based on the difference of the growth rate between volume of unloaded commercial products and GDP in the Darien and Panama provinces from 1998 to 2002.

Table 8.4.9 Future Unloaded Commercial Products in Panama Port

	1998	1999	2000	2001		2024
GDP (million Balboa)	6,069	6,323	6,564	6,591		17,136
Commercial. Products (ton)	789	860	401	1,790		10,000

Source: JICA Study Team

Accordingly, the future volume of unloaded commercial products is estimated to be 10,000 tons in 2024.

2) Loaded Commercial Products

According to AMP port statistics, majority of loaded commercial products were transported to the Darien province and islands in the Bay of Panama, which belong to the Panama province.

The future unloaded commercial products is estimated using an elastic value which is calculated based on the difference of the growth rate between volume of loaded commercial products and GDP in the Darien and Panama provinces from 1998 to 2002.

Table 8.4.10 Past and Future Loaded Commercial Products in Panama Port

	1998	1999	2000	2001	2002	2024
GDP (million Balboa)	6,069	6,323	6,564	6,591	6,653	17,136
Commercial. Products (ton)	7,788	9,730	8,862	8,483	10,265	32,000

Source: JICA Study Team

Accordingly future volume of loaded commercial products are estimated to be 32,000 tons in 2024.

8.4.4 Vacamonte Port

(1) Overview

Vacamonte Port is located at a distance of about 20 km from the Panama City and functions as an unloading base for fishing boats, majority of which catch shrimp and tuna. The port is equipped with freezing and processing facilities, and shipyard for repair of fishing boats.

(2) Major Commodities handled in Vacamonte Port

Major commodities handled in Vacamonte Port are shown in Table 8.4.11. According to the table, the imported fishery products including tuna have increased rapidly as well as local fish products for the last five years. However, handling of the shrimp product has decreased constantly for the last five years.

Table 8.4.11 Major Commodities handled in Vacamonte Port

(Unit: ton)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1.Import										
Tuna	3,921	0	0			1,667	2,171	1,593	1,452	4,077
Other Fish	25	0	0			355	1,597	2,268	9,019	5,949
Others	1,143	16	0			0	0	0	0	0
Sub	5,089	16	0	6,581	1,500	2,022	3,768	3,861	10,471	10,026
2.Export										
Tuna	2,272	859	0			0	0	0	0	0
Fish Meal/Oil	5,315	2,388	3,756			7,093	0	0	0	0
Others	1,010	2,547	2,634			1,035	496	0	0	0
Sub	8,597	5,794	6,390	4,646	6,469	8,128	496	0	0	0
3.Unloading										
Shrimp	4,253	4,202	6,496			12,555	11,608	8,348	8,003	6,117
Tuna	215	0	1			0	200	276	81	557
Other Fish	727	1,425	715			5,581	3,675	2,577	9,362	11,522
Sub	5,195	5,627	7,212	10,857	10,024	18,136	15,483	11,201	17,446	18,196
Total	18,881	11,437	13,601	22,084	17,933	31,286	19,747	15,062	27,917	28,222

Source: Panama Maritime Authority (AMP)

(3) Cargo Forecast

1) Imported Fishery Products

Export of fishery products has risen remarkably for the last five years and could further improve since Panama signed the "International Dolphin Conservation Program Agreement" in May 1998. Majority of fishery products imported at the port have been exported mainly to USA after processing.

The future volume of imported fishery products is calculated on the assumption that future volume will correlate with GDP Fishery Sector in Panama.

Table 8.4.12 Imported Fishery Products and GDP Fishery Sector in Panama

Year	GDP Fishery Sector in Panama (million Balboa)	Imported fishery Product (tons)
1998	120.5	2,022
1999	119.6	3,768
2000	180.1	3,861
2001	226.5	10,471
2002	213.5	10,026
2024	634.0	

Source: JICA Study Team and Panama Maritime Authority (AMP)

Y = 70.425X – 6,086.3 (R = 0.904)
Where, X: GDP Fishery Sector in Panama
Y: Projected Volume

Accordingly, the future volume of imported fishery products in Vacamonte Port is estimated as follows:

Y = 39,000 tons (Year 2024)

2) Unloaded Fishery Products

Majority of fishery products unloaded at the port have been exported mainly to USA after processing.

The future volume of unloaded fishery products will be calculated on the assumption that future volume will correlate with GDP Fishery Sector in Panama.

Table 8.4.13 Unloaded Fishery Products and GDP Fishery Sector in Panama

(Unit: ton)

Year	GDP Fishery Sector in Panama (million Balboa)	Imported Fishery Product (tons)
1998	120.5	5,581
1999	119.6	3,875
2000	180.1	2,853
2001	226.5	9,443
2002	213.5	12,079
2024	634.0	

Source: JICA Study Team and Panama Maritime Authority (AMP)

Y = 53.88X – 2,503.2 (R = 0.70)
Where, X: GDP Fishery Sector in Panama
Y: Projected Volume

Accordingly, the future volume of unloaded fishery products in Vacamonte Port is estimated as follows:

Y = 32,000 tons (Year 2024)

3) Unloaded Shrimp Products

Although shrimp products have decreased recently, shrimp is still a very important export commodity in Panama. Therefore, the expectation is that the shrimp products will keep a volume equivalent to that between 1998 and 2002, based on conservation of the shrimp resources by the fishery sector.

Table 8.4.14 Past and Future Volume of the Shrimp Products handled in Vacamonte Port

(Unit: ton)

Year	1998	1999	2000	2001	2002	Average	2024
Shrimp	12,555	11,608	8,348	8,003	6,117	9,326	10,000

8.4.5 Aguadulce Port

(1) Overview

Aguadulce Port is located 7 km from the Pacific Coast at the Palo Blanco inlet of Parita Bay and in the center of the agricultural field of the Cocle province. The port functions as a port for export of agro-products, especially sugar.

(2) Major Commodities handled in Aguadulce Port

The history of the major commodities handled in Aguadulce Port is shown in Table 8.4.15.

Table 8.4.15 Major Commodities handled in Aguadulce Port

(Unit: ton)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1.Import										
Fertilizer	52,818	56,894	59,686			15,401	30,184	47,623	49,476	48,809
Salt	0	0	0			12,005	9,521	4,775	7,207	0
Wheat	7,618	4,198	0			0	0	0	0	0
Others	5	9,242	651			21,472	6,441	0	3,331	0
Sub	60,441	70,334	60,337	65,498	48,326	48,878	46,146	52,398	60,014	48,809
2. Export										
Sugar	37,946	37,174	31,413			36,229	30,917	35,934	30,689	22,991
Others	36	1,176	2,013			596	156	91	0	0
Sub	37,982	38,350	33,426	29,963	46,051	36,825	31,073	36,025	30,689	22,991
Total	98,423	108,684	93,763	95,461	94,377	85,703	77,219	88,423	90,703	71,800

Source: Panama Maritime Authority (AMP)

The major imported commodity is fertilizer and its volume has increased for the last five years. Wheat of 4,000 to 8,000 tons and salt of 5,000 to 12,000 tons were imported from 1993 to 1994 and from 1998 to 2001. But there is no wheat/salt importation presently. Major exported commodity is sugar and its volume by year fluctuates with a gradual decline.

(3) Cargo Forecast

1) Fertilizer

Refer to “Chapter 8.1 (1) 2) ii) Fertilizer” and “Chapter 13.2 (1) 1) iii) Fertilizer”. The imported fertilizer volume at ports in Panama in 2024 is as follows:

Table 8.4.16 Fertilizer Import at Ports in Panama in 2024

(Unit: ton)

	Aguadulce Port	Pedregal Port	Import from Costa Rica By Trucks
Share (%)	40	30	30
Imported Volume	85,000	64,000	64,000

2) Sugar

Traditional products such as sugar and coffee have shown a constant decline over the last years. Expectations are that this trend will continuous and the latest data of the sector released by the Panamanian statistics bureau confirm this assumption. Based on the above, it is assumed that Aguadulce Port will handle sugar with volume equivalent to that between 1998 and 2002.

Table 8.4.17 Past and Future Volume of Sugar handled in Aguadulce Port

(Unit: ton)

Year	1998	1999	2000	2001	2002	Average/year	2024
Sugar	36,229	30,917	35,934	30,689	20,527	30,859	30,000 (20,000~40,000)

8.4.6 Mensabe Port

(1) Overview

Mensabe Port is located at the Mensabe River outlet in the Atlantic Coast, district of Las Tablas, Province of Los Santos.

(2) Major Commodities handled in Mensabe Port

The history of the major commodities handled in Mensabe Port is shown in Table 8.4.18.

Table 8.4.18 Major Commodities handled in Mensabe Port

(Unit: ton)

Year	1998	1999	2000	2001	2002
(Coastal Shipping)					
1. Unloading					
Fishery Products	515	91	213	471	456

Source: Panama Maritime Authority (AMP)

(3) Cargo Forecast

The future unloaded volume of fishery products in Mensabe Port is calculated on the assumption that it will increase with the growth rate equivalent to that in Vacamonte Port, because majority of fish products have been exported after processing. Accordingly, the volume of fishery products in 2024 are estimated to be 1,300 tons.

8.4.7 Mutis Port

(1) Overview

Mutis Port is located at the outlet of the Martin Grande River, at the Montijo Gulf, Province of Veraguas, Pacific Coast. The port has a potential gateway to the Coiba Island.

(2) Major Commodities handled in Mutis Port

The history of the major commodities handled in Mutis Port is shown in Table 8.4.19.

Table 8.4.19 Major Commodities handled in Mutis Port

(Unit: ton)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(Coastal)										
1.Unloading										
Shrimp	57	79	80				47	31		13
Fish	0	0	0				105	100		53
Others	2,448	1,873	139				4	0		0
Sub	2,505	1,952	219	188	382	261	156	131	106	66
2.Loading										
Others	501	18	0	0	0	0	0	0	0	0
Total	3,006	1,970	219	188	382	261	156	131	106	66

Source: Panama Maritime Authority (AMP)

(3) Cargo/Passenger Forecast

1) Cargo Forecast

Cargo volume in Mutis Port is quite small and has declined constantly for the last five years. It is assumed that this trend will continue unless passengers to the Coiba Island will increase. As a result of the assumption, volume of fishery products in 2024 are estimated to be 100~200 tons.

2) Passenger Forecast to Coiba Islands

As mentioned above, the tourists to Coiba Island will increase in future. However, the number is still to be studied.

8.4.8 Pedregal Port

(1) Overview

Pedregal Port is located at the outlet of the Platanares and Garibaldo Rivers, 7 km from the David City in the Chiriqui province, Pacific Coast. Ship calls at the port are restricted much due to the shallow river channel at low tide, especially at the river mouth.

(2) Major Commodities handled in Pedregal Port

The history of the major commodities handled in Pedregal Port is shown in Table 8.4.20.

Major commodities in Pedregal Port are similar to that in Aguadulce Port except fishery products. All the commodities fluctuate by year.

Table 8.4.20 Major Commodities handled in Pedregal Port

(Unit: ton)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1.Import										
Fertilizer	11,455	12,185	15,227			15,186	21,882	12,747	8,224	9,249
Others	0	660	843			0	0	0	0	0
Sub	11,455	12,845	16,070	22,556	16,403	15,186	21,882	12,747	8,224	9,249
2. Export										
Sugar	30,353	18,587	15,228			29,425	19,422	32,708	11,089	11,007
Others	0	0	0			0	0	1,132	0	0
Sub	30,353	18,587	15,228	17,945	25,451	29,425	19,422	33,840	11,089	11,007
3.Coastal (Unloading)										
Fishery products	451	898	588	551	376	610	328	234	7	3
Sub	451	898	588	551	376	610	328	234	7	3
Total	42,259	32,330	31,886	41,052	42,230	45,221	41,632	46,821	19,320	20,259

Source: Panama Maritime Authority (AMP)

(3) Cargo Forecast

1) Fertilizer

Refer to “Chapter 8.1 (1) 2) ii) Fertilizer” and “Chapter 13.2 (1) 1) iii) Fertilizer”. The imported fertilizer volume at ports in Panama in 2024 is as follows:

Table 8.4.21 Fertilizer Import at Ports in Panama in 2024

(Unit: ton)

	Aguadulce Port	Pedregal Port	Import from Costa Rica By Trucks
Share (%)	40	30	30
Imported Volume	85,000	64,000	64,000

2) Sugar

Traditional products such as sugar and coffee have shown a constant decline over the last years. Expectations are that this trend will continue and the latest data of the sector released by the Panamanian statistics bureau confirm this assumption. Based on the above, it is assumed that Pedregal Port will handle sugar with volume equivalent to that between 1998 and 2002.

Table 8.4.22 Past and Future Volume of Sugar handled in Pedregal Port

(Unit: ton)

Year	1998	1999	2000	2001	2002	Average/year	2024
Sugar	29,425	19,442	32,708	11,089	11,007	20,734	20,000 (10,000~30,000)

8.4.9 Armuelles Port

(1) Overview

Armuelles Port is located at the occidental extreme of the Pacific Coast of the Republic of Panama, at the Charco Azul Bay. Previously the port was used for banana export, as well as for export of agricultural products and import of fertilizer by the Chiriqui Land Company. However, the port facilities were damaged seriously by the earthquake in September 2002 and currently in have only limited use.

(2) Major Commodities handled in Armuelles Port

The history of the major commodities handled in Armuelles Port is shown in Table 8.4.23.

Table 8.4.23 Major Commodities handled in Armuelles Port

(Unit: ton)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1.Import										
Pallete	1,996	5,433	6,262				0	0	0	0
Paper	23,246	13,165	7,975				0	0	0	0
Fuel	4,227	2,582	8,149				0	0	0	0
Others	2,047	1,100	194				0	0	0	0
Sub	31,516	22,280	22,580	14,763	19,373	0	0	0	0	0
2.Export										
Banana	402,520	398,855	353,625				0	0	0	0
CFZ Cargo	0	0	0				34	696	668	14
Cement	0	0	0				0	340	0	0
Others	0	72	0				0	0	1,840	0
Sub	402,520	398,927	353,625	275,836	227,756	714	34	1,036	2,508	14
3.Coastal (Unloading)										
Shrimp	0	0	0	0	0	15	12	0	167	35
Total	434,036	421,207	376,205	290,599	247,129	729	46	1,036	2,675	49

Source: Panama Maritime Authority (AMP)

Major commodity in Armuelles Port was bananas 10 years ago and its volume was over 400,000 tons in 1993. Banana export had declined for the last decade and no bananas have been exported since 1998. The port currently has in limited use due to damage by earthquake in 2002.

(3) Cargo Forecast

Cargo forecast will be made based on development projects including a new port construction near Armuelles Port. However, the cargoes are assumed to be handled by the new port. Estimation of cargoes is still to be studied

8.4.10 Chiriqui Grande Port (State Port)

(1) Overview

Chiriqui Grande Port is located the Chiriqui Lagoon, on the west side of the City of Chiriqui Grande, Province of Bocas del Toro, Caribbean Coast.

(2) Major Commodities handled in Chiriqui Grande Port

The history of the major commodities handled in Chiriqui Grande Port is shown in Table 8.4.24.

Table 8.4.24 Major Commodities handled in Chiriqui Grande Port

(Unit: ton)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(Coastal)										
1.Unloading										
Commercial Products	44,164	44,177	47,578	58,891	53,516	2,000	2,000	1,701	0	0
2.Loading										
Commercial Products	46,788	45,990	49,631	58,513	66,884	115,738	95,073	1,596	0	0
Total	90,952	90,167	97,209	117,404	120,400	117,738	97,073	3,297	0	0

Source: Panama Maritime Authority (AMP)

Chiriqui Grande Port was a regional hub port, which had handled various commercial products transported to Almirante Port and islands before opening of road between Chiriqui Grand and Almirante. The port currently has no activity, according to AMP port statistics.

(3) Cargo Forecast

There will be no significant cargo volume to be handled in Chiriqui Grande Port.

8.4.11 Bocas del Toro Port

(1) Overview

Bocas de Toro Port is located at “Isla Colon” on the Caribbean Coast, Province of Bocas del Toro. There is a ferry service between Bocas del Toro Port and Almirante Port, which has an operation of 4 -5 days a week.

(2) Major Commodities handled in Bocas del Toro Port

The history of the major commodities handled in Bocas del Toro Port is shown in Table 8.4.25.

Table 8.4.25 Major Commodities handled in Bocas del Toro Port

(Unit: ton)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(Coastal)										
1.Unloading										
C. Products	1,745	17,893	3,042	4,389	4,175	2,388	5,743	7,489	8,524	10,967
Sub	1,745	17,893	3,042	4,489	4,175	2,388	5,743	7,489	8,524	10,967
2. Loading										
C. Products	386	478	212	0	333	468	5,108	7,169	7,746	9,967
Sub	386	478	212	0	333	468	5,108	7,169	7,746	9,967
Total	2,131	17,871	3,254	4,389	4,508	2,856	10,851	14,658	16,270	20,934

Source: Panama Maritime Authority (AMP)

Both of unloaded and loaded major commodities are commercial products and their volume has increased rapidly for the last five years.

(3) Cargo Forecast

1) Unloaded Commercial Products

The future volume of unloaded commercial products is calculated based on the assumption that it will increase with growth rate of the tourists in Bocas del Toro. Reference is made to “Passenger Forecast” in Bocas del Toro Port. Growth rate of the tourist is assumed to be 10 %/year.

Accordingly, the future volume of unloaded commercial products in Bocas del Toro Port is as follows:

Table 8.4.26 Future Volume of Unloaded Commercial Products to be handled in Bocas del Toro Port

(Unit: ton)

	2002	Growth Rate (%)	2024
Commercial Products	10,967	10 %/year	89,000

2) Loaded Commercial Products

The summary of cargo from Almirante Port to Bocas de Toro Port is shown in Tables 8.4.27 and Table 8.4.28, respectively.

Table 8.4.27 Ferry Cargo (1) at Almirante Port in 2003

	Cargo Volume (ton)	
	Unloading	Loading
January	615.5	713.5
February	780.5	846.0
March	812.0	787.0
April	744.5	703.0
May	759.5	634.5
June	579.0	656.0
July	433.0	466.0
August	594.5	679.0
September	1,067.5	1,109.0
October	683.5	795.5
November	1,137.0	1,261.0
Total	8,206.5	8,650.5

Source: Panama Maritime Authority (AMP)

Table 8.4.28 Ferry Cargo (2) at Almirante Port in October, 2003

	Unloading		Loading	
	Number of Car	Weight (ton)	Number of Car	Weight (ton)
1st to 10th	47	229	58	307
11th to 20th	40	229	52	256
21st to 31st	46	226	48	239
Total	133	684	158	802

Source: Panama Maritime Authority (AMP)

According to the above table, cargo volume and number of car between unloading and loading have no much difference. This means that ① majority of loaded cars return to Almirante Port and ② car weight is counted as cargo. In other words, weight of unloaded cargoes should be mainly weight of cars. AMP Bocas del Toro informed that no agricultural or industrial product was produced in Bocas del Toro.

Therefore, the future loaded commercial products in Bocas del Toro Port is calculated based on the assumption that loaded volume will be 90 % of unloaded volume, mainly car weight.

Accordingly, the loaded commercial products in 2024 are estimated to be 80,000 tons.

3) Passengers

"The Study of Tourism Development in the Coastal Area of the Republic of Panama 1995" by JICA is referenced. According to the report, two gateways are defined for tourists to visit the area.

One gateway is Changuinora airport for international charter flights mainly from North America and other is Almirante Port for boats/ships including international cruise ships. Volume of tourist inflows on the report is as follows:

Table 8.4.29 Target of Tourist Inflows in Bocas del Toro

(Unit: person-nights)

Tourists Types			2000	2005	2010
Night-stay Tourist	Foreign	By Changuinola Airport	-	-	350,000
		Via Tocumen	78,000	263,000	195,000
		Via Paso Canoa	12,000	17,000	25,000
		By Cruising Ship	10,000	20,000	30,000
	Domestic		68,000	123,000	248,000
	Total	Person-night Base	168,000	423,000	848,000
Daytime Visitors	Foreign	Daytime Excursion	109,000	221,000	383,000
	Domestic	Weekenders	44,000	73,000	136,000
	Total		153,000	294,000	519,000

Source: "The Study of Tourism Development in the Coastal Area of the Republic of Panama 1995" by JICA

Based on the above table, the future passengers by nationality in Bocas del Toro are estimated as follows.

Table 8.4.30 Future Passengers by Nationality in Bocas del Toro

(Unit: person-nights)

Year	2000	2005	2015
Foreign	209,000	521,000	983,000
Growth Rate		20.0%/year (2000~2005)	16.7%/year (2000~2010)
Domestic	112,000	196,000	384,000
Growth Rate		11.8 %/year (2000~2005)	13.1 %/year (2000~2010)
Total	321,000	717,000	1,367,000
Growth Rate		17.4 %/year (2000~2005)	15.6 %/year (2000~2010)

Source: JICA Study Team

Referring to the above, the future number of passengers is calculated on the assumption that it will increase with growth rate of 10 %/year, which is conservative with less tourists at present than the forecast figures in the above report.

8.4.12 Almirante Port

(1) Overview

Almirante Port is located at the Ambrosio Inlet on the Occidental side of Almirante Bay, 30 km from the Costa Rican Border, Province of Bocas del Toro, Caribbean Coast.

(2) Major Commodities handled in Almirante Port

The history of the major commodities handled in Almirante Port is shown in Table 8.4.31.

Table 8.4.31 Major Commodities handled in Almirante Port

(Unit: ton)

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(Coastal)										
1.Unloading							61,552	9,037	6,542	9,272
C. Products										
2.Loading										
C. Products							58,849	11,588	7,221	11,215
Total	95,412	88,574	104,113	115,567	118,532	128,501	120,401	20,625	13,763	20,487

Source: Panama Maritime Authority (AMP)

Cargo volume in Almirante Port has declined rapidly since 2000 due to opening of the road between Chiriqui Grande and Almirante, but its role for transportation of goods to islands still remains.

(3) Cargo/Passenger Forecast

Reference is made to the demand forecast in Bocas del Toro Port.

1) Unloaded Commercial Products

The unloaded commercial products in Almirante Port should be same as the loaded commercial products in Bocas del Toro Port. Therefore, the loaded commercial products in 2024 are estimated to be 80,000 tons.

2) Loaded Commercial Products

The loaded commercial products in Almirante Port should be same as the unloaded commercial products in Bocas del Toro Port. Therefore, the loaded commercial products in 2024 are estimated to be 89,000 tons.

3) Passengers

Refer to passenger forecast of Bocas del Toro Port mentioned in Chapter 12.2.

8.4.13 Summary

Table 8.4.32 Future Cargo/Passenger Demand (Target Year 2024)

Port	Type	Category	Commodity	Unit	Quantity	Key Factors for Forecast
La Palma	Unloading	Break Bulk	Commercial Products	ton	2,500	Growth rate of population in Darien Province
	Unloading	Breakbulk	Fish	ton		Refer to Chapter 15.2
	Loading	Break Bulk	Logs/Woods	ton	40,000	Sustainable Development Program for Darien by IADB
	Subtotal			ton	42,500	
Coquira	Unloading	Break Bulk	Fish & Livestock	ton	1,000	Past performance of port activities
	Subtotal			ton	1,000	
	Passenger	Embark & Disembark		trip	60,000	Growth rate of population in Panama Province
Panama	Unloading	Break Bulk	Commercial Products	ton	10,000	GDP in Darien and Panama Province
(Fiscal Port)	Loading	Break Bulk	Commercial Products	ton	32,000	GDP in Darien and Panama Province
	Subtotal			ton	42,000	
Vacamonte	Import	Break Bulk	Fish	ton	39,000	GDP Fishery Sector in Panama
	Unloading	Break Bulk	Fish	ton	32,000	GDP Fishery Sector in Panama
	Unloading	Break Bulk	Shrimp	ton	10,000	Past performance of port activities
	Subtotal			ton	81,000	
Aguadulce	Import	Dry Bulk	Fertilizer	ton	85,000	GDP Agricultural Sector in Panama
	Export	Dry Bulk	Sugar	ton	30,000	Past performance of port activities
	Subtotal			ton	115,000	
Mensabe	Unloading	Break Bulk	Fish	ton	1,300	GDP Fishery Sector in Panama
	Subtotal			ton	1,300	
Mutis	Unloading	Break Bulk	Fish	ton	150	Past performance of port activities
	Subtotal			ton	150	
	Passenger	Embark & Disembark		trip		No forecast in this Study
Pedregal	Import	Dry Bulk	Fertilizer	ton	64,000	GDP Agricultural Sector in Panama
	Export	Dry Bulk	Sugar	ton	20,000	Past performance of port activities
	Subtotal			ton	84,000	
Armuelles	Export	Break Bulk	Commercial Products	ton	2,000	Past performance of port activities
	Export	Break Bulk	Agro-Product	ton		No forecast in this Study
	Unloading	Break Bulk	Fish	ton		No forecast in this Study
	Subtotal			ton	2,000	
Chiriqui Grande						No forecast in this Study
(State Port)						
Armirante	Unloading	Break Bulk	Commercial Products	ton	80,000	Growth rate of the tourists in Bocas del Toro
	Loading	Break Bulk	Commercial Products	ton	89,000	Growth rate of the tourists in Bocas del Toro
	Subtotal			ton	169,000	
	Passenger	Embark & Disembark		trip		Refer to Chapter 12.2
Bocas del Toro	Unloading	Break Bulk	Commercial Products	ton	89,000	Growth rate of the tourists in Bocas del Toro
	Loading	Break Bulk	Commercial Products	ton	80,000	Growth rate of the tourists in Bocas del Toro
	Subtotal			ton	169,000	
	Passenger	Embark & Disembark		trip		Refer to Chapter 12.2

9. NATIONAL PORT STRATEGY

9.1 Basic Policies of the National Port Strategy

9.1.1 Objective of National Port Strategy

The major objectives of National Port Strategy proposed herewith are:

- To contribute to the successful promotion of national welfare through realizing further advanced socio-economic status of Panama;
- To provide AMP with a well analyzed long-term strategy of nationwide port development as a base of the sub-strategies, including the port development master plan and priority individual port development plans;
- To assist AMP in getting public acceptance by presenting to the national/regional societies the official intention of the Government on the national port development;
- To promote cooperation among the parties concerned for successful development of the ports;
- To guide and attract the potential private investment to the regional industries and marine businesses;
- To enhance overall port administrative capability of AMP through the course of formulation of National Port Strategy.

9.1.2 Basic Direction

(1) National Policy Targets

While there is no long-term comprehensive development policy of the nation officially available at this moment, the following policy package is conceived on the basis of the Study Team's findings from among various materials and discussions. The four key policy targets described herewith are to be the final base of National Port Strategy.

