4.7 Short Term Plan (Figure 4.7.1)

- The existing berths from Q1 to Q4 require filling to compensate for the rising water level of the Caspian Sea.

- The angle of the face line at Q5 should be moved to the north-east to increase the width of the basin infront of the quay-wall for berthing.

- Two multi-purpose berths (total length:170 m, depth:6.0 m) and one temporary liquid bulk berth (length:170 m, depth:6.5 m) will be constructed. In the Master Plan, the area of the temporary liquid bulk berth should be incorporated with the container berth.

- The existing western break-water shall be extended by about 500 m.

- Depth of the existing channel and basin north of the temporary liquid bulk berth is -6.5 m, while it is -6.0 m to the south.

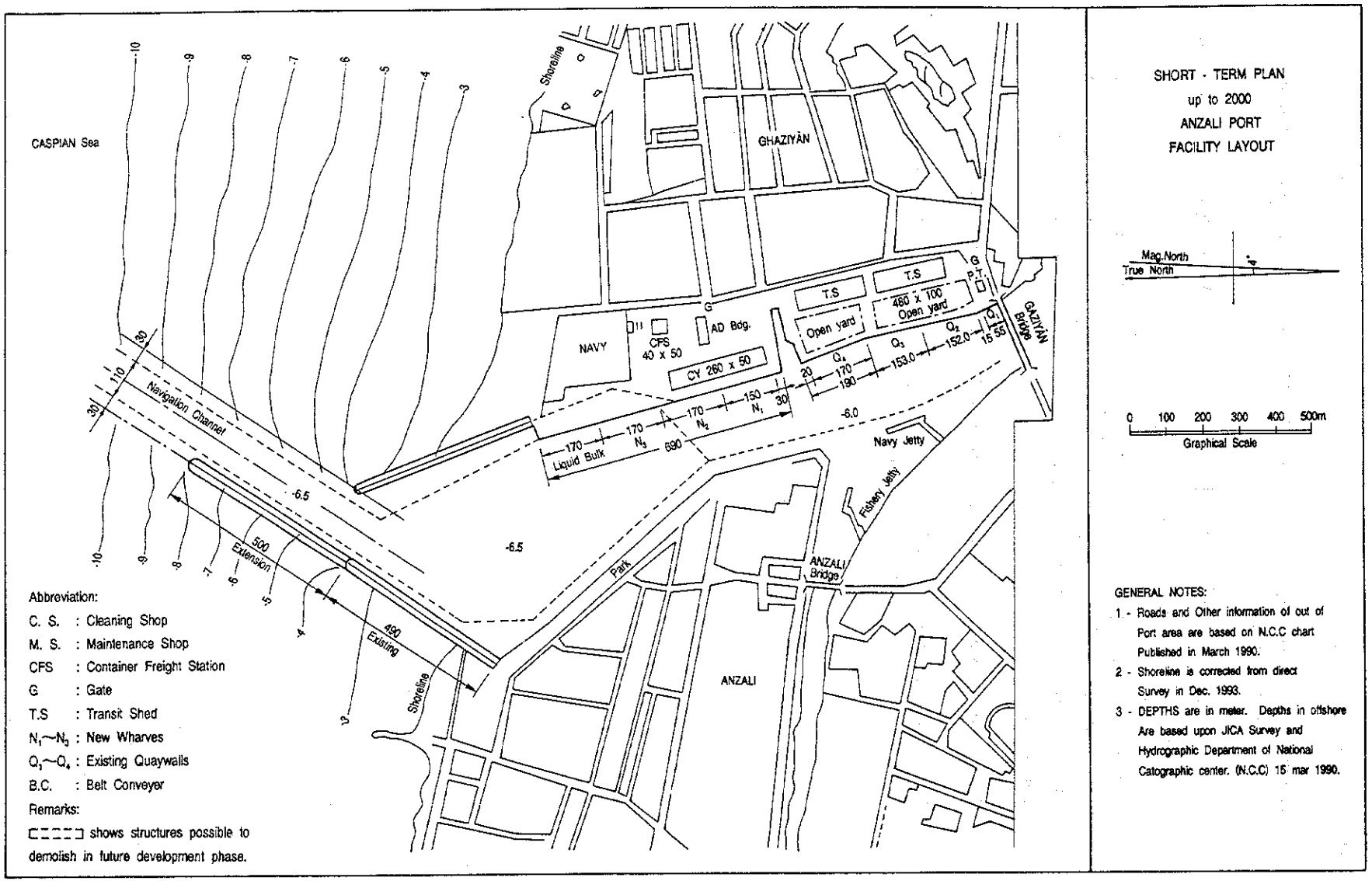


Figure 4.7.1 Short Term Plan

4.8 Preliminary Design and Cost Estimates of Required Port Facilities

4.8.1 Preliminary Design and Cost Estimates

(1) Review of Existing Structure

Current situation of the existing main facilities are shown in Table 4.8.1.1.

Table 4.8.1.1 List of Existing Facilities as of Dec. 1993.

No.	Name of Facilities	Description
01	Quaywall for Multi-purpose	Water depth: -5.5 m below C.D. Total length: 560 m Structure: Steel Sheet Piles Wall with 4 Gib cranes of 10 to 16 t capacity Apron elevation: +1.0 m above C.D.
02	Quaywall for Service Crafts	Water depth: -5.5 m below C.D. Length: 85 m Structure: Steel Sheet Piles Wall Apron elevation: +2.0 m above C.D.
03	Breakwaters	Total length: 970 m Structure: Stone + Concrete Block
04	Seawall	Total length: 762 m Structure: Stone
05	Slipway	Designed capacity: 2000 t
06	Navigation Channel	Water depth: -5.0 m below C.D. Width: 90 to 130 m
07	Basin	Diameter: 150 m
08	Administration Building	3F, Total floor area: 5,560 sq.m Structure: RC
09	Transit Shed	2 sheds, Total floor area: 19,934 sq.m
10	Others	Port related facilities

(2) Engineering Aspect

1) Main existing quaywalls consist of the Steel Sheet Piles wall and it is still stable to use due to low salt content in Caspian Sea water.
2) The alignments of the existing breakwaters are not so proper. Therefore, the calmness in the inner harbour is poor because the rough waves are entering directly through the estuary of the port area between two breakwaters in the stormy season. The existing quaywalls are keeping the calmness due to the land side location, but it is necessary to consider the alignments of the breakwaters in the future expansion of the port.
3) It is observed that the slope-end of the existing breakwater was partially damaged by the wave actions. PSO is planning to repair the damaged parts.

