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COOPERATION AGENCY (JICA)

NO. 52

PORTS AND SHIPPING ORGANIZATION

THE ISLAMIC REPUBLIC OF IRAN

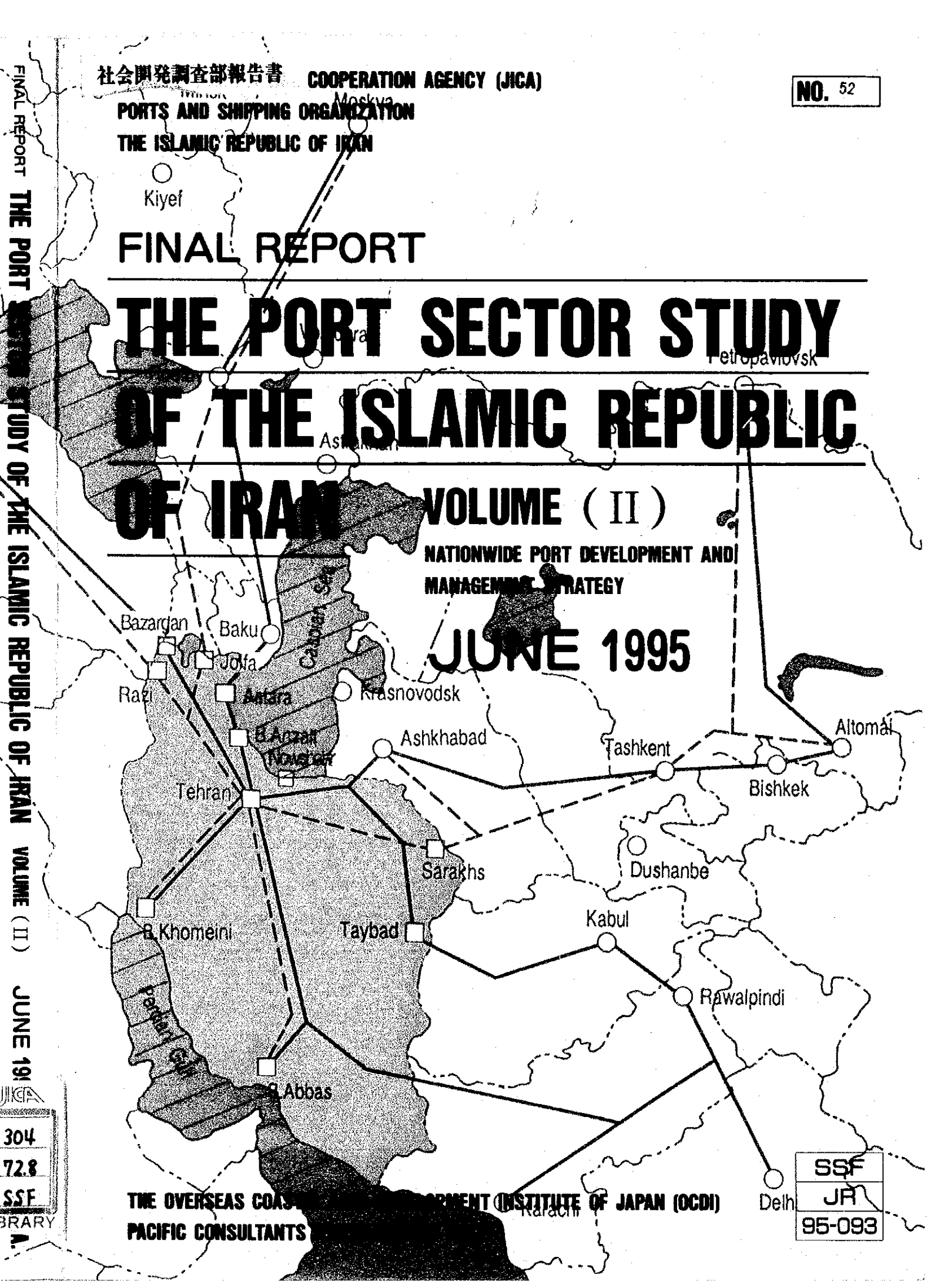
FINAL REPORT

THE PORT SECTOR STUDY OF THE ISLAMIC REPUBLIC OF IRAN

VOLUME (II)

NATIONWIDE PORT DEVELOPMENT AND MANAGEMENT STRATEGY

JUNE 1995



THE OVERSEAS COAST[illegible]PMENT INSTITUTE OF JAPAN (OCDI)

PACIFIC CONSULTANTS

The following foreign exchange rate is applied in this study:
US$1.00 = 2,000 Iranian Rials (as January 1994)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
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PREFACE

In response to a request from the Government of The Islamic Republic of Iran, the Government of Japan decided to conduct a feasibility study on the Port Sector Study of the Islamic Republic of Iran and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Iran a study team four times between October 1993 and January 1995, which was headed by Mr. Yukio Nishida and was composed of members from the Overseas Coastal Area Development Institute of Japan (OCDI) and Pacific Consultants International Co., Ltd. (PCI).

The team held discussions with the officials concerned of the Government of the Iran 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 Islamic Republic of Iran for the close cooperation they extended to the team.

June, 1995

Kimio FUJITA
President
Japan International Cooperation Agency

LETTER OF TRANSMITTAL

June 1995

Mr.Kimio FUJITA
President
Japan International Cooperation Agency

Dear Mr. Fujita,

It is my great pleasure to submit herewith the Report on the Port Sector Study of the Islamic Republic of Iran.

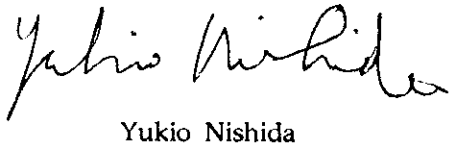
The Study Team which consists of the Overseas Coastal Area Development Institute of Japan (OCDI) and Pacific Consultants International (PCI) conducted surveys in Iran from October 1993 to January 1995 as per the contract with the Japan International Cooperation Agency.

Based on the finding of these surveys as well as the data and information collected and analyzed in Japan, the Study Team held discussions with the Iran officials of the Ministry of Road and Transportation and other authorities concerned, and has formulated the Long-Term Port Development Concept up to the year 2010 and the feasibility of the Short-term Plan for the period up to the year 2000.

On behalf of the study team, I would like to express my deepest appreciation to the Government of Iran, the Ministry of Road and Transportation and other authorities concerned for their brilliant cooporation and assistance and for the heartfelt hospitality which they extended to the study team during our stay in Iran.

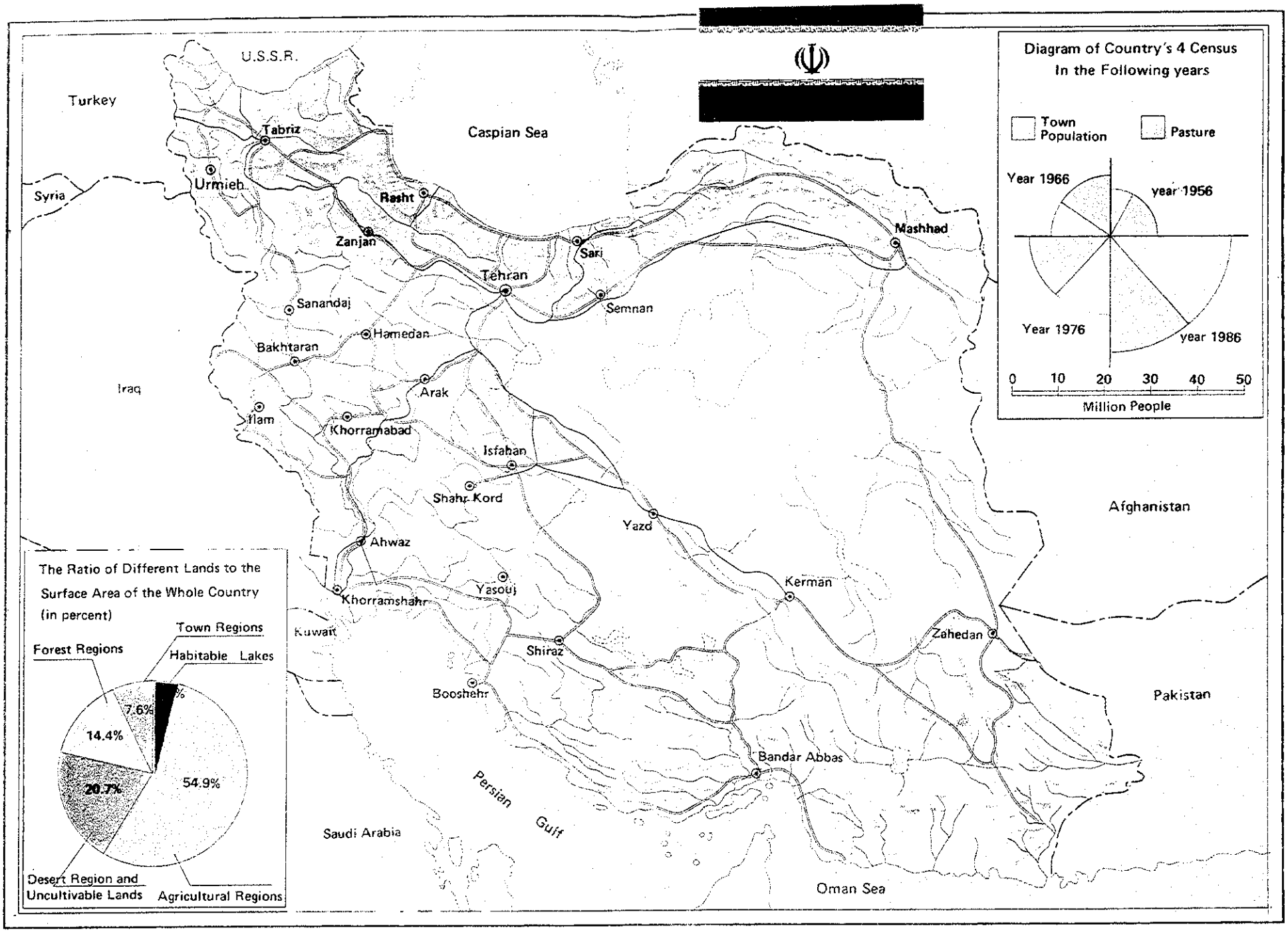
I am also greatly indebted to the Japan International Cooperation Agency, the Ministry of Foreign Affairs, the Ministry of Transport and the Embassy of Japan in Iran for giving us valuable suggestions and assistance during the preparation of this report.

Yours faithfully,



Yukio Nishida
Leader of the Study Team for the
Port Sector Study of the Islamic
Republic of Iran

LOCATION MAP (1)



LOCATION MAP (2)

THE PORT SECTOR STUDY OF THE ISLAMIC REPUBLIC OF IRAN

VOLUME(II)

Nationwide Port Development and Management Strategy

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List of Abbreviations

CIS	:	Commonwealth of Independent States
EIRR	:	Economic Internal Rate Return
EIA	:	Environmental Impact Assessment
PSO	:	Ports and Shipping Organization
IIRR	:	Islamic Iranian Republic Railways
DCDR	:	Deputy for Construction and Development of Railway Network
METRA	:	Railway Developing Consulting Engineers IRAN
DOE	:	Department of the Environment
STD	:	Short Term Development
LTD	:	Long Term Development
CIF	:	Cost, Insurance, and Freight
FOB	:	Free on Board
SCF	:	Standard Conversion Factor
CFC	:	Conversion Factor for Consumption
PES	:	Preliminary Environmental Survey
IEE	:	Initial Environmental Examination
FIRR	:	Financial Infernal Rate of Return
DWT	:	Dead Weight Tonnage
MRT	:	Ministry of Roads and Transportation
PBO	:	Planning and Budget Organization
G.T.	:	Gross Tons

SYMBOLS

Negligible fraction	-
Figures not available	?
Statistic data unavailable	***

I EXECUTIVE SUMMARY

The Port Sector Study of The Islamic Republic of Iran

October 1993- May 1995
Counter Part ; Ports and Shipping Organization

1. Background of Study

The major Iranian ports are Imam Khomeini port, Busher port, Abbas port and Chabahar port on the coast of the Persian Gulf, and Anzali port and Nowshahr port on the coast of the Caspian Sea. In 1974 PSO drafted the nationwide port development master plan. Since that time structural changes both globally and in Iran, in port and shipping activities have occurred.

At present, port activities are stagnant due to port management and low operation efficiency. Among the ports in the Persian Gulf and in the Caspian Sea, the functional allotment and priority of improvement among ports are unclearly. It is necessary to fix the master plan should be revised based on the new circumstances with nationwide viewpoint.

In light of the above, the Iranian government requested the government of Japan to formulate the nationwide port development and management strategy, to formulate the master plan for selected ports and to conduct the feasibility study for the short term plan in January 1992. The government of Japan set forth the Scope of Work for the study in February 1993, at which time both parties signed the agreement.

2. The Objectives of the Study

The objectives of the Study area:

(1) To formulate a nationwide port development and management strategy in Iran.

(2) To formulate master plans for selected ports for the period up to the year 2010/11.

(3) To conduct a feasibility study for short-term plans for the selected ports for the period up to the year 2000/01.

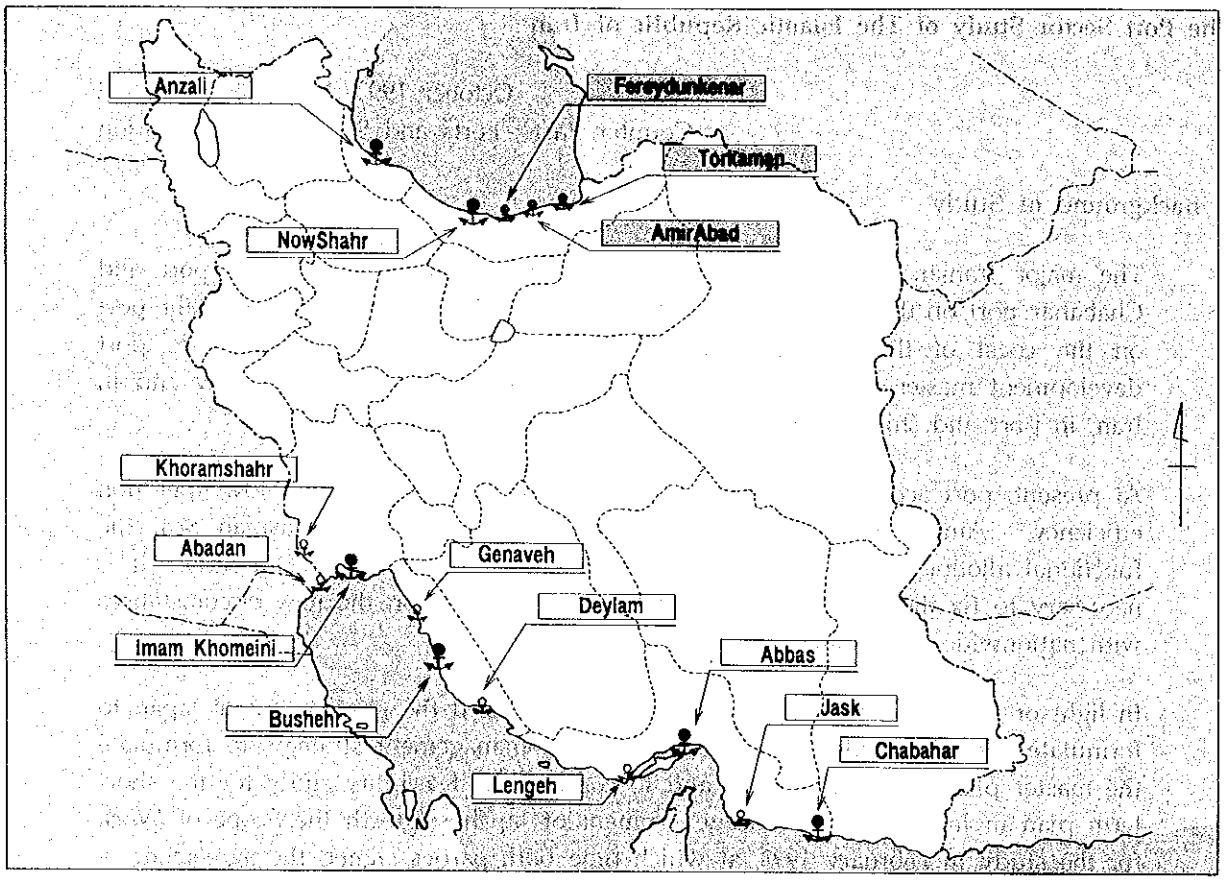
3. Objective ports

(1) For the nationwide port development and management strategy 16 ports, as shown in Figure-1.

(2) For the master plan and short-term plan Imam Khomeini port, Anzali port

4. Summary of the proposed port development plans

(1) Nationwide port development and management strategy Numerical targets and port development and management strategy are summarized in Figure-2.



	Major Port	7 Ports[1]
	Port	6 Ports
	Under Construction	3 Ports
	Total	16 Ports

Figure 1 Study Ports

(1); Abbas port has two harbors, Rajaee and Bahonar.

