Japan International Cooperation Agency (JICA)

Autoridad Marítima de Panamá (AMP)

No.

Final Report

THE STUDY ON THE COMPREHENSIVE PORTS DEVELOPMENT PLAN IN THE REPUBLIC OF PANAMA

Summary

August 2004

PACIFIC CONSULTANTS INTERNATIONAL

INTERNATIONAL DEVELOPMENT SYSTEM INC.

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Note: The following exchange rate are used in this report.
1.00 Balboa = US Dollar 1.00 = Japanese Yen 108
December 2003

PREFACE

In response to the request from the Government of the Republic of Panama (hereinafter referred to as “GOP”), the Government of Japan (hereinafter referred to as “GOJ”) has decided to conduct the Study on the Comprehensive Ports Development Plan in the Republic of Panama (hereinafter referred to as the “Study”) and entrusted the Study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team to Panama three times between June 2003 and June 2004, which was headed by Mr. Nobuo ENDO of Pacific Consultants International (PCI) and was comprised of PCI and International Development System Inc. (IDS).

The team held discussions with the officials concerned of the GOP and conducted the field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of GOP for their close cooperation extended to the Study Team during the Study.

August 2004

Kazuhisa Matsuoka
Vice President
Japan International Cooperation Agency

LETTER OF TRANSMITTAL

August 2004

Mr. Kazuhisa MATSUOKA
Vice President
Japan International Cooperation Agency

Dear Mr. MATSUOKA,

It is my great pleasure to submit herewith the Final Report of "The Study on the Comprehensive Ports Development Plan in the Republic of Panama".

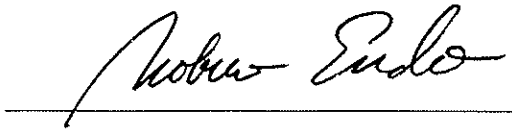
The Study Team comprised of Pacific Consultants International (PCI) and International Development System (IDS) conducted studies in the Republic of Panama over the period between June 2003 and June 2004 according to the contract with the Japan International Cooperation Agency (JICA).

The Study Team compiled this report, which proposes the future development scenario including a Nationwide Port Development Strategy in Panama for the target year 2024, Master Plans of selected four local ports for the target year 2024 and a feasibility Study on the priority projects, through close consultations with officials of the Panama Maritime Authority and other authorities concerned.

On behalf of the Study Team, I would like to express my sincere appreciation to the Panama Maritime Authority and other authorities concerned for their cooperation, assistance, and heartfelt hospitality extended to the Study Team.

We are also very grateful to the Japan International Cooperation Agency, the Ministry of Foreign Affairs, the Ministry of Land, Infrastructure and Transport, and the Embassy of Japan in the Republic of Panama for valuable suggestions and assistance during the course of the Study.

Yours faithfully,



Nobuo ENDO
Team Leader
The Study on the Comprehensive Ports Development Plan in the Republic of Panama

Bocas del Toro Port

Almirante Port

Chiriqui Port

Coquira Port

La Palma Port

LIST OF ABBREVIATIONS

ACP	:	Autoridad del Canal de Panamá (Panama Canal Authority)
AMP	:	Autoridad Marítima de Panamá (Panama Maritime Authority)
ANAM	:	Autoridad Nacional del Ambiente (National Authority of Environment)
ANCON	:	Asociacion Nacional para la Conservación de la Naturaleza /National Association for Nature Conservation
API	:	Administración Portuaria Integral (Integrated Port Administration)
APN	:	Autoridad Portuaria Nacional de Panamá (National Port Authority of Panama)
APSA	:	Atlantic Pacific, S.A.
ARI	:	Autoridad de la Región Interoceánica (Authority of the Interoceanic Region)
AUC	:	United Self Defense of Colombia
BFZA	:	Baru Free Zone Authority
BOO	:	Build-Own-Operate
BOT	:	Build-Operate-Transfer
CAPAC	:	Cámara Panameña de la Construcción (Panamanian Chamber of Construction)
CBP	:	Customs and Border Protection
CCT	:	Colon Container Terminal
CEMIS	:	Multimodal Industrial Service Center
CFZ	:	Colon Free Zone
CIQ	:	Customs, Immigration, Quarantine
COCATRAM	:	Commission of Central American Maritime Transport
CSI	:	Container Security Initiative
C-TPAT	:	Customs-Trade Partnership Against Terrorism
DGRMC	:	General Directorate of Marine and Coastal Resources
DHS	:	Department of Homeland of Security
DINAAC	:	National Aquaculture Directorate
DMPSP	:	Development Master Plan for Selected Ports
DO	:	Dissolved Oxygen
EAP	:	Economic Active Population
ECMWF	:	European Center for Medium-range Weather Forecasts
EIA	:	Energy Information Association
EIA	:	Environmental Impact Assessment
EIRR	:	Economic Internal Rate of Return
FAO	:	Food and Agriculture Organization of the United Nations
FC	:	Fecal Coliform
FCCA	:	Asociacion de Cruceros de Florida y el Caribe (Florida and Caribbean Cruisers Association)

FDI	:	Foreign Direct Investment
FERTICA	:	Fertilizantes de Centro America (Panamá) S.A.
FFD	:	Fondo Fiduciario para el Desarrollo (Develop Fiduciary Funds)
FSPDP	:	Feasibility Studies for Priority Development Projects
FTAA	:	Free Trade Area of the Americas
GANTRAP	:	Not-traditional Agricultural Exporters Association of Panama
GCO	:	Office of General Comptroller
GDP	:	Gross Domestic Product
GMT	:	Gross Metric Tons
ICAVE	:	Internacional de Contenedores Asociados de Veracruz (Internacional Associated Containers of Veracruz)
IDAAN	:	Instituto de Acueductos y Alcantarillados Nacionales (National Institute of Aqueducts and Sewage)
IDB/IADB	:	Inter-American Development Bank
IEE	:	Initial Environmental Examination
IMO	:	International Maritime Organization
INCOP	:	Instituto Costarricense de Puertos del Pacífico (Pacific Port Institute of Costa Rica)
IPAT	:	Instituto Panameño de Turismo (Panamarian Institute of Tourism)
IPDP	:	Individual Port Development Plans
IQ	:	Individual Quota
ISPS Code	:	International Ship and Port Facility Security Code
IT	:	Information Technology
JAPDEVA	:	Junta de la Administración Portuaria y de Desarrollo Economico de la Vertiente Atlantica (Port Administration and Economic Development of Atlantic Slope Union)
JICA	:	Japan International Cooperation Agency
JMA	:	Japan Meteorological Agency
JWA	:	Japan Weather Association
KCS	:	Kansas City Southern Railway
LLC	:	Lanigan Holdings
MARPOL	:	International Convention for Prevention of Marine Pollution
MEF	:	Ministerio de Economia y Finanzas (Ministry of Economy and Finance)
MICI	:	Ministry of Commerce and Industry
MIDA	:	Ministry of Agricultural Development
MIT	:	Mansanillo International Terminal
MIVI	:	Ministerio de Vivienda (Housing Ministry)
MOP	:	Ministerio de Obras Públicas (Ministry of Public Works)
MOPT	:	Ministry of Public Works and Transport

MSY	:	Maximum Sustainable Yield
MTSA	:	Maritime Transportation Security Act
NAMPF	:	Nationwide Allotment of Major Port Function
NMS	:	National Maritime Strategy
NMS	:	Servicio Maritimo Nacional (National Maritime Service)
NPDCP	:	National Port Development Conceptual Plan
NPS	:	National Port Strategy
OCUPA	:	Operadora de la Cuenca del Pacifico, S.A. de C.V (Pacific Basin Operator)
PCC	:	Pure Car Carrier
POT	:	Land Use Management Plan
PPC	:	Panama Port Company
PPP	:	Public and Private Partnership
PROPRIVAT	:	Unidad Coordinadora para el Proceso de Privatización (Coordinator Unity for Privatization Process)
PTP	:	Petro-terminal de Panama S.A.
RGDP	:	Regional Gross Domestic Product
SCF	:	Standard Conversión Factor
SCT	:	Secretary of Communications and Transportation
SIECA	:	Central Economic Integration System
SINCOTAVECOP	:	Sindicato de Conductores de Taxis y Vehículos Comerciales de la Provincia (Union of Taxi Drivers and Commercial Vehicles of the Province)
SOLAS	:	International Convention for Safety of Life at Sea
SPC	:	Special Purpose Company
TAC	:	Total Allowable Catch
THC	:	Total Hydrocarbon
TMM	:	Transportacion Marítima Mexicana (Mexican Maritime Transportation)
TN	:	Total Nitrogen
TP	:	Total Phosphorus
TSA	:	Transport Security Administration (United States)
UNFPA	:	United Nations Population Fund
UNHCR	:	United Nations High Commissioner for Refugees
USAID	:	U.S. Agency for International Development
UCST	:	Coordinator Unit of the Transportation Sector
UTM	:	Universal Transverse Mercator's Projection System
VAF	:	Value-Added Facility
VAS	:	Value-Added Service
VIPA	:	Virgin Island Port Authority
WB	:	World Bank

Executive Summary

1. Background

The Panama Maritime Authority (AMP) was established in 1998 integrating those agencies concerned with maritime affairs formerly belonged to various ministries. AMP inherited the administrative and managerial functions of the National Port Authority (APN, created in 1974) which had invested in, administrated, managed and operated the port system of Panama until 1998 when both Balboa and Cristobal (the principal public ports) were privatized.

Whereas APN was autonomous and had acted as the implementing agency for the development of the public port infrastructure throughout the country and operated the public port themselves, AMP has rather been focusing on its administrative and regulatory functions. It has been making efforts to promote the private investment in port related businesses among others, and has achieved great success in the principal ports within Canal Area. In contrast to the growth of port related businesses in the Canal Area, local ports have been left behind, and have long waited for private and public investment.

AMP has published the National Maritime Strategy (NMS). The NMS commits in Article 3,b of the Second Strategic Objective *'to carry out the necessary studies to implement a "Port Development Plan of the Republic of Panama" including the formulation of development master plans and feasibility studies for the port projects that are considered high-priority.'* The Study is intended to prepare the action plans to realize the commitments in NMS.

2. The Study on the Comprehensive Ports Development Plan in the Republic of Panama

The Study will be summarized, as shown in following pages.

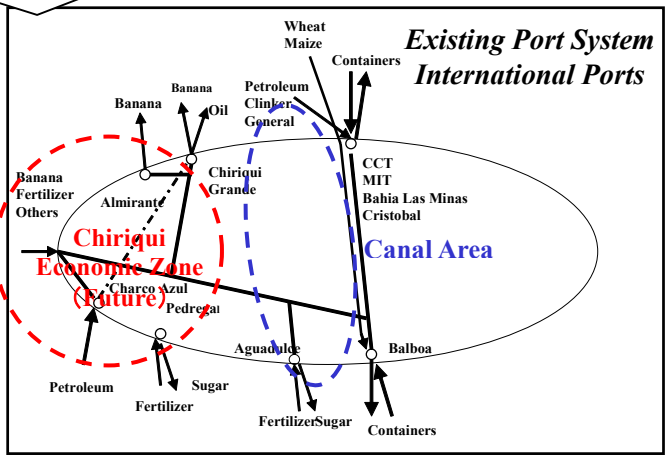
《Present Port Sector》

Ports in the Canal Area, especially large-scale container terminals, are very active, while local ports handle a little cargo and transportation of domestic cargoes depends mainly on land. This attributes to the followings:

1) Delay of local port development caused by lack of financial resources
2) Insufficient understanding on roles of local ports to reinvigorate local socio-economic activities

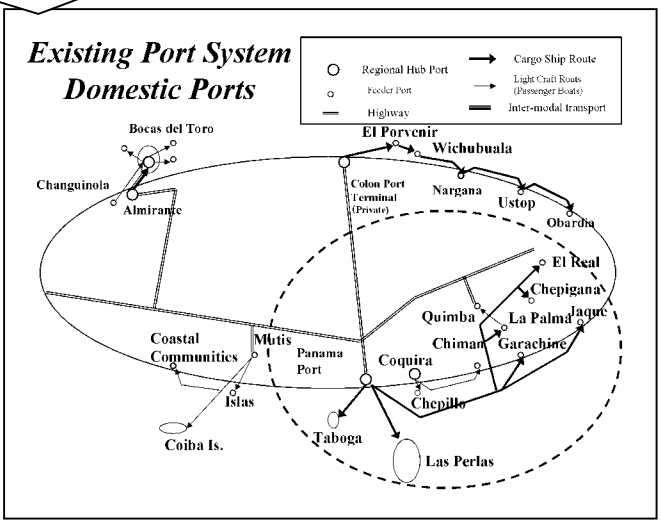
2.1 National Port System

(1) International Ports (Private Ports)
- **International Container Ports**
- **International Tourism Ports**
- **Industrial Ports**



Manzanillo International Terminal

(2) Domestic Ports mainly under AMP Management
- **Regional Hub Ports**
- **Feeder Ports**

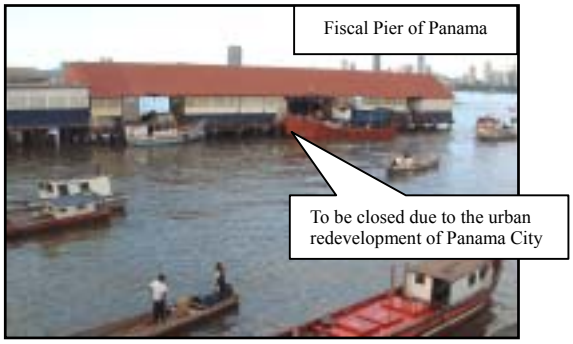


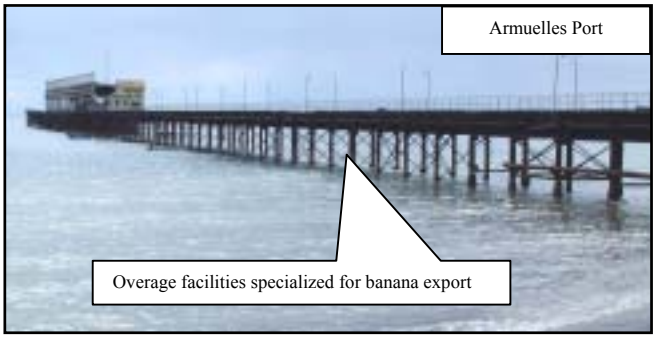
Mutis Port

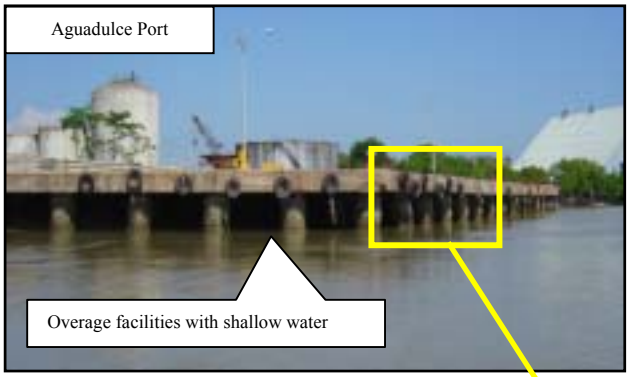
(3) Fish Port under AMP Management
- **Home Ports for local vessels**
- **Base Port for foreign vessels with processing facilities**

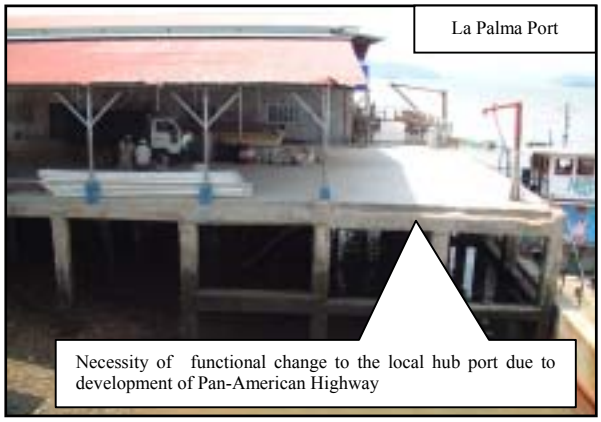
Vacamonte Port

2.2 Current Issues





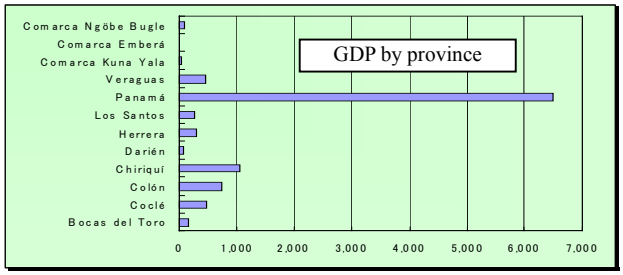


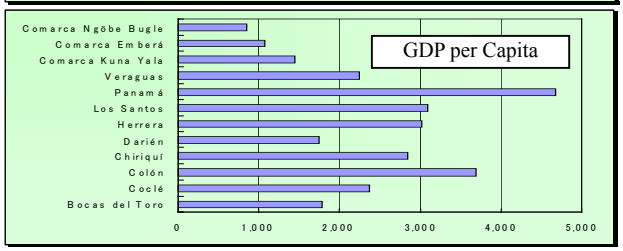


2.3 Port Development Strategy

GDP by Province and GDP per Capita (Year 2000)

◆Regional socio-economic disparities





Present Government Policies

1. Compite Panamá

Key Objectives	Area
Agriculture	Chiriqui, Azuero
Tourism	Bocas del Toro, Colon

2. Municipal Development and Decentralization Program

- Decrease of the dependency of local government from central government

3. Rural Development Plan 2001 – 2004

- Promotion of non-agricultural product
- Use of the biodiversity for tourism development

Port Development Strategy

(1) Basic Direction

1) Achieve sustainable economic development
2) Alleviate poverty, particularly in rural areas
3) Alleviate imbalance of regional economy
4) Ensure maritime safety and security

(2) Long-term Port Development

1) Take measures on the future container facility requirement in the Canal Area
2) Support the tourism city planning in Bocas del Toro
3) Create a new economic zone in Chiriqui province
4) Secure maritime access to islands in Panama province
5) Establish a regional socio-economic center in Darien

Workshop

Bocas del Toro	· Disordered occupation of the coast · Lack of coordination for issuance of the permit for construction on the coast · Lack of city planning · On-going Project : Strengthening local management capability
Chiriqui	· Lack of port facilities to meet the demand · Lack of port development plan · Potential of population increase and economic expansion
Coquira	· Lack of subsitute planning for the fiscal port of Panama
La Palma	· Lack of the local socio-economic center · Lack of access to the market for fishermen · Lack of utilization of marine resources · No planning for use of the existing airport site after relocation · Lack of promotion of port related industries · On-going Project : RoRo Ferry Service

Ongoing Project

1. Darien Regional Development Plan
2. Bocas del Toro Regional Development Plan
3. Local Infrastructure Development Plans
   - Panama city coastal development plan
   - Baru multimodal Free Zone

The National Maritime Strategy

First Strategic Objective

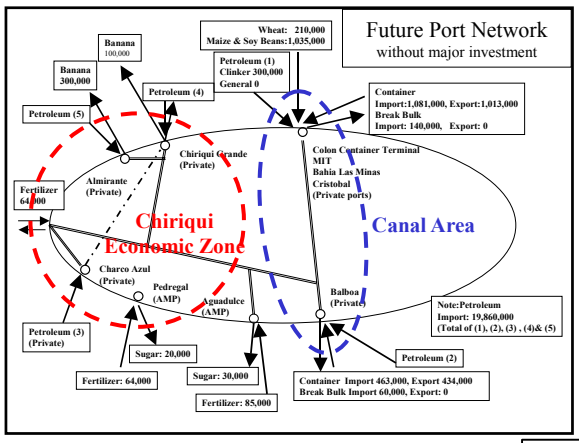
Second Strategic Objective

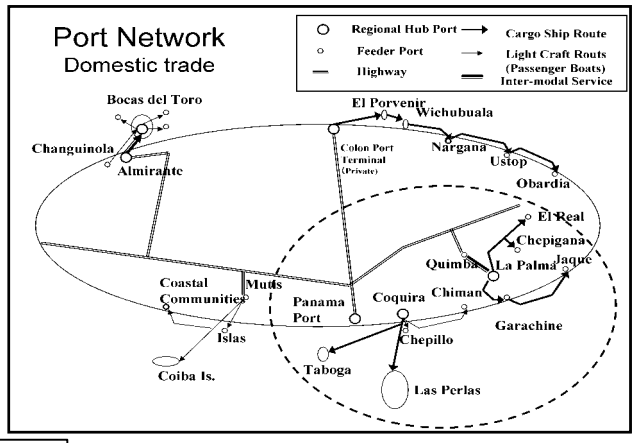
3. To stimulate the investment in the required physical infrastructures

b) To carry out the necessary studies to implement a "Port Development Plan of the Republic of Panama"

2.4 Master Plan up to the Target Year 2024

(1) Nationwide Port Network (International Trade) | **(Domestic Trade)**





Potential Problems

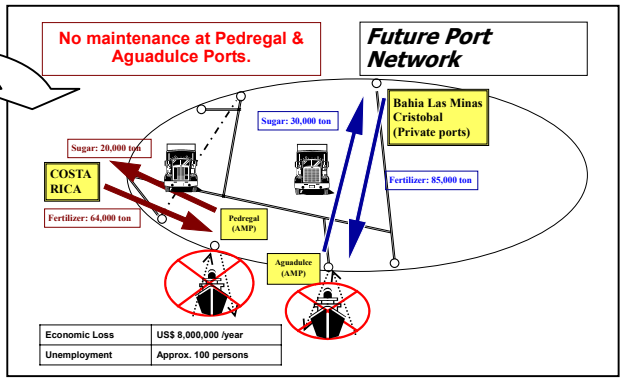
◆Bocas del Toro Port: Disordered development of the coastal area will destroy attractive environment for international tourists.

◆Pedregal and Aguadulce Ports: No maintenance dredging of the navigation channel will result in huge economic loss.

◆Fiscal Pier of Panama: Its demolition will need substitute facilities to maintain lifeline to islands and coastal areas having no land access.

◆La Palma Port: Without promotion, transport network and services to the coastal communities will deteriorate.

To support cargo and passenger distribution
(2) Maintenance of Port Infrastructures



Annual maintenance cost: USD 873,000/year
for 16 major local ports

Initial cost for repair: USD 575,000
for Pedregal, Aguadulce and Taboga ports

Financial Resources for Maintenance of the Port Infrastructures
◆ Maintenance Cost: USD 873,000/year VS AMP Profit (2001): USD 4,533,000

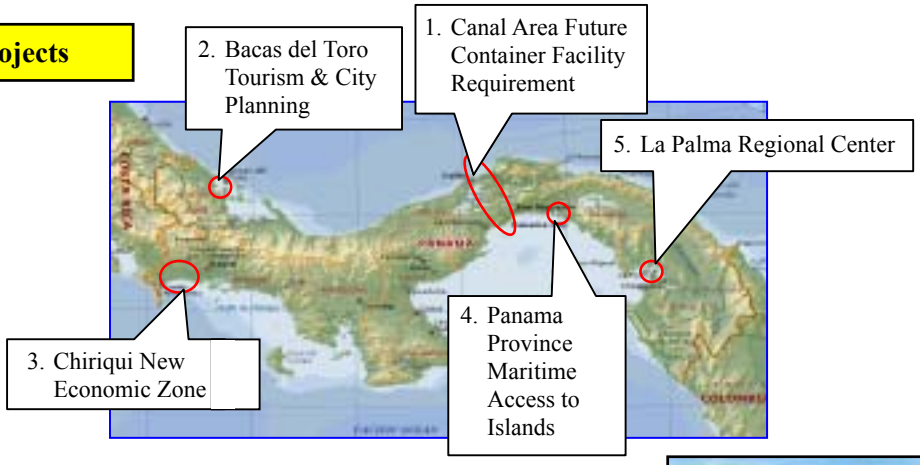
To achieve proper maintenance
(3) Strengthening AMP Organization

1. AMP's Role and Function
◆Achievement of port development on National Maritime Strategy

2. Present Issues on AMP Organization
◆ No financial independence
◆ Insufficient qualified human resources

3. Plan for Strengthening AMP Organization
1) To provide improvement cost for nationwide port network as current expenditure
2) To work out the National Investment Plan for port infrastructures
3) To establish the cooperative structure between public office and private firms through foundation of the third sector and public private partnership (PPP)

(4) Priority Projects



1) Bocas del Toro / Almirante Ports

Objevtive: Gateway to an international tourist resort

a) Provision of a passenger terminal
- **Improvement of a terminal suitable for a tourist resort**
- **Assurance of a safety transport**
- **Supervision and protection of passenger boat operators**
- **Encouragement of the tourism related industries**

b) Improvement of cargo transport services to islands
- **Assurance of regular and safety operations on ferry services**

c) Environmental improvement of Bocas del Toro city
- **Management of coastal area use and pollution control**

2) New Chiriqui Port

Objective: Industrial development in the Chiriqui zone

a) Regional economy promotion based on cost saving of transportation for import/export commodities

b) Creation of new industries and employment, e.g. cargo transport to Costa Rica, support to Baru Free Zone etc.