4) It is observed that the waves overflowed the top to seawall because the structure of the seawall was designed without any unsideration against wave actions.
5) The areas for the port roads and yards are not enough. PSO has efforts to expand the area by demolishing the existing time-worn buildings. It is obvious that the port area for the facilities is inadequate as a whole.
6) The clearance in height between the quaywall apron elevation and the water surface level is only 80 cm to 100 cm as of the end of 1993 due to the rising up of water level in the Caspian Sea. To cope with possible future rising of water level, the proper solution of the problem is urgently required.
7) It is observed that the access roads to the port area in the town are not enough.
8) The navy area is located in the port area. The port activities are limited due to the location of it. An urgent solution is required in this matter.

(3) Design Criteria

The design standards or criteria for the port facilities in Iran currently applied various foreign standards in case by case. Therefore, it is agreed with PSO that the Japanese technical standards for port and harbor facilities are applied generally in this study with appropriate consideration on the site conditions.

(4) Basic Concept of Design

The basic concepts of design are as follows.

1) To keep the stability of the structures
2) To economize the construction costs
3) To minimize the difficulty of the implementation
4) To keep positive utilization of the local materials and manpower

(5) Design Conditions

Main design conditions are as follows.

1) The apron elevation of the proposed quaywalls is originally designed in +2.5 m above C.D. and its structures are designed to be stable when the elevation will be in +3.5 m above C.D. to cope with the rising up of the water level in future.
2) The container cranes are installed at the container berths.
3) To take into the account of the earthquake.

4.8.2 Design of Main Facilities

(1) Quaywall

The steel sheet pile (SSP) type of quaywall as same as the existing one is selected to satisfy the requirements of the short time schedule, cheap maintenance cost and the experienced method in the site.

(2) Break Water

The stone type is selected from the cost, safety and experienced method.

4.8.3 Cargo Handling Equipment

The required cargo handling equipment and estimated cost are shown in Table 4.8.3.1.

Table 4.8.3.1 List of Equipment

Units: 1,000 US$ (ANZALI)

	Capacity	Existing	Unit Price	Master Plan			Short Term		
				Required	Procurement	Cost	Required	Procurement	Cost
Portal Jib Crane	16	2		2	0		2	0	
〃	10	3		3	0		3	0	
Container Crane	30.5 t	0	6,000	6	6	36,000			
Pneumatic Unloader	280 t/h	0	4,000	2	2	8,000			
〃	150 t/h	2					2	0	
Silo	19,240 t	0	5,000	1	1	5,000			
Related Equipment		0	10,000	1	1	10,000			
Transfer Crane	30.5	0	2,500	3	3	7,500	1	1	2,500
〃	20 t	0	2,000	14	14	28,000	2	2	4,000
Mobile Crane	100 t	0	1,500				2	2	3,000
	62 t	1							
	60 〃			1	0		1	0	
	40 〃	4		4	0		4	0	
	30 〃			2	0		2	0	
	25 〃	3		3	0		2	0	
	20 〃	1			0			0	
	16 〃	2			0			0	
	15 〃	2			0			0	
	10 〃	3			0			0	
	6 〃	1			0			0	
Fork-lift Truck	42 〃	2			0			0	
	40 〃	0		1	0			0	
	20 〃		300	2	1	300	0	0	
	13.5 〃	1			0			0	
	10 〃	5			0			0	
	7.5 〃			1	0			0	
	7.0 〃	2			0			0	
	5 〃	2		11	0		4	0	
	4.5 〃	2		0	0		0	0	
	3 〃	0	35	11	11	385	6	6	210
	2 〃	0	25	5	5	125	2	2	50
							0	0	0
Tractor Head			150	37	13	1,950	8	0	0
Trailer		28	0	4	0	0	4	0	0
Chassis			50	46	22	1,100	9	0	0
Truck-scale			150		3	450		1	150
Total						98,810			9,910

4.8.4 Navigation Aids

(1) The following factors should be kept in mind;

1) Removal of the wrecks
(near the Naval area)
2) Maintenance and accurate positioning of light buoys and beacons
(Periodical maintenance dredging and sounding of the channel)

(2) After completion of the new breakwater.

1) Relocation of the sea buoy to the northeast.
2) Relocation of the Pilot boarding point to a point near the new position of sea buoy.
(Definition of waiting anchorage)
3) Construction of the new lighthouse at the breakwater entrance

4.9 Project Implementation and Stage

4.9.1 Project Implementation Plan

The project implementation plans are scheduled as shown in the Table 4.9.1.1 and 4.9.1.2.

Table 4.9.1.1 Project Implementation Schedule

Item		94/95	95/96	96/97	97/98	98/99	99/00	00/01
Short-Term								
1 FS								
2 Financing								
3 Detail Design · Tender Document								
4 Tender · Contract								
5 Construction								
1) Preparation								
2) Dredging · Reclamation								
3) Quaywalls								
4) Breakwaters								
5) Seawall								
6) Buildings								
7) Pavement								
8) Utilities								
9) Handling Equipment								
10) Others								

Table 4.9.1.2 Implementation Schedule of Master Plan

No.	Year / Description	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09
1	Feasibility Study															
2	Finance for Investment															
3	Detail Design Tender Document															
4	Tender Selection of Contractor															
5	Construction															
5-1	Preparation															
5-2	Dredging Reclamation															
5-3	Wharves															
5-4	Breakwater															
5-5	Seawall															
5-6	Facilities on Land															
5-7	Pavement															
5-8	Utilities															
5-9	Others															

4.10 Project Cost Estimate

4.10.1 Cost Estimate for Short-term Plan up to 2,000

(1) The cost estimate for short-term plan up to 2,000/01 is shown in Table 4.10.1.1 4.10.1.2 and 4.10.1.3.

Table 4.10.1.1 Cost Estimation for Short-term Plan

No.	Description	Quantity	Unit cost US$	Amount US$
New Facilities:				
01	Preparation/Mobili-			
*	zation/Demobilization	LS		6,000,000
02	Dredging/Reclamation	200,000m^3	5	1,000,000
*	Dredging/Dumping	800,000m^3	4	3,200,000
03	Reclamation	150,000m^3	5	750,000
04	Multi. Berth, D:-6.5m	695m	47,000	32,430,000
05	Multi. Berth, D:-8.5m	565m	30,000	16,950,000
06	Breakwater, D:-8.0~4.0m	625m		7,000,000
07	Seawall	60m	1,800	110,000
08	Slipway,	LS		1,000,000
09	Buildings			1,190,000
10	Pavement			8,520,000
11				
12	Utilities	LS		2,530,000
13	Others (Navigation aids)	LS		1,300,000
14	Cargo Handling Equipment	LS		11,000,000
15	Sub-total			92,890,000
16	Physical Contingency	10% OF 15		9,298,000
17	Engineering Fee	10% OF 15		9,298,000
18	Sub-total	16+17		18,596,000
	Total	15+18		111,576,000