1) Successful Achievement of Sustainable Economic Development

Steady and sustainable increase of national economic income is no doubt one of the basic and common targets among developing countries to improve the general welfare of its citizens. It is not easy to quantify target values of this kind of index, in particular on a long-term basis for 2020. However, the current achievement of GDP per capita of Panama (about USD 2500 at 1982 prices) could substantially be improved to between USD 2,560 and USD 2,900 for 2020 based on GDP at 1982 prices, if an appropriate policy would be applied.

2) Alleviation of Income Gap and Poverty

The current income gap in Panama is considered large enough to jeopardize the stability of Panama society and incentives economic growth. The prevailing poverty, particularly in the local

sectors in this country, may also cause various adverse effects in achieving sound and stable status of the nation. Effective solution of these problems is considered vital in materializing the national policy targets. The port sector developments, particularly the local port projects, can contribute greatly to alleviating this gap, based on successful experience in alleviating such undesirable conditions in other local areas of the world.

3) Mitigation of Socio-Economic Regional Disparities

GDP and population of the Panama Province in the year 2000 are estimated as about 64 % and 49 % of the country respectively. These figures show that the socio-economic functions of Panama are already concentrated highly in this area and the most of other local areas are left economically less developed and plenty natural land/resources are not being fully utilized. The Statistical Bureau of Panama estimates the future population share of Panama as 54 % for 2024, which implies that the situation will worsen, if effective counter measures would not be taken by the government.

In order to avoid possible adverse effects of concentration on the effective development for the total country, a set of policy packages including port development in appropriate areas should be conceived and implemented.

4) Environmental Preservation of Land/Water-areas and Assurance of Social Security

Another key policy closely connected to achievement of a long-term national target is to maintain high quality of natural environment and security for citizens. One of the major issues on any development is how to balance development with preservation of natural environment. When we consider the development of ports, positive policies having this balance need to be examined.

9.1.3 Key Development Policies

For successful achievement of the above National Policies Targets, the following three supporting sub-policies focused on different sectors of Panama are proposed.

(1) Industrial Development Policy

1) Reinforcement and Diversification of Domestic Industries of Panama

The current structure of domestic industries of Panama is biased to historically dominant types of businesses, including the Canal related services, land rental, ship registration (flag of convenience), banking services, banana plantation, cattle breeding, fishery etc. It is essential to strengthen and diversify the structure of domestic industries for the future economy of the country.

2) Promotion of Economic Activities by Use of Geographic Advantages of Panama

For strengthening total economic power of Panama, it is also vital to maintain maximum utilization of geographic advantages of the Canal area in various aspects such as world maritime transport, maritime container transshipment, ownership and operation of the Panama Canal itself, and strategic exploitation of container terminal concessions of major ports. Conservation of

maritime resources and promotion of fishery is another target for maximum utilization of traditional advantages of the country.

3) Job Creation in the Rural Area through Promotion of Local Industries

As commonly understood, overall activity level of local industries in provinces is generally low compared with Panama City area. This again is the result of less allocation of administrative resources in promoting local economy. Naturally, job opportunities for the local citizens are still limited, which makes it difficult to reduce the number of low-income families in these areas. Well-conceived port development projects can often be effective in improving such a situation.

4) Promotion of Location of Foreign Industries and Investment

One of the most effective and feasible ways to mobilize the financing resources for regional development may be to invite foreign investment for the industrial development of the target areas. Of course, it is vital to offer highly attractive and competitive business environments to candidate firms through positive efforts of both public and private sector entities concerned.

5) Enhancement of Institutional System for Promotion of Industries

In order to support the above industrial promotion projects, it is mainly required for the government to establish various institutional arrangements, which include a kind of concessionary tax policy, special offers for convenient utilities or transport infrastructures, simplification of official documentation procedures and other various promotional offers.

(2) National Land Development Policy

1) Alleviation of Excess Concentration of Socio-Economic Functions to the Canal Area

This policy, from the viewpoint of national land development, is one of the more concrete ideas to realize National Policy Target No. 3 (Mitigation of Socio-Economic Regional Disparities). Although it is a hard and time-consuming task to relocate any of the social economic functions to the outside of the Canal area, this work will help ensure the future sound development of this country. Further detailed policy packages need to be developed accordingly.

2) Improvement of Infrastructure for Local Industries

Local industries always play an essential role to provide job opportunities to local people and maintaining local economy. Due to various historical and political reasons, the policy on promoting local industry of this country has not fully functioned so far. However, the national land development schemes were designed to support the policy with provision of required physical and institutional infrastructures.

3) Improvement of National Transport Infrastructure

Development of the national trunk transport network is one of the key components of the overall national land development policy. The high standard trunk road, railway, port and airport network

is highly effective in upgrading the total value of the national land. Without a well-designed transport network, no countries may achieve their national targets. A so-called comprehensive transport system plan should therefore be seriously considered and realization of the proposed schemes is essential to this end.

4) Upgrading and Stabilizing the Livings in Remote Rural Areas or Isolated Islands

Another important policy for stable and balanced development of the country, which may be effective in dispersing socio-economic activities to all available national land, is to improve the living standard of the people in remote island/areas. The rural road network or a small port needs to be developed to have good connection to the trunk transport system of the country. It is also worthwhile to link remote islands with a marine transport network or to improve the inter-islands transport system by constructing rural roads or shipping routes.

(3) Regional Development Policy

Through detailed discussions and examinations on the available long/medium term national policies of Panama as well as other sector development policies described above, the following five key regional development policies are proposed as the most effective measures in supporting the overall policy targets of the nation. The regional development policies proposed below should be considered as the foundation of the priority port development plans in each of the selected local areas.

1) Development of First Class International Tourism Complex in Bocas del Toro

The development concept of this area has been recognized as one of the priority policies for enhancement of local economy, utilizing the advantageous conditions of the excellent natural environment and traditional business. While the government has been promoting the tourism activities in this area, further policy inputs for encouraging tourism business is considered necessary to develop a first class international tourism complex. Under the policy, substantial contribution to improvement of the scale of local economy and eventually to achievement of the national policy targets can be expected. Provision of the appropriate port functions, services and facilities, and institutional arrangements are necessary accordingly.

2) Creation of New Economic Cluster in Chiriqui

The most important aspects of the new economic cluster in Chiriqui are national targets number two and three namely “Alleviation of Income Gap and Poverty” and “Mitigation of Socio-Economic Regional Disparities”. Since Chiriqui area is the second largest socio-economic center of the country, and because of the recently conceived development projects including Baru Free Zone and rehabilitation program of existing Armuelles port, this area is expected to grow into the 2nd largest economic center next to the Panama Canal area and to lead the overall national economic development of the country. In this sense, proactive policy in creating a new economic cluster in this area needs to be promoted through concentration of various development

resources such as industrial estates, transport network, power/water supplies, administrative infrastructures, etc.

3) Re-location of Socio-Economic and Industrial Function from Panama City

As commonly understood, the economic function of the entire country of Panama is heavily concentrated in the Panama Canal Zone including Panama City and Colon area. This situation causes various risks and negative impacts for maintaining the sound and sustainable economic growth of the country, which includes excess concentration of urban population, heavy intra/inter city traffic, deterioration of environmental conditions, inefficient space utilization, increase of urban crime/conflict and other urban problems. In order to reduce the above risks or negative impacts on the core of the Panama City in particular, it is necessary to relocate some major land uses such as domestic port function, urban industries, residential area and so on.

4) Reinforcement of the Basic Economy and Living Standard in Darien

Darien is located in the western part of Panama and near to the Colombia border. Due to various geographical and historical background, the socio-economic conditions of the district are generally poorer than other local communities. While the government has tried to improve this situation through construction of access roads and ports to this area (for instance, by the ongoing IADB projects), further proactive development actions are required to provide basic human needs of the communities. This kind of policy is also vital for mitigation of the socio-economic regional disparity that is one of the important national targets of the country.

5) Proactive Preservation of Natural Environment Resources of Key Protected Areas

The government is promoting natural environmental preservation by designating over 12% of the national land as protected areas. Needless to say, any regional development projects should be executed to harmonize with the above protection policy of the designated areas in particular. In connection with the regional development concept, of which the core project includes a port development project, it is vital to take the possible coastal/ marine environmental impacts into account. Hence, the actual project sites of regional development need to be selected at the areas where the development impacts to the environment can be minimized.

9.1.4 Basic Concept of National Maritime Strategy

The cabinet approved the National Maritime Strategy in January 2004 after discussing the contents for more then 7 years. The approved key strategies are defined as the general basic objectives in two categories namely Primary and Secondary Strategic Objectives.

The “Primary Strategic Objective” includes the general directions of institutional security and compliance with international regulations, efficient and effective measures for competitive market, enhancement of investment and innovation for strengthening physical and intellectual capital, protection and security synergy, inter-sector relationships, marketing activities for new

opportunities of maritime business, formation and execution of a program of national and international communication, conservation of environment, and labor regime.

In the "Secondary Strategic Objective" there are seven sub-objectives: namely, creation of new job opportunities, upgrading labor force quality and productivity, stimulating investment for required infrastructure, sustainable marine resource management and social responsibility, improving security, hygiene and health of the laborers, and enhancing good governance for the maritime sector.

The port sector strategies are proposed in the third section of the "Secondary Strategic Objective" and are rather general, including necessity of port and coastal shipping development plan and integrated coastal area development plan, and infrastructure development for these two plans.

In order to materialize the above-mentioned nature of National Maritime Strategy, which proposes only the general directions of the necessary strategic maritime objectives, National Port Strategy should develop further substantial and concrete ideas to contribute to formulating more practical guidelines for actual implementation of the port sector development.

9.2 Roles of Port Sector and Basic Policy for Promotion

In this section, the primary background of roles and functions of the ports sector of Panama are discussed. The basic policy of port sector promotion is proposed accordingly.

9.2.1 Specific Conditions and Background

Before discussing the roles of port sector of Panama and its promotion policy, it is necessary to identify the specific conditions and actual backgrounds of the Panamanian port sector as follows:

(1) Geographical Features of the Country

This background includes the unique location of the country in Central and Latin-American countries, which gives Panama various advantages in maritime transport businesses and activities.

(2) Co-existence of Two Groups of Ports with Disparate Functions (the Canal Ports and Local Ports Groups)

The container terminals at the Canal ports (Colon Container Terminal, Mansanillo International Terminal, and Balboa Port), which are totally privatized, function as pure international container terminals. While they are making substantial contribution to the financial position of the government, they do not have any inter-connection with other local ports in the country. On the other hand, there are many small-scale local ports which require heavy public funding and only produce minimal revenues from their operations. These situations make it difficult for AMP to keep a uniform administration practice.

(3) Highly Developed Concession to the Private Sector for Port Development and Operation

Under the positive introduction of privatization policy of the government to almost all possible business sectors of the country, some port sector activities are also highly privatized. This

situation creates both positive and negative effects, with different natures and levels of effects depending on each different port function, in securing sound port development of the country.

(4) Shortfall of Financial Resources for Port Sector Development

This kind of issue can be found in every developing country of the world. However, the port sector of Panama is quite unique in shortage of available public funding due to its excessive privatization policy. Counter policy to overcome this situation will be further discussed later in this chapter.

(5) Insufficient Human Resources for Port Sector Administration

Insufficient human resources for port sector administration also comes from the effects of excessive privatization of port activities, and creates another burden for AMP when trying to strengthen its administrative capability and rectify the inadequate supply of required port functions for the local ports in particular. The issues will be examined more in this chapter later.

9.2.2 Primary Roles and Functions

Considering the National Policy Targets together with the current backgrounds of port sector of Panama, the primary roles and functions of the future port sector of the country can be identified as follows:

- To provide international shipping and trade with the competitive integrated international container terminal functions.
- To provide the local communities with the port function of reasonable scale at appropriate locations with user friendly administrative services.
- To secure the safe, effective and economic port network covering the entire region of the country.
- To promote incentives for the public and private sectors to invest in effective industrial/transport infrastructures and the beneficial industries at the hinterland of the ports.
- To create job opportunities for the local communities through promotion of port related businesses.
- To lead the national maritime sector promotion through a steady and sustainable port development under well conceived port strategies.

9.2.3 Direction of Development and Administration

In this section, the basic ideas on promotion or development of the international container ports and other local ports, which have entirely different nature of port functions each other, are proposed. The details of the policies will be discussed in Chapter 10 National Port Development.

(1) Future Container Traffic and Facility Requirements at the Canal Area Container Ports

1) Container cargo volume forecast

As discussed in Chapter 8.1, the container cargo volumes will reach to 51.84 million tons in 2024: non-transshipment container; 3.56 million tons, transshipment container cargoes; 42.85 and container cargoes related to the Colon Free Zone; 5.43 million tons. This amount of container traffic corresponds to 5.2 million TEUs: on the average, the weight of a laden container is about 10 tons. Taking into consideration of the fact that additional empty containers that account for about 30% of the total volume are also handled in the actual container handling, the total container traffic will be 6.8 million TEUs.

The container handling capacity of the existing container terminals and planned terminals at both Balboa and Colon has been estimated to be 7.4 million TEUs (see Chap. 6.3). Therefore, as far as the total container handling capacities is concerned, the existing container traffic in 2024 will be still within the capacity, if the expansion of the container terminals are implemented as planned.

On the other hand, the JETRO study “the Preliminary Study on Land Reclamation Alternatives at the Pacific Entrance to the Panama Canal, March 2003” estimated the container traffic expected at the Pacific side of Panama to be 3.57 million TEUs in the year 2020. If the same methodology of the traffic forecast, the total container traffic in 2024 will reach to 4.45 million TEUs. This traffic volume exceeds the potential capacity of the container terminals of Balboa Port, which has the handling capacity of 3.2 million TEUs with total 1,500 m long quay and 12 container quay cranes. Thus, additional container terminals will be needed to handle about 1.3 million TEUs,

2) Facility requirements

A trial study on the future international container traffic and the potential requirement of container handling facilities in the Canal area shows that in total 5-6 fully equipped container berths for mother/feeder vessels may be required by the year of 2024 to handle 2-3 million TEUs of additional container traffic in/around the Canal area.

While dramatic increase of the maximum traffic capacity of the Canal may not be expected under the current severe conditions on the technical, economic and financial issues, it is clear that feasibility of the above mentioned new container berth projects will not be jeopardized at least by the capacity of the Canal, because the additional amount of container vessel traffic to be generated by the projects may not be large enough to have any adverse effects on the total capacity of the Canal.

(2) Development and Administration of International Container Port

As reported in Chapter 5 for present conditions of the Panamanian ports, the major international container ports of Panama are all located in Colon and Balboa areas, and private firms conduct development and operation of those ports under the concession agreements with the government

of Panama. At the same time, there still remain some important public port functions to be handled by various maritime administrations of the public agencies concerned.

Since the future prospect of physical development and capacity-up-grading of these container terminals is mostly dependent on the business policy of the concessionaires of the ports, it is not considered so realistic to expect the development of such container terminals under the initiative of public sector strategy. Naturally, the development of the above mentioned container terminals, if realized, will also be conducted under private sector initiatives. It may still be worthwhile, however, to seek positive involvement of the public sector by offering business incentives to the private terminal operators for the project.

While the government agencies concerned are engaged in the various administrative works such as custom, immigration and quarantine as well as navigation safety and other port-master assignments, the general port management for maintaining better performance of integrated port functions of Colon and Balboa area needs to be improved.

Considering the current level of administrative activities of the public maritime agencies concerned and the importance of overall port administrative function of these ports, AMP needs to strengthen its roles in the following areas:

- Coordinating function for various administrative activities required for a smooth and effective operation of privatized international container terminals;
- Port management function for the existing public port facilities and activities;
- Concession policy and contract management practice for future international container terminals to secure better returns from the public sector projects of Panama.

The above strategy is considered vital and practical in strengthening the financial position of the total maritime sector of the country, which may also create positive effects on potential substitution of the funding to local port development, if the situation allows. On the basis of above strategy, the detailed administration/management policies should be discussed and proposed.

(3) Other Local Ports

As discussed in the previous chapter, Panamanian ports include private and national ports. Private ports are managed and operated by private companies under either private ownership or concession contract with the government, while national ports are directly managed by AMP.

1) Private Ports

In addition to the international container ports, there are several international ports that are operated by private companies. Since these ports are closely related to specific business activities of the private companies, the development plans of the port facilities are highly dependent on their business policy. Thus, in principle, the responsibility of the public sector should be for

regulatory matters to achieve a suitable business environment. Therefore, the same directions as proposed for the international container ports are equally applicable for other private ports that are used for international trade.

However, since several private ports tend to handle the commodities produced and consumed in their immediate hinterlands, the improvement of the port services would contribute not only to the expansion of private business but also to the promotion of the local economy. Thus, the public service function of the private ports should be given due consideration and the public sector should work more closely with the private sector in the development of the capacity of the ports. Where it is needed, Concessioner-Concessionaire type relationship could be expanded to Public and Private Partnership (PPP).

2) National Ports

In general, the national ports are playing more important roles in domestic shipping service than international trade. Hence the activities of these ports have close interrelation with the socio-economic activities of their hinterland region, province and communities. Thus, the primary target of the Study is to propose local port promotion policies for national socio-economic development.

The general directions of the local port development for achieving national socio-economic development are as follows:

i) The administration, development and management policies should be composed generally under consistent directions of National Maritime Strategy of Panama, the National Target and Key Development Policies of National Port Strategy;

ii) The components of the local port development plans need to be well designed under full consideration on the specific backgrounds and conditions as well as primary roles and functions expected for the port sector of the country;

iii) Considering the above framework of development policy, local port development scenarios are to be formulated on the basis of the following objectives:

   a) To improve domestic maritime network, especially, in regional and community transport;

   b) To promote local socio-economic activities by providing incentives to attract industries;

   c) To promote activities of the ports and related activities with synergistic effect by integrating port functions: integration of commercial and fishing port functions together with logistic functions;

   d) To improve physical and/or institutional functions for upgrading the socio-economic conditions of port hinterlands and securing basic needs of the local people;

   e) To keep constant and continuous port development under well conceived implementation program with practical financial support.

iv) The key port development projects, of which activities are particularly important for materializing the national policy targets, should be implemented under the long-term master plan concept. The master plan ports shall be identified based on the demand forecasts, regional development trends, and degree of positive impacts of the port development on regional socio-economic activities. Development of the master plan ports needs to be promoted under intensive inputs of financial and/or administrative resources from both the public and private sectors.

On the basis of the premises described in the previous chapter and above-mentioned directions, the following are the potential projects for long-term master planning:

a) La Palma Port as a regional center in Darien
To achieve the goals of the on-going IDB funded Inter-modal transport development in Darien by providing private Roll-on/Roll-off ferry operators with increased business (i.e., traffic demand). This will, in turn, provide better access to far remote communities.

b) Tourism port in Bocas del Toro
To enhance the on-going IDB funded program for sustainable development of Bocas del Toro by assuring the safety and comfort of passenger boat services and to preserve and restore tourism resources by establishing well organized land use near the port.

c) A New Port to Promote the Socio-Economic Activities in Chiriqui
To construct a new multi-purpose port to promote agricultural, fishing and service industries in the remote provinces by providing direct access to the world trade route.

d) Coquira Port in Panama
To improve cargo transport function to/from the remote islands in Panama Bay as an alternative route for islands from Panama Port, which is to be demolished in due course.

e) Vacamonte Port in Panama Province
To enhance port administration and management functions for maximum use of the existing facilities and encourage private sector activities through further effective port administration and management.

v) Priority port projects to meet urgent demands are to be examined and proposed among the ports where physical and institutional capacity developments are urgently needed based on the magnitude of beneficiaries. Hence higher priority should be given to those ports that functionally serve as local transport hubs or bases of marine activities.

3) Policy on the Public Investment for Local Ports

It is commonly understood that a firm and sound financial foundation is one of the most important factors for successful port sector development. The financial strategy of the government is particularly vital for the local ports where commercial benefit cannot be expected

in general. As already discussed, the international container and bulk cargo terminals in this country have been developed and operated well under private sector initiative. However, the roles of the public sector in this field have not been quite active except for concession contracts. The problem was in the fact that the government could not play a positive role in financing local port development mainly because of the general financial shortage of the country. Considering the substantial demand of local port development, however, public sector investment needs to be encouraged for local port development in particular.

The following are basic investment policies on local port development to this end:

- The national government should be the first player of port investment both for development and maintenance;
- The government port investment should be focused on services and facilities of public interest;
- The target services and facilities for government investment should be the ones for encouraging private investment and providing basic needs, such as navigational channel, breakwaters, pure public wharves, remote island ports and so on;
- The government investment should be justified fully on the basis of the authorized master plans and budgetary arrangements.

Possible alternative financial resources are discussed in the following sections.

9.2.4 Supporting Policies

Port development cannot be successfully carried out without some backup policies such as those listed below. While these policies tend to be unfocused in port development policy planning, they are considered essential for successful implementation and actual operation of the projects in particular.

(1) Use of Appropriate Financial Resources
(2) Strengthening Organizational Capacity of Human Resources
(3) Upgrading Collection/Transmission of Data/Information and Public
(4) Enhancement Maritime Safety and Security

For the successful implementation of the strategy, financial and personnel issues are most critical points among the others, and any shortfalls should be overcome as suggested below:

(1) Use of Appropriate Financial Resources

Maintaining present capacity of ports, maintaining and operating existing facilities, dredging and maintaining the navigational channels require financial expenditure. Environment and security aspects also call for additional expenses. New facilities to be proposed in the Study require considerable capital investment. It is clear that AMP, with present appropriation of budget cannot meet these expenses. The financial issue, however, could be solved by diversification of investment resources.

1) Private Investment

The first solution is foreign investment. Panama has already experienced successful privatizations, many of which were invested in from abroad. Telecommunication, electricity companies, railways, sugar mills, oil terminals, hotels as well as ports are invested in by foreign capital and at present most are lucratively operated. These successes are historically achieved because the economy of Panama is depending on relationships with foreign countries in terms of trade and financing. In spite of strict labor code and judicial system, Panama still offers conditions favorable for investment from abroad as follows:

- The US Dollar is legal tender;
- Total absence of exchange controls;
- No nationality or residence requirements for shareholders;
- One of the most flexible corporate laws;
- Favorable investment and financial incentives;
- Stable economy such as only 0.3% increase of Consumers Price Index;
- Relatively high percentage of English speaking population.

Among the proposed development plans, a port which handles foreign trade may well be constructed by means of BOO or BOT scheme. In such case, it might be argued that in view of cost and risk sharing, some facilities such as breakwater or approach channel should be invested by government (PPP), or joint venture of public and private interest (e.g. Petro-terminal of Panama); however, certain doubt exists that these ways are affordable under the present fiscal conditions and budget management. Further, since several projects are proposed in the Study, the priority among the projects should be weighed taking into account the costs and benefits (to be discussed in a separate section).

Domestic private firms are already investing individual port facilities and services in many ports (piecemeal concession) and investing in terminal operations (hybrid concession) in Pedregal Port. It is expected, therefore, that some private firms will show an interest in the projects proposed in the Study.

2) International Financial Institution

The second solution is to obtain finance from international foreign institutions. Inter-American Development Bank (IADB) has financed a total amount of Balboa 1,500 million since 1961 (disbursement base). In recent years, major efforts of IADB were spent on the sustainable social and economic development of Darien Province, and to the management and protection of the region’s natural resources. One of the five components is rehabilitation of the transportation system to provide rehabilitation, improvement or construction for small ports, airport feeder roads and existing highways.

In March 2003, IADB decided to give 25.2 million USD loan to support a program for the sustainable development of the Bocas del Toro region and a program to strengthen the fiscal management of the public sector. It comprises 15.2 million USD loan to help finance the first phase of a 46.9 million USD program to promote sustainable development in the Region. The 27 million USD loan for the second phase is projected subject to the approval of IADB. Thus it may be possible to have support of IADB for port development of the region.

For the port sector of the region, with a view to improve the accessibility of the coastal community as well as to stimulate tourism sector, IPAT proposed a project to improve port infrastructure by construction of new community docks. Since various schemes are being planned under the umbrella of IADB Program, it is fairy probable to get financing for the port sector projects from diversified sources, in particular international financial institutions, if the plan is attractive and fits in the comprehensive plan for the sustainable development of the region. In the vicinity of the port, some facilities can be set up by private initiative under a well-defined location plan.

3) Government

It is clear that the first player of port investment is the national government. In 2002 AMP budget, income of port sector amounted 8,035 million USD, which is 11% of total AMP revenue. With this in mind, it may be reasonable that the capital expenditure budget be increased for the port sector, which is only 2% of total amount appropriated for decentralized agencies.

However, in view of the highly restrained budget at present, it is imperative that AMP should make effort to reduce the request to national budget by the following measures:

- Minimizing investment in each project;
- Phased construction, in terms of all projects and within a project.

The Study Team examined if Provinces could contribute to their ports. At present, the total income of provinces is only 88.5 million USD (3% of public sector income), of which 69.6% is revenue of Panama Province. Next comes Colon, and the third is Chiriqui. The share of these top three provinces is 88%. Municipality's financial size is much smaller. Although the Government of Panama claims to strengthen power and functions of local governments, it is not conceivable at least for the moment that they furnish financial capability sufficient for participating port development, except sharing a small amount of maintenance cost.

(2) Strengthening Organizational Capacity of Human Resources

Even though avoiding shortfall of financial resources may not be easy, overcoming insufficient personnel, which was pointed out in section 2.3.3 in this Report, is much more difficult. This issue has already been included in the Institutional Strategy of AMP promulgated in November 2002. Nevertheless, it is the Study Team's observation that the agenda should divide personnel arrangement into short-term and long-term programs.

The short -term program aims to make proper personnel deployment and to improve the execution of tasks.

The long -term program aims to achieve best-qualified work practices as a public organ, such as:

- To evolve the recruit system with the view to obtain professional resources, particularly in the fields of port management, civil engineering and electronic data processing;
- To establish a promotion system with the view to enhance morale of professional staff.

(3) Upgrading Collection/Transmission of Information/Data and Publicity

AMP is a unified body of various maritime competencies from different institutions, and it seems to be still on the way to bring real coordination among its branches. In such circumstances, all the sectors commonly own information concerning the activities of the organization. However, the Study team observed that open information within the organization is rare.

Also the processes that headquarters used to collect data or information is very slow. Data concerning vessels entry and exit to a port are collected and written by hand. Data is in many times sent by mail. Information from offices abroad is transmitted by outdated telex.

These are some examples of inadequate measures. Issues mentioned in this section should be addressed by high priority.

AMP is in a position to promulgate or inform publicly of matters concerning treaties, conventions, laws, rules, regulations, as well as announcement of procurement, etc. Thus it is recommended to publish an official gazette or bulletin for the purpose of public relations. Also, it is recommended to open an internet home page.