Figure 2 Nationwide Port Development and Management Strategy

The Core Roles Expected of the Port Sector and Basic requirements

Logistics Centers to Provide Necessities of Life	To Support Development of the National Economy	To Play the Central role in the International Transport Network	Encouragement of various port functions
Share of ship cargo is large Sea water level is rising Cargo storage days seem to be long Activity of domestic shipping line is substandard Railroads connecting between port and city is very few Many port require maintenace dredging	Non-oil export cargo volume is very small Import cargo value is limited by export income Production and consumption area incline to north-western part of Iran Government pushes to be independent from oil economy Pushes to boost non-oil exports	Share of ship cargo is large Iranian trade cargo is transhipped by other countrie's port Containerized cargo is small comparing with other countries Iranian port lack suitable plan for development Free trade zone are developing Trade should be active on the coast of the Caspian Sea	Incresing foreign passenger
Quality improvement and modernization of port Improvement of the port facilities for cargo traffic demand Provision of easy access to/from hinterland To cope with containerization	Promotion of regional development Provision of better environment for industries	Encouragement of international transit through Iran Supporting of the free trade zone activity To cope with containerization Tendency of larger ship size Provision of exchanging commodity style	Such as fishery, refuge and recreation Enhancement of environment protection Improvement of the port facilities for passenger demand

Numerical Targets

Population,GDP and GDP per-capita

	1991/92	2000/01	2010/11
Pop (1,000)	57,234	70,019	85,353
GDP (BN. Rls)	12,181	19,891	33,224
Per (1,000 Rls)	213	284	389

Note; 1982 Fixed Price

Sea Borne Cargo Traffic Demand

		2000/01	2010/11
Handling Cargo Vol. (1,000 ton)	Import	32,455	53,315
	Export	8,936	23,768
	Total	41,391	77,083

Transit Cargo to/from CIS Countries

Unit; 1,000 ton

		2000/01	010/11
To	CIS Countries	620	1,540
From	CIS Countries	470	1,180
Total		1,090	2,720

Maximum Port Capacity

Number of Berth	Persian Gulf	Caspian Sea
Existing (1)	86	16
Capacity (1,000T)	50,574	4,139
Required (2)	19	14

Note; Excluding oil and oil products
(1); 180 m length / Berth
(2); 220 m length / Berth

Development Strategy

Quality improvement and modernization of ports and maritime transport to attract More ship calls
Improvement of the port facilities for cargo and passenger traffic demand
Encouragement of international transit through Iran
Promotion of regional development through provision of better business environment for port related industries
Provision of increasing cargo volume on the coast of the Caspian sea
Supporting of the free trade zone activity
Encouragement of other various port functions such as fishery, refuge and recreation
Enhancement of environment protection

Development Subjects

Development of container, bulky and steel cargo handling facilities
Provision of easy access to/from truck roads and rail
Provision of available areas or lots, utilities and services for various port related industries
Maintenance of navigation aides, navigation channel and basin for safety
Modification of standard berth length and depth to cope with large vessel
Push the construction on the coast of the Caspian Sea

Management Strategy

Application of strategic tariff policy for inviting more ship
Rationalization of custom clearance procedures and bonded transport/strage systems for international transit cargoes
Total improvement in variety of option and quality of required port services
Promoting privatization with regards to port operation and management
Reinforcement of personnel and training system
Establishment of technical standards and improvement of port statistics and recording system
Establishment of effective maintenance system

Allotments

NAME	1993/94 Import	1993/94 Export	1993/94 Total	2000/01 Import	2000/01 Export	2000/01 Total	2010/11 Import	2010/11 Export	2010/11 Total	Max Handling Capacity (1,000 tons)	Development Priority
Persian Gulf											
Imam Khomeini	7,259	2,788	10,047	11,052	5,181	16,233	19,663	11,513	31,176	24,970	1
Rajaee	8,410	931	9,341	11,901	2,721	14,622	19,158	10,088	29,246	17,210	1
Bahonar	3,330	553	3,883	3,552	867	4,419	3,896	1,651	5,547	5,900	
Busher	1,412	174	1,586	1,815	300	2,115	2,599	654	3,253	2,335	
Chabahar	816	2	818	1,158	9	1,167	2,008	226	2,234	2,044	
*Khoramshahr	-	-	-	732	268	1,000	671	329	1,000	2,035	1
*Abadan	-	-	-	146	54	200	134	66	200	480	1
Sub Total	21,227	4,448	25,675	30,356	9,400	39,756	48,129	24,527	72,656	54,974	
Caspian sea											
Anzali	1,036	42	1,078	1,593	218	1,811	4,241	841	5,082	2,340	1
Nowshahr	388	8	396	692	137	829	1,826	399	2,225	2,260	
** Amir Abad	-	-	-	485	175	660	956	444	1,400	1,415	1
** Fereydunkener	-	-	-	349	21	370	713	87	800	1,025	1
** Torkaman	-	-	-	70	75	145	170	190	360	100	
Sub Total	1,424	50	1,474	3,189	626	3,815	7,906	1,961	9,867	7,140	
TOTAL	22,651	4,498	27,149	33,545	10,026	43,571	56,035	26,488	82,523	62,114	

Note; Including oil and oil products. *; Reconstruction, ** ; Under Construction

Functions

Imam Khomeini	Main port of import/export. Container terminal. Large vessel.
Rajaee	Main port of import/export. Container terminal. Large vessel. Supporting free trade zone's activity
Bahonar	Sub port of Abbas (Rajaee)
Bushehr	Import/export sub port in region.
Behesti	Import/export sub port in regiRegional development core. Roles of national safety. Supporting free trade zone's activity
Khoramshahr	Sub port of Imam Khomeini port. Trading for Arabian countries.
Abadan	Sub port of Imam Khomeini port.
Genaveh	Coastal transportation. Fishery.
Deylam	Coastal transportation. Fishery.
Lengeh	Supporting free trade zone activity. Fishery.
Jask	Coastal transportation. Fishery.
Anzali	Foreign trade port in Caspian Sea. Transit cargo.
Nowshahr	Foreign trade port in Caspian Sea. Transit cargo.
Amir Abad	Foreign trade port in Caspian Sea. Transit cargo.
Fereydunkener	Foreign trade port in Caspian Fishery.
Torkaman	Transit cargo.

(2) Master plan for selected ports

Master plan for Imam Khomeini port includes the construction of an international container terminal and the development of new West harbor. Also, the plan includes an access route from the West harbor to express highway.

Master plan for Anzali port includes the development of a breakwater and new berths to handle the land-bridge cargo to/from CIS countries (CIS; Commonwealth of Independent States) and other general cargo.

(3) Short-term plan

Basic concept of the short-term plan for Imam Khomeini port is to handle the cargo more efficiently using the existing facilities. To cope with the increasing cargo volume, the plan includes the following.

1) Improvement of silo jetty by dolphin style, dredging of basin. (60 m length, -13 m)
2) Minimum investment to keep the berth length for the large calling vessel, dredging of basin. (200 m length, -9 m)
3) Improvement of the Western jetty, dredging of basin. (240 m length, -13 m)
4) Improvement of container terminal (No.11 - No. 15), dredging of basin. (260 m length, -12.5 m)
5) Setting the new standard berth length.
6) Maintenance dredging of the basin in the port.
7) Improvement of warehouse, yard and cargo handling equipment.

Basic concept of the master plan for Anzali port is to cope with the rising water level and ensure non-stop utilization of the wharves for cargo handling activities. The plan includes the improvement of wharves to meet the increasing cargo volume and expansion of the break water to maintain calmness in the port.

1) Improvement of wharves, dredging of basin. (690 m length, -6.5 m)
2) Expansion of the breakwater. (500 m)
3) Improvement of warehouse and cargo handling equipment.

5. Project cost

The total cost of Imam Khomeini port is 1,151.9 million dollars including short-term plan's cost, 124.3 million dollars. That of Anzali port is 338.6 million dollars including short-term plan's cost, 111.5 million dollars.

unit; Mn. US $

TERM	Imam Khomeini		Anzali	
1995-2000	124.3		111.5	
	Foreign currency	Local currency	Foreign currency	Local currency
	95.5	28.8	50.9	60.6
2001- 2010	1,027.7		227.1	
TOTAL	1,151.9		338.6	

Foreign currency exchange rate (Jan. 1994) US$ 1 = Rls 2,000

Average investment per year of the project is about 180 billion rials. Port sector's investment is about 90 billion rials per year (1994 price). Considering that growth rate of government investment for transport sector is more than ten percent, the investment is on an acceptable scale.

6. Evaluation

(1) Three kinds of economic benefits shown below are evaluated as benefits from the Short-term plan for the selected ports.

Saving in ships staying cost (Imam Khomeini)
Saving in interest of cargo cost (Imam Khomeini, Anzali)
Saving in land transportation cost (Anzali)

The Economic Internal Rate of Return (EIRR) of the Short-term Plan for Imam Khomeini port and Anzali port is calculated as 19.7% and 18.6% respectively. Comparing the EIRR with the social rate of discount (the opportunity cost of the domestic capital), the project is feasible from the viewpoint of the national income.

The Financial Internal Rate of Return (FIRR) of Imam Khomeini port and Anzali port is calculated as 22.5% and 7.0% respectively. At Anzali port, the FIRR is almost same as the long term interest rate of the World Bank loans (7%). Considering the importance of regional transportation and the need to counteract the rising sea level, the Short-term plan for Anzali port is both reasonable and financially viable.

(2) Environmental impact assessment

According to the results of the environmental impact assessment (EIA) of which items are selected by the initial environmental examination (IEE), the effect of the project proposed in the Short-term Plan on the surrounding environment is expected to be minimal, and thus there are no environmental problems arising from implementation of the project.

The Master Plan cal lead to a better-off in the environment by removing oil terminal at Anzali Port and unifying coal and ore terminals at Imam Khomeini port.

7. Recommendation

7.1 Overall Port Administration

(1) Financial Autonomy for the

The current practice of contribution system to the Government should be phased out.

(2) Decentralization of Port Administration

The appropriate part of competence fields need to be transferred from PSO central office to the port authority offices.

(3) Restructuring of PSO Organization

It is recommended to create, at PSO central office, the new organizations for timely response to the current requirements in port administration.

(4) Reinforcement of Personnel Policy and Training system

The well designed personnel policy and training system are essential to encourage or to educe the positive incentive and potential capability of PSO staff.

7.2 Port Planning

(1) The port plans need to be formulated by a systematic way.

(2) Port plans should be applicable and practicable

(3) In order to realize the proposed schemes of the plans, it is essential to secure active utilization of the plans by PSO.

7.3 Environmental Consideration in port operation

(1) Establishment of Environmental protection Policy in port operation

Overall policy to consider and conserve port environment need to be established.

(2) Environmental Consideration for Imam Khomeini port

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

(3) Environmental Consideration for Anzali port

In the Master Plan, there are reclamation works which will cause water pollution. Therefore, countermeasures should be studied. The Sea-bed quality test should need

again.

(4) Strengthening of PSO Organization for Environmental Administration

For maintaining the port environment, it is recommended to create at PSO central office a special department or section which is responsible in taking care of port environmental affairs.

7.4 Improvement of Port Engineering Aspects

(1) Overall Upgrading of PSO Engineering System

In order to carry out an appropriate future major port development, PSO's organization, with respect to engineering aspects, can be improved further.

(2) Establishment of Technical Standards for Port Facility Design

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

(3) Improvement of Engineering Statistics and Recording System

The records should be given well-informed easy access to touch the records.

(4) Monitoring and Review for Flexible Project Implementation

PSO should enforce to monitor and to review the Plan.

(5) Establishment of Effective Maintenance System

According to past experience, if preventive maintenance is appropriately performed, the required cost for corrective maintenance works will be minimum.

7.5 Port Management and Operation

(1) Proper Application of Privatization Policy

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

(2) Strategic Tariff Policy for Transit Cargoes

PSO should have a more aggressive tariff policy for further increase of cargo handling revenue through inviting transit cargoes to the ports along the Persian Gulf coast.

(3) Improvement of Port Statistics and Recording System

In order to support port planning and administration, it is essential to build up a well designed port statistic and recording system.

(4) Reinforcement of Port Promotion Activities

PSO should reinforce the port promotion activities.

7.6 Physical Implementation of Proposed Port Development Schemes

(1) Imam Khomeini Port

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

(2) Anzali Port

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

7.7 Financial Issues for Successful Implementation of the Project

(1) Procurement of Necessary Funds For the Project

Considering the actual Iranian port development system, government bond and foreign currency loan are most practical at least for the basic port facilities. Private funds may also reasonably be introduced for some superstructures and cargo handling equipment in accordance with possible future privatization of port operation.

(2) Appropriate Policy Making on Reasonable Level of PSO Contribution To the National Revenue

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

(3) Budgetary Arrangements For the Urgent Improvement Schemes

Immediate action for securing next year's budget for urgent improvement schemes is essential for timely completion of the project.

(4) Effective Utilization of Earnings from the Short Term Project of Imam Khomeini Port

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

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

7.8 Other Relevant Issues to be Considered

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

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

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

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

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

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

II. The Process of the Study

The process of the Study is drawn as Figure 3.

1. The overall objectives of the study are defined by the Scope of Work agreed upon in February 1993 between the Ports and Shipping Organization(PSO) and the Japan International Cooperation Agency(JICA) as follows.
(1) To provide an overview of the Port Sector in Iran and to analyze its role and potential in the national economy
(2) To formulate a nationwide port development and management strategy in Iran
(3) To formulate the Master Plan for the Imam Khomeini Port and Anzali Port for the period up to the year 2010
(4) To conduct Feasibility Studies for the Short Term Plan for the period up to the year 2000 within the framework of the Master Plan
(5) To conduct technology transfer to the Iranian counterpart personnel in the course of the Study

2. The Study had been carried out under the close cooperation between the PSO and the Study Team for the period of sixteen months from October 1993 to January 1995 : (1) analysis of the present situations from October 1993 through January 1994; (2) formulation of basic strategies and preparation of Master Plan for the port of Imam Khomeini and Anzali from February to June 1994; (3) formulation of Short Term Development Plan and its feasibility study from July to October 1994; (4) finalization of the study from November 1994 through January 1995; (5) Submission of Final report of the Study in May 1995; (6) Study ports are 16 as shown in Figure 1.

3. The PSO counterpart, headed by Mr.S.M.R.Massoumi guided the general directions of the Study, under which the JICA Study Team studied to fulfill the above objectives. The study results could form a base for the development works of the Iranian Ports which should be implemented by PSO in due course.

4. The Final Report comprises five volumes:
Volume Ⅰ: Summary
Volume Ⅱ: Nationwide Port Development and Management Strategies
Volume Ⅲ: Master Plan and Feasibility Study for the Imam Khomeini Port
Volume Ⅳ: Master Plan and Feasibility Study for the Anzali Port
Volume Ⅴ: Appendix

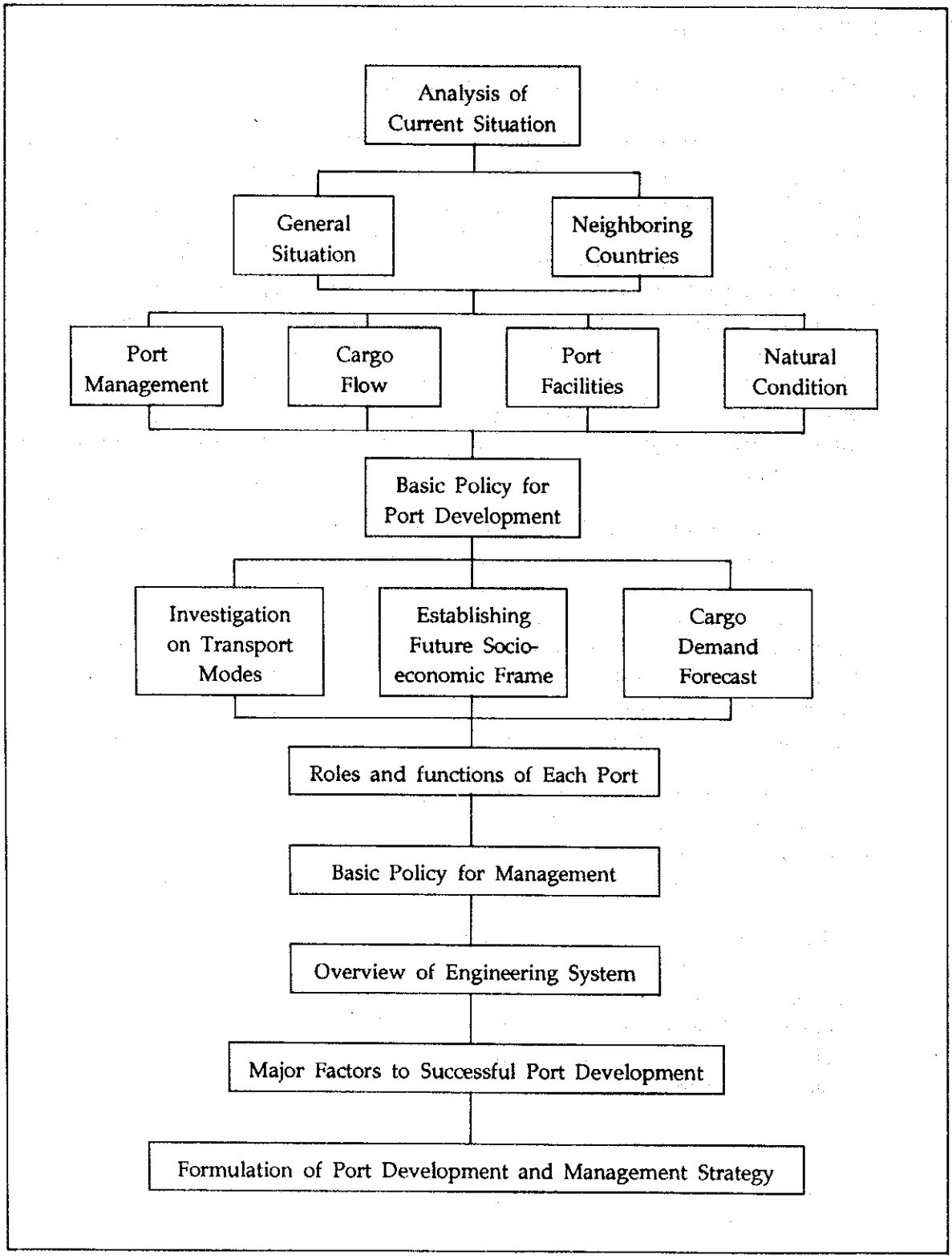


Figure 3 Process of the Study

III. Project Focus, Design and Rationale

Since the 1979 revolution, Iran and the international community at large have witnessed dramatic changes. Change has perhaps been most notable in the newly emerged Commonwealth of Independent States (CIS), but is evident in Eastern and Central European countries as well.