Table 4.10.1.2 Foreign/Local Portion of Cost

Unit: 1,000 US$

No.	Item	Amount	Portion	Local Currency	Foreign Currency
01	Preparation	6,000	25:75	1,500	4,500
02	Dredging/Rec.	4,950	40:60	1,980	2,970
03	Seawall	110	100:00	110	0
04	Quaywall	49,380	60:40	29,628	19,752
05	Breakwater	7,000	90:10	6,300	700
06	Slipway	1,000	70:30	700	300
07	Pavement	8,520	90:10	7,668	852
08					
09	Gate etc.	590	90:10	531	59
12	CFS	600	60:40	360	240
16	Utilities	2,330	70:30	1,631	699
23	Navigation Aids	200	40:60	80	120
25	Environment	300	60:40	180	120
26	Handling Eq.	11,000	20:80	2,200	8,800
27	Survey	1,000	60:40	600	400
	Sub-total	92,980	57:43	53,468	39,512
28	Physical Contingencies	9,298	57:43	5,300	3,998
29	Engineering Fee	9,298	20:80	1,860	7,438
	Total 111,576	54:46		60,628	50,948

Table 4.10.1.3 Investment Plan (Short-term)

Upper line: Urgent
Lower line: Improvement/Rehabilitation

Item		94/95	95/96	96/97	97/98	98/99	99/00	00/01
1 FS								
2 Financing								
3 Detail Design・Tender Document	4.72		3.79	0.93				
4 Tender・Contract								
5 Construction								
1) Preparation	6.00			3.50			1.50	
2) Dredging・Reclamation	4.95				1.00 2.20	2.00		
3) Quaywalls	0.11					0.75 0.11		
4) Breakwaters	49.38				32.43			
5) Seawall	7.00			1.50	2.00	16.95 2.00	1.50	
6) Slipway	1.00					1.00		
7) Pavement	8.52				2.52	3.00	3.00	
8) Gate etc.	0.59					0.59		
9) CFS	0.60					0.60		
10) Utilities	2.33				1.00	1.00		
11) Navigation Aids	0.2					0.20	0.33	
12) Environment	0.3					0.30		
13) Handling Equipment	11.00					5.00	6.00	
14) Survey etc.	1.00					0.70		
Subl-total	92.98		3.79	5.00 0.93	40.15 1.00	15.5 18.70	0.30 9.00 3.63	
Physical Contingencies	9.298		0.298	1.50	2.167 0.333	2.00 1.00	1.00 1.00	
Engineering Fee	9.298			0.578	0.80 0.50	0.80 0.50	1.00 0.40	
Total	111.576		4.088	8.008	43.117 1.833	18.30 20.20	11.00 5.03	

4.10.2 Cost Estimate for Plan up to 2,010

(1) Project Cost Estimate

The cost estimate for the plan based on the costing criteria is as same as the Short Term Plan.

Table 4.10.2.1 Project Cost of Master Plan

(Alternative-3)

No.	Item	Amount (US$)	Remarks
01	Preparation	6,000,000	Including Mobilization/ Demobilization
02	Dredging/Rec.	9,095,000	
03	Seawall	1,422,000	Total length 790 m
04	Quaywall	76,865,000	Total length 1,970 m
05	Breakwater	32,580,000	Total length 1,600 m
06	Slipway	1,000,000	Rehabilitation
07	Pavement	18,880,000	Road/Yard
09	Gate etc.	310,000	
10	Control Office	9,090,000	Floor area 16,200 m^2
11	Meintenance Shop	2,340,000	Floor area 5,200 m^2
12	CFS	1,980,000	Floor area 6,600 m^2
13	Transit Shed	2,850,000	Floor area 9,500 m^2
14	Warehouse	10,000,000	Including Grain Silo
15	Passenger Terminal	270,000	Floor area 600 m^2
16	Electrical power Equipment	1,400,000	
17	Weighing Facilities	130,000	
18	Water Supply Facilities	1,000,000	
19	Fire Extinguishing Facilities	670,000	
20	Drainage Facilities	670,000	
21	Lighting Facilities	900,000	
22	Correspondence Facilities	1,340,000	
23	Navigation Aids	600,000	
24	Removal Fee	600,000	Breakwater
25	Environment	500,000	Water analysis, Drainage management
26	Handling Equipment	100,000,000	Including Container Crane
27	Others	1,700,000	Survey Equipment etc.
	Sub-total (01~27)	282,192,000	
28	Physical Contingencies	28,219,000	10%
29	Engineering Fee	28,219,000	10%
Total	338,630,000		

4.11 Economic Analysis

4.11.1 Purpose and Methodology of Economic Analysis

The purpose of the economic analysis is to appraise the economic feasibility of the Short Term Plan for the new port facilities of the port from the viewpoint of the national economy. Therefore, the purpose of this chapter is to investigate the economic benefits as well as the economic costs which will arise from the project and to evaluate whether the net benefit of the project exceed those which could be obtained from other investment opportunities in Iran.

The economic internal rate of return (EIRR) based on a cost-benefit analysis is used in order to appraise the feasibility of the project.

The EIRR value is obtained from the annual economic benefit-cost value. The economic benefits are obtained from the difference between the "With the project" case (hereinafter referred to as "With" case) and "Without the project case (hereinafter referred to as "Without" case).

In estimating the costs and benefits of the project, "economic pricing" is applied.

4.11.2 "Without" Case and "With" Case

(1) "Without" Cast

The berth conditions of "Without" case are assumed that it is impossible to use.

(2) "With" Case

The conditions of "With" case are assumed as follows.

Table 4.11.2.1 Berth Condition of "With" Case

With Case		
New Berth Number	Depth (m)	Number of Berth
G.C.Berth	-6.5	3
Oil Berth	-6.5	1

4.11.3 Prerequisites of Economic Analysis

(1) Base Year

In this Study, 1994 is set as the base year.

(2) Project Life

The target term of economic analysis is 30 years.

4.11.4 Economic Prices

In general, all costs and benefits are divided into traded goods, non-traded goods labor and transfer items. Labor is further divided into skilled and unskilled labor.

Traded goods are expressed at CIF (cost, insurance and freight) prices for imports and at FOB (free on board)prices for exports, which are border prices themselves.

The Standard Conversion Factor (SCF) is used to determine the economic prices of certain non-traded goods and services that cannot be directly valued at border prices.

The economic cost of skilled labor is obtained by multiplying its market prices by the Conversion Factor for Consumption(CFC).

For the economic analysis, cost of unskilled labor should be measured in terms of their opportunity costs. In this study, the SCF of 0.862 and CFC of 0.791 are adopted according to the fast records of trade and customs The conversion factor for skilled labor of 0.640 is adopted.

4.11.5 Benefits and Costs of the Project

Considering the "With" and "Without" scenarios above, the following items are identified as the benefits of the Short Term Plan for Anzali port.

1) Saving in-land transportation costs
2) Saving in interest of cargo costs.
3) Development of port related industries.
4) Increase in employment opportunities.
5) Improvement of cargo handling safety and reduction of cargo damage.

(1) Calculation of Benefits

1) Saving in Transportation Costs from/to Other Ports
The reduction of the transportation costs under the "With" cases is one of the main benefits of the project.