(4) Enforcement of Maritime Safety and Security

The maritime safety and environmental requirements were, up to present, mainly carried out by ships, shipping industry or the flag states, and the port only had supporting function. Examples are the furnishing of reception facilities for waste and oil residue, watching out for unlawful acts in terms safety or dangerous cargo. However, recent developments of security demands deeper involvement of port facility and port management (details are discussed in section 4.1.2), and for this, tremendous works have to be done by the authorities and industries related to ports Although AMP Direction General of Merchant Marine, that represents Panama to IMO is the first responsible organization, AMP Port sector, National Maritime Service, Customs, Immigration and ACP should work together towards a new regime of international risk management.

9.3 Nationwide Port Planning Structure

In this section, a hierarchical port planning structure is proposed for effective formulation of the nationwide port development/administration plans by different types/nature of planning targets. The actual port plans of each level need to be discussed in the framework of the port planning structure. In this strategy, three levels of port planning are proposed as follows:

Level 1: Nationwide Port Development Plan
Level 2: Development Master Plans for Selected Ports
Level 3: Feasibility Studies for Priority Development Projects

9.3.1 Nationwide Port Development Plan

Level 1: Nationwide Port Development Plan is one of the most basic planning stages giving general conceptual ideas on the desirable future port system of the country. This stage of port development plan is composed of Nationwide Port Network Plan and Individual Port Development Plans. The concept of overall port administration for AMP headquarters and port management for each different port category is also discussed in this stage.

Nationwide Port Network Plan proposes the basic allotment of various port functions over the entire country by showing a national port network with long-term target planning up to 2024.

Individual Port Development Plans proposes preliminary facility planning for the ports where new investments will be necessary to meet the future port traffic demand up to 2024.

9.3.2 Development Master Plan for Selected Ports

Level 2: Development Master Plans for Selected Ports is designed for formulation of the long term Master Plans for selected individual ports with the target year of 2024. In this stage of port planning, the necessary port facility plans with rough cost estimates are examined together with port administration/management plans for each target port. The target ports for master plan are to be based on selection criteria, which are developed on the basis of National Port Strategy concept. The master plans are composed along the lines of development scenarios of each target port.

9.3.3 Feasibility Study for Priority Projects

Level 3: Feasibility Study for Priority Development Project is for the priority projects selected from the master plan ports and other local ports. This level of study includes the economic, financial and initial environmental analyses and other examinations required to confirm the feasibility of the priority projects. Administration and management aspects of the projects are also to be examined and proposed rather practically to assist the public and/or private entities concerned in playing their appropriate roles for expected functions of the ports.

10. NATIONWIDE PORT DEVELOPMENT

In accordance with the Port Strategy presented in Chapter 9, Section 9.3.1, the National Port development Conceptual Plan (NPDCP) will be proposed as the most basic plan showing general conceptual ideas on the desirable future port system of the country. This stage of port development plan is composed of Nationwide Port Development Plan (NPDP) and Individual Port Development Plans (IPDP). In this chapter, NPDP and IPDP shall be discussed.

10.1 Nationwide Port Development Plan (NPDP)

10.1.1 Summary and Review of Traffic Forecast

Prior to the discussion of the allotment of the function of individual ports, it seems to be worthwhile to review the traffic nationwide. The full explanation of commodity-wise cargo forecast is given in Chapter 8 for nationwide and Chapter 10.4 for the individual ports. The following is the summary and evaluation of the forecasts.

(1) International Cargo Traffic

1) Liquid Bulk import

Table 10.1.1 shows the volumes handled in Panama over the period from 1997 to 2002. Bahia Las Minas, which used to be the largest oil terminal, stopped refinery and, since 2002, has been importing petroleum products only. In 2002, a petroleum terminal in Tabogilla Island in the Gulf of Panama, started it operation and complement the roles of the oil terminal at Bahia Las Minas Port.

Table 10.1.1 Liquid Bulk Domestic Consumption of Liquid Bulk

Unit: ton

Port	1997	1998	1999	2000	2001	2002
Import						
Almirante	20,213	17,920	15,097	3,447	15,619	26,181
Bahia Las Minas	1,822,954	1,357,835	2,893,719	3,044,719	4,165,155	2,352,417
Charco Azul	150	672,128	409,120	267,232	1,588,768	495,331
Chiriqui Grande	0	49,909	0	242,684	71,121	491,442
Panama Port Co.	1,200,000	1,495,088	1,084,096	1,222,511	1,555,744	1,550,000
Sub Total	3,043,317	3,592,880	4,402,032	4,780,593	7,396,407	4,915,371
Export						
Almirante	0	0	0	0	0	0
Bahia Las Minas	273,443	162,325	512,328	237,362	725,747	792,605
Charco Azul	0	516,907	462,349	261,394	1,196,209	546,856
Chiriqui Grande	0	1,798	4,283	258,481	94,072	915,598
Panama Port Co.	1,177,953	1,517,630	1,209,104	1,017,223	1,453,690	1,552,347
Sub Total	1,451,396	2,198,660	2,188,064	1,774,460	3,469,718	3,807,406
Import-Export						
Almirante	20,213	17,920	15,097	3,447	15,619	26,181
Bahia Las Minas	1,549,511	1,195,510	2,381,391	2,807,357	3,439,408	1,559,812
Charco Azul	150	155,221	(53,229)	5,838	392,559	(51,525)
Chiriqui Grande	0	48,111	(4,283)	(15,797)	(22,951)	(424,156)
Panama Port Co.	22,047	(22,542)	(125,008)	205,288	102,054	(2,347)
Sub Total	1,571,708	1,376,300	2,198,871	3,002,686	3,911,070	1,081,784

Source: AMP Statistics
Note: ( ) indicates the value is negative

Among these ports in Table 10.1.1, Almirante and Bahia Las Minas Ports imported petroleum for domestic consumption, while Charco Azul, Chiriqui Grande Ports handled transshipment with a pipeline interconnecting these two ports and Panama Port Company handled bunker oil for the Canal Transit Ships. Thus, the domestic petroleum consumption in Panama is calculated as the difference between the import and export volume at Almirante and Bahia Las Minas Ports. Table 10.1.2 shows the volume of the petroleum products consumed in the domestic market in Panama.

Table 10.1.2 Domestic Consumption of Petroleum Products

Unit: ton

Port	1997	1998	1999	2000	2001	2002
Import						
Almirante	20,213	17,920	15,097	3,447	15,619	26,181
Bahia Las Minas	1,822,954	1,357,835	2,893,719	3,044,719	4,165,155	2,352,417
Sub Total	1,843,167	1,375,755	2,908,816	3,048,166	4,180,774	2,378,598
Export						
Almirante	0	0	0	0	0	0
Bahia Las Minas	273,443	162,325	512,328	237,362	725,747	792,605
Sub Total	273,443	162,325	512,328	237,362	725,747	792,605
Import-Export						
Almirante	20,213	17,920	15,097	3,447	15,619	26,181
Bahia Las Minas	1,549,511	1,195,510	2,381,391	2,807,357	3,439,408	1,559,812
Sub Total	1,569,724	1,213,430	2,396,488	2,810,804	3,455,027	1,585,993

Source: AMP Statistics

The relation ship between the domestic consumptions of petroleum products and GDP (1982 Price) over the period is exhibited in Figure 10.1.1. The best fit regression equation is given as Eq. (10.1).

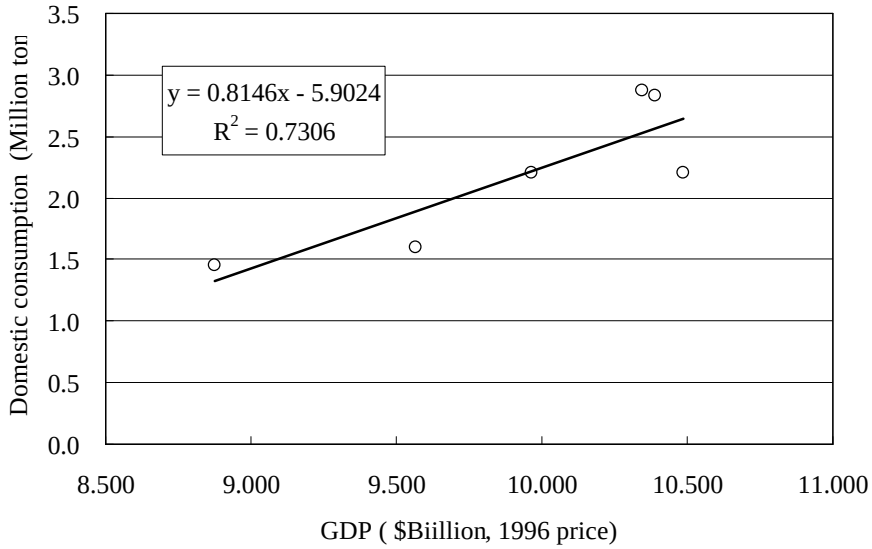


Figure 10.1.1 Domestic Consumption of Petroleum Products vs GDP

$$Y = 1.4379X - 8.1914 \quad \text{..... (10.1)}$$

where,

Y: annual domestic consumption of petroleum products (in Million ton), X: GDP of Panama (in USD Billion).

The GDP values from 1997 to 2002 and the GDP forecasts value in the year 2024 are as shown in Table 10.1.3. In the table all the GDP values are in 1982 price.

Table 10.1.3 Population and GDP of Panama

Year	1996	1997	1998	1999	2000	2001	2002	2024
Population (1,000)	2,726	2,781	2,837	2,893	2,948	3,004	3,060	4,193
GDP (USD Million, 1996Price)	8,519	8,874	9,564	9,966	10,345	10,388	10,486	24,373
GDP/Capita (USD 1,000, '96 Price)	3.125	3.191	3.371	3.445	3.509	3.458	3.427	5.813

Since the consumption volumes widely vary year by year, for the purpose of the regression analysis, the consumption volumes in Table 10.1.2 was smoothed with Eq. (8-2).

$$\begin{aligned} Y_i &= Z_{i-1} + 2 \mathbf{x} Z_i + Z_{i+1} \quad \text{for i = 1998, 1999, 2000, 2001} \\ Y_{1997} &= 2 \text{ x } Z_{1997} + Z_{1998} \\ Y_{2002} &= Z_{2001} + 2 \text{ x } Z_{2002} \end{aligned} \quad \text{..... (10.2)}$$

where,

Zi: Consumption volume in the year i, Yi : smoothed data for the year i.

Equation (10.1) yields the estimate volume of the domestic consumption of petroleum products in the year 2024 to be 13.95 million tons when the national GDP grows to 24,373 million (in 1996 price).

This estimate volume is 2.4 times as large as the sum of the volumes imported at Almirante, Bahia las Minas, Charco Azul and Chiriqui Grande Ports in 2001 (5.84 Million ton): it is assumed that the petroleum imported by the Panama Port Company is outside domestic market.

2) Dry Cargoes

i) Import Dry Cargoes

Table 10.1.4 is the summary of the dry cargo import of Panama over the period from 1997 to 2001 and the forecast in 2024. As a potential cargo, the fertilizer import from Costa Rica via land route is also included in Table 10.1.4.

As shown in the table, the total dry cargo import will increase by 3.26 times as large as that in 2001, while the population will increase by 1.33 times and the GDP by 2.35 times.

Table 10.1.4 Import Dry Cargo Volumes

Total Import Cargo	1997	1998	1999	2000	2001	2024	2024/2002
Wheat	102,000	126,000	114,000	123,000	111,000	210,000	1.89
Maize, Soya Beans	235,460	319,091	230,768	374,604	418,966	1,400,000	3.34
Fertilizer (Aguadulce)	n.a	35,670	37,241	44,672	49,477	104,000	
Fertilizer (Pedregal)	n.a	15,186	30,529	6,800	8,224	56,000	3.61
Fertilizer (Costa Rica)	n.a	26,274	39,348	23,989	14,375	100,000	
Break Bulk	313,186	39,348	185,288	54,577	92,755	200,000	2.16
Clinker	n.a	n.a.	318,208	177,939	103,329	340,000	3.29
Container	281,442	231,952	290,799	323,408	429,177	1,543,827	3.60
Total Import Cargo	932,088	767,247	1,206,833	1,105,000	1,212,928	3,953,827	3.26
Population	2,781,457	2,836,979	2,892,501	2,948,023	3,004,108	4,193,342	1.40
Dray Cargo Vol. ton/ Capita	0.335	0.270	0.417	0.375	0.404	0.943	2.34

In general, the per capita import dry cargoes i.e., the total import cargo volume except liquid bulk cargo, increases as the per capita GDP of the country. There are some factors that increase or decrease the volumes of import dry bulk cargoes via sea ports. There are countries where the transshipment and transit cargoes are handled at their ports and where export oriented processing industries are flourishing tend to import larger volume of dry cargoes, while there are countries where agro-industry is flourishing enough to support domestic consumption and where the cross boarder trade is substantial tend to import fewer amount of dry cargoes. Taking into considerations of these factors, it seems that there is an universal relationship between per capita volume of import dry cargo and per capita GDP. Figure 10.1.2 was drawn in the reference[1)] for those countries which do not have remarkable elements that increase or decrease dry cargo imports. Panama is one of about 40 countries that fall on this category, and it appears at the location indicated with filled circle in the figure. According to the report, in 1989, the per capita GDP of Panama was USD 1,800 and per capita import dry cargo was 0.274 tons (World Bank Statistical Report). In Figure 10.1.2, Panama falls on below the line, which indicates the average relationship between the two factors over 44 countries. The import dry cargo volume per capita of Panama is smaller than that is given by the average relationship that is given by Eq.(10.1).

$$Y = 0.2595\ X^{0.8049} \quad \text{..... (10.1)}$$

where,

Y: Per Capita import dry cargo volume (ton), X: per capita GDP (USD 1,000, 1989 Price).

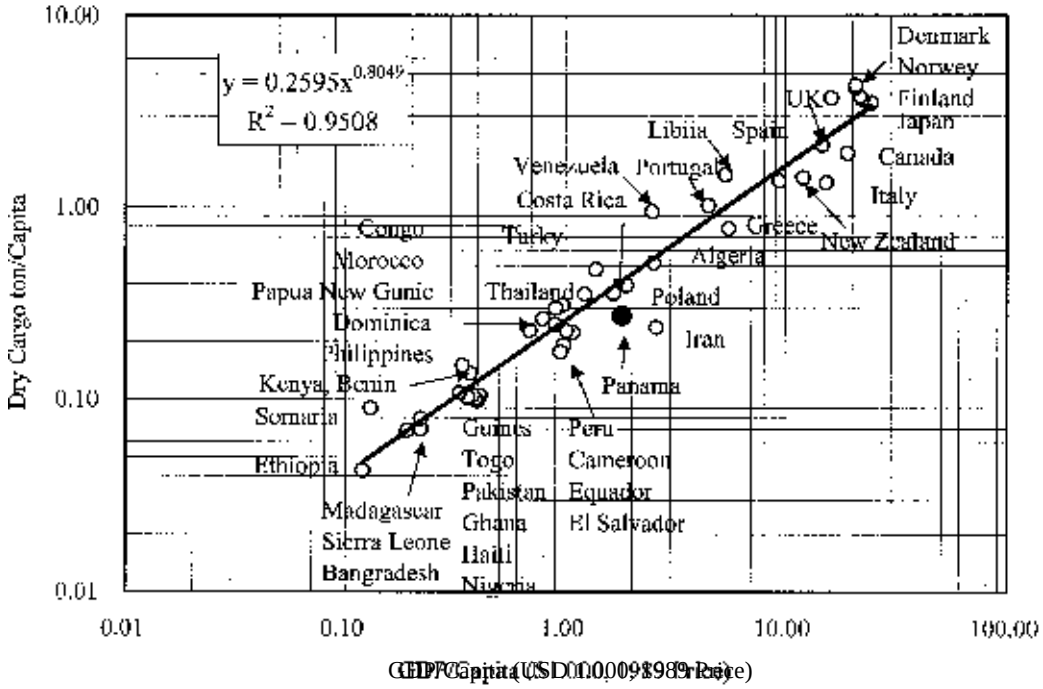


Figure 10.1.2 Per Capita Dry import cargo vs. GDP (in 1989 Price) [147]

It seems that, in Panama, the self supply of food has been quite substantial except for wheat and that the service (tertiary) industries have been prosperous while the secondary industry which involves import and export cargo has been less flourishing. In addition, there is a cross boarder trade between Costa Rica. These elements might be some of the reasons the per capita import dry cargo has been a little smaller in comparison with many other countries having the similar level of per capita GDP.

Coupled with the GDP per capita. the import dry cargo volumes per capita were plotted in the same manner as Figure10.1.2 for the year 1999, 2000, 2001 and 2024 forecast (see Figure 10.1.3). It is observed In Figure 10.1.3 that, while the per capita import dry cargo volumes in 1999, 2000 and 2001 are still lower than the line given by Eq. (10.1), the per capita import dry cargo volume is almost the same as is observed in those countries having the same level of par capita GDP. This implies that, in 2024, the economic structure would have changed from the service sector dominant structure to another economic structure where the primary and the secondary industry sectors, which require more imported dry cargoes, will have larger contribution in the national economy.

[147] Yukio Nishida, Koji Kobune; "On project evaluation in port planning in developing countries", 29th Permanent International Association on Navigation Congress, Session II-1, 1997

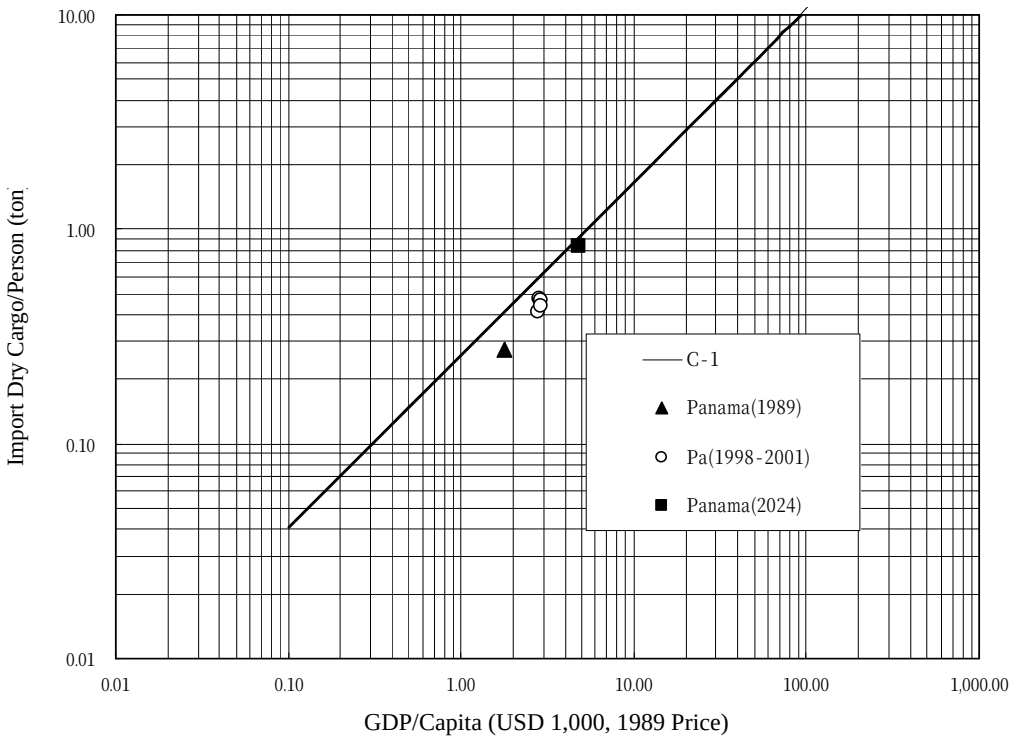


Figure 10.1.3 Per Capita Import Dry Cargo Volume vs. Per Capita GDP in Panama

ii) Export Cargoes

The export cargoes are bananas at Almirante and Chiriqui Grande Ports, sugar at Pedregal and Aguadulce Ports and break bulk and container cargoes at Balboa and Private terminals at Colon.

The volumes are shown in Table 10.1.5 together with the forecast volumes in 2024. While the container cargoes expected to grow, other traditional export commodities, i.e. bananas and sugar exports seem to remain unchanged.

Table 10.1.5 Export Cargoes of Panama

(Unit: ton)

Export	1996	1997	1998	1999	2000	2001	2002	2024	2024/2002
Sugar	47,000	62,000	66,000	34,000	67,000	36,000	38,000	50,000	1.32
Break Bulk(Banana)	719,112	686,169	628,161	586,027	726,209	629,531	518,000	400,000	0.77
Container	103,000	150,000	166,000	425,000	301,000	274,000	350,000	2,017,000	5.76
Grand Total	869,000	898,000	860,000	1,045,000	1,094,000	940,000	906,000	2,467,000	2.72

The volume of the export container cargoes was estimated on the basis of macroscopic regression analysis between the national GDP and the container export volumes over the past seven years. The commodity-wise cargo forecast yielded the export volume of the agricultural and fishery products (See Chapter 13.2.2.) The results are summarized in Table 10.1.6.

As seen in Table 10.1.6, the total export volume of the agricultural and fishery products is estimated to be 860,000 tons (2024). This volume accounts for 43 % of the total export container cargo volume of 2,017,000 tons in 2024. The share of the vegetable and livestock in 2002 within the commodities that are supposedly exported in containers was 55.5%, and the rest of 44.5% consisted of manufacturing products. Since Commodities shown in Table 10.1.6 do not cover all the export volume of agriculture and fishery products in Panama, and the manufacturing sector is also expected to grow towards 2024, the estimate volume of export container cargos seems to be reasonable.

Table 10.1.6 Export volume of agricultural and fishery products in 2024

Commodity	2024 export ton
Melon	193,000
Watermelon	109,000
Pumpkin	114,000
Plantain, Name,Yuca, Otoe	236,000
Coffee	5,000
Cattle	112,000
Egg	10,000
Fishery Pruduct	71,000
Shrimp	10,000
Total	860,000

Table 10.1.7 Commodity Share in the export container cargoes in 2002

Export by commodity group	2002		
Exclude Oil, Banana, Sugar	Gross Weight(t)	Share	
Total	472,705	100.0%	
Vegetables,Fruits(Except Banana)	163,563	34.6%	55.5%
Livestock&Animal Products	98,747	20.9%	
Food Products, Beverages	54,375	11.5%	
Wood/Charcoal/Cork Manufactures	31,688	6.7%	
Fats&Animal/Vegetable Oil	14,267	3.0%	44.5%
Paper Manufactures, Waste Paper	24,244	5.1%	
Metal Manufactures	23,092	4.9%	
Other Manufactured goods	30,593	6.5%	
Other	32,136	6.8%	

iii) International container transshipment

Balboa Port and the container terminals are handling container transshipment and containers to and from Colon Free Zone. In the Port statistics these containers are separately recorded from local container cargoes, i.e. import and export containers of Panama.

The transshipment containers are estimated as shown in Table 10.1.8, while the countries of origin and destinations of these transshipment containers are shown in Table 10.1.9 together with their share. The containers to and from Colon Free Zone is shown Table 10.1.10.

The volumes of the transshipment container cargoes and the container cargoes to and from Colon Free Zone were estimated from the regression analysis between the total GDP of the countries of origin and destination and the historical record of respective container cargo volumes. In 2024, it is expected the transshipment container cargoes will reach 43 million tons, while the Containers related to Colon Free Zone will reach 5.4 million. The major countries of origin and destination of the transshipment containers are Columbia and Venesuela, which are the closest countries to Panama..

Table 10.1.8 Transshipment Containers at Balboa and Colon

	Container Transshipment Cargo (1,000 ton)							
Year	1996	1997	1998	1999	2000	2001	2002	2024
Volume	2,466	3,860	5,573	6,337	6,733	8,727	9,517	42,850

Table 10.1.9 Countries of Origin and Destination of the Transshipment Containers

	Country of ogigine and destination and Volume Share (%)								
Share	Argentina	Brazil	Chile	Columbia	Costa Rica	Peru	Trinidad Tobago	Venesuela	Other
2000	7.9	2.8	3.8	19.5	7.8	1.8	14.4	19.4	22.6
2001	0.4	5.1	10.0	43.1	6.5	5.8	0.1	13.0	16.0

Table 10.1.10 Containers to and from Colon Free Zone

	Colon Free Zone							
Year	1996	1997	1998	1999	2000	2001	2002	2024
Import	515,996	633,995	797,642	855,316	886,132	604,028	670,170	
Re-export	244,974	368,326	578,647	758,282	778,228	694,351	635,903	
Total	760,970	1,002,321	1,376,289	1,613,598	1,664,360	1,298,379	1,306,073	5,428,000

2) Domestic Cargo and Passengers

1) Panama - Darien and Panama Island Routes

Currently, Panama Port is the regional hub of the maritime routes to the coastal communities in Darien Province and on the islands in Gulf of Panama. The cargoes are transported between Panama Port and these communities. Table 10.1.11 shows the cargo traffics by the sea routes to Darien Province, while Table 10.1.12 shows those by the routes to the islands.

In these tables, the cargo forecast volumes in 2024 are also exhibited. The assumptions employed in the cargo forecast are as follows:

i) The cargo volumes in Darien sea routes should increase at the annual rate of 10%, which is the average cargo growth rate observed over the period from 1998 to 2002.

ii) The cargo volumes shipped from Panama Port to the islands should increase proportionally to the population growth rate of Panama Province (1.83%), while the cargo volumes brought from the islands to Panama Port should be 15% of the above mentioned shipped cargo volumes: most of the return cargoes are assumed to be empty bottles.

Table 10.1.11 Cargo Traffic in Darien Routes

(Unit in ton)

	Loading at Panama Port					Unloading at Panama Port				
Year	1998	2000	2001	2002	2024	1998	2000	2001	2002	2024
La Palma	1,134	432	107	1,334	9,872	604	284	88	581	4,300
El Real	-	-	-	76		199	-	77	46	
Yaviza	271	1,181	632	667		112	767	303	536	
Camoganti	116	79	10	-		38	15	4	-	
Sub-total	387	1,260	642	743	5,498	349	782	384	582	4,307
Garachine	44	-	779	1,634		38	-	162	1,059	
Sambu	1,280	2,270	1,091	183		764	1,155	449	54	
Jaque	1,034	1,489	1,484	2,151		634	904	564	1,041	
Puerto Pina	-	65	15	14		-	80	21	17	
Sub total	2358	3824	3369	3982	29,468	1436	2139	1196	2171	16,066
Chiman	24	43	-	26	192	36	54	-	11	81
Total	3,859	5,559	4,118	6,085	45,031	2,425	3,259	1,668	3,345	24,754

Source: Port Statistics, AMP

In addition to the cargo traffic, there are regular passenger services in the island routes; Balboa - Taboga Island and Balboa - Contadola Island.