<Economic benefits>

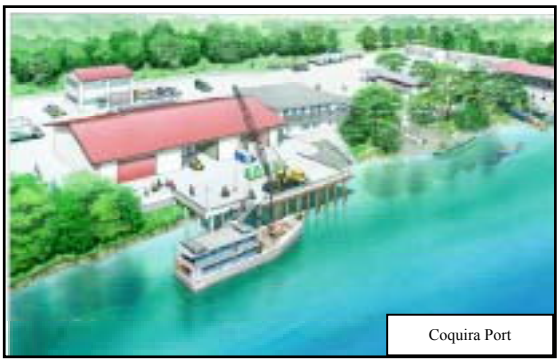
- **Quantifiable components (2009-2014)**
  - **Cost saving on transport: USD 44 Million**
  - **Benefit from tuna ships: USD 8 Million**
- **Non-quantifiable components**
  - **Baru Free Zone, Promotion of industries, Handling cargoes from/to Costa Rica**

3) Coquira Port

Objective: Assurance of maritime access to islands

a) Improvement of transport services to coastal communities

b) Provision of a substitute port after closure of Fiscal Port of Panama



4) La Palma Port

Objective: Formulation of a socio-economic center and promotion of local industries

a) Improvement of transport services to coastal communities in Darien province

b) Provision of market access for local fishermen

c) Conservation of marine resources

d) Improvement of commercial fisheries

e) Promotion of local industries (Value-added industries, Shrimp processing etc)

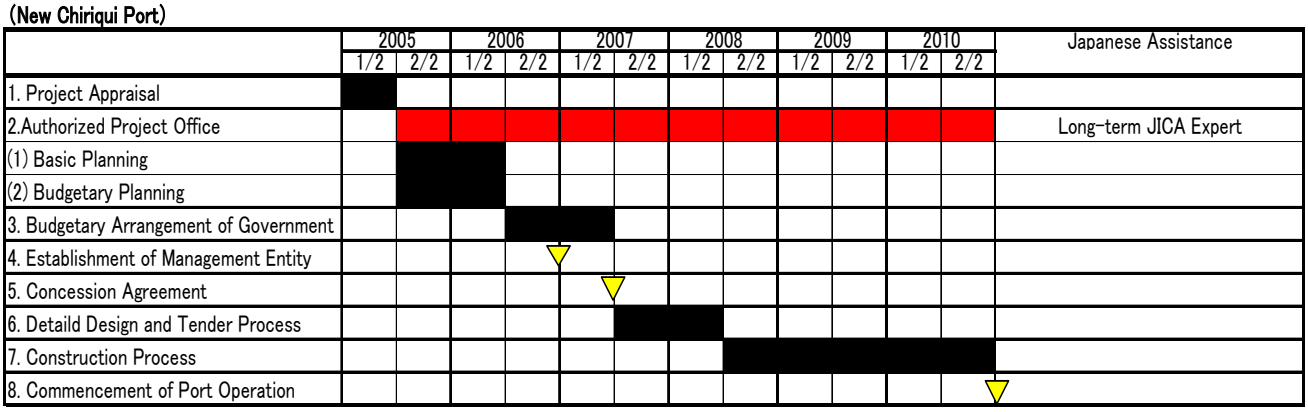
2.5 Feasibility Studies

(1) Feasibility of Projects

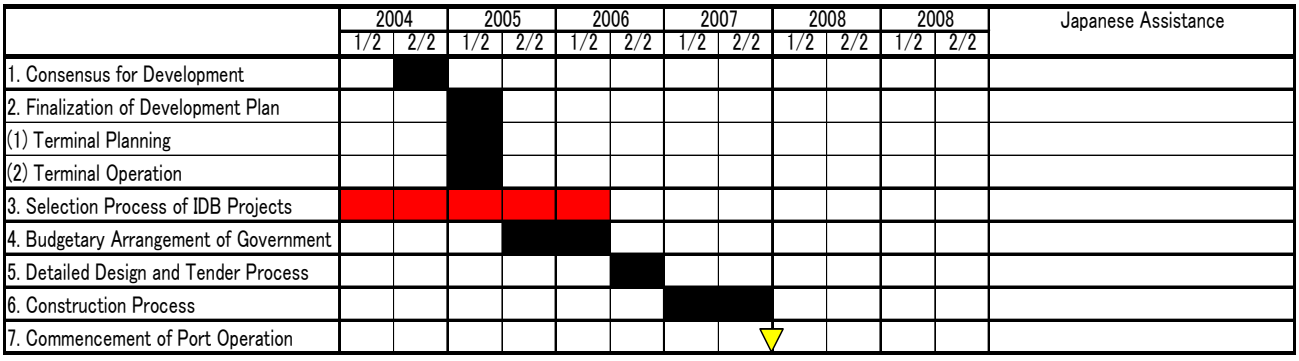
Port	Cost (USD)	EIRR	FIRR	Management Entity
Bocas del Toro / Almirante Ports	4.6 Million	20.7%	10.7% (Government Spending 10%, Loan 90%)	AMP
New Chiriqui Port	49.8 Million	15.4%	9.8% (Equity Investment 40%, Loan 60%)	Private
Coquira Port	2.3 Million	13.9%	11.7% (Loan 100%)	Private
La Palma Port	5.9 Million	15.7%	12.7% (Grant 90%, Loan 10%)	AMP

(2) Implementation Schedule

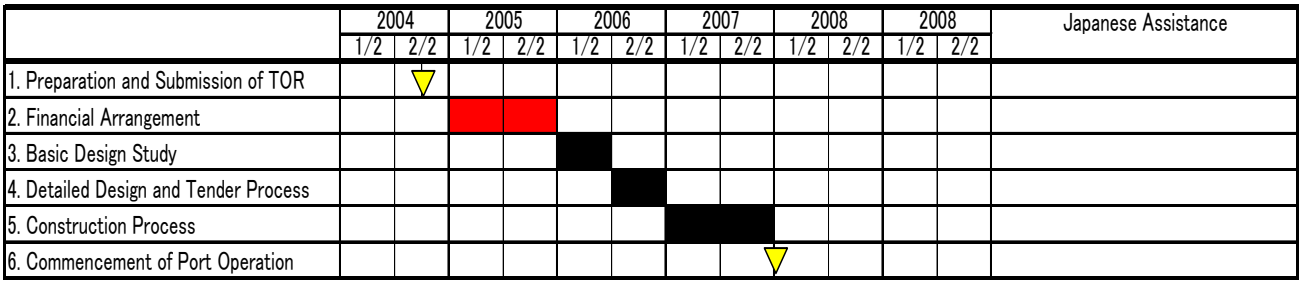
(New Chiriqui Port)



(Bocas del Toro Port)



(La Palma Port)



3. Recommendations

Recommendations presented hereunder focus on the administration and management of AMP, and present four different targets: (1) to realize the mission and vision of AMP, (2) to implement the nationwide port development plan, (3) to authorize the Master Plan and (4) to implement the priority project.

3.1 For the Realization of the Mission and Vision of AMP

(1) Institutional Strengthening Plans of AMP for the Execution of the Assigned Tasks prescribed in its Organic Law

AMP should take the following actions for the strengthening its institutional capacity

1) Compliance with the international treaties and conventions related to maritime sector.

2) Promotion of the private investment in the port related businesses

   a. AMP should make the procedure of awarding concessions more transparent and to grant the concession on a timely basis.
   b. Marketing the potential business areas for private investment and the elaboration of programs to support the private investment have to be performed.
   c. Legislative and cooperative support of the private firms who are investing in public port services.
   d. AMP inherited the role of the Port Authority of Panama and should send delegates to international conferences on Port communities

3) Strengthening of coordinating functions with the agencies concerned

   a. CIQ procedures
   b. Communication with the port users
   c. Maintenance of navigation channel

4) Promotion of local ports and the human resource development

   a. Public relations to propagate the activities and development plan of the local ports
   b. Coordination with maritime schools to make the curriculum suitable for the demand of the labor market.

5) Promotion of private investment in the domestic shipping business

6) Upgrading the productivity of routine work of AMP

   a. Data / Information Transmission
   b. Publicity and Archives of Basic Documents

7) Internal Matters

a. Improvement of Budgetary System
   Repair and maintenance should be classified as current expense rather than capital expenditure.
b. Human Resource development
   To upgrade the recruit system, to invite applicants openly, to draft and start training, and to establish transparent promotion system.

(2) Strengthening of the Port Management Functions of Local Port Offices

1) General plan

a. Policy Change of AMP
   From passive attitude to positive attitude on inviting the concessionaire

b. Funds needed for the enhancement and maintenance of port infrastructure

c. Roles of the port administration
   - Ensure the basic port services
   - Disseminate the rules, regulations and procedures to the port users
   - Establish communication with the port users to achieve user-friendly port management

d. Coastal zone management

e. Port statistics

3.2 For the Implement the Nationwide Port Development Plan

1) AMP organization at the ports in Canal Area

The Port Office of Balboa and Cristobal should act as the coordinators.

2) Major local ports

Private investment in the port related services may be possible provided that AMP will keep maintaining the basic port infrastructure. The administrators of the AMP local offices also have to play the role as the liaison between AMP Headquarters and the local business community.

3) Other smaller national ports

It is most important for AMP to assure the regular shipping services as well as the development and maintenance of the port infrastructure especially in Darien, San Blas and islands.

3.3 For the Realization of the Master Plan for the Selected Ports

AMP should take steps to realize the development master plans for the selected ports. This is a part of the realization of its mission and the National Maritime Strategy.

(1) AMP, the leading agency

AMP is the leading agency to realize the master plan. AMP should change its policy as "Authority" so that it proactively promotes private participation in the port infrastructure development by establishing suitable environment for the private investment. To this end, AMP should take part in the investment together with the private sector.

(2) Enhancement of public investment program

For the realization of these projects, considerable amount of public fund is indispensable to shoulder initial cost for the development of port infrastructure. This holds true for not only port development but also all the development of the basic infrastructure of the country.

AMP should make efforts to enhance national investment and loan programs that encourage further the public investment for infrastructure development. To this end, the collaboration with the ACP, the Ministry of Public Works and others government agencies responsible for the basic national infrastructure is vital.

(3) Start of the project

The four projects have been proposed as the Master Plans. However, there are a lot of things to be done by AMP. Therefore, AMP should take actions at the soonest opportunity.

(4) Respective ports

1) Bocas del Toro/Almirante

AMP Headquarters should undertake the following steps:

First of all, AMP Headquarters should start discussions with the agencies concerned with the projects. To this end, a task force to proceed with the following tasks should be formed in the Planning and Development Division:

i) Authorization of the project
ii) Clarifying the existing situation of the private use of seashore
iii) Finalizing the infrastructure development plan

Tasks to be carried out by the Administrators of the port offices:

i) Coordination with the agencies concerned
ii) Regular meeting

2) Chiriqui Port

<u>Steps to be undertaken by AMP Headquarters</u>

AMP should take necessary procedures to have the project approved and then formulate task forces in its Headquarters and field office.

Steps to be undertaken by the field office

Presently, AMP has two local port offices one at Pedregal and the other at Puerto Armuelles. Because of the proximity of the location of its office to the Administrator of Puerto Armuelles Port, the Administrator should play a role as the liaison between AMP and PTP and BFZA.

An additional field office should be established at David to keep public relations with the local industries

Administrator of Pedregal Port Office should start marketing of the new use of the existing Pedregal Port.

3) Coquira Port

Steps to be undertaken by AMP Headquarters

a. Acquisition of right of way
b. Public and Private Partnership
c. Redeployment of labor among the port offices
d. Assurance of shipping and logistic services

Steps to be undertaken by the Local Port Offices of Coquira Port

The port office of Coquira Port should play a role as the liaison between AMP Headquarters and the local institutions and communities.

4) La Palma Port

Steps to be undertaken by AMP Headquarters

a. Review of the existing policy and regulations of centralized shrimp processing industry
b. Incentives to the commercial fishing boats to move to La Palma
c. Interfacing with Darien Sustainable Development Plan
d. Public Relations to promote the inter-modal services between La Palma and Quimba
e. Formulation of urban development plan of La Palma by supporting the municipality in the coordination with the Darien Project Office of MEF, MIVI and IPAT, and so on.
f. Security
   Security system for the whole municipality is also important to encourage the private firms to think of starting businesses in La Palma.

Steps to be undertaken by the Local Port Offices of La Palma Port

a. Coordination with the agencies concerned
   The Administrator is the liaison between the Headquarters and the local agencies.

b. Regular meetings
   Administrator should hold meetings among local fishermen and local agencies regularly.

3.4 For the Implementation of the Priority Project.

1) Bocas del Toro

a. To formulate a consensus opinion for the project
b. To ensure public funding for passenger terminal building
c. To establish the operating body of the passenger terminal
d. To make necessary arrangement for security and safety

2) Chiriqui

A Special Purpose Company (SPC) should be established to manage and operate the whole port.

60% of the construction cost (USD 30 million) should be financed by the government of which 50% (USD 15 million) should be the grant element that shall be given to the SPC in terms of equity as the government share.

3) Coquira

The key items for the realization of Coquira Port are:

a. To arrange the public funds
b. To invite a private firm to operate the port under a concession contract.

When AMP negotiates with the private operator the conditions of concession, it should pay due consideration to the quality of the services provided and the level of the tariff charged to port users.

4) La Palma

i) Administrative matters

AMP has the responsibility in organizing the passenger ship operators, local fishermen and local communities. Therefore, it is recommended that cooperatives of fishermen should operate the fish port. Monitoring the daily fish catch should be carried out by the cooperatives. AMP should outsource the manpower rather than simply increase the number of its staff.

3.5 Environmental Impact Assessment

Potential adverse environmental effects from the construction and subsequent operation of all four short-term port development projects are manageable. Still, concerning operation of all port facilities, due care in adherence to the port operational management requirements focused on ship and port terminal waste management, in particular enforcement of MARPOL regulations and its Annexes, is utmost important to mitigate potential long-term adverse environmental effects of port operation.

Currently the most significant source of pollution in coastal waters of most short-term project development areas is the runoff of untreated wastes from the land based miscellaneous human activities that are essentially unrelated to port operational activity. Accordingly, it is recommended to undertake necessary improvement measures targeting the wastes of land origin as the highest priority in the relevant project areas of Bocas Del Toro, Almirante, Puerto Armuelles and La Palma. Moreover, it is emphasized that waste management improvement measures need to be undertaken independently irrespective of the status of implementation of these port development projects.

In fact, improper management of wastes of land based human activities is the principal cause of coastal water environmental degradation, and is a nationwide environmental issue that needs to be addressed.

3.6 Enhancement of Public Investment Program

For the realization of these projects, considerable amount of public fund is indispensable to shoulder initial cost for the development of port infrastructure. This holds true for not only port development but also all the development of the basic infrastructure of the country.

AMP should make efforts to enhance national investment and loan programs that encourage further the public investment for infrastructure development. To this end, the collaboration with the ACP, the Ministry of Public Works and others government agencies responsible for the basic national infrastructure is vital.

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1. ECONOMIC FORECASTS

1.1 Long-term GDP Forecast for Panama

Long-term GDP forecasts for Panama have been adopted as a base case scenario, based upon GDP forecasts for Panama and South and Central America issued by the World Bank and the other international organizations concerned, as shown in Table 1.1.

Table 1.1 Long-term GDP Forecasts for Panama (2000-2024)

1996 constant USD	2000	2001	2002	2003	2004	'05 - '09	'10 - '14	'15 - '19	'20 - '24
World Bank									
% growth	3.3	0.34	1.9	2	3.4	3.8	3.8		
GDP (USD million)	11,196	11,235	11,448	11,677	12,074	14,549	17,532		
Consensus GDP (JICA Study Team)									
Base growth (%)	3.3	0.34	0.8	1.7	3.8	4.3	4.5	4.6	5.1
GDP (USD million)	11,196	11,235	11,325	11,517	11,955	14,756	18,388	23,025	29,527
(Excl. CFZ, Canal, Tax)				9,511	9,873	12,186	15,186	19,015	24,385

Source: JICA Study Team

The rates of the future GDP for the low and high growth scenarios during the 5 year periods from 2005 to 2024 in the above table are assumed 1.2 percent plus and minus to those of the base scenario respectively.

- Low case : -1.2% of the base case
- High case : +1.2% of the base case

The following data issued by Office of General Comptroller is referred to:

a. "Economic Statistics" by Ministry of Economy and Finance, Directorate of Analysis and Economic Policies, Economic and Statistical Information Department

b. "Population Forecasts by the Controlaria Genaral de la Republica"

1.2 Sector's Share on GDP Forecasts Values

Two assumptions are applied to estimate the sector share on GDP forecast values as shown below.

1) Sector performance in 2003 was taken as the basis for forecasting future economic performance per sector, which means that the share of each sector remains constant during the entire period of the forecast.

2) A development scenario, based on the possible positive impact of the various national and regional development plans focusing on stimulating the primary and secondary sector, will be

used in addition to the base case scenario to estimate the future long-term economic performance per sector and per province.

Table 1.2 shows GDP forecasts in five year intervals per sector.

Table 1.2 GDP Forecasts by Sector

	sectors	Stable	Variable			
		2005-2024	2005-2009	2010-2014	2015-2020	2020-2024
A	Agriculture, cattle, hunting and silviculture	5.6%	5.6%	5.8%	6.0%	6.1%
B	Fishing	2.1%	2.1%	2.3%	2.5%	2.6%
C	Quarries and mines exploitation	0.6%	0.6%	0.7%	0.7%	0.8%
D	Manufacturing and industries	8.2%	8.2%	8.3%	8.3%	8.6%
E	Electricity, gas and water supply	3.7%	3.7%	3.7%	3.9%	4.0%
F	Construction	4.4%	4.4%	4.6%	4.6%	4.9%
G	Wholesale and retail commerce, cars&motorcycles repair, personal effects and household equipment	10.7%	10.7%	10.7%	10.7%	10.5%
H	Hotels and restaurants	0.7%	0.7%	0.9%	1.1%	1.3%
I	Transport, storage and communications	15.3%	15.3%	15.3%	15.3%	15.1%
J	Intermediate financing	11.9%	11.9%	11.5%	11.3%	11.2%
K	Real estates, business studies and rent	17.4%	17.4%	17.1%	16.8%	16.5%
L	Public administration and defence, obligatory social security and affeliation plans	12.8%	12.8%	12.4%	12.2%	12.1%
M	Other activities, communities, social and personal services	6.4%	6.4%	6.4%	6.3%	6.1%
N	Private services at private homes	0.1%	0.1%	0.1%	0.1%	0.1%
O	Organizations and extraterritorial agencies	0.0%	0.0%	0.0%	0.0%	0.0%
P	Non-specified activities	0.3%	0.3%	0.3%	0.3%	0.1%
	total (excluding CFZ, PCA and taxes)	100.0%	100.0%	100.0%	100.0%	100.0%

Source: JICA Study Team

GDP growth rate per sector is shown in Table 1.3, based on the data in Table 1.2.

Table 1.3 GDP Growth Rate by Sector

	Sectors	GDP (1996 constant value)			
		2005-09	2010-14	2015-19	2020-24
A	Agriculture, cattle, hunting and silviculture	4.30%	5.27%	5.64%	5.10%
B	Fishing	4.30%	7.16%	6.29%	6.67%
C	Quarries and mines exploitation	4.30%	6.95%	1.84%	7.94%
D	Manufacturing and industries	4.30%	4.74%	4.60%	5.85%
E	Electricity, gas and water supply	4.30%	3.67%	5.71%	5.63%
F	Construction	4.30%	5.59%	4.60%	6.44%
G	Wholesale and retail commerce, cars & motorcycles repair, personal effects and household equipment	4.30%	4.50%	4.60%	4.67%
H	Hotels and restaurants	4.30%	10.19%	8.88%	8.67%
I	Transport, storage and communications	4.30%	4.50%	4.60%	4.86%
J	Intermediate financing	4.30%	3.84%	4.23%	4.91%
K	Real estates, business studies and rent	4.30%	4.19%	4.23%	4.59%
L	Public administration and defense, obligatory social security and affiliation plans	4.30%	3.87%	4.26%	4.93%
M	Other activities, communities, social and personal services	4.30%	4.50%	4.35%	4.42%
	Total GDP	4.30%	4.49%	4.61%	5.10%
	Constant	**4.30%**	**3.84%**	**4.23%**	**4.91%**

Source: JICA Study Team

It is expected in Table 1.3 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.

1.3 GDP per Province

The Study Team has estimated the regional GDP (RGDP), which is not available in Panama, as follows:

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

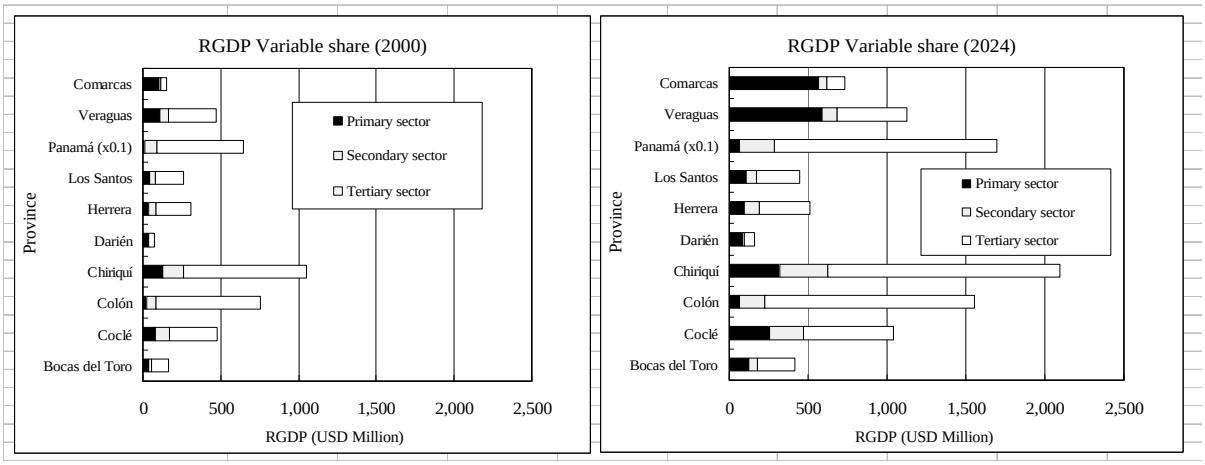
$RGDP_s$ = Absolute GDP per province for a particular sector "s"
$REAP_s$ = EAP at a given time period for a particular sector "s"
$(GDP/EAP)_s$ = The value for a particular sector "s" of the GDP over EAP

The total RGDP by province is calculated by accumulating RGDPs per each sector for all the provinces. The results are given in Table 1.4.

Table 1.4 RGDP by Province

	Bocas del Toro	Coclé	Colón	Chiriquí	Darién	Herrera	Los Santos	Panamá	Veraguas	Comarcas	GDP
2000	160	480	754	1,051	70	310	258	6,489	469	150	10,192
2009	198	545	799	1,253	87	307	267	7,999	496	309	12,186
2014	247	684	1,021	1,394	103	391	332	10,165	563	398	15,188
2019	326	821	1,232	1,613	123	434	370	13,015	620	528	19,023
2024	419	1,044	1,556	2,098	161	513	446	16,975	1,127	735	24,373

Source: JICA Study Team



Source: JICA Study Team

Figure 1.1 GDP by Sectors

Table 1.5 shows population, GDP and GDP per capita for the last 8 years and forecasts for 2024. The economic indicators in 2024 will increase 1.4 times for population, 2.4 times for GDP and 1.7 times for GDP per capita over those in 2002.

Table 1.5 Future Population, GDP and GDP per Capita

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, 1996 Price)	8,519	8,874	9,564	9,966	10,345	10,388	10,486	24,373
GDP/Capita (USD 1,000, 1996 Price)	3.125	3.191	3.371	3.445	3.509	3.458	3.427	5.813

Source: JICA Study Team

2. DEMAND FORECAST

2.1 International Cargo

(1) Import Liquid Bulk Cargo

Oil and oil products have been imported at Ports of Almirante, Chiriqui Grande, Charco Azul and Bahia Las Minus in Panama. Out of four ports, Ports of Chiriqui Grande and Charco Azul function as a land bridge between Pacific Ocean and Atlantic Ocean, which means that oil and oil products imported at Port of Charco Azul are transported to Port of Chiriqui Grande through the pipeline and exported mainly to Caribbean countries. Atlantic Pacific S.A. (APSA), which buys oil from traders, is the only operator to supply diesel oil and fuel oil in the canal market.

Therefore, oil and oil products consumed in Panama have been imported at Ports of Almirante and Bahia Las Minus. It is assumed that difference between imported and exported quantities is the consumption in Panama.

The consumption in Panama for the last 8 years is shown in Table 2.1. According to the Table, the consumption in 2024 (19.86 million tons) will be 5.7 times over levels in 2001.

Table 2.1 Oil Consumption Rate in Panama

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

By way of comparison, the consumption of oil and oil products (estimated at 19.86 million tons), is 3.4 times larger than the total imported volume in 2001 (5.84 million tons), which has a correlation with GDP in Panama.

(2) Import of Dry Cargo

Table 2.2 shows import volume of dry cargoes for the past 5 years and its forecast in 2024. The main import cargoes in Panama are wheat, maize, soybean, fertilizer, general cargoes, clinker and container cargoes. It is expected that maize and soybeans as feed grains and container cargoes will increase with the growth of the agricultural and stock farming sectors, and with the growth of GDP in Panama respectively.

Table 2.2 Import Dry Cargo

Unit: ton

Total Import Cargo	1997	1998	1999	2000	2001	2024	2024/2001
Wheat	110,000	97,000	98,000	108,000	108,000	210,000	1.94
Maize,Soya Beans	235,000	319,000	231,000	375,000	419,000	1,035,000	2.47
Fertilizer (Aguadulce)	n.a.	15,000	30,000	48,000	49,000	85,000	
Fertilizer (Pedregal)	n.a.	15,000	22,000	13,000	8,000	64,000	3.00
Fertilizer (Costa Rica)	n.a.	26,000	39,000	24,000	14,000	64,000	
Break Bulk	313,000	416,000	503,000	233,000	196,000	200,000	1.02
Clinker	n.a.	n.a.	318,000	178,000	103,000	300,000	2.91
Container	281,000	232,000	291,000	323,000	429,000	1,544,000	3.60
Total Import Cargo	939,000	1,123,000	1,532,000	1,301,000	1,328,000	3,522,000	2.65
Population	2,781,457	2,836,979	2,892,501	2,948,023	3,004,108	4,193,342	1.40
Dry Cargo Vol ton/Capita	0.338	0.396	0.530	0.441	0.442	0.840	1.90

Source: Port Statistics, Fertica, Cement Panama S.A., Melo group etc

(3) Export Dry Cargo

The export cargoes are banana, sugar and container cargoes. The volume is shown in Table 2.3 together with the forecast volume in 2024. While the container cargoes are expected to grow, other traditional export commodities (i.e. bananas and sugar exports) seem to remain unchanged.

Export container cargoes are estimated on the assumption that export volume will correlate with GDP in Panama.

Table 2.3 Export Dry Cargo

(Unit: ton)

Export	1996	1997	1998	1999	2000	2001	2002	2024	2024/2002
Banana	719,000	686,000	628,000	586,000	726,000	630,000	518,000	400,000	0.77
Sugar	47,000	62,000	66,000	34,000	67,000	36,000	38,000	50,000	1.32
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

Source: Port Statistics, AMP

(4) Transshipment Container Cargo including Cargo through Colon Free Zone

Transshipment container cargoes have been handled in Port of Balboa, Manzanillo International Terminal (MIT) and Colon Container Terminal (CCT). The transshipment container cargo volume in Panama is shown in Table 2.4 and will be equal to 42 million tons, which is 12 times as much as domestic container cargo volume.

Table 2.4 Transshipment Container Cargo

	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

Source: Port Statistics, AMP

Origin/destination of the transshipment cargo is shown in Table 2.5. In 2001, more than 70% of the container cargo has origin/destination from the South American countries, of which Colombia and Venezuela. have big shares. The transshipment cargo volume is estimated on the assumption that container volume will correlate with GDP in those countries.

