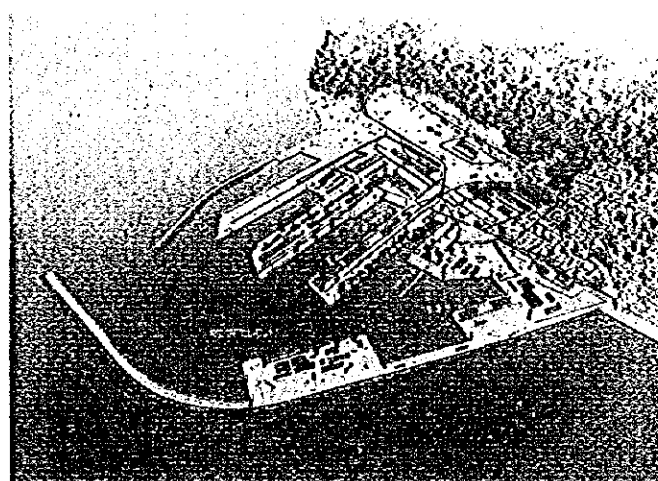
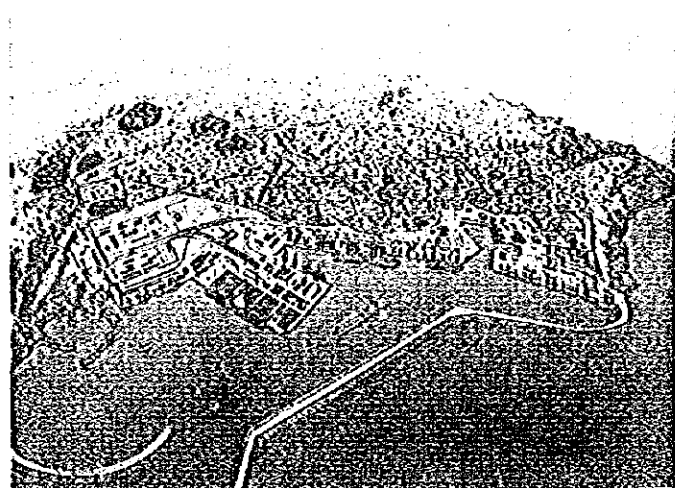
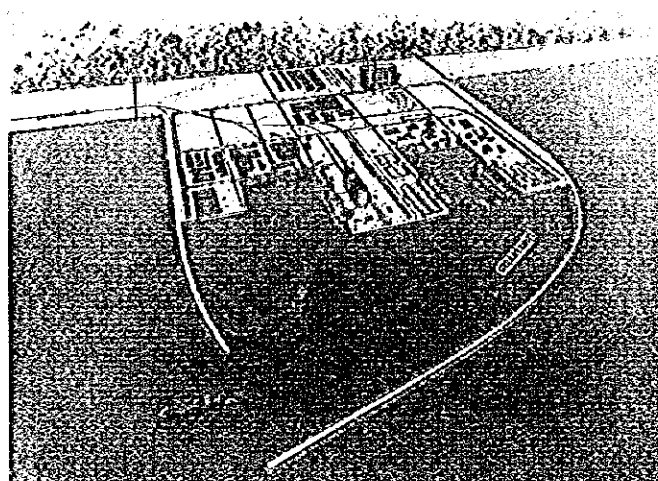
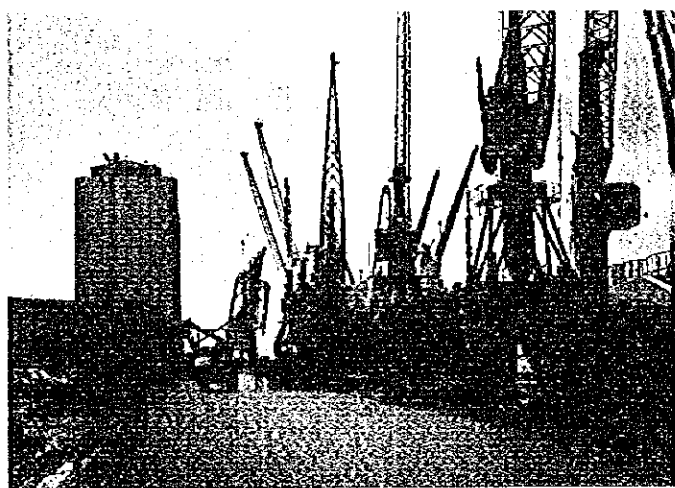


社会開発調査部報告書

FINAL REPORT

THE STUDY ON THE PORT DEVELOPMENT PLAN IN THE SYRIAN ARAB REPUBLIC

(SUMMARY)



AUGUST 1996

JICA LIBRARY



J 1131974(6)

The Overseas Coastal Area Development Institute of Japan (OCDI)
NIPPON KOEI CO.,LTD.(NK)

SSF

SC

96-106

The following foreign exchange rate is applied in this study:
US\$1.00 = 42 Syrian Pound (as October 1995) = ¥100



1131974 [6]

FINAL REPORT

**THE STUDY ON THE PORT
DEVELOPMENT PLAN
IN THE SYRIAN ARAB REPUBLIC**

(SUMMARY)

AUGUST 1996

PREFACE

In response to a request from the Government of the Syrian Arab Republic, the Government of Japan decided to conduct a study on the Port Development Plan in the Syrian Arab Republic and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent a study team to Syria headed by Mr. Yugo Otsuki, Senior Advisor of the Overseas Coastal Area development Institute of Japan (OCDI) and composed of members from this institute and the company, Nippon Koei Co., five times between March 1995 and May 1996.

The team held discussions with the officials concerned of the Government of Syria and conducted field surveys in the study area. After the team returned to Japan, further studies were made and the present report was prepared.

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

I wish to express my sincere appreciation to the officials concerned of the Government of the Syrian Arab Republic for the close cooperation they extended to the team.

August, 1996



Kimio Fujita
President

Japan International Cooperation Agency

LETTER OF TRANSMITTAL

August 1996

Mr. Kimio FUJITA
President
Japan International Cooperation Agency

Dear Sir,

It is my great pleasure to submit the Final Report for the Study on the Port Development Plan in the Syrian Arab Republic.

This report is the outcome of works between March 1995 and August 1996 including five field surveys during the period. The work was undertaken by the Overseas Coastal Area Development Institute of Japan (OCDI) and Nippon Koei Co., Ltd. as per the contract with the Japan International Cooperation Agency (JICA).

Based on the findings of these surveys and utilizing data and information collected, and along the line of the scope of work which was agreed upon by both governments, the report is formulated to cover the following subjects;

- (1) To formulate a master plan for the existing two ports (Latakia and Tartous) and a new port for bulk cargoes up to the year 2010.
- (2) To conduct a feasibility study of a short-term plan for the existing two ports and the new port for the period up to the year 2005.

On behalf of the study team, I would like to express my deep appreciation to the Government of Syria, the Latakia Port General Company, the Tartous Port General Company and other authorities concerned for their thoughtful cooperation and assistance and for the heartfelt hospitality which they extended to the study team during our stay in Syria.

I am also greatly indebted to the Japan Cooperation Agency, the Ministry of Foreign Affairs, the Ministry of Transport and the Embassy of Japan in Syria for giving us valuable advice and assistance at every step in the whole course of the study.

Yours faithfully,



Yugo Otsuki
Leader, Team for the Study on the
Port Development Plan in the Syrian
Arab Republic