Table 10.1.12 Cargo Traffic in the Routes to the Islands

	Loading at Panama Port					Unloading at Panama Port				
Year	1998	2000	2001	2002	2024	1998	2000	2001	2002	2024
Contadora	2,367	2,309	1,718	1,858		161	254	235	438	
San Miguel	679	584	744	562		173	93	142	271	
La Esmeralda	-	-	108	314		-	-	13	94	
La Guinea	-	-	138	117		-	-	14	28	
Pedro Gonzalez	-		165	222		-	-	14	7	
Saboga	-	18	34	-		-	1	21	-	
Taboga	24	145	324	616		6	74	25	1	
Taboguilla	-	46	-	-		-	-	-	-	
Total	3,070	3,102	3,231	3,689	6,000	340	422	464	839	1,000

2) Coquira and Coastal Community

The passenger traffic at Coquira Port is shown in Table 10.1.13. The passenger traffic at this port seems to be proportional to the population of the coastal communities. Thus the traffic volume has been assumed to grow at the annual growth rate of 1.83 %, i.e. the population growth rate of Panama Province. In 2024, the passenger traffic is expected to reach 60,000.

Table 10.1.13 Passenger Traffic at Coquira Port

Year	1997	1998	1999	2000	2001	2002	2003	2024
Embark	12,335	12,751	15,941	17,943	20,018	12,643	14,995	22,000
Disembark	12,335	12,751	15,941	17,943	20,018	12,643	14,995	22,000
Total	24,670	25,502	31,882	35,886	40,036	25,286	29,989	44,000

The cargoes delivered to the coastal communities are also carried with the passengers by the small crafts. Aside from these passenger crafts, the port has occasionally been called by cargo ships that brought logs/woods from Darien Province and livestock from other side of Bayano River. Fish catches are also brought to the port by local fishing boats. The volumes of these commodities handled in recent years are as shown in Table 10.1.11.

Table 10.1.14 Cargo Traffic at Coquira Port (Unit: ton)

Year	1999	2000	2001	2002	2024	Ship used
Unloading						
Logs/Woods	2,162	941	345	340	Tends to decrease	Cargo ship (Max. 80GT)
Livestock	151	123	628	510	Max. 1,000	Barge
Fish	12	306	475	53	Max. 500	Local fishing boat
Sub Total	2,325	1,370	1,448	903	1,500	
Loading						
Miscellaneous	10	76	25	3		
	10	76	25	3	100	Passenger crafts
Total	2,335	1,446	1,473	906	1,600	

Logs and woods seemed to be brought from coastal communities in Panama Province and the volume tends to decrease. The livestock has been brought from cattle farms on the other side of the river with barges. Taking into consideration of the fact that there is no highway on the other side of the river, the scale of the cattle farming will remain as same as at present. Thus, the volume of livestock in 2024 is supposed to be less than 1,000 tons. Likewise, the fish catch brought by local fisher folks remain as the same amount as it is observed at present, because the number of fishing boats will not increase because of the ship registry policy of AMP to preserve marine resources and limit the fishing license.

3) Vacamonte Port

The cargo volumes handled in recent years at Vacamonte Port are shown in Table 10.1.15. It is observed that the fish catch brought by foreign tuna boats has been increasing, while that brought by domestic commercial fishing boats remain at the same level. The foreign tuna boats used to dock at Balboa Ports, and after the privatization of the Balboa Port in 2000, they tend to dock at Vacamonte for unloading tuna and other fish catch and for supply. Tuna boats no longer dock at Balboa port, because it has been fully specialized for container handling. Thus, the number of tuna boats calling Vacamonte Port has increased drastically from the year 2000 to 2002. The reason must be the lift of an international ban imposed on Panama in relation of dolphin catch (not intentional but) by use of long line to catch tuna. In 2003, by the end of July, 132 tuna boats called on Vacamonte Port. The relocation of tuna boat from Balboa Port to Vacamonte seems to complete, it is unlikely, however, that the tune boat call keeps increasing in the coming years. It seems to be realistic to assume the tuna boat calls will not exceed 300.

Table 10.1.15 Cargo Traffic at Vacamonte Port

Unit: ton

Year	1998	1999	2000	2001	2002	2024
1. Foreign Tuna Boat						
Tuna	1,667	2,171	1,593	1,452	4,077	
(Ship Calls)			(80)	(122)	(195)	Max. 300 calls
Other fish	355	1,597	2,268	9,019	5,949	
Sub-total	2,022	3,768	3,861	10,471	10,026	
2. Unloading Domestic commercial fishing boat						
Shrimp	12,555	11,608	8,348	8,003	6,117	
Tuna	0	200	276	81	557	
Other fish	5,581	3,675	2,577	9,362	11,522	
Sub-total	18,136	15,483	11,201	17,446	18,196	Max. 20,000
Total	20,158	19,251	15,062	27,917	28,222	

Source: AMP Port Statistics

While foreign tuna boat calls has been increased, the shrimp unloading from domestic fishing boats has been drastically decreased, though the total unloaded volume was regained due to the increase of the volume of other fish. The unloaded volume of fish catch is not expected to increase in the future, because of the AMP's policy to preserve marine resources. Thus, the unloaded volume from domestic fishing boats will be less than 20,000 tons.

4) Aguadulce

There is no domestic shipping service.

5) Mensabe Port

The traffic in the recent years at Mensabe Port is shown in Table 10.1.16. The port is used by about 70 fishing boats to unload their fish catch. On the average, a boat made 10 calls per year and brought 7 tons of fish catch. The port is used by the regular local users. The traffic at the port seems to remain unchanged, since the same port users are expected to use the port and the volume of their fish catch is unlikely to increase because of the regulatory measure to preserve marine resources.

Table 10.1.16 Traffic at Mensabe Port

Year	1998	1999	2000	2001	2002	2024
Unloading						
Fish Catch (ton)	515	91	213	471	456	Remain
Number of Ships				75	71	unchanged
Port Calls				711	632	

Source: AMP Port Statistics

6) Mutis Port

Mutis port is also used by regular users, which are fishing boats and small passenger crafts. AMP's statistics shows cargo traffic only. There is no statistics of passenger traffic. In 2001, 122 fishing boats made 692 calls (see Table 10.1.17).

Table 10.1.17 Traffic at Mutis Port

Year	1998	1999	2000	2001	2002	2024
Unloading						
Fish Catch (ton)	216	156	131	106	66	Remain
Number of Ships				122		unchanged
Port Calls				692		

Source: AMP Port Statistics

Of the 122 fishing boats, about 40 boats called more than 10 times. The port will remain to serve its regular users. The traffic of fishing boats seems to remain unchanged, while the passenger traffic may increase as the tourism in the Coiba Island and other places in the region is promoted.

7) Pedregal Port

There is no domestic shipping service at Pedregal Port.

8) Puerto Armuelles Port

Table 10.1.18 shows the ship calls in the recent years. Puerto Armuelles Port was called by three types of ships: foreign general cargo ships, tuna boats and domestic shrimp boats. The general cargo ships called on the port on the way from Ecuador to Chile and, on the average unloaded about 50 tons of commercial goods, while tuna boats called on the port for supply. The domestic shrimp boats also stopped by at the port for supply.

It is observed that the tuna boat calls has been increasing.

Table 10.1.18 Traffic at Puerto Armuelles Port

		Ship size	2001	2002	2003 Jan.-Jun.
International					
General Cargo ship	Ships	150 GRT	3		6
	Calls		20		18
Tuna	Ships	100 - 2000 GRT	4	21	23
	Calls		6	39	29
Domestic					
Shrimp Boat	Ships		31	33	15
	Calls	50-120 GRT	98	77	16

9) Chiriqui Grande Port

The Roll-on/Roll-off ferry stopped operation in 2000.

10) Bocas del Toro and Almirante Port

The cargo and passenger traffic in the recent years at Bocas del Toro and Almirante Ports are shown in Table 10.1.19. The Forecast of Cargo and Passenger Traffic in 2024 is also indicated in the Table.

Table 10.1.19 Cargo and Passenger Traffic at Bocas del Toro and Almirante Port

Year	1998	1999	2000	2001	2002	2024
Bocas del Toro (Cargoes, ton)						
Unloading	2,388	5,743	7,489	8,524	10,967	89,000
Loading	468	5,108	7,169	7,746	9,967	80,000
Passengers						
Bocas del Toro			125,378	246,244	255,164	1,590,000
to/from Almirante						660,000
to/from Changuinora						340,000
to/from islands						590,000
Almiramte	9,398	7,321	6,265	13,246	14,162	660,000
Source: AMP Statistics						

10.1.2 National Port Network in the Future

In general, the major roles and functions of the individual ports of existing port system of Panama will remain unchanged, i.e. the classification by the roles and functions of ports described in **Chapter 6.1** generally remains the same over the coming decades.

(1) General Overview of the Functions of Ports in Panama

1) Canal Area International Container Ports（Future Container Traffic and Facility Requirement)

The activities of International container ports in Canal Area will be further expanded to a logistic center with the support of the policies of the government, “Compíte Panama”, as well as the National Maritime Strategy.

A trial study on the future international container traffic and the potential requirement of container handling facilities in the Canal area shows that in total 3-4 fully equipped new container terminals for mother/feeder vessels may be required to handle 1.5 million TEUs out of total about 6.7 million TEUs container traffic demand in/around the Canal area in the year of 2024.

While dramatic increase of the maximum traffic capacity of the Canal may not be expected under the current severe conditions on the technical, economic and financial issues, it is considered clear that feasibility of the above mentioned new container terminal projects will not be jeopardized at least by available capacity of the Canal, because the additional amount of container vessel traffic through the Canal to be generated by the projects may not be large enough to have any adverse effects on the total capacity of the Canal.

2) Industrial ports (functional diversification)

The activities of the industrial ports that are presently operated by private companies will be diversified with the efforts of AMP to maximize the use of resources. This trend is seen especially at Bahia Las Minas Port and Puerto Rodman when the Colon Free Zone Multimodal Center and Howard Multimodal Hub Projects proceed respectively. Likewise, the terminals of PTP in Charco Azul and Chiriqui Grande are expected to diversify their services: at present, the former terminal handle petroleum products only while the latter handles bananas only.

3) Domestic Port

The role of Panama Port will become more important as a hub port of domestic shipping service to Darien and islands in Panama Bay, while the on-going project "Panama City Coastal Development Plan" will restrict the loading and unloading cargoes at the port. Thus, it is required to find another regional hub port near Panama City. From the viewpoint of proximity to Panama City, Vacamonte port and Coquira ports can be the candidate ports to be the alternative port to Panama Port.

With the new wharf at La Palma and Quimba that are to be completed in 2004 by IDB fund, these ports are expected to expand further their roles as the local hub to serve coastal communities.

(2) Traffic Forecast and the Capacity of the Existing Ports

The roles and functions of the port shall be discussed in the light of the traffic forecast and capacity of the existing ports.

Table 10.1.20 is the summary of the future traffic forecast of international cargoes, which was discussed above and the capacity of the existing port, which was discussed in **Chapter 6.3**. Table 10.1.21 is prepared in the same manner for the domestic cargo and passenger traffic.

1) International Cargoes

As observed in Table 10.1.20, the import volume of liquid bulk in 2024 (13.95 million tons) exceeds the maximum import volume over the past few yeas (6.27 million tons). Thus, the petroleum terminals need expansion of their capacity.

Bananas will be exported at Almirante and Chiriqui Grande Port, both of which are private ports. Since export volume is expected to remain at the present level, the port facilities have enough capacity in 2024. For the import of wheat, maize and soya beans, the importers have a plan to construct a bulk terminal at Cristobal Port to cope with the increase in the import of bulk cargoes.

Import of fertilizer is also expected to increase at Aguadulce and Pedregal Ports. It is also expected that the volume of fertilizer import from Costa Rice will increase. Located in the middle of the plain rich in agricultural products, Pedreag and Aguadulce Port will be importing more fertilizer. However, the capacities of the existing facilities are still enough to handle the cargo volume in these ports.

Major commodities of break bulk cargoes are automobiles and construction materials and equipment. These import commodities will be handled at Balboa and Cristobal Ports.

Container cargoes are expected to increase substantially. The private container terminals at Balboa and Colon are expanding their capacity and, when all their plans are completed, the total container handling capacity is estimated to be seven (7) million TEU's, or 52 million tons in terms of weight. With the flourishing container terminals at national principal ports, the volume

of local containers in 2024, i.e. import and export containers of Panama, accounts for only 6% of the total capacity.

2) Domestic Cargoes and Passengers

The comparison between the domestic traffic forecast and the capacity of the existing ports is shown in Table 10.1.21.

As indicated in the Table, there are three outstanding issues:

- Panama Port will soon be closed for cargo handling,
- The passenger boat landing facility at Balboa Port is requested to be relocated for the Container Terminal expansion.
- Puerto Armuelles Port is time worn and damaged. In addition, the structure of the pier does not suitable for the users; general cargo ships of smaller size and tuna and shrimp boats, and
- There are no public port facilities for passengers at Bocas del Toro and Almirante Ports

Except for these ports, the existing facilities have enough capacity to cope with the future traffic demands.

Table 10.1.20 Future Cargo Traffic and Capacity of the existing Port Facilities (International Port)

Liquid Bulk import	Bahia Las Minas Charco Azul Chiriqui Grande Almirante Total	 19,860,000				**19,860,000**	Bahia Las Minas Charco Azul Chiriqui Grande Almirante Total	4,165,000 1,588,000 491,000 26,000 **6,270,000**
Dry Cargoes								
Wheat	Cristobal (Private)	210,000				210,000	New Dry Bulk Terminal at Cristobal	
Maize & Sotya Beans	Cristobal (Private)	1,035,000				1,035,000	New Dry Bulk Terminal at Cristobal	
Fertilizer	Aguadulce Pedregal Costa Rica (Over land)	85,000 64,000 64,000	Sugar	Aguadulce Pedregal	30,000 20,000	115,000 84,000 64,000	Aguadulce Pedregal	120,000 120,000
Break Bulk	Balboa & Cristobal(Private)	200,000	Banana	Almirante (Private) Chiriqui Grande (Private) Sub-total	300,000 100,000 400,000	600,000		
Clinker	Bahia Las Minas (Private)	300,000				300,000	New Dry Bulk Terminal at Bahia las Minas	
Container	Balboa & Colon (Private)	1,544,000	Container	Balboa & Colon (Private)	2,017,000	3,561,000	Balboa & Colon (Private)	**51,800,000**
Total Dry Cargo		3,502,000			2,467,000			
Total of International	Total Import	23,362,000		Total Export	2,467,000	25,829,000		
Container Transshipment Colon Free Zone						42,850,000 5,428,000		
Container cargo Total						51,839,000		

Table 10.1.21 Future Cargo Traffic and the Capacity of the Existing Port Facilities (Domestic Traffic)

Port	Route to/from	Loading ton	Unloading ton	Ship calls	Capacity ton/Passengers
La Palma	Panama	4,300	9,872		Fixed Pier 65,700 ton
Coquira	Chiman	200	100		
	Coastal Community	100	1,500		
Passenger	Coastal Community	22,000	22,000		140, 000 passengers
Panama	La Palma	9,872	4,300		**To be closed**
	Other Port near La Palma	5,498	4,307		**for cargo handling**
	Pacific Coast of Darien	29,468	16,066		
	Islands in Gulf of Panama	6,000	1,000		
Balboa (Passenger)	Passengers to the Islands				**To be relocated**
Vacamonte	Foreign Tuna Boat		15,000	300	29,200 ton
	Local shrimp & fish		20,000		39,420 ton
Mensabe	Fishing Boats		500	700	3,650 ton
Mutis	Fishing Boats		200	700	14,600 ton
Puerto Almuelles	Foreign Commercial			40	Existing pier is time worn
	Foreign Tuna boat			60	and damaged. Also too
	Local Fishing boats			100	big for the calling ships
Bocas del Toro					
Cargo	Almirante	80,000	89,000		262,800 ton
Passenger	Almirante	330,000	330,000		**No public facilities**
	Changuinola	170,000	170,000		
	Island	390,000	390,000		
Almirante					
Cargo	Bocas del Toro	89,000	80,000		262,800 ton
Passenger	Bocas del Toro	330,000	330,000		**No public facilities**

(3) National Port Network

1) International Trade

The existing system, which is schematically exhibited in Chapter 6.1, Figure 6.1.9, will sustain the international trades. However, some enhancement is required.

i) Petroleum terminals at Bahia las minas, Charco Azul and Chiriqui Grande

In 2024, the import volume of liquid bulk will reach 14 million tons, which is larger than double the maximum volume handled in the past. The petroleum terminals need to expand their capacity.

ii) Fertilizer import at Aguadulce and Pedregal Ports

The capacity of Aguadulce Port need to be maintained. In addition, due consideration should be given to the act that cross-boarder import of fertilizer from Costa Rica will reach substantial amount. Unless the two ports are not well maintained, The fertilizer import tends to shift to land route from Costa Rica.

iii) The dry bulk cargoes

The dry bulk cargoes such as Wheat, Corn and Soya beans have been handled at Balboa Port. However, the port is being specialized to Container port, and the multi-purpose berth having a

draft of -12 m will be closed for bulk cargo handling. Since late 2003, the Panama Port Company gives priority to container carriers for berthing at the multi-purpose berth. Thus, another berth having a shallower draft, which was formerly used for petroleum products, is the only available berth for bulk cargoes.

Now, a group of importers of dry bulk dry bulk lead by Melo, the largest grain importer, is planning to construct a new dry bulk terminal at Cristobal Port in accordance with the suggestion of PPC. When the new dry bulk terminal is completed, the capacity of handling will be expanded to cope with the future increase in the export volume.

However, it should be noted that the project of the construction of the dry bulk terminal was proposed under such circumstance that the importer had no other choice. This situation indicates the fact that the private port operators tend to focus on more profitable business rather than services for the public. It is the concern of the study team that the costs of the construction of the unloading and stocking facilities and the land transportation from Colon to Pacific side would be imposed on the importers. This, in turn, may push up the price of wheat flours, corns, soya beans, etc.

While the Panama Maritime Strategy aims at the further promotion of the container transshipment business among others, it is also the responsibility of the AMP to monitor the impact on other businesses, and when some adverse effects observed, AMP is also responsible to take action to mitigate these effects.

iv) International container transshipment ports

The total container cargo volumes will increase to 51.8 million tons. (see Table 10.1.20):

Import container cargoes :	1.54 million tons
Export container cargoes:	2.02 million tons
Transshipment container cargoes:	48.28 million tons
Total:	51.84 million ton

The total capacity of the container cargo handling at the existing and planned international container terminals has been estimated to be 51.8 million tons or 7.4 million TEU (See Table 6.3.1), and the total container cargo volumes estimated in 2024 is similar to the capacity. However, the container terminals have to handle empty containers as well as loaded containers. It is generally observed that about 30 % of containers handled in container terminals are empty. Thus, taking into consideration of empty container volumes, about 2.2 million TEU will overflow the capacity: in this calculation, it is assumed that, on the average, one TEU contains 7 metric of cargoes, and the volume of the empty containers are calculated as 51.84 million ton/ 7 tons x 0.3 = 2.2 million TEU.

Thus in the year 2024, about four additional full container berths will be needed to cope with the container cargoes handled at Panamanian ports.

On the basis of above discussion, the international cargo flow in the year 2024 is schematically exhibited as shown in Figure 10.1.4.

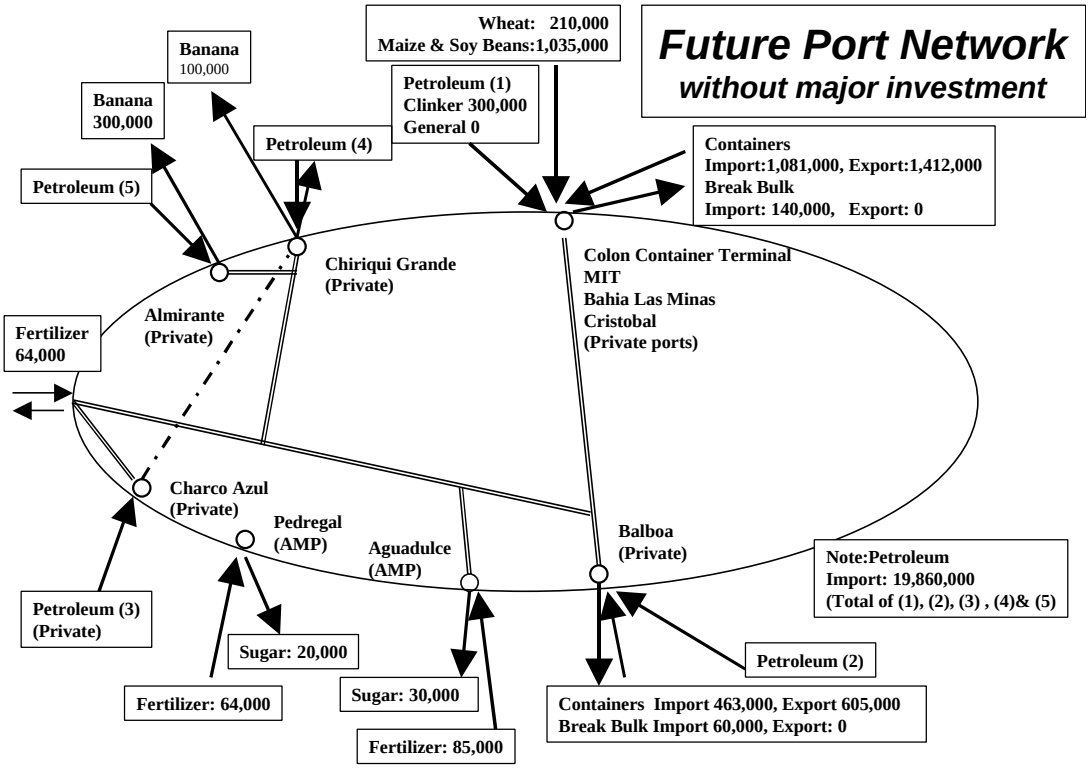


Figure 10.1.4 International cargo flow in Panama (2024)

2) Domestic Trade

i) Alternative Port to Panama Port

Panama Port has been playing an important role to provide accesses to the coastal communities in Darien and the island in Gulf of Panama, its closure for cargo traffic will cause a great impact on the existing maritime transport network and then, of course, the activities of these communities. It is expected that, after Pan-American Highway is fully improved and the inter-modal connection between Quimba and La Palma are completed, the existing coastal shipping route between La Palma and Panama will be taken over by the land route via inter-modal service between La Palma and Quimba. However, even with the highway improvement, there are still some coastal communities that do not have land access to La Palma, namely, Jaque, Garachine, El Real, etc. The impact of the Panama Port closure is serious for the communities on Perlas islands and other islands in Gulf of Panama. Thus, it is quite urgent for AMP to provide an alternative port to Panama Port.

From the viewpoint of proximity to the existing Panama Port in Panama City, Vacamonte and Coquira Ports are the candidates. On the basis of the analysis and discussion of the advantages

and disadvantages of the two ports as the alternative ports to Panama Port, the Study Team recommends Coquira Port, because of the following reasons:

a) The major user of the alternative port is the cargo ships going to the islands and the cargo volume is forecasted to be 6,000 tons to the islands and 1,000 tons back to Panama City in 2024. The traffic is too small to construct new commercial port facilities at Vacamonte Port.
b) Vacamonte Port is specialized as a fish port and it also wants more space for expansion of private businesses: ship repair, tuna handling, fish processing.
c) The present users of Vacamonte Port rather prefer to maintain the port as the specialized fish port.
d) Perlas islands are closer from Coquira Port than from Vacamonte Port.
e) Coquira Port is occasionally called by cargo ships and need docking facility for these cargo ships.
f) Coquira Port is located in a river where the water depth of four (4) m is ensured with out maintenance dredge, and no breakwater is needed.
g) Though Coquira Port is an hour and half distant from Panama City to the east, the industrial and commercial areas have been expanding eastward.

ii) Relocation of Passenger Boat Landing in Balboa Port

Some of possible alternative landing places are a private tourist port at Amador area and Panama Port: the former is an appropriate port facility for the passenger boats though the port charges may be higher because it is privately operated, while the latter can be remain as passenger boat landing. The Panama City plan rather recommends the existing Panama Port be converted to a passenger pier. Thus, it seems that this issue should firstly be discussed to find out administrative solution rather than planning infrastructure development of a new alternative port.

iii) Puerto Armuelles Port

The existing port facilities are not usable for handling heavy cargoes. Taking into considerations of the current users of the port, it is necessary to identify new roles and functions of the port. The potential for the development of this port is further discussed in Chapter 11.

iv) Bocas del Toro and Almirante Ports

Taking into consideration of the importance of the passenger service at these tow ports, meanwhile there are no suitable landing facilities, AMP should take actions to improve and enhance passenger service in this area.

Development of the two ports shall be discussed further in Chapter 11.

Summing up above discussions, the domestic sea routes in the future is schematically shown in Figure 10.1.5.

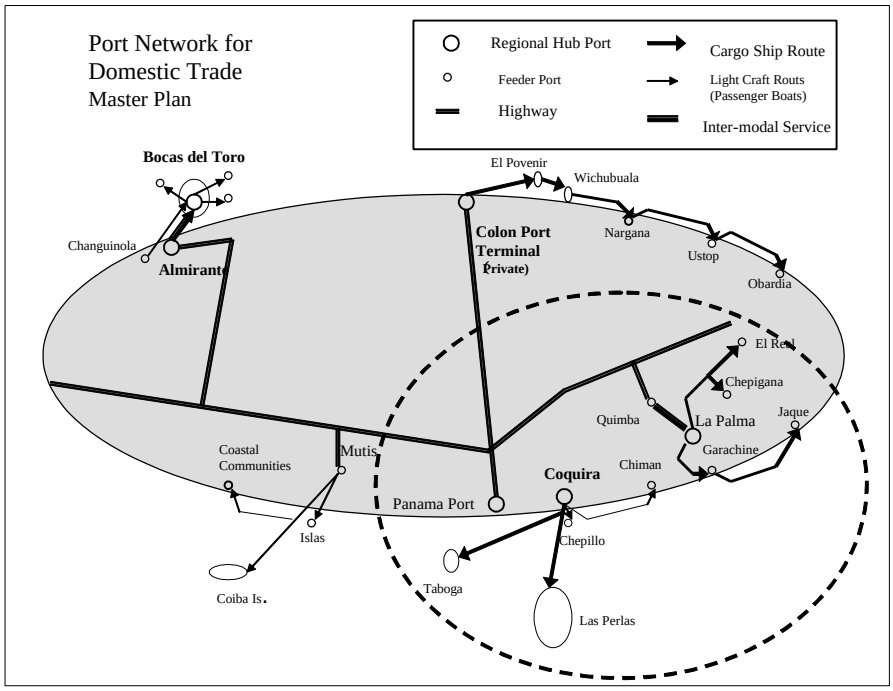


Figure 10.1.5 Future Port Network for Domestic Shipping Service

The functions of the individual ports are summarized in Table 10.1.22

Table 10.1.22 Summary of Functions of Individual Ports

Classification	Name of Port	Location Province	Port function					
			Container	Petroleum	Dry Bulk	Break Bulk	Passenger	Fish
International	Balboa	Panama City	○			○	○	
Container ports	Colon Container Terminal	Colon	○					
	Mansanillo International Terminal	Colon	○			○		
	Cristobal	Colon	○		○	○		
Other port								
International Port	Bahia Las Minas	Colon		○	○			
	Charco Azul	Bocas del Toro		○				
	Chiriqui Grande	Bocas del Toro		○				
	Colon 2000	Colon					○	
	Almirante	Bocas del Toro	○			○		
	Charco Azul	Chiriqui	○			○		
	Pedregal	Chiriqui			○	○		
	Aguadulce	Cocle			○	○		
Domestic Port	La Palama	Darien				○	○	○
	Coquira	Panama				○	○	
	Panama	Panama					○	
	Colon Port Terminal	Colon					○	○
	Vacamonte	Panama						○
	Mensabe	Los Santos						○
	Mutis	Veraguas					○	○
	Puerto Almuelles	Chiriqui					○	○
	Bocas del Toro	Bocas del Toro				○	○	
	Almirante	Bocas del Toro				○	○	

10.2 Individual Port Development Plans

On the basis of the discussion in Section 10.1, it was reconfirmed that the existing port system composed of the ports listed in Table 10.1.21 will continue to play vital role to support the cargo and passenger transport in the coming years. As compared in Tabled 10.1.20 and 10.1.21, most of the existing national port facilities that are currently managed by AMP have enough capacity to handle the cargo volumes expected in 2024. Therefore, it is the responsibility of AMP to maintain the port facilities in good condition and, when needed, to repair and renew the damaged and timeworn facilities. The study tem identified the ports that need enhancement or rehabilitation development are Aguadulce, Coquira, La Palma, Bocas del Toro and Almirante Ports. The following are the discussion how the port can be developed.