Table 2.5 Share of Origin/destination

	Country of origin and destination and Volume Share (%)								
Share	Argentina	Brazil	Chile	Colombia	Costa Rica	Peru	Trinidad Tobago	Venezuela	Others
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

Source: Port Statistics, AMP

Cargoes through Colon Free Zone are estimated in the same manner as the transshipment container cargo is estimated and will be 5.43 million tons in 2024.

Table 2.6 Container Cargo through 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

Source: Port Statistics, AMP

Summary of the international cargo is shown in Table 2.7.

Table 2.7 Summary of Import and Export Cargoes

Import			Export			Import & Export		
Commodity	Port	ton	Commodity	Port	ton	Volume ton	Port	ton
								Max. in the
								past record
Liquid Bulk import	Bahia Las Minas						Bahia Las Minas	4,165,000
	Charco Azul						Charco Azul	1,588,000
	Chiriqui Grande						Chiriqui Grande	491,000
	Almirante						Almirante	26,000
	Total	19,860,000				**19,860,000**	Total	**6,270,000**
Dry Cargoes								
							Almirante (Private)	
							Chiriqui Grande (Private)	
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	85,000	Sugar	Aguadulce	30,000	115,000	Aguadulce	120,000
	Pedregal	64,000		Pedregal	20,000	84,000	Pedregal	120,000
	Costa Rica (Over land)	64,000				64,000		
Break Bulk	Balboa & Cristobal(Private)	200,000	Banana	Almirante (Private)	300,000	600,000		
				Chiriqui Grande (Private)	100,000			
				Sub-total	400,000			
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						42,850,000		
Colon Free Zone						5,428,000		
Container cargo Total						51,839,000		

2.2 Domestic Cargo

Summary of the future domestic cargo volume and passenger movement is shown in Table 2.8. Key factors for forecast are growth rate of population for cargoes in La Palma Port and passengers in Coquira Port, GDP in Darien and Panama provinces for cargoes in Panama Port, GDP Fishery Sector in Panama in Vacamonte Port and Mensabe Port, and growth rate of the tourists for cargoes and passengers in Bocas del Toro Port.

Table 2.8 Domestic Cargo and Passenger Movement in 2024

Port	Route to/from	Loading ton	Unloading ton	Ship calls	Capacity ton/Passengers
La Palma	Panama	0	2,500		Fixed Pier 65,700 ton
Coquira	Chiman	0	1,000		
	Coastal Community				
Passenger	Coastal Community	30,000	30,000		140, 000 passengers
Panama	La Palma	32,000	10,000		**To be closed**
	Other Port near La Palma				**for cargo handling**
	Pacific Coast of Darien				
	Islands in Gulf of Panama				
Balboa (Passenger)	Passengers to the Islands				**To be relocated**
Vacamonte	Foreign Tuna Boat		15,000	300	29,200 ton
	Local shrimp & fish		66,000		39,420 ton
Mensabe	Fishing Boats		1,300	700	3,650 ton
Mutis	Fishing Boats		150	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	295,000	295,000		
Almirante					
Cargo	Bocas del Toro	89,000	80,000		262,800 ton
Passenger	Bocas del Toro	330,000	330,000		**No public facilities**

Source: JICA Study Team

3. PORT SECTOR OF PANAMA

3.1 National Port System and Maritime Network

The Panamanian ports can be classified from the viewpoint of their roles and functions. Firstly, the ports are classified into three major categories and then sub-categories:

1) International Port
   - International Container Port
   - International Tourism Port
   - Industrial Port (Private Business Port)

2) Domestic Port
   - Regional Hub Port
   - Local Hub Port
   - Feeder Port

3) Fish Port
   - Base Port and Fish Processing
   - Home Port

The existing marine networks for international and domestic trades are shown in Figures 3.1 and 3.2 respectively.

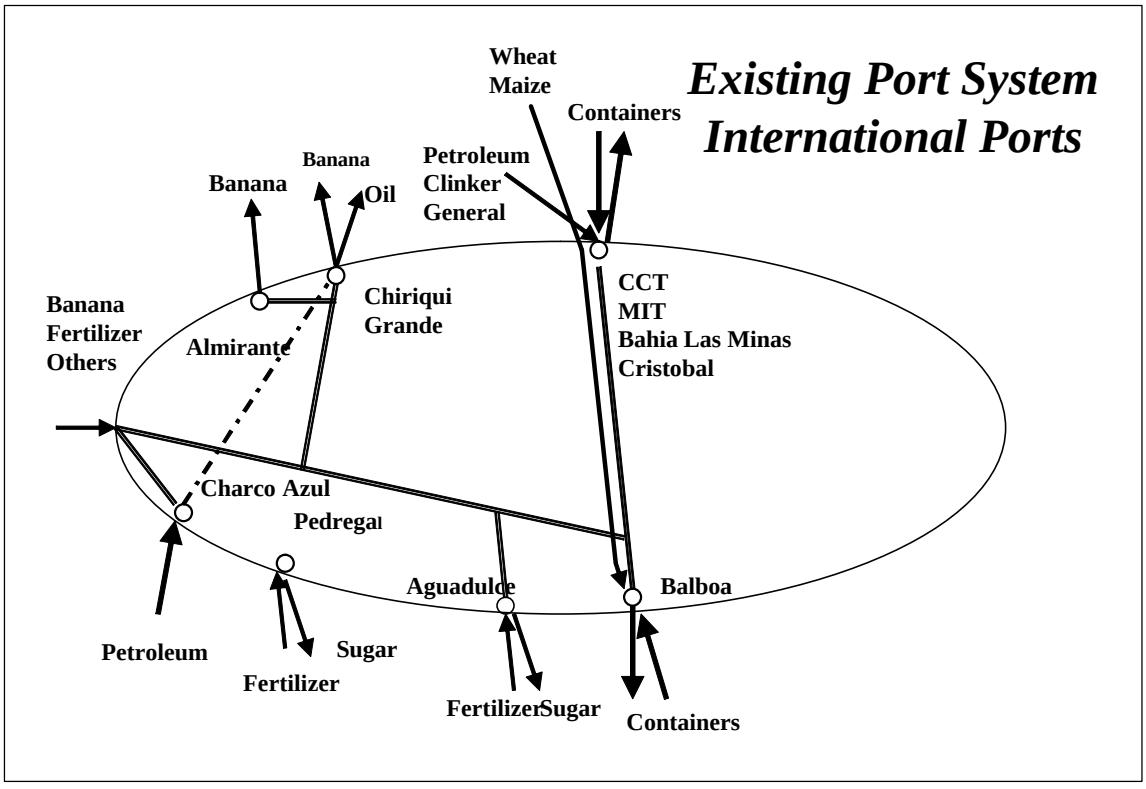


Figure 3.1 Maritime Network for International Trade

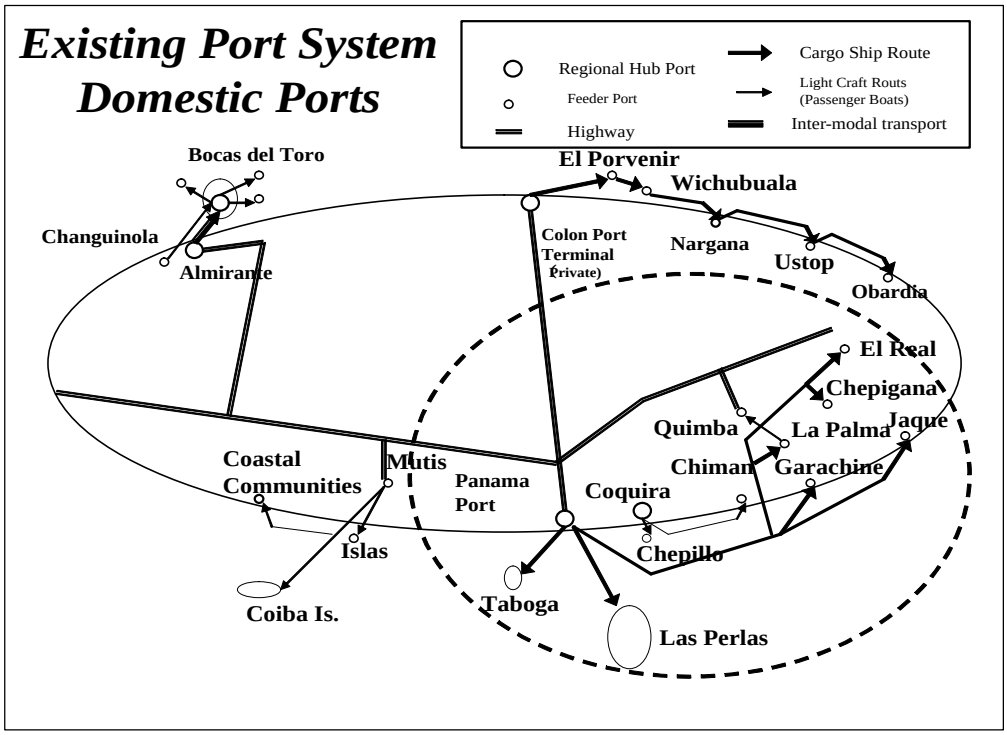


Figure 3.2 Maritime Network for Domestic trade

3.2 Objectives and Functions of AMP

The Maritime Authority of Panama (AMP) was created by Decreto Ley (Law Decree) No.7 issued by the President on February 10, 1998, in accordance with 1998 Ley No.1, to give the President extraordinary and specified powers for making necessary arrangements for creation of the National Bank Commission and AMP.

AMP is a unified body of various maritime competencies from different institutions such as managing of marine and coastal resources from the Ministry of Commerce and Industry (MICI), education and training of seafarers from the Ministry of Education, registry of merchant marine vessels from the Ministry of Economy and Finance (MEF), and absorbing APN on port matters (after privatization of major ports).

(1) Objectives and Duties of AMP

The objectives of AMP are as follows:

1) To regulate, project and carry out the policies, strategies, laws and programs that are related to the functioning and development of the Maritime Sector.
2) To coordinate its activities with institutions related to the Maritime Sector for promoting the country's socio-economic development.
3) To act as a supreme maritime authority of Panama within the framework of the UN Convention of LAW of the Sea.

The following duties for AMP are also stipulated:

1) To propose, coordinate and carry out National Maritime Strategy.
2) To recommend policies and actions, to carry out administrative actions, and to enforce laws and regulations regarding the Maritime Sector.
3) To prepare jointly measures to safeguard the national interest within territorial waters.
4) To enforce strictly the provisions of the UN Convention on the Law of the Sea, 1982 and other international treaties, conventions and instruments ratified by Panama
5) To cooperate with the National Maritime Service in order to enforce national laws in the maritime areas and internal waters of Panama.
6) To update signaling systems, navigation aids, nautical charts and other hydrographic data needed for safe passage of ships through the waters of Panama.
7) To conduct, with cooperation of other competent State agencies, the operations required for controlling oil and chemical spills, and other disasters or casualties.

The following duties of Directorate General of Ports and Auxiliary Industries, which is one of four Directorate General owned by AMP, are specially mentioned:

1) Planning and execution of the development on the maritime network
2) Construction, improvement, extension and maintenance of the commercial ports for public use
3) Management of ports without management and operation bodies
4) Management of the state ports
5) Execution of the procedure and supervision on concessions for the state ports
6) Improvement of the facilities for navigation, maneuvering and mooring on the state ports
7) Execution of cargo handling, movement, custody and delivery by AMP/concessionaires
8) Establishment of port tariff
9) Improvement of services to the ports and auxiliary industries

(2) National Maritime Strategy

The approved key strategies are defined as the general basic objectives in two categories (namely, Primary and Secondary Strategic Objectives).

The Primary Strategic Objectives (Administration field):

1) The general directions of institutional security and compliance with international regulations,
2) Efficient and effective measures for competitive market,
3) Enhancement of investment and innovation for strengthening physical and intellectual capital,
4) Protection and security synergy, inter-sector relationships, marketing activities for new opportunities of maritime business,
5) Formation and execution of a program of national and international communication,
6) Conservation of environment and labor regime.

The Secondary Strategic Objectives (Support of the sustainable socio-economic development):

1) Creation of new job opportunities, upgrading labor force quality and productivity,
2) Stimulating investment for required infrastructure, sustainable marine resource management and social responsibility,
3) Improving security, hygiene and health of the laborers, and enhancing good governance for the maritime sector.

3.3 Present Issues

(1) Port Development and Closure of the Facilities

The following points are highlighted to draw up the master plan:

1) International Ports: Balboa Port should be specialized for international trade, mainly container cargo handling and as a result, a port specialized for bulk cargo will be needed. According to information from grain dealers, a new bulk terminal has been planned at Cristobal Port.
2) Domestic Ports: La Palma will soon be interconnected 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.
3) Fiscal Port of Panama: The port will be closed due to the urban planning by Panama city.

(2) Existing Problems of the Ports

Problems mentioned at workshops are as follows:

(Bocas del Toro Port)

1) No proper coordination among the government agencies to issue the permissions for the use of coastal zones
2) No appropriate docking facilities for small passenger craft
3) No adequate regulation, administration and guidance to prevent the contamination of the water area, illegal occupancy of shoreline and treatment of waste.
4) Shortage of the safety management for passengers
5) No policy by the central and local government organizations
6) No practical result of the Sustainable Projects in Bocas del Toro

(Ports in the Chiriqui province)

1) Facilities too old in Port of Armuelles
2) Shallow depth and no adequate tariff system in Port of Pedregal
3) Necessity of a new port development in the Chiriqui province
4) Shortage of port planning in the Chiriqui province

(Vacamonte Port)

1) No maintenance dredging
2) Lack of port services such as security system, garbage collection etc

(Ports in the Colon province)

1) No clear responsibility for maintenance dredging
2) No information to the immigration office about cruiser arrivals
3) Lack of human resources to communicate with tourists
4) Lack of human resources in the local ports

(La Palma Port)

1) Lack of infrastructures of port, water, power, communications etc.
2) No support to the Darien province by the central government
3) No customs and immigration office and security problem

In addition, improvement of the budgetary system and resolving of insufficient human resources are urgently required for AMP administration and management.

3.4 Capacity of the Existing Port Infrastructure

The handling capacity of the port facilities was evaluated for 2024.

(1) International Ports

1) Oil and Oil Products

Import oil and oil products volume in 2024 will increase three times to 6.3 million tons. They will be handled at the private ports, which will cope with future demand in case of shortage of the handling facilities.

2) Dry Cargo

Banana: Future export volume will remain and there will be no shortage of the handling facilities.

Wheat, feed: A new terminal at Cristobal Port, which will be operated by private enterprises, will open soon.

Fertilizer: Fertilizer will be imported at Aguadulce and Pedregal Ports, which have enough handling capacity in future, and by trucks from Costa Rica.

Breakbulk: Cars will be imported at Balboa Port and Mansanillo International Terminal, and other breakbulk will be handled at Cristobal Port, which has enough handling capacity for the future.

Clinker: A new bulk terminal opened at Bahia Las Minus Port.

Container cargoes: Container cargo to/from the domestic market is less than 10 % of the transshipment container cargo and the former has higher priority than the latter due to higher handling charge. The transshipment container cargo volume in 2024 will be over 4 million TEUs and present handling capacity of the container terminal in Balboa and Colon will be insufficient.

(2) Domestic Ports

La Palma: La Palma Port will have the role as the local hub port with the newly constructed inter-modal port facilities, which have enough handling capacity for cargo and passenger ships plying to other coastal communities.

Coquira Port: The port will handle cargoes to the islands in Gulf of Panama after closure of the Fiscal Port of Panama. Therefore, a new berth for 200 GRT vessels will be needed.

Fiscal Pier of Panama: The port will be closed in future due to the urban planning by Panama city and passenger crafts will move to other terminals like the one in Amador.

Balboa Port: The passenger terminal will move to Amador and the bulk terminal move to Cristobal Port.

Vacamonte Port: Fishery products in Panama will remain in future. So, the port will have enough capability to handle fishery products from foreign tuna ships and domestic fishing ships.

Mensabe and Mutis Ports: The ports have been utilized by the local fishing ships and the existing facility has enough capacity for the future.

Armuelles Port: The facility is too old and not usable. Presently foreign tuna ships use the damaged pier but they may move to other ports in Costa Rica unless proper services are provided.

Bocas del Toro and Almirante Ports: The ports have a ferry berth but not a passenger boat berth.

4. PORT DEVELOPMENT STRATEGY

1) Objectives

a) To contribute to the successful promotion of national welfare through realizing the development direction of the maritime sector shown in National Maritime Strategy.
b) To provide AMP with guidelines for development of the future national port network.

2) Basic Direction

a) Successful achievement of sustainable economic development
b) Alleviation of income gap and poverty
c) Mitigation of socio-economic regional disparities
d) Environmental preservation of land/water areas and assurance of social security

3) Regional Development Policy

a) Development of an international distribution center in the Canal Area
b) Development of a first class international tourism complex in Bocas del Toro
c) Creation of a new economic cluster in Chiriqui
d) Relocation of a part of socio-economic and industrial function from Panama city
e) Reinforcement of the basic economy and living standard in Darien
f) Proactive preservation of natural environment resources in key protected areas

4) Long-term Port Development

a) Expansion of the container ports at the Canal Area to meet future container traffic and facility requirements
b) Development of a tourist port in Bocas del Toro
c) Construction of a new multipurpose port in Chiriqui
d) Development of Coquira Port in the Panama province
e) Establishment of a local hub in the water way transport network in La Palma

5) Improvement of Port Administration and Management

a) AMP head office:

- To establish financial resources, human resources and maritime safety, and improvement of port administration and management functions

b) AMP offices at ports:

- To coordinate closely with a local society and local industries, especially on the regional development
- To coordinate consistently with AMP and the other government organizations concerned
- To adopt private finance and know-how for port management and operation
- To coordinate function for various administrative activities required for a smooth and effective operation of privatized international container terminals.

5. NATIONWIDE PORT DEVELOPMENT

5.1 Future Port Network (Year 2024)

(1) International Trade

Future port network for international trade, in case no major investment for the port development is attained, is shown in Figure 5.1.

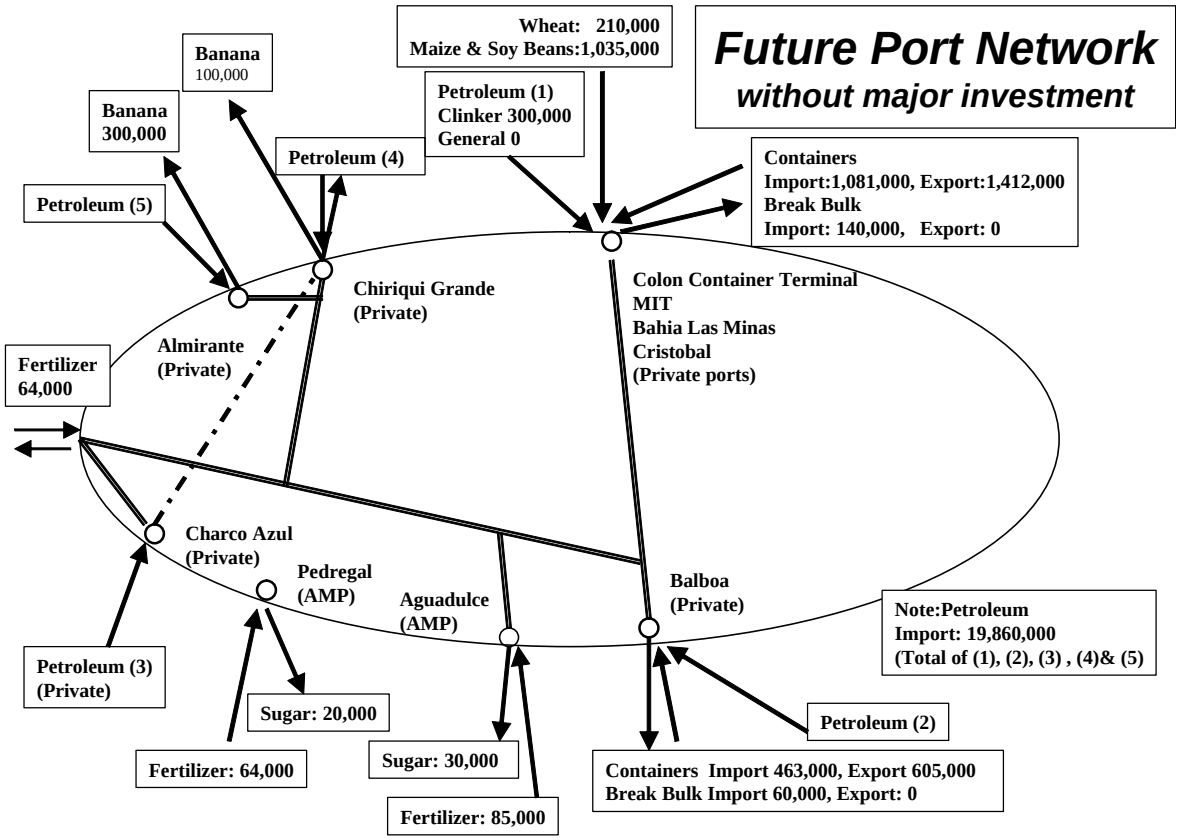


Figure 5.1 Port Network in 2024 without Major Investment for International Trade

The existing port system can sustain the international trade in 2024 with continuous maintenance of the existing facilities, on the assumption that fertilizer will be imported by trucks from Costa Rica and import/export cargoes in the Chiriqui economic zone will be transported by land to the ports in Panama city and Colon.

(2) Domestic Trade

The following activities are forecast on the domestic trade in Panama up to 2024.

1) Pan-American Highway in the Darien province will be fully paved and the ferry service between Ports of Quimba and La Palma will be opened to traffic.

2) Fiscal Port of Panama will be closed soon. Therefore, cargo transportation between the Darien and Panama provinces, which depends on sea transportation at present, will most probably switch to land transportation.

With the new inter-modal port facilities, La Palma will have the role as the local hub port, where cargo and passenger ships plying to other coastal communities will call.

On the other hand, Port of Coquira should be developed as a port to the islands in Gulf of Panama after closure of the Fiscal Pier of Panama. This is the sea route required for living of inhabitants in the islands and should be secured by the central government in the future.

Future network for the domestic trade is shown in Figure 5.2, which indicates the above developments circled with a dotted line.

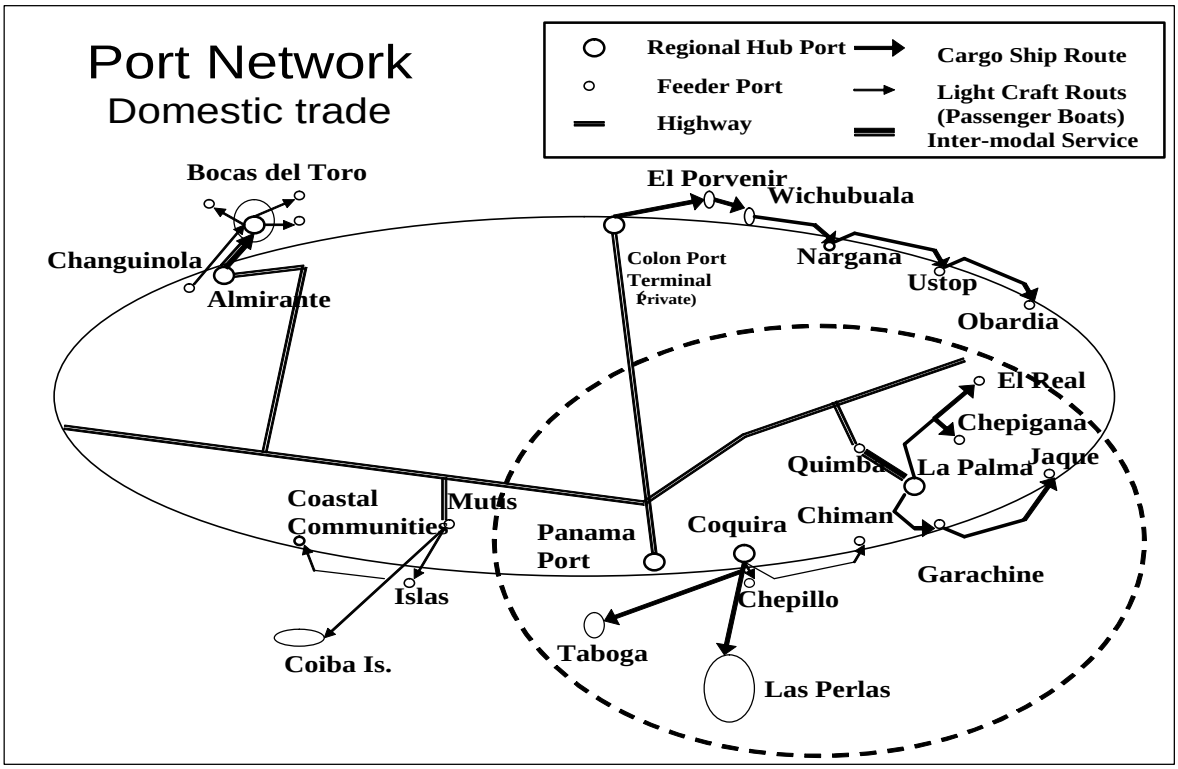


Figure 5.2 Future Port Network for the Domestic Trade

5.2 Maintenance and Management for Port Infrastructures

AMP is responsible for maintenance and management of port infrastructures in order to continue the domestic shipping service, so that cargo and passenger transportation network in Panama will develop sound up to 2024. Maintenance and management cost for the major local ports, which compose the port network for the domestic trade, is shown in Table 5.1.