In terms of geography, Iran is located at the international crossroads of the east-west and north-south transport corridors. These corridors are important not only for Iran but also for the Middle East, Asia and Europe. International transport demand to/from Iran is expected to increase in line with the economic development of the country. Also transit cargo through Iran is expected to increase in the long run in line with the progress of economic restructuring in the CIS as well as the East European countries. Consider its locational advantage, Iran needs to improve its border crossings. Ports, in particular, should receive special attention.

In 1989, the government formulated the new economic development plan. In this plan, the policy of the government is, with respect to its precious resources and capabilities, to be a powerful presence in the world markets and international economy and to reduce the country's dependence on oil-sales revenues.

In order to maintain high economic growth and to improve the quality of life of the Iranian people considering the expected annual population growth rate of 2.0 percent which will result in a population of 80 million in 2010/11, the industrial sector should have to expand at a growth rate of 7.3 percent per annum, since the growth of agricultural sector should be limited due to the limitation of arable land and water supply, and foreign exchange earnings from oil sector may eventually decrease considering the limited reserves of oil and the probable future increase in domestic consumption of petroleum products.

Based on the national and regional settings and considering the development potential of Iran, the major management strategy and the major development goals in the Master Plan are set as integration of the port and national development, and enforcement of the foreign trade. Hence, the conceptual plan for the development is formulated as follows;

(1) The major project components for the port of Imam Khomeini are construction of the international container terminal, improvement or development of the West Harbor for handling of steel cargo, and completion of access route from the West harbor to the express way.

The Short Term Plan focuses on the effective utilization of existing infrastructures. The main objective of the Short Term Plan is to provide an potential capacity for the handling of projected traffic demand until 2000/01.

The proposed project, includes the following main components:

(i) improvement of silo jetty by dolphin structure of 60 m long and dredging of basin, -13.0 m
(ii) improvement of the Eastern jetty 200 m long for the large calling vessels with minimum cost, dredging of basin, -9.0 m
(iii) improvement of the Western jetty 240 m long, dredging of basin, -13.0 m
(iv) improvement container berth 260 m long, dredging of basin, -12.5 m with repairing the gantry crane
(v) modifying the berth length
(vi) dredging the basin
(vii) sheds and yards, utilities

Total cost of the Project is estimated at 124.3 million US dollars of which 95.5 million US dollars will be the foreign currency cost and 28.8 million US dollars will be the local currency cost which is to be met from the PSO and Government's own resources.

The Project will result in significant economic benefits. The development of Imam Khomeini port will reduce the berth waiting cost of ships and hence, increase the locational advantages for industries.

The economic internal rate of return for the Project is estimated at 19.7 per cent and the financial internal rate of return at 23.5 per cent. Therefore, the Project is viable.

(2) The major project components for the port of Anzali are the improvement of the break water and the berths handling of transit cargo from CIS countries, and general cargo.

The Short Term Plan concentrates from the view point of countermeasures of rising sea level of the Caspian Sea. The main objectives of the Short Term Plan is to construct the berths handling of cargo with safety and break water for keeping the calmness.

The proposed Project, therefore, includes the following main components:

(i) construction of cargo handling site 690 m long with an alongside depth of 6.5 m
(ii) construction of break water 500 m long
(iii) dredging and cargo equipment

The cost of the Project is estimated at 111.5 million US dollars of which 50.9 million US dollars will be the foreign currency cost and 60.6 million US dollars will be the local currency cost which is to be met from the PSO and Government's own resources.

The Project results in significant economic benefits. The development of Anzali port will reduce the berth waiting cost of ships and the inland transportation cost of goods, and hence, it will increase the locational advantages for industries.

The economic internal rate of return for the Project is estimated at 18.6 per cent and the financial internal rate of return at 8.5 per cent. Therefore, the Project is viable.

Chapter 1

Background

Chapter 1 Background

1.1 General Situation of Transport Sector of Iran

1.1.1 Location of Iran and International Cargo Flow

(1) Location

Because of its favorable geographical situation, Iran has always been in the center of world trade. With the transformation of the former USSR, the roles of Iran will be more important, as the economic central country in the Middle East and Central Asia. On the other side, Commonwealth of Independent States (CIS) want to expand outer republic trade and seek the reliable cargo transport channels including through Iran. In this context, it is expected that cargo bound for the CIS countries from abroad will be transported through Iran at an increasing rate. The cargo flow to/from Iran is shown as Figure 1.1.1.1, the population of neighboring countries is shown in Figure 1.1.1.2.

The environment has changed rapidly in terms of the Iranian transport system, and the many borders such as Bazargan, Austra, Julfa and seaports shall perform their roles for the various patterns of cargo flow.

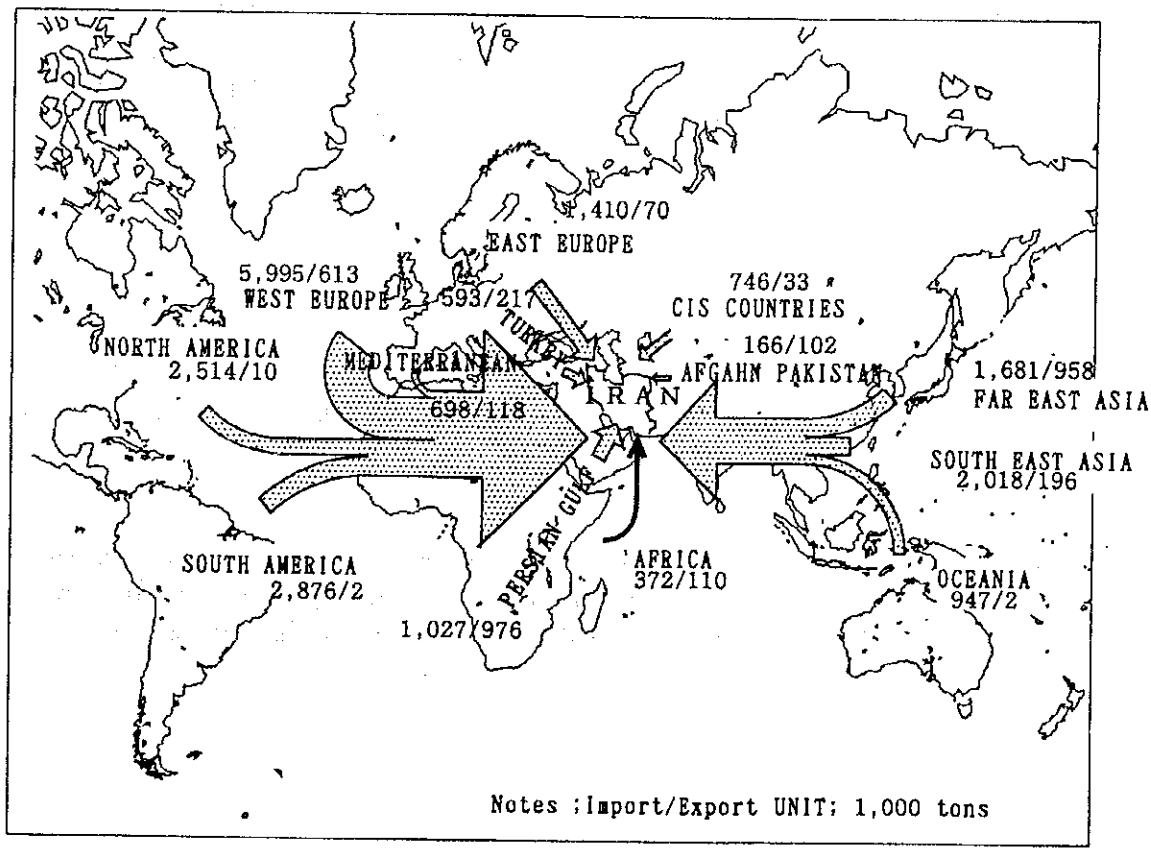


Figure 1.1.1.1 Location of Iran and Trading Volume

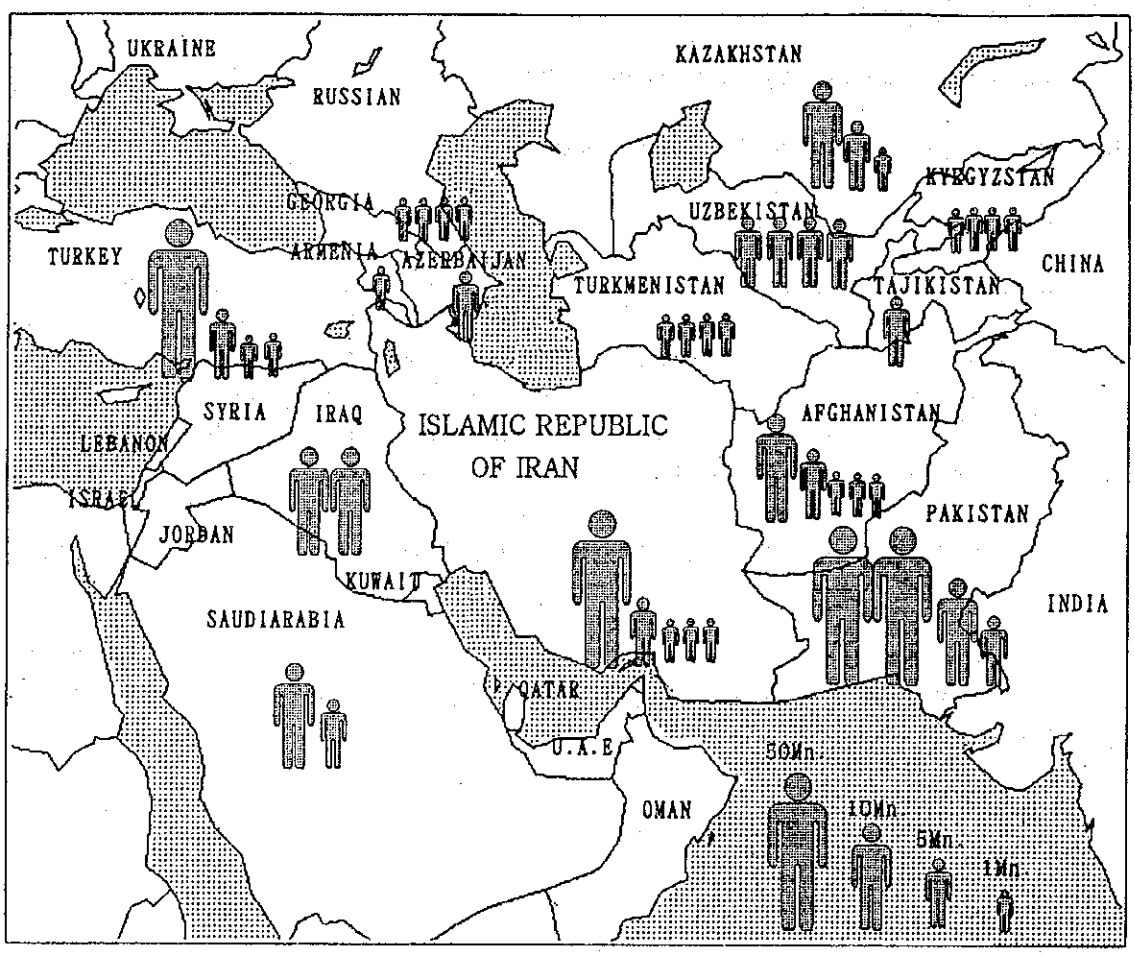


Figure 1.1.1.2 Population of Neighboring Countries

(2) Foreign Trade of Iran

Total foreign trade goods in 1992/93 reached 24.5 million tons and total value reached 2,205 billion Rials in Iran. (excluding oil and oil products, Custom Offices of I.R.I).

In recent six years, the volume and the value of the foreign trade are increasing steadily. The trade value per-capita and the trade volume per-capita are 0.4 ton and 434 dollars. Table 1.1.1.1 shows the balance of foreign trade in past six years.

Table 1.1.1.1 Balance of Trade

(unit: Mn. US$)

Year	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93*
Non Oil Export	1,161	1,036	1,044	1,312	2,613	2,800
Oil Export	10,755	9,673	12,037	17,993	15,802	15,300
Total Export	11,916	10,709	13,081	19,305	18,415	18,100
Total Import	13,236	10,608	13,448	18,330	24,975	23,200

*Source: Central Bank of I.R.I., *: Preliminary*

Import value is about eight times larger than non oil export value. The balance of trade in non oil products is over import. Europe is the largest region in the share of trade by region.

Main imported cargoes by ship are grains, iron-steel, chemical products and mineral fertilizer. Main exported cargoes are ore and dry fruits. On trade value, major exported cargoes are carpets and fruits.

(3) Characteristics of Foreign trade

1) General Situation of Export and Import

Followings are unique characteristics of Iranian trade.

i) The non-oil export goods of the foreign trade is very small
ii) Import good value and volume is limited by export income
iii) There are few counter-part countries with whom Iran can keep a balance of imports and exports
iv) Share of ship cargo is large
v) High value cargo is transported by air
vi) Containerized general cargo is small comparing with other countries
vii) Production and consumption area incline to western and northern part of Iran
viii)Cargo storage days are long
ix) Activity of domestic shipping line is substandard

In Iran, the volume of imports is determined by the amount of oil revenues in any particular year. The Iranian Government has pushed to boost non-oil exports and succeeded in raising their value in the past years. The Iranian Government's policies for improvement of foreign trade may be identified as follows.

i) to improve quality of non-oil goods, intensifying marketing efforts for them and raising their exports, increasing high value export goods rather than traditional products and primary materials
ii) increasing oil exports to major exporting countries

iii) reducing imports of goods and increasing products in sufficient quantities domestically

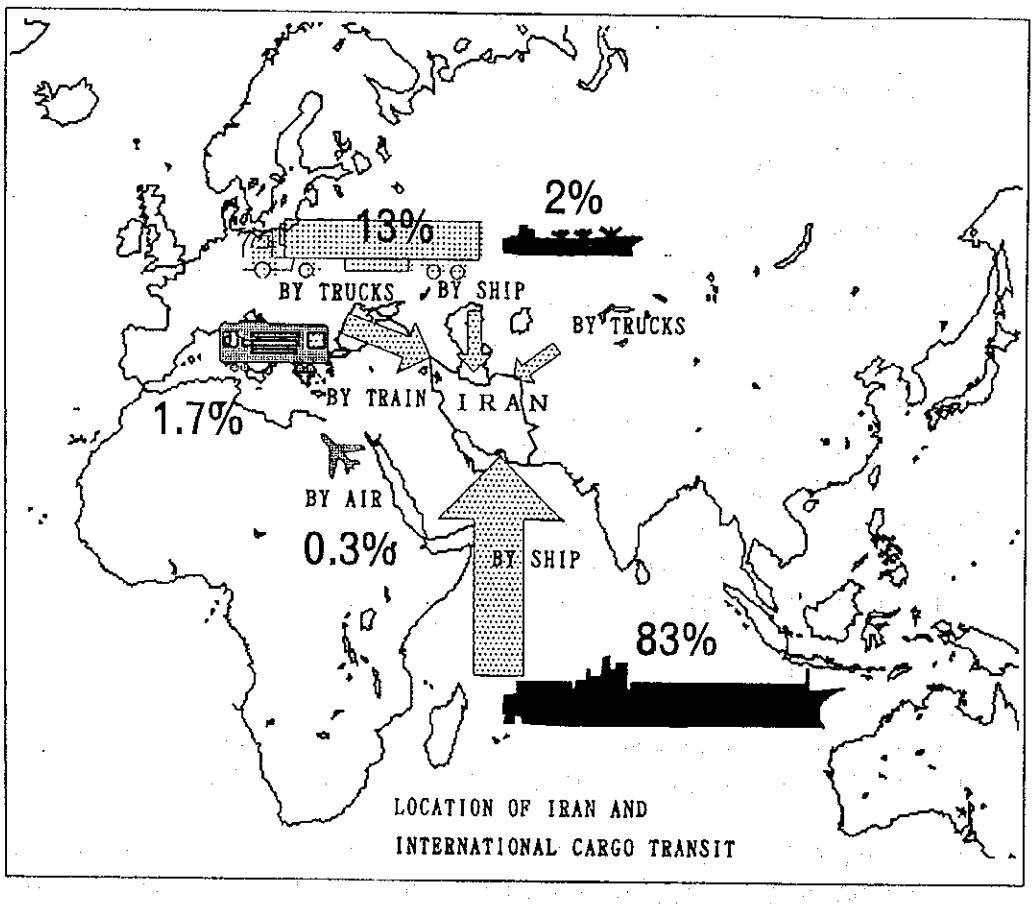
(4) Roles of Port Sector and Its Activities

The most significant aspect of Iranian ports is that the ports have intensified their activities mainly in regards with overseas cargo trade.