LATAKIA PORT

TARTOUS PORT

NEW PORT

MEDITERRANEAN SEA

LEBANON

BEIRUT DISTRICT

Tripoli

R

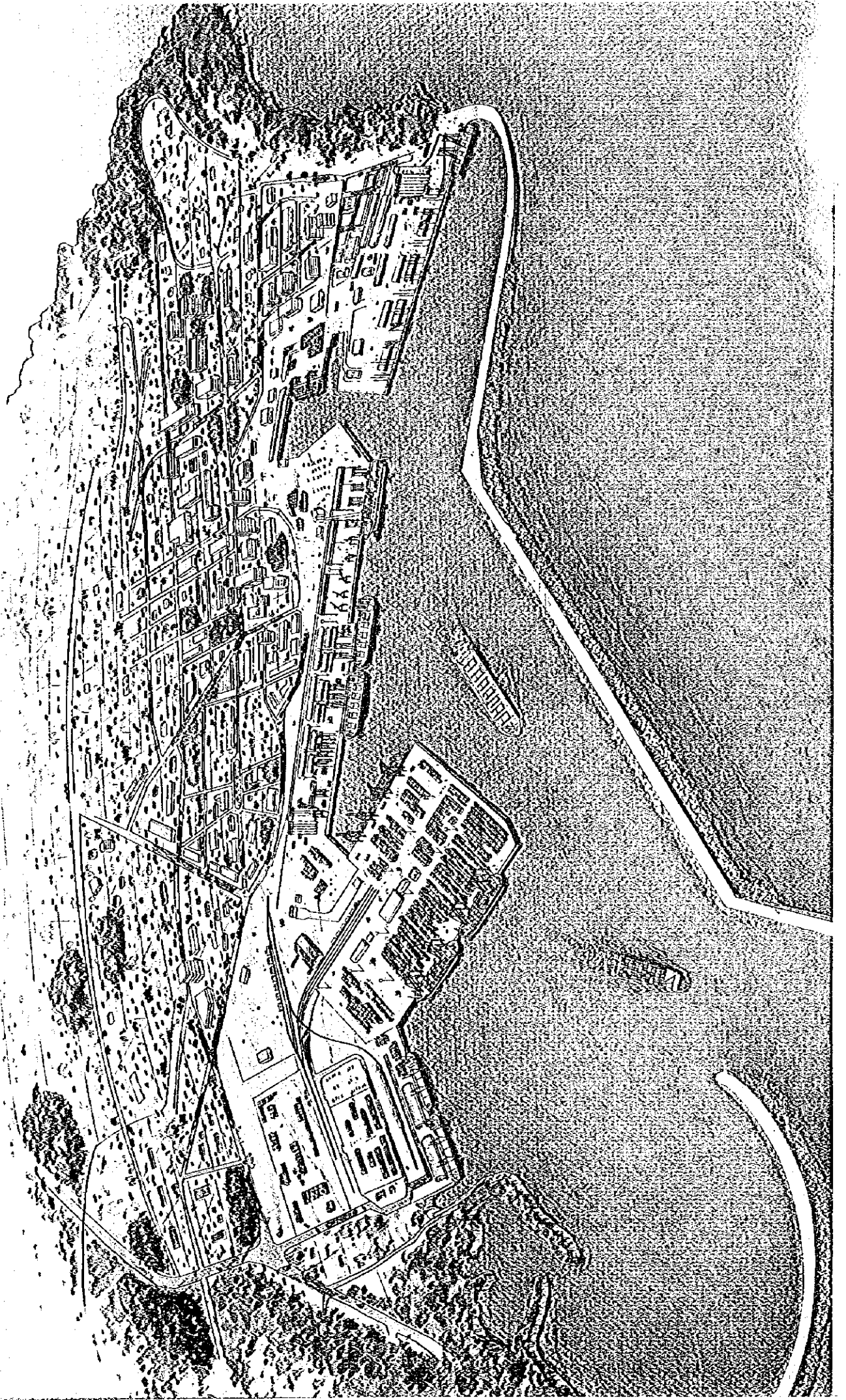
S H B

ISRAEL

Tel Aviv

LOCATION MAP

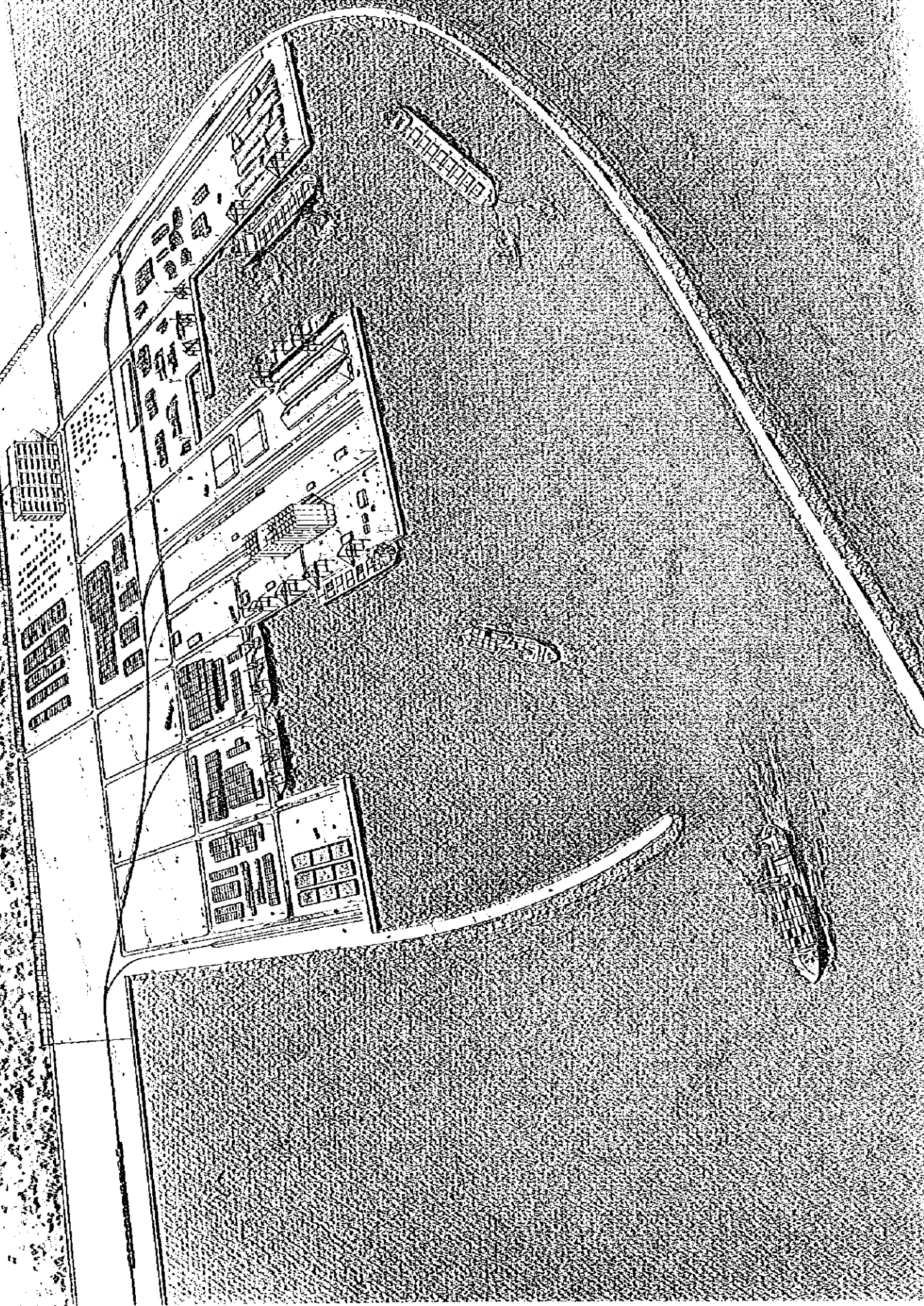
LATAKIA PORT



TARTOUS PORT



NEW PORT



ABBREVIATIONS

B/L	Bill of lading
CAMP	Coastal Area Management Plan
CBR	Cost Benefit Ratio
CFC	Conversion Factor for Consumption
CFL	Conversion Factor for Labor
CFS	Container Freight Station
CIF	Cost Insurance and Freight
COD	Chemical Oxygen Demand
CPU	Central Processing Unit
CY	Container Yard
dB	Decibel
DG	Dangerous Goods
DMC	Developing Member Countries
DO	Dissolved Oxygen
DWT	Dead Weight Tonnage
ECU	European Currency Unit
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EPZ	Exporting Processing Zone
ETA	Estimated Time of Arrival
EDA	Estimated Time of Departure
FCL	Full Container Load
FEU	Forty-foot Equivalent Unit
FIRR	Financial Internal Rate of Return
FOB	Free on Board
FTZ	Free Trade Zone
GDP	Gross Domestic Product
GL	Ground Level
GNP	Gross National Product
GRT	Gross Registered Tonnage
HP	Horse Power
hr	hour
IALA	International Association of Lighthouse Authorities
IEE	Initial Environmental Examination
IMF	International Monetary Fund
IMO	International Maritime Organization
JICA	Japan International Cooperation Agency
LCL	Less than Container Load
LOA	Length Over All
MLWL	Mean Low Water Level
MOT	the Ministry of Transport
MT	Metric Ton
NRT	Net Registered Tonnage

OD-Survey	Origin and Destination Survey
OECD	The Overseas Economic Cooperation Fund
OS	Operation System
PH/ph	Potential of Hydrogen
Ro-Ro	Roll-on Roll-off
SCF	Standard Conversion Factor
SDR	Special Drawing Rights
SHIPCO	Shipping Agencies Company
SP	Syrian Pound
SPC	State Planning Committee
SS	Suspended Substance
SW	Scope of Work
TEU	Twenty-foot Equivalent Unit
UAE	United Arab Emirates
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
UNDP	United Nations Development Programme
US\$	US Dollar
WHO	World Health Organization

Contents of the Draft Final Report

- Summary -

EXECUTIVE SUMMARY	(1)
CHAPTER 1 PRESENT CONDITIONS	1
1.1 Socio-economic Conditions	1
1.1.1 Population	1
1.1.2 GDP	1
1.1.3 Foreign Trade	2
1.1.4 Industry	2
1.1.5 Economic Policy and Historical Aspects in Syria	4
1.2 Natural Conditions	5
1.2.1 Geographic Conditions	5
1.2.2 Meteorological Conditions	5
1.2.3 Oceanographic Conditions	5
1.2.4 Geological Conditions	5
1.3 Transport Systems	8
1.3.1 Ports in Syria	8
1.3.2 Roads	8
1.3.3 Railways	8
1.3.4 Airport	8
1.4 Present Conditions of Latakia Port	10
1.4.1 Port Facilities	10
1.4.2 Port Activities	12
1.4.3 Cargo Handling System	14
1.4.4 Port Services	15
1.5 Present Conditions of Tartous Port	16
1.5.1 Port Facilities	16
1.5.2 Port Activities	18
1.5.3 Cargo Handling System	20
1.5.4 Port Services	21
1.6 Conditions of Design and Cost Estimate	22
1.6.1 Design Conditions	22
1.6.2 Cost Estimate	23
1.7 Environmental Conditions	25
1.8 Present Management and Operations	29
1.8.1 Outline of Syrian Ports' Management and Operations	29
1.8.2 Port General Company	29
1.8.3 Trade Union	30
1.8.4 Existing Port Operations	30
1.8.5 Port Finance	31
CHAPTER 2 MASTER PLAN	33
2.1 Socio-economic Framework	33

2.2	Demand Forecast and Function Allotment	33
2.2.1	Demand Forecast (Nationwide)	33
2.2.2	Demand Forecast (Each Port)	34
2.3	Master Plan of Latakia Port	37
2.3.1	The Basic Concept of the Port Development	37
2.3.2	Usage Plan for the Existing Port Facilities	38
2.3.3	Container Terminal Plan	39
2.3.4	Grain Terminal	40
2.3.5	Conventional Terminal and Other Facility Plan	41
2.3.6	Cargo Handling System	42
2.3.7	Access Channel and Basins	43
2.3.8	Breakwaters	44
2.3.9	Access Roads and Railways	45
2.3.10	Alternative Layout Plans	45
2.3.11	Initial Environmental Examination	53
2.3.12	Facility Design	54
2.3.13	Cost Estimation	57
2.3.14	Preliminary Economic Analysis	58
2.4	Master Plan of Tartous Port	60
2.4.1	The Basic Concept of the Port Development	60
2.4.2	Usage Plan for the Existing Port Facilities	61
2.4.3	Container Terminal Plan	62
2.4.4	Conventional Terminal and Other Port Facilities	63
2.4.5	Cargo Handling System	64
2.4.6	Alternative Layout Plans	65
2.4.7	Initial Environmental Examination	69
2.4.8	Facility Design	70
2.4.9	Cost Estimation	71
2.4.10	Preliminary Economic Analysis	72
2.5	Master Plan of the New Port	73
2.5.1	The Basic Concept of the Port Development	73
2.5.2	Facility Plan of Each Terminal	74
2.5.3	Cargo Handling System	75
2.5.4	Access Channel and Basins	80
2.5.5	Breakwaters	80
2.5.6	Access Roads and Railways	82
2.5.7	Site Selection	82
2.5.8	Alternative Layout Plans	87
2.5.9	Initial Environmental Examination	93
2.5.10	Facility Design	94
2.5.11	Cost Estimation	98
2.5.12	Preliminary Economic Analysis	99
2.6	Port Management and Operation	100
2.6.1	Existing Two Ports	100
2.6.2	The New Port	107

CHAPTER 3 SHORT-TERM PLAN	110
3.1 Short-Term Plan of Latakia Port	110
3.1.1 The Basic Concept of the Port Development Plan	110
3.1.2 Usage Plan for the Existing Port Facilities	110
3.1.3 Container Terminal Plan	111
3.1.4 Grain Terminal	111
3.1.5 Passenger Terminal	112
3.1.6 Cargo Handling System	115
3.1.7 Access Channel and Basins	115
3.1.8 Layout Plan	116
3.1.9 Design of the Major Structures	119
3.1.10 Design of Cargo Handling Equipment	122
3.1.11 Implementation Program	123
3.1.12 Cost Estimation	125
3.1.13 Economic Analysis	128
3.1.14 Financial Analysis	129
3.1.15 Environmental Impact Analysis	134
3.2 Short-Term Plan of Tartous Port	135
3.2.1 The Basic Concept of the Port Development Plan	135
3.2.2 Usage Plan for the Existing Port Facilities	135
3.2.3 Multi-purpose Terminal Plan	136
3.2.4 Conventional Terminal Plan	136
3.2.5 Cargo Handling System	137
3.2.6 Layout Plan	137
3.2.7 Design of the Major Structures	141
3.2.8 Design of Cargo Handling Equipment	143
3.2.9 Implementation Program	144
3.2.10 Cost Estimation	146
3.2.11 Economic Analysis	149
3.2.12 Financial Analysis	150
3.2.13 Environmental Impact Analysis	152
3.3 Short-Term Plan of the New Port	153
3.3.1 The Basic Concept of the Port Development Plan	153
3.3.2 Facility Plan of Each Terminal	153
3.3.3 Cargo Handling System	154
3.3.4 Access Roads and Railways	155
3.3.5 Layout Plan	156
3.3.6 Design of the Major Structures	159
3.3.7 Design of Cargo Handling Equipment	161
3.3.8 Implementation Program	164
3.3.9 Cost Estimation	166
3.3.10 Economic Analysis	169
3.3.11 Financial Analysis	170
3.3.12 Environmental Impact Assessment	173
3.4 Port Management and Operation	175
3.4.1 Personnel-arrangement of the Proposed Components	175

3.4.2 Human Resource Development in the Short-Term Plan	178
CONCLUSIONS AND RECOMMENDATIONS	181

LIST OF FIGURES

Figure 1.2.3-1	Sounding Map at New Port Area	6
Figure 1.2.4-1	Boring Logs	7
Figure 2.3.8-1	Wave Diffraction from SW Deep Water Wave	44
Figure 2.3.10-1	Master Plan of LATAKIA PORT - Case (1)	47
Figure 2.3.10-2	Master Plan of LATAKIA PORT - Case (2)	49
Figure 2.3.10-3	Master Plan of LATAKIA PORT - Case (3)	51
Figure 2.3.12-1	Standard Cross Section of Breakwater Rubble Mound Type (-15.0m)	55
Figure 2.3.12-2	Standard Cross Section of Quay Block Type (-12.0m)	55
Figure 2.3.12-3	Standard Cross Section of Container Yard	56
Figure 2.3.12-4	Standard Cross Section of Yard, Apron	56
Figure 2.4.6-1	Master Plan of TARTOUS PORT	67
Figure 2.5.3.1	Flow Chart for Estimation of Minimum Required Area of Storage Facilities for Export Cargo	78
Figure 2.5.3.2	Flow Chart for Estimation for Area of Storage Facilities for Import Cargo	79
Figure 2.5.5-1	Wave Diffraction from SW Deep Water Wave	81
Figure 2.5.7-1	Sites of the New Port	83
Figure 2.5.8-1	Location of New Port	89
Figure 2.5.8-2	Alternatives of the New Port	91
Figure 2.5.10-3	Standard Cross Section of Revetment	96
Figure 2.5.10-1	Standard Cross Section of Breakwater Rubble Mound Type (-12.0m)	97
Figure 2.5.10-2	Standard Cross Section of Quay Block Type (-11.5m)	97
Figure 3.1.5-1	Layout of Passenger Terminal Facility	113
Figure 3.1.5-2	Layout of Terminal Building	114
Figure 3.1.8-1	Layout Plan of Latakia Port	117
Figure 3.1.9-1	Conceptional Plan of Passenger Terminal Elevation	121
Figure 3.1.9-2	Conceptional Plan of Passenger Terminal Side Elevation	121
Figure 3.1.11-1	Construction Schedule for Latakia Port	124
Figure 3.1.14-1	Flowchart of the Financial Analysis	132
Figure 3.2.6-1	Short-Term Plan of Tartous Port	139
Figure 3.2.9-1	Construction Schedule for Tartous Port	145
Figure 3.3.5-1	Short-Term Plan of the New Port	157
Figure 3.3.6-1	Standard Cross Section of Breakwater Rubble Mound Type (-10.0m)	160
Figure 3.3.6-2	Standard Cross Section of Breakwater Caisson Type (-10.0m)	160
Figure 3.3.8-1	Construction Schedule for New Port	165
Figure 3.4.1	Proposed Organization of the New Port Corporation	179
Figure 1	Master Plan for Development of Latakia Port	197
Figure 2	Master Plan for Development of Tartous Port	199
Figure 3	Master Plan for Development of The New Port	201
Figure 4	Short-Term Plan for Development of Latakia Port	211
Figure 5	Short-Term Plan for Development of Tartous Port	213
Figure 6	Short-Term Plan for Development of The New Port	215