Benefits derived from savings in transportation costs due to the implementation of this project are calculated in Table 4.11.5.1.

Table 4.11.5.1 Saving in Land Transportation Costs

(Mn US$)

	2000/01	2010/11
Accruing to Anzali Port	16,275	42,825

2) Saving in Interest of Cargo Costs

According to the above benefits derived from savings of interest of cargo costs due to the implementation of this project are calculated in Table 4.11.5.2.

Table 4.11.5.2 Saving in Interest of Cargo Costs

(Mn US$)

	2000/01	2010/11
Accruing to Anzali Port	87	228

4.11.6 Evaluation and Conclusion

(1) Calculation of EIRR

The economic internal rate of return(EIRR) based upon a cost-benefit analysis is used to appraise the economic feasibility of project.

The calculation for the EIRR as follows : EIRR = 18.59%

(2) Sensitivity Analysis

In order to estimate the EIRR, When certain conditions change, a sensitivity analysis is conducted. The changing range is based on cargo forecasts difference between macro and micro forecast.

Base Case :	EIRR=18.59%
Case A : The costs increase by 10%	EIRR=17.16%
Case B : The benefits decrease by 10%	EIRR=17.01%
Case C : Combination of the above A and B	EIRR=15.63%

(3) Conclusion

There are various views concerning the appropriate EIRR level used to guide the judgement as to whether a project is feasible or not. The leading view is that the project is feasible if the EIRR exceeds the opportunity cost of capital. Generally it is standard that the opportunity cost of capital in development countries is more than 10%. Therefore, this Short-term Development Project is feasible from the viewpoint of the national economy.

4.12 Financial Analysis

4.12.1 Purpose and Methodology of the Financial Analysis

(1) Purpose

The purpose of the financial analysis is to appraise the financial feasibility of the Proposed port development Scheme. The analysis focuses on the financial viability of the project itself and to check the influence on the soundness of the port management body during the project life.
The project in this study is defined as construction and repair in the short term plan.

(2) Methodology

The viability of the project is analyzed using the Discount Cash Flow Method and appraised by the FIRR (financial internal rate of return). The influence on the financial soundness of the port management body is appraised based on projected financial statements regarding the project.

4.12.2 Prerequisites of the Financial Analysis

(1) Fund raising

Funds for construction are all raised by foreign loans. Funds for repair and renewal investment are all raised by Government subsidies. Short term loans are all raised by domestic funds.

The foreign and domestic funds carry the following conditions.

a) Foreign funds
Loan period: 30 years, including a grace period of 3 years
Interest rate: 3% per annum
Repayment: fixed amount repayment of principal and interest

b) Domestic funds
Domestic funds are raised by non-interest loans from Government.
Loan period: 10 years (grace period: none)
Repayment: fixed amount repayment of principal

(2) Others

Project life: 30 years
Base year: 1994
Cargo handling volume: Based on the demand forecast

4.12.3 Income and Expense

(1) Income

Marine and terminal operations income, Port operations income, Loading/Unloading operations income, Equipment service income, Miscellaneous income.

(2) Expense

Cost for initial investments, Operating expense (Personnel, Maintenance and repair, other expense, Depreciation costs), Reinvestment.

4.12.4 Financial Analysis

(1) Appraisal by FIRR

The results of FIRR calculation including sensitivity analysis are shown in Table 4.11.4.1.

Sensitivity analysis

Case A : The income decreases by 10%
Case B : The project cost increases by 10%
Case C : The income decreases by 10% and the project cost increases by 10%

Table 4.12.4.1 Result of Calculation

Original Case	7.0%	
Sensitivity Analysis A	5.5%	Revenue 10% Down
Sensitivity Analysis B	5.7%	Cost 10% Up
Sensitivity Analysis C	4.1%	Revenue 10% Down, Cost 10% Up

Weighted average interest rate of the funds, which is the floor limit, is 5% in this study. FIRR exceeds this rate, even in case C of the sensitivity analysis, therefore we can judge this project can be judged financially feasible.

(2) Financial soundness of the port management body

The financial indicators based on the projected financial statement, show excellent levels. Therefore, the port management body will be financially sound.

4.13 Management and Operation for the Proposed Port Activities

4.13.1 Privatization of Terminal Operation

(1) Overall Administration System

As is commonly understood, public sector is normally not flexible in providing personnel or investment in response to the actual fluctuation of demand. In this sense, full involvement of port authority in cargo handling services is not always suitable for improvement of efficiency of such services under a competitive market, and increased situation of cargo flow in particular.

(2) Port Authority

If cargo handling service is privatized, the sections for cargo verification, cargo handling, warehouse will be separated from Anzali port authority. Eventually the organization for mooring, water supply, repair work of cargo handling equipment, should also be separated. Towage and pilotage can be separated if there is enough demand.

However, the organization which conducts management of port infrastructure and facilities should be left under their administration.

4.13.2 Major Proposals for Effective Port Management

(1) Financial System and Port Tariff

In future, port income is expected to greatly increase at Anzali port. Therefore, it is desired that Anzali Port Authority has a self-supporting accounting system.
To put it concretely, in future, Port Authority should begin to allocate income for maintenance and repair expenditures. And gradually, investment funds should also begin to be raised from income. It is desirable to consider about gradual decreasing of the contributions to Government.

If investment funds can not be raised only from income, Port Authority should consider regular loans.
To support above financial system, PSO should set its tariff at a proper level to obtain sufficient income to maintain sound financial condition and to make the necessary investments.
On the other hand, tariff should be set taking levels of neighboring ports into consideration to attract more port users.
To set tariff at a proper level, PSO and Port Authority should have power to revise and fix tariff.

4.14 Environmental Consideration

The Procedure of a environmental study on a feasibility study has as same process as Imam Khomeini Port. (See Subsection 3.14)

4.14.1 Present Condition

According to the screening results of site investigations, interviews at PSO and water and sea-bed quality studies, each Iranian port has different environmental conditions. The environmental problems at Anzali Port are coastal erosion caused by the water rising level, relocation of the residential area for expansion of the back up area of the port, and the inflow of waste water and wastes from the urban areas and industrial plants in the hinterland. Cadmium and lead are in the sea-bed.

4.14.2 Proposed Measures for Environmental Consideration

According to the result of the environmental impact assessment(EIA) of which items are selected by the initial environmental examination, the effect of the present project in the Short Term Plan for the surrounding environment is expected to be minimal. There are no environmental problems concerning implementation of their project.

In Master Plan, the detail study of relocation of the residents should be needed because the port facilities is expanded to the east.

In view of expansion of port activity in the post Master Plan, we assumed the increase of calling ships and working craft operating in Anzali Port. We also expect increase of residents and industrial plants in the surrounding area. Therefore, an oil treatment plant, a sewage treatment plant and a waste treatment plant should be constructed in vicinity of Anzali Port at the post Master Plan.
In future, the sea-bed quality test should need in Anzali Port.