Total foreign trade goods in 1992/93 (excluding oil) reached 24.5 million tons, of which 20.9 million tons (85.1 % of total import/export cargo) were handled by ship and the rest by roads, railways and airplanes. The trade cargo by land is coming mainly from Turkey, Pakistan, Afghanistan, CIS Republics and European countries.

The trading share are of total trade volume by transport mode is shown in Figure 1.1.1.3. Most of trading goods are imported/exported to/from Iran, go through the Persian Gulf at the south and on land at the north.

Marine transport is the most important traffic mode for Iran and this trend is considered to be unchanged for a while.



Number : Cargo Volume Share by Transport Mode, 1992/93
Iran Customs Administration

Figure 1.1.1.3 Share of Trade Volume by Transport Mode

(5) National Budget and Investment

To meet the country's growing demand for transport, the Government has stepped up its investment in the transport sector. In 1992/93, government investment in the transport sector amounted 545.2 billion rials, of this, 70 billion rials is allocated for port works.

Table 1.1.1.2 National Budget

(unit: Bn. Rls.)

Year	1991/92	1992/93	1993/94*
Oil Income	3,550	5,141	15,597
Tax	2,765	3,776	5,410
Others	689	982	2,514
Total Income	**7,004**	**9,899**	**23,521**
Current	5,564	7,783	14,012
Development	2,527	3,193	9,684
Total Expenditure	**8,091**	**10,976**	**23,696**
Deficit	**1,087**	**1,077**	**175**

Source: P.B.O., 1982 price

** Preliminary*

1.1.2 Transport Infrastructure Network

(1) Road Network

1) The present transport network

a) Organization

Ministry of Roads and Transportation is responsible for construction of roads, railways, and airports, land, air and sea transport, planning for and expanding infrastructure facilities on the basis of social economic development and national de-fence priorities.

The major organizational structure for road administration is shown below.

Ministry of Roads and Transportation (MRT)

- Deputy Department of Maintenance and Coordination of Affairs of Provinces
- Deputy Department of Technical Affairs and Road Construction

Under the supervision of the Department of Maintenance and Coordination of the Affairs of Provinces, there are 29 general offices located in the center of provinces and some other cities. This Department and the central offices employ about 20,000 people in total.

Under the supervision of the Department of Technical Affairs and Road Construction, there are 5 general offices. Iran is divided into 5 sections and every general office is responsible for a section. For example the general office of road construction for the central and north section is responsible for Tehran, Mazrkazi, Semnan, Mazandaran, Giran and Khorasan Provinces.

b) Road maintenance

Road maintenance includes route maintenance, recurrent maintenance, periodic maintenance, and urgent maintenance. Route maintenance and urgent maintenance is done by the personnel of the Deputy Department of Maintenance with Coordination of the Affairs of Provinces.
Recurrent maintenances and periodic maintenance is done by contractors (private sector) or personnel of the Deputy Department of Maintenance with Coordination of the Affairs of Provinces. Road construction can be done by contractors (private sector).

c) Length of roads and number of vehicles

Total lengths of roads: 107,019 km (1992/93)
(Excluding small village roads which are constructed and maintained by the Ministry of Construction Jihad.)

The lengths of roads by road category is showed as follows.

Table 1.1.2.1 The Lengths of Roads by Road Category

road category		Length(km)		
		1982	1985	1992
Free ways		411	504	470
Express ways		364	620	943
Wide main roads		927	2,736	4,757
Ordinary main roads		12,339	13,585	13,766
Secondary roads	(paved)			27,600
	(unpaved)			14,332
Oter types	(paved)			17,444
	(unpaved)			27,697

Vehicles

Number of vehicles (light and heavy-duty inter-city cargo vehicles)are shown in the road transport census carried out by the Statistics Centre of Iran in 1989 as follows

Table 1.1.2.2 Number of Vehicles
Light and Heavy-duty Inter-city Cargo Vehicles

pickuptrucks:	345,683
trucks :	63,472
dump trucks :	34,717
trailers :	19,748
trailers tankers :	14,851
trailers cold storage :	1,672
others :	7,718
Total	487,861

d) Transportation networks among cities and ports

Inland cities

Road networks of major cities,Tehran,Mashhad,Esfahan,Tabriz are advanced. Freeways and expressways are arranged around these cities. Feeways in the Tehran-Tabriz section are the most advanced. While the Tehran-Qazvin section (150km) has already been constructed, and Qazvin-Zanjan section (170km) is under construction. This route is a part of Asian Highway Route 1.
Concerning road networks in the east and west direction, Tabriz-Tehran-Mashhad route in the northern part of Iran is the most advanced. Tehran-Esfahan-Shiraz route is the most advanced route running from north to south.

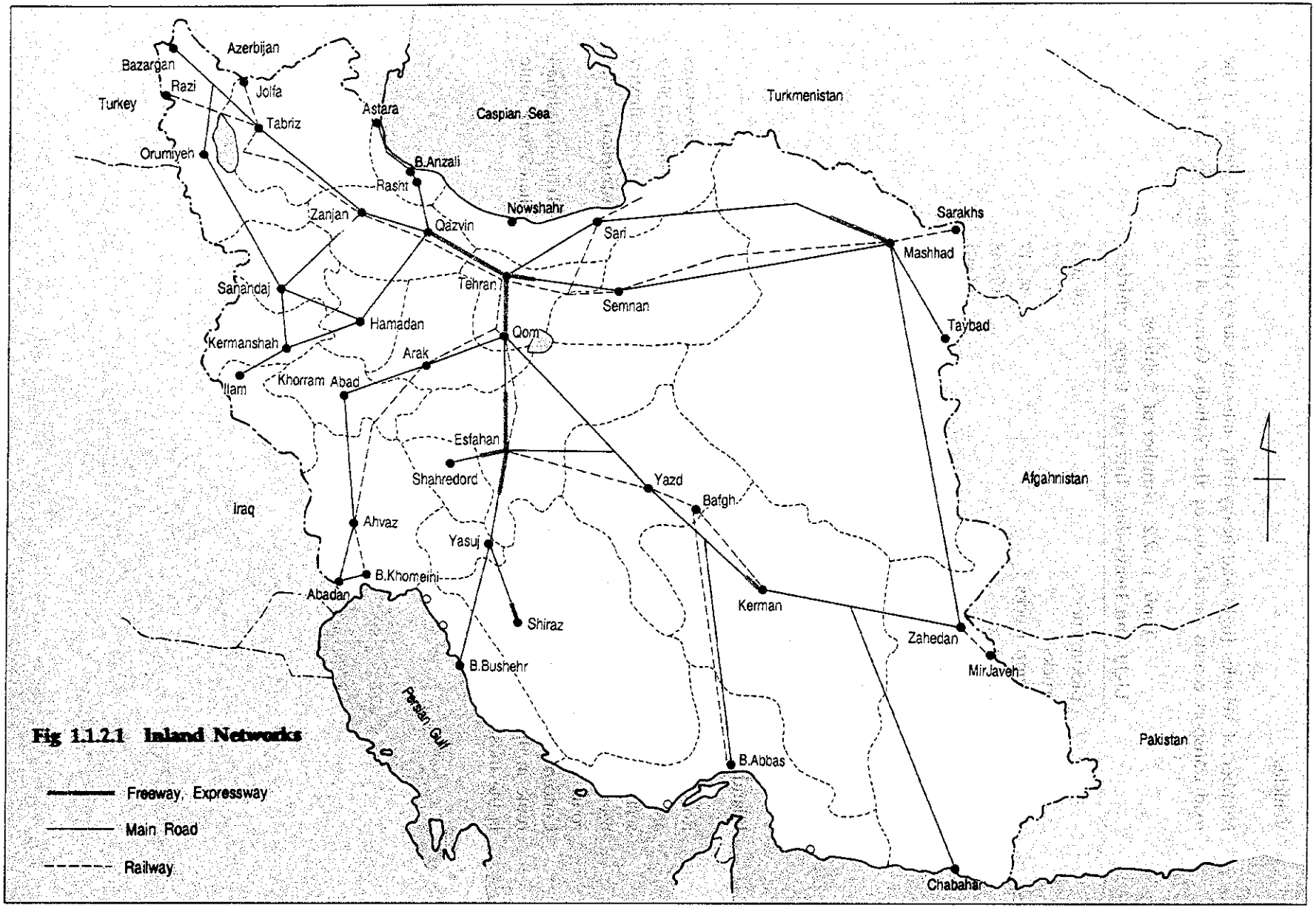


Fig 1.1.2.1 Inland Networks

Table 1.1.2.3 Distance of Main Cities from Tehran by Road

Route		Distance	Lane	Note
Northwest area				
Tehran-Orumiyeh	road	907 km	6,2	Turkey border
Tehran-Rasht	road	325 km	6,2	Caspian sea
Tehran-Tabriz	road	599 km	6,2	Oil refinery
Tehran-Zanjan	road	319 km	6,2	
Tehran-Astara	road	514 km	6,2	Azerbaijan border
Tehran-Bazargan	road	879 km	6,2	Turkey border
Tehran-Jolfa	road	734 km	6,2	Turkey border
Northeast area				
Tehran-Mashhad	road	824 km	4,2	
Tehran-Sari	road	267 km	4,2	Caspian Sea
Tehran-Semnan	road	236 km	4,2	
Tehran-Sarakhs	road	1,079 km	4,2	Turkmenistan border
Tehran-Taybad	road	1,118 km	4,2	Afghanistan border
Southwest area				
Tehran-Ahvaz	road	874 km	6,2	Steel complex
Tehran-Arak	road	293 km	6,2	Aluminium plant
Tehran-Hamadan	road	337 km	6,2	
Tehran-Ilam	road	745 km	6,2	
Tehran-Khorram abad	road	499 km	6,2	
Tehran-Sanandaj	road	501 km	6,2	
Tehran-Kermanshah	road	561 km	6,2	
Southeast area				
Tehran-B.Abbas	road	1,333 km	6,2	Persian Gulf
Tehran-B.Bushehr	road	1,228 km	6,2	Persian Gulf
Tehran-Esfahan	road	439 km	6,2	Steel complex
Tehran-Kerman	road	1,038 km	6,2	
Tehran-Shahrekord	road	543 km	6,2	
Tehran-Shiraz	road	924 km	6,2	Petrochemical plant
Tehran-Yasuj	road	1,169 km	6,2	
Tehran-Yazd	road	677 km	6,2	Iron ore mine
Tehran-Chabahar	road	1,961 km	6,2	Persian Gulf
Tehran-Mir Javeh	road	1,651 km	6,2	Pakistan border

Ports of Caspian the Sea

The northern part of Iran is formed by the mountains of the Alborz range. It forms a high and narrow barrier and separates the Caspian Sea from the interior desert region. Access roads for the major Caspian Sea ports (Anzali port and Nowshahr port) through these mountains are not in good conditions with narrow road, steep

slope and sharpturn.

Ports of the Persian Gulf

The mountains of the Zagros Range run from north-west to south-east in the western part of Iran. Route of Tehran-Khomeini port confronts the Zagros Range, requiring many bridges and tunnels. Route of Tehran-Abbas port passes through the desert region where weather conditions are very severe.

e) Truck operating cost

Road transportation costs are composed of many variables such as costs of vehicle and fuel and other factors including size and conditions of vehicles used, speed of travel, road conditions (surface, road gradient, road curvature).
Khomeini port is the only port that can be accessed by railway line. In Khomeini port 70 percent of unloaded cargo is transported by truck.
The truck operating costs were calculated based on the following conditions and are shown in Table 1.1.2.4 and Table 1.1.2.5.

Terrain condition : Flat
Road surface : Asphalt
Type of vehicle : 10 tons truck
Speed of vehicle : 50km/h
Operating costs : 30 Rls/t-km

Table 1.1.2.4 Truck Operating Cost

section	distance	time	cost
Abbas port-Tehran	1,334 km	27 hour	30 Rls/t-km
Abbas port-Tehran	1,334 km	27 hour	200 US$/TEU
Khomeini port-Tehran	928 km	21 hour	160 US$/TEU
Chabahar port-Tehran	1,961 km	39 hour	600 US$/TEU

Table 1.1.2.5 Inland Networks and Transportation Costs

Border Connection	mode		1 Tehran	2 Esfahan	3 Kerman	4 Shiraz	5 Mashhad	6 Bakhtaran	7 Arak
Persian Gulf									
Charbahar	truck	km	1,970	1,600	930	1,500	1,680	2,530	1,940
		time	39	32	19	30	34	51	39
		cost	59,100	48,000	27,900	45,000	50,400	75,900	58,200
B.Abbas	truck	km	1340	980	400	600	1420	1750	1380
		time	27	20	8	12	28	35	28
		cost	40,200	29,400	12,000	18,000	42,600	52,500	41,400
B.Abbas	rail	km	1,460	1,080	820		1,340		1,180
		time	37	27	20		34		30
		cost	21,170	15,660	11,890		19,430		17,110
B.Khomeini	truck	km	1,030	940	1,360	560	1,980	690	770
		time	21	19	27	11	40	14	15
		cost	30,900	28,200	40,800	16,800	59,400	20,700	23,100
B.Khomeini	rail	km	930	1330	2060		1830		650
		time	23	33	52		46		16
		cost	13,485	19,285	29,870		26,535		9,425
Bushehr	truck	km	1,230	790	1,120	320	2,040	1,140	1,100
		time	25	16	22	6	41	23	22
		cost	36,900	23,700	33,600	9,600	61,200	34,200	33,000
Caspian Sea									
B.Anzali	truck	km	370	810	1,400	1,290	1,260	930	660
		time	7	16	28	26	25	19	13
		cost	11,100	24,300	42,000	38,700	37,800	27,900	19,800
Nowshahr	truck	km	280	720	1,320	1,200	1,180	840	570
		time	6	14	26	24	24	17	11
		cost	8,400	21,600	39,600	36,000	35,400	25,200	17,100
Inland									
Julfa	rail	km	750	1,150	1,880		1,640		1,030
		time	19	29	47		41		26
		cost	10,875	16,675	27,260		23,780		14,935
Sarakhs	rail	km	1,060	1,460	1,160		170		1,350
		time	27	37	29		4		34
		cost	15,370	21,170	16,820		2,465		19,575
Bazargan	truck	km	880	1,320	1,920	1,800	1,780	1,440	1,180
		time	18	26	38	36	36	29	24
		cost	26,400	39,600	57,600	54,000	53,400	43,200	35,400
Astara	truck	km	520	960	1,560	1,440	1,410	1,080	810
		time	10	19	31	29	28	22	16
		cost	15,600	28,800	46,800	43,200	42,300	32,400	24,300
Taybad	truck	km	1,120	1,560	1,150	2,050	230	1,680	1,440
		time	22	31	23	41	5	34	29
		cost	33,600	46,800	34,500	61,500	6,900	50,400	43,200

truck 30 Rls / t/km V=50km/h time=hours
rail 14.5 Rls / t/km V=40km/h cost=Rls

2) International road networks

a) Present network

Iran is connected to Europe and Central Asia by road through Turkey, Azerbaijan, Turkmenistan, Afgahnistan, and Pakistan.
Present main transport routes are Turkey through Bazargan and Azerbaijan through Astara.

Table 1.1.2.6 International Boundary---Tehran Distances

Turkey	: Bazargan-- Tabriz-------- Zanjan-------- Tehran	879 km
Azerbaijan	: Astara---------- Rasht---------- Tehran	514 km
Turkmenistan	: Sarakhs--- Mashhad----- Semnan------- Tehran	1,079 km
Afghanistan	: Taybad---- Mashhad----- Semnan------- Tehran	1,118 km
Pakistan	: MirJaveh-- zahedan--- Kerman-- Yazd-- Tehran	1,651 km
	Persian Gulf Ports---Tehran distances	
Khomeini port---	Ahvaz------ Khorramabad---- Arak------- Tehran	1,024 km
Bushehr port----------	Shiraz---------- Esfahan------- Tehran	1,228 km
Abbas port----------	Sirjan---------- Shahrebabak- Tehran	1,334 km
Chahbahar port-	Iranshahr- Kerman---------- Yazd------ Tehran	1,961 km
	Caspian Sea port---Tehran Total distances	
Anzali port----------	Qazvin---------- Tehran	365 km
Nowshahr port----------	Amol---------- Tehran	278 km

b) International cargo networks

The international land borders of Iran are Bazargan, Astara, Taybad, Mirjaveh. The most important borders are Bazargan and Astara. Astara is situated in the north part of Iran is close to the Azerbayjanian border. Bazargan is located in the north-west part of Iran and is connected with the Turkish border.

Accrding to the traffic of trades shown in Table 1.1.2.7.

Table 1.1.2.7 In-coming Trucks in Iran 1988

Name of Customs	Trucks No	Weight(t)
Bazargan	23,949	395,868
Taybad	7	153
Astara	1,956	6,323
Mirjaveh	-	-

Cargo flow from Central Asia, Turkmenistan,Uzbekistan,Tajikistan is very small by reason of delay of road network. But in 1992 Highway project of Istanbul-Almatoi route started and this route will be important in future.

(2) Railway Network

1) The present railway network

a) Organization

IIRR (Islamic Iranian Republic Railways) consists of a head office and 12 operational divisions. IIRR is under the influence of the Ministry of Roads and Transport along with similar organizations such as Deputy for Construction and Development of Railway Network (DCDR) and Railway Developing Consulting Engineers Iran (METRA).