LIST OF TABLES

Table 1.1.2-1	Main Economic Indicators	1
Table 1.1.2-2	GDP by Sector at 1985 Constant Price	2
Table 1.1.3-1	External trade of Syria	2
Table 1.4.1-2	Summary of Main Facilities at Latakia Port	10
Table 1.4.2-1	Berth Occupancy Condition	13
Table 1.4.2-2	Cargo Handling Productivities of Major Cargo	13
Table 1.5.2-1	Berth Occupancy Condition	19
Table 1.5.2-2	Cargo Handling Productivities of Major Cargoes	19
Table 1.6.2-1	Unit Price	24
Table 2.1.1-1	Growth Rates and Socio-economic Indicators in the future	33
Table 2.2.1-1	Summary of Demand Forecast on Handling Cargo Volume through Syrian Ports	34
Table 2.2.2-1	Results of Demand Forecast in Latakia Port	35
Table 2.2.2-2	Results of Demand Forecast in Tartus Port	35
Table 2.2.2-3	Results of Demand Forecast in New Port	36
Table 2.3.2-1	Usage Plan of the Berths by Vessel Type	38
Table 2.3.13-1	Total Cost of Master-Plan	57
Table 2.3.14-1	Costs and Benefits of the Projects	59
Table 2.4.2-1	Usage Plan of the Berths by Vessel Type	61
Table 2.4.9-1	Total Cost of Master-Plan	71
Table 2.4.10-1	Costs and Benefits of the Projects	72
Table 2.5.2-1	Usage Plan of the Berths by Vessel Type	75
Table 2.5.3.1	Minimum Required capacity of Storage facility at New Port	80
Table 2.5.7-1	Summary of Site Conditions	84
Table 2.5.7-1	Summary of Site Condition (Continued)	85
Table 2.5.7-2	Evaluation of Sites	86
Table 2.5.10-1	Main Dimensions of Breakwater	94
Table 2.5.10-2	Design Conditions of Berths	95
Table 2.5.10-3	Overtopping Quantity	95
Table 2.5.10-4	Standard of Overtopping Quantity	95
Table 2.5.11-1	Total Cost of Master-Plan	98
Table 2.5.12-1	Costs and Benefits of the projects	99
Table 2.6.2.1-1	Number of Workers for Break Bulk Cargo at Latakia Port in the Master Plan	102
Table 2.6.2.1-2	Number of Employees at Grain Terminal	102
Table 2.6.2.1-3	Required Number of Employees at Container Terminal in the Master Plan	102
Table 2.6.2.1-4	Number of Workers for Break Bulk Cargo at Tartous Port	104
Table 2.3.2.1-5	Required Number of Employees at New Grain Terminal in Tartous Port	104
Table 2.6.2.1-6	Required Number of Employees of Container Terminal Department at Tartous Port in the Master Plan	104
Table 2.6.2.2-1	Number of employees of Exclusive Terminal	109

Table 2.6.2.2-2	Number of Cargo Handling Workers for General Cargo Berths at New Port in the Master Plan	109
Table 3.1.2-1	Usage Plan of the Berths by Vessel Type	110
Table 3.1.9-1	Planned Facilities in the Short-Term Plan of Latakia Port	119
Table 3.1.9-2	Design Conditions for Grain Berth	119
Table 3.1.9-3	Safety Factors of Grain Terminal Berth	120
Table 3.1.11-1	Working Efficiency	123
Table 3.1.12-1	Total Cost of Short-Term	126
Table 3.1.12-2	Yearly Investment Schedule	127
Table 3.1.13-1	Costs and Benefits by the projects	128
Table 3.1.13-2	Economic Internal Rate of Return (EIRR)	129
Table 3.2.2-1	Usage Plan of the Berths by Vessel Type	135
Table 3.2.7-1	Planned Facilities in the Short-Term Plan of Tartous Port	141
Table 3.2.7-2	Design Conditions for General/RoRo Berth (-10m)	141
Table 3.2.7-3	Safety Factors of General/RoRo Berth	141
Table 3.2.9-1	Working Efficiency	144
Table 3.2.10-1	Total Cost of Short-Term	147
Table 3.2.10-2	Yearly Investment Schedule	148
Table 3.2.11-1	Costs and Benefits by the projects	149
Table 3.2.11-2	Economic Internal Rate of Return (EIRR)	149
Table 3.3.2-1	Usage Plan of the Berths by Vessel Type	154
Table 3.3.4-1	Railway Related Cargoes	155
Table 3.3.6-1	Comparison of Construction Costs of Breakwaters	159
Table 3.3.8-1	Construction Quantities	164
Table 3.3.9-1	Total Cost of New Port	167
Table 3.3.9-2	Yearly Investment Schedule	168
Table 3.3.10-1	Costs and Benefits by the projects	169
Table 3.4.1	Required Number of Employees at Container Terminal in the Short-term Plan	176
Table 3.4.2	Required Number of Employees at Multi-purpose Terminal in Tartous Port in the Short-term Plan	177

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

1. Background of the Study

Along with a long-term program of gradual economic liberalization which has been under way since the late 1980's, the Syrian economy has achieved stable growth since the late 1980's. In a series of five-year socio-economic development plans, the emphasis has been put on the promotion of basic industries comprising agriculture, manufacturing and exploitation of natural resources so as to sustain steady growth of the Syrian economy.

Infrastructures in Syria, however, are insufficient for the above industrial activities. Hence, it is urgently required to prepare necessary infrastructures, especially port facilities which are essential to support the promotion of manufacturing, the exploitation of natural resources and the export of agricultural products.

At the two principal commercial ports, Latakia and Tartous, situated on the coast of the Mediterranean Sea, some of their facilities are obsolete and there is a shortage of required facilities, causing inefficient cargo-handling operations and consequent longer berthing times of calling vessels. Thus, it is required to urgently prepare necessary port facilities together with the establishment of an efficient cargo-handling system.

Furthermore, along with the progress of the development of manufacturing and the exploitation of natural resources inland, it is also required to construct a new port to import or export bulk cargoes including phosphate rock, iron ore, sulphur, cement, fertilizer and petroleum coke, etc.

Under the above situation, the Government of Syria requested the Government of Japan to conduct a study on the development plans of Latakia Port, Tartous Port and the New Bulk Cargo Port. For the preliminary study and the arrangement of the scope of the study, JICA has sent a preparatory study team to the Syrian Arab Republic and both sides have agreed on the Scope of Work for the Study.

2. Objectives of the Study

The objectives of the study are:

- (1) To formulate a Master Plan for the ports development taking into account roles and functions of the ports for the period up to the year 2010, and
- (2) To conduct a feasibility study on the priority Short-Term projects proposed by the Master Plan.

3. Outline of the Master Plan and the Short-Term Plan

3.1 Port Facilities

Forecast volumes of cargo, main port facilities and construction costs proposed in this study are outlined in the table below:

(1) Latakia Port

Item	Short-Term Plan	Master Plan
1. Target Year	2003	2010
2. Volume of Cargo('000 tons)	6,600	10,800
3. Facility Plan		
3.1 The existing container terminal		
1) Procurement of container gantry cranes and straddle carriers	*	*
2) Construction of terminal office and gate house	*	*
3.2 New grain terminal on the 12-A berth		
1) Procurement of shiploader/unloader	*	*
2) Construction of silos	*	*
3.3 The existing grain terminal		
1) Procurement of shiploader/unloader	*	*
2) Reconstruction of the berth	*	*
3.4 The existing conventional berths		
1) Procurement of portal jib cranes	*	*
3.5 New passenger terminal		
1) Construction of a terminal building	*	*
3.6 New container terminal		
1) Procurement of container gantry cranes and straddle carriers		*
2) Construction of berths and marshaling yard		*
3) Construction of CFS, repair shop, terminal office, gate house		*
3.7 New general cargo berths		
1) Construction of berths		*
2) Procurement of portal jib cranes		*
3.8 Infra-structures		
1) Construction of breakwaters		*
2) Preparation of access channel and basins		*
3) Preparation of access roads and siding railway		*
4. Construction Cost (billion SP)	4.91	13.24

(2) Tartous Port

Item	Short-Term Plan	Master Plan
1. Target Year	2003	2010
2. Volume of Cargo('000 tons)	4,500	7,600
3. Facility Plan		
3.1 Multi-purpose terminal		
1) Procurement of quay-side gantry cranes, rail-mounted transfer cranes	*	*
3.2 New general cargo and Ro-Ro berths		
1) Construction of berths and open yard	*	*
3.3 The existing conventional berths		
1) Procurement of portal jib cranes	*	*
3.4 Conversion of multi-purpose terminal to a full-scale container terminal		
1) Procurement of rail-mounted and tire-mounted transfer cranes		*
2) Construction of terminal office and gate house		*
3.5 Conversion of the existing phosphate terminal to a grain terminal and general and Ro-Ro berths		*
3.6 New passenger terminal		
1) Construction of a terminal building		*
4. Construction Cost (billion SP)	2.02	2.80

(NOTE)

The Master Plan is composed of the two phase plans: Short-Term Plan as the first phase plan and the second phase plan with the term of the years 2004 - 2010.

(3) New Port

Item	Short-Term Plan	Master Plan
1. Target Year	2003	2010
2. Volume of Cargo('000 tons)	7,200	8,100
3. Facility Plan		
3.1 Phosphate terminal		
1) Procurement of shiploaders	*	*
2) Construction of silos		
3) Construction of berths	*	*
3.2 Cement clinker terminal		
1) Procurement of shiploaders	*	*
2) Construction of sheds		
3) Construction of a berth	*	*
3.3 Pellet terminal		
1) Procurement of unloaders, stacker/reclaimers	*	*
2) Construction of storage yard	*	*
3) Construction of a berth	*	*
3.4 Scrap terminal		
1) Procurement of level-ruffing cranes	*	*
2) Construction of storage yard	*	*
3) Construction of a berth	*	*
3.5 Sulphur terminal		
1) Construction of sheds	*	*
2) Construction of a berth	*	*
3.6 Fertilizer terminal		
1) Construction of sheds	*	*
2) Construction of a berth	*	*
3.7 Public berths		
1) Construction of open yard	*	*
2) Construction of berths	*	*
3.8 Infra-structures		
1) Construction of breakwaters	*	*
2) Preparation of access channel and basins	*	*
3) Preparation of access roads and siding railway	*	*
4) Construction of a port office and a repair shop	*	*
4. Construction Cost (billion SP)	19.60	19.60

3.2 Management/Operations and Institutional Matters

The following items on management/operations and institutional matters are proposed.

(1) The Ports of Latakia and Tartous

- 1) Introduction of the closed terminal operation system for the full-scale container terminals to be established
- 2) Adequate control of the number of employees by classification
- 3) Development of human resources in the port companies through both on-the-job-training by competent specialists and basic training in the field of port.

(2) The New Port

- 1) Establishment of a new port company to construct and administrate the new port
- 2) Development of human resources of the port company through both on-the-job-training and basic training.

4. Evaluation of Feasibility of the Short-Term Plan

4.1 Economic Feasibility

Comparisons between the "Without-Project" case and the "With- Project" case were carried out to evaluate the respective feasibility of the projects for development of Latakia Port, Tartous Port and the New Port proposed in the Short-Term Plan from the viewpoint of the national economy of Syria using the economic rate of return (EIRR). The resulting EIRRs of the projects of Latakia Port, Tartous Port and the New Port are estimated as 18.9%, 19.8% and 14.8% respectively, exceeding the general criterion to assess the economic justifiability.

4.2 Financial Feasibility

The financial revenues of the proposed projects are generated from port charges based on the tariff proposed to cover capital investment and operational costs by referring to the current tariff level including that of neighboring ports. The resulting financial rate of return (FIRR) of Latakia Port, Tartous Port and The New Port are estimated as 14.1%, 7.8% and 7.7%. These FIRRs exceed the weighted average interest rates of assumed fund raising plans and hence the proposed projects are considered to be financially feasible.

4.3 Environmental Impacts

As for proposed projects of the existing two ports, Latakia and Tartous, a full EIA are not considered necessary. Monitoring of seawater for heavy metals during dredging is recommended. The planned activities at the new port that may have a significant impact are dust generation and port-related road traffic. The degree of these impacts has been examined and where appropriate mitigation measures have been recommended. Apart from these impacts which can be controlled to acceptable levels there are no environmental reasons against the project proceeding of the new port.

5. Outline of Recommendations

It is recommended that the projects proposed in the above development plans of Latakia Port, Tartous Port and the New Port be implemented to contribute to the Syrian economy. When implementing the projects, it is proposed to take the following measures:

- 1) Both investment in necessary physical facilities and the adequate management and operations through the development of human resources for port employees shall be given emphasis and be implemented simultaneously.
- 2) Considering that the project of the New Port requires a large investment the port project shall proceed deliberately by keeping pace with inland projects for the development of manufacturing or the exploitation of natural resources.
- 3) The appropriate railway connection between the New Port and its potential inland hinterland needs to be studied by the railway side including the necessity of the installation of double tracks.