Table 5.1 (1) Maintenance and Management Cost for the Major Ports

Unit : USD

Location			Facilities	Descriptions	Conditions	Maintenance Method	Annual Cost (USD/Year)
Caribbean West Coast	Bocas del Toro	Bocas del Toro	Land Area	Ro-Ro : approx. 600 sq.m	N/A	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		
						Sub Total of Annual Cost	**0**
		Almirante	Land Area	Ro-Ro : approx. 600 sq.m and CBI Port	N/A	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		
						Sub Total of Annual Cost	**2,400**
		Chiriqui Grande	Land Area	Container Yard 8ha and Others.	N/A	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	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 Annual Cost	**0**
Pacific West Coast	Chiriqui	Charco Azul	Land Area	approx. 835,600 sq.m	N/A	Maintained by the private.	—
			Berthing Facility (PTP)	Steel Pipe Piled Jetty, D=24.2m	Good Condition		
			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 Annual Cost	**0**
		Armuelles	Land Area	2,125 sq.m	N/A	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
						Sub Total of Annual Cost	**24,000**
		Pedregal	Land Area	#1: 4,334sq.m, #2: 23,357sq.m	N/A	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)
			Basin	Ext. Depth : -2.5～3.5m	On the sedimentation.	80,000 cu.m of sediments shall be dredged annually.	259,700
			Passageway	—			
			Others	Sugar Storage: 2,000metric tons		Maintained by the private.	—
						Sub Total of Annual Cost	**259,700**
						Sub Total of Initial Cost	**50,000**

Table 5.1 (2) Maintenance and Management Cost for the Major Ports

Unit : USD

Location			Facilities	Descriptions	Conditions	Maintenance Method	Annual Cost (USD/Year)
Pacific Central Coast	Veragus	Mutis	Land Area	2,420 sq.m	N/A	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
						Sub Total of Annual Cost	**24,000**
	Cocle	Aguadulce	Land Area	approx. 7,000 sq.m	N/A	N/A	0
			Berthing Facility	L 100m × B 24m (-2.7 ～ 4.4m)	Damaging of slab	Re-construction of concrete slab.	(375,400)
			Mooring Facility		Loss of Bitt	Construction of Mooring Dolphin	(90,070)
			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.			
			Bulk Loading Berth	Consessioned to the Private	Good Condition	Maintained by the private.	—
						Sub Total of Annual Cost	**204,800**
						Sub Total of Initial Cost	**465,470**
	Los Santos	Mensabe	Land Area	N/A	N/A	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			
						Sub Total of Annual Cost	**10,000**
Panama Canal Area	Colon	Bahia Las Minas	Land Area	4.7ha	N/A	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	0
			Clinker Unloading Berth	L 110m (-10.5m), Access L 60m	by Cemento Panama	Maintained by the private.	—
						Sub Total of Annual Cost	**0**
Panama Canal Area	Panama	Vacamonte	Land Area	1,040,950sq.m	N/A	N/A	0
			Tuna Berth (-6m)	T-Shape, L 132.5m × B 12.5m	N/A	Maintained by the private.	—
			ditto., but Trestle	L 108m ×B 12.5m	N/A		
			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
			Repairing Yard w/Lifter	Concessioned to the Private	N/A	Maintained by the private.	—
						Sub Total of Annual Cost	**223,500**
		Fiscal Quay in Panama City	Land Area	approx. 2,007 sq.m	N/A	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
						Sub Total of Annual Cost	**31,200**

Table 5.1 (3) Maintenance and Management Cost for the Major Ports

Unit : USD

Location			Facilities	Descriptions	Conditions	Maintenance Method	Annual Cost (USD/Year)
Pacific East Coast	Panama	Taboga	Berthing Facility	Steel Made Pontoon, Moored by Piles.	Damaging.	Re-construction of the pontoon body is being considered by the AMP.	(150,000)
							1,500
						Sub Total of Annual Cost	**1,500**
						Sub Total of Initial Cost	**150,000**
		Coquira	Land Area	approx. 5,000 sq.m	Leased land	N/A	0
			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
						Sub Total of Annual Cost	**0**
	Darien	Quimba	Land Area		N/A	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 Annual Cost	**6,000**
		La Palma	Land Area		N/A	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
						Sub Total of Annual Cost	14,000
						Total Annual Cost (USD)	**801,100**
						Total Initial Cost (USD)	**665,470**

Brevity Code in the Table; (Ext.):Existing Facility, (Pln.):Planned Facility, Utilities(E/W/O): Utilities (Electricity/ Water/ Bunkering)

The initial cost including maintenance dredging and structural repairing, and the annual maintenance cost will be USD 665,470 and USD 801,100, respectively.

Note: 1) Object ports for the annual maintenance cost: Bocas del Toro, Almirante, Armuelles, Pedregal, Mutis, Mensabe, Aguadulce, Vacamonte, Taboga, Bahia Las Minus, Panama, Quimba and La Palma
2) Object ports for the initial cost: Pedregal, Aguadulce and Taboga

5.3 Strengthening AMP Functions

(1) Enforcement of Law and Achievement of National Maritime Strategy

1) Enforcement of the international Law of the Sea: Promotion of ISPS Code on security as an IMO representative in Panama including public relations and guidance to ports and vessels

2) Support to private investment

a) Transparency and timely response for concession procedures
b) AMP's own marketing and provision of port development plan for private investment
c) Support to development of the private bulk terminal in Port of Cristobal

d) Port sales of ports in Panama and participation in international conferences for ports
e) Acquisition of a site for the future container terminal
f) Coordination with the related organizations to realize development of the road between the Colon and Panama city

3) Strengthening functions for coordination with the related organizations

a) Strengthening communications with customs, immigration and quarantine, and simplification of procedure, especially for cargoes through Colon Free Zone
b) Communication with port users
c) Coordination with the related organizations to conduct maintenance dredging of access channel in Colon and Balboa

4) Promotion of local ports and training of human resources

a) Public information on activities of local ports
b) Strengthening education programs in the Maritime School

5) Improvement of the private domestic shipping services

a) Opening of the ferry service between La Palma and Quimba
b) Improvement of the ferry services between Almirante and Bocas del Toro
c) Enforcement of the safe operations
d) Support to private ports and operators on the sea route required for living of inhabitants

(2) Strengthening AMP's Practical Port Management

1) Mind reforms to the high-ranking officials in AMP:

Ports should be managed considering regional development and promotion of the maritime industries, not making a profit from concession contracts.

2) Procurement of funds necessary for maintenance of local ports

Public ports, which are socio-economic infrastructures of the nation, should be developed and maintained by the central government based on budget requirement, cost saving, tariff amendment, promotion of private participation through concessions and grants-in-aid, and other possible ways.

3) Reconfirmation of roles of port administration

a) To implement basic services, which include maintenance of port facilities, security, safety, fire fighting, waste disposal etc, to port users as the responsible organization
b) To execute port basic services, which include coordination with the related organizations and promotion of private participation by concession contracts

c) To clarify various laws, regulations and procedures
d) To establish the port management system in which port users' requests are reflected

4) Coastal management

Utilized conditions for coastal areas should be clarified, for example concerning regulations of water pollution.

5) Management of marine resources: Monitoring of fishery products

6) Improvement of statistics: Port statistics, fishery products etc

6. SELECTION OF PORTS SUBJECT TO MASTER PLANNING

6.1 Development Concept

The development of private ports, which are highly specialized for international trade, is planned and executed by the 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 development shall be identified among national ports that are directly managed by AMP.

As shown in Chapter 5, the existing port system will be able to sustain international trade in 2024 with the full support by AMP for the private port development and the maintenance of the local port network. In addition, the maritime sector can contribute to following fields under the concept of the national maritime strategy, which aims to increase national benefits by strengthening the maritime sector.

1) Support to national policies

a) Mitigation of socio-economic disparities between the Panama metropolitan area and the other areas
b) Support to the on-going projects in the less developed 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) Execution of AMP roles

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 generated by the infrastructure development of the transport sector

The following three ports are identified to have development potential according to the above development concept:

Port	Development Concept
Bocas del Toro	1) a), b), c), 2) b), c), d), 3)
Chiriqui	1) a), c), d), 2) d), 3)
La Palma	1) a), b), 2) a), b), c), d), 3)

Furthermore, Port of Coquira should be developed by the central government to handle cargoes to the islands in Gulf of Panama after closure of the Fiscal Pier of Panama.

Development scenarios on the above four ports are as follows:

(1) Bocas del Toro

The development objective is to renovate and improve the gateway to the international tourist resort as follows:

a) Provision of a passenger terminal at Bocas del Toro and Almirante

- Restoration of the suitable tourism environment in the port area
- Assurance of a safe transport
- Supervision and protection of management bodies for passenger crafts
- Encouragement of the tourism related industries

b) Improvement of cargo transportation services to isolated islands

- Assurance of regular and safety operations on ferry services

c) Restoration of the Bocas del Toro city with the port development as a leading part

- Regulating the coastal use and pollution control management

(2) New Chiriqui Port

The development objective is to enhance the industrial development in Chiriqui area as follows:

a) Local economy promotion based on cost saving of transportation for import/export commodities
b) Creation of new industries and employment, and provision of a base port to tuna ships, for example, cargo transport to the southern part in Costa Rica, support to Baru Free Zone

(3) La Palma Port

The development objective is to establish a socio-economic center in the coastal area by providing fish landing facilities as follows:

a) Provision of market access for local fishermen
b) Reinforcement of commercial fishing efficiency
c) Promotion of local industries such as value-added industries, shrimp processing, wood processing
d) Conservation of marine resources

(4) Coquira Port

The development objective is to ensure transport services to isolated islands and coastal areas.

6.2 Demand Forecast of Each Port

(1) Bocas del Toro/Almirante Ports

The existing facilities for cargo handling have sufficient capacity. Number of passengers including tourists will be 795,000 persons in 2024.

(2) New Chiriqui Port

a) Dry bulk cargo

Main import cargoes in 2024 are fertilizer of 128,000 tons, wheat of 42,000 tons and maize and soybean of 194,000. Main export cargo in 2024 is sugar of 20,000 tons.

b) Container cargo

Import and export container cargoes in 2024 are 50,000 tons and 125,000 tons, respectively.

c) Fishing ships

Expected ship calls in 2024 are 300 nos/year for tuna ships and 20 nos/year for reefers.

(3) La Palma Port

Expected ship calls in 2024 are 72 nos/year for shrimp trawlers, 30nos/year for commercial fishing ships and 100 nos/year for local fishing ships with outboard engine.

(4) Coquira Port

Cargo volume handled at the port in 2024 will be 5,500 tons for loading and 825 tons for unloading.

Table 6.1 Export Cargo at the New Chiriqui Port in 2024

	All Panama		Chriqui Port		
Commodities	Volume	TEU	Share %	Volume	TEU
Bulk					
Banana	400,000		5%	20,000	
Sugar	50,000		40%	20,000	
Container					
Melon	193,000	20,273	10%	19,300	2,027
Watermelon	109,000	11,450	10%	10,900	1,145
Pumpkin	114,000	11,975	10%	11,400	1,197
Yuca, Otoe					
Plantain, Name	236,000	24,790	10%	23,600	2,479
Coffee	5,000	525	20%	1,000	105
Cattle	112,000	11,765	50%	56,000	5,882
Egg	10,000	1,050	30%	3,000	315
Fishery Pruduct	71,000	7,458			
Shrimp	10,000	1,050			
	860,000	90,336		125,200	13,151

Source: JICA Study Team

Future port network in Panama will be as follows in case that new Chiriqui Port is constructed.

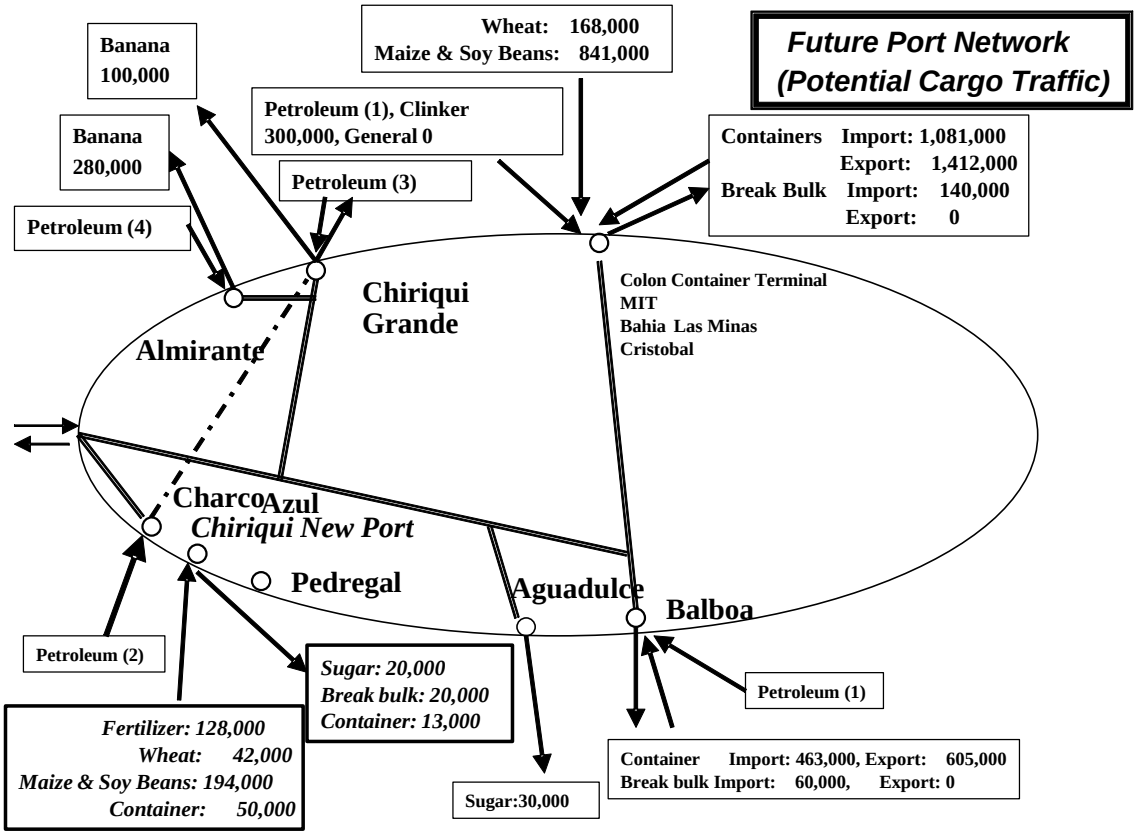


Figure 6.1 Future Port Network in Panama

7. MASTER PLAN

7.1 Facility Layout Plan

(1) Bocas del Toro and Almirante Ports (refer to Figures 7.1 &7.2)

The basic idea of the development of Bocas del Toro is to restore a suitable environment of tourism of the port area. AMP has administrative powers to manage the ports, i.e. Bocas del Toro and its counterpart port Almirante, to regulate the use of the coastal areas and to enforce regulations related to ships and shipping. Thus, AMP has a great opportunity and power to contribute to the restoration of tourism environment at Bocas del Toro, especially in and around port areas.

In addition to tourism elements such as beautification of the port area, the commercialization of the local fishing, and well-combined service scheme by both Ro/Ro ferry and passenger boats should be elaborated in the master plan. The same concept should be employed for the development of both Bocas del Toro and Almirante ports.

The project shall take account of the following objective vessels:

- Object vessel : The same RoRo ferry service (1,000GRT, $^{L}57\ m \times ^{B}15m \times ^{D}1.8m$)
- Passenger craft : 40-passenger craft for Almirante, and 20-passenger craft for Almirante and Changuinola

(2) New Chiriqui Port (refer to Figure 7.3)

Taking into considerations of the fact that the population and the GDP of the province are expected to grow up to substantial amount, as described in Chapter 9.2, the cargo volume originated from Chiriqui also will grow.

The volumes of dry bulk cargoes i.e. wheat, maize and soy beans, which grain distributors assume to handle at Cristobal Port, include the amount to be consumed in Chiriqui. If proper port facilities are provided, some portion of these commodities will be imported directly at the new port. This may reduce the transportation cost. Likewise, fertilizer import overland from Costa Rica will shift to sea route. In addition, the container destined to and originated from Chririqui will be handled at the new port.

In addition, the Chirqui port can provide unloading and supply facilities to tuna boats and reefer ships. Thus, Chiriqui has a potential to have a new port that accommodate oceangoing ships including container feeder vessels as well as tuna boats.

The project will take account of the following objective vessels:

- Object vessel : 25,000 DWT for dry bulk and container cargoes, and 5~6,000 DWT for sugar
- Tuna ships : 150 GRT
- Reefer : 1,400 GRT

(3) Coquira Port (refer to Figure 7.4)

Fiscal Pier is to be demolished by the re-development program of the waterfront area in Plan para el Saneamiento de la Bahía de Panamá, while the current sea transport connecting Darien and the remote islands with Panama City docks at Fiscal Pier. This function has to be secured by construction of a new pier at a proper location (i.e., Coquira) in the near future.

To cope with the demolition of the port function of Fiscal Pier and the increase of the handling volume of general cargo and dry bulk cargo at Panama Port, the port function is necessary to secure the transport linking Panama with the Darien province and the remote islands.

The project shall take account of the following objective vessels:

- Object vessel : The same service (max. 150 GRT)

(4) La Palma Port (refer to Figure 7.5)

The fisheries in Darien have long been handicapped for transportation of the fish-catches to the Panama area and other consuming regions due to poor land traffic conditions and also poor infrastructure conditions for fishery. The industrial shrimp-trawlers and semi-industrial fishing boats operating in the Darien fishing ground have been obliged to continue high cost fishing due to lack of a proper fishing port where they could land their fish-catches and they could refuel the fishing boats.

It is against this background that the region has been far left behind from the economic development of Panama without any local fishing industry developing in Darien.

The government of Panama is promoting the construction of the Pan-American Highway from Panama to the Darien region as the Sustainable Development Program in Darien Province being assisted by IDB. In the program, there is the construction plan of the ferry facility to secure the waterway traffic between Quimba and La Palma.

Based on the above idea, development of fishing infrastructure facilities at La Palma is proposed, in conjunction with the above traffic development, aiming at the establishment of the regional industries of the Darien due to the marine resources of the region.

The project shall take account of the following objective vessels:

- Commercial fishing vessels : 150 GRT

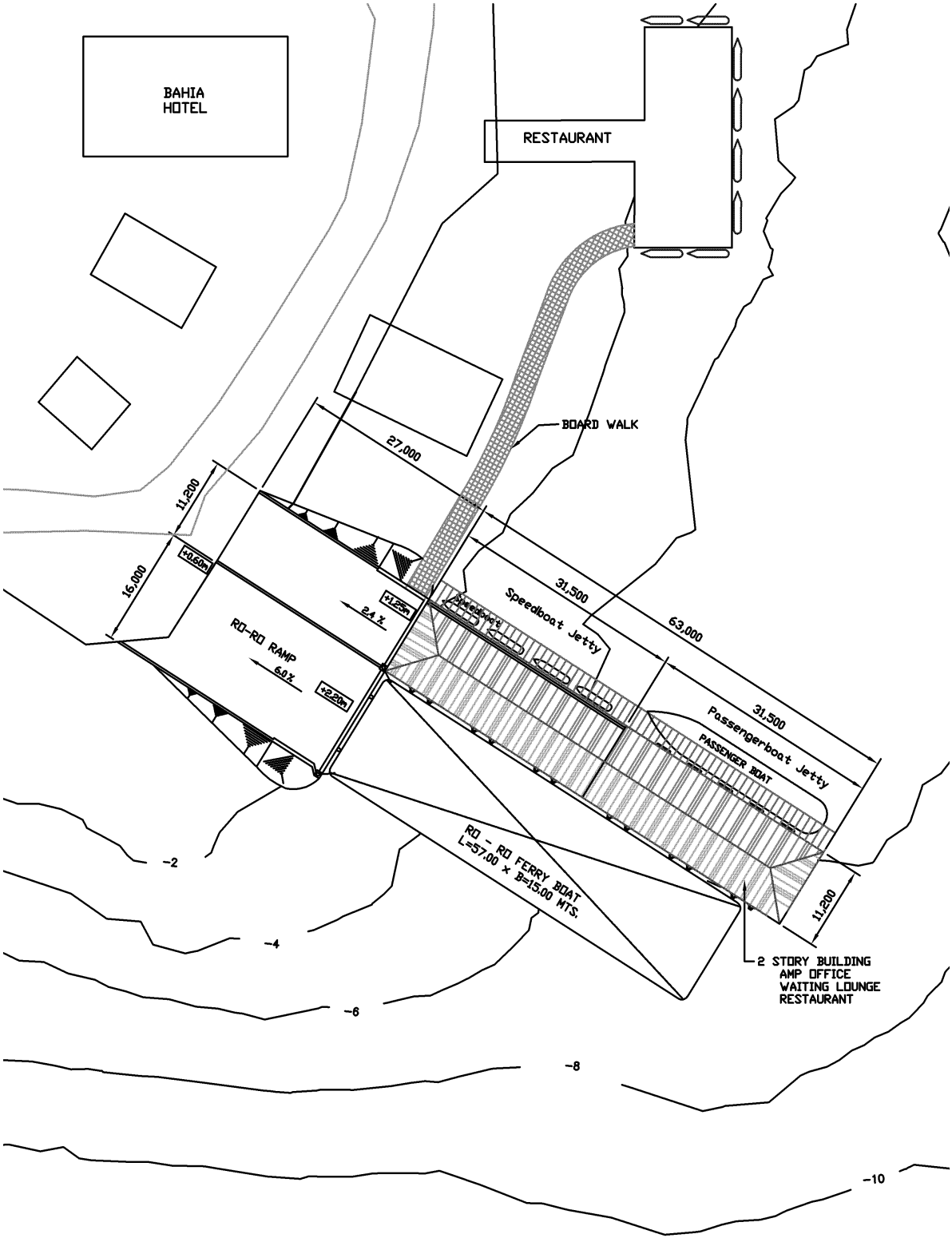


Figure 7.1 Layout Plan of Bocas del Toro Port

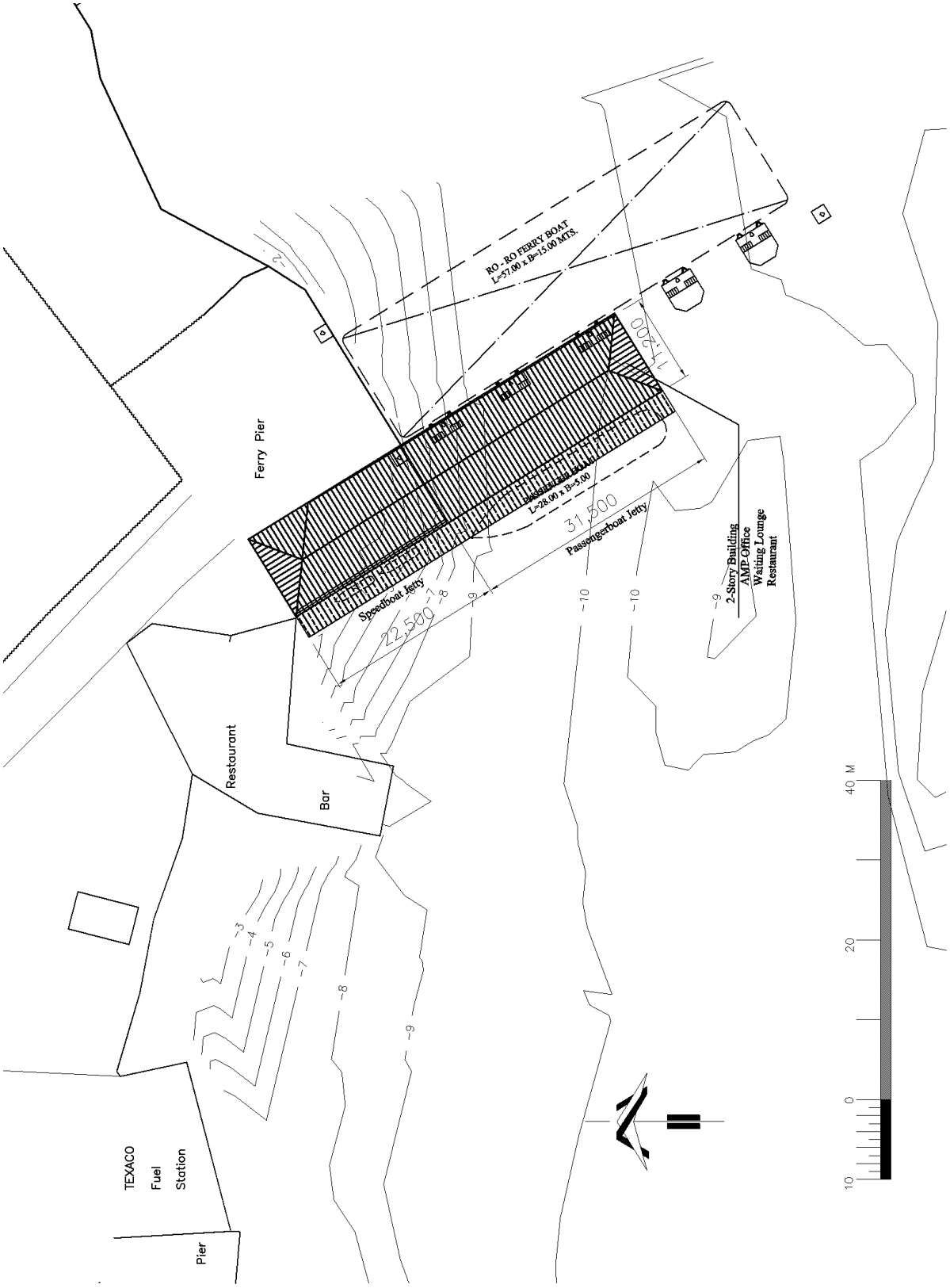


Figure 7.2 Layout Plan of Almirante Port

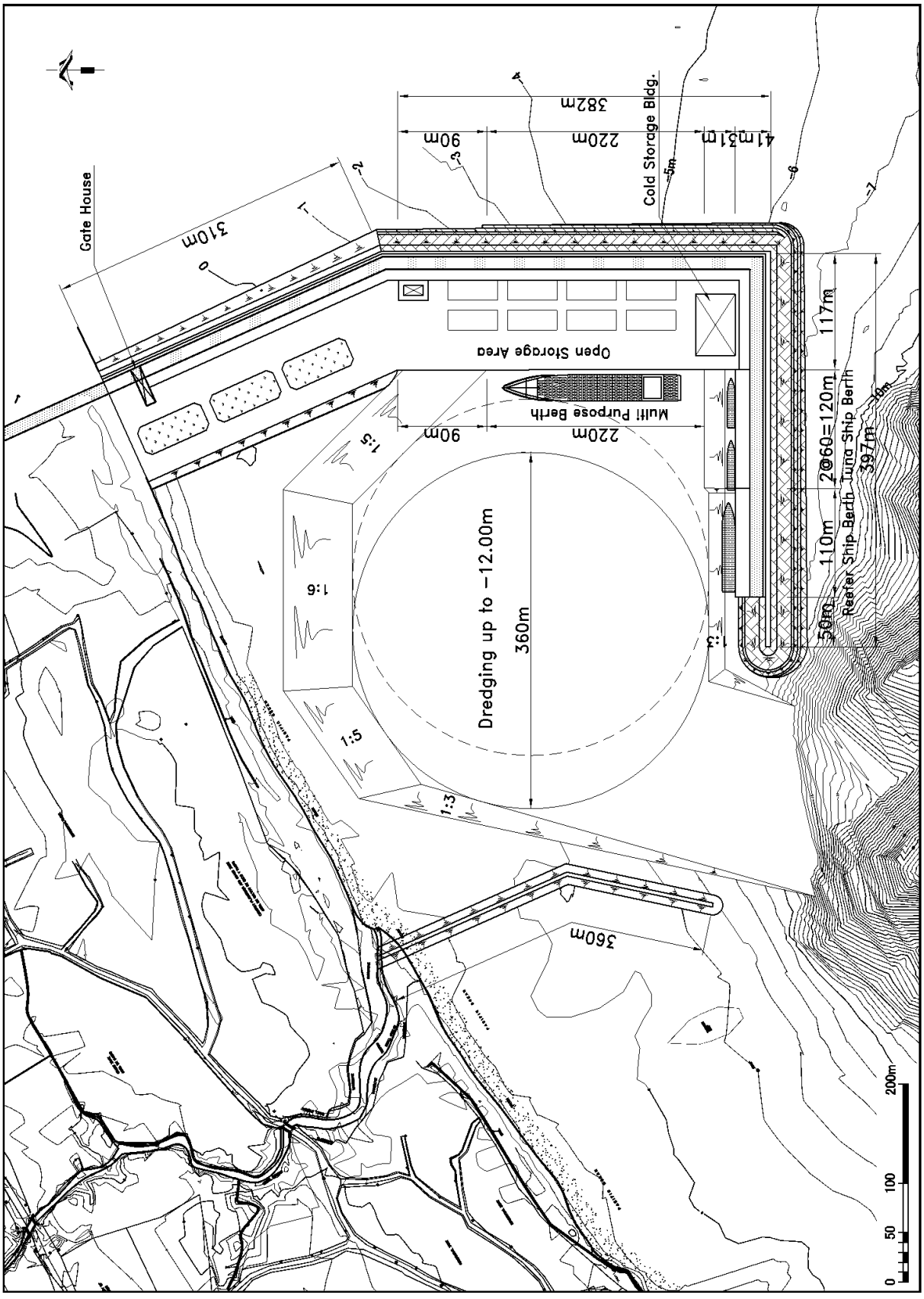


Figure 7.3 Layout Plan of New Chiriqui Port

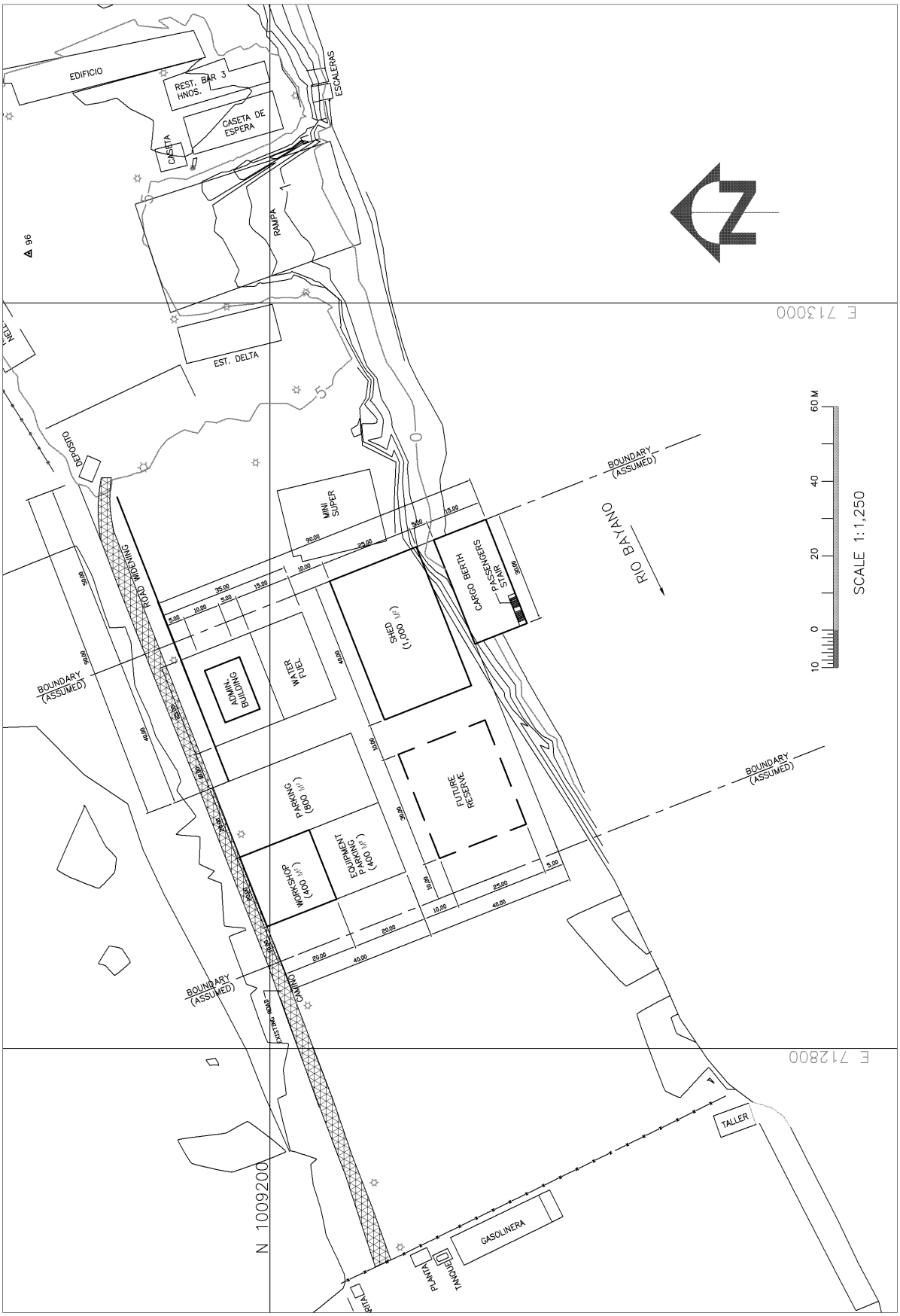


Figure 7.4 Layout Plan of Coquira Port

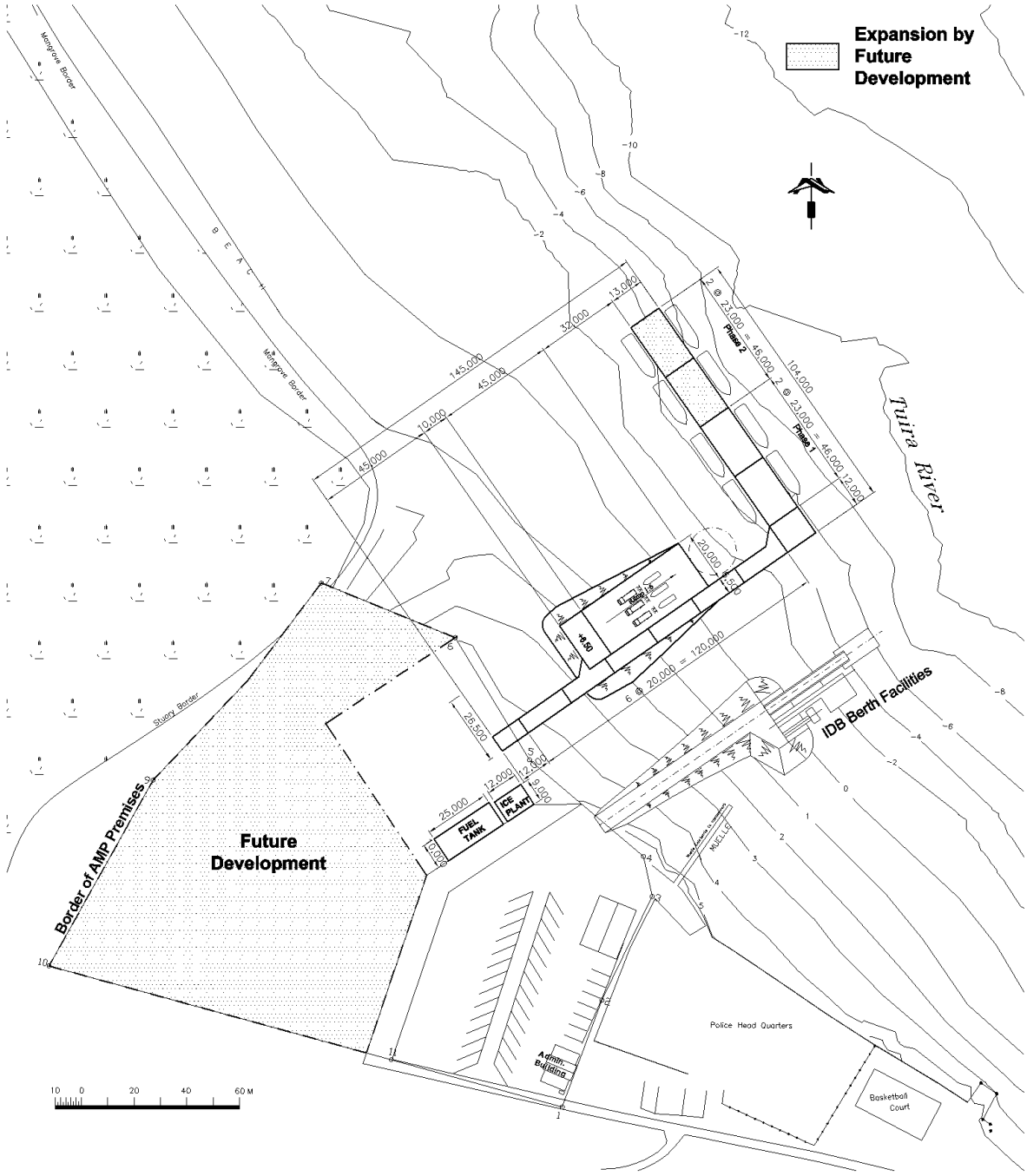


Figure 7.5 Layout Plan of La Palma Port

7.2 Cost Estimate

The project costs are estimated based on the following conditions:

- Unit prices of each element such as major construction materials, equipment and manpower cost are calculated based on the unit prices, which were collected from the local contractors and suppliers in December 2003.
- The prices of imported construction plants and materials are estimated based on the exchange rate in December 2003.

The project costs for each port are as follows:

Table 7.1 Project Cost

Port	Const. Cost (USD)	Share (%)	Break Down
Bocas del Toro including Almirante	4,562,624	7.1	Refer to Table 7.2
Chiriqui	49,793,444	78.0	Refer to Table 7.3
Coquira	2,346,760	3.7	Refer to Table 7.4
La Palma	7,134,049	11.2	Refer to Table 7.5
Total	63,836,877	100.0	

Table 7.2 Breakdown of Project Cost for Bocas del Toro and Almirante Ports

Bocas del Toro						Unit : USD
	Item	**Description**	**Unit**	**Quantity**	**Unit Rate**	**Amount**
1	Demolition	Exist. Jetty, Shed, Ramp, Office	l.sum	1	89,816.0	89,816
2	Jetty	705.6 sq.m	sq.m	706	2,104.8	1,485,124
3	Revetment	for Ramp	lin.m	70	3,009.1	210,638
4	Reclamation	Land for the Office	cu.m	687	55.6	38,165
5	Pavement	for the above Item 3. and 4.	sq.m	868	106.0	92,008
6	Buildings	Terminal Bld. 1,200sq.m	sq.m	605	500.0	302,500
7	Outdoor Lighting		unit	16	1,250.0	20,000
8	Utilities	Supply line, Connection to city line	l.sum	1	67,150.0	67,150
Sub Total						**2,305,401**
Almirante						Unit : USD
	Item	**Description**	**Unit**	**Quantity**	**Unit Rate**	**Amount**
1	Demolition	Exist. Ramp	l.sum	1	57,893.0	57,893
2	Jetty	705.6 sq.m	sq.m	605	1,615.1	977,130
3	Bresting Dolphin	PC Pile Supported	unit	2	141,520.0	283,040
4	Mooring Dolphin	PC Pile Supported	unit	1	63,367.0	63,367
5	Revetment	for Ramp	lin.m	106	2,959.7	313,726
6	Reclamation	Land for the Office	cu.m	802	50.9	40,788
7	Pavement	for the above Item 3. and 4.	sq.m	1,255	106.0	133,030
8	Buildings	Terminal Bld.	sq.m	605	500.0	302,500
9	Outdoor Lighting		unit	16	1,250.0	20,000
10	Utilities	Supply line, Connection to city line	l.sum	1	65,750.0	65,750
Sub Total						**2,257,224**
Bocas del Toro, Almirante Total						**4,562,624**

Table 7.3 Breakdown of Project Cost for the New Chiriqui Port

Chiriqui						Unit : USD
	Item	**Description**	**Unit**	**Quantity**	**Unit Rate**	**Amount**
1	Dredging	up to -12m	cu.m	1,938,000	2.0	3,876,000
2	Reclamation	up to +4m	cu.m	449,192	7.0	3,144,344
3	-12m Berth	Multi Purpose Berth	lin.m	250	47,935.2	11,983,804
4	-6.5m Berth	Refer Carrier Berth	lin.m	110	10,480.5	1,152,860
5	-5m Berth	Tuna Boat Berth incl. Approach	lin.m	120	9,558.3	1,146,992
6	Breakwater	South East Side	lin.m	780	29,281.7	22,839,690
7	Groin	West Side	lin.m	360	716.1	257,796
8	Revetment	East Side	lin.m	310	2,926.4	907,184
9	Building	RC-made, Flat Floor	sq.m	250	500.0	125,000
10	Pavement		sq.m	38,790	80.0	3,103,200
11	Fuel Supply	for Fishing Boat	l.sum	1	203,780.0	203,780
12	Outdoor Lighting		unit	95	1,250.0	118,750
13	landscaping		sq.m	32,760	3.0	98,280
14	Utilities	Supply line, Connection to city line	l.sum	1	835,764.0	835,764
Total						**49,793,444**

Table 7.4 Breakdown of Project Cost for Coquira Port

Coquira						Unit : USD
	Item	**Description**	**Unit**	**Quantity**	**Unit Rate**	**Amount**
1	Land Preparation	including Hinterland	sq.m	7,200	4.3	30,660
2	-3.0m Berth	450 sq.m	sq.m	450	2,301.7	1,035,776
3	Revetment	SSP type	lin.m	40	6,822.9	272,914
4	Building	Office, Workshop, Shed, Gate & Fenc	sq.m	1,700	245.6	417,500
5	Fuel Supply	Oil Tank and Piping	l.sum	1	115,120.0	115,120
6	Pavement	Hinterland	sq.m	2,675	106.0	283,550
7	Outdoor Lighting		unit	30	1,250.0	37,500
8	Landscaping		sq.m	1,440	3.0	4,320
9	Utilities	Suppline Line, Connection to city line	l.sum	1	65,920.0	65,920
10	Equipment	Crane and Forklift	l.sum	1	83,500.0	83,500
Total						**2,346,760**

Table 7.5 Breakdown of Project Cost for La Palma Port

La Palma (Phase I, II)						Unit : USD
	Item	**Description**	**Unit**	**Quantity**	**Unit Rate**	**Amount**
1	Land Preparation	including Parking and Hinterland	sq.m	18,487	7.2	132,824
2	Berth/Trestle	2,246 sq.m	sq.m	2,246	1,536.8	3,451,662
3	Mooring Buoy	Steel Made	unit	2	20,000.0	40,000
4	Slipway	B 20m x L 45m	l.sum	1	858,656.0	858,656
5	Revetment		lin.m	130	796.5	103,545
6	Buildings	Shed 400sq.m	l.sum	1	235,000.0	235,000
7	Ice Making Plant	7.5 t/dayx2, with Ice Storage	l.sum	1	1,200,000.0	1,200,000
8	Fuel Supply	with Accessories	l.sum	1	302,140.0	302,140
9	Pavement	Parking Area	sq.m	4,137	106.0	438,522
10	Outdoor Lighting		unit	35	1,250.0	43,750
11	Deck Crane		unit	4	12,500.0	50,000
12	Utilities	Supply line, Connection to city line	l.sum	1	212,800.0	212,800
13	Handling Equip.	3.0 t Forklift, Diesel	unit	1	19,500.0	19,500
14	Cooler Box	1 cu.m	pcs	50	913.0	45,650
Phase I,II Total						**7,134,049**

7.3 Economic Analysis

(1) Bocas del Toro and Almirante Ports

Economic benefits are as follows: If the current port terminals at both Bocas del Toro and Almirante are not repaired and improved, some tourists will not come again and bad information will be disseminated. Thus, 15% the increase of foreign tourist to Bocas del Toro will be the positive result of the project. And they are expected to spend USD 100 per person, which constitutes the economic benefit.

EIRR for the project is estimated at 20.7% and the project will be economically feasible.

(2) New Chiriqui Port

Economic benefits are as follows:

a) Reduction of land transportation cost of container cargoes

The cost of transporting a container box between Panama City and Chiriqui by truck is USD 650. If the container box will be handled at the new Chiriqui port, the land transportation cost will be reduced because the distance is much shorter while additional costs are required for the transshipment between feeder ships to mother vessels at base ports and non-base port surcharge. It is estimated that the sum of these additional charges to be USD 200, the cost saving per container will be USD 450.

b) Reduction of land transportation cost of dry bulk cargoes currently transported overland from Costa Rica

Without New Chiriqui Port, a substantial amount of fertilizer should be transported overland from Caldera Port in Costa Rica to Panama, while, with New Chiriqui Port, the land transportation cost will be deduced because the distance is considerably shortened, especially for the consumers in Chiriqui and Veraguas Provinces. Thus, it was assessed that the cost reduction should be USD 43 per ton.

c) Reduction of sea transportation cost by the employment of larger vessels in fertilizer import

Because of the draft restriction at Pedregal Port, cargo ships having 2,000 DWT are employed for the importation of fertilizer at the port. With the deep draft wharf of the new Chiriqui Port, fertilizer can be imported by ships as large as 25,000 DWT. The employment of larger dry bulk carriers results in the cost reduction of USD 10 per ton.

In the same manner, those cargo ships having 2,000 DWT currently employed for sugar export can be replaced by ships as large as 6,000 DWT: those ships currently employed for the sugar export are calling both Pedregal and Aguadulce Ports in one voyage and thus the ship size is now restricted by the draft limit at Pedregal Port. The cost reduction attained by the employment of larger ships for sugar export has been estimated to be USD 2 per ton.

d) Expenditure by foreign tuna ships

The new Chiriqui Port is intended to provide foreign tuna boats with a sheltered base port where they will be able to be moored for unloading tuna and minor maintenance as well as supply of food and bunker oil. Thus, the tuna boats will stay at the port longer and both the ship owners and crew spend more while the boats stay in the port. Unloading tuna also generate a new business in the port.

The expenditure of tuna boats has been estimated to be USD 7,600 per boat: total expenditure by crew to be USD 6,600 per boat, i.e., 22 crew members x USD 300 per member, and tuna handling to be USD 1,000.

EIRR for the project is estimated at 15.4% and the project will be economically feasible.

(3) Coquira Port

Economic benefits have been estimated in the following manner: It is assumed that, without a new wharf is constructed in Coquira Port, Aguadulce Port should be used after the closure of Fiscal Pier of Panama and that the cargoes to be handled there should be transported from Panama City to Aguadulce Port. Thus, the land transportation costs would be higher for the case without Coquira Port than "With" Coquira Port. The distances of sea transportation to and from the island in the Gulf of Panama and Darien are also shorter for the case of "With" Coquira port. The cost saving is Therefore, the transportation cost will be saved by the construction of Port of Coquira: the reduction of the transportation costs are USD 39.8 per ton for the cargoes to and from the island while USD 67.1 per ton is saved for those cargoes to and from Darien..

EIRR for the project is estimated at 13.9% and the project will be economically feasible.

(4) La Palma Port

Economic benefits are as follows: A portion of the industrial fishery boats currently based at Vacamonte fishery port is expected to move to the new La Palma fishery boat complex. The trip time to the Darien fishery ground will decrease remarkably. This time saving will bring higher market price due to fish freshness. Secondly, the fuel saving is also achieved by the closer fishery ground from the homeport. The study team evaluated that the freshness of fish, especially shrimp, will improve the market price by USD 1.584 per kilogram, while the cost of transportation from Darien to Panama will be reduced by USD 0.137 per kilograms: this is the difference between the cost reduction by saving the fuel and the additional cost for the land transportation from La Palma to Panama City.

However, until fish processing firms are operational in La Palma, additional land transportation cost is required to deliver un-processed shrimp to Vacamonte Port where processing firms are located. The additional land transportation cost between Panama City to Vacamonte Port is assumed to be USD 60,000 per year until 2017 when processing firms are expected to operate at La Palma.

EIRR for the project is estimated at 16.4% and the project will be economically feasible.

7.4 Administration and Management

(1) Bocas del Toro and Almirante Ports

1) RoRo ferry facilities as national transport infrastructures

Operations of the RoRo ferry facilities should be managed by AMP from a point of view of securing access to isolated islands.

2) Support to activities in the community

AMP roles are planning of the passenger terminal, which is one of the tools for the tourism development, coordination with the persons concerned about a management system, establishment of a management body and support for the body to be active after opening of the terminal.

3) Management of the waterfront development

Inventories, which include the right of ownership and construction permits in the waterfront, should be provided in cooperation with the organizations concerned. In addition, procedures for a withdrawal of illegal buildings and an issue of construction permits should be clarified. It is important that consensus on orderly land use is taken through discussions with the local government and the government organizations concerned, and provide a guideline for an issue of the construction permit.

Presently AMP is the only government organization to coordinate the above and a role of Bocas del Toro Administration office is a liaison between the central government and the region.

From a point of view of the environmental preservation, which is one of AMP's duties, permission for land use in the waterfront should be issued on condition that protective measures against the marine pollution are made.

4) A management body for the new port

A wharf in the passenger terminal should be constructed by AMP. However, it is recommended that private sectors will participate in the construction of the terminal building, which includes a waiting room, restaurants, an information center, an exhibition hall, and operation of the terminal.

5) Shipping administration, safety for passengers and port security

Permissions for the shipping services should be issued on conditions that safety measures and improvement in services will be made. As a result of tightening the control of non-permitted operators, permitted operators will be protected.

(2) New Chiriqui Port

1) Approval by the government as a national project

It is a first action necessary for AMP that the new Chiriqui port will be approved as a national project by the government, and it is indispensable for the government organizations concerned and private sector to work together.

The project should include not only construction of the port but the access road between the David city and Port of Armuelles.

2) Consensus of the project implementation in the local area

Consensus of the project should be formulated with the private sector and the local organizations concerned. It is recommended that the project office for the new Chiriqui port will be established in AMP headquarters and that the role of local administration office in Ports of Armuelles and Pedregal includes being a liaison between the central government and the region. It is indispensable that the project summary will be explained for people in Port of Armuelles and the local government will set about the urban planning based on the new port. AMP is requested to cooperate with them to draw up the planning.

3) Establishment of the administration and management system for the new port

The government organization concerned should work together with the private sector in the project and allotment of roles between both parties must be discussed.

Private participation to the project management is necessary: for example, PTP has an experience for the port management, and fuel supply and tugboat services in the new port will rely on PTP.

The new port has high public importance because various import/export commodities will be handled at the port. Therefore, it is not recommended that whole management and future development of the port will be given to the private sector by concession contract. The government (AMP) should play a leading and supervising role in order to proceed with the development and achieve the project objectives.

4) Customs, immigration and quarantine (CIQ)

The new Chiriqui port is an international port and needs smooth procedures for CIQ. Integration of the procedures is expected for cargoes to/from the Baru Free Zone and Costa Rica. For example, there need no inspection at the border if the customs inspect in the new port.

5) Attraction of tuna ships

Port of Balboa was a supply base for tuna vessels before but they will move to Vacamonte and Armuelles Ports due to the extension of the container terminal in the port. Recently tuna vessels, which use Port of Armuelles, tended to increase. However, their owner intends to move to the port in Costa Rica due to poor facilities in Port of Armuelles. Therefore, it is recommended that

the government will publicly announce the project implementation urgently to attract the tuna companies to Panama.

6) A new scheme for Port of Pedregal

If the new Chiriqui port will be constructed, Port of Pedregal will be in no use. Therefore, new port users for Port of Pedregal should be found, for example fishery companies or marina business.

(3) Coquira Port

1) Objectives of Coquira Port extension

It is recommended that the government should construct the new port as a public work in consideration that the port replaces Fiscal Port of Panama and functions as a base to support living in the isolated islands.

The port area belongs to a private owner and there is no lease contract between AMP and the owner. Therefore, it is recommended that AMP will purchase the area or make a BOO/BOT contract including wharf construction with the private sector.

A private company has unloading facilities for shrimp trawlers including a repair dock in the port. If a fishing port will be developed in Port of La Palma, the private company might handle cargoes to/from isolated islands due to low number of ship calls to the port.

2) Re-distribution of staffs in Fiscal Port of Panama

The deployment of 23 staffs in Fiscal Port of Panama is necessary after closure of the port. Scale of the new facility in Coquira Port is rather small and a small number of staff can manage the port if it is operated by the private sector.

Therefore, re-distribution of staff will be considered in all local ports in AMP.

(4) La Palma Port

1) Urban planning

Planning of a fishing port aims to develop La Palma as a regional center for socio-economic activities in future in cooperation with the IADB project. Therefore, it is important that AMP will carry out urban planning of La Palma with the support of the Chepigana local government and the other government organizations.

2) Explanation to the fishing industry

It is a first objective for the fishing port that a small fishing industry in the Darien province will be commercialized. The following activities are very important to achieve this:

- Explanation of the project summary to the local fishermen
- Discussion about future direction of the fishermen's cooperative
- Consensus of the people

It is necessary that a monitoring system will be established to ensure that individual businesses in the coastal villages and approaches to the industries concerned will be made for fair trade in La Palma.

3) Attraction of the value-added industries

It is recommended that AMP takes the initiative to attract supply services for fuel, water and ice to fishing boats and cargo vessels, and private companies, which specialize in fish processing and keeping in a freezing.

4) Security

More public and private properties will be made if the project will be realized. Therefore, a security system to guard them should be established, for example support from the police.

7.5 Environmental Impact Assessment

(1) Bocas del Toro and Almirante Ports

It is concluded that potential adverse environmental effects caused by the project execution and its subsequent operation of the port terminals in both Bocas del Toro and Almirante are manageable and hence not significant. Still, the most important port operational environmental requirement is proper waste management.

It is recommended for AMP to initiate a port water quality monitoring program initially targeting at least simple potable water quality parameters, in particular DO level. This monitoring program could be initiated concurrently with the commencement of construction works.