Ministry of Roads and Transport

- ○ Islamic Iranian Republic Railways (IIRR)
- ○ Deputy for Construction and Development of Railway Network (DCDR)
- ○ Railway Developing Consulting Engineers Iran (METRA)

b) Operational divisions

Iranian railway network consists of twelve operating divisions as shown in Table 1.1.2.8.

Table 1.1.2.8 Operational Divisions and Distances

operational division	main lines (km)
North	381
Tehran	435
Arak	293
Lorestan	214
South	386
Northwest	467
Azarbaijan	468
Northeast	477
Khorasan	334
Esfahan	623
Southeast	416
Zahedan	96
total	4,587

c) Length of railways

Iran has 5,044 km of railroads including 146 km of electric railtracks. The present network is a system of single track lines and standard gauge. The borders from where the goods are transported by railways are Julfa and Razi borders and Imam Khomeini port.

Existing main lines	5,044 km (including Bafq-Sirjan Line)
Existing industrial lines	1,185 km
Under construction lines	1,000 km
Under study lines	5,500 km
Proposed lines	1,500 km

Table 1.1.2.9 Length of Railways

No	main section	distance (km)	operation year
1	Tehran-B. Khomeini	928	1938
2	B. Torkaman-Tehran	461	1937
3	Gorgan-B. Torkamen	35	1960
4	Tehran-Tabriz	736	1958
5	Garmsar-Mashhad	811	1957
6	Ahwaz-Khorramshahr	121	1942
7	Ghom-Zarand	847	1971
8	Zarand-Kerman	80	1978
9	Sistan-Steel Mill	111	1971
10	Tabriz-Julfa	149	1916
11	Sofyan-Border Turkey	193	1971
12	Mirjawa-Zahedan	94	1920
	Total	4,566	(excluding Bafq-Sirjan)

(2) Cargo and passenger traffic

1) Passenger and Cargo Transport

Table 1.1.2.10 Passenger and Cargo Transport

	1986	1987	1988	1989	1990
Passengers ('000)	6,336	5,274	6,799	6,672	6,999
Cargo ('000tons)	12,705	14,788	12,957	12,334	14,881
Train Engines	313	301	206	236	241

Passenger transport temporarily decreased from 1985 to 1987 because of the war. Since 1987 passenger transport has been increasing. Cargo transport increased in 1987 and has been gradually increasing since the end of the war.

2) Operation of train

Main railway routes

Tehran---Tabriz (Julfa)	Tehran----Ahwaz(B.Khomeini)
Tehran----Mashhad	Tehran---Imam Kerman
Tehran----Esfahan	

Operation of cargo train is determined when freight car is collected in the station. There is no fixed schedule for each train.

3) Rolling Stock

Number of Locomotives

locomotives	328
cargo cars	13,000
passenger wagons	800

4) Freight rates

Table 1.1.2.11 Freight Rates Per Ton-km

Class rate	Rials	Typical commodities
1	14.5	Machinery, Chemicals
2	13.5	-
3	12.5	-
4	11.5	-
5	10.5	Water, Coal, Iron ore
Loading and Unloading supervision : 100 Rials per ton		

Freight rates of domestic cargo transportation by the Iranian Railway are classified into five groups. In addition to these basic freight rates, additional cost of supervising is required.

(3) International railway networks

Iran is linked by rail to three countries. The most active route at present is the one to Azerbaijan Republic through Julfa. Expansion of railway between Mashhad and Sarakhs straddles the Iran-Trukmenistan border.
Turkey is the geographical junction that connects Asia and Europe,and constitutes an important portion of the Trans Euro-Asian railway roulte. At the Turkish border near Razi, the railway stops at Lake Van.
At the Pakistan border, Mirjavhe-Zahedan section is operated by Pakistan with wide gauge.
At the Turkmenistan border Sarahks(Iran)-Tedzhen(Trukmenistan) section of 300km is under construction.

1) Present network

The borders from where the goods are transported by railways are shown as follows.

Table 1.1.2.12 Borders

Borders	routes
Azerbaijan	: Julfa---Tabriz---Tehran
Turkey	: Razi----Tabriz---Tehran
Turkmenistan	: Sarakhs--Mashhad--Tehran (Under construction)
Pakistan	: Mirjaveh--Zahedan
Persian Gulf	: Imam Khomeini-------Tehran

(4) Air Network

1) Present air network

a) Airports

There are 26 domestic airports in Iran operating round-the-clock, six international airports, and six airfields for the National Iranian Oil Company

International airports : 6
Mehrabad, Ishafan, Shiraz, Mashhad, Tabriz, B.Abbas,

Domestic important airports
Bushehr, B.Lengeh, Kish, Kerman, Rasht, Chahbahar, Ahvaz, Urmiya, Bakhtaran, Birjand, Zabol, Iranshahr, Lar Khorramabad, Hamedan, Sanandaj, Ramsar, Nowshahr, Abadan Zahedan, Sari, Yazd,

b) Air Passenger transport

It is estimated that air travellers by the year ending 20 March 1999 will reach 10,000,000 persons in the domestic market and 1,700,000 persons in the international market but the performance for the year ending 20 March 1994 shall be 800,000 persons domestic and 1,300,000 International.
Iran's main passenger transport bottleneck is in the air segment. Currently Iran is hiring aircraft and has got agency from Russian Airlines.

2) International networks

Iran Air operates 30 international flights a week from Tehran.

Tehran--- London, Paris, Frankfurt, Vienna, Rome, Geneva, Milan, Istanbul, Larnaca, Damascus, Dubai, Karachi, Bombay, Kualalompur, Beijing, Tokyo

New flight was established between Isfahan and Dubai in 1989. There are plans to schedule flights from Tehran and Shiraz to Kuwait, from Mashad to Damascus in Syria and Karachi in Pakistan and from Shiraz to Muscat in Oman.

Several airlines fly to and from Iran, namely. Aeroflot, Air France, Air India, Alitalia, Austrian Airlines, Emirates, Gulf Air, KLM, Lufthansa, PIA, Swiss Air, Syrian Airlines, Turkish Airways

(5) Shipping Networks

1) The Caspian Sea networks

On the Caspian Sea there are two important sailing routes. One is Baltic Sea--Volga River--Caspian Sea route(Volga-Baltic canal) and the other is Black Sea--Volga Don Canal--Volga River--Csapian Sea route(Volga-Don canal). Volga-Baltic canal is open for roughly 5 months during summer and Volga-Don canal for 7 months.
When the Volga route is closed, inside route of the Caspian Sea is available. Routes of the port Baku to B.Anzali and Nowshahr are used in all seasons.

a) The Caspian Sea Routes

Western Europe

Rotterdam---Baltic Sea---Volga R---the Caspian Sea(Astarkhan)---Anzali---(road)Tehran

Rotterdam---Black Sea---Volga R---the Caspian Sea(Baku)---Anzali---(road)Tehran

Eastern Europe

Moscow---Volga R---the Caspian Sea(Astarkhan)---Anzali---(road)Tehran

Mediterranean

Milano---Black Sea---Volga R---the Caspian Sea(Baku)---Anzali---(road) Tehran

Milano---Black Sea---Volga R---the Caspian Sea(Astarkhan)---Anzali---(road)Tehran

b) Facility of route of the Caspian Sea and Black Sea

Canal	:	the Caspian sea--Astarkhan--Volgograd--Kazan--St. Petersburg--Baltic Sea Number of locks are 8.
Canal	:	Caspian Sea--Astarkhan--Volgograd--Rostov--Black Sea Number of locks are 8.
Available Ship size	:	The maximum of draft is 3.2 m.
	:	The maximum breadth is 20.0 m.

Table 1.1.2.13 Ports of Caspian Sea

Port	Number of berth	Depth of berth
Baku (Azerbaidjan)	44	9.0
Makhacakala (Russian)	8	5.5
Astarkhan (Russian)	5	4.5
Guryev (Kazakhstan)	7	3.0
Aktau (Kazakhstan)	4	4.5
Krasnovodsk (Turkmenistan)	3	5.0

2) the Persian Gulf networks

On the Persian Gulf main transport routes are B.Abbas,B.Khomeini to/from Europe, Asia, America.B.Abbas-Dubai, Sharjeh route is used inside the Persian Gulf.

a) Western Europe
Rotterdam--- Suez--- the Persian Gulf------ Bandar Abbas------- (A)Tehran
Bandar Khomeini--- (A)Tehran
(A):road,railways

b) Eastern Europe
Moskva-- Baltic Sea-- Suez-- the Persian Gulf–
Bandar Abbas------- (A)Tehran :
Bandar Khomeini--- (A)Tehran
(A):road,railways

c) Mediterranean
Milan---Suez---the Persian Gulf---------- Bandar Abbas------- (A)Tehran
Bandar Khomeini--- (A)Tehran
(A):road,railways

d) North America
Newyork-Atlantic Ocean-Suez-the Persian Gulf--Bandar Abbas--------
(A)Tehran
(A):road,railways
Bandar Khomeini--- (A)Tehran

e) South America
Reodejaneilo–Atlantic Ocean–Suez--the Persian Gulf–
Bandar Abbas------- (A)Tehran
Bandar Khomeini---- (A)Tehran
(A):road,railways

f) Asia
Bangkok---Indian Sea---the Persian Gulf--- Bandar Abbas------- (A)Tehran
Bandar Khomeini---- (A)Tehran
(A):road,railways

g) Far East Asia

Yokohama---Indian Sea---the Persian Gulf--	Bandar Abbas-------	(A)Tehran
	Bander Khomeini-----	(A)Tehran
		(A):road,railways

h) Oceania

Sydney---Indian Sea---the Persian Gulf-----	Bandar Abbas--------	(A)Tehran
	Bander Khomeini-----	(A)Tehran
		(A):road,railways

i) Africa

Tunis---Suez---the Persian Gulf----------	Bandar Abbas--------	(A)Tehran
	Bander Khomeini-----	(A)Tehran
		(A):road,railways

3) Other land transport networks

a) Western Europe

Rotterdam---Istanbul---(road)Bazargan---(road)Tehran---(road)Astara-----(road)Tehran

Rotterdam---(road)---Bazargan---(road)---Tehran (all road)---Astara-----(road)---Tehran

Rotterdam---(railways)---Tabriz---(railways)---Tehran (all railways)

b) Eastern Europe

Moskva---Astara,Bazargan---Tehran (all road)

Moskva---Julfa---Tehran (all railways)

c) Mediterranean

Milan---Istanbul---(road)Astara,Bazargan---(road)Tehran

d) Central Asia to sea

Turkmenistan---Afghanistan---Pakistan---Karachi (road,railways)

Turkmenistan---Gorgan---Tehran---B.Khomeini (all road)

Turkmenistan---Mashhad---B.Abbas (all road)

Turkmenistan---Mashhad---B.Chabahar (all road)

4) Intrenational networks and transportation costs

The movement of cargo to and from Iran is principally by sea, road, and railways.

The routes of these transport modes and transportation costs are shown in Table 1.1.2.14 and Fig. 1.1.2.2.

Table 1.2.14 International Networks and Transportation Cost

Explanatory notes

Border Connection	mode		1 Persian G B.Khomeini	2 Persian G B.Abbas	3 Caspian S B.Anzali	4 Inland Jolfa/Astara	5 Inland Sarakhs
West Euro							
Rotterdam	ship	km day cost	Rotterdam ↓ B.Khomeini	Rotterdam ↓ B.Abbas	Rotterdam ↓ B.Anzali		
	truck	km day cost	B.Khomeini ↓ Tehran	B.Abbas ↓ Tehran	B.Anzali ↓ Tehran	Rotterdam ↓ Tehran	
	rail	km day cost	B.Khomeini ↓ Tehran	B.Abbas ↓ Tehran	B.Anzali ↓ Tehran	Rotterdam ↓ Tehran	

1,2,3 : real data
time : days
cost : US$

4,5 : calculated data
truck
V=15km/h 0.97US$/TEU-km
rail
V=10km/h 0.55US$/TEU-km

NOTE: calculated data

1 Inland Transportation

Khomeini--Tehran

truck	18h	1024km	160US$/TEU	0.16US$/TEU-km
rail	24h	928km	300US$/TEU	0.32US$/TEU-km

B.Abbas--Tehran

truck	28h	1334km	200US$/TEU	0.15US$/TEU-km
rail	38h	1457km	450US$/TEU	0.31US$/TEU-km

2 International Transportation

Rotterdam--Tehran

truck	14d	5700km	6400US$/TEU	1.12US$/TEU-km
rail	18d	5700km	5000US$/TEU	0.88US$/TEU-km

Milano--Tehran

truck	20d	4700km	8500US$/TEU	1.81US$/TEU-km

Moskva--Tehran

truck	10d	3500km	60US$/t*10t =600US$/TEU	0.17US$/TEU-km
rail	15d	3700km	80US$/t*10t =800US$/TEU	0.22US$/TEU-km

Ashkhabad--Tehran

truck	6d	1900km	1500US$/TEU	0.79US$/TEU-km

Mean

truck	0.97US$/TEU-km
rail	0.55US$/TEU-km

Table 1.1.2.15 International Networks and Transportation Cost

Border Connection	mode		1 Persian G B.Khomeini	2 Persian G B.Abbas	3 Caspian S B.Anzali	4 Inland Jolfa/Astara	5 Inland Sarakhs
West Euro							
Rotterdam	ship	km	12,332	11,423	6,393		
		day	34	30	20		
		cost	2,650	2,500	3,000		
	truck	km	1,000	1,400	300	5,700	
		day	1	2	1	16	
		cost	160	200	110	5,529	
	rail	km	930	1,460		5,700	
		day	1	2		24	
		cost	300	450		3,135	
East Euro							
Moskva	ship	km	15,325	14,416	3,800		
		day	35	35	8		
		cost	2,500	2,500	800		
	truck	km	1,000	1,400	300	3,500	
		day	1	2	1	10	
		cost	160	200	110	3,395	
	rail	km	930	1,460		3,700	
		day	1	2		15	
		cost	300	450		2,035	
Mediterran							
Milano	ship	km	9,012	8,103	5,395		
		day	28	28	45		
		cost	2,300	2,300	1,800		
	truck	km	1,000	1,400	300	4,700	
		day	1	2	1	13	
		cost	160	200	110	4,559	
CIS Republ							
Ashkhabad	truck	km	1,850	2,250		850	
		day	6	8		1	
		cost	1,500	1,900		824	
	rail	km					
		day					
		cost					
Baku	ship	km					
		day			1		
		cost			400		
	truck	km				800	
		day				1	
		cost				400	
Tashkent	truck	km					2,100
		day					6
		cost					2,037
	rail	km					2,250
		day					9
		cost					1,238
Almaata	truck	km					2,900
		day					8
		cost					2,813
	rail	km					3,150
		day					13
		cost					1,733

Border Connection	mode		1 Persian G B.Khomeini	2 Persian G B.Abbas	3 Caspian S B.Anzali	4 Inland Jolfa/Astara	5 Inland Sarakhs
Petropavlo	truck	km day cost					4,200 12 4,074
	rail	km day cost					4,150 17 2,283
Turkey							
Istanbul	truck	km day cost				2,700 8 2,619	
	rail	km day cost				2,700 11 1,485	
Afganistan							
Kabul	truck	km day cost					2,300 6 2,231
Pakistan							
Islamabad	truck	km day cost					2,700 8 2,619
Persian G							
Dubay	ship	km day cost	3 700	1 400			
N.America Newyork	ship	km day cost	35 7,000	31 7,000			
S.America Riodejanei	ship	km day cost	23 6,800	23 6,800			
Far E Asia Yokohama	ship	km day cost	21 2,500	21 2,500			
S.E.Asia Singapore	ship	km day cost	16 2,500	16 2,500			
Calcutta	ship	km day cost					
Oceania Melbourne	ship	km day cost	25 2,800	25 2,800			
Africa Dakar	ship	km day cost					