Members

The study Term personnel are as follows:

Mr. Yugo OTSUKI	Overall Management / Port Development Policy
Mr. Jun SAITO	Port Planning/Environmental consideration
Mr. Hisafumi ISHIKAWA	Demand Forecast (1) / Economic Analysis
Mr. Makoto OWADA	Demand Forecast (2)
Mr. Tetsuro ICHISE	Management and Operation/Financial Analysis
Mr. Tomoo AMANO	Cargo Handling System
Mr. Fujio SAIGUSA	Port Facility Design
Mr. Toshio SHIBAO	Machine Equipment
Mr. Noboru MURAI	Construction Plan / Cost Estimation
Mr. Hiroyuki TAKAKAZE	Natural Conditions Survey
Mr. David G. LEES	Environmental Survey
Mr. Yoshitsugu ISHIKAWA	Interpretation
Mr. Akira KUROSAWA	Interpretation
Ms. Akiko YAMADA	Interpretation
Mr. Kenji KURIYAGAWA	Coordination
Mr. Kazuhiro IWAKI	Coordination

SUMMARY

SUMMARY

Chapter 1 PRESENT CONDITIONS

1.1 Socio-economic Conditions

1.1.1 Population

The population of Syria in 1994 is estimated to be about 13,840,000. The annual population growth rate has remained steady at 3.4% over the past two decades. Among Middle East countries, this growth rate is rather high. The Syrian population can be characterized as being very young. Using intervals of five years, the first three age brackets, 0-14 years, account for 46% of the total population. This trend has been maintained over the past two decades.

There are 14 administrative districts in Syria. In terms of population distributions, the Damascus area which includes both Damascus city and the Damascus rural area has a population of about three million or 22% of the total population, followed by Aleppo (2.9 million), Homs (1.3 million), Hama (1.1 million) and Hassakeh (1.0 million).

1.1.2 GDP

The Syrian GDP amounted to around 110 billion Syrian Pounds (S.P.) in 1993 at constant price of the year 1985, and except for a period of standstill between 1983 and 1989, GDP has grown steadily since 1975. The growth rate of GDP per annum is over 4% on average in the period of 1975-1993, exceeding 10% in the years of 1980, 1988 and 1992.

GDP per capita in the past decade, 1983-1993, was kept mostly on the same level without any growth, presumably due to a considerably high population growth rate of 3.4% per annum on average, and economic stagnation up to 1989.

As to GDP by sector, the product of the mining and manufacturing sector in 1993 accounts for 28.1% of the total GDP, followed by the agriculture sector (20.6%) and the commerce sector (19.1%). The mining and manufacturing sector has been gradually increasing its share since the start of the petroleum production at Deir-ez-Zor in around 1987. On the other hand, the share of the agriculture sector has maintained a level of slightly more or less than 20% in the past decade depending on whether it was a good or bad harvest year.

Table 1.1.2-1 Main Economic Indicators

Year	GDP at 1985 Constant Price (Million SP)	Population (,000)	GDP per Capita (SP)
1983	81,758	9,611	8,507
1988	91,313	11,338	8,054
1990	89,485	12,116	7,386
1993	110,151	13,393	8,225

Source: STATISTICAL ABSTRACT

Table 1.1.2-2 GDP by Sector at 1985 Constant Price

(Unit: Million SP)

Year	Agricul.	Mining & Manufact.	Construct.	Wholesale	Transport	Finance	Personal Service	Government service	Non-profit Service
1988	18,021	11,518	4,615	18,949	7,338	4,896	2,279	14,091	51
1990	17,891	26,434	2,257	16,032	9,436	3,974	1,315	12,063	83
1993	22,723	30,969	2,906	21,051	11,745	4,847	1,659	14,143	108

Source: STATISTICAL ABSTRACT

1.1.3 Foreign Trade

The value of exports and imports in 1993 is about 35 billion SP and 46 billion SP respectively.

In 1989 the value of exports exceeded that of imports for the first time in 30 years owing to a sharp increase in income earned from petroleum export.

In 1987, Syrian Pound was depreciated by around one third from the former value in terms of the exchange rate between S.P. and US\$, resulting in a large gap between the statistics in 1989 and the preceding year.

As to commodity-wise share in trade value, in export, petroleum comprising crude and refined oils has the largest share accounting for two thirds of the total exports in 1993, followed by foodstuffs including vegetables and fruits, textile materials including cotton and clothing accessories. On the other hand, in import, the major commodities are machinery, vehicles, foodstuffs, iron/steel products, fibers/textile and chemical products

Table 1.1.3-1 External trade of Syria

(Unit: Million SP)

Year	Total	Export (FOB)	Import (CIF)	Balance
1989	57,284	33,740	23,544	10,196
1990	74,218	47,282	26,936	20,346
1991	69,570	38,504	31,066	7,438
1992	73,898	34,720	39,178	-4,458
1993	81,787	35,318	46,469	-11,151

Source: STATISTICAL ABSTRACT

1.1.4 Industry

(1) Agriculture

The land of Syrian Arab Republic is 185,200 sq.km. Steppes and forests account for 47.5% of the total land. Cultivable land excluding rocky lands and deserts amount to one third of the total area. The districts of Aleppo, AL-Hassakeh and AL-Rakka located north of Syria have spacious cultivable land.

Irrigation has not yet been well extended over Syria. In 1993 only one million hectares, less than 20% of the total cultivated land of five million hectares excluding fallow, were irrigated. Nevertheless irrigated land area has increased steadily, especially in recent years.

As to the value of agricultural output, The cereals product has the largest share,

accounting for 20-25% of the total agricultural product since the year 1990, followed by industrial crops such as cotton, fruits such as olives and oranges, milk and meat, accounting for 12-15% each. In addition, the share of vegetables such as tomatoes and potatoes is nearly 10%. As to the yield of major crops in 1993, the volume of wheat was the largest with 3.6 million tons, followed by barley (1.6 million tons), sugar beet (1.2 million tons), cotton (639,000 tons).

(2) Phosphate Rock

As of 1993, the volume of phosphate rock produced in Syria is 931,000 tons and the ninth largest in the world. In 1971 the General Company for Phosphate and Mines was established and it started full-scale production of phosphate rock in the Khneifiss mine with a view to exporting the product. In 1974, the Ash-shirks mine opened.

The volume of phosphate rock product peaked in 1989, amounting to 2,250,000 tons. Since then, product of phosphate rock in Syria has shown a downward trend. A similar trend is seen throughout the world as phosphate trade has been presumably affected by the political and economic chaos in Eastern Europe and Russia triggered by the collapse of the Soviet Union.

(3) Petroleum

From the middle to the end of the 1980's, in the eastern part of the Deir-ez-Zor district, many oil fields such as Thayyem, Omar, etc. were discovered one after another and commercial production started at each field. The petroleum dug out in these fields was a kind of light oil including a little sulphur.

Since then, the volume of crude oil production has steadily increased and in 1994 it amounted to 600,000 barrels/day.

Nowadays a portion of crude oil is refined in the oil refineries in Homs and Baniyas (capacity of each is about 120,000 barrels/day), which is mainly used for domestic consumption, while approximately 60% of total crude oil dug out in Syria, together with the rest of refined oil is exported. The exported petroleum earns valuable foreign currency, accounting for around 70% of the total export value.

(4) Manufacturing

1) Sugar

The volume of sugar consumption per capita in Syria is the fifth largest in the world. The annual volume of sugar consumed in Syria has been 400,000-450,000 tons recently, 40% of which has been refined at sugar factories in Syria, while the rest comes from abroad.

2) Flour

The volume of flour made in Syria has kept the approximately constant level of 1-1.2 million tons per annum in the last decade, while 300,000-400,000 tons of flour

has been imported per annum in the same period.

3) Iron and Steel

In Syria, the consumption volume of iron and steel products per annum has fluctuated widely. In 1993, the consumption volume is roughly estimated to be about 900,000 tons. In Syria, steel products are produced by the General Company of Iron and Steel Products in Hama, producing steel bars of 83,000 tons and pipes of 15,000 tons in 1993.

4) Cement and clinker

The consumption volume of cement in Syria once exceeded 4 million tons in the middle of the 1980's, but fell to the level of three million tons keeping its level until it recovered to the degree of 3.5 million tons in 1993. In 1994 it amounted to 4.4 million tons. From 1988 to 1993 cement and clinker were exported in the range of 150,000-1,000,000 tons per annum and then in 1994 its exports were suspended. There are nine cement factories in Syria and their actual production capacity is around 4.9 million tons in total.

5) Fertilizer

Although fertilizer is essential to Syrian agriculture, there is only one fertilizer factory in Homs, with the result that supply is not sufficient for domestic demand. Thus, a large amount of fertilizer is presently imported.

1.1.5 Economic Policy and Historical Aspects in Syria

Since 1961, socio-economic development plan has been practiced through five year plans.

In the 1970s, that is, the period of the Third and Fourth Five Year Plan, the Syrian economy achieved a considerably high growth rate owing to the oil price boom and the volumes of aid from Arab states.

In the 1980s, that is, the period of the Fifth and Sixth Five Year Plan, the Syrian economy stagnated due to a bad harvest, sharp drop in oil price and decrease in aid from Arab states.

Since the Damascus Declaration in March 1991, the amount of aid from the Arab states such as Kuwait Fund and Saudi fund has been increased, having a favorable influence on the Syrian economy. Since the beginning of the 1990s, the Syrian economy has shown a steady growth owing to the economic liberalization policy, smooth oil export, increase in aid from the Arab states and abundant harvests.

Especially in 1991, Law No 10 for the Encouragement of Investment was promulgated to promote productive investment by both foreign and domestic investors with a wide range of incentives including tax exemptions and regulatory privileges, to generate an economic growth, create employment, raise exports and contribute to import substitution.

1.2 Natural Conditions

1.2.1 Geographic Conditions

Latakia port located at 183km south-west from Aleppo is serving as the main port in northern Syria. Tartous port is located 96km from Homs, 251km from Damascus. New port is planned between Arab Asshati and Shaikh Jabil. The distance from Tartous to New Port is approximately 26km.

1.2.2 Meteorological Conditions

Meteorological conditions of Latakia, Tartous and New port area are almost same conditions. From May to August, dry season, south-west wind is predominant and from October to February, rainy season, north-east wind is predominant.

1.2.3 Oceanographic Conditions

(1) Wave

Design wave of existing breakwaters of Latakia and Tartous port is 7.0m. In 1968, 9.5 height's wave attacked Latakia port and destructed the breakwater. Predominant wave direction is south-west.

(2) Current

Due to the small amplitude of tide fluctuation, no significant current movement which may cause difficulties of maneuvering exists. Under the stormy conditions, the speed of current reaches 1.0m/sec.

(3) Water Depth

In Latakia port, maintenance dredging whose frequencies is once per 5 years is conducted. The sedimented materials discharge to the port from the town. In Tartous port, no siltations seem to occur.

At new port area, bathymetric survey was carried out in May 1995. The sounding map is shown in Fig. 1.2.4-1.

1.2.4 Geological Conditions

In Latakia port, 169 numbers of borings were carried out. In Tartous port, 41 numbers of borings were carried out. At new port area, 3 borings were carried out in December 1995. Their boring logs are shown in Fig. 1.2.4-1. According to the results, rock is found in comparatively shallow surface.