(2) New Chiriqui Port

It is concluded that potential adverse environmental effects consequent to the project construction and its subsequent operation of the port terminals are manageable. Although dredged material management is the most significant environmental issue concerning the construction works of the project, deep sea disposal of dredged material is a feasible option in consideration of the availability of vast deep sea waters in the vicinity and further from the project area and also due to the non-contaminating nature of the dredged material. Still, beneficial use of the dredged material for the regeneration of mangrove woods in the mangrove wetland area located beyond the Rio Palo Blanco should be investigated and be the preferred option.

Concerning operation of the project facilities, due care in adherence to the port operational management requirements focused on ship and port terminal waste management, in particular

enforcement of MARPOL regulations and its Annexes, is of utmost importance to mitigate potential long-term adverse environmental effects of port operation.

It is recommended for AMP to initiate a port water quality monitoring program initially targeting at least simple potable water quality parameters, in particular DO level. This monitoring program could be initiated concurrently with the commencement of construction works.

(3) Coquira Port

It is concluded that potential adverse environmental effects consequent to the project execution and its subsequent operation of the Coquira port is manageable and hence not significant. Still, the most important port operational environmental requirement is proper waste management.

It is recommended for AMP to initiate a port water quality monitoring program initially targeting at least simple potable water quality parameters, in particular DO level. This monitoring program could be initiated concurrently with the commencement of construction work.

(4) La Palma Port

It is concluded that potential adverse environmental effects consequent to the project execution and its subsequent operation of the La Palma port terminal is manageable and hence not significant. Still, the most important port operational environmental requirement is proper waste management.

It is recommended for AMP to initiate a port water quality monitoring program initially targeting at least simple potable water quality parameters, in particular DO level. This monitoring program could be initiated concurrently with the commencement of construction work.

8. FEASIBILITY STUDIES

This chapter summarizes the results of feasibility studies on short-term development plans of the four ports. A summary table is presented in Table 8.1. Project description and project appraisal of each project are given in the following sections.

8.1 Bocas del Toro/Almirante

(1) Proposed Facilities for Short-term Development

Facility requirements in the short-term development at Bocas del Toro and Almirante Ports are shown in the table below. Taking into consideration that the scale of the project is very limited, it is recommended that the whole master plan should be implemented in one package.

Table 8.2 Proposed Facilities at Bocas del Toro and Almirante

(Short-term development)

Item	Description
Waterfront Facilities	
- Ro-Ro Ferry Berth	Length: 63 m, design depth: -2.5 m
- Speedboat Jetty	Length: 31.5 m, design depth: -1.0 m
Passenger Boat Jetty	Length: 31.5 m, design depth: -2.0 m
Revetment	Retaining wall for protecting reclamation works
Utility Supply Facilities	- Water supply system with supply piping to buildings and firefighting - Electric power supply to buildings
Buildings	2-story Building Complex: 700 m^2 (AMP Office, Waiting Lounge, Ticket Booth, Restaurant, Public Toilet, etc.)

(2) Scope of Works and Cost Estimate

Scope of works and cost estimate of the short-term development at Bocas del Toro Port and Almirante Port are summarized in Tables 8.3 (1) and (2).

Table 8.3 (1) Scope of Works and Cost Estimate of Short-term Development

(Bocas del Toro; Unit in USD)

Bocas del Toro						
Item		Description	Unit	Quantity	Unit Rate	Amount
1	Demolition	Existing jetty, shed, ramp, etc.	l.s.	1	89,816.0	89,816
2	Jetty		m^2	705.6	2,104.8	1,485,124
3	Revetment	for Ramp	m	70	3,009.1	210,638
4	Reclamation	Land for AMP Office	m^3	687	55.6	38,165
5	Pavement	for the Items 3 and 4	m^2	868	106.0	92,008
6	Buildings	Terminal Building	m^2	605	500.0	302,500
7	Outdoor Lighting		unit	16	1,250.0	20,000
8	Utilities	Supply line, connection	l.s.	1	67,150.0	67,150
Sub Total						**2,305,401**

Table 8.1 Summary Table of Short-term Port Developments

	Bocas del Toro/Almirante	Chiriqui New Port	Coquira Port	La Palma Fishing Port
Port Development Components and Facilities	Ro-Ro Ferry Berth Speedboat Jetty Passenger Boat Jetty Revetment Utility Supply Facilities Buildings	Multi-purpose Berth Reefer Ship Berth Tuna Berth Breakwater / Groin On Land Facilities Utility Supply Facilities Buildings Waste Treatment Facilities Access Road	General Cargo Berth Shed Administration Building Workshop Equipment for Cargo Handling Parking Space Approach Road / Utilities	Ramp Shrimp Jetty and Trestle Mooring Buoy Ice Plant and Ice Storage Fuel Tank and supply facilities Water Supply Equipment Cooler Box / Utilities
Construction Cost	4,562,624 USD	49,793,444 USD	2,346,760 USD	5,917,587 USD
Operational at	2008	2011	2007	2008
O&M Entity	AMP	Special Purpose Company (SPC)	Private Concessionaire	AMP
Private Participation	Port ancillary services	O&M and shareholding of SPC	Port management, operation	Port ancillary services
Financial Sources	10 % borne by AMP 90 % fundraised with loan Interest Rate: 3 % per annum Grace Period: 5 years Repayment: 20 years	40 % financed as Equity Capital of SPC by AMP and Private Investor 60 % funded with loan by SPC Interest Rate: 6 % per annum Grace Period: 5 years Repayment: 20 years	Wharf construction borne by AMP with Government's budget On-land facilities constructed by Private Concessionaire with loan Interest Rate: 6 % per annum Grace Period: 5 years Repayment: 10 years	90% borne by AMP with Government's budget 10 % funded with loan Interest Rate: 3 % per annum Grace Period: 5 years Repayment: 20 years
EIRR	20.74 %	15.42 %	13.89 %	15.68 %
FIRR	10.69 %	9.79 %	11.27 %	12.74 %
Environmental Consideration	Environmental impact not significant; port water quality to be monitored targeting potable water quality (DO level)	Dredged material management is the most significant issue; port water quality be monitored targeting potable water quality (DO level)	Environmental impact not significant; port water quality to be monitored targeting potable water quality (DO level)	Environmental impact not significant; port water quality to be monitored targeting potable water quality (DO level)

Table 8.3 (2) Scope of Works and Cost Estimate of Short-term Development

(Almirante; Unit in USD)

Almirante						
Item		**Description**	**Unit**	**Quantity**	**Unit Cost**	**Amount**
1	Demolition	Existing ramp, etc.	l.s.	1	57,893.0	57,893
2	Jetty		m^2	605	1,615.1	977,130
3	Breasting Dolphin	PC Pile supported	unit	2	141,520.0	283,040
4	Mooring Dolphin	PC Pile supported	unit	1	63,367.0	63,367
5	Revetment	for Ramp	m	106	2,959.7	313,726
6	Reclamation	Land for AMP Office	m^3	802	50.9	40,788
7	Pavement	for Items 3 and 4	m^2	1,255	106.0	133,030
8	Buildings	Terminal Building	m^2	605	500.0	302,500
9	Outdoor Lighting		unit	16	1,250.0	20,000
10	Utilities	Supply line, connection	l.s.	1	65,750.0	65,750
Sub Total						**2,257,224**
Bocas del Toro + Almirante						**4,562,624**

(3) Implementation Plan

Implementation plan of the short-term development at Bocas del Toro Port and Almirante Port is summarized in Table 8.4.

Table 8.4 Implementation Plan of Bocas del Toro/Almirante Ports Development

Bocas del Toro / Almirante		2004		2005		2006		2007		2008		2009	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	Consensus Building for Development												
2	Finalization of Development Plan												
3	Selection Process of IDB Projects (Sustainable Development of Bocas del Toro)												
4	Budgetary Arrangement of IDB and Government												
5	Detail Design Study, Preparation of Tender Documents, Construction Supervision												
6	Tender Process and Contractor Selection												
7	Construction Process												
8	Commencement of Port Operation												

(4) Operation and Management Scheme

The primary task of AMP is to organize all the stakeholders of this project. In particular, the operators of passenger boats are the primary stakeholders. AMP should also commit them to fair competition by strict regulation of illegal services without proper licenses.

While some portion of the superstructure such as the passenger terminal building may be financed by the private sector, AMP has to bear the construction cost of the whole infrastructure. Since the project also aims at strengthening the organizing capability of the local government and promoting local tourism industry, the project may be eligible for IDB loan.

Private sector should participate in ancillary services such as fuel and water supply, running stores and restaurants, cleaning-up of port area and garbage collection. Environment protection (water quality, marine grass) should be carefully implemented in cooperation with the competent agencies.

(5) Economic Evaluation

Table 8.3 summarizes the economic cost of the Bocas del Toro/Almirante Port Project. Contingencies for the construction cost are estimated at 10 % of the civil works. Engineering fee is expected at 10 % of the construction cost except for the procurement cost of equipment. Long term operation and maintenance cost is estimated as 1 % of the construction cost annually.

Among direct and indirect economic benefits expected from the project, increase of the foreign tourists by air and their spending are taken into account in the study. Study Team estimates annual increase of foreign tourists to Bocas del Toro at 10 % through whole study period (2005 – 2014).

Table 8.5 shows that EIRR for the short-term development project is 20.74 %.

Due to the shortfall of traffic volume growth and other unforeseeable factors, the actual costs might exceed our estimates and the actual economic benefits might not be realized fully. Sensitivity analysis on EIRR was set out with the following three unfavorable situations.

Case A : 10 % overrun of the capital investment cost
Case B : 10 % decrease of the economic benefit
Case C : Combination of both Case A and Case B (the worst scenario)

Table 8.5 Economic Analysis of Bocas del Toro / Almirante Ports Development

Study Cases		Economic Internal Rate of Return (EIRR)
Master Plan		20.74 %
Short-term Development	Base Case	20.74 %
	Case A (Cost plus 10 %)	19.51 %
	Case B (Benefit minus 10 %)	19.33 %
	Case C (Combining Cases A and B)	18.17 %

Considering relatively high EIRR with robustness shown in the sensitivity analysis even where unfavorable situations are assumed, this project is judged to be feasible and recommendable from the economic point of view.

(6) Financial Viability

Financial analysis reviews the financial revenue and financial expenditure that are expressed in market prices. The same conditions used for the economic analysis are set up for the financial analysis. AMP is assumed as the managing entity of the project. Financial analysis treats the business that is directly managed by the entity and excludes the activity of the concessionaire.

To cover the space of the administration office, 10 % of the construction cost will be borne by AMP administration budget. The rest of the project cost (90 %) is to be funded by a concessional loan. The conditions of the loan are assumed as follows.

Interest Rate : 3 % per annum
Grace Period : 5 years from the start of operation (only interest portion shall be paid)
Repayment : 20 years (fixed amount repayment of principal)

Calculated FIRR for the project is 10.69 %. According to Income Statement, annual income will become positive in 2011 (4th year of operation) but cumulative profit will be still negative until 2013. From the first year of operation, the net cash flow is positive except for 2017 due to the re-investment for renewal of utility facilities and is positive again in 2018. Cumulative cash will become positive in 2009 (2nd year of operation) and remain positive subsequently until 2024. By Balance Sheet, cash position becomes positive in 2009 but net equity is still negative until 2013.

Table 8.6 Financial Analysis of Bocas del Toro / Almirante Ports Development

Study Cases		Financial Internal Rate of Return (FIRR)
Short-term Development	Base Case	10.69 %
	Case A (Cost plus 10 %)	9.81 %
	Case B (Revenue minus 10 %)	9.78 %
	Case C (Combining Cases A and B)	8.92 %

Considering that the estimated high FIRR (10.69 %) as a public infrastructure project and the soundness of the pro forma income statement and cash flow statement, this project is judged to be financially feasible and recommendable.

(7) Environmental Considerations

The facilities planned for passenger and tourist boats and Ro-Ro ferry in Bocas del Toro, and the passenger boats and Ro-Ro ferry in Almirante involve essentially rehabilitation of existing damaged facilities belonging to AMP and located over coastal sea waters. Accordingly, provision of port facilities does not involve any land acquisition or resettlement of population including housing compensation.

Nevertheless, the coastal road beautification plan in Bocas del Toro and other auxiliary plans that are to be located in the vicinity of the port areas may involve land acquisition as well as resettlement of population, and housing and commercial property compensation requirements. In this respect the affected people are willing to be cooperative provided they are awarded due compensation and given alternative suitable locations to reestablish their businesses and other activities.

Accordingly, it is concluded that potential adverse social effects consequent to the implementation of the project is manageable and all land and property acquisition works could be accomplished with the adoption of a reasonable compensation and relocation system.

The berths for passenger and tourist boats as well as Ro-Ro ferry terminal in Bocas del Toro are sited on coral seabed, currently. Anyhow since the coral areas are not pristine and have been affected already for a long time, it is assessed that any potential adverse effects due to these berthing facilities on coral communities in the seabed is not that significant.

In fact the most significant potential long-term adverse effects consequent to the berthing of passenger/tourist boats as well as Ro-Ro ferry is the potential sea water pollution due to improper waste management of vessel generated wastes such as oily (bilge) wastes and garbage. In this respect AMP as the project owner shall undertake a vigilant waste management program, including surveillance against illegal dumping of wastes by vessels, so as not to pollute the coastal waters of berthing areas. This requirement has particular relevance for Bocas del Toro where tourism is the most significant development component of the project.

Potential adverse environmental effects consequent to the project execution and its subsequent operation of the port terminals in both Bocas del Toro and Almirante are manageable and hence not significant. Still, the most important port operational environmental requirement to be ensured is proper waste management.

It is recommended to initiate a port water quality monitoring program initially targeting at least simple potable water quality parameters, in particular DO level, by AMP. This monitoring program should be initiated at least concurrently with the commencement of construction works.

8.2 New Chiriqui Port

(1) Proposed Facilities for Short-term Development

The project consists of two elements: tuna wharves and a multipurpose wharf. By integrating these two plans, tuna boats will become able to export their catches immediately from their landing port while the multi-purpose wharf will be able to ensure the users. Both tuna boats and oceangoing cargo ships need an all-whether port in the area. To this end, breakwaters are needed due to the geographical and oceanographic conditions of Chiriqui.

Since the construction of breakwaters amounts to a big share in the project cost and in order to make maximum use of the investment, it is recommended that the whole project including the profit-making facilities like tuna berth and multi-purpose berth should be implemented in one package. Facility requirements in the short-term development plan at Chiriqui Port are shown in Table 8.7.

Table 8.7 Proposed Facilities at Chiriqui New Port

Item	Description
Waterfront Facilities	
Multi-purpose Berth	Length: 230 m, Design depth: –12.0 m
Reefer Ship Berth	Length: 110 m, Design depth: –6.5 m
Tuna Berth	Length: 120 m, Design depth: –5.0 m
Breakwater	Extension: 780 m, Crown Height: +8.0 m
Groin	Extension: 360 m, Crown Height: +3.0 m
On Land Facilities	- Service road construction with drainage system inside the port area - Open yard for conventional cargo and container - Fence and Landscaping
Utility Supply Facilities	- Water supply system with supply piping to buildings and firefighting - Power supply to buildings, lighting to buildings and yard
Buildings	- Administration Building: 300 m^2 - Cold Storage: 2,300 m^2 - Gate House: 2 lane, 1 booth
Access Road	2-lane road connecting port area and existing national road, Extension: 100 m

(2) Scope of Works and Cost Estimate

Scope of works and cost estimate of the short-term development at Chiriqui Port are summarized in Table 8.8.

Table 8.8 Scope of Works and Cost Estimate of Short-term Development

(Chiriqui New Port; Unit in USD)

	Item	Description	Unit	Quantity	Unit Rate	Amount
1	Dredging	Basin up to -12 m	m^3	1,938,000	2.00	3,876,000
2	Reclamation	up to +4 m	m^3	449,000	7.00	3,144,344
3	Berth; -12 m	Multipurpose Berth	m	250	47,935.2	11,983,804
4	Berth; -6.5 m	Reefer Carrier Berth	m	110	10,480.6	1,152,860
5	Berth; -5 m	Tuna Boat Berth + Approach	m	120	9,558.3	1,146,992
6	Breakwater	Southeast Side	m	780	29,281.7	22,839,690
7	Groin	West side	m	360	716.1	257,796
8	Revetment	East side	m	310	2,926.4	907,184
9	Building	RC Structure, 1-story	m^2	250	500.0	125,000
10	Pavement		m^2	38,790	80.0	3,103,200
11	Fuel Supply	for tuna boats	l.s.	1	203,780.0	203,780
12	Outdoor Lighting		unit	95	1,250.0	118,750
13	Landscaping		m^2	32,760	3.0	98,280
14	Utilities	Supply line, connection	l.s.	1	835,764.0	835,764
Total						**49,793,444**

(3) Implementation Plan

Implementation plan of the short-term development at Chiriqui Port is summarized in Table 8.9.

Table 8.9 Implementation Plan of Chiriqui New Port Development

	Chiriqui	2005		2006		2007		2008		2009		2010	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	Project Appraisal												
2	Authorized Project Office (Set-up, Project Implementation)												
3	Budgetary Arrangement of Government												
4	Establishment of Management Entity (Special Purpose Company)												
5	Contract Agreement between SPC and Private Concessionaires												
6	Detail Design Study, Preparation of Tender Documents, Construction Supervision												
7	Tender Process and Contractor Selection												
8	Construction Process												
9	Commencement of Port Operation												

(4) Operation and Management Scheme

Since the function of the port includes services to specific users (tuna boats) and to other public users, public-private joint financing seems to be realistic. Taking into consideration the wide range of the stakeholders of the project, it is recommended that an independent management entity (Special Purpose Company; SPC) should be established for development of Chiriqui New Port and that the government should provide SPC with the port infrastructure in terms of equity capital or through concession contract.

While the government will provide the SPC with the basic port infrastructure in terms of assets, SPC will finance itself to develop the tuna and the multi-purpose wharves. Since the multi-purpose wharf is intended to serve the public, SPC may raise funds in terms of stocks from various stakeholders especially in Chiriqui Province. PTP, Baru Free Zone Authority, the fertilizer importers and sugar companies are the primary stakeholders.

Among others AMP has the responsibility of taking the following steps:

1) Financing for the construction of basic port infrastructure
2) Establishment of SPC for development, management and operation of Chiriqi New Port.

After the establishment of SPC, the roles and functions of AMP are rather administrative services. Being a member of the board directors of SPC representing the government's share, AMP should proactively support the business of SPC.

(5) Economic Evaluation

Table 8.8 summarizes the construction cost of the Chiriqui New Port Project. Contingencies for the construction cost are estimated as 10 % of the civil works. Engineering fee is expected as 5 % for the construction cost except for equipment. Long-term operation and maintenance cost is estimated as 1 % of the construction cost annually.

Following six groups of the economic benefits are taken into account in the study.

- Cost saving of container transport: 450 USD/container.
- Saving of land transportation cost of fertilizer from Costa Rica.
- Cost saving of maritime tariff by 10 USD/ton for bulk cargos (fertilizer, wheat, corn, etc.)
- Cost saving of region's sugar export: 4 USD/ton
- Port charges levied on Tuna Boats and the spending of the crews
- Handling charge of reefer containers.

Table 8.10 shows that EIRR for the short-term development project is 15.42 %.

Table 8.10 Economic Analysis of Chiriqui New Port Development

Study Cases		Economic Internal Rate of Return (EIRR)
Master Plan		15.42 %
Short-term Development	Base Case	15.42 %
	Case A (Cost plus 10 %)	14.31 %
	Case B (Benefit minus 10 %)	14.16 %
	Case C (Combining Cases A and B)	13.11 %

This port will be the gateway to Baru Multimodal Free Zone that is now being promoted as the trigger of the regional development in Chiriqui Province. This project will give the economic benefit not only to the region but also to the eastern Costa Rica. Considering relatively high EIRR with robustness shown in the sensitivity analysis, this project is judged to be feasible and recommendable from the economic point of view.

(6) Financial Viability

In order to facilitate the participation of private business and to achieve operating efficiency, introduction of SPC is assumed to operate both multipurpose terminal and fishery wharves of the new port. It is expected that 40 % of the capital investment will be funded by equity investment from both public and private investors.

The rest of the construction cost (60 %) should be funded by SPC. Conditions of the loan for SPC to raise are assumed as follows.

Interest Rate : 6 % per annum
Grace Period : 5 years from the start of operation (only interest portion shall be paid)
Repayment : 20 years (fixed amount repayment of principal)

Equity investment (40 % of the capital investment) is not required to repay but is to be depreciated. The saving of the annual dredging cost by AMP in Pedregal Port (USD 259,000/year) is considered in financial analysis.

Calculated FIRR for the project is 9.79 %. The port will be operational in 2011 and, according to Income Statement, annual income will become positive in 2011 (from the 1st year of operation) but cumulative profit will be still negative until 2015. Net cash flow is positive from the first year of operation (2011). Cumulative cash will become positive in 2013 (3rd year of operation). In Balance Sheet, cash position becomes positive in 2013 and net equity is still negative until 2015.

Table 8.11 Financial Analysis of Chiriqui New Port Development

Study Cases		Financial Internal Rate of Return (FIRR)
Short-term Development	Base Case	9.79 %
	Case A (Cost plus 10 %)	9.05 %
	Case B (Revenue minus 10 %)	8.92 %
	Case C (Combining Cases A and B)	8.22 %

Considering that the estimated high FIRR (9.79 %) as public infrastructure project and the soundness of the pro forma income statement and cash flow statement during feasibility study period, this project is judged to be financially feasible and recommendable.

(7) Environmental Considerations

This is the project where an entire new port would be built to handle a variety of cargoes including containers. Accordingly, construction of the port facility and access road would involve land acquisition and resettlement of population as well as housing compensation requirements to some extent. In this respect the affected people are willing to be cooperative provided they are awarded due compensation for their resettlement. Accordingly, it is concluded that potential adverse social effects consequent to the implementation of the project is manageable.

The construction works of the port facility involve a very significant dredging and subsequent dredged material management works. In this respect the dredged material is of clayey soil, and the dredged material has no significant engineering reuse for such use as a reclamation material. It is planned to dispose this uncontaminated dredged material in deep seawaters of about 120m deep, located at a distance of about 1 km offshore from the planned dredging area for port development.

This dredging and dredged material disposal works would adversely affect the aquatic life, in particular the benthic organisms inhabiting the seabed having very little mobility. However, in the long-term, the aquatic life in the areas, including benthic organisms is expected to recover naturally. Accordingly, any potential adverse effect consequent to this dredging and dredged

material disposal works are assessed as only of medium term and have no significant long-term (permanent) adverse effects.

In fact the most significant potential long-term adverse effects consequent to the berthing of ships in calm port sea waters protected with breakwaters, is the potential accumulation of water pollutants in the port waters attributed to ship berthing as well as port terminal operation including cargo handling activities, in particular handling of dry-bulk cargo having high dispersion potential. In order to mitigate potential port water pollution, AMP as the project owner shall undertake a vigilant waste management program for the port. In this respect concerning mitigation of pollution due to ship and vessel berthing, implementation of MARPOL requirements by AMP is emphasized.

Potential adverse environmental effects consequent to the project construction and its subsequent operation are manageable. Although dredged material management is the most significant environmental issue concerned to the construction works of the project, deep sea disposal of dredged material is a feasible option in consideration of the availability of vast deep sea waters in the vicinity of the project area and also the non-contaminating nature of the dredged material.

It is recommended to initiate a port water quality monitoring program initially targeting at least simple potable water quality parameters, in particular DO level, by AMP. This monitoring program should be initiated at least concurrently with the commencement of construction works. It is of utmost importance to improve overall waste management including the provision of sewage treatment plant for the urban area of Puerto Armuelles.

8.3 Coquira Port

(1) Proposed Facilities for Short-term Development

Main components of the project are summarized in Table 8.12. These facilities will be able to cover the requirements for dozens of years following the closing of Panama Port. It is assumed that a part of these administration functions of Panama Port except for CIQ will be relocated to Coquira Port.

Table 8.12 Proposed Facilities at Coquira Port

Facility	Dimensions	Remarks
General Cargo Berth	30 m x 15 m	
Shed	1,000 m^2	
Administration Building	300 m^2	2-story Building
Workshop	400 m^2	Repair and maintenance of equipment
Equipment for Cargo Handling	Mobile Crane x 1 Unit	25-ton
	Forklift x 3 Unit	3.5-ton, Diesel
Parking Space	1,200 m^2	Truck, bus, equipment
Approach Road	900 m^2	Widen existing road
Utilities	Water, Fuel, Yard Lighting, Electricity connection	

(2) Scope of Works and Cost Estimate

Scope of works and cost estimate of the short-term development at Coquira Port are summarized in Table 8.13.

Table 8.13 Scope of Works and Cost Estimate of Short-term Development

(Coquira Port; Unit in USD)

Coquira						
Item		**Description**	**Unit**	**Quantity**	**Unit Rate**	**Amount**
1	Land preparation		m^2	7,200	4.3	30,660
2	Berth; -3 m		m^2	450	2,301.7	1,035,776
3	Revetment	Steel sheet pile type	m	40	6,822.9	272,914
4	Building	Office, workshop, shed, etc.	m^2	1,700	245.6	417,500
5	Fuel Supply	Oil tank and piping	l.s.	1	115,120.0	115,120
6	Pavement	Yard area	m^2	2,675	106.0	283,550
7	Outdoor lighting		unit	30	1,250.0	37,500
8	Landscaping		m^2	1,440	3.0	4,320
9	Utilities	Supply line, connection	l.s.	1	65,920.0	65,920
10	Equipment	Crane, forklift	l.s.	1	83,500.0	83,500
Total						**2,346,760**

(3) Implementation Plan

Implementation plan of the short-term development at Coquira Port is summarized in Table 8.14.

Table 8.14 Implementation Plan of Coquira Port Development

Coquira		2004		2005		2006		2007		2008		2009	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	Consensus Building for Development												
2	Finalization of Development Plan												
3	Financial Arrangement												
4	Contract Agreement between AMP and Private Concessionaires												
5	Detail Design Study, Preparation of Tender Documents, Construction Supervision												
6	Tender Process and Contractor Selection												
7	Construction Process												
8	Commencement of Port Operation												

(4) Operation and Management Scheme

According to the current approval procedure of project by MEF, the public investment is allowed only on the public owned lands. A possible way to clear the problem of land-ownership is to seek a PPP (Public-Private Partnership) scheme. The port facilities constructed in the water area can be financed by public, while those facilities on land can be financed by private firms who have ownership or right-of-use.

Since the nature of the project is to construct a wharf to ensure the access sea routes to the remote communities, the construction cost should be shouldered by public funding. The project cost which covers the construction of the wharf should be granted to AMP by the Government.