III CONCLUSION AND RECOMMENDATION

III. Conclusion and Recommendation

1. Conclusion

1.1 Port Development and Management Strategy

1.1.1 Basic Strategy

(1) Basic concept of public port

1) Public ports should be considered, in principle, as economic infrastructure, or social capital, or as a national asset which is vital in promoting the national economy and upgrading total welfare of the citizen.

2) Under the above understanding, the ports should generally be owned by the public sector, and basic port development and management policy and provision of major port facilities need to be controlled by the public sector.

3) Through the above function, the public port sector should play an important role to provide private sector entities with well cultivated field in which they can promote their economic activities freely under a liberalized competitive market.

4) From an administrative point of view, it is also essential that a public agency maintains uniform control over the entire area of public port.

(2) roles and requirements for the Iranian port sector

Considering the basic requirements for the country, the core roles expected of the port sector are summarized as follows.

1) To be logistics centers to provide the national citizens with necessities of life

2) To support development of the national economy

3) To play the central role in the international economy

4) Encouragement of various port functions

In order to fulfill the above roles, the Iranian ports should satisfy the following requirements.

1) Quality improvement and modernization of ports and maritime transport to attract more ship calls

2) Improvement of the port facilities for future cargo and passenger traffic demand

3) Encouragement of international transit through Iran

4) Promotion of regional development through provision of better business environment for port related industries

5) Supporting of the free trade zone activities

6) Encouragement of other various port function such as fishery, refuge and recreation

7) Enhancement of environment protection

1.1.2 Port Development Strategy

(1) Basic requirements for physical development of port related facilities

The major physical development needs for port related facilities are identified as follows.

1) Reinforcement of cargo handling capacity mainly for future container, bulk and general cargo traffic demand

2) Provision of easy access to/from trunk roads and railways

3) Provision of available areas or lots, utilities and services specially prepared for various port related industries

4) Improvement of navigation aids, channels and basins for safety of vessels' navigation and berthing

(2) Numerical Target

1) Future economic scenario
As a base of forecasting the future cargo traffic through the Iranian ports, future status of population, GDP and GDP per capita of the country are presumed as shown in Table 1.1.2.1.

Table 1.1.2.1 Population, GDP and GDP per Capita

	1991/92	2000/01	2010/11
Population (1,000)	57,234	70,019	85,353
GDP (Bn.Rls)	12,181	19,891	33,224
GDP per-capita (1,000 Rls)	213	284	389

2) Sea born cargo volume

On the basis of the future economic status of the country, the total sea born cargo traffic demand is forecasted as shown in Table 1.1.2.2.

Table 1.1.2.2 Sea Borne Cargo Traffic Demand

(1,000 ton)

		2000/01	2010/11
Handling Cargo Volume	Import	32,455	53,315
	Export	8,936	23,768
	Total	41,391	77,083

3) Transhipment cargo to/from CIS countries (Land-bridge cargo)

Future Land-bridge cargo for CIS countries is forecasted separately from the above sea borne cargo traffic as shown in Table 1.1.2.3.

Table 1.1.2.3 Transhipment Cargo to/from CIS Countries

(unit 1,000 ton)

	TO	FROM	TOTAL
2000/01	620	470	1,090
2010/11	1,540	1,180	2,720

(3) Functional allotment among major Iranian ports

According to the basic port development concept, the allotment of port function of 6 Major ports is proposed as shown in Table 1.1.2.4.

Table 1.1.2.4 Functional Allotment among Major Iranian Ports

Ports / Function	Imam Khomeini	Abbas	Bushehr	Chabahar	Anzali	Now Shahr
Foreign Trade	AA	AA	A	A	A	B
Domestic Trade	A	A	A	C	B	C
Commercial	AA	AA	A	A	A	B
Industrial	AA	AA	B	B	B	B
Container Cargo	AA	AA	A	B	A	B
Bulk Cargo	A	A	B	A	B	C
Heavy Cargo	A	A	B	B	A	B
Ro-Ro Cargo	A	A	-	-	A	-
Transit Cargo	A	AA	-	A	A	-
Liquid Cargo	C	AA	AA	A	A	B
Fishery	C	A	A	A	A	C
Passenger	B	A	A	-	A	A
Refuge	-	-	-	B	A	A

Allotment Degree
AA: High
A: Medium High
B: Medium Low
C: Low
-: Not Handled

Considering the above general allotment of port function among the ports, allocation of total future cargo volume among 12 ports is proposed as shown in Table 1.1.2.5.

Table 1.1.2.5 Total Cargo Volume at Major Iranian Ports

Port Name	1993/94			2000/01			2010/11		
	Import	Export	Total	Import	Export	Total	Import	Export	Total
Persian Gulf									
Imam Khomeini	7,259	2,788	10,047	11,051	5,182	16,233	19,663	11,512	31,175
Rajace	8,410	931	9,341	11,901	2,721	14,622	19,158	10,088	29,246
Bahonar	3,330	553	3,883	3,552	867	4,419	3,896	1,651	5,547
Behesti	1,412	174	1,586	1,815	300	2,115	2,599	654	3,253
Bushehr	816	2	818	1,158	9	1,167	2,008	226	2,234
* Khoramshahr	-	-	-	732	268	1,000	671	329	1,000
* Abadan	-	-	-	146	54	200	134	66	200
Sub-Total	21,227	4,448	25,675	30,355	9,401	39,756	48,129	24,526	72,655
Caspian Sea									
Anzali	1,036	42	1,078	1,594	218	1,812	4,240	842	5,082
Noshahr	388	8	396	692	137	829	1,826	399	2,225
** Amir Abad	-	-	-	485	175	660	956	444	1,400
** Fereydunkener	-	-	-	349	21	370	713	87	800
** Torkaman	-	-	-	70	75	145	170	190	360
Sub-Total	1,424	50	1,474	3,190	626	3,816	7,905	1,962	9,867
TOTAL	22,651	4,498	27,149	33,545	10,027	43,572	56,034	26,488	82,522

Note: Including land bridge cargo

* *ports were under re-construction in 1993/94*

** *ports were under construction in 1993/94*

(4) Priority of required port facilities at major Iranian ports

On the basis of the future cargo traffic demand at each port, priority requirements for improvement of port facilities are derived as shown in Table 1.1.2.6.