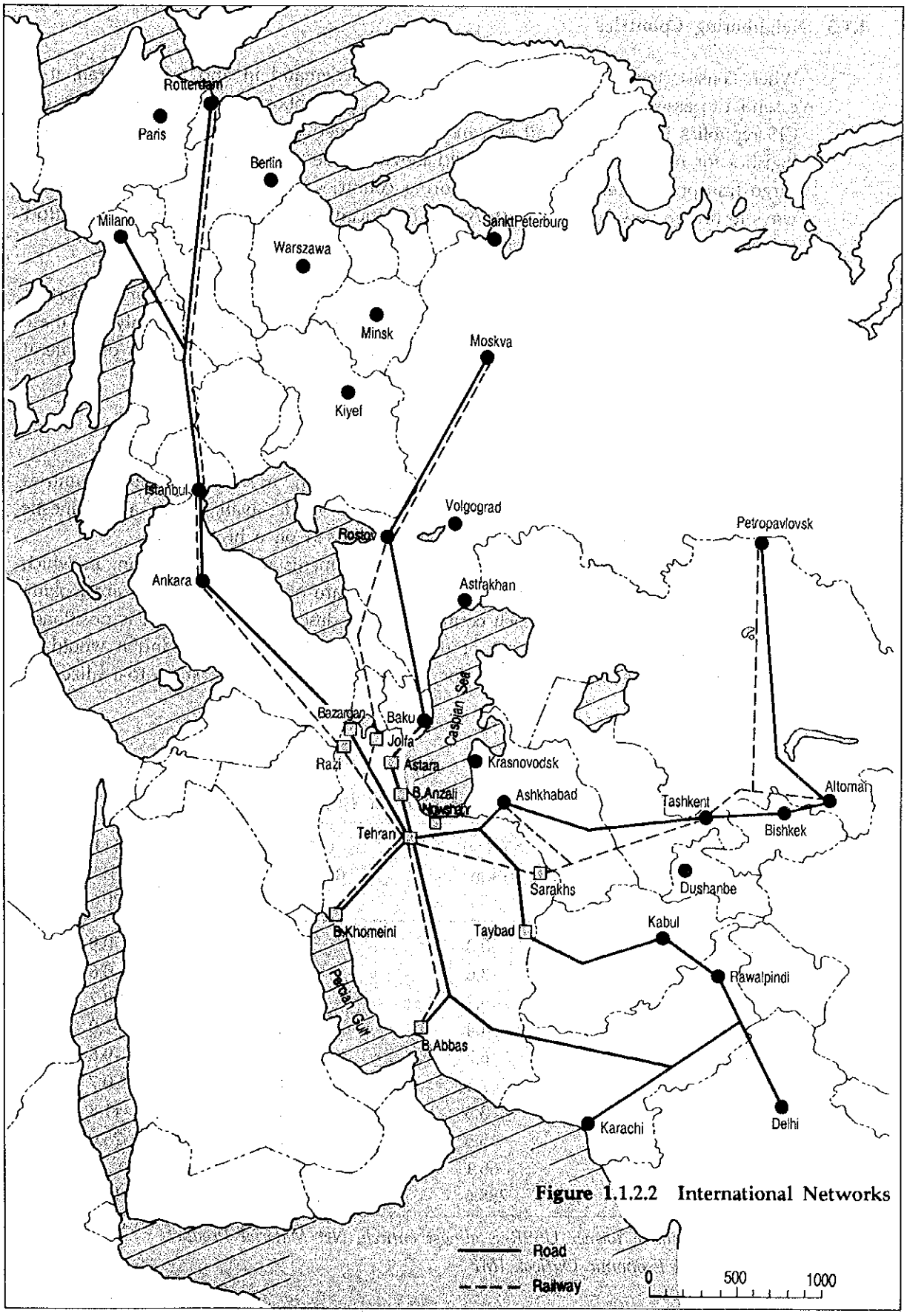


Figure 1.1.2.2 International Networks

1.1.3 Neighboring Countries

When considering the international cargo traffic demand in and around Iran, it is essential to assess future source of cargo traffic of neighboring countries including the CIS republics in particular, all of which are so called land-locked countries of which logistics for required cargo flow should inevitably be dependent on the international cargo transport systems of the neighboring countries. CIS countries are looking for ways to bridge new relations with Asian, European, and Islamic countries in an effort to achieve economic independence.

Also, countries that border Iran such as Turkey, Armenia, Azerbaijan are important as gateways to West Europe, Russia and East Europe. And not only do these countries offer access to distant markets,they are also important in terms of bilateral trade with Iran.

(1) CIS Countries

With the dissolution of the COMECON trade system, in which member countries specialized in one specific commodity that was made available to all, domestic production in the former Soviet Union has decreased on a broad scale.
Consequently, countries such as Uzbekistan, Turkmenistan and Tajikistan, in which cotton products hold a disproportionately high share of total production, are looking for other markets (details of each country will be described later). Iran is positioned to act as the gateway to the rest of the world for these countries and it would be one of the important policy choice for Iran to take appropriate steps to realize this role.

1) Population, GDP

Table 1.1.3.1 Population and GDP of CIS Countries (1991)

	POPULATION Mn.persons	GDP Bn.ruble	GROWTH RATE of GDP(%)
Uzbekistan	20.3	32.4	-0.9
Turkmenistan	3.6	7.3	-0.6
Tajikistan	5.2	7.1	-8.7
Kyrgyzstan	4.4	8.3	-2.0
Kazakhstan	16.7	35.0	-9.6
Azerbaijan	7.1	13.1	-0.7
Armenia	3.3	7.9	-11.8
Georgia	5.5	10.1	-25.0
TOTAL	66.1	121.2	-
all former USSR	288.6	860.0	-17.0

Note: GDP data of former USSR is almost entirely Net Material Product
Source: World Economic Outlook IMF

The CIS's total population is about 70 million which is close to that of Iran and represents about 23 % of the former USSR. The GDP of CIS countries comprises about 14.1 % of the former USSR.

2) Foreign trade

The foreign trade value of CIS countries is about 173 billion rubles, however, here is a negative growth rate of more than 40% in 1991. And about 90 % of the trade value is inter republic trade. Furthermore the CIS trade value (173 billion rubles) is only 11.4% of the USSR (151.78 billion rubles) in 1991 (See Table 1.1.3.2.) and foreign trade with countries outside the former USSR was very small.

Table 1.1.3.2 Inter Republic Relations in the Former USSR (1991)

	EXPORT VALUE (Bn. ruble)	IMPORT VALUE (Bn. ruble)	INTER TRADE OF FORMER USSR	
			[1]RATIO of GDP(%)	[2]RATIO of TOTAL TRADE(%)
Uzbekistan	1.13	2.31	39.5	85.8(89.4)
Turkmenistan	0.17	0.70	39.3	89.1(92.5)
Tajikistan	0.49	0.80	41.6	86.3(86.5)
Kyrgyzstan	0.08	0.98	45.2	86.9(85.7)
Kazakhstan	1.35	2.88	33.9	86.3(88.7)
Azerbaijan	0.56	1.41	42.0	85.6(87.7)
Armenia	0.12	1.38	54.9	89.1(90.1)
Georgia	0.37	2.57	44.3	86.5(85.9)
TOTAL	4.27	13.03		
all USSR	79.67	72.11	29.4	71.8

Source : Common Issues and Inter Republic Relations in the Former USSR(IMF)
(1)(2) : Trade and Payment Arrangements for States of the Former USSR(World Bank, 1998) (See Appendix II-1.1)

Since future trade value of each country by GDP will be different, we surmise that the outer republic trade ratio will eventually reach the same value of the former USSR, which is about 70% according to Table 1.1.3.2.

Total trade value of the five countries located on the east side of the Caspian Sea is determined by multiplying 9.01 billion rubles with 70 %, which yields 64 billion rubles.

Note: In this chapter CIS's data are obtained from economic magazines published in Iran and by the study of "The general Findings of Central Asian Transport System, MOT, Japan, 1993".

These countries will each trade with a variety of countries in future and it is difficult to predict what trade scenario will emerge. In general, however, we expect four types of cargo flow as shown below.

Cargo flows (to/from);

- West Europe
- East Europe and Russia
- Asian countries, including China
- Middle East countries, in particular, Turkey and Iran

Cargo and commodity-wise forecast of these countries will be estimated from their national economic frame and industrial constitution. Outline of existing conditions of these countries is given below, while detailed description will be mentioned later.

3) Economic Overview of CIS Countries (1992)

i) Kazakhstan

<Industry and Mining>

There is an industrial complex in the northern part of the country where iron steel,chemical fertilizer, medicine, mechanical products, light industry and food are produced. Chrome, coal, lead are produced on a large-scale, and natural gas and oil are produced near the Caspian Sea of which and the potential for development is considered high. (see the appendix)

Main products;	Oil	500,000 barrels per day
	Natural gas	7 billion m^3 annually
	Coal	138 Mn.ton annually
	Non-iron metals	77.7 Mn. ton annually
	Power station	90 Bn.kw/hour

<Agriculture>

There is an abundance of agricultural products including potato, vegetable, meat and dairy products. Self-sufficiency has almost been realized though there is a need for consumer goods.

Main products;	Cotton	324,000 ton annually(1990)
	Meat	1.26 Mn.ton annually
	Wheat	28.6 Mn.ton annually
	Potato	2.57 Mn.ton annually

<Outer republic Trade>

Main trading partners are China and the former USSR.

By commodity, steel, mineral materials oil and oil products are mainly exported to these areas.

Note: Economic data of CIS countries is in 1992 expecting only by notice.

ii) Uzbekistan

<Industry and Mining>

Industrial development has not yet matured.

Main products;	Natural gas	42.8 Bn.m^3 annually
	Oil	60,000 barrels per day
	Power station	50.6 Bn.kw/hour
	Cement	5,582,000 ton annually
	Gold	42 ton annually
	Coal	6 Mn.ton annually

<Agriculture>

Main products;	Cotton	5.365 Mn.ton annually
	Vegetable oil	5.8% Production of former Soviet Union

<Outer Republic Trade>

Food stuffs are imported from Germany and East Europe.

Exports are textile material and chemical products bound for Germany and Poland.

USA, Germany and Turkey have a plan to offer economic aid each other.

iii) Kirghyzstan

This country has a chronic shortage of energy (especially oil) and food (grain sugar).

<Industry and Mining>

Main products; Electric motors (3.4% of total products of former Soviet Union) computers, electric goods, glass, rugs, tobacco, antennas.

<Agriculture>

Main products;	Sugar	415,000 ton
	Cotton	74,000 ton
	Wool	38,600 ton
	Meat	133,000 ton

<Outer Republic Trade>

Steel, machinery and so on are exported from this country mainly to Italy, Germany and Bulgaria.

Food stuffs, machinery and transport equipment are imported mainly from Germany, Czech and Bulgaria.

iv) Turkmenistan

<Industry and Mining>

There are abundant resources of oil, natural gas, sulphur, salt, calcium, stones for construction, mineral water.

Production of natural gas is second after Russia.

Main industries are oil refinery, gas, chemicals, machinery and electronic equipment, cotton-gin, handicrafts(carpets), light industry, minerals.

Main Products; Power station electricity production 14.5 Mn.k/w, 40% is sent

to Uzbekistan and Afghanistan.
Natural gas 84.7 Bn.M^3 annually(1991)
Oil 5.4 Mn.ton annually

<Agriculture>

Main Products;	Grain	4 Mn.ton
	Cotton seed	194 Mn.ton
	Potato	27,000 ton
	Grape	1.7 Mn.ton
	Fruits	50 Mn.ton
	Vegetables	405,000 ton

<Outer Republic Trade>
It is alarming that 20% of outer republic imports are food stuffs, mainly from Germany and Poland. Natural gas, metallic mineral and metallic products are exported mainly to Germany and Bulgaria.

v) Other CIS Countries
Armenia and Azerbaijan have cultural ties with Iran dating from the past. These countries represent trading opportunities for Iran and also offer access to European countries.

(2) Turkey, Pakistan and Afghanistan

Population, GNP and cargo flow to/from Turkey and Pakistan are shown in Table 1.1.3.3

When the trade between Europe and Economic Cooperation Organization (ECO) countries increases, the cargo transported on the Atlantic Ocean will increase through the Mediterranean Sea and Black Sea. Turkey will be the Land Bridge gate to ECO countries. Since most of these cargoes will be transported by trucks, it is considered important to mitigate the customs and trade bottleneck.

Table 1.1.3.3 Socio-economic Condition of Turkey and Pakistan

	CURRENT GNP PER CAPITA (US$)			POPULATION (THU)			GNP (Bn. $)		
YEAR	TURKEY	PAKISTAN	IRAN	TURKEY	PAKISTAN	IRAN	TURKEY	PAKISTAN	IRAN
1971	400	170	420	36,248	62,573	29,297	14.50	10.64	12.30
1972	410	160	510	37,217	64,610	30,209	15.26	10.34	15.41
1973	470	130	700	38,201	66,706	31,165	17.95	8.67	21.82
1974	630	130	940	39,162	68,849	32,164	24.67	8.95	30.23
1975	830	130	1,310	40,078	71,033	33,206	33.26	9.23	43.50
1976	1,000	170	1,890	40,952	73,251	34,294	40.95	12.45	64.82
1977	1,110	190	2,170	41,777	75,494	35,431	46.37	14.34	76.89
1978	1,220	220	1,960	42,593	77,779	36,617	51.96	17.11	71.77
1979	1,380	250	2,060	43,466	80,135	37,848	59.98	20.03	77.97
1980	1,400	290	1,950	44,438	82,581	39,124	62.21	23.95	76.29
1981	1,450	330	2,530	45,500	85,114	40,446	65.98	28.09	102.33
1982	1,300	350	3,200	46,657	87,736	41,813	60.65	30.71	133.80
1983	1,180	390	3,530	47,877	90,452	43,242	56.49	35.28	152.64
1984	1,110	380	3,750	49,105	93,265	44,757	54.51	35.44	167.84
1985	1,080	370	4,030	50,306	96,180	46,374	54.33	35.59	186.89
1986	1,110	370	3,920	51,475	99,199	48,087	57.14	36.70	188.50
1987	1,220	360	3,610	52,622	102,324	49,889	64.20	36.84	180.10
1988	1,290	370	3,050	53,764	105,558	51,778	69.36	39.06	157.92
1989	1,370	390	2,590	54,916	108,900	53,744	75.23	42.47	139.20
1990	1,640	390	2,500	56,098	112,351	55,779	92.00	43.82	139.45
1991	1,780	400	2,170	57,326	115,844	57,727	102.04	46.34	125.27

Source: World Tables 1993, A WORLD BANK BOOK, pp.328f.

Table 1.1.3.4 Cargo volume Iran to/from Turkey

(1,000 tons)

	IMPORT	EXPORT
1984	69.8	16.4
1985	1,999.4	9.9
1986	1,054.5	7.3
1987	1,080.0	33.8
1988	812.7	19.6
1989	1,257.5	34.4
1990	1,029.1	139.3
1991	811.0	178.4
1992	593.1	217.4

Table 1.1.3.5 Cargo volume Iran to/from Afghan/Pakistan

(1,000 tons)

	IMPORT	EXPORT
1987	145	25
1988	32	26
1989	179	13
1990	40	12
1991	103	57
1992	166	102

Bazargan customs office is located in the northwestern part of Iran and generally a large number of trucks pass through this border to Turkey or vice versa.

(2) the Persian Gulf

Persian Gulf is the main water way for Iran, Iraq and the countries located along the coast of the Arabian Peninsula. There are five countries in this area actively engaged in world trade. (See Appendix II-1.4)

1) Socio-economy

Socio-economic data except for Iraq is as follows.

Table 1.1.3.6 GNP and Population of Arab Countries

GNP	IRAN	BAHRAIN	QATAR*	SAUDI ARABIA	UNITED ARAB	KUWAIT	YEMEN*	OMAN	TURKEY
1987	180,099	3,137	5,507	91,064	24,194	27,552	4,966	7,579	64,199
1988	157,923	2,933	5,781	90,964	24,653	28,802	6,358	6,882	69,356
1989	139,197	3,306	6,724	93,106	28,546	33,198	7,203	7,517	75,235
SHARE	43.7%	1.0%	2.1%	29.2%	9.0%	10.4%	2.3%	2.4%	
POPULATION									
1987	49,889	458	-	13,612	1,447	1,873	10,245	1,368	52,622
1988	51,778	473	341	14,016	1,495	1,958	10,555	1,419	53,764
1989	53,744	489	422	14,435	1,543	2,048	10,896	1,471	54,916
SHARE	63.2%	0.6%	0.5%	17.0%	1.8%	2.4%	12.8%	1.7%	

Source: World Tables, 1993

**: Inter National Financial Statistics, 1991*

2) Trade

There are many container ports in the Persian Gulf where many containers are handled and transhipped. When the under planning free trade zones in the Persian Gulf area starts their operation, the international trade will be more active and a large hub port may emerge. In terms of serving South Asia and Middle East countries, the entrance area of the Persian Gulf is perhaps best suited as the site for the hub port from the economic and geographical point of view. (See Appendix II-1.8)

3) Transportation in the Persian Gulf

The number of ships plying the Persian Gulf and Indian Ocean is increasing and offer better connections between Arab and Asian countries. On the other hand, the big consumption area is near the port at the bottom of the Persian Gulf and it is expected that liner services for general and raw material cargo will increase.

Though it is difficult to predict which ports and routes cargoes from the CIS countries and Russia will use, at least, it is certain that port activities will prosper with the increased transit cargo. As the cargo handling becomes more convenient, it with a great number of ships calling is easy to raise the level of transit cargo.

4) General Findings of Dubai port

i) Growth of container cargo volume at Dubai port has been steadily increasing. In 1993, 60 percent of total handling cargo volume is container cargo as

shown in Table 1.1.3.7.

ii) In particular, growth rate of transhipment container cargo has markedly increased. Container volume of transhipment cargo is 56 percent of total container cargo on a TEU basis as shown in Table 1.1.3.8.

iii) The number of container ships has increased with the increase in container cargo, while other ships have increased slightly or remained level.

iv) The volume of transhipment cargoes from Dubai to Iran is larger than that of any other country, comprising 30% of the total as shown in Figure 1.1.3.2.

v) The contents of 50 percent of transhipment cargo are machinery, automobile and textile as shown in Table 1.1.3.9.

vi) The distance from Dubai to Bander Abbas is 117 miles and takes 2 hours by ship.

vii) Total container cargo volume at both ports (Port Rashid and Jebel Ali) is 14.75 million tons. Seventy percent of aforesaid cargo volume is transhipment cargo. On a TEU basis, about 56 percent (0.94 million TEU) of the total container cargo volume (1.68 million TEU) is transhipment cargo. Designation of the transhipment cargo is divided among Iran (30 percent), Bombay and Karachi, etc. Forty to fifty percent of the transhipment cargo will be transferred by sea and then 70 percent of this transhipment cargo is bound for Iran.

viii) Transhipment cargoes for Iran amount to 3.3 million tons (10.5 million tons x 45% x 70%). Twenty percent of total transhipment cargo is by road (mainly to Doha). Thirty to forty percent of total transhipment cargo is for domestic use. Average ship type is 400 DWT and 40 to 50 feet in length.