AMP should find a concessionaire that invests to construct the land-based facilities of the port and operates the whole new port. The concessionaire can also run ancillary business such as bunkering and water supply, ship repair and logistics for the coastal shipping. The conditions of loan for the concessionaire are assumed as follows.

Interest Rate : 6 % per annum
Grace Period : 5 years from the start of operation (only interest of the loan shall be paid)
Repayment : 10 years (fixed amount repayment of principal)

(5) Economic Evaluation

According to the city plan of Panama City, Fiscal Pier of Panama Port is to be closed in the near future. It is assumed that Fiscal Pier will be closed at the end of 2014. The new berth at Coquira will start handling cargo in 2007 when the capacity of Fiscal Pier is expected to be saturated.

The economic benefits of the development of Coquira Port as the substitute of Fiscal Pier is given by considering "Without Case" of the development.

Aguadulce Port is selected as the "Without Case" for the Coquira Port development. The cargo from/to both the islands and the Darien Province is assumed to be handled at Aguadulce Port. Aguadulce Port would accommodate the cargo that exceeds the capacity of Fiscal Pier until the end of 2014 when Fiscal Pier is assumed to be closed. The final destination of the cargo from the islands and the Darien Province is assumed to be Panama City and vice versa.

Table 8.15 shows that EIRR for the short-term development project is 13.89 %.

Table 8.15 Economic Analysis of Coquira Port Development

Study Cases		Economic Internal Rate of Return (EIRR)
Master Plan		13.89 %
Short-term Development	Base Case	13.89 %
	Case A (Cost plus 10 %)	12.91 %
	Case B (Benefit minus 10 %)	12.77 %
	Case C (Combining Cases A and B)	11.83 %

This port is planned as the substitute for Fiscal Pier of Panama Port that is to be closed in near future. The value of the lifeline is very large and really unquantifiable. Although the highway to Darien Province is under construction, the sea route to the Province still will have a very important role for the region. Considering relatively high EIRR with robustness shown in the sensitivity analysis, this project is judged to be feasible and recommendable from the economic point of view.

(6) Financial Viability

Contingencies for the construction cost are estimated at 10 % of civil works. Engineering fee is expected at 10 % of the construction cost except for equipment. Long-term operation and maintenance cost is estimated as 1 % of the construction cost.

Port operation at Coquira will start in 2007. It is assumed that 40 % of the cargo previously handled at Fiscal Pier will move to Coquira port in 2007 and will increase at rate of 5 % of total traffic to Darien and islands until 2014 (closing of Fiscal Pier).

Compensation for the cost to move the port operation from Panama Port to Coquira is not considered, while AMP may have a right to ask for compensation to Panama Municipality.

Calculated FIRR for the project is 11.27 %. The port will be operational in 2007 and, according to Income Statement, annual income will become positive in 2009 (3rd year of operation) but cumulative profit will be still negative in 2011. Net cash flow is positive from the start of operation except for 2016 and 2018. This is due to re-investment for equipment and utility facilities (2016) and also because a steep decrease of port traffic and it will hit the bottom in 2018. Cumulative cash will become positive in 2009. In Balance Sheet, cash position becomes positive in 2009 and net equity becomes positive in 2012.

Table 8.16 Financial Analysis of Coquira Port Development

Study Cases		Financial Internal Rate of Return (FIRR)
Short-term Development	Base Case	11.27 %
	Case A (Cost plus 10 %)	11.07 %
	Case B (Revenue minus 10 %)	9.76 %
	Case C (Combining Cases A and B)	8.64 %

Considering that the estimated FIRR (11.27 %) as public infrastructure project and the soundness of the pro forma income statement, and that the cash flow statement and financial rations during feasibility study period and onward, this project is judged to be financially feasible and recommendable.

(7) Environmental Considerations

Basically the planned facilities are to be constructed on the water of Bayano River along its riverbank in the form of expansion of the existing port facilities. The expansion works of the port facility involves land acquisition since the port land area is privately owned. Still no resettlement of population including any housing compensation is involved.

The port location is still in the fresh water reaches of Bayano River and hence there is no precious ecological resource like mangrove woods. Accordingly it is assessed that the expansion of the port facility in itself has no long-term significant adverse effects on ecological resources.

Still, berthing of vessels would result in inherent waste generation. AMP as the project owner, so as not pollute the waters of Bayano River, shall properly manage the potential wastes generated due to vessel berthing including oily (bilge) wastes and also garbage. Proper management of these wastes so as to prevent illegal dumping of such wastes into the rive waters is the only available means to mitigate water pollution attributed to vessel berthing.

Potential adverse environmental effects consequent to the project execution and its subsequent operation of the Coquira port are manageable and hence not significant. Still, the most important port operational environmental requirement to be ensured is proper waste management.

It is recommended to initiate a port water quality monitoring program initially targeting at least simple potable water quality parameters, in particular DO level, by AMP. This monitoring program should be initiated at least concurrently with the commencement of construction works.

8.4 La Palma Port

(1) Proposed Facilities for Short-term Development

The short-term development plan consists mainly of ramp for the artisanal fishing boats and berth for the industrial shrimp trawlers, and these are designed to be able to cope with the projected growth of the fish landing volume at La Palma for 10 years after completion. An ice-making plant and ice storage, fuel tanks and fuel-supply, and water-supply are also planned as utilities for the fishing boats. Table 8.17 gives the objectives of the short-term development plan of La Palma Fishing Port.

Table 8.17 Proposed Facilities at La Palma Fishing Port

Facility	Dimensions	Remarks
Ramp for Artisanal Fishing Boats	20 m x 45 m	
Shrimp Jetty and Trestle	Jetty: 4 berth, 58 m x 13 m Trestle: 132 m x 6.5 m	1,642 m^2
Mooring Buoy	2 units	
Ice Making Plant and Ice Storage	15 tons/day (7.5 tons/day x 2 units)	108 m^2
Fuel Tank and supply facilities	Diesel Oil (36,000 gallons; 144 m^3), Gasoline (7,500 gallons; 30 m^3), and Lubricant	with accessories and attachments
Water Supply	Reservoir: 20 m^3	
Equipment for Fish Landing	Deck Crane x 4 Units	1 ton at 10 m reach
	Forklift x 1 Unit	3 tons, Diesel
Cooler Box	1 m^3 x 50 boxes	
Utilities	Lighting, Electricity connection	

(2) Scope of Works and Cost Estimate

Scope of works and cost estimate of the short-term development at La Palma Fishing Port are summarized in Table 8.18.

Table 8.18 Scope of Works and Cost Estimate of Short-term Development

(La Palma Fishing Port; Unit in USD)

La Palma (Phase I)						
Item		**Description**	**Unit**	**Quantity**	**Unit Rate**	**Amount**
1	Land preparation	Parking area	m^2	4,137	4.1	17,044
2	Berth/Trestle		m^2	1,648	1,426.6	2,350,980
3	Mooring Buoy	Steel-made	unit	2	20,000.0	40,000
4	Slipway	B: 20 m x L: 45 m	l.s.	1	858,656.0	858,656
5	Revetment		m	130	796.5	103,545
6	Building	Shed: 400m^2	l.s.	1	235,000.0	235,000
7	Ice Making Plant	2 x 7.5 ton/day, Ice storage	l.s.	1	1,200,000.0	1,200,000
8	Fuel Supply	with accessories	l.s.	1	302,140.0	302,140
9	Pavement	Parking Area	m^2	4,137	106.0	438,522
10	Outdoor Lighting		unit	35	1,250.0	43,750
11	Deck Crane		unit	4	12,500.0	50,000
12	Utilities	Supply line, connection	l.s.	1	212,800.0	212,800
13	Equipment	Forklift (3 ton, diesel)	unit	1	19,500.0	19,500
14	Cooler Box	1 m^3	pcs	50	913.0	45,650
Total						**5,917,587**

(3) Implementation Plan

Implementation plan of the short-term development at La Palma is summarized in Table 8.19.

Table 8.19 Implementation Plan of La Palma Fishing Port Development

La Palma		2004		2005		2006		2007		2008		2009	
		1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	Preparation of Request and Submission												
2	Financial Arrangement												
3	Basic Design Study												
4	Detail Design Study, Preparation of Tender Documents, Construction Supervision												
5	Tender Process and Contractor Selection												
6	Construction Process												
7	Commencement of Port Operation												

(4) Operation and Management Scheme

Public funds are essential for the development of port facilities at La Palma. The financial analysis shows that the 90 % of the construction cost should be the grant. Only 10% of the total construction cost can be recovered by the revenues from the fish port operation.

AMP should manage and operate La Palma Fishing Port. AMP should invite private firms who have willingness to operate ancillary services at La Palma Fishing Port: bunkering and water supply, ice plant, cold storage, garbage collection, clean-up of the port area and logistic services.

AMP's local office should ensure that all the port services are properly performed, in particular the security and safety. Another objective of the development of La Palma Fishing Port is to monitor closely the volumes of marine production. It is essential for AMP to formulate the cooperative partnership between industrial fishing and artisanal fishing to achieve the pertinent control of the fishing industry.

(5) Economic Evaluation

The following three groups of the economic benefits are taken into account in the study:

- Market price increase due to the freshness of white shrimps landed at La Palma Port
- Saving of fuel cost due to the shorter distance between La Palma and Darien Fishing Ground than between Vacamonte and the same
- Land transportation cost from La Palma to Vacamonte (disbenefit)

Table 8.20 shows that EIRR for the short-term development project is 15.68 %.

Table 8.20 Economic Analysis of La Palma Fishing Port Development

Study Cases		Economic Internal Rate of Return (EIRR)
Master Plan		16.39 %
Short-term Development	Base Case	15.68 %
	Case A (Cost plus 10 %)	14.44 %
	Case B (Benefit minus 10 %)	14.22 %
	Case C (Combining Cases A and B)	13.05 %

The Darien Province is the least developed region in the country while the physical distance to the central part of the country is not far. Recent IDB projects to build the highway to Darien and provide Ro-Ro service to La Palma are historical breakthrough to the development of the region. The new La Palma fishery complex will be the trigger to the regional development.

Considering that this is the key project to bring the breakthrough to the least developed region, Darien, this project is evaluated as being feasible and recommendable from the economic point of view.

(6) Financial Viability

Grant from the government is expected for 90 % of the construction cost. The rest of the investment (10 %) will be funded by concessional loan. The conditions of loan for the concessionaire to raise fund are assumed as follows.

Interest Rate : 3 % per annum
Grace Period : 5 years from the start of operation (only interest of the loan shall be paid)
Repayment : 20 years (fixed amount repayment of principal)

As for the fish landing equipment, renewal investment is required at every eleven years. Contingencies for the construction are estimated at 10 % of civil works. Engineering fee is

expected at 10 % for the construction cost except for equipment. Long-term operation and maintenance cost is estimated as 1 % of the construction cost per annum.

Calculated FIRR for the project is 12.74 %. The port will be operational in 2008 and, according to Income Statement, annual income will become positive in 2010 (the 3rd year of operation) but cumulative profit will be still negative until 2012. Net cash flow is positive in 2009 except for 2017 due to re-investment for utility facilities and equipment. Cumulative cash will be positive from 2010 (the 3rd year of operation). By Balance Sheet, cash position is positive in 2010 but net equity is still negative until 2012.

Table 8.21 Financial Analysis of La Palma Fishing Port Development

Study Cases		Financial Internal Rate of Return (FIRR)
Short-term Development	Base Case	12.74 %
	Case A (Cost plus 10 %)	11.72 %
	Case B (Revenue minus 10 %)	10.94 %
	Case C (Combining Cases A and B)	10.00 %

Considering that the estimated FIRR (12.74 %) as public infrastructure project and the soundness of the pro forma income statement, this project is financially judged to be feasible and recommendable if the grant portion of the investment is expected..

(7) Environmental Considerations

The planned facilities are to be constructed on the water of Turia River and the adjoining mangrove shoreline belonging to the owner of the project, AMP. The implementation of the plan involves no land acquisition or resettlement of population including any housing compensation. Hence there exist no potential social adverse effects consequent to the implementation of the port development facilities.

The planned facilities involves destruction of some mangrove woods, an irreversible ecological loss. Although the loss for the provision of essential shoreline access facilities to the piers is very little and could be regarded as extremely insignificant, it is still recommended to minimize this loss in mangrove woods.

Moreover, berthing of ships and also shrimp processing will result in inherent waste generation. AMP, as the project owner, so as not pollute the estuarine waters of Turia River, shall properly manage the potential wastes generated due to vessel berthing include oily (bilge) wastes and also garbage. Proper management of these wastes so as to mitigate illegal dumping of such wastes into the river waters is the only available means to mitigate water environmental pollution attributed to vessel berthing.

Potential adverse environmental effects consequent to the project execution and its subsequent operation of the La Palma are manageable and hence not significant. Still, the most important port operational environment requirement to be ensured is proper waste treatment.

It is recommended to initiate a port water quality monitoring program initially targeting at least simple potable water quality parameters, in particular DO level, by AMP. This monitoring program could be initiated at least concurrently with the commencement of construction works.

Sedimentation is anticipated at the water area where water flow is stagnant such as the places between the ferry jetty (IDB Project) and the ramp for artisanal fishing boats in the case that those strctures are constructed by embankment and the beaches situated next to these facilities. Sohoreline will advance forward in these beaches and water will become shallower.

Design consideration will be required not to obstruct the river water flow and sediment transport passing by the structures. For this purpose, the part of approach connecting shoreline and the ramp and shrimp berth is designed with the piled pier.

9. CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

(1) Socio-economic Framework

The long-term GDP forecasts published by the World Bank and other international organizations institutions and the "Economic Statistics" published by Office of General Comptroller have been reviewed. On the basis of the review and comparison, the GDP growth rates have been forecast for every five years from 2005 through 2024:

From	To	GDP Growth rate
2005	2009	4.3 %
2010	2014	4.5 %
2015	2019	4.6 %
2020	2014	5.1 %

The average share of the primary sector of GDP over the past 10 years is 8.3 %, while those of the secondary and the tertiary sectors are 16.3 % and 75.4 %, respectively.

Taking into consideration the growth potential of the primary and the secondary sectors and the government policy as well as the on-going programs to promote agricultural sector in the central and western regions, the study team assumed that the primary and the secondary sector will grow at a higher rate than the tertiary sector, and in the coming years the GDP share of the two sectors will also be expanded. The sector shares in GDP estimated are as follows:

Year	GDP share (%)		
	Primary	Secondary	Tertiary
up to 2002	8.3	16.3	75.4
2009	8.3	16.3	75.4
2014	8.8	16.6	74.2
2019	9.2	16.8	74.0
2024	9.5	17.5	73.0

On the basis of the weighted GDP share in the coming years, the GDP in 2024 has been forecast to grow up to USD 24.4 billion, from USD 10.5 billion in 2003 (1996 constant value). GDP per capita also is estimated to grow to USD 5,813 from USD 3,427 in 2002. The estimates of regional GDP the provinces are also presented.

The population will grow to 4.19 million in 2024 from 2.95 million in 2000.

(2) Demand Forecasts

International trade

On the basis of the GDP forecast, the cargo volumes have been forecast. The import dry cargoes in 2024 will be 23.36 million tons consist of liquid bulk 19.86 million tons, Dry bulk cargoes 1.96 million tons, and container cargoes 1.54 million tons. The export cargo volumes will be 2.47 million tons consisting of dry bulk 450,000 tons and containers 2.02 million tons.

In 2024, the volumes of the container cargoes for transshipment and for the Colon Free Zone will be 42.85 million tons and 5.43 million tons respectively.

Domestic trade

The traffic of domestic shipping has been estimated at the major local ports and compared with the capacity of the existing port facilities. In general, the existing port facilities will be able to accommodate the cargo volumes.

(3) Existing Issues in Port Sector

1) Existing port network

There are about 100 ports in Panama including national and private ports. These ports are classified into three categories on the basis of their functions: International ports, domestic ports and fishing ports. The ports are further classified on the basis of the commodities handled and the relations with other ports as follows:

International Ports	:	International container ports, International tourism ports, and Industrial ports.
Domestic ports	:	Regional hub ports, local hub and feeder ports
Fishing ports	:	Base and fish processing ports, home ports

The study analyzed the roles, functions and the relationship among these ports, and illustrated the port network visually.

2) Outstanding issues

The handling capacity of the port facilities was evaluated for the year 2024.

i) International Ports

a. Oil and Oil Products

Import oil and oil products volume in 2024 will increase three times to 6.3 million tons. They will be handled at the private ports, which will cope with future demand to increase their handling capacity.

b. Dry Cargo

Banana	:	Future export volume will remain constant and there will be no shortage of the handling facilities.
Wheat, feed	:	A new terminal at Port of Cristobal, which will be operated by private enterprises, will open soon.
Fertilizer	:	Fertilizer will be imported at Aguadulce and Pedregal Ports, which have enough handling capacity in future, and by trucks from Costa Rica.
Breakbulk	:	Cars will be imported at Balboa Port and Mansanillo International Terminal, and other breakbulk will be handled at Cristobal Port, based on the evaluation of the handling capacity by the Study Team.
Clinker	:	A new bulk terminal opened at Bahia Las Minus Port.
Container cargoes	:	Container cargo to/from the domestic market is less than 10 % of the transshipment container cargo and the former has higher priority than the latter due to higher handling charge. The transshipment container cargo volume in 2024 will be over 4 million TEUs, and thus present handling capacity of the container terminal in Balboa and Colon will be insufficient.

ii) Domestic Ports

La Palma	:	La Palma Port will have the role as the local hub port with the newly constructed inter-modal port facilities, which have enough handling capacity for cargo and passenger ships plying to other coastal communities.
Coquira Port	:	The port will handle cargoes to the islands in Gulf of Panama after closure of the Fiscal Pier of Panama. Therefore, a new berth for 150 GRT vessels will be needed.
Fiscal Pier of Panama	:	The port will be closed in future due to the urban planning by Panama city and passenger crafts will move to other terminals like the one in Amador.
Balboa Port	:	The passenger terminal will move to Amador and the bulk terminal move to Cristobal Port.
Vacamonte Port	:	Fishery products in Panama will remain in future. So, the port will have enough capability to handle fishery products from foreign tuna ships and domestic fishing ships.

Mensabe and Mutis Ports : The ports have been utilized by the local fishing ships and the existing facility has enough capacity for the future.

Armuelles Port : The facility is too old and not usable. Presently foreign tuna ships use the damaged pier but they may move to other ports in Costa Rica unless proper services are provided.

Bocas del Toro and Almirante Ports :

The ports have a ferry berth but not a passenger boat berth.

iii) Issues to be considered in master planning

a. International Ports : Balboa Port should be specialized for international trade, mainly container cargo handling and as a result, a bulk cargo terminal will be needed at Canal Area. According to information from grain dealers, a new bulk terminal has been planned at Cristobal Port.

b. Domestic Ports : La Palma will soon be interconnected 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.

c. Fiscal Pier of Panama : The port will be closed based on the urban planning by the Panama city.

3) Port administration and management system

AMP was created in 1998. Basically, it inherited the roles and functions of APN. AMP is a unified body of various maritime competencies from different institutions such as managing of marine and coastal resources from the Ministry of Commerce and Industry (MICI), education and training of seafarers from the Ministry of Education, registry of merchant marine vessels from the Ministry of Economy and Finance (MEF), and absorbing APN on port matters (after privatization of major ports).

Having inherited from APN, the organic law of AMP prescribes that Directorate General of Ports and Auxiliary Industries is responsible for the following tasks:

a. Planning and execution of the development on the maritime network
b. Construction, improvement, extension and maintenance of the commercial ports for public use
c. Management of ports without management and operation bodies
d. Management of the state ports
e. Execution of the procedure and supervision on concessions for the state ports
f. Improvement of the facilities for navigation, maneuvering and mooring on the state ports
g. Execution of cargo handling, movement, custody and delivery by AMP/concessionaires

h. Establishment of port tariff
i. Improvement of services to the ports and auxiliary industries

The primary mission of AMP prescribed in the organic Law is to prepare the National Maritime Strategy, which was approved and published in 2003. The National Maritime Strategy states the basic policy guidelines of Panama.

The approved key strategies are defined as general basic objectives in two categories (namely, Primary and Secondary Strategic Objectives).

The Primary Strategic Objectives (Administration field):

1) The general directions of institutional security and compliance with international regulations
2) Efficient and effective measures for competitive market
3) Enhancement of investment and innovation for strengthening physical and intellectual capital
4) Protection and security synergy, inter-sector relationships, marketing activities for new opportunities of maritime business
5) Formation and execution of a program of national and international communication,
6) Conservation of environment and labor regime.

The Secondary Strategic Objectives (Support of the sustainable socio-economic development):

1) Creation of new job opportunities, upgrading labor force quality and productivity
2) Stimulating investment for required infrastructure, sustainable marine resource management and social responsibility
3) Improving security, hygiene and health of the laborers, and enhancing good governance for the maritime sector.

The National Maritime Strategy describes in the second item of the second strategic objective that AMP should conduct port master planning and feasibility study of developments. Thus, this JICA study will be used for AMP to make action plans for the development of the national port system.

(4) Port Development Strategy

The basic direction of the development of the national port system has been defined as follows:

a. Successful achievement of sustainable economic development
b. Alleviation of income gap and poverty
c. Mitigation of socio-economic regional disparities
d. Environmental preservation of land/water areas and assurance of social security

The study has identified the areas to be focused in the Long-term Port Development:

a. Development of the container ports at the Canal Area to meet future container traffic and facility requirements

b. Development of a tourist port in Bocas del Toro
c. Construction of a new multipurpose port in Chiriqui
d. Development of Port of Coquira in the Panama province
e. Establishment of a local hub in the water transport network in La Palma

In addition, the study also identified the approaches that AMP should take for the improvement of port administration and management as follows:

a. AMP head office:

- To establish financial resources, human resources and maritime safety, and improvement of port administration and management functions

b. Local ports:

- To coordinate closely with a local society and local industries, especially on the regional development
- To coordinate consistently with AMP head office and the other government organization concerned
- To adopt private finance and know-how for port management and operation
- To coordinate function for various administrative activities required for a smooth and effective operation of privatized international container terminals.

(5) Nationwide Port Development Plan

1) Maintenance and repair of the existing port system

The existing port system can sustain international trade in 2024 with the continuous maintenance of the existing facilities, on the assumption that fertilizer will be imported by trucks from Costa Rica and import/export cargoes in the Chiriqui economic zone will be transported by land to the ports in the Panama city and Colon.

Following activities are forecast on the domestic trade in Panama up to year 2024.

a. Pan-American Highway in the Darien province will be fully paved and the ferry service between Ports of Quimba and La Palma will be opened to traffic.

b. Fiscal Pier of Panama will be closed soon. Therefore, cargo transportation between the Darien and Panama provinces, which depends on sea transportation at present, will most probably switch to land transportation.

c. At Bocas del Toro and Almirante Ports, there are no suitable port facilities for passengers in these two ports. This situation has an adverse effect on the tourism environment.

With the new inter-modal port facilities, La Palma will have the role as the local hub port, where cargo and passenger ships are plying to other coastal communities.

On the other hand, Coquira Port should be developed as a port to the islands in Gulf of Panama after closure of the Fiscal Pier of Panama. This sea route is necessary for inhabitants in the islands and should be secured by the central government in the future.

AMP is responsible for the maintenance and the management of port infrastructures in order to continue international and domestic shipping services, so that the cargo and passenger transportation network in Panama will have sound development up to 2024. Maintenance and management cost for the major local ports has been estimated to be USD 801,100 for annual maintenance and USD 665,470 for repairs, which is a one-time expenditure.

Among other works, outstanding elements of the expenditure are:

a. Repair of deck of the wharf at Aguadulce Port
b. Replacement of the floating wharf at Taboga Port
c. Maintenance dredging at Pedregal, Mutis, Aguadulce, and Vacamonte Ports
d. Security facilities at Vacamonte Port

2) Strengthening AMP's practical port management

a. Consciousness building for senior officials in AMP:

Ports should be managed considering regional development and promotion of the maritime industries, not for making a profit from concession contracts.

b. Procurement of funds necessary for maintenance of local ports

Public ports, which are socio-economic infrastructures of the nation, should be developed and maintained by the central government in consideration of budget requirements, cost, tariff amendment, promotion of private participation through concessions, grant, and other possible ways.

c. Reconfirmation of the role of port administration

i) To implement basic services, which include maintenance of port facilities, security, safety, fire fighting, waste disposal etc, to port users as a first person in charge

ii) To execute port basic services, which include coordination with the related organizations and promotion of private participation by concession contracts

iii) To clarify various laws, regulations and procedures

iv) To establish the port management system in which port users' requests are reflected

d. Coastal management

Utilized conditions for coastal areas should be clarified, regulations of water pollution for example.

e. Management of marine resources: Monitoring of fishery products

f. Improvement of statistics: Port statistics, fishery products, etc.

(6) Master Plan for Selected Ports

The following four ports have been selected for the master plan study aiming at their respective objectives:

1) Bocas del Toro

The development objective is to renovate and improve the gateway to the international tourist resort as follows:

a) Provision of a passenger terminal at Bocas del Toro and Almirante

- Restoration of the suitable tourism environment in the port area
- Assurance of a safe transport
- Supervision and protection of management bodies for passenger crafts
- Encouragement of the tourism related industries

b) Improvement of cargo transportation services to isolated islands

- Assurance of regular and safety operations on ferry services

c) Restoration of the Bocas del Toro city with the port development as a leading part

- Regulating the coastal use and pollution control management

2) New Chiriqui Port

The development objective is to enhance the industrial development in Chiriqui area as follows:

a) Local economy promotion based on cost saving of transportation for import/export commodities
b) Creation of new industries and employment, and provision of a base port to tuna ships, for example, cargo transport to the southern part in Costa Rica, support to Baru Free Zone

3) La Palma Port

The development objective is to establish a socio-economic center in the coastal area by providing fish landing facilities as follows:

a) Provision of market access for local fishermen
b) Reinforcement of commercial fishing efficiency
c) Promotion of local industries such as value-added industries, shrimp processing, wood processing
d) Conservation of marine resources

4) Coquira Port

The development objective is to ensure transport services to isolated islands and coastal areas.

The project cost as well as the Economic Internal Rate of Return have been estimated as follows:

Port	Project cost	Share	EIRR
Bocas del Toro & Almirante	USD 4.56 million	7.1 %	20.7 %
Chiriqui	USD 49.8 million	77.8 %	15.4 %
Coquira	USD 2.3 million	3.7 %	13.9 %
La Palma	USD 7.3 million	11.4 %	16.4 %
Total	USD 64.0 million	100.0 %	

The proposed master plans for the four selected ports are evaluated to be economically feasible.