Table 1.1.2.6 Priority of Required Port Facilities at Major Iranian Ports

Name of Port		Imam Khomaini Port	Abbas Port	Busher Port	Chabahar Port	Anzali Port	Now Shar Port
Kind of Berth							
Foreign Trade	General cargo berth	***	***	***	***	***	**
	Container berth	***	***				
	Ro/Ro berth	**	**				
	Dry bulk berth	**	**		**		
	Passenger berth			**			
	Liquid bulk berth	*	**	**	**	***	*
Domestic trade	General cargo berth			**			*
	Dry bulk berth	**	**				
Fishery	Fishery berth	*	**	**	*	**	*
Kind of Sorting Facility							
Foreign Trade	Transit shed	***	***	***	***	***	**
	Open yard for General Cargo	***	***	***	***	***	**
	Container Freight station	***	***			***	
	Container Yard	***	***			***	
	Open yard for Ro/Ro	**	**			**	
	Open Storage Yard	**	**			*	*
	Silo	**	**		**		
	Transit shed for dry bulk	**	**		**	*	*
	Passenger Facility	*	***	**		**	**
	Liquid bulk Facility		**	**	**	***	*
Domestic trade	Transit shed			**		*	*
	Open yard for General Cargo			*		*	
	Open Storage Yard	**	**				
Fishery	Fishing Storage	*	**	**	*	**	*
Break water					***	***	**

Note:***:Required Facility with first priority for construction
**:Required Facility with second priority for construction
*:Required Facility with third priority for construction

1.1.3 Port Management and Operation Strategy

(1) Basic policy for port management and operation

In order to support the future port activities to be conducted at each Iranian port developed under the proposed scheme, port management and operation system should substantially be improved according to the following policy.

1) Improvement of overall efficiency and reliability of port management and operation

2) Decentralization of a part of competence of PSO head quarter to each port authority

3) Reorganization of each port authority for partial privatization of port operation

4) Introduction of more self-sustainable way of financial system

5) Reinforcement of general competence of PSO in deciding its original port tariffs

6) Introduction of more rationalized way of procurement system

(2) Application of privatization policy

Under the basic understanding on the nature of public port illustrated in 1.1.1(1), it is recommended that the following guidelines be taken into account in applying the government's privatization policy to PSO.

1) The ultimate objective of privatization of port sector is to maximize economic return from the target port activity for both the public and private sectors under careful consideration on effective removal of possible inefficiency of public sector as well as adverse effects of monopoly by private sector.

2) Port functions and activities to be privatized should be limited within the areas where the privatized activities can be fully controlled under PSO administrative authority, and the areas where the effects of privatization can fully be expected without any negative impact to sound performance of the port.

3) the target areas to be privatized should be planned and arranged appropriately to guarantee the necessary conditions under which the free market system can fully be activated.

4) In principle, ownership of the land and water area necessary for PSO port administration, and the basic port facilities such as water area for navigation channels and turning/berthing basins, public wharves, main access roads, utility mains, power supply, reserved space/land for public use or future expansion, should belong to PSO.

5) Basic port facilities and major cargo handling equipment should be open to public use, in principle, but can be leased out to private firms on a contract basis for their exclusive use under appropriate condition.

6) Practice of privatization should be step wise considering its applicability to the situation of each target stage including practicability, acceptability, profitability of the intended privatization schemes so that they could fully contribute in securing the total efficiency of port administration and its performance.

(3) Future terminal operation system

In the context of privatization for more efficient port operation, the alternative ways of marine terminal operation are developed and the following two alternatives shown in Table 1.1.3.1 are selected to be applied for the Iranian ports.

Table 1.1.3.1 Recommended Terminal Operation System for Iranian Ports

Alternative		Present		Short Term Plan (- 2000)		Long Term Plan (- 2010)	
		Major ports on Persian Gulf	Major ports on Caspian Sea	Major ports on Persian Gulf	Major ports on Caspian Sea	Major ports on Persian Gulf	Major ports on Caspian Sea
(A)	Owned by	Public	Public	Public	Public	Public	Public
	Provide service for	Open	Open	Open	Open	Open & Exclusive	Open
	Cargo handled by	Public & Private	Public & Private	Private	Private	Private	Private
(B)	Owned by	Public	Public	Public	Public	Public	Public
	Provide service for	Open	Open	Open & Exclusive	Open	Open & Exclusive	Open
	Cargo handled by	Public & Private	Public & Private	Private	Private	Private	Private

Note: Exclusive; The type of operation which allows only limited companies to use berths.

Open & Exclusive; In principle the berths are open to public use, but exclusive use berths will be partly introduced.

(4) Basic tariff policy

In order to establish the most appropriate tariff system for the Iranian ports, the following points need to be considered.

1) Tariffs should be set at proper level to obtain sufficient income for necessary investment for development, maintenance and operation of the facilities under sound financial condition.

2) Well attractive level of tariffs should be examined and offered to the port users so that PSO could receive more ship calls to the ports.

3) Strategic tariff policy to be applied to selected users should be considered to compete with the other ports in inviting target cargo flow to the PSO ports.

2. Recommendation

With a view to securing successful realization of the proposed port development schemes under efficient port management and operation, the timely actions by the Government of Iran are recommended as illustrated as follows.

2.1 Overall Port Administration

2.1.1 Independence of Financial Status of PSO

While PSO can be understood as a kind of independent organization, its financial position is not considered fully independent from the Government. To keep financial independence of the public sector entities from the Government is generally understood effective to encourage their positive efforts in promoting effective management and operation of their facilities.

Considering the above principle, it is recommended that the current practice of subsidies and contribution system from/to the Government should be phased out. In this connection, it is also important to establish the independent decision making system for tariff policy under initiative of PSO.

2.1.2 Promotion of Decentralization of Port Administration Competence

The port authority offices currently conduct their activities under strict control of PSO central office. With a view to activating function of each port authority, the appropriate part of competence in the following fields need to be transferred from PSO central office to the port authority offices.

1) Procurement, 2)Budgetary arrangements and financing, 3)Personnel affairs, 4)Port promotion, 5)Planning and construction, and 6)Operation of the ports.

2.1.3 Restructuring of PSO Organization

While any serious problem area is not observed at current organization structure of PSO, it is recommended to create, at PSO central office, the following new organizations for timely response to the current port administration requirements.

1) Department for port promotion, 2)Department for tariff, 3)Section for environmental affairs.

In addition to the above policy, the following functions may be transferred to private entities according to progress of privatization in the field of port operation.

1) Calculation, billing, collection of cargo handling charge, 2)Grievance procedure concerning cargo handling operation, 3)Management of cargo handling workers.

2.1.4 Reinforcement of Personnel Policy and Training system

The well designed personnel policy and training system are essential to encourage or to educe the positive incentive and potential capability of PSO staff.
In order to support the effective personnel policy of PSO, the following measures need to be carefully examined and applied under the "appoint right person to right position" principle.

1) Establishment of proper personnel evaluation and transfer system

2) Introduction of steady and encouraging promotion system

3) Provision of attractive positions for able technocrats

4) Creation of positive incentive mechanism built in the salary/wages system

With respect to staff training, PSO needs to develop its own training courses, the core purpose of which are;

1) to give them full knowledge and understanding both on technological and functional requirements of the ports, and thus

2) to give them cost-conscious and efficiency oriented mind in conducting their duty and assignment.