Note: Data is obtained by the Dubai Port Authority through the meeting in March 1994 at Dubai.

Table 1.1.3.7 Container Cargo Volume

	1992		1993	
Tonnage				
Import	2,628,811		3,018,097	
Export	1,101,481		1,218,707	
Transhipment	8,576,363		10,513,527	
Total	12,306,655		14,750,331	
TEU				
Import	239,125		270,315	
〃 Empty	149,736		164,579	
Export	91,517		106,926	
〃 Empty	227,284		194,178	
Transhipment	713,987		829,469	
〃 Empty	60,158		113,311	
Total	1,481,807		1,678,778	
Units	20ft	40ft	20ft	40ft
Import	129,197	54,964	143,849	63,233
Export	56,247	17,635	62,814	22,056
Empty	204,770	116,204	213,896	129,086
Transhipment	344,293	184,847	412,627	208,421
Total	734,507	373,650	833,186	422,796

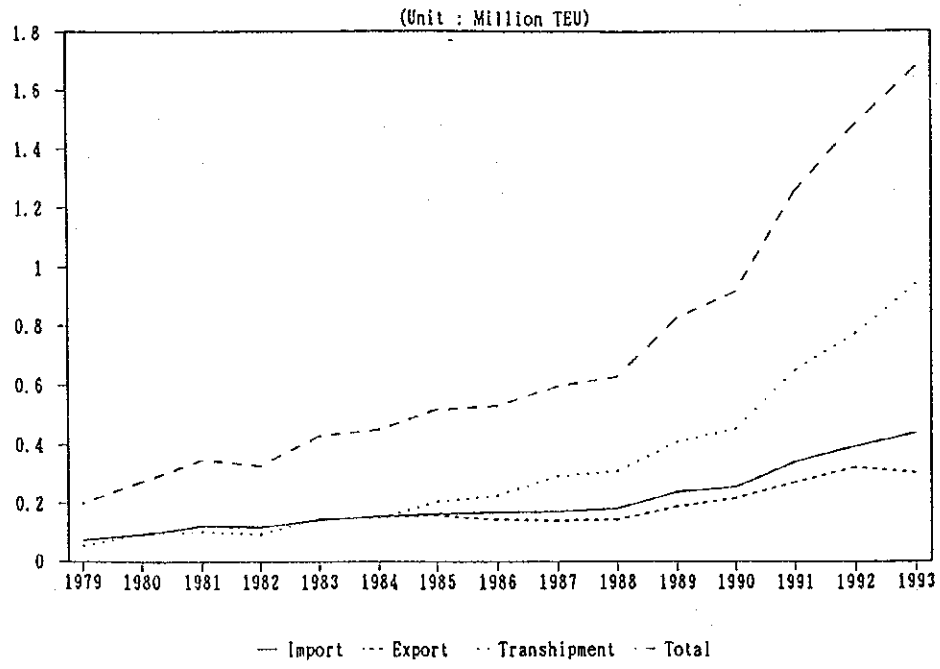


Figure 1.1.3.1 Container Cargo Volume through Dubai

Table 1.1.3.8 Regional Throughput of Cargo Volume

(Unit : ,000 MT)

Region	1992	Ratio	1993	Ratio
North Europe	2,006	14.97%	2,815	15.19%
South Europe	676	5.05%	1,529	8.25%
Africa	128	0.96%	276	1.49%
Middle East	322	2.40%	538	2.90%
Persian Gulf	3,699	27.61%	3,898	21.04%
India	2,464	18.39%	4,049	21.86%
South East Asia	1,423	10.62%	2,221	11.99%
Australia & NZ	405	3.02%	801	4.32%
Far East	1,794	13.39%	1,677	9.05%
East Coast USA	479	3.58%	722	3.90%
Total	13,396		18,526	

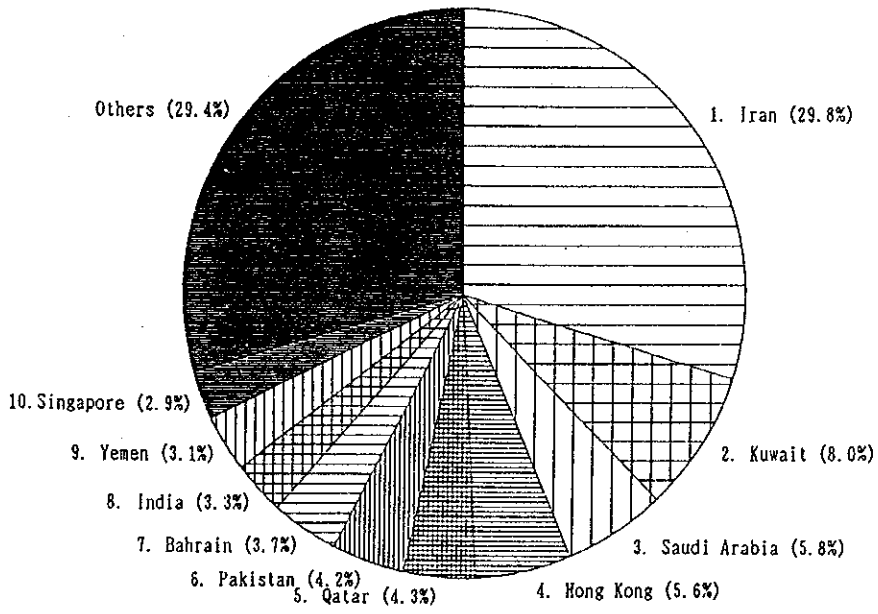


Figure 1.1.3.2 Share of Cargo Value Dubai Re-Export(1993)

Table 1.1.3.9 Re-Export by Product

Product	1991	1992
Machinery, recorders, TV's	20.30%	19.49%
Vehicles, aircraft, vessels	14.82%	16.66%
Textiles & textile products	18.83%	16.10%
Vegetable products	10.80%	10.81%
Pearls, precious stones, metals	2.18%	7.60%
Products of chemical/allied industries	5.20%	5.09%
Base metals & products	4.12%	4.01%
Plastics & rubber products	4.03%	3.84%
Foodstuff, beverages, tobacco	5.69%	3.66%
Misc manufactured articles	3.03%	3.21%
Optical, medical, equipment	2.54%	2.21%
Footwear, headgear	1.38%	1.66%
Wood & wood products	0.96%	1.23%
Others	6.14%	4.43%

(4) the Caspian Sea

As mentioned before, four CIS countries and Russia face the Caspian Sea, and thus it is useful and necessary for future encouraging trade in this region to improve the port function as fast as possible. In this way, mass scale cargo transport by water instead of land can be expected.

CIS countries are trying to enlarge their outer republic trade, so up grading diversify trade routes.

Under the above background, trade between Iran and the CIS countries is expected to increase transhipment cargo volume at a high rate.

It is necessary, therefore, to prepare services for the cargo distribution, storage and transportation at Iranian ports.

1.1.4 Scale and Pattern of Overall Cargo Flow

(1) General Situation of Export and Import

In Iran, the volume of import is determined by the amount of oil revenues in any particular year. The Iranian Government's policies for improvement of foreign trade may be identified as follows.

i) Improving quality of non-oil goods, intensifying marketing efforts for them and raising their exports; increasing highvalue exports rather than traditional products and primary materials;

ii) Increasing oil exports to major exporting countries

iii) Prohibiting imports of goods produced in sufficient quantities domestically

The Iranian Government has pushed to boost non-oil exports and succeeded in raising their value in the past years.

Followings are special characteristics of Iranian trade.

i) The non-oil export goods of the foreign trade is very small

ii) Import good value and volume is limited by export income

iii) There are few counter-part countries with whom Iran can keep a balance of imports and exports

iv) Share of ship cargo is large

v) Small amount of high value cargo is transported by air

vi) Containerized general cargo is small compared with other countries

vii) Production and consumption area incline to western and northern part of Iran

viii) Cargo storage days seem to be long

ix) Activity of domestic shipping line is substandard

Historical trend of Iranian trade are shown in Table 1.1.4.1.
The value of trade per capita has been low-level compared with other countries having similar economic conditions.
Cargo traffic by each transport mode to/from Iran is shown in Table 1.1.4.2.

Table 1.1.4.1 Past Trade Frame

	CURRENT GNP PER CAPITA (US$)			POPULATION (THU)			GNP (Bn. $)		
YEAR	TURKEY	PAKISTAN	IRAN	TURKEY	PAKISTAN	IRAN	TURKEY	PAKISTAN	IRAN
1971	400	170	420	36,248	62,573	29,297	14.50	10.64	12.30
1972	410	160	510	37,217	64,610	30,209	15.26	10.34	15.41
1973	470	130	700	38,201	66,706	31,165	17.95	8.67	21.82
1974	630	130	940	39,162	68,849	32,164	24.67	8.95	30.23
1975	830	130	1,310	40,078	71,033	33,206	33.26	9.23	43.50
1976	1,000	170	1,890	40,952	73,251	34,294	40.95	12.45	64.82
1977	1,110	190	2,170	41,777	75,494	35,431	46.37	14.34	76.89
1978	1,220	220	1,960	42,593	77,779	36,617	51.96	17.11	71.77
1979	1,380	250	2,060	43,466	80,135	37,848	59.98	20.03	77.97
1980	1,400	290	1,950	44,438	82,581	39,124	62.21	23.95	76.29
1981	1,450	330	2,530	45,500	85,114	40,446	65.98	28.09	102.33
1982	1,300	350	3,200	46,657	87,736	41,813	60.65	30.71	133.80
1983	1,180	390	3,530	47,877	90,452	43,242	56.49	35.28	152.64
1984	1,110	380	3,750	49,105	93,265	44,757	54.51	35.44	167.84
1985	1,080	370	4,030	50,306	96,180	46,374	54.33	35.59	186.89
1986	1,110	370	3,920	51,475	99,199	48,087	57.14	36.70	188.50
1987	1,220	360	3,610	52,622	102,324	49,889	64.20	36.84	180.10
1988	1,290	370	3,050	53,764	105,558	51,778	69.36	39.06	157.92
1989	1,370	390	2,590	54,916	108,900	53,744	75.23	42.47	139.20
1990	1,640	390	2,500	56,098	112,351	55,779	92.00	43.82	139.45
1991	1,780	400	2,170	57,326	115,844	57,727	102.04	46.34	125.27

SOURCE: WORLD TABLES 1993 ,A WORLD BANK BOOK, pp.328f.

Table 1.1.4.2 Cargo Traffic by Transportation Mode

(Unit:1000 tons)

CARGO VOLUME (THOU TONS)

	1992/93			1993(JAN-SEP)		
	IMPORT	EXPORT	TOTAL	IMPORT	EXPORT	TOTAL
SHIP	18,025	2,870	20,895	7,036	2,386	9,422
TRUCK	2,645	501	3,146	953	307	1,260
AIRPLANE	36	27	63	10	8	18
TRAIN	408	40	448	78	10	88
TOTAL	21,114	3,438	24,552	8,077	2,711	10,788
SHIP	85.4%	83.5%	85.1%	87.1%	88.0%	87.3%
TRUCK	12.5%	14.6%	12.8%	11.8%	11.3%	11.7%
AIRPLANE	0.2%	0.8%	0.3%	0.1%	0.3%	0.2%
TRAIN	1.9%	1.2%	1.8%	1.0%	0.4%	0.8%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

(2) Cargo Flow

1) Cargo value and quantity by Region

Cargo value and volume by region in 1992/93 is shown in Table 1.1.4.3 and data from 1987-1990 are given in Appendix 1.1.4. The value and volume of Iranian Imports/Exports by region are shown in Table 1.1.4.4 and 1.1.4.5 respectively.

Table 1.1.4.3 Cargo Value and Quantity by Region (1992/93)

1992	IMPORT VALUE MIL. IRLS		IMPORT QUANTITY THU. TONS		EXPORT VALUE MIL. IRLS		EXPORT QUANTITY THU. TONS		TOTAL VALUE MIL. IRLS		TOTAL QUANTITY THU. TONS	
TOTAL	2,009,335	100.0%	21,150	100.0%	194,456	100.0%	3,415	100.0%	2,203,791	100.0%	24,565	100.0%
KISH	206	0.0%	0	0.0%	0	0.0%	0	0.0%	206	0.0%	0	0.0%
AFGAN PAKISTAN	6,684	0.3%	166	0.8%	3,235	1.7%	102	3.0%	9,918	0.5%	268	1.1%
TURKEY	43,736	2.2%	593	2.8%	23,334	12.0%	217	6.4%	67,070	3.0%	810	3.3%
CIS	14,367	0.7%	746	3.5%	3,485	1.8%	33	1.0%	17,852	0.8%	779	3.2%
ARAB	7,647	0.4%	357	1.7%	2,955	1.5%	9	0.3%	10,602	0.5%	367	1.5%
PERSIAN GULF	107,200	5.3%	1,027	4.9%	27,817	14.3%	976	28.6%	135,017	6.1%	2,003	8.2%
OCEANIA	24,307	1.2%	947	4.5%	422	0.2%	2	0.1%	24,729	1.1%	949	3.9%
NORTH AMERICA	93,442	4.7%	2,514	11.9%	4,247	2.2%	10	0.3%	97,689	4.4%	2,524	10.3%
EF ASIA	318,461	15.8%	1,681	7.9%	16,999	8.7%	958	28.0%	335,460	15.2%	2,639	10.7%
SE ASIA	75,182	3.7%	2,018	9.5%	2,041	1.0%	196	5.7%	77,223	3.5%	2,214	9.0%
MEDITERRANEAN	215,522	10.7%	698	3.3%	16,539	8.5%	118	3.5%	232,061	10.5%	816	3.3%
WEST EUROPE	933,187	46.4%	5,595	26.5%	78,836	40.5%	613	18.0%	1,012,023	45.9%	6,208	25.3%
EAST EUROPE	60,406	3.0%	1,410	6.7%	9,985	5.1%	70	2.0%	70,391	3.2%	1,479	6.0%
SOUTH AMERICA	65,054	3.2%	2,876	13.6%	563	0.3%	2	0.0%	65,617	3.0%	2,878	11.7%
AFRICA	10,689	0.5%	372	1.8%	3,996	2.1%	110	3.2%	14,685	0.7%	482	2.0%
OTHERS	33,246	1.7%	149	0.7%	0	0.0%	0	0.0%	33,246	1.5%	149	0.6%

Source: Custom Organization of IRI
Excluding oil, oil products

i) Turkey

Total cargo value imported by truck from Turkey has been generally stable in recent years. But it decreased suddenly in 1992/93 with sharp increase of export.

ii) Western Europe

Germany (50% of imported goods value, 62% of exported goods value) and France (40% of import value) are the dominated trade partners of Iran among 17 Western Europe countries. The foreign trade seems to be concentrated in a few countries; however Western Europe is the most important trade partner for Iran and this relationship will be maintained in future. The cargo from this area is transported by ship and truck.

iii) Far East Asia

In this report Far East Asia refers only to Japan, Taiwan, Korea, Hong Kong and China. Japan is the most important trade partner though in a few years the trade value and volume with China will rapidly increase. In any case the foreign trade between Far East Asia and Iran is increasing at a satisfactory rate.

iv) South East Asia

South East Asia includes 10 countries, the Philippines, Malaysia, Vietnam, Bangladesh, Sri Lanka, India, Indonesia, Singapore and Thailand. India and Singapore are important countries for imports. The future target is to increase exports to this region.

v) North and South America

Raw material and grains are imported from Canada, Brazil and Argentina by Iran.

vi) Africa

In the past trade with Tunisia was on a large scale but it is small now. Imported goods from Senegal increased in 1992/93.

2) Cargo Flow by Commodity

Major cargo commodity are shown in Table 1.1.4.6.
The major kinds of export cargo are mining products and agricultural products.