10.2.1 Bocas del Toro and Almirante Ports

Municipality of Bocas del Toro is the provincial capital of Bocas del Toro Province. Located in the island, the existing RoRo ferry route between Bocas del Toro and Almirante Ports will remain as the principal sea route connecting the island with the mainland. Thus, it is the responsibility of AMP to continue operating the RoRo Ferry facilities at the two ports. The RoRo facilities at the two ports are in good condition. Thus, it was assessed that the maintenance cost for the AMP Almirante Office should be budgeted. The annual maintenance cost has been estimated to be USD 2,400.

In addition, AMP office is also responsible for other aspects, especially at the island areas in Bocas del Toro Province: the administration of the use of coastal zone, enforce the maritime safety through ship registration, the promotion of the fishery sector and preservation of marine resources and the pollution control. Therefore, for the purpose of improvement of record keeping and the preparation of statistics, it is recommended to install a set of personal computer system: the procurement cost is estimated to be USD 4,000 and the expenditure for the consumable supply for the computer system to be USD 1,200 per year.

Bocas del Toro is one of the most famous tourist destinations in Panama. The function of the port is not only the ferry terminals to and from Almirante, but the local hub for the tourists coming and leaving Bocas del Toro and visiting various islands there. While the passenger traffic at Bocas del Toro has been increasing, the passenger boats landing facilities are provided by the boat operators, since the public passenger facilities were damaged and have not been repaired. Most of the private landing facilities are far below the suitable level for world class tourism area and inappropriate from the viewpoint of safety and comfortableness. Some of the landing facilities are located in inappropriate environment; this is especially true at Almirante Port.

The development plan should be prepared from the integrated approaches to fulfill these AMP's responsibilities to promote the local socio-economic activities. The full discussion of the development of Bocas del Toro and Almirante Ports shall be given in Chapter 12.

10.2.2 Chiriqui Grande Port

Chiriqui Grande Port consists of the private port that includes PTP's Oil terminal and multi-purpose wharf and the national Port used to the gateway port to Almilante and Bocas del Toro. The private port will continue to handle petroleum and banana, while the roles of the RoRo facilities was over when the highway to Almirante was completed. Though there are a lot of remote communities in the province of Bocas del Toro, it is unlikely RoRo ferry service will revive within the coming one or two decades. Thus, the existing facilities can be utilized for other purposes, and it seems to be unnecessary to spend any investment until the purpose of the use of the existing facilities is specified.

The multipurpose wharf of PTP presently handles mainly bananas: either in the form of container or bulk. The wharf, however, when the export volume of local products in Bocas del Toro and Chiriqui Provinces reaches substantial amount, the port can be used for the import and export of other commercial goods.

10.2.3 Charco Azul Port

Since Charco Azul Port is private port, the maintenance of the port facilities is a part of the business activites of PTP. From the viewpoint of the promotion of maritime sector activities in Chiriqui Province, AMP has the role to coordinate the all the parties concerned. Thus, AMP should keep monitoring the business activities of PTP and the Baru Free Zone Authority, especially their investment plans.

10.2.4 Puerto Almuelles Port

The major users of Puerto Almuelles Port are foreign tuna boats calling on the port for the supply. Taking into consideration of the increase in ship calls in recent years, AMP should make a decision whether it should promote itself the port services to these tuna boats or leave the service entirely to private sector, such as PTP. Taking into consideration of such socioeconomic situation there that unemployment rate is still high after the banana industry closed its business and the Baru Free Zone is still planning stage, it seems to be reasonable to assume that AMP is responsible to maintain the service for the existing users of Puerto Armuelles Port.

Thus, AMP should invest at least minimum maintenance and operational cost for services to the tuna boats. The annual maintenance cost of the existing pier has been estimated to be USD 24,000. In addition, for the purpose of improvement of record keeping and the preparation of statistics, it is recommended to install a set of personal computer system: the procurement cost is estimated to be USD 4,000 and the expenditure for the consumable supply for the computer system to be USD 1,200 per year.

10.2.5 Pedregal Port

Pedregal Port will remain as the international port of Chiriqui over the coming decades as described 10-1.2 (3). Fertilizer will be imported and sugar is exported via Pedregal Port. Thus, the port should be well maintained to allow the cargo ships call on the port. Since the revetment of the wharf has been damaged and needs repair work. Maintenance dredging is also required. The costs for the work have been estimated as follows:

Repair of the revetment;	USD 50,000
Maintenance dredge;	USD 259,700/year
	(80,000 m^3 per year)

In addition, for the purpose of improvement of record keeping and the preparation of statistics, it is recommended to install a set of personal computer system: the procurement cost is estimated to be USD 4,000 and the expenditure for the consumable supply for the computer system to be USD 1,200 per year.

10.2.6 Mutis Port

Mutis port is mainly used by small passenger crafts and local fishing boats plying along coastal area of Azuero Peninsula and Gulf of Montijo. They call on the port for pick up and unload passengers to and from the coastal communities and tourist spots. Fishing boats dock at the port for unloading fish catch and supply water, ice and fuel. This function of the port will remain unchanged over the coming decades. Thus, it is necessary for AMP to maintain the port facilities. The existing T-shape pier, floating wharf and slipways are in good condition. The scheduled repainting and minor rehabilitations are required. The annual maintenance cost of these facilities has been estimated to be USD 24,000/year.

The procurement of a personal computer system and annual purchase of consumables for the computer have been estimated to be USD 4,000 and USD 1,200/year, respectively.

10.2.7 Aguadulce Port

(1) Basic Development Needs

1) Increase of Cargo Handling at Port

Comparatively larger cargo vessels are calling at Aguadulce Port through the shallow access channel in the river. Present calling ships consists of about 20 ships of fertilizer import (about 50,000 tons/year) and about 15 ships of sugar export (30,000 tons/year), and they are in the class of 2,000 - 3,000 GRT (5,000 - 6,000 DWT). Also, several tens of sand barges can be seen going in/out of the port. According to the forecast of the traffic demand for the 20 years in future, the cargo volume of fertilizer imports handled at Aguadulce Port will increase by 2.5 times (120,000 tons/year at 2024) and the sugar exports will be stagnant at the present level (30,000 tons/year).

2) Improvement of Access Channel

The access channel in the river and also in the outer bar area is equipped with navigation aids. However, the access channel to Aguadulce Port does not have its own design section and maintenance dredging work has not been conducted regularly. Additionally, several problems exist such as that traffic is one-way and without any turning basin in the channel, curvature radius is smaller than required, and so on. It is necessary to set up the proper alignment and design section of the navigation channel in the river.

3) Rehabilitation of RC deck of Quay Structure

JICA Study Team found deteriorated structure and damage of the RC deck of the general cargo quay of Aguadulce Port. This quay is an aged facility constructed in 1923 and has already come to the end of its economic life. The foundation structure is judged to be well maintained in the sound condition, and the rehabilitation plan of the facility was studied to renew the RC deck of the quay.

In the study of the Aguadulce Port development, the present conditions of the port facility and navigation channel are evaluated, and it is clarified that the dimension of the port corresponds to 1,000 - 2,000 DWT class ships. It is assumed that the dimension of the calling ships will not change from the present (5,000 - 6,000 DWT) and the number of calling ships will increase to cope with the cargo increase toward the target year 2024.

(2) Present Conditions of Aguadulce Port

1) Present Facilities of Aguadulce Port

Aguadulce Port is a river port constructed in 1925 and located at about 10 km upstream from the Palo Blanco estuary. Although there is a restriction due to the shallow river channel, the ships navigate and enter the port using the large tidal range in Gulf of Panamá.

The port is located in the center of the agricultural plain of Coclé Province and has long functioned as the port for export of the agro-products in the region. Currently, this port is operated and administrated by AMP, and the principal activity is the handling of general and bulk cargo at the general cargo berth (length: 69.7 m, refer to Figure 10.2.1).

The port is also equipped with a warehouse for sugar and two sugar loaders. The sugar exporting function is operated by a private company by a concession contract with AMP.

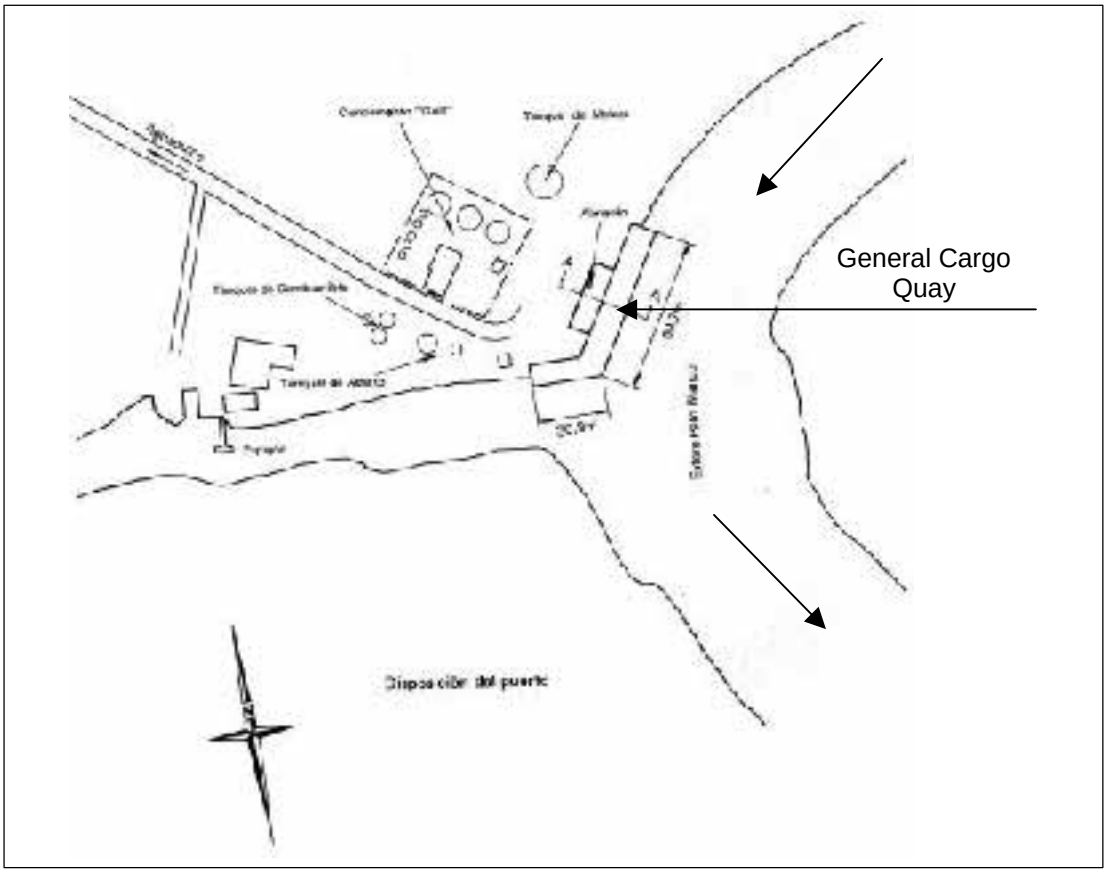


Figure 10.2.1 Present Port Arrangement of the Aguadulce Port

Bulk of fertilizer and sugar accounts for the most part of the cargo handled at Aguadulce. The port capacity at Aguadulce is estimated as **200,000 tons/year** assuming cargo handling by ship-gear and 16-hour operation (8 hours x 2 shifts).

2) Navigation Rule at Aguadulce Port

Navigation Rule applied in the administration of the river channel is as follows (according to the interview at the AMP office at Aguadulce).

i) AMP regulates navigation in the channel at Estero Palo Blanco.
ii) Pilotage is compulsory for the vessels over 500 GRT to enter Estero Palo Blanco.
iii) Maximum dimension of the vessel allowed to enter is 5,000 GRT or less than 120 m in length overall (LOA) of the vessel.
iv) Vessel traffic is one-way throughout the channel.
v) There is no definition of draught of the vessel in Navigation Rule at Aguadulce Port.
vi) AMP provides pilot service daily from 5:00 am to 8:00 pm. No tugboat service is provided at Aguadulce Port.

(3) Evaluation of Port Facilities

The existing port facilities at Aguadulce and river channel are evaluated in terms of their dimensions and capacities.

1) Ship Size of Cargo Ships

Typical dimensions of cargo ships are given in Table 10.2.1.

Table 10.2.1 Typical Dimensions of Cargo Ships

Dead weight tonnage (DWT)	Gross tonnage (GT)	Length overall (L; m)	Molded breadth (B; m)	Full load draught (D; m)
1,000	540	67	10.9	3.9
2,000	1,100	83	13.1	4.9
3,000	1,600	94	14.6	5.6
5,000	2,700	109	16.8	6.5
10,000	5,400	137	19.9	8.2

Source: Technical Standards and Commentaries for Port and Harbour Facilities in Japan, 2002
Note: An empirical equation: GT = 0.541*DWT for cargo ships is applied.

2) Guidelines for Channel Design

UNCTAD's planning handbook "Port Development" (1985) instructs the design dimensions of water area and navigation as follows (Part One, Chapter VI).

1) Under-keel Clearance can be taken as follows (PIANC):
   a) Open sea areas exposed to strong swell: 20 % of the maximum draught
   b) Channel and waiting areas exposed to strong swell: 15 % of the draught
   c) Channel less exposed: 10 %.
2) Turning Diameter: 2 - 2.5 L (L: ship length) for conventional general cargo vessels
3) Width of a one-way channel: Minimum 5 B (B: breadth of ship) at the full depth of channel
4) Curve Radius should be greater than or equal to 10 L, or in exceptional cases 5 L.

3) Existing condition of Aguadulce Port

Berth length: Berth length only has 70 m at the main wharf of Aguadulce Port. Thus, it is understood that the berth is designed for the 1,000 DWT class ship with LOA: 67 m (refer to Table 10.2.1).

Turning Basin: No turning area for ships is prepared in the water area of Aguadulce Port.

Channel Width: The channel width at the assumed depth MLWS-2 m is interpreted as 50 - 60 m by the bathymetric survey chart at Aguadulce Port. The present condition of the channel width is evaluated to correspond to 1,000 DWT class ships (5 x B = about 55 m; refer to Table 10.2.1).

Curve radius of the channel: The minimum curve radius of the approach channel to Aguadulce Port is 350 - 400 m at the vicinity of the port facility. This is evaluated as corresponding to the ships smaller than 1,000 DWT class.

Channel depth: Elevation of the riverbed along the approach channel to Aguadulce Port ranges approximately between MLWS-2 m and -4 m (refer to Figure 10.2.2). This condition is evaluated as a 1,000 DWT class ships (draught: 3.9 m + 20 % under-keel clearance; refer to Table 10.2.1) can enter the channel with probability of 37 % as follows.

Assuming that the Balboa tide is directly applied to the river channel of Aguadulce Port, the probability of water level change is studied based on the exceedence probability of the Balboa tide (refer to Figure 10.2.3). 5 m of water depth is secured below Tide level MLWS+3.0 m to Riverbed MLWS-2 m at the exceedence probability 37 %.

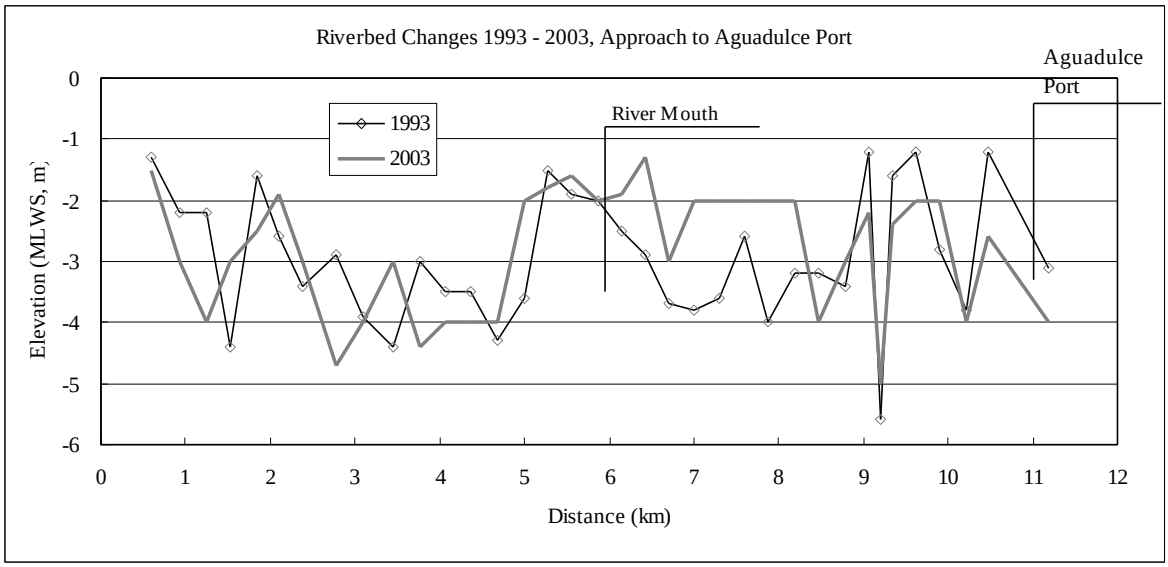


Figure 10.2.2 Longitudinal Profile of River Channel to Aguadulce Port

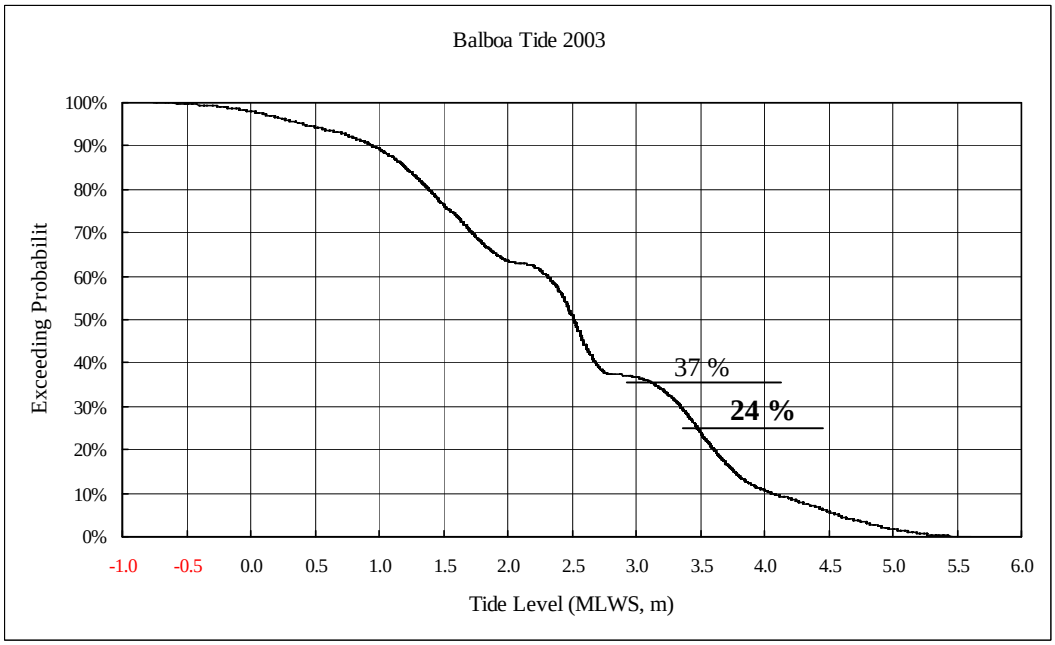


Figure 10.2.3 Exceedence Probability of Tide Level (Balboa estimate)

(4) Calling Ships and Cargo

1) Port Statistics

Number of annual port calls is about 20 for fertilizer ships and about 12 for sugar ships (refer to Table 10.2.2). The main origins of the ships are the ports in the United States and Ecuador. Their size ranges from 2,000 - 3,000 GRT (5,000 - 6,000 DWT class).

As mentioned above, the water area and channel of Aguadulce Port is evaluated totally to have the capacity for ships of 1,000 DWT class. However, actual size of the calling ships belongs to the 5,000 DWT class.

Table 10.2.2 Port Statistics of Aguadulce Port in 1999-2003

Year	1999	2000	2001	2002	2003*
Commodities (tons)	**77,208**	**87,210**	**90,703**	**73,253**	**34,653**
Fertilizer	35,137	43,466	47,712	50,261	21,716
Sugar	31,415	38,896	32,454	22,992	11,684
Non-refined Salt	9,521	4,775	7,207		
Various Commodities	1,135	73	3,330		1,253
Calling Ships	**110**	**93**	**150**	**99**	**37**
Fertilizer Ship	16	21	21	19	9
Average GRT	1,832	1,732	1,953	2,072	2,054
Maximum GRT	3,230	2,598	2,514	2,514	2,854
Sugar Ship	10	18	12	9	5
Average GRT	1,776	1,825	1,808	2,292	1,838
Maximum GRT	2,514	4,993	2,798	2,854	2,514

Source: AMP * Data for 2003 up to June

2) Future Cargo Traffic at Aguadulce

The forecast for the future cargo volume in the target year 2024 handled at Aguadulce Port is givern as follows:

Fertilizer (import)	120,000 tons/year
Sugar (export)	30,000 tons/year

The export of sugar is assumed that it will not increase in the environment of the administratively controlled trade. The import of fertilizer is expected to increase by 2.5 times the present level. Assuming that the dimensions of the fertilizer ship as 5,000 DWT, and its load factor as 0.6 (based on the actual records), the number of calling ships is estimated as follows:

Fertilizer (import)	40 ships/year
Sugar (export)	15 ships/year

(5) Design conditions and Development contents

1) Development target

In order to cope with the future demand of cargo traffic and calling ships, the development aims to accommodate 5,000 - 6,000 DWT class cargo ships of 55 calls/year (fertilizer ships: 40; sugar ships: 15), i.e., 15 % of days per year.

2) Design ship size and draught

5,000 - 6,000 DWT class ship is considered.

L (length overall) = 110 m, breadth B= 17 m,
D (draught) = 6.5 m

Hence, the design depth of the channel and basin is given as 7.5 m
(D plus under-keel clearance 1.0 m)

3) Contents of Improvement

a) Improvement of approach channel to design depth: d = MLWS-4 m.
(Ship-entrance probability 24 % is secured at Tide level MLWS+3.5 m; Figure 10.2.3)
Design Width of channel: 5 B (breadth) = 85 m with trench slope 1:5.0 at the divisions of the channel where straight alignment continues.
Design Width of the channel at divisions of continuous curved alignment: 100 m (1.2 x 5B)
b) Turning space at Aguadulce Port: Diameter of Turning Basin = 1.5 x L = 165 m
c) Mooring dolphins at both sides of the berth to improve berthing condition
d) Rehabilitation of the General Cargo Wharf by Renewal of Apron Slab
e) Installation of fenders in front of the existing berth structure.

Improvement of port facilities at Aguadulce Port is illustrated in Figure 10.2.4.

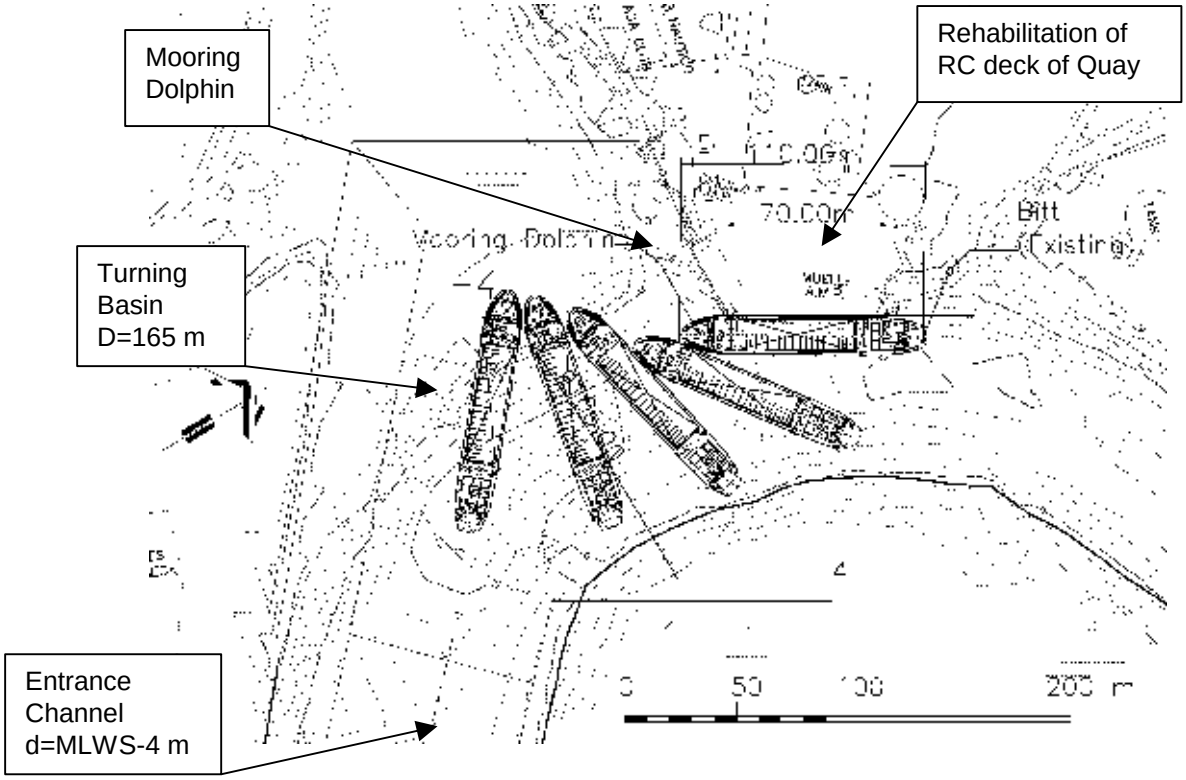


Figure 10.2.4 Improvement of Port Facilities

(6) Rehabilitation of existing RC deck

The typical plan and section of the existing quay structure is shown in Figure 10.2.5. According to the inspection by JICA Study Team, this quay was built in 1925 and RC deck has been overlaid several times up to now. Although the surface of RC deck was rehabilitated, the bottom side of RC deck, RC beams and RC pile caps are seriously damaged with age and/or salt water. Most RC beams are observed having flaking concrete and the exposure of rusty reinforcing bars, so obviously this quay does not meet the required design loads. As for concrete piles, no visible damages are observed.