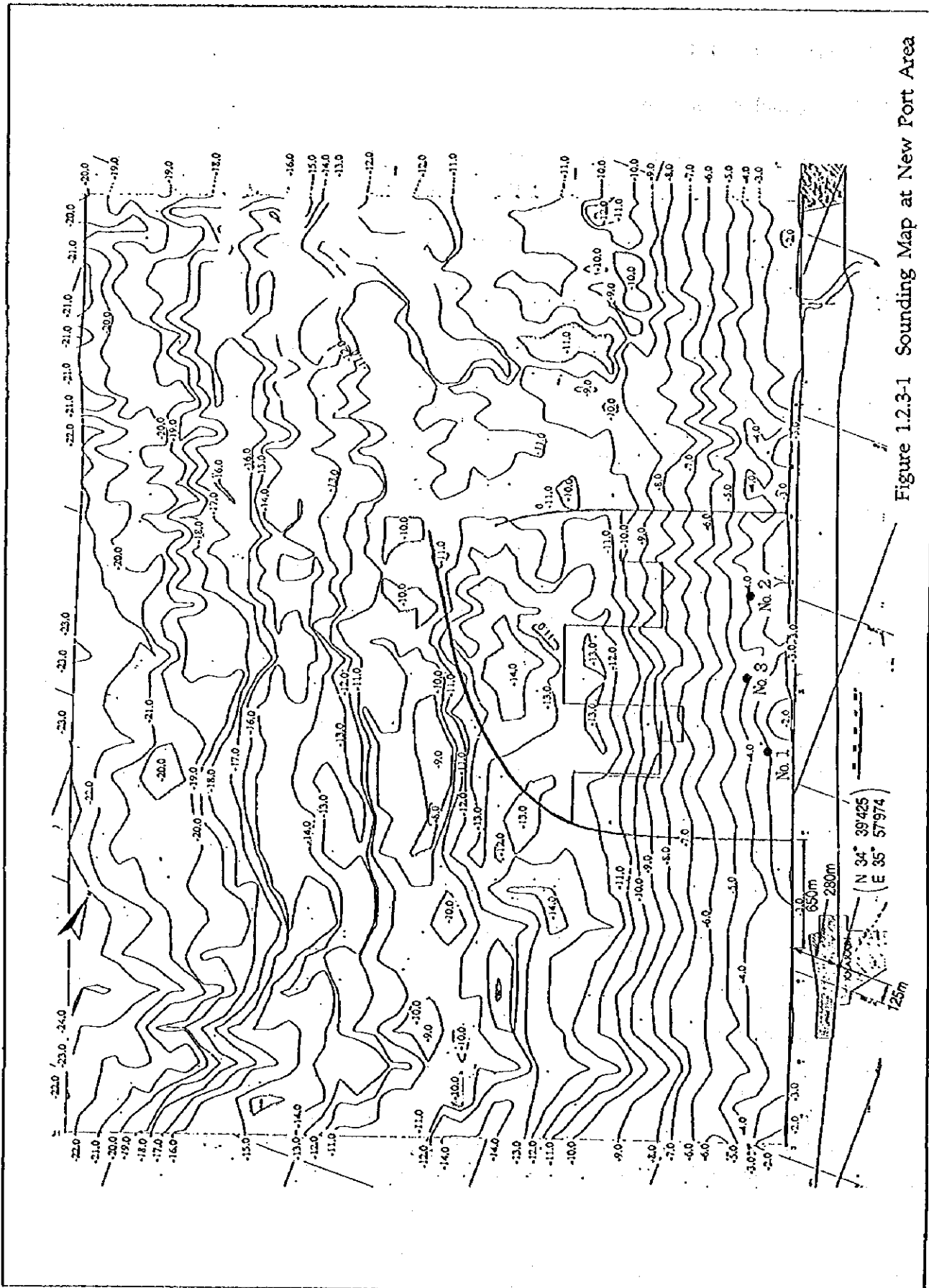
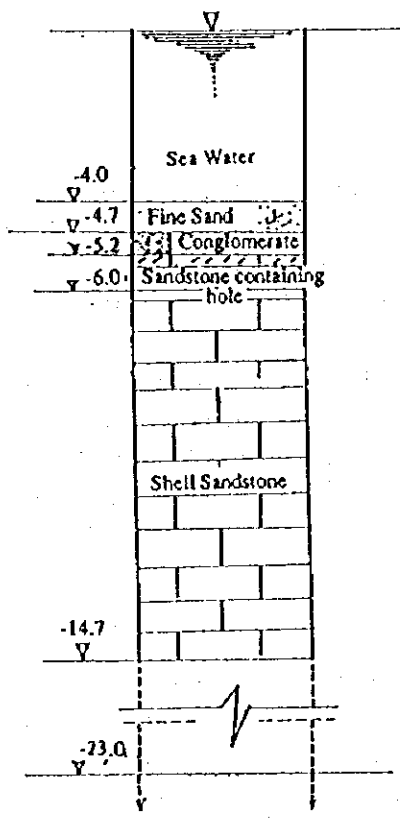
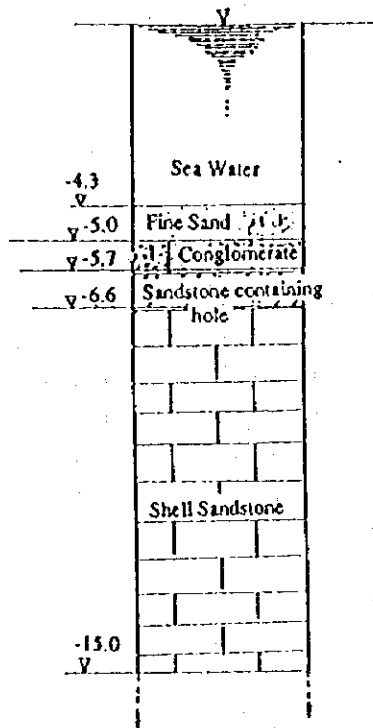


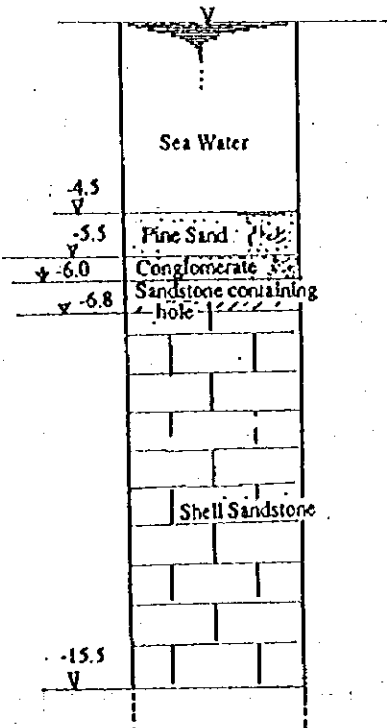
Figure 1.2.3-1 Sounding Map at New Port Area



Boring No.-1



Boring No.-2



Boring No.-3

Figure 1.2.4-1 Boring Logs

1.3 Transport Systems

1.3.1 Ports in Syria

In Syria, the two principal ports, Latakia and Tartous are situated on the coast facing the Mediterranean Sea. They are commercial ports open for public use serving for ocean-going vessels from/onto which various kinds of foreign trade cargoes such as container cargo, break-bulk cargo and dry bulk cargo are discharged/loaded. The two ports are administrated and operated by the state-owned port companies, Latakia Port General Company and Tartous Port General Company, respectively, under the jurisdiction of the Ministry of Transport. Additionally, the three petroleum marine terminals are situated in Baniyas, Tartous and Latakia, respectively, which are administrated and operated by Syrian Arab Distribution Company of Petroleum

1.3.2 Roads

Total length of roads in 1993 is 36,377 km and has been remarkably increasing, especially paved roads. Even since 1985, length of asphalted roads has been increased 600-800 km annually. As a result, paved roads account for 94% of the total in 1993. In the western area where population and main industries are concentrated, the highway network connected between main cities is almost completed excluding the route between Latakia and Aleppo. Most main roads except for highway are two-lane paved roads.

1.3.3 Railways

Railways in Syria are constructed by the General Company for Railway Construction and operated by the General Organization for Railway. Total Length of railway is 2342 km (1993) of which 327 km is narrow gauge. From 1985 to 1993, total extension of 330 km was realized for a 20% overall increase. Narrow gauge line is distributed in the south of Damascus. All lines are single-track.

The total cargo volume carried by railway in 1993 is 3.9 million tons, and passenger number is 3 million. The total volume has been decreasing in recent 5 years. The cargo volume in 1993 fell by 9%. The major commodities are fuels, phosphate, cement/sand and cereals. These commodities account for more than 80 % of all railway cargoes. Phosphate, sand and imported cargo decreased drastically, while cement, flour wood/iron have been increasing. The number of passengers has also fallen in recent years. The total number fell by 13% between 1991 and 1992, and by 26% in 1993.

1.3.4 Airport

There are five airports in Syria for civil aviation use. The number of passengers and volume of cargoes passing through these airports in 1993 is about 1,580,000

persons and 2,800 tons respectively.

Damascus Airport is an international airport, and large number of passengers and volume of cargoes pass through it. Aleppo Airport which is located in the main city of the northern part of Syria is also used to a certain extent. The other three airports are sparingly used.

1.4 Present Conditions of Latakia Port

1.4.1 Port Facilities

(1) Port Limits

The land areas which are used for the port activities are owned by the Latakia Port Company. This area spans around 6 km from the north to south along the shore line.

In Syria, sea and shore line belong to the country in principle. But, the port facilities such as approach channel and water basin etc. are administrated and maintained by the Port Company. At Latakia Port, water areas designated as the port facilities consist of approach channel, turning basin and anchorage basin. Water areas designated as the port facilities are administrated and operated by the Port Company. Navigation is controlled by Harbor Master except in emergency cases.

In general, development of port facilities both on land and off shore is planned by the ministry of transportation, and these facilities are constructed and maintained by the Port Company.

(2) Infrastructures

Latakia Port consists of Inner Port Area, Old Port Area and 1st Stage Area. Originally, Inner Port Area had its facilities only within the small bay, thus its use was restricted to small ships. In 1952, after the establishment of the Latakia Port Company, development of Old Port Area was planned and the breakwater (1,400m), water areas and deep-water quays (-9.5m) were constructed. This is the origin of the modern Latakia Port.

1st Stage Area was expanded from the Old Port Area, with further extension of breakwater (1,730m), expansion of the port area by reclamation, deep-water quays (-13.3m) and construction of the container terminal. Main facilities are summarized as follows.

Table 1.4.1-2 Summary of Main Facilities at Latakia Port

Facilities	Inner Port Area	Old Port Area	1st Stage Area
Breakwater	-	1,400 m	1,730 m
Quay: General Cargo	270 m	630 m	1,566 m
Grain	-	185 m	-
Container	-	-	584 m
Passenger	-	240 m	-
Small Boats (less than -5m)	805 m	-	-
Warehouses, Transit Sheds	22,304 m ²	74,156 m ²	34,440 m ²
Open Yard, Container Yard	41,000 m ²	96,500 m ²	240,000 m ²

(3) Cargo Handling Equipment

1) Existing Cargo Handling Equipment

The general cargo handling from/to ship at the conventional cargo berths is carried out by the quay side cranes in combination with ship gears. The cargo handling at the apron and/or open yard is carried out by mobile cranes in combination with trailer because the pallet system has hardly introduced yet. The container handling from/to ship at container berths is carried out by ship cranes because of no container crane and the handling at yard is mainly carried out by straddle carriers.

A) Quay side cranes

Thirty three(33) quay side cranes for general cargo has been arranged on each conventional berth. However, eleven cranes(11) of them are very old(1957 procured) and their conditions are not sufficient. Then they will have to be replaced as soon as possible.

B) Other handling equipment

Seven(7) straddle carriers, two(2) top lifters and four(4) large forklift trucks has been arranged for container handling at container yard.

Fifty eight(58) mobile cranes for general cargo handling are owned by the port but they are very old (their average age is about eighteen(18) years old) and approximately one third (35%) of them are not workable.

Seventy five (75) small forklift trucks are owned but also they are very old (average twelve(12) years old) and about 40% of them are not workable.

C) Actual working days(hours)

The statistics for all the equipment was not available but according to some (available) data, the actual working days of the workable equipment are high and especially that of container handling equipment are very high (the average working hours of the straddle carriers are 3647 hours per year).

D) Brokendown days

The statistics for all the equipment was not available. Judging from some statistics which were given, the brokendown days per year of some equipment are very long due to old aged equipment and shortage of spare parts.

2) Maintenance

A) Maintenance Shop

There is a maintenance shop which belong to Technical Management and there are forty (40) engineers and one hundred and sixty(160) workers in the shop and many machinery for maintenance have been arranged in the shop.

B) maintenance system

Periodical oiling, greasing and replacement are systematically carried out. However

there are no preventive maintenance system at this port. So all the equipment is used without any maintenance until it breaks down.

C) Spare parts

At first, a two year supply of required spare parts is procured with equipment and about 39,000 items of spare parts are stored at present.

1.4.2 Port Activities

(1) Cargo Traffic

The volume of cargo handled in Latakia Port has fluctuated according to the prosperity or stagnation of the Syrian economy. In the first half of the 1980s, handling cargo volume decreased sharply due to the stagnation of the Syrian economy but since then has increased steadily along with the recovery of the Syrian economy.

Total handling cargo volume in 1994 was about three million tons, recovering the peak level of 1981. Container cargo volume in 1994 was about 1,250,000 tons.

The transit cargo volume excluding the internal cargo which had reached to about 580,000 tons in 1981 decreased rapidly after that and has varied within 10,000 tons since the latter half of the 1980s.

Major cargoes among export commodities are grain and cotton. Most of other export cargoes are agricultural products, foodstuffs and textiles.

Major cargoes among import commodities are fertilizer & chemicals, iron & steel, machine & equipment, grain and foodstuffs.

(2) Vessels

Number of calling vessels in 1994 was 1,259, an increase of 1.5% over the previous year. Number of calling vessels has been increasing since 1990. In 1994, the greatest number of vessels called in spring. More than 30% of the vessels are under 1,000 DWT.

(3) Berth Occupancy Rates

The berths of Latakia Port are located in three areas, Old Port, New Port including Container Terminal, and Passenger Terminal.

As for Berth Occupancy Condition, both waiting period and mooring period are longer in the new port area. Among the vessels berthing in the new port, container vessels recorded the shortest mooring period. Berth occupancy rate is high in the passenger terminal and low in the silo and container terminal.

Table 1.4.2-1 Berth Occupancy Condition

AREA	No. of Vessels	Average Waiting	Average Mooring	No. of Berth	Berth Occupancy Rate
Old Port (Silo)	257 (39)	1.70day (3.15)	2.30day (3.02)	4	40.5 %
New Port	543	1.84	3.05	11	41.3
Passenger	262	3.15	1.67	2	59.8
Container	290	0.69	1.09	3	28.7
Average	1100	1.6	2.52	17	43.3

Note : "Silo" means vessels from which grain is carried into the silo. "Container" means container or semi-container vessels that moor in the New Port.

(4) Cargo Handling Productivities

Commodity-wise cargo handling productivities per vessel are calculated by using the records of berthing vessels and cargo handling operations.

The resulting average cargo handling productivities by commodity are described in Table 1.4.2-2.

Table 1.4.2-2 Cargo Handling Productivities of Major Cargo

COMMODITY	TOTAL VOLUME (ton)	TOTAL MOORING PERIOD(day)	AVERAGE CARGO HANDLING PRODUCTIVITY
General	618,196	759.63	33.91 t/hr
Maize	160,407	107.25	62.32
Steel	155,827	309.13	21.00
Flour	140,145	70.88	82.38
Wood	72,025	282.08	10.64
Container	101,427*	316.10	10.05*
Rice	48,927	112.00	18.20
Sugar	45,000	59.42	31.56
Banana	34,888	57.62	25.23
Cotton	21,558	48.33	18.59
Lentil	17,109	77.37	9.21
Chemical	14,369	28.67	20.88
Cement	6,455	21.08	12.76
Machines	3,912	9.71	17.04
Equipment	3,684	13.33	11.52
Car	3,097	31.04	4.16

Note: Commodities included in the table include only that are carried solely by vessels.
Volume and Productivity of container are measured in TEUs and boxes respectively.