2.2 Port Planning

2.2.1 Establishment of Systematic Port Planning Policy

The port plans need to be formulated by systematic way, taking the following points into account;

1) Coverage of port plan (nation wide, regional and individual)

2) Terms of port plans (long, medium and short term or urgent)

3) Type of port plans (physical development, management and operation)

4) Port planning body central, regional or local government)

5) Interval of formulation (periodical, ad-hoc)

6) Legal status (authorized by law or not)

2.2.2 Essential Requirements to The Functional Position of Port Plan

In order to secure applicability and practicability of the port plan, the following requirements of its functional position should be considered.

1) Time span of the plan should correspond to other long-term national or regional economic plans, if any.

2) The plan should be flexible enough to adjust to possible contingency.

3) The plan should, if possible, be vested with a certain legal power or be authorized by the government to promote its development scheme.

4) Easy access to the contents of the plan should be secured for the interested parties concerned.

2.2.3 Effective Utilization of Port Plans

In order to realize the proposed schemes of the plans, it is essential to secure active utilization of the plans through the following efforts by PSO.

1) To promote full understanding on the contents of the plans and its significance both by all staff of PSO and agencies concerned

2) To conduct periodical review and modification of the plans to adjust the schemes according to the actual socio-economic situation of the country

3) To secure adequate financial support with proper budgetary arrangements for the plans through constant negotiation with the agencies concerned

4) To promote public understanding and acceptance on the proposed schemes through positive public relation activities, in particular on the environmental consideration policy and economic merits of the plans.

2.3 Port Environmental Consideration

2.3.1 Establishment of Port Environmental Policy

The environmental consideration is one of the most vital issues in promoting port development. Since the environmental administration system and practice of PSO seem inadequate to satisfy the general requirements of international standard, overall port environmental consideration and conservation policy need to be established considering the following points.

1) Quality standard of air, seawater and seabed materials at the PSO port area should set in consultation with DOE.

2) Routine inspection system for water and seabed quality needs to be established.

3) A laboratory for minimum required analyses of the samples of seawater, discharging waste water and seabed materials should be established.

4) Specialists for material sampling and data analysis should be trained and assigned to all major ports.

5) Treatment plants for waste oil from ships and waste water of general port activity should be installed at least at selected major ports.

2.3.2 Environmental Consideration Particular for Imam Khomeini port

Air polution and water polution are problem at Imam Khomeini port. Therefore, countermeasures of these problem should be studied.

2.3.3 Environmental Consideration Particular for Anzali port

In the Master Plan, there are reclamation works which will cause water pollution. This situation is an environmental problem. Therefore, countermeasures should be studied.

2.3.4 Strengthening of PSO Organization for Environmental Administration

In order to cope with the above requirements for maintaining the port environment, it is recommended to create at PSO central office a special department or section which is responsible in taking care of port environmental affairs.

2.4 Improvement of Port Engineering Aspects

2.4.1 Overall Upgrading of PSO Engineering System

In order to carry out an appropriate future major port development, PSO's organization, with respect to engineering aspects, can be improved further. The following suggestions on such improvement are based on the experience of the Study Team working with PSO.

(1) It is recommended to continue the PSO technical sessions.
(2) Introduction of technology of other countries including the technical analysis by computers.
(3) Introduction of overseas training of junior engineers.
(4) Preparation of own technical standards and common design criteria.
(5) Active communication between the departments concerning.
(6) More communications between the junior engineers and senior engineers

Another point which should be noted is that average age of PSO employees is rather

high. It is essential matter to open the employment chance to the young engineers. It is strongly recommended to add more attractiveness on the present PSO engineering system for young generation in order to ensure a continuity of PSO engineering.

2.4.2 Establishment of Technical Standards for Port Facility Design

PSO recognized the importance of keeping its own technical standards and tried to prepare them before. However the preparation of them was not completed yet. The consultant employed by PSO usually select the standards by themselves based on characteristics of each project.

It is strongly recommended to PSO to continue its efforts to carry out necessary technical arrangement for PSO's technical standards.

2.4.3 Improvement of Engineering Statistics and Recording System

The engineering records of PSO project in the past contain a variety of useful information.

However, if any information about records is not given to those who needs it, utilization of such record will be limited to those who knows the existence of records. Thus, they should be given well-informed easy access to touch the records.

2.4.4 Monitoring and Review for Flexible Project Implementation

All the facilities specified in the master plan were reflected on the forecast data of cargo demand together with type of cargo. However actual figures may deviate from the forecasts due to changes in various social and economic factors. Although a detailed study to cope with this situation is required, following countermeasures may be useful.

(1) Review of cargo forecast based on the latest data
(2) Review of the master plan
(3) Review of the implementation schedule

2.4.5 Establishment of Effective Maintenance System

PSO has conducted its efforts to provide the existing facilities with the required maintenance services. However there are several damaged structures which require both periodical maintenance works and urgent rehabilitation.

Maintenance work on the structures can be divided into two categories, namely the routine maintenance and the urgent rehabilitation. The former consists of preventive measures and required cost of which is minor, however the latter consists of corrective measures against large scale damage and required cost of which is large. According to past experience, if preventive maintenance is appropriately performed,

the required cost for corrective maintenance works will be minimum.

2.5 Port Management and Operation

2.5.1 Proper Application of Privatization Policy

While privatization of public entities' business has become new world trend, the policy should always be applied under careful consideration on the actual situation of the target sector.

Considering the nature of pubic port, partial and step-wise application of the policy is therefore desirable for the Iranian ports under deep understanding on the ultimate objective of privatization policy, which reads;

"to maximize economic return from the target port activity for both the public and private sectors through effective removal of possible inefficiency of public sector as well as adverse effects of monopoly by private sector"

2.5.2 Strategic Tariff Policy for Transit Cargoes

Invitation of the potential transit cargoes is one of the effective ways for maximum utilization of future cargo handling capacity of iranian ports.

While it is generally understood difficult to attract the transit cargoes being handled at neighboring competing ports, it is still recommendable that PSO should have a more aggressive tariff policy for further increase of cargo handling revenue through inviting transit cargoes to the ports along the Persian Gulf coast.

For instance, PSO may set the tariff for transit cargoes far below the normal level, even if operational earnings could not be expected at the initial stage under such a highly concessional tariff. This policy implies that PSO could recover any initial losses and get more earnings in long-term range through dramatic increase of transit cargoes expected under policy if it is prepared appropriately and applied successfully.

2.5.3 Improvement of Port Statistics and Recording system

In order to support port planning and administration, it is essential to build up a well designed port statistic and recording system. In addition to current data base of PSO, the following data need to be prepared.

1) Commodity-wise cargo volume arranged by origin and destination

2) Cargo handling efficiency

3) Dimensions of calling vessels

4) Condition of usage of cargo handling and storage facilities

5) Number of passengers

6) Traffic volume of the access roads around port

7) Cargo turnover records

In this connection, it is also recommended to provide the users with easy access to port related information including the available data base.