For the reasons stated above, all RC deck including beams and pile caps should be demolished and rebuilt on the existing piles. The quantities of concrete for rehabilitation work will be approximately 440 m^3.

(7) Design of New Mooring Dolphin

As shown in Figure 10.2.4, one new mooring dolphin is planned to construct at the south side of existing quay structure. The location of mooring dolphin is decided in consideration of the vessel's stern turning performance and easy maneuvering.

The mooring dolphin is planned with open pile type RC deck structure supported by the PC concrete piles. The concrete piles are to be driven into the layer to secure the bearing force.

For the horizontal force of the berth such as mooring force and seismic force of the dolphin, the batter piles are to be used. Based on the alignment of the piles and loads on the dolphin, the adopted size of the piles is 500 mm and the capacity of mooring bitt is 35-ton for 6,000 DWT cargo ships.

The typical plan and section of mooring dolphin is shown in Figure 10.2.6.

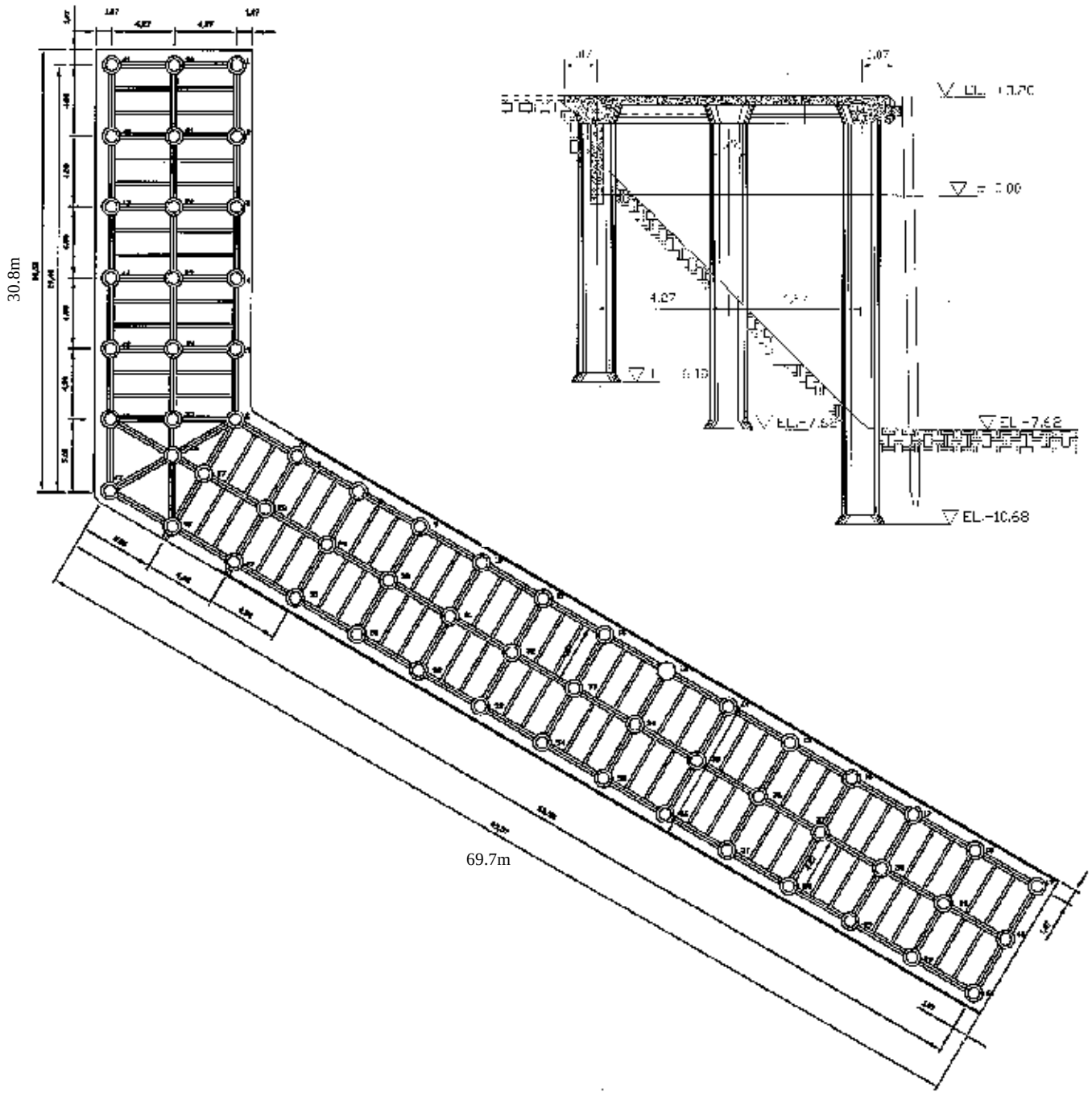


Figure 10.2.5 Typical plan and section of Existing Quay Structure

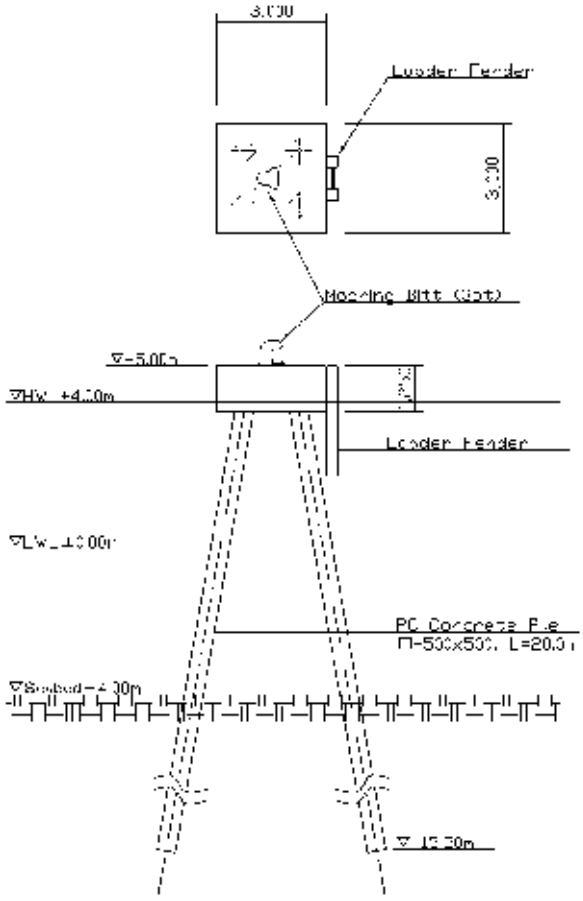


Figure 10.2.6 Typical plan and section of Mooring Dolphin

(8) Improvement of Approach Channel

The extension of the approach channel ranges at about 11 km along the river channel from the outer bar area up to Aguadulce Port. The work volume of the excavation of riverbed (up to MLWS-4 m and the design width 85 m) and the excavation to secure the turning basin is about 2.7 million m^3. Detail information of the improvement of the approach channel is given in the Appendix D.

In this section, the present conditions of the port facility and navigation channel are evaluated and clarified that the present port corresponds to the dimensions to accommodate 1,000 - 2,000 DWT class ships. Since the calling ships will not change from the present (5,000 - 6,000 DWT) and the number of calling ships will increase toward the target year 2024, the dimensions of the corresponding port facilities (design depth and width of navigation channel and turning basin) are suggested in this section.

Technical evaluation on the present Aguadulce Port and the direction of the improvement are presented here. The feasibility of the improvement should be determined in accordance with the revenue produced by Aguadulce Port.

(9) Riverbed Changes and Maintenance of Channel

The riverbed changes between the years from 1993 to 2003 are given in Figure 10.2.2. The detail changes in cross sections between 1993 are 2003 along the approach channel are shown in Appendix D. The following characteristics can be abstracted from the longitudinal profile of the riverbed and the changes in the cross sections of the river channel.

1) Active sediment transport is taking place in the river channel of Aguadulce Port by the strong up-and-down river flow induced by the big tidal range in the Gulf of Panama. A dynamicly stable river channel has been maintained here.

   The outside of the river mouth is called as Outer Bar Area, and estuarine sand bar develops in this area as seen in Figure 10.2.2. A circular shaped channel (with its curvature radius of 1 km) is formed in the Outer Bar area of the estuary of Aguadulce and is maintained by the tidal current.

   Figure 10.2.7 gives the results of the sediment balance (accretion and erosion) along the approach channel to the Aguadulce Port. The accretion and erosion balance between 1993 - 2003 between was calculated from comparison of the cross sections (refer to Appendix D) along the river channel. According to Figure 10.2.7, the Outer Bar Area is understood as a domain of erosion in the estuary of Aguadulce.

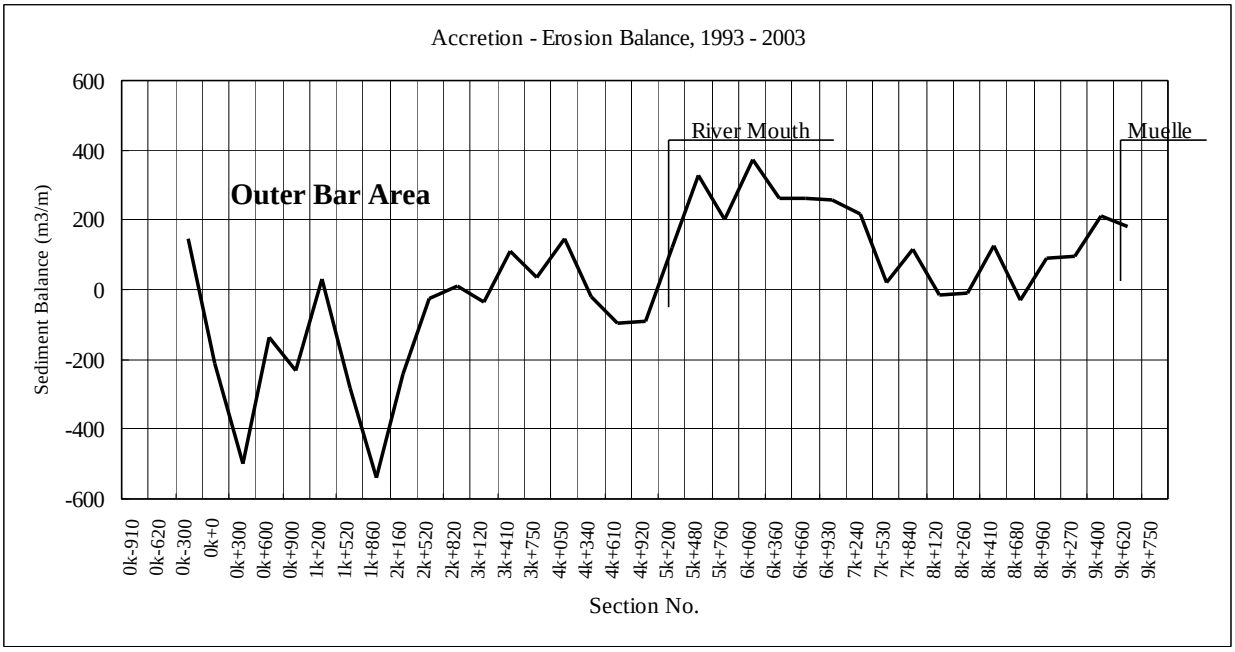


Figure 10.2.7 Accretion - Erosion Balance in Approach Channel (1993 - 2003)

2) Where accretion is seen significant is at the division from the river mouth (Section No. 5k+200 to the Section No. 7k+840) and the vicinity. This division shows a continuous domain of accretion. The sediment volume of the accretion is estimated as about 600,000 m^3 for the 10 years and the average depth of sedimentation reaches up to 1.5 to 2 m.

There is a crescent-shaped lagoon in the vicinity of the Section No. 7k+840 and this configuration is understood as the remainder of the old meandering of the river. Most of the flux flowing up-and-down this division will overflow into the crescent lagoon, and the sediment suspended in the river flow tends to settle to the riverbed due to the slowing down of its speed.

Hence, the 2.6 km division of the channel from the river mouth becomes the particular domain of the accretion.

3) The river channel upstrteam is seen as rather a stable channel up to the vicinity of Aguadulce Port, and the average depth of sedimentation is about 0.4 - 0.7 m for the past 10 years.

(10) Maintenance Dredging Volume

The main division of the maintenance dredging is designed from the river mouth (Section No. 5k+200 to the Section No. 7k+840) and the vicinity (with the extension about 2.6 km). The average annual dredging volume is estimated as 60,000 m^3/year from the above-mentioned study on the riverbed changes.

For reference, an old APN report* on the maintenance of the river channel gives the maintenance dredging volume as 40,000 - 100,000 m^3 annually.

* Autoridad Portuaria Nacional (1993): Improvements on the accessibility to the ports of Aguadulce and Pedregal, April 1993.

10.2.8 Mensabe Port

Main user of Mensabe Port is local and commercial fishing boats. They call on the port for unloading fich catch and supply. The function of the port will remain unchanged. The existing facilities are assessed in good condition. The annual maintenance cost for the T-shape pier has been estimated to be USD 10,000 per year. For the improvement of the record keeping and communications, a personal computer system should be introduced. The procurement cost is USD 4,000 and annual cost for the cosumables for the computer system is USD 1,200.

10.2.9 Bahia Las Minas Port

The port facilities in Bahia las Minals are operated by private companies. There are still unused berthing facilities having a water depth of -7m, and they are in good condition. Thus, it is assumed that no investment and maintenance is needed until the user of the facility is determined. However, for the improvenet of the administrative work of AMP office, introduction of a computer system is recommended: the procurement cost is USD 4,000 and annual cost for consumables is USD 1,200/year.

10.2.10 Vacamonte Port

Through the workshop, it was identified that the current service provided by Vacamonte Port administration does not satisfy the port users. The major concern of the port users are administrative and regulatory matters. However, to provide the basic port services such as maintenance dredge, security and fire fighting, surely require the funds. The study team assessed the situation to be serious. The annual costs for the maintenance have been estimated as well as some capital investment for the improvement of the security and fire fighting in the port. The maintenance and capital investment cost required are as follows:

Annual maintenance cost;

Painting and minor repair of Service Jetty	USD 48,000
Painting and minor repair of Shrimp Jetty	USD 48,000
Dredging of sediments (31,000 m3/year)	USD 125,000
Navigation aids(Beacons and Buoys)	USD 2,400

Capital investment

Fire fighting facilities	USD 233,800
(Fire hydrant, 3000L/50m, 2 units)	
Annual maintenance cost	USD 2,300
Security Facilities	
(Video Monitor 12 units, and fence/gate)	USD 208,800
Annual maintenance cost	USD 2,100
A personal computer system	USD 4,000
Consumables per year	USD 1,200

The total capital investment estimate is USD 446,600 and annual maintenance cost is estimates to amounts to USD 229,100.

It is assumed that the maintenance of Tuna berth including trestle and the yards that have been already in concession are assumed to be done by private companies.

10.2.11 Panama Port (Fiscal Pier Panama City)

Though Panama City has a plan to redevelop it historical area that requires the relocation of Panama Port, AMP has the responsibility to maintain, manage and operate the port until an alternative port is operational. The berthing facility, the pier, needs minor repair, the warehouse and utilities need regular maintenance. The navigation aids should be well maintained. The maintenance cost is estimated to be as follows:

Annual maintenance cost

Pier;	USD 4,800
Warehouse;	USD 24,000
Navigation Aids	USD 2,400

In addition, introduction of a computer system is recommended for the record keeping and communication. The procurement cost is USD 4,000 and the annual expenditure for the consumables is USD 1,200.

10.2.12 Taboga Port

Taboga Island is one of the most famous tourist destinations in Panama. The floating wharf of Taboga Port has been timeworn. The replacement of the wharf is very urgent for the tourism activities there. The cost of the replacement was estimated. (See Section 10.2.7).

10.2.13 Coquira Port

Coquira port will remain as the local gateway port serving for the passenger shipping service to the coastal communities in the Province of Panama. AMP is responsible to operate the port as it is. The passenger and the cargo traffic at Coquira Port are shown in **Tables 10.1.13** and **10.1.14**, respectively. The passenger traffic is expected to grow up to 44,000 trips in 2024 from 30,000 trips in 2003, while the cargo volumes estimated to increase to 1,600 tons in 2024 from about 1,000 tons in 2002. These traffic volumes in 2024 correspond to 4.4 ton per day and 83 trips per day. The major commodities handled at Coquira Port are livestock that are brought from the other side of the river by barges and fish catches that are brought to the port by small fishing boats. The volume of logs and woods tend to decrease.

The principal users of the port are small crafts: passenger boats and local fishing boats. Thus, on the average the number of calls per day is estimated to be about 20 or so. Therefore, the existing slipway has enough capacity to accommodate the calling ships.

Though no new investment on infrastructure is required to continue the current function of Coquira Port, it is recommended to procure a personal computer for the improvement of processing and transmittal of port statistical data.

In addition, when Panama Port is closed for cargoes, Coquira Port is the nearest port that can be an alternative port to Panama Port in terms of the shipping service for the islands in the Gulf of Panama. The cargo volume carried to the islands in Gulf of Panama is estimated to reach 7,000 tons in 2024 (see Table 10.1.12).

A cargo ship plying to the island carries 30 tons on the average. A new wharf is needed to accommodate those ships, since they cannot dock at the slipway. The number of annual ship calls is estimated to be 233. The average number of calling ships is less than one per day. Thus one berth is enough to accommodate the cargo ships servicing the islands.

The full discussion of the plan and the facility layout are given in Chapter 14.

10.2.14 La Palma Port and Quimba Port

The cargo traffic volume at La Palma Port can be evaluated on the basis of the cargo volumes handled at Panama Port: Muelle Fiscal, which is the counter part port of La Palma.

The forecast cargo volumes at Panama Port is shown in Tables 10.1.11 and 10.1.12. The cargoes handled at Panama Port are classified into five categories according to the destinations (see Table 10.2.3)

Table 10.2.3 Cargo Volumes Handled at Panama Port by Destinations

Destination	Location	Cargo volume (ton)			
		2002		2024	
		Loaded	Unloaded	Loaded	Unloaded
(1) La Palma	La Palma Port	1,334	581	9,872	4,300
(2) El Real, Yaviza, Camoganti	River Side accessible via Pan Am. HWY	743	582	5,498	4,307
(3) Garachine, Sambu, Jaque, Puerto Pina	Outer Coastal Area of Darien not accessible via Pan-Am. HWY	3,982	29,468	2,171	16,066
(4) Chiman	Coastal area in Panama Province	192	11	192	81
(5) Contadora, San Miguel, etc.	Islands in Panama Gulf	3,689	839	6,000	1,000

When the Pan-American Highway is fully upgraded and the Inter-modal transport facilities are completed between La Palma and Quimba Ports, the cargoes that fall on the categrry (1) and (2) in Table 10.2.3 will be transported overland via Pan-American Highway.

Thus, La Palma Port will be playing a role as the local hub port, where cargo and passenger ships plying to other coastal communities are calling. The forecast cargo volumes that would be carried to and from those coastal communities which do not have land access to La Palma: Garachine, Sambo, Jaque, and Puerto Pina, Thus, the cargoes to and from these communities classified in the category (3) in Table 10.2.3 will be handled at La Palma:. the unload cargo volume is 29,468 ton while unloaded cargo volume is 16,066 ton in 2024.

If the same size of ships are employed to transport these cargoes, on the average a ship carries 50 tons of cargo. Therefore, total 910 ships will be calling on La Palma (departing ships: unloading volume 29,468 /50 = 590, arriving ships: 16,066/50 = 320). On the average 2.5 ships (910/365=2.5) are calling at La Palma Port.

With the assumption that cargo handling productivity is 15 ton /hour with the use of equipment, each ship should stay at the dock for four (4) hours (handling time: 50 / 15 = 3.3 hour, plus preparation and docking and departure time). Thus, on the average, 10 berth-hours per day (2.5 ships x 4 hours = 10 hours) are necessary.

Since these ships will be plying in the designated routes and according to the schedule, the arrival time at La Palma Port can be scheduled among these ships and berth windows can be allocated to each ship. Therefore, it is assessed that one berth is enough to accommodate these ships and that the fixed pier to be constructed under IDB project will be sustained up to 2024.

To maintain and operate the Inter-modal transport facilities to be completed under IDB project, the Floating wharves and fixed piers should be well maintained. The cost for the maintenance is estimated as follows:

Maintenance of floating wharves:	RoRo wharf	USD 12,000 per year
	Small crafts wharf	USD 12,000 per year
	Fixed pier	USD 2,000 per year

For the purpose of the upgrading the administrative work, the introduction of a computer system is recommended:

Procurement of a personal computer	USD 4,000
Consumables for the computer	USD 1,200 per year

Likewise, the maintenance of the floating wharf at Quimba Port will require USD 6,000 per year.

10.2.15 Nationwide port development plan

AMP has the responsibility to develop, maintain and operate the national port system discussed above. The annual maintenance cost and the capital investment cost for major repair and renewal are estimated as shown in Table 10.2.4.

The annual maintenance cost is estimated to be USD 0.8 million. The capital investment for repair, renewal and purchase of the equipment is estimated to be USD 1.2 million.

Major items in the annual maintenance costs are the maintenance dredge at Pedregal, Aguadulce and Vacamonte Ports, while the major capital investment includes the reconstruction of the wharf of Aguadulce and Taboga Ports, the construction of fence and the procurement vigilance and firefighting equipment at Vacamonte Port.

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Table 10.2.4 (1) Maintenance cost of the nationwide port system

Unit : USD

Location			Facilities	Descriptions	Conditions	Management	Maintenance Method	Initial Cost (USD)	Annual Cost (USD/Year)
Caribbean West Coast	Bocas del Toro	Bocas del Toro	Land Area	Ro-Ro : approx. 600 sq.m	N/A	AMP (Bocas del Toro)	N/A	—	0
			Berthing Facility (Ext.)	Concrete Made Platform with Ro-Ro Ramp	Damaging of Platform		Major function will be moved to the new Ro-Ro berth which is recommended by the JICA study team.	—	0
			AMP Office	Tin-Roofed Office	Damaging				
			Basin	N/A	Using of open sea.				
			Passageway	N/A	N/A				
			Computer	P4,LaserPrinter, UPS, Software	N/A		Newly Supply	4,000	—
			Supply for the Computer	Ink Cartridg, Paper etc.	N/A		Consumable Supply	—	1,200
							Sub Total of the Cost	**4,000**	**1,200**
		Almirante	Land Area	Ro-Ro : approx. 600 sq.m and CBI Port	N/A	AMP (Almirante)	N/A	—	0
			Berthing Facility (Private)	Banana-Handling Terminal	Good Condition		Maintained by the CBI (Private Company)	—	—
			AMP Office	Brick Made Office	Good Condition		Proper maintenance shall be carried out.	—	2,400
			Berthing Facility (AMP)	Ro-Ro Ramp	Good Condition		Major function will be moved to the new Ro-Ro berth which is recommended by the JICA study team.	—	0
			Basin	N/A	N/A				
			Passageway	N/A	N/A				
			Computer	P4,LaserPrinter, UPS, Software	N/A		Newly Supply	4,000	—
			Supply for the Computer	Ink Cartridg, Paper etc.	N/A		Consumable Supply	—	1,200
							Sub Total of the Cost	**4,000**	**3,600**
		Chiriqui Grande	Land Area	Container Yard 8ha and Others.	N/A	AMP	N/A	—	0
			Ro-Ro Berth (AMP)	L 25.5m, B 14.2m, D=2.2m	Good Condition		Keep the present condition.	—	0
			Berthing Facility (PTP)	L 182m, B 24.2m, D=11.0m	Good Condition	Private (PTP)	Maintained by the private.	—	—
			Basin	N/A	Using of open sea.			—	—
			Passageway	N/A	N/A			—	—
			Others	Utilities(E/W/0), VHF etc.	Good Condition			—	—
							Sub Total of the Cost	**0**	**0**
Pacific West Coast	Chiriqui	Charco Azul	Land Area	approx. 835,600 sq.m	N/A	Private (PTP)	N/A	—	0
			Berthing Facility (PTP)	Steel Pipe Piled Jetty, D=24.2m	Good Condition		Maintained by the private.	—	—
			Berthing Facility (PTP)	Steel Pipe Piled Jetty, D=21.0m	Good Condition			—	—
			Basin	N/A	Using of open sea.			—	—
			Passageway	N/A	N/A			—	—
			Others	Utilities(E/W/0), VHF etc.	Good Condition			—	—
							Sub Total of the Cost	**0**	**0**
		Armuelles	Land Area	2,125 sq.m	N/A	AMP (Armuelles)	N/A	—	0
			Berthing Facility (-10m)	Steel Pipe Pile Supported : L 137m	Rehabilitation program is on going.		Proper maintenance, such as painting and minor rehabilitations, shall be carried out.	—	24,000
			Trestle	ditto. L 277m, B 5.5m					
			Basin	N/A	Using of open sea.		N/A	—	0
			Passageway	N/A	N/A		N/A	—	0
			Computer	P4,LaserPrinter, UPS, Software	N/A		Newly Supply	4,000	—
			Supply for the Computer	Ink Cartridg, Paper etc.	N/A		Consumable Supply	—	1,200
							Sub Total of the Cost	**4,000**	**25,200**

Brevity Code in the Table; (Ext.):Existing Facility, (Pln.):Planned Facility, Utilities(E/W/O):Utilities(Electricity/Water/Bunkering)