1.4.3 Cargo-Handling System

1.4.3.1 Container-Handling

In Latakia Port, import containers are unloaded from ship to aprons or directly to trailers by using ship's cranes, mobile cranes or floating crane. In the former case, containers are loaded onto trailers or shifted to the place for switching container to straddle carriers by using forklift trucks. Then, those containers are handled by trailers or straddle carriers and then are stacked on the right position within the marshaling yards for storage. In the latter case, containers are handled to the back side marshaling yard by trailers and then lifted off by forklifts or straddle carriers.

As to export, container movements within the container yard are vice-versa.

Almost all containers are stored at container yard after unloading from ships. The storage period of container boxes at container yard from unloading to loading is as follows:

- About 30% of unloading containers: approximately 30 days
- About 70% of unloading containers: approximately 45 days

Seventy-five percent of unloaded container cargoes are un-stuffed at the yard. Fifteen percent of unloaded container cargoes is stored in sheds. Five percents of unloaded container cargoes are transported to consignee by container trailer after the customs clearance.

Almost all empty containers are stored at the container yards.

The export container cargoes are stored approximately one week at the container yard after being stuffed into containers. Then, the containers are loaded onto ships.

Official cargo handling time of container cargo is from 07:00 hrs. to 15:00 hrs. for the first shift, from 15:00 hrs. to 23:00 hrs. for the second shift and from 23:00 hrs. to 07:00 hrs. for the third shift.

1.4.3.2 Handling of Conventional Cargo

Cargo handling of conventional cargoes except bulk cargo for import between a vessel and a quay is done by quay cranes or ship's cranes in general. There are four receiving method for conventional cargoes unloaded at the quay.

- 1) Cargoes are unloaded from a ship on to apron.
- 2) Cargoes are unloaded directly from a ship on to 2nd or 3rd floor of warehouses by quay cranes.
- 3) Cargoes are unloaded from a ship on to trucks at an apron.
- 4) Cargoes are unloaded from a ship to wagons at an apron.

Some portion of bagged cargo, heavy and long cargo are directly loaded on to trucks or railway wagons from a ship.

Official cargo handling time of conventional cargo at Latakia port is from 7 o'clock in the morning to 3 o'clock in the afternoon for the first shift and from 3 o'clock to 11 o'clock in the evening for the second shift. But, according to the observation, actual cargo handling time of these cargoes at Latakia port is from 8 or 8.15 to 2.15 or 2.30 and from 3 or 3.15 to 6 or 7 in general.

1.4.3.3 Grain Handling

The total storage capacity of the silo is about 35,000 tons. There are three receiving lines on land side whose capacity is 100 tons per hour per line. The loading facilities from silo to ship have two lines whose capacity is 150 tons per hour per line.

The import silo-cargo does not directly enter the silo. The import cargo is unloaded to lorries by the portable unloader. The cargo is then transported to the dumper at the silo facilities.

1.4.4 Port Services

(1) Pilotage/Tug services

The port is equipped with 4 tug boats and 12 pilot/general service boats. However most of them are very old (about 24 years of age on average)

1.5 Present Conditions of Tartous Port

1.5.1 Port Facilities

(1) Port Limits

Port administration system of Tartous Port is the same as Latakia ports. (see, 1.4.1) The land area administrated by the Tartous Port Company between the basins and the existing shore line amounts to about 750,000 m²; total available land area including piers is 1,100,000 m². The total water area is 1,300,000 m².

(2) Infrastructures

Tartous Port was planned as an all-weather deep-water port with breakwaters, approach channel, and turning basin for large ships as well as small ships.

The most important point to be considered when planning the Tartous Port is to avoid as far as in any way possible dredging in rock, due to the very high construction cost for such dredging. At Tartous Port, sufficient water depths in the different basins could be secured without costly dredging.

The rock surface at the Port is sloping from east to west; i.e. from shore to sea; it is therefore natural to design the basins and quay walls with less depth at their eastern ends close to the shore than at their western and other ends.

The main direction of the piers and basins is chosen parallel to the sub-breakwater, mainly in order to obtain the most favorable conditions with regard to sheltering of the basins against wave penetration.

Tartous Port consists of bulk terminal, Pier A, Pier B, Pier C and inner area.

Following the construction of breakwaters, phosphate pier and southern quays of Pier A were constructed up to 1968. Tartous Port has since been developed in accordance with the increase of port cargo. Cargo handling volume of Tartous Port amounts to 3.5 million tons of 1993.

Tartous Port plays a roll of large Mediterranean port for international shipping with sufficient water depth and quay length.

(3) Cargo Handling Equipment

1) Existing Handling Equipment

Most of the general cargoes handled at the port are not yet palletized. The general cargo handling from/to ship at pier A is carried out by quay side cranes in combination with ship gears and the handling at pier B is carried out by mobile tower cranes in combination with ship gears. The container handling from/to ship is carried out by ship gears or floating crane.

A grain terminal equipped with loaders cum unloader, silo and others related equipment is located on pier A. Furthermore A phosphate terminal equipped with loaders, silo and related equipment is located at the port.

A) Quay side cranes

Seventeen(17) quay side cranes(portal jib cranes) have been arranged at pier A and some of them are very old(1968 procured).

B) Other handling equipment

Three(3) straddle carriers, three(3) large forklift trucks have been arranged for container handling. Nine(9) mobile tower cranes, fifty-five(55) mobile cranes, sixty(60) forklift trucks and others minor handling equipment have been arranged for general cargo handling.

Most of them are very old and their average age is about 18 years old.

C) Actual working days(hours)

The actual working hours of the portal jib cranes(sixteen cranes average 1,700 hours /year), mobile tower cranes(seven cranes average 1,800 hours), straddle carriers(three carriers average 1,900 hours) are very high.

On the other hand, mobile cranes(forty-four average 450 hours) and small forklift trucks(fifty average 470 hours) are very low.

D) Breakdown days

The breakdown days per year of some equipment are very long due to old aged equipment and shortage of spare parts.

2) Maintenance

A) Maintenance Shop

There is a maintenance shop which belong to Technical Management and there are thirty-four engineers (34) and two hundred and eighty three(283) workers work in the shop and some machinery for maintenance have been arranged in the shop.

B) Maintenance system

According to the interview, a preventive maintenance has been carried out. But it seems to be insufficient because the conditions of the existing equipment is not sufficient.

1.5.2 Port Activities

(1) Cargo Traffic

The share of bulk cargo volume in the total cargo volume handled of Tartous Port is high comparing with that of Latakia Port. In the first half of the 1980s, handling cargo volume decreased sharply due to the stagnation of the Syrian economy except for a lot of import of grain in 1984 due to a poor harvest. And then, import cargo volume has increased steadily until now along with the recovery of the Syrian economy while export cargo volume has been influenced by the activities of phosphate and cement industry and has decreased since 1989. Total handling cargo volume and container cargo volume in 1994 was about 3,600,000 tons, 170,000 tons respectively.

The transit cargo volume which had reached to about 890,000 tons in 1981 has decreased rapidly after that and has varied with about 100,000 tons recently.

Major cargoes among export commodities are phosphate rock and cement & clinker. Most of other export cargoes are grain, foodstuffs and textiles like those of Latakia Port.

Major cargoes among import commodities are grain, iron & steel, fertilizer & chemicals, foodstuffs and sugar.

(2) Vessels Calling to Tartous Port

Number of calling vessels in 1994 was 1,707, an increase of 2% over the previous year. The number of calling vessels has been increasing since 1989. In 1994, spring was the peak season for vessels calls Fifty-eight percent of vessels are under 1,000 DWT, while 2.9% are over 10,000 DWT.

(3) Berth Occupancy Rates

According to vessel records, the berths of Tartous Port are numbered off from 1 to 22. Both average waiting period and average mooring period are longest in berth Nos 12, 13 and 14. Berth Nos 16 and 17 recorded the lowest waiting and mooring period. Berth occupancy rate of No 9 and 17 are extremely high. (see Table 1.5.2-1)

Table 1.5.2-1 Berth Occupancy Condition

Quay No	No. of Vessels	Average Waiting	Average Mooring	No of Berth	Berth Occupancy Rate
4	73	2.27 day	3.29	3	43.5 %
7	82	3.39	3.52	3	52.4
9	171	2.88	2.95	3	91.5
12	67	4.22	3.79	3	46.0
13+14	79	3.72	4.52	4	48.5
16	70	0.53	2.27	2	43.2
17	51	0.45	2.63	1	72.8
18	28	2.93	2.21	1	33.7
19	13	1.0	1.69	1	11.9
TOTAL	634	2.62	3.18	21	52.3

Note: Quay No.13 and 14 are considered as one quay because vessel records of mooring place between these two berths is not clear.

No. of Berth is decided considering actual number of vessels that moor at the berths.

(4) Cargo Handling Productivities

Commodity-wise cargo handling productivities per vessel are calculated by using the records of berthing vessels and cargo handling operations.

The Resulting average cargo handling productivities by commodity are described in Table 1.5.2-2.

Table 1.5.2-2 Cargo Handling Productivities of Major Cargoes

COMMODITY	VOLUME (ton)	TOTAL MOORING PERIOD(day)	CARGO HANDLING PRODUCTIVITY (ton/hour)
Phosphate	257,017	86	124.52
Steel	178,988	359	20.77
General	170,586	487	14.59
Container	83,680	66	52.83 (4.9Box)
Maize	83,184	24	144.42
Sugar	76,812	105	30.48
Flour	62,136	38	68.13
Animals	59,359	519	4.77
Car	22,877	50	19.06
Chemical	21,248	37	23.93
Rice	16,792	45	15.71
Wood	5,878	23	10.65
Cotton	4,100	12	14.24
Plastic	2,882	25	4.80
Cement	1,720	5	14.33

1.5.3 Cargo Handling System

1.5.3.1 Container-Handling

All of the container cargoes are handled by ship's cranes or mobil tower cranes.

Import containers are unloaded from ship to trailers or from ship to the apron. Then, the containers are moved to container yard by trailers or large forklift.

The straddle carrier system has been adopted at container yard. There is no mark of slots in the yard. The location of storage containers is decided by Chief of yard according to the zoning by the group of shipping lines.

All of the unloaded container boxes are stored at the container yard in the port. The average period of storage for container boxes at the container yard from the time of unloading is from 50 days to 60 days. In general, unloaded empty containers do not go outside the port until they are loaded to ship.

Fifty-five percent of import container cargoes are unstuffed at the container yard, and then transported to consignees. Almost all of the remainder is transported to the transit shed for import container cargo after being un-stuffed from container-boxes at the yard.

Almost all export container cargoes are stuffed in container boxes at the container yard in the port. After stuffing, the containers are stored about 10 days on average at the container yard.

Official cargo handling time of container cargo at Tartous Port is the same as at Latakia port.

1.5.3.2 Handling of Conventional Cargo

(1) Cargo Flow

The cargo handling of conventional import cargoes (except bulk cargo) between vessel and quay is done by quay cranes or ship's cranes in general. There are basically three receiving methods used to unload the conventional cargoes at the quay: 1)The unloading cargoes are handled from ship to apron. 2)The unloading cargoes are handled from ship to trucks at the apron. 3)The unloading cargoes are handled from ship to wagons at the apron. The main packing styles of the receiving types 2) and 3) are bagged cargo, heavy cargo(such as iron plates, iron bars, pipes and coils) and long goods (for example logs, lumber and timber).

After cargo handling between ship and quay, the import cargoes are stored inside the port or directly delivered to consignees. The ratios of storage cargo volume/direct delivery cargo volume and storage volume at warehouse/open area for import general cargo except bagged cargo are about 85 percent/15 percent and

35 percent/50 percent, respectively. For import bagged cargo, the ratio of storage cargo volume and direct delivery cargo volume is about 30 percent and 70 percent, respectively. All of the storage bagged cargo is stored at sheds inside the port. The average storage period of general cargo at storage facilities inside the port is about 60 days.

(2) Cargo Handling Time

Official cargo handling time of conventional cargo at Tartous port is the same as at Latakia port.

(3) Cargo Handling for each cargo type

Break bulk cargoes at Tartous port are handled at mainly Pier-A and B.

The heavy cargoes and the long goods are handled mainly at Number 9 berth of Pier-B and Number 12 and 14 berths of Pier-A. The import heavy cargoes and long goods are often directly loaded from the ship to trucks or trailers.

The roll-on/roll-off ships(Ro-Ro ships) are berthed usually at Number 7 at Pier-B. The container cargoes of Ro-Ro ship are handled by the fork-lifts and the trailers.

There are two types of grain-handling. In one system, cargo is handled at grain silo berth in Pier-A. Then, the cargo is sent to the grain silo facility, directly. In the other case, cargo is handled at general cargo berths by grab or portable pneumatic unloader. Then, the cargo is directly delivered to outside the port or the cargo is sent to the grain silo facility in the port by trucks. The total storage capacity of silo is 81,000 tons.