It is concluded that potential adverse environmental effects caused by the project execution and its subsequent operation of the port terminals in all the objective ports for the master plan are manageable and hence not significant. Still, the most important port operational environmental requirement is proper waste management. Although dredged material management for the new Chiriqui Port is the most significant environmental issue concerning the construction works of the project, deep sea disposal of dredged material is a feasible option in consideration of the availability of vast deep sea waters in the vicinity and further from the project area and also due to the non-contaminating nature of the dredged material.

(7) Short-term Developments in master plans

The feasibility study on the short-term developments has been carried out for the selected four ports with the target year 2014. Except for La Palma, the short-term developments for each port are recommended to implement the whole scale of the master plans. La Palma Port development project is better implemented in two phases, and the feasibility of the first phase is examined.

The project costs of Bocas del Toro, Chiriqui and Coquira are the same as those estimated for the master plans but not in economic cost. The first phase of La Palma Port has been estimated to amount to USD 6.36 million.

Project costs are finance by the government either by grant or loan with the interest rate of 3 %. The financial analysis calculated the FIRR for each port as follows:

Name of Port	Managing Entity	FIRR	Type of funding			
			Government Expenditure	Equity	Loan	Grant
Bocas del Toro	AMP	10.7 %	10 %		90 %	
Chiriqui	SPC[1)]	9.8 %		40 %	60 %	
Coquira[2)]	Private	11.3 %			100 %	
La Palma	AMP	12.7 %			10 %	90 %

Note 1) SPC denotes the Special Purpose Company that shall be established by Public and Private Partnership

2) The financial analysis focus only the facilities invested by the private operator who will construct the facilities on land or 43.2 %of the total project cost. The rest of 56.8 % shall be paid by public as the government expenditure.

In the table, the definitions of the types of funding are as follows:

Government Expenditure;	Simple expenditure by the government. The managing entity need not to pay pack or to maintain the value as equity
Equity;	The managing entity need not to pay back the capital or interest, but need to maintain the value. Thus depreciation is done on equity.
Loan;	The managing entity should pay back the amount together with interest with the loan period
Grant;	The amount is not paid back. Depreciation is not considered either.

The four projects are all evaluated to be financially feasible from the view point of the managing entiry.

The operation schemes recommended for the four ports are:

Bocas del Toro : The whole ports should be managed by AMP. RoRo terminal is to be operated by AMP, while the operation of the passenger terminal may be operated by a cooperative under concession contract.

Chiriqui : The whole port shall be managed and operated by a Special Purpose Company, which is established by the public and private partnership where the government and private firms contribute each share both in equity and loan. The share between the government and private shall be determined through the negotiation between the two parties. In general, it seems to be realistic to assume that government should shoulder a larger portion than private partner.

Coquira : The whole port should be managed by AMP. The marine facilities are constructed by the government and concessioned to a private operator at a reasonable fee, while the land facilities are invested and operated by a private firm.

La Palma : This project requires public funds in the form of a grant. Thus, AMP shall manage and operate the port. However, port operation can be performed by a cooperative of fishermen under concession contract.

9.2 Recommendations

Summing up the discussions above, the study team recommends the followings:

Recommendations presented hereunder focus on the administration and management of AMP, and present four different targets: (1) to realize the mission and vision of AMP, (2) to implement the nationwide port development plan, (3) to authorize the Master Plan and (4) to implement the priority project.

9.2.1 For the Realization of the Mission and Vision of AMP

(1) Institutional Strengthening Plans of AMP for the Execution of the Assigned Tasks Prescribed in its Organic Law

AMP should take the following actions for the strengthening its institutional capacity

1) Compliance with the international treaties and conventions related to maritime sector.
As the delegate of Panama to IMO, AMP should take the initiative in the supervision of the ports and ships calling Panamanian ports. To meet the urgent requirements of compliance with ISPS Code, AMP may rely on the technical support of a foreign consultant as well as the financial support of the privately operated ports in the Canal Area. AMP is yet to be responsible to supervise ports and ships to prepare their security plans. For the national ports that are open to international trade, AMP has the full responsibility to prepare the security plan. Above all, AMP is responsible to disseminate the treaties and conventions to the maritime sector.

2) Promotion of the private investment in the port related businesses

a. AMP should make the procedure of awarding concessions more transparent and to grant the concession on a timely basis.

b. Marketing of the potential business areas for private investment and the elaboration of programs to support the private investment have to be performed. AMP should work together with agencies concerned to formulate land use plans in order to secure land and water areas for the future expansion of port related activities. Suitable areas should be placed in the land use plan for container terminal expansion in Canal Area in the future.

c. Legislative and cooperative support of the private firms who are investing in 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 consumers.

d. AMP inherited the role of the Port Authority of Panama. It should send delegates to international conferences on Port communities such as the International Association of Ports and harbors (IAPH), the International Navigation Association (PIANC, intergovernmental), the International Cargo Handling Co-ordination Association (ICHCA), International Association of Cities and Ports (IACP), American Association of Ports Authority (AAPA), 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 the Panama –Colon Highway

3) Strengthening of coordinating functions with the agencies concerned

a. CIQ procedures

The customs, immigration and quarantine procedures still need further improvement. AMP should take the initiative in the coordination among the agencies for the smooth transaction of cargoes. This is especially needed in the 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 action to hold regular meetings with the maritime community such as forum and port advisory committee. Such regular meetings will provide AMP with opportunities to sound out and recognize the movement 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 plans in coordination with the Panama Canal Authority.

4) 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 to meet the labor market demand.

5) Promotion of the private investment in the domestic shipping business

AMP is responsible not only for the port system, but also to secure regular shipping services in domestic sea routes. RoRo ferry terminals at La Palma and Quimba Ports will need 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. AMP should keep making efforts to upgrade the shipping services of these sea routes as well as securing their safety.

Above all, the following are the areas that AMP should give higher priority:

6) Upgrading the productivity of routine work of AMP

a. Data / Information Transmission

Upgrading of the information/data-transmission system of AMP should be given a high priority. 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.

b. Publicity and Archives of Basic Documents

AMP is responsible for the dissemination of 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 and its 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 keeps 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, with records and evidences. This is especially true for the concession contracts.

7) Internal Matters

a. 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.

Proper consideration should be given to practices in the present budget system where the expenditures for the repair and maintenance are classified as 'Capital Expenditure', which has to undergo careful examination by MEF since 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.

b. Human Resource development

A short-term program should aim at making proper deployment of human resources 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 to places needing personnel
- To redeploy personnel in the headquarters as appropriate, particularly reducing over-manned supporting level and transferring them to the frontline
- In the initial stage of training scheme, start training the 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 workers. 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 applicants openly
- To draft and start training in specific field such as management, electronic devices, security in ports, etc.
- To establish transparent promotion system with the view to enhance morale of personnel as professionals.

(2) Strengthening of the Port Management Functions of Local Port Offices

1) General Plan

The implementation of the nationwide port development plan requires funds. In addition to the improvement measures of budgetary system, some drastic changes in the policy of AMP may be required.

a. 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 socio-economic activities in the regions have not been given proper consideration. In fact, the revenue that AMP earned from the port sector well exceeded the expenditures to cover operation and maintenance cost.

The study team identified the national ports that formulate the national port network and will support the national economy over the coming decades. The cost required for the enhancement and maintenance of the port infrastructure has been estimated. AMP should change its policy from revenue earning to a new policy that aims at maximizing the national profits and providing proper port services.

For the port infrastructure, it should be noted that the Panamanian government has sold out in terms of concession all the properties having commercial value to private firms: Balboa and Cristobal Ports, and other port infrastructure in Colon and Bahia Las Minas are the examples. What is left behind in the hand of AMP is not attractive enough for private firms to think of starting a new concession business out of the facilities and spaces. Therefore, AMP has to make effort now to improve its property to attract for private investors. Concession is not the objective, but one of the schemes that public and private sectors jointly work towards a goal.

b. Funds needed for the enhancement and maintenance of port infrastructure

It is the vital role of AMP to implement all the enhancement and maintenance work listed in Table 5.1 to keep the national port system operational. To this end, AMP should make all 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.

c. 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, it has the responsibility to provide itself (or provide 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 to the port users who are paying the charges for the basic port services.

To this end AMP should do the following:

- 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
- Disseminate the rules, regulations and procedures to the port users through periodic circulation of public relation brochures as well as to speed up the procedures
- Establish formal and informal communication with the port users to achieve user-friendly port management

While the major ports in Canal Area are operated by private operators who have the great concern about the compliance with the international treaties and conventions, other local ports have another concern. The most serious security problem in these ports is 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.

d. Coastal zone management

It is very necessary for the integrated coastal management of AMP to prepare an inventory of the existing concessions. 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.

e. 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 transition period from APN to AMP. Port statistics are 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 exhibit the history of the economic growth of the country. Any changes appearing in the yearly variation of port traffic reflects those changes occurring in the economic activities. This implies that, if a drastic change is observed in the 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 volume of marine products: yearly variation of the unloaded volumes of marine products is the most useful information to assess if the marine resources are being exhausted.

9.2.2 For the Implementation of the Nationwide Port Development Plan

(1) AMP organization at the ports in Canal Area

The field offices of Cristobal and Balboa are expected to play the role as the catalyst and so they must fulfill increasing requirements: currently these two offices have difficulties to fulfill their roles due to shortage of human resources. To cope with this situation, there are three possible alternatives as described below. 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 most adequate form for the execution of the task imposed on the port administrations, because it is located at the site to determine problems by itself. There are many examples among world major ports managed by independent port authorities (not necessarily financially independent). However there are some difficulties in the establishment of such an independent port authorities. For one thing, it usually takes considerable time to enact a new regime within the financial and social environment. In addition there is a risk, in particular, whether the new organ would be able to recruit necessary staff to execute functions of the port authorities. 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.

Historically, the revenue earned through the port administration at the ports in canal area have subsidized the maintenance and operation costs of other local ports. Therefore, the establishment of port authorities of Colon and Balboa may result in the loss of the administrative power of AMP, especially from the financial viewpoint to maintain the whole national port system including local ports.

Second alternative is to have ACP execute 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 work. 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 labor 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 time to realize, but for the moment this alternative will be the quickest way to fulfill the increasing requirements.

(2) Major local ports

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 private investment in 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 a new bulk terminal has started its operation.

However, it is unrealistic to assume that all other national ports 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. Taking into considerations the important roles of the local national ports in the regions, AMP has the responsibility to assure the funds required to keep the major local 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 the local business community. The port administrators are the key players in promoting the participation of the local firms in 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 in 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. It is most 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 focuses on the development of the local hub ports, such as La Palma, Coquila, and Bocas del Toro, because the smaller local ports cannot function without ensuring the local hub port functions properly.

AMP should 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 shipping services. Workshops among the stakeholders will provide valuable information for AMP to draw up the plan for the future improvement of the local port system.

9.2.3 Steps to realize the Master Plans for the Selected Ports

AMP should take steps to realize the development master plans for the selected ports. This is a part of the realization of its mission and the National Maritime Strategy.

(1) AMP, the leading agency

AMP is the leading agency to realize the master plan. The realization of the master plans requires the change of the policy of AMP and some amendment of current financial rules. It is the vital role of AMP to take initiatives and to coordinate the agencies concerned to have the master plans authorized by the government as the national projects. Above all, AMP should change its policy as "Authority" so that it proactively promotes private participation in the port infrastructure development by establishing suitable environment for the private investment. To this end, AMP should take part in the investment together with the private sector.

(2) Enhancement of public investment program

For the realization of these projects, considerable amount of public fund is indispensable to shoulder initial cost for the development of port infrastructure. This holds true for not only port development but also all the development of the basic infrastructure of the country.

AMP should make efforts to enhance national investment and loan programs that encourage further the public investment for infrastructure development. To this end, the collaboration with the ACP, the Ministry of Public Works and others government agencies responsible for the basic national infrastructure is vital.

(3) Start of the project

The four projects have been proposed as the Master Plans. However, there are a lot of things to be done by AMP. Therefore, AMP should take actions at the soonest opportunity.

All the four projects need to be implemented urgently:

Bocas del Toro; The popularity of the place among the tourists should be maintained and the on-going Sustainable Development Project should achieve the goal,

Chiriqui; Without the new port, Chiriqui economic zone will be included in the economic zone of Costa Rica, and the opportunity to integrate various plans of various institutions will be lost

because the each institutions tends to proceed individually without coordination. Tuna boats that are looking for better services are important clients for the realization of the whole project,

Coquira; The lifeline port for the communities in the remote islands,

La Palma; Marine resource is in danger of exhaustion. Without regional activity center, Darien Province will remain undeveloped.

(4) Respective ports

1) Bocas del Toro/Almirante

AMP Headquarters should take the following steps.

First of all, AMP Headquarters should start discussions with the agencies concerned with the projects. To this end, a task force to proceed with the following tasks should be formulated in the Planning and Development Division:

i) Authorization of the project

a. To inform the project proposal to MEF, IPAT, MIDA, and local government to formulate consensus on the proposed master plans. Discussions with them should cover issues such as the collection scheme of passenger terminal charges on the tourists and interfacing and incorporation with the on-going Multiphase Program for Sustainable Development of Bocas del Toro.

b. To assist the local government to get consensus and authorization of the urban development plan and the land-use plan.

ii) Clarifying the existing situation of the private use of seashore

a. To make a full inventory of the existing concession contracts that AMP and APN have awarded on the coastal zones near the project sites.

b. Through the coordination of MEF and local government, to make a full inventory of the existing land titles of seashore near the project sites and construction permissions issued by other agencies.

c. Through the coordination with agencies concerned, to clarify the procedure and guidelines of awarding new concessions and permission to use seashore in the future.

iii) Finalizing the infrastructure development plan

a. To hold forums in Bocas del Toro and Almirante to continue discussions to get consensus on the development among those concerned with the tourism, transport and fishing businesses as well as the representatives from the local governments.

b. Through the discussion in the forums, to clear all the outstanding issues related to the port development.

c. To clarify the areas that the local private firms and individuals can participate in the project: financing and operating the passenger terminal buildings, for instance.

In addition to the operation and maintenance work that the local port offices are performing, the following tasks should be carried out by the Administrators of the port offices under the supervision of the Headquarters.

i) Coordination with the agencies concerned

The Administrators are liaisons between the Headquarters and the local offices of the various government agencies. Being the Liaison, the Administrator should be the focal point in the communications between the local communities and the AMP Headquarter, and all the information of the progress in the Headquarter should be propagated to the local communities and vice versa.

ii) Regular meeting of the forum

Administrator should hold the forum regularly, to discuss outstanding issues.

2) Chiriqui Port

Steps to be taken by AMP Headquarters

First of all, AMP should approve the project and then formulate task forces in its Headquarters and field office. The task force in the Headquarters will coordinate with the agencies of the central governments for the authorization of the project. The task force should also take responsibility for the public relations, especially the propagation of the project proposal to the Maritime Chamber, in particular the terminal operators and transport logistics industries both based in Panama and in the world. One of the most important roles of the task force is to find private firms who are interested in participating in the business in the new Chiriqui port.

It is quite likely that the new Chiriqui port will be managed by a special port management body that would be jointly established by public and private. Therefore, the task force should make necessary preparation to establish the legal base to formulate such a special port management body.

Steps to be taken by the field office

Presently, AMP has two local port offices at Pedregal and Armuelles Ports. Because of the proximity of the location of its office to PTP and BFZA, the Administrator of Armuelles Port should play a role as the liaison between AMP and these two institutions. It is also the responsibility of the Administrator of Armuelles Port to coordinate with the municipality and the communities, to interface the project with the urban development plan of the Municipality of Puerto Armuelles.

It is also vital to continue public relations with the local industries in whole Chiriqui Province, an additional field office should be established at David.

Administrator of Pedregal Port Office, with the collaboration with the Headquarters and the task force established in David, should start marketing the new uses of the existing Pedregal Port when the new Chriqui Port starts operation, the existing Pedregal Port can be used for other activities. Possible alternative roles of Pedregal Port are marinas for pleasure boats and home port of fishing boats.

3) Coquira Port

Steps to be taken by AMP Headquarters

i) Acquisition of right of way

For the realization of the project, AMP should confirm the right-of-way if it implements the project itself. Another alternative approach is to let a private firm construct and operate a new wharf under a concession contract. For the latter approach, some incentives including financial assistance are needed to encourage private companies in the port operation business. In addition, AMP should take all the possible measures to maintain the tariff at a reasonable level.

ii) Public and Private Partnership

Another possible way to clear the right-of-way issue is to seek a PPP (Public-Private Partnership) scheme since water areas are public property while land areas consist of both public and private properties. Thus, the port facilities constructed in the water area can be financed by public, while those facilities on land can be financed by private firms who have the right-of-way.

There are various schemes of PPP that can be employed for this project. A concession of the port facilities on the water area is one of the examples. To establish a joint venture between AMP and private firm is another example. AMP should examine which scheme is more practical and should make necessary legal and administrative arrangements to implement the scheme.

iii) Redeployment of labor among the port offices

When the new facilities of Coquira Port are operational, the port may need additional labor force, while Office of Panama Port requires only limited number of staff members because of the closure for cargo handling. Thus, the redeployment of labor force is necessary. In addition, AMP should also take into consideration the port workers presently employed for the cargo handling at Panama Port who are losing their job due to the port closure.

iv) Assurance of shipping and logistic services

In the course of authorization of the project, AMP should first propagate the project to all the shipping companies and logistics firms, in particular those that are currently providing services at Panama Port. It is the responsibility of AMP Headquarter to ensure that the shipping services will continue between Coquira Port and the islands and that the logistics service will start operation at Coquira Port.

Once again, if necessary, AMP should examine the possible incentives to those private firms that will start business at the port.

Steps to be taken by the Local Port Offices of Coquira Port

The port office of Coquira Port should play a role as the liaison between AMP Headquarters and the local institutions and communities.

4) La Palma Port

Steps to be taken by AMP Headquarters

i) Review of the existing policy and regulations

So far, it has been the government policy to centralize the shrimp processing industry at Vacamonte Fish Port for the promotion of the Fish Port. Therefore, AMP needs to review and, if necessary, make necessary amendments of rules and regulations in order to allow the establishment of shrimp processing business in other places. A full explanation of the change of policy should be given to shrimp processing firms, especially those based on Vacamonte Port.

ii) Incentives to the commercial fishing boats to move to La Palma

To encourage the relocation of the commercial fishing boats to La Palma, AMP should provide better service to the users of La Palma Port than those who remain in Vacamonte Port. All the possible incentive measures should be taken.

iii) Interfacing with Darien Sustainable Development Plan

AMP should coordinate MEF and other agencies concerned to interface the project with the on-going Darien Sustainable Development Plan.

iv) Public relations

AMP should propagate the project as well as the inter-modal services between La Palma and Quimba to the public to promote the transport service along the Pan-American Highways. In addition, it should announce its policy for the promotion of the intra-regional coastal shipping with the regional hub port at La Palma.

AMP should also organize forums among the local artisan fishermen. The participation of the local fishermen is also indispensable in the stage of the finalization of the development plan, in particular the operational scheme of the fish port facilities.

v) Formulation of urban development plan of La Palma

AMP should start talks with the local agencies, including the local governments and various ministries concerned, to formulate the urban development plan at La Palma. The preparation of the land use plan should be started at the earliest opportunity for the establishment of activity center with the maximum use of the space generated by the relocation of the airport and also of the existing AMP port facilities.

In line with the Municipal Development and Decentralization Program, the municipality should be the lead agency in the preparation of the urban-planning. AMP should act proactively in support of the municipality in coordination with the Darien Project Office of MEF, MIVI and IPAT and so on.

vi) Security

When the fishing port is operational, the security of public and private properties, such as buildings and equipment, is the most important to protect these properties from robbery. AMP should coordinate with the National Police to establish a security system in the port area.

Security system for the whole municipality is also important to encourage private firms to consider business in La Palma.

Steps to be taken by the Local Port Offices of La Palma Port

i) Coordination with the agencies concerned

The Administrator is the liaison between the Headquarters and the local agencies. Being the Liaison, the Administrator should be the focal point in the communications between the local communities and the AMP Headquarters, and all the information of the progress in the Headquarters should be propagated to the local communities and vice versa.

ii) Regular meeting

Administrator should hold forums among local fishermen and local agencies regularly, to discuss outstanding issues related to the project.

9.2.4 Implementation of the Priority Projects

(1) Individual Port

1) Bocas del Toro

i) Consensus opinion for the projects

Whether Bocas del Toro will continue to attract tourists highly depends on the steps taken by AMP. It is recommended for AMP to take the following steps. First of all, AMP should

keep in touch with the local communities, local and national governments, those who are involved in tourism business, and so on. AMP should hold forums regularly to reach consensus opinion on the project including facility layout, detailed design of the structure, the operational scheme of the passenger terminal and tariff to be charged to the users, among others.

ii) Ensure public funding

While AMP itself requests and negotiates with the central government for the necessary funds, it should coordinate with other agencies concerned for the collaboration to realize the project and for the improvement of other infrastructure and services such as road, communications, water supply and sewage, and waste treatment and garbage collection. In addition, it is most important for AMP to disseminate that the project is intended to develop a port for the local people and industry and that the local community should also appeal to the government via other possible routes.

iii) Operating body of the passenger terminal

While AMP is currently responsible for the operation of RoRo Ferry wharf, it should make efforts to establish a separate management body for the passenger terminal by either a concession contract with a private firm or a cooperative of stakeholders. It is also important to encourage local industries to participate in the project both financially and technically.

iv) Security and safety

It is the responsibility of AMP to take all possible measures to ensure the security and safety in the ports and ships. Thus, AMP should assess the vulnerability to crimes and prepare a security enhancement program.

v) Facility design

For the facility design of Bocas del Toro and Almirante Port, no difficulties are anticipated except dealing with a seismic force, whose coefficient of effective peak acceleration is 0.21. Also, the complex building should be designed suitably as the gateway of the tourist resort.

During construction of the new facilities, a temporary ferry ramp should be built not to disturb present ferry operations.

2) Chiriqui

i) Administrative matters

The public-private partnership is the key element of the project. Organizing the stakeholders of the project is the most important role of AMP. Since the multi-purpose wharf constructed for public use, it is recommended that a SPC, which will be financed by the government and stakeholders, should be established to manage and operate the whole port. The government

should shoulder the funds needed for the construction cost of the breakwaters, access channels and basin, while the private sector should shoulder the cost of the construction of the wharves.

On the basis of the financial analysis from the viewpoint of SPC management, 40% of total cost should be financed as equity while the rest of 60% should be finance by loan. The portions of the equity and loan that should be financed by public or private sectors shall be determined through the negotiations between the both parties. Thus the amount to be financed by the government is not fixed at this stage. It seems to be realistic to assume that the total amount shouldered by the government in both equity and loan should cover the costs for the breakwater, channel and basin.

AMP has the responsibility to regulate the SPC in the same manner as it is administrating the major international port in Canal area. In addition, it has also an important responsibility to participate in the management of the SPC as one of the major shareholders.

ii) Facility design

The study team has made site reconnaissance survey along the coast of Chiriqui Gulf. It was the assessment of the study team through the survey that almost all the coast line except the vicinity of Puerto Armuelles are not suitable for the port construction due to heavy siltation or huge sand dune.

As waves propagate into the shore, the waves change their direction and heights due to the refraction caused by the sea bead topography. For the case of Puerto Armuelles coast, waves decrease the heights. In addition, breakwaters will give a chance to display their diffraction effect to the full.

At Chiriqui Port, breakwaters are designed to maintain the calmness in harbor, facilitate cargo loading and unloading, ensure the safety of ships during navigation or anchorage, and protect mooring facilities. The level of seismicity is large, the 2nd in Panama, and its coefficient of effective peak acceleration is 0.24. Therefore, the attention on seismic force should be paid for to the detailed design of port facilities.

3) Coquira

i) Administrative matters

The key items for the realization of Coquira Port are:

a. To arrange the public funds
b. To invite a private firm to operate the port under a concession contract.

While AMP negotiates with the private operator the conditions of concession, it should pay due consideration to the quality of the services provided and the level of the tariff charged to port users.

ii) Facility design

The Quay of Coquira Port shall be situated on the river and if the quay structure will disturb the flow of river, configuration of riverbed and riverbank in upstream and downstream should be changed. To avoid such phenomena, attention should be paid the detailed design of quay and revetment structures.

4) La Palma

i) Administrative matters

AMP has the responsibility in organizing the passenger ship operators, local fishermen and local communities. Therefore, it is recommended that cooperatives of fishermen should operate the fish port. Monitoring the daily fish catch should be carried out by the cooperatives. When the new port facilities are built, the work of AMP local office will expand and more manpower will be needed. It is recommended to utilize the human resources locally available such as the cooperatives of passenger boat operators and the cooperatives of local fishermen. AMP should try to outsource the manpower rather than simply increase the number of its staff.

ii) Facility design

The very soft subsoil layer in La Palma site is about 20 m thick. Soft-ground-stabilization method, which is to prevent the circular slip failure, is necessary and the same attention should be paid for the detailed design of the rubble mound.

Design consideration will be required not to obstruct the river water flow and sediment transport passing by the structures. It is recommended that the part of approach connecting shoreline and ramp for artisanal fishing boats is designed with the piled pier structure.

(2) Environmental Impact Assessment

Potential adverse environmental effects consequent to the construction and subsequent operation of all four short-term port development projects are manageable. Still, concerning operation of all port facilities, due care in adherence to the port operational management requirements focused on ship and port terminal waste management, in particular enforcement of MARPOL regulations and its Annexes, is of utmost important to mitigate potential long-term adverse environmental effects of port operation.

Currently the most significant source of pollution in coastal waters of most short-term project development areas is the runoff of untreated wastes consequent to the land based miscellaneous anthropogenic activities that are essentially unrelated to the port operational activity. Accordingly, it is recommended to undertake necessary improvement measures targeting the wastes of land origin as the highest priority in the relevant project areas of Bocas Del Toro, Almirante, Puerto Armuelles and La Palma. Moreover, it is emphasized that waste

management improvement measures need to be undertaken independently irrespective of the status of implementation of these port development projects.

In fact improper management of wastes of land based anthropogenic activities being the principal cause of coastal water environmental degradation is a nationwide environmental issue to be addressed.

The construction works of the port in Chiriqui involve dredging and subsequent dredged material management works. This dredging and dredged material disposal works would adversely affect the aquatic life, in particular the benthic organisms inhabiting the seabed having very little mobility, for a considerable period of time. However, in the long-term the aquatic life in the areas including benthic organisms is expected to recover naturally. Accordingly, any potential adverse effects consequent to this dredging and dredged material disposal works are assessed as only of medium term and have no significant long-term adverse effects.