Table 10.2.4 (2) Maintenance cost of the nationwide port system

Unit : USD

Location			Facilities	Descriptions	Conditions	Management	Maintenance Method	Initial Cost (USD)	Annual Cost (USD/Year)
Pacific West Coast	Chiriqui	Pedregal	Land Area	#1: 4,334sq.m, #2: 23,357sq.m	N/A	AMP (Pedregal)	N/A	—	0
			Berthing Facility (-2.5m)	RC Concrete, Pile Supported	Appropriate for the age.		Keep the present condition.	—	0
			Revetment	Rubble Mounded	Partially slipping.		Damaged slope shall be repaired.	50,000	0
			Basin	Ext. Depth : -2.5～3.5m	On the sedimentation.		80,000 cu.m of sediments shall be dredged annually.	—	259,700
			Passageway	—					
			Computer	P4,LaserPrinter, UPS, Software	N/A		Newly Supply	4,000	—
			Supply for the Computer	Ink Cartridg, Paper etc.	N/A		Consumable Supply	—	1,200
			Others	Sugar Storage: 2,000metric tons		Private	Maintained by the private.	—	—
							Sub Total of the Cost	**54,000**	**260,900**
Pacific Central Coast	Veragus	Mutis	Land Area	2,420 sq.m	N/A	AMP (Mutis)	N/A	—	0
			Berthing Facility (1)	Marginal Type : L 16.5m	Appropriate condition for these ages.		Proper maintenance, such as painting and minor rehabilitations, shall be carried out.	—	24,000
			Berthing Facility (2)	T-Shaped : L 15.0m				—	
			Slipway	L 20m				—	
			Basin	Outlet of Martin Grande River	Good Condition		Maintenance dredging is not necessary.	—	0
			Passageway	Martin Grande River	Good Condition			—	0
			Computer	P4,LaserPrinter, UPS, Software	N/A		Newly Supply	4,000	—
			Supply for the Computer	Ink Cartridg, Paper etc.	N/A		Consumable Supply	—	1,200
							Sub Total of the Cost	**4,000**	**25,200**
	Cocle	Aguadulce	Land Area	approx. 7,000 sq.m	N/A	AMP (Aguadulce)	N/A	—	0
			Berthing Facility	L 100m ×B 24m (-2.7 ～ 4.4m)	Damaging of slab		Re-construction of concrete slab.	375,400	0
			Mooring Facility		Loss of Bitt		Construction of Mooring Dolphin	90,070	0
			Basin	approx. -2.7 ～ 4.4m	On the sedimentation.		60,000 cu.m of sediments shall be dredged annually.	—	204,800
			Passageway	9.5km Upstream from the Entrance.					
			Computer	P4,LaserPrinter, UPS, Software	N/A		Newly Supply	4,000	—
			Supply for the Computer	Ink Cartridg, Paper etc.	N/A		Consumable Supply	—	1,200
			Bulk Loading Berth	Consessioned to the Private	Good Condition	Private	Maintained by the private.	—	—
							Sub Total of the Cost	**469,470**	**206,000**
	Los Santos	Mensabe	Land Area	N/A	N/A	AMP (Mensabe)	Location of the jetty is not proper for the port, it can be used for small boats under the limited conditions. Presently, the port is not in operation.	—	10,000
			Berthing Facility (-4m)	T-Shape, L 16.3m ×B 3.9m	Constructed in 1996				
			ditto., but trestle	L 55.9m ×B 3.0m					
			Basin	Outlet of Mensabe River	Difficult to maintain in proper depth.				
			Passageway	Mensabe River					
			Computer	P4,LaserPrinter, UPS, Software	N/A		Newly Supply	4,000	—
			Supply for the Computer	Ink Cartridg, Paper etc.	N/A		Consumable Supply	—	1,200
							Sub Total of the Cost	**4,000**	**11,200**

Brevity Code in the Table; (Ext.):Existing Facility, (Pln.):Planned Facility, Utilities(E/W/O):Utilities(Electricity/Water/Bunkering)

Table 10.2.4 (3) Maintenance cost of the nationwide port system

Unit : USD

Location			Facilities	Descriptions	Conditions	Management	Maintenance Method	Initial Cost (USD)	Annual Cost (USD/Year)
Panama Canal Area	Colon	Bahia Las Minas	Land Area	4.7ha	N/A	AMP (Bahia Las Minas)	N/A	—	0
			Berthing Facility (-7m)	L 91m ×B 16m	Good Condition		Out of services. Waiting concession procedure for private company.	—	0
			Navigation Aid	Beacons and Buoys	Good Condition			—	0
			Basin	-7.0m	Good Condition		N/A	—	0
			Passageway	N/A	N/A		N/A	—	—
			Computer	P4,LaserPrinter, UPS, Software	N/A		Newly Supply	4,000	—
			Supply for the Computer	Ink Cartridg, Paper etc.	N/A		Consumable Supply	—	1,200
			Clinker unloading berth	L 110m (-10.5m), Access L 60m	by Cemento Panama	Private	Maintained by the private.	—	—
							Sub Total of the Cost	**4,000**	**1,200**
	Panama	Vacamonte	Land Area	1,040,950sq.m	N/A	AMP (Vacamonte)	N/A	—	0
			Service Jetty (-3m)	L 100m ×B 6.5m×2	Good Condition		Proper maintenance, such as painting and minor rehabilitations, shall be carried out.	—	48,000
			Shrimp Jetty (-3m)	L 60m ×B 5.5m×2	Good Condition			—	48,000
			Basin	31.5ha, -3.0 ～ 6.0m	Maintenance dredging is required		31,000 cu.m of sediments shall be dredged annually.	—	125,100
			Passageway	L = 1km, -6.0m				—	
			Breakwater	L = 1,050m	Good Condition		Keep the present condition.	—	0
			Navigation Aid	Beacons and Buoys	Good Condition		Proper maintenance shall be carried out.	—	2,400
			Computer	P4,LaserPrinter, UPS, Software	N/A		Newly Supply	4,000	—
			Supply for the Computer	Ink Cartridg, Paper etc.	N/A		Consumable Supply	—	1,200
			Fire Fighting Facilities	Fire Hydrant, 3,000L/50m, 2unit	(Planned)		Newly recommended by JICA Study Team.	233,800	2,300
			Security Facilities	Video Monitor 12unit, Fence/Gate	(Planned)			208,800	2,100
			Tuna Berth (-6m)	T-Shape, L 132.5m ×B 12.5m	N/A	Private	Maintained by the private.	—	—
			ditto., but trestle	L 108m ×B 12.5m	N/A			—	—
			Repairing Yard w/lifter	Concessioned to the Private	N/A			—	—
							Sub Total of the Cost	**446,600**	**229,100**
		Fiscal Quay in Panama City	Land Area	approx. 2,007 sq.m	N/A	AMP (Fiscal Quay)	N/A	—	0
			Berthing Facility	L 145m ×B 14.5m with Shed	Good Condition		Minor maintenance is necessary.	—	4,800
			Warehouse Shed	approx. 1,000 sq.m	Good Condition		Maintenance for utilities, painting.	—	24,000
			Basin	0 ～ -4.0m	Shallow		The municipal office is considering to close the port.	—	0
			Passageway	N/A	N/A			—	0
			Navigation Aid	Beacons and Buoys	Good Condition		Maintenance for the navigation aid.	—	2,400
			Computer	P4,LaserPrinter, UPS, Software	N/A		Newly Supply	4,000	—
			Supply for the Computer	Ink Cartridg, Paper etc.	N/A		Consumable Supply	—	1,200
							Sub Total of the Cost	**4,000**	**32,400**

Brevity Code in the Table; (Ext.):Existing Facility, (Pln.):Planned Facility, Utilities(E/W/O):Utilities(Electricity/Water/Bunkering)

Table 10.2.4 (4) Maintenance cost of the nationwide port system

Unit : USD

Location			Facilities	Descriptions	Conditions	Management	Maintenance Method	Initial Cost (USD)	Annual Cost (USD/Year)
Pacific East Coast	Panama	Taboga	Berthing Facility	Steel Made Pontoon, Moored by Piles.	Damaging.	AMP	Re-construction of the pontoon body is being considered by the AMP.	150,000	0
								—	1,500
							Sub Total of the Cost	**150,000**	**1,500**
		Coquira	Land Area	approx. 5,000 sq.m	Leased land	AMP (Coquira)	(Estimated annual charge.)	—	800
			Berthing Facility	Slipway L 58m ×B 34m	Good Condition		Keep the present condition.	—	0
			Basin	25km Upstream from the River Mouth.	Stabilized river channel		Maintenance dredging is not necessary.	—	0
			Passageway					—	0
			Computer	P4,LaserPrinter, UPS, Software	N/A		Newly Supply	4,000	—
			Supply for the Computer	Ink Cartridg, Paper etc.	N/A		Consumable Supply	—	1,200
							Sub Total of the Cost	**4,000**	**2,000**
	Darien	Quimba	Land Area		N/A	AMP (La Palma / Quimba)	N/A	—	0
			Pontoon (Ext.)	L 6.4m ×B 4.6m	Damaging of wooden floor		Major function will be moved for the new berth, recommended by the IDB.	—	0
			ditto., but bridge	L 13.6m ×B 2.0m				—	0
			Ro-Ro Pontoon (Pln.)	Ro-Ro	Planned		(New Construction by IDB Project.)	—	6,000
			Basin	N/A	Good Condition		Maintenance dredging is not necessary.	—	0
			Passageway	N/A	Good Condition				
							Sub Total of the Cost	**0**	**6,000**
		La Palma	Land Area		N/A	AMP (La Palma)	N/A	—	0
			Berthing Facility (Ext.)	L 40m ×B 16m = 640 sq.m	Good Condition		Keep the present condition.	—	0
			Shed	Steel Frame, Galvanized Iron Roof	Good Condition		Painting, once every year.	—	2,000
			Office	Concert Block Made	Good Condition		Keep the present condition.	—	0
			Ro-Ro Pontoon (Pln.)	(Ro-Ro, Cargo, Passenger)	(Planned)		(New Construction by IDB Project.)	—	12,000
			Basin	N/A	Good Condition		Maintenance dredging is not necessary.	—	0
			Passageway	N/A	Good Condition			—	0
			Computer	P4,LaserPrinter, UPS, Software	N/A		Newly Supply	4,000	—
			Supply for the Computer	Ink Cartridg, Paper etc.	N/A		Consumable Supply	—	1,200
							Sub Total of the Cost	**4,000**	**15,200**
							Total Cost (USD)	**1,156,070**	**820,700**
								1,976,770	

Brevity Code in the Table; (Ext.):Existing Facility, (Pln.):Planned Facility, Utilities(E/W/O):Utilities(Electricity/Water/Bunkering)

10.3 Port Administration and Management Plans

The development of the port infrastructure cannot achieve the objective unless port administration and management system work properly. In this Section, the basic direction of the functions of the headquarters and the field offices of AMP to achieve the goal of the nationwide port development proposed above. The responsibilities of AMP for the successful management and operation of the ports are also discussed

10.3.1 Objectives and Approach

(1) Objectives

The port administration and management plans have been prepared with the following objectives:

- To provide AMP with a proper institutional improvement plan of port administration and management systems for sustaining the roles and functions of the national port system composed of national and private ports
- To provide AMP with the information that is needed to make other government agencies understand and positively support the plan.
- To provide AMP with the materials needed for showing its political will of strengthening its port administrative and managerial functions to the public in order to stimulate the investment incentives of the private sector.

(2) Approach employed in the preparation of the Plan

The port administration and management plan has been formulated on the basis of the following approaches.

1) Practical Approach

The plan has been elaborated within the current legal framework prescribed in the organic law of AMP and current budgetary system of AMP. The most practical measures were chosen for AMP to proceed with the realization of the National Maritime Strategy.

2) Highlighting the function of the headquarters and the local offices of AMP

Strengthening the functions of AMP headquarter is one of the critical issues, and thus the plan focuses on the measures to strengthen the headquarters. To realize the national port development plan, the local offices of AMP have to play important roles, thus the weakness in functions of local offices is also focused.

3) Staged Plan

As the initial steps, the step-wise and on-demand improvement plans have been elaborated for the upgrading of the organizational functions of the local offices, since the long-term target has not yet definite at this moment.

4) Involvement of the stakeholders

Since the National Maritime Strategy emphasizes the promotion of the private sector participation, the plan also proposes possible measures to reinforce the coordination and cooperation with stakeholders and to encourage private sector participation in port development and management.

10.3.2 AMP Headquarters

(1) Institutional strengthening Plan

On the basis of the analysis of the responsibilities to perform its functions and reviewing existing situation and the outstanding issues identified through the discussions in Chapter 6, the study tem assesses that the AMP should take the following actions for the institutional strengthening. This plan does not include any port infrastructure development. The items are the responsibilities of AMP to fulfill its assigned duties as an executive blanch of the government.

i) Compliance with the international treaties and conventions related to maritime sector.

As the delegate of Panama to IMO, AMP should take initiative in the supervision of the ports and ships calling Panamanian ports. For the urgent requirement of the compliance with ISPS Code, AMP may rely on the technical support of foreign consultant as well as the financial support of the privately operated ports in the Canal area. AMP is yet responsible to supervise ports and ships to prepare their security plans. For the national ports that open to international trade, AMP has the full responsibility to prepare the security plan. Above all, AMP is also responsible to disseminate the treaties and conventions to the maritime sector.

ii) Promotion of the private investment in the port related businesses

The promotion of the private investment is one of the vital roles, AMP should make efforts on the following:

a. to make the procedure of awarding concessions more transparent and to grant the concession timely.

b. marketing of the potential business areas for private investment and the elaboration of program to support the private investment. AMP should work together with agencies concerned to formulate land use plan in order to secure land and water spaces for the future expansion of the port related activities. Suitable spaces should be placed in the land use plan for container terminal expansion in the future.

c. legislative and cooperative support of the private firms who is investing in the public port services. The construction of a bulk terminal in Cristobal Port is an example. The bulk terminal operation is not simply for the private business, but also beneficial for the consumers.

d. AMP inherited the roles of the Port Authority of Panama. It should send delegates to international conferences on Port communities such as IAPH, PIANC, ICHCA and etc. It is

also the responsibility of AMP to be the liaison of port sector with the international port business community.

e. For the further promotion of the business activities in Colon, AMP should make efforts to realize the improvement of Panama -Colon Highway

iii) Strengthening of coordinating functions with the agencies concerned

a. CIQ procedure

The custom, immigration and quarantine procedures still need further improvement. AMP should take initiative in the coordination among the agencies for the smooth transaction of the cargoes. This is especially needed in Colon Port Complex.

b. communication with the port users

Formal and informal communication channel between the port management and the users should be established. AMP should take actions to hold regular meeting with the Maritime community such as forum and port advisory committee. Such regular meeting will be providing AMP with such opportunities to sound and recognize the move of the maritime business communities.

c. Guidelines for the maintenance of navigation channel

While the concession contracts require the concessionaires of the port in Canal Area to maintain the port facilities and the access channels, AMP is responsible to determine the dimensions of the access channel on the basis of the port safety and efficiency of the ship maneuvering. AMP should prepare channel maintenance in coordination with the Panama Canal Authority.

iv) Promotion of local ports and the human resource development

a. Public relations to propagate the activities and development plan of the local ports, and the availability of the facilities, land and water areas for lease and concession.

b. Coordination with maritime schools is needed to make the curriculum more suitable for the demand of the labor market.

v) Promotion of the private investment in the domestic shipping business

AMP is responsible for not only the port system, but also for secure regular shipping services in domestic sea routes. RoRo ferry terminals at La Palma and Quimba Ports are waiting for a ferry operator when the intermodal facilities are completed. In the same manner, the ferry services between Bocas del Toro and Almirante and coastal shipping services covering San Blas and Darien are vital for the coastal communities. The AMP should keep making efforts to upgrade the shipping services of these sea routes as well as securing the safety.

Above all, the following are the areas that AMP should give higher priority:

(2) Upgrading of Existing Works

i) Data / Information Transmission

In order to establish its identity as a unified organization, all the constituents must be the common owner of such information that is concerning with the activities of the whole organization. Every department and section should have an equal write to access the information. However, at present, there are some difficulties for one department to get information related to the activities and current issues of other offices of the organization: sometimes this happens even within the same office. One of the reasons lies in slow transmission of information. Data concerning vessels entering and leaving a port collected at local offices are handwritten and sent by courier. Information from offices abroad is transmitted by outdated telex. Nowadays, there are more suitable measures for data transmission are available at reasonable costs.

Upgrading of the information/data-transmission system of AMP should be given a high priority. At present, an efficient communication system, which is called frame relay, is installed between the headquarters in Diablo Heights and its detached office at Calle 50. AMP has a plan to expand the same system to cover several important offices. This expanded system, when materialized, will contribute to speed-up and cost-down the communication between the offices. It is of course highly desirable that the upgraded network will be extended to cover all the offices of AMP.

On the long-term agenda, a comprehensive electronic data exchange system should be installed to cover all the offices of AMP for data/information collection and transmission. The system will contribute to establish the identity of the organization.

ii) Publicity and Archives of Basic Documents

AMP is responsible for the dissemination of such matters concerning international treaties and conventions, Panamanian laws, rules and regulations of AMP to the public. It is also the responsibility of AMP to make announcements of procurement, recruitment, etc. It is recommended to publish an official gazette or bulletin for the purpose of public relations. Also it might be useful to open an internet home page showing the activities of AMP and important items for the maritime business circle in day to day business.

In the long history of the organization with the predecessors, AMP inherited and has produced many important instruments and documents in the course of its activities. In addition to these official instruments and documents, AMP might keep records of statistics, accounts and assets, design and constructions, concessions, licenses, accidents etc. If the organization keeps these records or their synopsis in good order and in a manner easy to search, the archives of the records will help AMP in the assessment of the past activities and in planning its future activities by providing reference of past experience, record and evidences. This is especially true for the concession contracts.

(3) Legislation Matters

i) Maritime Security, Safety and Environmental Regime

For the urgent requirement for the compliance with the international treaties and conventions, it is the most practical that relevant organizations, at its initial stage, concentrate their efforts in the enforcement of the Amendments of SOLAS Convention over the Panama Canal and the ports at the both ends of the Canal. This is because other local ports open to foreign trade may be less vulnerable than the Canal ports: the large scale ports in the regions outside the Canal area are currently operated by private companies who are responsible for the whole activities of their port under the concession contract including security, safety and pollution control, while national ports handles bulk cargoes of limited volumes.

However, it should be reconfirmed that, as the representing government agency of the state to the IMO, AMP has the responsibility to ensure the compliance of all the ports and ships with the Amendments. AMP has the responsibility to disseminate the requirements of the international treaties and conventions to the public and to monitor and supervise the action taken by the ports and ships.

Above all, the most serious security problem in Panama is not the compliance with the International Conventions, but the protection of the public and private properties within the port area from crimes such as robberies. The firefighting system is insufficient. In these cases, AMP has the responsibility to initiate the action for security.

ii) Rationalization of Concession rules

Year by year, requests for transparency is growing for administrative action. Some countries concession law provides that decision to award a concession trust an independent panel. According to Agreement No.9-76, concessions are awarded by the resolution of the Executive Committee (or Director General). In such cases, it may be worth considered to create an advisory committee constituted by knowledgeable outside persons for maintaining neutrality and transparency. Transparency is required for AMP making decisions in terms of not only awarding (or rejecting), but also expiring concessions (Agreement Art.38).

(4) Internal Matters

i) Improvement of Budgetary System

It is vital for AMP to ensure the budget for the development and proper maintenance and operation of the national port system.

A proper consideration should be given on such practice in the present budget system that the expenditures for the repair and maintenance are classified as ‘Capital Expenditure’, which has to undergo careful examination by MEF. However, many of these works are simply routine in

nature, or merely restoration from a natural disaster. The value of the asset does not increase after the works have been completed. It is reasonable to account for these works as current expense rather than capital expenditure.

ii) Resolving of Insufficient Human Resources

The personnel issue is also vital for AMP in order to fulfill its responsibility prescribed in the 1998 Ley Decreto, and to implement the Maritime Strategy, which was published in December, 2003. The study has identified the actual work items to realize its mission. Such as data/information processing, publicity and archives, environment and security and certain port development. AMP has already perceived the personnel issue, and included it in the AMP Institutional Strategy issued in November 2002. Nevertheless, it is the Study team's observation that the agenda should divide personnel arrangements into short-term and long-term programs. At this stage, it is premature to specify the target year of both programs, since eligibility of personnel in demand is not clearly defined yet.

Under the environment, to strengthen AMP's personnel structure, a suggestion is made as follows:

A short-term program should aim at making the deployment proper and to improve the quality of work. Elements of the plan should include the following:

- To review the work of each section (central and local) and make suitable arrangement plan for personnel;
- To redeploy among the port sector of AMP by transferring over-manned Administradors to Capitania and places needing personnel;
- To redeploy personnel in the headquarters as appropriate, particularly reducing over-manned supporting level and transferred to the frontline;
- As the initial stage of training scheme, to start training existing personnel for upgrading the quality of their work. It may make possible to carry out 'on-the-job' training;
- To recruit personnel as appropriate.

Long-term program should aim to achieve best-qualified work. The plan should include the following, among others:

- To upgrade the recruit system with the view to obtain professional and expert resources, particularly in the fields of port management, civil engineering and electronics high technology;
- To invite candidates openly;
- To draft and start training in specific field such as management, electronic devices, security in port, etc.;
- To establish transparent promotion system with the view to enhance morale of personnel as professionals with the view to enhance morale of personnel as professionals.

10.3.3 Strengthening of the Port Management functions of local port offices

(1) General plan

The implementation of the plan proposed herewith requires funds. In addition to the improvement measures of budgetary system, some drastic change in the policy of AMP may be required.

i) Policy Change of AMP

At present, it seems that the principal role of AMP is to raise revenue by awarding concessions to private firms, and that the functions of port to support and promote the socioeconomic activities in the regions have not been given proper considerations. In fact, the revenue that AMP earned from the port sector well exceeded the expenditure to cover the operation and maintenance cost.

The study team identified the national ports that formulate national port network to support national economy over the coming decades. The cost required for the enhancement and maintenance of the port infrastructure has been estimated. The AMP should change its policy from revenue earning to a new policy that aims at maximizing the national profits providing proper port services.

It should be noted that, regarding port infrastructure, the Panamanian government has given all the inherited properties having commercial values to the private firms: such as Balboa and Cristobal Ports, and other port infrastructure in colon and Bahia Las Ninas. What left behind in the hand of AMP is not attractive enough for private firms to think of stating a new business out of concession of the facilities and spaces. Now, therefore, AMP has to make efforts to improve its property to attract private investors. Concession is not the objective, but one of the schemes that public and private sectors jointly work toward the goal.

ii) Secure the funds needed for the enhancement and maintenance of the port infrastructure

It is the vital role of AMP to implement all the enhancement and maintenance work listed in Table 10.2.4 to keep the national port system operational. To this end, AMP should make all the possible efforts to secure the funds needed for the implementation of the plan: such as budget-making, streamlining the expenditure, revision of tariff, promotion of private investment through concession, etc.

iii) Reconfirm the roles of the port administration

AMP should reconfirm the roles and functions of the port administration to provide basic services. While AMP awards concession to private firms to provide various services in the port as mentioned in Chapter 6.5, it has the responsibility to provide itself, or through the concession contract, the basic port services such as management of the facilities, security, safety, fire fighting, garbage collection.

AMP is also responsible for the service performance of the contract firms. The concession contact does not excuse AMP from the responsibility for the port users who are paying the charges for the basic port services.

To this end AMP should do the following;

a. to ensure the basic port services by coordinating with the agencies concerned, such as local government, police and fire station, and by awarding concessions to private firms,
b. to disseminate the rules, regulations and procedures to the port users through periodical circulation of public relation brochures as well as to speed up the procedures.
c. to establish formal and informal communication with the port users for the user-friendly port management,

iv) Coastal zone management

It is very necessary for the integrated coastal management of AMP to prepare the inventory of the existing concession. The process of the awarding concessions should be transparent, and conditions of awarding concessions such as the compliance with the pollution control regulations also clearly stated in the concession contract.

v) Port statistics

The port statistics of the national port system that AMP presently possesses covers only the past seven years and lacks the continuity during the transit period from APN to AMP. The port statistics is very important not only for the monitoring of the current performance of the port system, but also for assessing the economic activities of the whole country. The port statistics also exhibits the history of the economic growth of the country. Any change appears in the yearly variation of port traffic reflects those changes occurred in the economic activities. This implies that, if a drastic change is observed in the time variation of annual port traffic volumes, the statistical data may include errors.

The port statistics is of course vital information for the planning of national port system. Thus, keeping correct record of port traffic is one of the most important roles of the port offices of AMP. At those ports where the fishing boats dock, the port offices should also gather the statistics of unloaded volumes: yearly variation of the unloaded volumes of marine products is the most useful information to assess if the marine resources are exhausting.

(2) Plans for specific ports

i) AMP organization at the ports in Canal Area

As discussed in Section 6.5.3, the field offices of Cristobal and Balboa are expected to play the role as the catalyst and they must fulfill increasing requirements, while the these two offices have difficulties to fulfill their roles due to the short of human resources. To cope with this situation,

there are three possible alternatives. The study team assessed the third alternative is the most practical.

First alternative is to create an independent port authority that governs Balboa and Cristobal, or two authorities as the case may be. This is the form, which is most adequate for the task to be recently assigned to administrations, because it is located at site to determine problems by itself. There are many major ports managed by independent port authorities (not necessarily financially independent). On the other hand, it takes considerable time to enact a new regime within the financial and social environment, and particularly with certain doubt whether the new organ can recruit necessary staff for the functions requested. If staff shortage occurs, the organ will be less workable than at present. Also, the functions of AMP and new port authority(s) become duplicated, and for bringing the new organ's ability into full play, most of the AMP's powers and functions should be transplanted to the new organ. In this case, AMP's port functions may diminish to the extent that it cannot even maintain the capability of ports other than the two ports.

Second alternative is ACP executing the functions. At this moment, among the relevant decentralized organs, only ACP furnishes sufficient resources in terms of finance and manning. For this reason, ACP could take this charge. However, it appears of some doubt that ACP is allowed to take such extra burden under the ACP Law.

Third alternative is to augment AMP's Capitania in terms of budget and personnel enough for meeting the responsibility as port administration body. In addition, considering the fact that AMP was created only a few years ago, and is now in the process of consolidation, this scheme may have two advantages: First, directorates concerning merchant marine and seafarers school of AMP would provide the hands for the new security task, since both directorates are responsible to domestically enforce the revised SOLAS and ISPS Code. Second, AMP's Capitania, Balboa and Cristobal, if augmented by enough budget and expertise, may act as local core of administration with functions now requested. Augmenting may take a long time to realize, but for the moment this alternative will be the quickest way to attain the above goal.