As to land side, the grain silo facilities have two receiving lines, one is for trucks and the other is for wagons. The capacity of the receiving is 8 tons an hour per line. There are two discharging lines, one is for trucks and the other is for wagons; both lines have a capacity of 200 tons an hour. Loading /unloading system for ship side of this facility has one ship loader and two ship unloaders. The capacity is 240 tons per hour for the former and 120 tons an hour per line for the latter.

As to phosphate handling, there are two receiving lines with dumpers from wagons with capacity of 450 tons an hour per line and 22 silo bins(12 old bins and 10 new bins) whose total capacity is 80,000 tons. At this silo facility, there are two ship loaders with total capacity of 1,100-1,300 tons per hour.

1.5.4 Port Services

(1) Pilot/Tug service

The port is equipped with 6 tug boats and 5 pilot/general service boats. However most of them are old, the average age is about 22 years old.

1.6 Condition of Design and Cost Estimate

1.6.1 Design Conditions

(1) Meteorological Conditions

At the Syrian coastal area, predominant wind directions are as follows: in summer, from May to September, South and South-West 29-66%; in winter, from October to March, North-East and East 34-58%. Maximum wind velocity 27m/sec was observed in January 1968 from North and in June 1965 from South-West. (Period of observation 1960-1970)

(2) Tidal Ranges

Tidal ranges based on the average sea level are observed as follows. The sea level is subject to fluctuations caused by tides and wind tides. High water level is +30cm. Low water level is -30cm. According to observations carried on for 10 years, absolute tidal amplitude is 60-80 cm.

(3) Wave Conditions

Wave conditions at Latakia Port and Tartous Port are similar. At the port entrance of Latakia Port, maximum wave parameters are calculated under the south-western wind as follows: Wave height; 6.8m, wave period; 9.5 sec, wave length; 95m. The probability of the occurrence is once in 50 years.

(4) Siltation

Judging from the estimated coastal sand drift volume and the tendency of beach evolution at the neighboring shore line of the Latakia and Tartous Port, the siltation of the port water area can be assumed negligible.

(5) Geological Conditions

Generally speaking sub-soil conditions are somewhat similar at both the ports, with a little more sand and clay covering the rock on average. Rock levels seem to be below around -9m except for the areas near the shore. It appears that the rock surface is sloping towards the sea.

(6) Seismic Conditions

Seismic conditions of the ports in Syria are not defined yet. But, in design of port facilities of Latakia, it is said that the design seismic coefficient 0.03 was adopted in the seismic coefficient method.

1.6.2 Cost Estimate

(1) Workable Days

Workable days per year are assumed to be 265~280 days, or 22~23 days per one month.

(2) Working Hours

Working hours per one day are assumed to be 8 hours except 1 hour rest.

(3) Tax

Import tax for imported construction materials, and equipment mobilized from foreign countries are excluded from cost estimate.

(4) Exchange Rate

1 US\$ = 42 S.P (Syria Pound)

1 US\$ = 100 yen (Japanese Yen)

(5) Foreign Portion / Local Portion

Foreign Portion

- Imported materials, construction equipment.
- Salary allowance for the foreign laborers.
- Engineering Fee

(6) Cost of Utilities

The cost of utilities are calculated based the following ratio against the each direct cost.

Utilities for wharf, yard road : 4 % of each cost

Utilities for container yard : 6 % of cost

Utilities for office and passnger terminal : 8 % of each cost

(7) Others

Price escalation and cost of land acquisition are excluded from the estimate.

(8) Unit Price

Unit price of various items is listed in Table 1.6.2-1.

Table 1.6.2-1 Unit Price

(Unit : L.S.)

Items	Unit	(A)	(B)	(C)	(X)
Labor Unskilled	Daily	-	250.0	225	250
Skilled	Daily	-	400.0	350	400
Crew	Daily	-	2,500.0	-	2,500
Crew (high)	Daily	-	4,000.0	-	4,000
Operator	Daily	-	500.0	400	500
(Heavy Machine)		-			
Material					
Sand	cu.m.	160	400.0	-	200
Crushed Stone	cu.m.	175	350.0	200	200
Stone (10~250 kg)	cu.m.	180	550.0	250	200
Stone (250~2000 kg)	cu.m.	250	600.0	250	250
Stone (2~5 t)	cu.m.	550	700.0	400	550
Ready-Mixed Concrete	cu.m.	1,750	4,000.0	1,500	1,750
Pavement Asphalt	ton	990	1,000.0	1.50/m ²	1,000
Steel Pile	ton	28,000	30,000.0	29,000	28,000
Steel Bar	ton	20,000	20,000.0	18,000	20,000
Steel Sheet Pile	ton	30,000	50,000.0	30,000	30,000
Tetrapod (12 ton)	piece	36,000	4,000.0	-	36,000
Tetrapod (25 ton)	piece	75,000	6,000.0	-	75,000
Prestress Concrete Pile	piece	40,000		40,000	40,000
Regular Gasoline	litter	20.1	20.3	20.3	20
Diesel Oil	litter	5.2	6.0	6.2	6
Heavy Oil	litter	50.3	50.0	50	50
Electricity	kwh	4.35	3.0	3.0	3
Rental Fee					
Bulldozer (20 t class)	Daily	7,814.4	8,000.0	2,000/hr	8,000
Back hoe (1.0 cu.m. class)	Daily	7,814.4	6,000.0	2,000/hr	8,000
Dump Truck (10 t class)	Daily	3,907.2	3,000.0	800/hr	3,000
Truck Shovel (2.2 cu.m.)	Daily	2,931.2	5,000.0	500/hr	3,000
Crawler Crane (25 t class)	Daily	7,814.4	10,000.0	2,000/hr	8,000
Tug Boat (65 hp class)	Daily	9,765.6	10,000.0	-	10,000
Work boat	Daily	5,859.6	5,000.0	-	6,000
Barge (500 t class)	Daily	2,441.4	3,000.0	-	3,000
Floating Crane (100 t class)	Daily	19,431.6	25,000.0	-	20,000
Traffic Boat (15 t class)	Daily	5,859.6	5,000.0	-	5,000
Small Boat (1 t class)	Daily	5,859.6	2,000.0	-	2,000

Note : (A), (B), (C) : Information from three difference sources. (X) Derived Price

1.7 Environmental Conditions

General Environmental Situation in Syria

EIA Capability

In the past responsibility for environmental matters has been fragmented among with several organisations. This situation is being redressed under a current project to establish and strengthen an EIA unit in the Ministry of Environment. The project is supported by the World Bank and the European Investment Bank under the Mediterranean Technical Action Plan.

EIA Procedures

EIAs are carried out in Syria if deemed necessary but no standard format yet applies. It is intended that procedures will be developed by a new EIA unit located within the Engineering Department of the Ministry of Environment.

Environmental Standards and Environmental Law

Industrial pollution discharges are required to comply with the Guidelines of the Arab League and UNEP. There are draft National Standards for Ambient Air Quality and Waste Water Discharge. Standards for Drinking Water apply and are basically the same as WHO standards.

Fresh Water Supply and Quality

At a national level there is a water shortage in Syria. Water is obtained from rivers, lakes, reservoirs, streams, springs, and groundwater. The coastal zone receives more than sufficient water for its needs and so does not currently have a water budget deficit. The interior region is arid and in order to supplement the available water supply recharge dams are planned. Further water may be supplied by the Euphrates dam project.

Waste Water and Water Reuse

Most major cities and towns have a sewerage system in place but no sewage treatment plant. As a result at the coast raw sewage is discharged to the ocean. In the interior raw sewage is removed from the cities and used as irrigation supply water. Complaints have been reported of illness due to consumption of vegetables watered with untreated effluent. Waste water treatment plants are planned for Damascus, Tartous, and Latakia.

Electricity Supply

Power supply is the responsibility of the Ministry of Electricity. The base load demand is supplied by thermal power stations with the peak load supplemented by hydro. The power sector is currently receiving funds under the Global Environmental Facility administered by UNEP/World Bank. This aims to reduce Greenhouse Gas Emissions by reducing fuel consumption.

Coastal Region International Environmental Situation

Under the UN Regional Seas Program the Mediterranean Sea was designated a critical area in 1975 due to high levels of pollution. A strategy was formulated ("Medpol") and implemented by common agreement by the 17 countries bordering the Mediterranean, including Syria. This strategy requires a Coastal Area Management Plan (CAMP) for all countries which consists of 10 components. The main planning document is "Development / Environment: Systemic and Prospective Approach for the Syrian Coastal Region; Mediterranean Action Plan, UNEP, Draft 1994. This is known as the Blue Plan, and represents a fundamental economic planning strategy for the coastal zone. An international concern at the moment is global warming and the potential associated sea level rise.

Coastal Environmental Setting

General

The coastal region of Syria covers 145 kms from the border with Turkey in the north to Hamidié on the border with Lebanon in the south. The region is basically a fertile coastal plain experiencing Mediterranean climate, mild winters and abundant rainfall. This contrasts sharply with the rest of Syria which has extremes of climate and in places is extremely arid. In terms of development potential this gives the region considerable comparative advantage over the rest of the country.

Beaches and Cliffs

Although the coast line is basically flat and straight with no major bays or indentations it does vary considerably over its length. Major features are sandy beaches of narrow width, extensive sand dunes, low rocky cliffs, and steep rocky cliffs. The main sandy beaches in the study area are located south of Latakia, from Tartous to the Lebanon border, and small areas of sandy beaches north and south of Jableh, north of Baniyas and north of Tartous.

Agriculture

The most fertile agricultural soils are found west of the Jableh and Akkari plains. The high rainfall, irrigation and the transport infrastructure allows high agricultural productivity. Main crops are wheat, peanuts, olives, olive oil, citrus fruit, apples, green peppers, tomatoes, cucumbers and egg plant. There is a trend to convert olive groves into plantations for citrus fruits, as these are financially more attractive to the farmer. It is thought that this may encourage soil erosion.

Farming

Farming represents a major source of income for many families supplemented by income from other jobs. Farming takes place on natural soils, on terraces, under greenhouse cover and is assisted by chemical fertilisers and pesticides. Domestic animals and hens are reared.

Silviculture

The government has implemented a longterm afforestation program in the coastal region. This is intended to replace trees lost in forest fires and so avoid soil erosion and landslides, improve timber production, and increase fruit production.

Aesthetics and Visual Impacts

The natural attractions of the coastal area include beaches (although in town areas these are heavily polluted by garbage), natural rock outcrops such as occur near Jableh, the sand dunes south of Latakia, and the white cliffs north of Latakia.

Flora and Fauna

The low areas of the coastal region are characterised by Mediterranean oaks. The higher altitudes north of Latakia are dominated by pines. These have been depleted by forest fires in 1990 and felling for timber. The endemic fauna of the area has long been displaced to the inner hinterland. No significant fauna remain other than domesticated animals.

Historical Sites

The coastal zone has a rich cultural heritage and many historical sites. Several places have been proposed as sites of special historical interest.

Tourism

The Government are exerting efforts to promote tourism, both on an international and regional basis. At the moment tourism has not realised its full potential, although certain large planned developments have been constructed.

Industrial Areas

The main industrial concentration occurs around Baniyas. These include an oil refinery, the oil fired power station, and a large cement plant. There is some small manufacturing industry along the eastern edge of Latakia.

Environmental Conditions at the Ports

In order to establish the existing environmental conditions in the ports, a field survey was carried out on water quality, sediments, air pollution and ecology.

Latakia Port

In general Water Quality was high with clear water. High organic loads were detected which originated from the sewage from the city but dissolved oxygen figures were acceptable. Oil content was high. Sediment samples showed high levels of mercury and arsenic.

Tartous Port

In general water quality was high with clear water. High organic loads were detected which originated from the sewage from the city but dissolved oxygen figures were acceptable. Oil content was high. Sediment samples showed high levels

of mercury and arsenic.

In order to assess air quality, monitoring was carried out at three locations around the port. Measured levels varied from 81 ug/m³ to 788 ug/m³. The standard for air quality based on USEPA requirements is 260ug/m³ for a 24 hour period. The standard based on WHO requirements is 150ug/m³. This indicates that the levels in the port are in excess of the standard.

The phosphate handling conveyor system was built in 1972 with Rumanian assistance. The equipment is not operating as originally intended and much spillage occurs. Also although dust control equipment has been installed it is not working effectively. Large amounts of dust are lost and blown away in the wind, creating nuisance to the inhabitants of Tartous town.

New Port

The coastal area is intensively developed. This includes residential development, tourist hotels and holiday homes, oil loading facilities, and intensive cultivation both in fields and under greenhouses. Also there are many areas which have been designated as restricted areas under the Blue Plan for historical, cultural and ecological reasons and so the sites remaining for location of a new port are restricted. A series of sites were examined from Hamide in the south to Latakia in the north. The coastline between Latakia and the southern border with Lebanon contains many sites of outstanding natural value, historical value, ecological value, and high amenity value to the local residents as well as domestic tourists. Foreign tourism is not so well developed but may become so with time. The only area which is suitable for development of the new port is south of Hamidie.

1.8 Present Management and Operations

1.8.1 Outline of Syrian Ports' Management and Operations

There now exist two Port General Companies of which manage and operate major two commercial ports in Syria. They are statutory organizations, each functioning independently of the other and operated semiautonomously. Agent services rendered to vessels after arranging pratique formalities are carried out by Shipping Agencies Company (SHIPCO) - the exclusive agent in the Syrian Ports. Both of the entities belong to the Ministry of Transport (MOT).