2.5.4 Reinforcement of Port Promotion Activities

Port promotion or sales is one of the most important fields of activities for attracting port users. PSO administration, however, does not seem very active in conducting this assignment. Since competition among the neighboring ports or other transport modes in collecting cargoes will be much tighter in future, the following actions by PSO are recommended in securing adequate level of revenue from users at the major Iranian ports.

(1) Establishment of port promotion strategy focusing the most effective target groups of clients

(2) Under the systematic action program, PSO staff should call for sales at shipping companies or shippers through active appeals in getting their understanding on real merits of utilizing the Iranian ports.

(3) It is usefull for effective sales activities to prepare an attractive brochure in which the sales points including various advantages and merits for the target users are explained plainly.

(4) To hold seminars to introduce the Iranian ports to shippers of various countries is another effective way to assist the promotion activities.

2.6 Physical Implementation of Proposed Port Development Schemes

2.6.1 General Idea

(1) PSO should conduct the priority analysis on major ports and should inform the priority project to the Central Government.
(2) If so required, financial arrangement should be undertaken for the introduction of external financial institution.
(3) Detailed engineering including preparation of tender documents should be conducted by the consultants.
(4) In order to perform such project as proposed in this study, PSO should untie its Best efforts to strengthen of engineering capabilities.
(5) Cargo review should be undertaken in order to make the view investment efficient.

2.6.2 Imam Khomeini Port

(1) PSO should study mitigation measures on the disturbance of port operation during the project implementation.
(2) Necessary arrangement should be conducted for the new access to the West Harbor.
(3) Periodical hydrographic survey and maintenance dredging should be carried out.

2.6.3 Anzali Port

(1) Detailed plan of urgent mitigation measures against the water raise should be prepared.
(2) PSO should provide the residents with the explanation about importance of port activities.
(3) PSO should discuss with the municipality about the future port expansion eastward.
(4) PSO should make its best efforts to convince the military that the existing military area behind the port area should remove to other site.

2.7 Financial Issues for Successful Implementation of the Project

2.7.1 Procurement of Necessary Funds For the Project

Provision of required funds is no doubt one of the most critical issues for successful realization of the project. The financial sources available for a public port development can generally be categorized as follows.

(1) Funds provided by the national budget or government bond issued for the project
(2) Funds provided by the local government budget or bond
(3) Funds procured through foreign currency loan from international multi- or by-lateral financing agencies (so called Official Development Assistance (ODA) basis)
(4) Funds invested by domestic or foreign private sectors
(5) Funds procured through co-financing arrangement of various different sources

While category (5) is selected mostly for actual project financing, core funds are normally procured from categories (1) to (4) as the major financing sources. Considering the actual Iranian port development system, utilization of categories (1) and/or (3) are most practical at least for the basic port facilities. Private funds may also reasonably be introduced for some superstructures and cargo handling equipment in accordance with possible future privatization of port operation.

2.7.2 Appropriate Policy Making on Reasonable Level of PSO Contribution to the National Revenue

The current practice of transference of PSO revenue to the National Treasury seems jeopardizing financial independence of PSO. Reinforcement of the self-sustainable financial position of PSO is considered an essential requirement for successful

realization of the proposed project.

In this sense, it is recommended that PSO should seek possible way to set reasonable level of contribution through active appeal to the agencies concerned on significance of the port development and financial requirements for the project.

2.7.3 Budgetary Arrangements For the Urgent Improvement Schemes

As proposed in the implementation schedule of the projects, available term for construction works of short term plan is only five years including the term for the urgent improvement schemes of which implementation should start in 1996.

Taking the above situation into consideration, immediate action for securing next year's budget for urgent improvement schemes is essential for timely completion of the project.

2.7.4 Effective Utilization of Earnings from the Short Term Project of Imam Khomeini Port

Considering the current level of adequate port facilities and rather small investment requirements for the short term project at Imam Khomeini port, it is recommended that substantial earnings from the short term project should effectively be utilized;

1) for the Master Plan project of the port which will require a huge investment, by string them with in PSO accounts, and
2) for the development projects of other PSO ports, by re-allocating them through PSO contribution to the Government.

2.8 Other Relevant Issues to be Considered

(1) Promotion of regional development to be conducted together with the proposed port development schemes

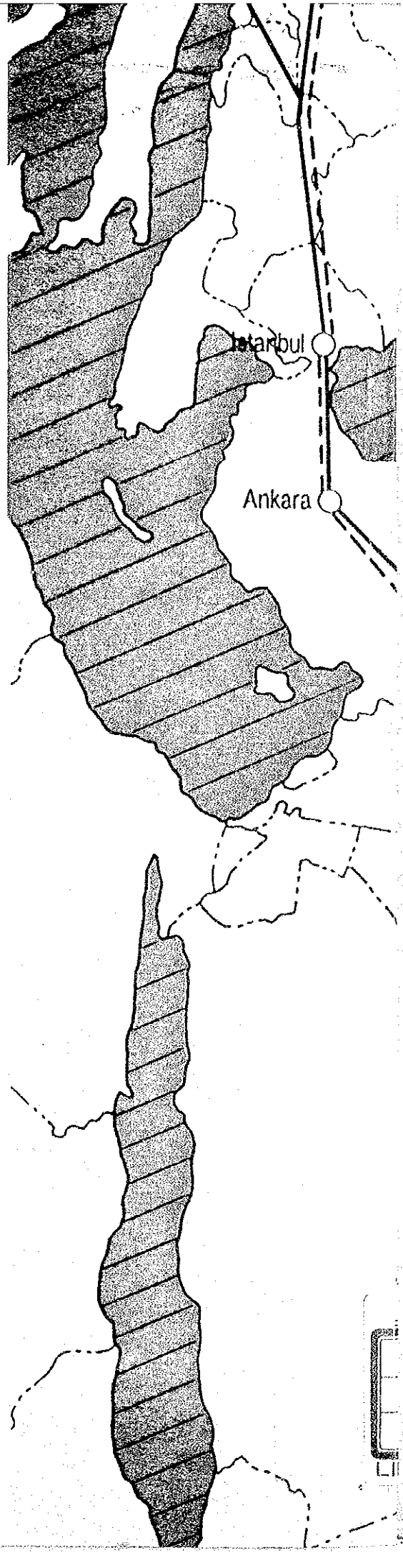
(2) Organization, for port sector promotion, of wide-range of supporting groups composed of both public and private entities

(3) Constant dialogue between PSO and port users for effective improvement of port operation and services

(4) Early commencement of a detailed planning study on Abbas port for harmonized development with on-going Free Trade Zone project at Quesim Island.

(5) Consolidation of PSO position and its concern in participating in the development scheme of Free Zone.

(6) Promotion of active approaches to and coordination with the agencies concerned for timely construction of the roads and railways relevant to the proposed port development.



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