2) Major local ports

A number of ports function as a focal point of the transportation for the region. Chiriqui Grande, Almirante, Pedregal, Aguadulce Ports are open for foreign trade. Chiriqui Grande and Almirante ports are known as the Banana export, while Pedregal and Aguadulce Ports are exporting the agricultural product in the regions, i.e. sugar, and importing material needed for the local industries, i.e. fertilizer. Panama, La Palma, Coquira, Mutis, Bocas del Toro, Almirante Ports and other ports listed in Table 10.2.4 provide domestic sea routes to those coastal communities where no land access is available. Except the Banana export ports that are operated by private firms, all the local ports are national ports that AMP is directly managing, maintaining and operating. Even though the traffic volumes at these national ports is much fewer than that those of the ports in Canal area, they are playing vital roles for the socioeconomic activities in the respective regions.

Most of port infrastructure of these national ports were constructed and rehabilitated during the period of late 1970s to early 1980s when APN was the administrating and operating the whole port system that included the principal ports in Canal Area. APN was a centralized port authority and was able to financially support the cost needed for the development and operation of the local ports out of the revenues raised from the operation of its principal ports, namely Balboa and Cristobal Ports.

Since its creation, it has been the policy of AMP to promote the private investment on the port infrastructure. Thus, most of the national ports have been waiting for private investors who are interested to operate the ports under concession contract. In fact, some port infrastructure in Bahia Las Minas Port successfully found private investors and new bulk terminal has started its operation.

However, it is unrealistic to assume that all other national port will be able to find private investors to take over the responsibility of spending the cost required for the operation of the national port system, including the repair and maintenance costs estimated as shown in Table 10.2.4. Taking into considerations of the important roles of the local national ports in the regions, AMP has the responsibility to assure the fund required to keep the listed ports in proper shape. Private investment in the port related services may be possible provided that AMP will keep maintaining the basic port infrastructure over the coming decades.

The administrators of the AMP local offices have to play the role as the liaison between AMP Headquarters and local business community. The port administrators are the key players in promoting the participation of the local firms in to port related services.

3) Other smaller national ports

In Panama, there are more than 80 smaller ports. They are either the home ports of local fishing boats or the commercial ports of the coastal community. The development of those ports that are mainly used by the local fishing boats is highly dependent on the policy of AMP on the fishing sector and the development of these ports should be discussed separately from this study.

With respect to those ports serving for the domestic shipping, the study team assesses that AMP should include the following ports in the nationwide port development plan:

Ports in Darien, San Blas, islands in Gulf of Panama, Bocas del Toro and coastal area in western area of Azuero Peninsula (See Figure 10.1.6). It is more important for AMP to assure the regular shipping services as well as the development and maintenance of the port infrastructure. This is especially true for the coastal sea routes in Darien, San Blas and Islands. In the light of establishing the nationwide sea transport network, the current study focused on the development of the local hub ports, such as La Palma, Coquila, and Bocas del Toro, because the smaller local port cannot function without assuring ensuring the hub port will be functioning properly.

AMP should start first gather the information of shipping services in the coastal sea routes. Then it should start talks with the ship operators and coastal communities to identify the most suitable services and to find out how AMP, private ship operators and local communities can participate in the promotion and improvement of the shipping services. Workshops among the stakeholders will provide valuable information for AMP to draw the plan for the future improvement of local port system.

11. SELECTION OF PORTS SUBJECT TO MASTER PLANNING

11.1 Policy and Directions Employed in the Identification of the Projects

In Chapter 10, the Nationwide Port Development Plan has been proposed to meet the requirements simply to accommodate the port traffic expected to occur in the year 2024. It is the responsibility of AMP in line with the current practice of their port administration. If AMP fails in the realization of the proposed plan, the functional insufficiency of the national port system, especially the national ports, will have adverse effects on the national and regional socioeconomic activities. Thus, the Nationwide Port Development Plan is the minimum requirements for the AMP to fulfill its mission to avoid adverse effect occur over the coming years.

In the end of 2003, the National Maritime Strategy (NMS) was published. The NMS indicates the mission, vision, and goals that the agencies should achieve through collective efforts for the maximum use of the potential resources that the Panamanian Maritime Sector promotion has. In order to realize the mission and achieve the goal, MAP has to take initiative and proactive coordination toward the goals prescribed in NMS.

Since middle of 1990's, it seems that the policy direction of the government of Panama on the national port system has been to promote the participation of the private sector in the operation and management of ports as well as in the investment in the port infrastructure. In line with the policy direction, the MIT was started its operation in 1995 and the major ports formerly managed and operated by the APN in Canal Area were privatized in1996.

As discussed in Chapter 9, the further capacity development of the private ports, which are highly specialized for international trade, shall be managed and operated by private sector. The initiative of planning should be taken by the private companies and the public sector should avoid direct intervention and focus administrative and regulatory aspects to formulate favorable business environments for port related industries. Thus, projects for the port capacity developments shall be identified among national ports that are directly managed by AMP.

In the coming decades, the national ports, most of which are local ports and currently managed and operated by AMP directly, should strengthen the following primary roles and functions (see 9.2.2 Primary Roles and Functions of the Port Sector of the Country):

- To provide the local communities with the port functions of reasonable scale at appropriate locations with user-friendly administrative services;
- To secure the safe, effective and economic port network covering the entire country;
- To promote incentives of the public and private sectors to invest in the effective industrial/transport infrastructures and the beneficial industries at the hinterland of the ports;

- To create job opportunities for the local communities through promotion of port related businesses; and
- To lead the national maritime sector promotion through the steady and sustainable port development under well conceived port strategies.

In order to strengthen the above mentioned roles of the national ports, the AMP should taka initiative in the identification of the direction of the development of these ports and should prepare the development and upgrading plan to fulfill their roles. As mentioned above, the Nationwide Port Development Plan proposed in Chapter 10 is the minimum requirements for the AMP to have its port system will sustain their rolls and functions needed by the socioeconomic activities in the regions and local communities. In the NMS, AMP has announced to the public its mission and vision to promote the maritime sector of Panama. To materialize the mission and vision, AMP has further responsibility to work proactively to encourage private sector to participate more in the port related businesses.

Once again, the planning of national ports system should be initiated by public sector. This is because the private sector tends to think of their profitability in the investment in their investment while the above mentioned primary roles of the ports are given lower priority. Hence, it is the responsibility of the AMP to prepare and show the development plans of the national ports in concrete forms so that the private sector could be able to think of their parts to contribute and participate in the port related businesses.

In this chapter, for the purpose of realizing the mission and vision of the National Maritime Strategy, particularly in the field of the port sector development, four projects (ports) shall be selected. The criteria employed in the selection are as follows:

(1) The projects should be intended to strengthen the primary roles stated above,

(2) The projects should provide the port sector, both public and private, with suitable environments to contribute to the following fields;

1) Support to national policies

   a) Mitigation of socio-economic disparities between the Panama metropolitan area and the other areas
   b) Support of the on-going projects in the development areas with high priority such as the Darien and Bocas del Toro provinces.
   c) Tourist development in the Bocas del Toro province
   d) Promotion of the agricultural sector, especially encouragement of non-traditional production

2) AMP performance of duties

   a) Sustainable marine resource management
   b) Management of coastal areas

c) Conservation of the marine environment
d) Safety and security of maritime transportation services

3) Promotion of local economies

a) Enhancement of economic activities by the infrastructure development of the transport sector

(3) The realization can be realized only by the initiatives of the AMP in planning the port development including public investment in the port infrastructure development, which is one of the vital elements of the authority prescribed in its organic law.

On the basis of these criteria for the selection, the national ports should be given priority to the private ports, since the investment plan in the port infrastructure should be done by the private initiatives rather than by public sector intervention. Thus, the domestic ports listed in Table 6.2.2 are the primary candidate for the master planning, while the infrastructural development of international container transshipment ports and international passenger port in Canal area, the banana export ports and liquid bulk terminal in Chiriqui and Bocas del Toro Provinces, the liquid and dry bulk terminals in Bahia las Minas in Colon Province are supposed to be subject to private initiatives.

Vacamonte Port and other fishing port may require infrastructural enhancement. Being the largest fishing port facilitating the commercial fishing by providing the base port function and the processing facilities of fishing products, Vacamonte Port, on the assessment of the study team, has various elements that should be improved especially in managerial and operational aspects. However, the current study rather focuses on the national port system development from the viewpoint of the nationwide passenger and cargo movements and the master planning of the fishing port system requires the a policy and guideline for the fishery development of whole country, which is outside the scope of this study. Therefore, the fishing ports listed in **Table 6.2.2** are also given lower priority as the candidate ports for the master plan.

Among the national ports, in Chapter 10.1.2 (3) , the following ports have been identified to be playing important roles in the national transport system over the coming years (see Figure 10.1.4 and 10.1.5):

- Pedregal and Aguadulce Ports as the international ports for sugar export and fertilizer import,
- Bocas del Toro, Mutis, Coquila and La Palma Ports as Local hubs,
- Almirante Port as the gateways to the islands in Bocas del Toro Province

The private port of Colon Port Terminal is the gateway to the coastal communities of San Blas that is the poorest province: actually it is called Region (Comarca). All the commodities to and from San Blas are handled at the private port. Thus, in the light of the first criterion, “Support to national policies to mitigate the socioeconomic disparities among the provinces”, the port should

be given special attention in the selection of the candidate ports. However, the scope of work of this study excluded the ports in Comarca de San Blas because of the security reasons. Thus, it should be noted that the reason why no port in San Blas were selected is not that they have been identified to have lower potential for the future development. The study tem strongly recommends that another study be carried out when the security problems are settled.

Among the ports listed above, further selection shall be done hereunder.

11.2 Development Concepts of Major National Ports

In Chapter 8, the capacity of the existing port system was assessed in the light of the cargo and passenger traffic forecasted in the 2024 and the restrictions that will occur in the coming years have been identified. The outstanding issues are:

- La Palma Port will become a local hub port for the coastal communities in Darien Province;
- Coquira port will become the gateway to the islands in Gulf of Panama;
- The future roles and functions of Puerto Armuelles Port should be identified in the light of the new environment in the future and, then, it should be renovated to meet with the new requirement;
- Appropriate landing facilities should be provided for the passenger boats in Bocas del Toro and Almirante Ports;
- Aguadulce Port needs to enhance the capacity for fertilizer unloading.

It is matter of course that AMP has the responsibility to provide port infrastructure having enough capacity to cope with the traffic demands. In this sense, providing the necessary facilities is the minimum requirement. It is also AMP's responsibility to actively plan and implement the projects in order that the projects will give substantial impacts and positive effects on the local socioeconomic activities. In the light of the roles of national ports stated in the previous Section 11.1, AMP should take the projects as the opportunity to realize its mission and vision prescribed in NMS.

All the above mentioned outstanding issues will not be materialized by such simple projects to enhance the capacity of port infrastructure. For instance, when La Palma Port starts serving as the local hub, more cargoes and passengers pass through the port. This implies that as the traffic increases, more port related activities will be generated. It is also often observed in modern ports that ports related industries starting from simple cargo handling business expand their activities to value-added businesses. Thus, the master plan of La Palma Port should be drawn from the concept to change the roles of the port and also promote the municipality of La Palma into the activity center in the region.

The same concept should be employed for the enhancement of the port infrastructure of Coquira and Bocas del Toro Ports.

For the case of Puerto Armuelles Port, the roles and functions of the port in the future could be identified only by analyzing the socio-economic activities of the Chiriqui Province and the adjacent regions. Because the original role of the port, i.e. banana export, is over.

In Chapter 6, the traffic demands were examined on the basis of existing port system. Container cargo traffic, for instance, has been forecasted with the assumption that all the containers should be handled at either Balboa Port or container terminals in Colon. Since population and economic activities are concentrated in Panama City and its suburbs, it is of course most of import container cargoes, which consist of food, industrial products and other various materials, are used and consumed in the metropolitan Panama. However, some portion of the container cargoes are delivered to other provinces: Chiriqui is one of those.

The population of Chiriqui is expected to grow to 463,000 in 2024 from 381,000 in 2000. The GDP of the Province is also expected grow to two folds (from USD 1.05 Billion in 2000 to USD 2.10 Billion). Recent years, David, provincial capital of Chiriqui, is becoming a regional logistic center and its economic zone has covered Bocas del Toro Province. The share of the total of Chiriqui, Bocas del Toro and Veraguas will account for 15% in GDP and 20 % in Population. Thus it is reasonable that the volume of the imported container cargoes brought to Chiriqui region is substantial.

The import container volume is expected to grow to 1.54 million tons in 2024. On the assumption that the consumptions of the good imported as container cargoes in a province should be proportional to the GDP share of the province, the container cargoes brought from Panama City to Chiriqui province is estimated to amount 231,000 tons. Even with the consideration of the fact that container cargoes are first brought to warehouses in Panama City or Colon and substantial portion is used by the factories there, still quite a volume of container cargoes are brought to Chiriqui and adjacent provinces.

Chiriqui is rich in agriculture products, and at present several projects are on-going in Chiriqui and Veraguas Provinces to promote the production non-traditional agricultural products. Thus, export cargoes generated in Chiriqui and nearby provinces are also expected to grow.

Without proper ports in the region, all the import and export commodities of the region have to be hauled all the way to Panama City. This remains as the disadvantage of the business in remote provinces. Thus, Chiriqui and adjacent provinces wants direct access to the world market. Taking into consideration that the container feeder services along Central American coast are provided and that these routes are very close to Panama coast (see Figure 11.2.1), some of these feeder service vessels would call on Chiriqui if certain amount of container cargoes, e.g. 100 boxes per week would be generated.

Figure 11.2.1 Coastal Container Service Route

The concept of the development is schematically exhibited in Figure 11.2.2 and Figure 11.2.3. Figure 11.2.2 shows the existing system, which is centralized transport system and all the commodities are imported and exported via Balboa or Colon Ports. Figure 11.2.3 shows the development concept proposed herein, which aims at the establishment of sub-economic centers.

The same development concept could be applied for other ports: La Palma Coquira and Bocas del Toro. Though the scales are smaller than Chiriqui Port, the concept of establishing regional and local activity center remain the same.

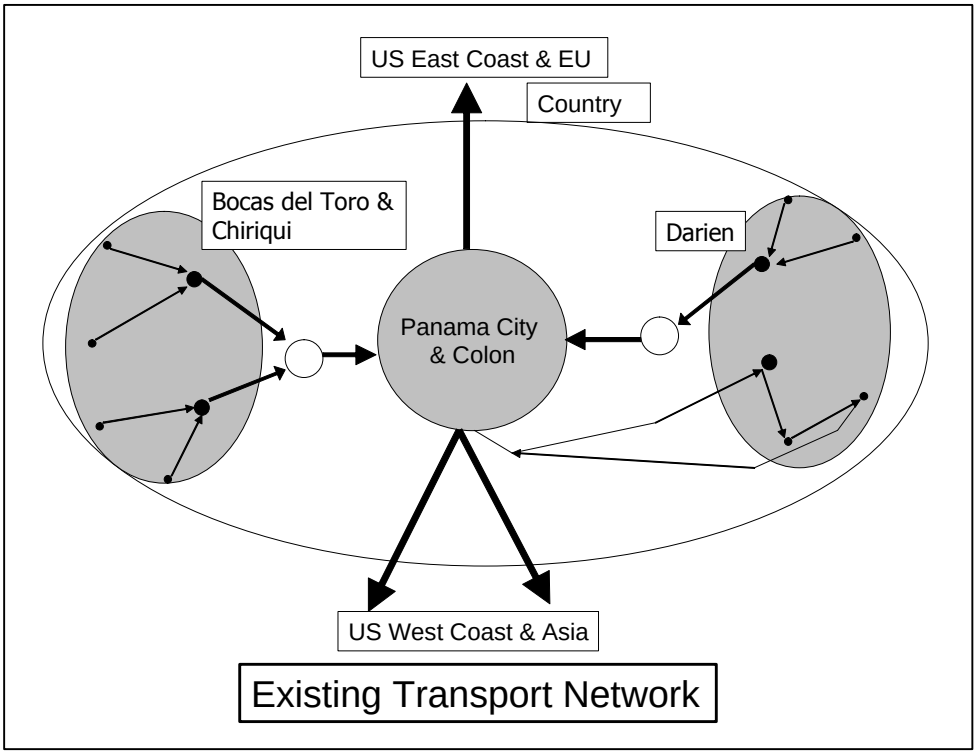

Figure 11.2.2 Existing Transport Network

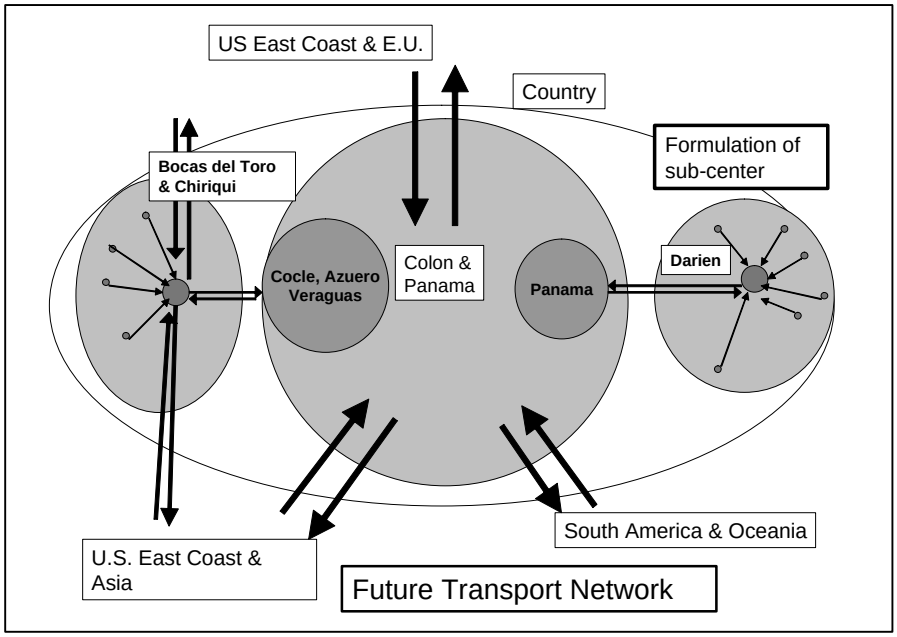

Figure 11.2.3 Concept of National Port Network Development

11.3 Selection of Ports subject to Master Planning

11.3.1 Selection criteria

On the basis of the review of the present conditions and perspectives of the major national ports, under the circumstances of the AMP's policy published in the National Maritime Strategy and the national policy targets observed in the on-going projects, the ports should be given special emphasis are:

The development of the port should

1) directly contribute to the Mitigation of Socio-economic Regional Disparities which, in turn contribute to the Alleviation of Income Gap and Poverty (National Policy Target),
2) facilitate the ongoing projects to achieve their goals by complementing each other(National Policy Target),
3) "promote the private investment in cargo and passenger ships in coastal transport service, to upgrade the quality, frequency and security of the domestic maritime transport services toward the most remote communities" (National Maritime Strategy, Second Strategic Objective, Sec. 2, b),
4) "set up the necessary infrastructure that allows maximizing the use and efficient interconnection of the activities of the marine conglomerate" (National Maritime Strategy, Second Strategic Objective, Sec. 2, d),
5) to respond to the need of local people (discussions in Workshops) and facilitate to organize the local community to take their part collectively to improve their living environment, and
6) generate national benefit further by implementing the development project,

On the basis of the first and second criteria, the most remote provinces such as Darien, Bocas del Toro and Chiriqui Provinces are focused. Other provinces such as Cocle, Herera, Los Santos and Ver Aguas Provinces have been enjoying economic growth under the expanding economy of Panama Canal in accordance with the completion of four-lane Highways as far as Santiago.

In the light of the third criteria, the remote areas in Darien, Panama, and Bocas del Toro are focused: It should be noted that San Blas region also has most remote communities and it is very necessary to develop accesses to the communities, though the region was excluded from the study scope for the security reasons.

From the criteria 4) and 5), Bocas del Toro and Chiriqui are focused. The economy of the former highly depends on the water transportation, while the latter has a disadvantage in the access to the world market. In addition, in these provinces there are business companies and communities in various sectors that are the potential supporters in the development of the ports.

Thus, the following four projects have been chosen for the master planning:

1) Bocas del Toro & Almirante Ports
2) a new port in Chiriqui,
3) La Palma Port and
4) Coquira Ports from the viewpoint of local transport.

Though Aguadulce Port has been identified to be an important constituent within the national transport network. As mentioned and proposed in Chapter 10, the requirements for Aguadulce port is only the enhancement within their current roles and functions and, except for maintenance of the access channel, the improvement measures are done only within the existing port areas. Thus, this should be a part of AMP's own port improvement programs and will not involve other agencies. Taking into consideration of the scale, the improvement measures should be implemented once sometime in the near future rather than implemented in several phases over a long period of time.

The development of the four ports are aiming at the functional expansion so that the ports will not only meet the requirements as terminals in the transport network but also generate positive impacts on the local socio-economic activities. Therefore, these four ports have been selected for the master plan. The development concepts of the master plan of the four ports are as follows:

- Tourism Port in Bocas del Toro
  To enhance the on-going IDB funded program for sustainable development of Bocas del Toro by assuring the safety and comfortableness of the passenger boat services and to preserve and restore tourism resources by establishing well organized land use plan near the port.

- A New Port to Promote the Socioeconomic Activities in Chiriqui
  To construct a new multipurpose port to promote agricultural, fishing and service industries in the remote provinces by providing a direct access to the world trade route.

- Coquira Port in Panama Province
  To develop a gateway to the islands in Gulf of Panama. Together with pier, backup facilities also should be constructed as a part of the project. With the new port facilities, the port management should be modernized. For the smooth implementation of the project and the promotion of port related businesses, the possibility of public-private-partnership should be sought.

- La Palma Port in Darien
  To promote further the function of La Palma Port as a local hub of the water transport network among the remote communities in Darien coast and to provide more efficient and convenient access to La Palma, which will soon be inter-connected with Pan-American Highways via inter-modal link. With this improved transport network, the port should take an active role to facilitate and promote local industries by providing a suitable environment for new business establishment. The development plan also should focus on the local fishing activities that currently have the difficulties to reach the commercial market.

11.3.2 Preliminary Discussion on the Management Scheme of the Selected Ports

Since the development is intended to expand and diversify the function of the ports and to promote the involvement of local industries and people, much coordination and cooperation should be needed with other related institutions concerned. In this section, preliminary discussions shall be done on what type of involvement of the local people and industries is possible for respective ports. The viability of the management discussed hereunder shall be evaluated through financial analysis in the later sections.

(1) Bocas del Toro

Bocas del Toro and Almirante Ports have two functions: the RoRo Ferry service and Passenger services. The RoRo Ferry service is a fundamental service for the life of the communities in the islands. Thus, it is the responsibility of the AMP to endure the service and take necessary steps to maintain the proper frequencies and the safety ensure the service. On the other hand, the passenger service involves a lot of tourism activities of local people: passenger boat operators, hotel, restaurant and shop owners, as well as the local government and other government agencies. The operation of the passenger terminal involves various elements such as handling baggage, ticketing, food and drinks etc. At Almirante Port, it is also important to interface the schedule between the passenger boats and bas operations Therefore, the passenger services may be better done by private sector. Since the orderly operation of passenger boats among various operators

can be better performed by operator themselves, it seems to be desirable that the association of passenger boat operators manages the passenger terminal.

The two ports will be a sort of symbol of the tourism towns, though the ports as a whole managed by AMP, it is very necessary to establish a port advisory committee composed of stakeholders in various sectors that will play as a conduit between AMP port manager and the users.

(2) Chiriqui Port

The beneficiaries of the development of Chiriqui Port are the local industries and communities. Hence, it is assessed that the private sector will participate in the funding for the project. However, due to the traffic volume, the project is not attractive enough for the private operators to invest the whole cost. To lessen the amount of public investment and to manage and operate the port most efficiently, the establishment of a Special Purpose Company (SPC) would be most realistic.

In Chiriqui, there are some institutions that are the potential constituents of the SPC: PTP and Baru Free Zone Authority. The PTP is currently operates its oil terminal and has a plan to expand their business in dry bulk handling and supply service for tuna boats. It has also the experience in port management and operation. Their tug boats can provide tug services in the new port and the company also will increase the clients of bunkering service. For Baru Free Zone Authority who is the primary beneficiary, a direct access to the world market is very necessary. In addition, the private firms that are handling import and export goods in Chiriqui Province will be also interested in the participation in the development of the new port.

The study shall elaborate a master plan attractive for both government and the private sector.

(3) Coquira Port

The port is the alternative port to Panama Port that will be closed for cargos. After the Pan-American Highway is fully improved, the client of the port will be only the ships calling on the islands in the Gulf of Panama. Thus, basically, it is the responsibility of the government and the project should be considered as the compensation of the closure of Panama Port.

To lessen the amount of public investment and to manage and operate the port most efficiently, a possible scheme of private participation should be elaborated. The scale of the investment would be relatively small, and the demand is already exist. Thus, the project could be attractive for the private sector provided that some portion of the project cost is shouldered by the government.

In Coquila, there is a private firm that is operating a fish port as well as a ship repair yard. Thus, the knowledge and experience is locally available and there is obviously primary beneficiary of the project. It seems that concession may be one of the possible schemes: those port facilities in water area such as pier and revetment are constructed by public and leased to a private operator while the private operator will construct the facilities in land area such as shed, warehouse and equipment. The conditions of the lease or concession shall be determined through the negotiation.

(4) La Palma Port

AMP will remain as the port management body for the new RoRo ferry terminal that will be completed soon under IADB project. Taking into consideration of the facts that the facilities for fishing boats should be developed in the area close to the Ferry terminal, that there are no private firms that are interested in participating in financing the project, and that the experience and knowledge of the port operation is locally available except AMP, it is realistic to assume that the operation of the new fishing port facilities should be managed by AMP together with the RoRo ferry terminal.

However, in the actual operation of the port facilities for the fishing boats, the users such as the local fishing communities should be involved. The participation in the operation could provide an opportunity to strengthen the ties among the local fishing communities that may lead to collective efforts among them to protect their fishing ground from over-catching and to commercialize their activities.

Summing up above preliminary discussion, it is foreseen that the potential management scheme and the share between the public and the private sector in the funding of initial const of the projects as shown in Table 11.3.1.

Table 11.3.1 Management Scheme of the Selected Ports

	Share in financing in initial construction cost		Managing Entity (Operation & Maintenance)	Participation of Local firms and Communities in the Port Operation
	Public	Private		
Bocas del Toro	100%	0%	AMP Port Office	Operation of Passenger Terminal - Berth Assignment to Passenger Boats by Association of Passenger Boat operators - Running Passenger services, restaurant and shops by local community
Chiriqui	> 50%*	< 50%*	Special Purpose Company	Cargo handling (Container, Bulk, Tuna) Other port related services: Logistics, Agents
Coquira	> 50%*	< 50%*	Private Operator	Storage and logistics service by private firms
La Palma	100%	0%	AMP Port Office	- Berth assignment to fish boats, and Operation of Ice Plant Fish storage service by cooperatives of local fishermen - Logistics, including bunker '& water supply and rucking by private firms

* to be determined through negotiation between the partners