Entering permission into the Syrian ports is one of the duties of the General Directorate of Seaports. Duties of the Directorate extend over not only maritime industries but also navigational safety. The duties are connected with the Ministry of Defence. The Directorate has to perform the duties concerned with maritime navigation, maritime commerce, lighthouses, preparing new projects and making suggestions related with planning & technical affairs of this Directorate.

1.8.2 Port General Company

The General Company of Latakia Port was appointed to exploit Latakia Port by the legislative Act No.97 dated October 4, 1953. The General Company of Tartous Port was established by the legislative Act No.314 dated December 16, 1969. General objectives of the two Companies are to make a plan to develop each Port and implement operations ('exploit'), financing, and maintenance of port facilities. An integrated program for the planning, development, and policy formulation of the two Ports is made by each of the Port Management Committees. The Committees are convened as the need arises and decision-making shall be made after consultation with the members.

(1) The General Company of Latakia Port

1) Organization

Policies are implemented by the Director General as the Chief Executive Officer and 9 line Directorates and 2 line Divisions.

2) Personnel

There are 2,631 employees at the Port Company as of April, 1994. Mandatory retirement age is sixty. However, a person may be granted an extension of five years if he is highly capable.

(2) The General Company of Tartous Port

1) Organization

Policies are implemented by the Director General as the Chief Executive Officer and 10 line Directorates.

2) Personnel at the Tartous General Port Company

There are 2,927 employees at the Port Company in 1994.

Mandatory retirement system is same as the General Company of Latakia Port

1.8.3 Trade Union

Four single Unions combine to form Port's Trade Union. Representatives of the Union take part in the Management Committee of the Port. The Union is, in a sense, a closed shop system. Therefore every worker is a member of the Union. The Port's Trade Union belongs to Prefectural Trade Union Association, which is one of the members of Syrian Trade Union Association.

1.8.4 Existing Port Operations

1.8.4.1 Berth Assignment

Both Ports are operated under a 'common use' policy. Berthing priority is granted to vessels owned and operated by 1) Container Ship, 2) Ro-Ro Ship, 3) Ship Carrying Animals, and 4) Ship Carrying Fruits.

(Berthing Procedure)

(1) Pre-arrival

SHIPCO files Notice of Arrival and Application for Berth, including the preparation of local Cargo Manifest, to the Exploitation Department through the Harbor Master. Berth assignment meeting is held everyday twice. Decision of the assignment shall be made by the mutual consent of the members.

(2) Arrival

The vessel stays at Quarantine for Quarantine clearance. After that, other parties concerned get on board the vessel to finish formalities. Vessels are docking under the Harbor Master (General Directorate of Seaports).

1.8.4.2 Pilotage

Pilotage is compulsory. Vessels not exceeding 10 meters length are exempt from the compulsory pilotage and towage operations. Pilotage service in the Ports provided by the pilotage division of the Companies is operated in 3 shifts. The number of pilots to be appointed into service is currently 10 persons (all 1st grade) in Latakia Port and 6 persons (5 pilots 1st grade, one pilot 3rd grade) in Tartous Port. Pilotage License is endowed by the Harbor Master, being graded from 3rd to 1st rank.

1.8.4.3 Working Conditions

Conditions for workers of the Ports are based on the Fundamental Law which is called 'Unified Work Law'. This Law is applied for all the Syrian workers of the Ministries and Government Offices and Government-owned Companies.

(1) Working time of the Port

- 1) Administrative, Clerical Sections other than Production and Production Service Sections 6.5 hours a day
- 2) Cargo Handling Sections Production and Production Service Sections 2 shifts 8 hours a day
- 3) Pilotage Sections, Guards and Workers for power plant 3 shifts 8 hours a day (No closed day for services)

1.8.4.4 Computerization in the Ports

The Port Companies and SHIPCO are embarking on computerization programs. (Port Companies / Total System, SHIPCO / Management System)

(1) General Company of the Tartous Port

This system was decided through bidding. The evaluations of the tenders were based on the criteria which is 50% technical points and 50% price points. In this plan, every department will have at least one terminal and 30 terminals will be erected totally.

(2) General Company of the Latakia Port

The General Company of the Latakia Port has just formed its computer system concept. This Study was evaluated by the Port Co. which pointed out several difficulties for execution. The main obstacle pointed out by the Port Company is the lack of technically educated personnel required to control such a system.

1.8.5 Port Finance

1.8.5.1 General

The budget plans of the Ports are brought up for discussion at SPC via MOT. After completing this assessment, the budget plans are introduced in the Prime Minister's Office and approved finally.

On the occasion of expansion of the Port, renovating the Port's facilities or constructing new buildings, Port Companies finance the needed money out of the

General Monetary Fund which belongs to the Ministry of Finance. Interests of the loan is 9%. Port Company can not get a foreign loan independently but through the General Monetary Fund.

Port Companies pay 45% of the annual net income (in the case of more than 200 thousands Syrian Pounds) as income tax. And net income after tax of the Ports is collected by the Fund.

1.8.5.2 Tariffs

Tariff modification is carried out considering the following points :

- (1) The cost per ton
- (2) Setting rates to cover the expenses and make profits
- (3) Comparing the proposed rates with those applicable in Arab and foreign ports so that they are less than the rates in other ports

Modification proposal is presented to the MOT, and then being adopted, it will be submitted to the Economic Committee in the Cabinet. After being approved by the Committee, the new Tariff is issued.

However when it needs to be raised or decreased, the board of directors of the Latakia Port Company and the Administrative Commission of the Tartous Port Company are empowered to do so when such changes on the whole or in part do not exceed 25 %.

1.8.5.3 Financial situation

With the increase of the cargo volume, the revenues from operations of the General Company of Latakia Port in 1994 amounted to 482 million SP and that of the General Company of Tartous Port amounted to 453 million SP, both of which represent increase of more than 300% in 4 years. However, due to the total increase of the operating expenses, both of Working ratio and Operating ratio other than in the year of 1994 of Latakia Port are still not within the maximum requirement of 50-60% and 70-75%. However the net fixed assets did not increase very much.

Rate of Return on Net Fixed Assets which relates to operating profits with operating fixed assets were all below the minimum requirement of 7%.

In addition, Personnel Costs are considerably high.

Chapter 2 MASTER PLAN

2.1 Socio-economic Framework

As to the population forecast, taking account of the forecast figures by the authorities concerned of the Government of Syria and the interviews with them, the average population growth rate of 3% per annum towards the year 2010 is adopted.

As to the prospects of the growth rate of GDP in the future, taking account of the actual upward trend of GDP and the target growth rate of GDP towards the near future covering the coming 8th Five-Year Plan (1996-2000) through the interview with the authorities concerned of the Government of Syria, the average GDP growth rate of 6% per annum towards the year 2010 is adopted. (see Table 2.1.1-1)

Table 2.1.1-1 Growth Rates and Socio-economic Indicators in the future

[Population]

Items	1994	2003	2010
Population (thousand person)	13,844	18,435	22,216
Growth Rates (%)		3.2	2.8

[GDP]

Items	1993	2003	2010
GDP (million SP)	110,151	200,000	300,000
Growth Rates (%)		6.0	6.0

2.2 Demand Forecast and Function Allotment

2.2.1 Demand Forecast (Nation wide)

Judging from the cargoes handled in Syrian ports, the handling cargoes are classified into 3 categories, that is, "major cargoes" (phosphate rock, iron and steel products, cement and clinker, sulphur, oil cokes, grain), "other cargoes" and "transit cargoes".

(i) As to "major cargoes", taking account of the consumption and the domestic production through the interview with the authorities concerned of the Government of Syria, handling cargo volume in the future is estimated.

(ii) As to "other cargoes", the method of the correlation analysis between the volume of port cargoes and the socio-economic indices is mainly adopted.

(iii) As to "transit cargoes", considering the historical trend of the transit cargo

volume, 3 countries, that is, Jordan, Iraq and UAE and Gulf countries are selected as objects of projection.

The results of demand forecast are shown in Table 2.2.1-1.

Table 2.2.1-1 Summary of Demand Forecast on Handling Cargo Volume through Syrian Ports

(Unit: thousand ton)

	2003			2010		
	Domestic	Transit	Total	Domestic	Transit	Total
Total	16,180	2,130	18,310	22,665	3,790	26,455
Export Total	6,700	1,500	8,200	8,055	1,500	9,555
Grain	2,000	0	2,000	2,000	0	2,000
Phosphate Rock	2,200	1,000	3,200	3,100	1,000	4,100
Cement&Clinker	1,100	0	1,100	1,000	0	1,000
Sulphur	0	500	500	0	500	500
Oil Cokes	100	0	100	200	0	200
Fertilizer	510	0	510	480	0	480
Others	790	0	790	1,275	0	1,275
Import Total	9,480	630	10,110	14,610	2,290	16,900
Grain	650	0	650	1,100	0	1,100
Metal Products	2,380	165	2,545	3,115	530	3,645
Fertilizer	170	0	170	210	0	210
Others	6,280	465	6,745	10,185	1,760	11,945

Note: Cargo volume excludes empty container.

2.2.2 Demand Forecast (Each Port)

(1) Methodology of Allotment to Each Port

The major hinterlands of the ports of Latakia and Tartous are northern and the southern parts of Syria respectively, though there is overlap, especially in the Damascus area which is a major hinterland of Latakia Port as well as of Tartous.

Total cargo volume is allotted to each port based on the following way of thinking.

- (i) All bulk cargoes related to manufacturing industry and mining are handled in New Port. Most general cargoes are handled in the ports of Latakia and Tartous.
- (ii) As to grain cargoes, considering the production volume in the hinterland and the handling capacity in the ports of Latakia and Tartous respectively, handling cargo volume of each port is determined.
- (iii) As to other cargoes excluding the above commodities, considering the share of each port in the total cargo, the handling volume by commodities is determined.

(2) Forecast of Container Cargo Volume

The volume of container cargoes in the target years can be obtained by multiplying

the volume of containerizable cargoes by the percentage of containerization. The containerizable cargoes is estimated by their suitability for containerization from the statistics data and the analysis for the manifest. The percentage of containerization is estimated by using the logistic curve and the correlation based on the historical trend of handling cargo volume.

(3) Results of Demand Forecast in Each Port

The handling cargo volume of each port in the target year is shown in Table 2.2.2-1, 2.2.2-2 and 2.2.2-3 each.

Table 2.2.2-1 Results of Demand Forecast in Latakia Port

(Unit: thousand ton)

Latakia Port	2003					2010				
	Domestic	Transit	Total	Con	Other	Domestic	Transit	Total	Con	Other
Total	6,340	255	6,595	3,250	3,345	9,590	1,220	10,810	6,290	4,520
Grain	1,660	0	1,660	0	1,660	1,640	0	1,640	0	1,640
Others	4,680	255	4,935	3,250	1,685	7,950	1,220	9,170	6,290	2,880
Export Total	2,070	0	2,070	615	1,455	2,285	0	2,285	1,030	1,255
Grain	1400	0	1,400	0	1,400	1200	0	1,200	0	1,200
Others	670	0	670	615	55	1085	0	1,085	1030	55
Import Total	4,270	255	4,525	2,635	1,890	7,305	1,220	8,525	5,260	3,265
Grain	260	0	260	0	260	440	0	440	0	440
Others	4010	255	4,265	2635	1,630	6865	1220	8,085	5260	2,825

Note: Cargo volume excludes empty container.

Table 2.2.2-2 Result of Demand Forecast in Tartus Port

(Unit: thousand ton)

Tartous Port	2003					2010				
	Domestic	Transit	Total	Con	Other	Domestic	Transit	Total	Con	Other
Total	4,160	375	4,535	660	3,875	6,485	1,070	7,555	1,710	5,845
Grain	990	0	990	0	990	1,460	0	1,460	0	1,460
Others	3,170	375	3,545	660	2,885	5,025	1,070	6,095	1,710	4,385
Export	720	0	720	95	625	990	0	990	180	810
Grain	600	0	600	0	600	800	0	800	0	800
Others	120	0	120	95	25	190	0	190	180	10
Import	3,440	375	3,815	565	3,250	5,495	1,070	6,565	1,530	5,035
Grain	390	0	390	0	390	660	0	660	0	660
Others	3050	375	3425	565	2,860	4835	1070	5905	1530	4,375

Note: Cargo volume excludes empty container.

Table 2.2.2-3 Results of Demand Forecast in New Port

(Unit: thousand ton)

New Port	2003					2010				
	Domestic	Transit	Total	Con	Other	Domestic	Transit	Total	Con	Other
Total	5,680	1,500	7,180	0	7,180	6,590	1,500	8,090	0	8,090
Export Total	3,910	1,500	5,410	0	5,410	4,780	1,500	6,280	0	6,280
Phosphate Rock	2,200	1000	3,200	0	3,200	3,100	1000	4,100	0	4,100
Cement & Clinker	1,100	0	1,100	0	1,100	1,000	0	1,000	0	1,000
Sulphur	0	500	500	0	500	0	500	500	0	500
Oil Cokes	100	0	100	0	100	200	0	200	0	200
Fertilizer	510	0	510	0	510	480	0	480	0	480
Import Total	1,770	0	1,770	0	1,770	1,810	0	1,810	0	1,810
Metal Products	1,600	0	1,600	0	1,600	1,600	0	1,600	0	1,600
Fertilizer	170	0	170	0	170	210	0	210	0	210