Table 1.1.4.4 Value of Trade (Top five regions)

1992	Region (share)				
Export	W-Europe	PerGulf	Turkey	FE-Asia	Mediterr
194 Bn. Rls	(40.5%)	(14.3%)	(12.0%)	(8.7%)	(8.5%)
Import	W-Europe	FE-Asia	Mediterr	Per-Gulf	N-America
2009 Bn. Rls	(46.4%)	(15.8%)	(10.7%)	(5.3%)	(4.7%)
Total	W-Europe	FE-Asia	Mediterr	Per-Gulf	N-America
2204 Bn. Rls	(45.9%)	(15.2%)	(10.5%)	(6.1%)	(4.4%)
1990					
Export	W-Europe	Mediterr-	Per-Gulf	Turkey	FE-Asia
87 Bn. Rls	(50.0%)	(13.7%)	(14.4%)	(8.1%)	(7.1%)
Import	W-Europe	FE-Asia	Mediterr	S-Americ	Per-Gulf
1261 Bn. Rls	(43.1%)	(15.0%)	(8.2%)	(7.0%)	(5.7%)
Total	W-Europe	FE-Asia	Mediterr	S-Americ	Per-Gulf
1348 Bn. Rls	(43.5%)	(14.5%)	(10.4%)	(6.5%)	(6.1%)
1989					
Export	W-Europe	Mediterr	Per-Gulf	FE-Asia	SE-Asia
75 Bn. Rls	(51.5%)	(15.6%)	(14.4%)	(7.2%)	(4.0%)
Import	W-Europe	FE-Asia	Mediterr	S-Americ	Per-Gulf
927 Bn. Rls	(38.1%)	(12.4%)	(8.2%)	(7.1%)	(5.8%)
Total	W-Europe	FE-Asia	Mediterr	S-Americ	Per-Gulf
1002 Bn. Rls	(39.1%)	(12.0%)	(8.8%)	(6.6%)	(6.4%)

Note: By all modes excluding oil and oil products.
In this section, Western Europe refers only to Germany, Denmark, England, Finland, Norway, France, Netherlands, etc.
Far East Asia refers only to Japan, China, Hong-Kong, Korea, etc.
for details refer to Appendix II-1.2,1.5

Table 1.1.4.5 Volume of Trade (Top five regions)

1992	Region (share)				
Export	Per-Gulf	FE-Asia	W-Europe	Turkey	SE-Asia
3.44 Mn. ton	(28.6%)	(28.0%)	(18.0%)	(6.4%)	(5.7%)
Import	W-Europe	S-Americ	N-Americ	SE-Asia	FE-Asia
21.1 Mn. ton	(26.5%)	(13.6%)	(11.9%)	(9.5%)	(7.9%)
Total	W-Europe	S-Americ	FE-Asia	N-Americ	SE-Asia
24.5 Mn. ton	(25.3%)	(11.7%)	(10.7%)	(10.3%)	(9.0%)
1990					
Export	Per-Gulf	SE-Asia	FE-Asia	Turke	W-Europe
1.24 Mn. ton	(33.7%)	(19.9%)	(12.2%)	(11.2%)	(10.4%)
Import	S-Americ	W-Europe	Oceania	E-Europe	FE-Asia
19.5 Mn. ton	(19.5%)	(18.9%)	(14.1%)	(9.9%)	(7.8%)
Total	S-Americ	S-Americ	Oceania	E-Europe	FE-Asia
20.8 Mn. ton	(18.4)	(18.3%)	(13.2%)	(9.4%)	(8.0%)
1989					
Export	SE-Asia	Per-Gulf	FE-Asia	Africa	W-Europe
1.45 Mn. ton	(25.2%)	(21.5%)	(15.2%)	(11.6%)	(11.1%)
Import	S-Americ	W-Europe	Oceania	N-Americ	E-Europe
19.2 Mn. ton	(18.7%)	(18.3%)	(10.9%)	(9.5%)	(7.5%)
Total	W-Europe	S-Americ	Oceania	N-Americ	Per-Gulf
20.7 Mn. ton	(17.8%)	(17.4%)	(10.1%)	(8.9%)	(7.8%)

By all modes excluding oil and oil-products (See Appendix II-1.5)

Table 1.1.4.6 Major Foreign Trade Commodity

(unit;1,000 ton)

EXPORT			IMPORT		
	1989	1990		1989	1990
Mineral products	491	430	Grains	8,221	5,698
Chemical products	428	183	Iron,Steel	1,838	4,794
Fresh & dried fruits	236	311	Fertilizer	1,413	860
Coffee & tea	23	31	Fat	858	-
Leather & leather products	16	12	Chemical products	414	669
Vegetables	12	44	Plastic Materials	320	451
Copper & copper products	-	33	Sugar	480	-
Carpets & rugs	-	11	Paper & card bord	277	352
			Machinery	174	290
			Meat	114	-
			Clocks	-	974
			Clarified butter	-	590
			Wooden objects	-	290
			Medicine	-	101
			Thred	-	88

Note: By all modes excluding oil and oil-products (See Appendix II-1.3)

Import cargo and countries of origin in the first nine months (1-9) of 1993 are shown in Table 1.1.4.7.

Table 1.1.4.7 Import Commodity (1993)

Commodity	Major country (1,000 tons)
Hard Wheat	Canada 436, Argentina 95, Saudi Arabia 79, France 31
Other kinds of Wheat	Argentina 39
Peeled rice	India 20
Rice	India 0.1
Meat(Chicken, Beef, Fowl)	Germany 6, France 12
Oil(Soya Bean, Almond, Olive, Sunflower, Vegetable)	Argentina 88, Brazil 163, Turkey 14, Germany 4
Sugar	Brazil 28, Turkey 15, Germany 5
Chemicals(Sulphur, Carbon, Argon, Helium, Nitrogen, Hydrogen, Phosphorus, Metalloid, Mercury, and so on)	Germany, Italy, Japan, France, Turkey
Nitrate Ammonium	Qatar 26
Ammonium Sulhate	Belgium 21, Azerbaijan 4.4, Kazaghstan 2.5
Urine	Bulgaria 51, Turkey 52, Qatar 35, Poland 21
Super Phosphate	Turkmenistan 3.9
Fertilizers	U.S.A 35, Morocco 33, Jordan 56
Phosphoric Acid	Tunisia 11
Electric appliances	Germany, Japan, Korea, France, Italy, Turkey
Spare parts of car	Japan 9, Germany 4, Turkey 1, Italy 0.9, Brazil 0.6, France 0.5, India 0.4
Medicine	Germany, Italy, France, england, Turkey, Korea
Ethylene	Saudi Arabia 18
Small ingot	Turkey 41
Iron Rod	Italy 6
Steel Sheet	Germany 65, Japan 142, Brazil 30, Turkey 10, Italy 22, Korea 9
Angle Pipe	Azerbaijan 53, Ukraine 2, Russia 10, Poland 2
Textile	U.A.E, Korea, Kish, China, Spain, France, Azerbaijan, Turkmenistan, Syria, Bangladesh 13

Sorce: Customs organization of IRI

Destination countries of commodities expected from Iran in the first nine months of 1993 are shown in Table 1.1.4.8.

Table 1.1.4.8 Export Commodity (1993)

Commodity	Country (1000. tons)
Wool Carpet	Norway, Germany, Armenia, Azerbaijan, Turkmenistan
Silk Carpet	Germany, U.A.E, Italy, Japan
Raisen	Germany 7, U.A.E. 3, U.K. 1, Poland 1
Pistachios	Germany 22, U.A.E. 6, Italy 4, Japan 1.5, France 1.8
Caviar	Swiss, Denmark, France, Japan
Sugar	Armenia 1
Food Salt	U.A.E. 13
Stones for construction	Italy 3, U.A.E 1
Rubble stones for road construction	Kuwait 42, U.A.E. 14
Gypsum	Kuwait 11, U.A.E. 2, Kuwait 2
Iron stone	Belgium, Bulgaria, Russia, India
Copper stone	Russia, Oman
Lead stone	U.A.E., Belgium, India
Zinc stone	Russia, Belgium, Greece
Chrome stone	Italy, Czech, China
Coal Coke	Turkey 14, Azerbaijan
Liquid propane & butane	Japan 112, Europe 88, China 31, Turkey 26
Sulphur	India 103, Tunisia 98, Indonesia 32, Pakistan 5
Liquid Ammonia	Taiwan 15, India 95
Benzine	India 15
Toluene	India 6, Europe 6.5
Methanol	Japan 7, Indonesia 5, U.K. 5, Holland 5
Papers in roles or sheets	Armenia, Afghanistan, U.A.E., Kuwait

Source; Customs Organization of IRI

(3) the Persian Gulf and the Caspian Sea

The cargo flows both in the Persian Gulf and the Caspian Sea are the most important factors for the Study.

1) the Persian Gulf

For the Persian Gulf, containerization, free trade zone, port network are the keywords to be noted in considering future development of Iranian ports.

Substantial amount of container cargo is handled at ports in the Persian Gulf countries, including U.A.E. in particular, with the total container cargo handled at this region reaching over 2.6 Mn.TEU. in 1991. In world shipping, containerization has

progressed and expanded rapidly. From a global point of view, some of the main container line is between Singapore and Suez in the Indian Ocean. Ships call some ports on this line, in Thailand, India and the Middle East. At present, Dubay Port rules this function as the main port in this area and will retain this role in the future. (See Appendix II-1.8)

Another point is new development of free trade zones, in which foreign countries manufacture products and transport them abroad through by ports. In Iran, Qeshim Island is considered as such a free trade zone. Shortage of infrastructure, however may be impeding the realization of this plan.

Over Panamax type vessels call major ports in the world on the main shipping line, however, most Iranian ports cannot accommdate these vessels. Therefore, transhipment by smaller ships or lighting the draft is necessary.

2) Caspian Sea

The following points are to be considered fully in studying the transportation on the Caspian Sea.

i) Transport cargo is increasing

ii) New mode of transport and new routes will be created

Almost 20 Mn. tons of cargo currently traverse the Caspian Sea. Behind this trend there is the fact that CIS countries intend to expand trade with the outside to generate foreign currency, develop the country and so on. This means that new modes of cargo transportation will appear and cargo activities will be more active.

There are some major ports in the Caspian Sea which will form a new trade network.

(4) On land Cargo Flow

From the Table 1.1.4.2, the cargo volume transported on land is estimted about 3.6 Mn. tons. This volume consists of cargo from Turkey, Eastern Europe and a part of the cargo volume from Western Europe (The majority of cargo from Western Europe is transported by sea).

The on-land share of transportation will increase because CIS republics are developing their road networks. Cargo to/from Turkmenistan, Azerbaijan, Armenia, Kazakhistan and so on will also increase by sea and by land.

(5) Passenger Traffic

1) In order to extend passenger services in the Persian Gulf and to provide facilities to transport goods and passengers between different islands, ports, and also Arabic countries of the Persian Gulf, Valfajr 8 Shipping Company started its activities in

transportation of passengers and goods in the Persian Gulf and Oman sea region in 1986.

Table 1.1.4.9 Statistics of Commerce Activities of "Valfajr 8 Shipping Company" (1991/92)

Type of activity	Number of voyage	Passengers
Foreign Voyage	189	55,548
Domestic Voyage	510	78,137

Main lines are as follows;

Bushehr/Bahrain
This line is transporting goods and passengers with two voyages per month.

Bushehr/Kuwait
This line, which had ceased operations because of the Persian Gulf war, resumed activities this year(1993) with two voyages per month.

Bandar Abbas/Shareje
In 1991, 28,462 passengers traveled on 116 voyages by 4 ships.

2) Future Target

Passenger services are primarily provided in two ports in the Persian Gulf, Bandar Abbas and Bushehr. But service frequency of passenger boats at the ports seems not adequate to meet the potential demand of passenger traffic in this region.

Preliminary examination shows that the trip schedule shall be adjusted in the future to offer more voyages and more ports shall offer new lines, for example, Abadan/Kuwait, Abbas/Arab Countries, Bushehr/Coastal Island.

1.1.5 Roles of Port Sector and Its Activities

(1) Cargo Distribution

The Port Sector Study of the Islamic Republic of Iran (IRI) is conducted adjusting with the Second Five Year Plan in which Iran will direct its efforts towards the new century.
In this section, the major factors concerning the general situation of Iranian ports are illustrated in connection with the "Roles of Port Sector" which is described in the Second Five Year Plan.

1) Importance of sea-borne cargo traffic in total foreign trade

The most significant aspect of Iranian ports is that the ports have intensified their activities mainly in regards to overseas cargo trade. The international cargo transport of Iran is principally by sea, railways and roads. Cargo movements by air and pipelines are also important for Iran's economy.

Total imported goods in 1992/93 (Excluding oil) reached 21.1 million tons, of which 18.0 million tons (85.4 % of total import cargo) were imported by ship and the rest by roads, railways and airplanes. The imported cargo by land is coming mainly from Turkey, Pakistan, Afghanistan, CIS Republics and European countries.

In recent five years, the share of sea-borne cargo in total import has increased substantially as shown in Figure 1.1.5.1.

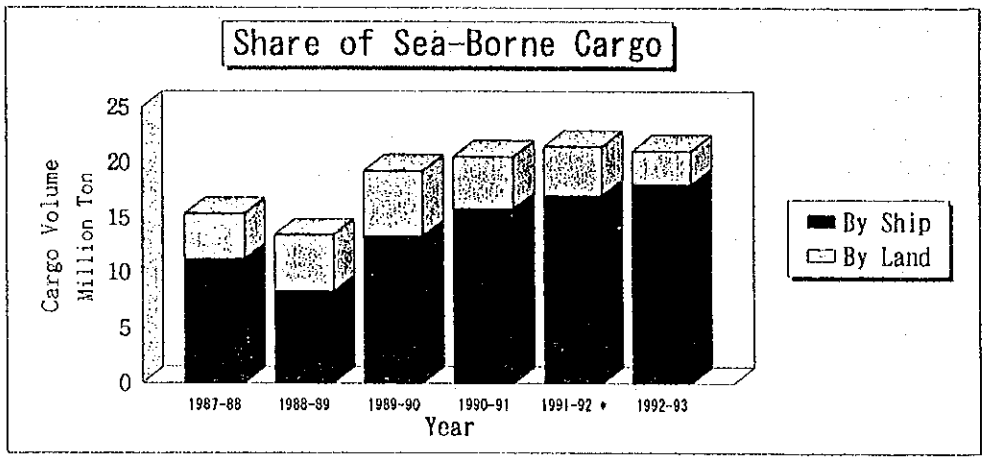


Figure 1.1.5.1 The Share of Sea-Borne Cargo

From these data, it can be understood that marine transport is the most important traffic mode for Iran and this trend is considered to be unchanged for a while.
Main imported cargoes by ship are grains, iron-steel, chemical products and mineral fertilizer.

The policy of the Iranian government is, with respect to its precious resources and capabilities, to be a powerful presence in the world markets and international economy and to reduce the country's dependance on oil-sales revenues. From this stand point, the roles of ports will become more important in international transport of the country.

2) Cargo distribution center

The significant feature of the Iranian ports is that they are far from the center of the consumption-area and industrial complexes. Generally, to identify the role of ports, it is important to trace and analyze the foreign trade and transport chain. This chain does not necessarily start from either the port or the factory, but can start from any number of places.

Two ports in the Persian Gulf, Imam Khomeini and Shahid Rajaee are predicted to have cargo-handling capacities over 25 million tons in 1998/99. Their share is almost 80 % of total loading/unloading volumes in Iranian ports. However Imam Khomeini is located 1,024 km away from Tehran and Shahid Rajaee' is 1,334 km away while other ports are not convenient to transport the cargo. In future the port will be used as not only for changing point of transport mode but also integrated transport center, industrial and commercial center for domestic and international trade. The two main ports shall be more active and effective and perform as multi-purpose ports.

3) Transition point of transport mode

To provide services for changing from one transport mode to another is one of the traditional functions of a port. To connect the inland transport mode is very important, but Iran's transport system (road and railroad) appears to have been contrived poorly and does not complement its marine transport.
Following bottlenecks are identified in the current Iranian port system.

For the countries like Iran where consumption and production area are far from ports, inland distribution points are normally required to realize world efficient treatment system.

At present there are a few alternative distribution patterns of cargo flow to/from the port. One is where cargoes are transported between port and inland deposit center by rail or trucks and distributed to the origin/destination to/from the inland distribution center. Another is where the cargo is distributed directly to/from the port by trucks and the other is a combination of the above two styles. The consumption and production area are far from ports in Iran.

Actually, Bandar Abbas and Chabahar utilize the first style and the mixed type is predominant in Imam Khomeini Port.

The location of distribution centers should be within easy access of the inland transport network.

(2) Industrial and Commercial Service

It is rather new concept to understand that the transportation/distribution activities should be considered as a subsystem of the whole production system since cargo distribution activities include such activities as transport, storage, cargo handling, package & labeling, distribution processing.

In Iran, where export goods should be increased for national economy, it seems more important to promote regional development with ports as the core of efficient utilization of national land and resources. It is necessary to support various industrial development projects including free trade zones or export processing zones through timely provision of attractive business environment.

In Iran, each port is located far from consumption center or production center as mentioned above. And their functions are mainly loading/unloading to and from vessels. However port sometimes have different functions, such as supporting the activity of production, trade and transport.

Some ports in Iran are regarded as transport, industrial and commercial service centers. As mentioned above the port will be used for many purposes such as connection of road & port, warehouse & storage yard for transportation facilities, urban & civic development plan, inter-modal terminals, connection of rail and port, cruise industry, office space development, airport, communication facilities, commercial services, industrial services and so on. The port users which include the shippers, freight forwarders, shipowner, ship agents, cargo distributors, cargo transformation companies, packing companies, land transport operators, customs office, cargo inspectors, banks, insurance companies and other relevant organizations will use the above facilities.

(3) Transport Network Center of Cargo

1) Domestic transportation

To determine the roles and hinterland of Iranian ports, should carefully be considered. It is important to improve the transport infrastructure sufficiently so that cargo can move between port and origin/destination easily.

It is important to lead and stimulate the development or improvement of inland transport system towards the completion of an efficient and well-balanced transport network through priority investment in port development.

2) Port Network

In the past, when the oil price raised some demurrage trouble occurred at Imam Khomeini Port. When oil prices rose, the import cargo abruptly increased. There were many reasons which caused ships to wait such a long time. One of the reasons was shortage of cargo equipment, another was shortage of port facilities, berths, jetties and probably wagons and vehicles in inland transportation.

Moreover the port authority thought that it was necessary to make a plan to improve port in order to avoid such situation as paying demurrage. Increases in import cargo should be independent from oil prices, which can be gradually accomplished by increasing the non-oil export goods. Foreign trade should be generally kept in an appropriate balance.

Here, some of the mentions which may affect future port development and planning will be briefly described, while the detailed consideration of Iranian ports will be dealt with at a later on.

Requirements of the foreign trade for transport and distribution are important to expand and renew the network. It is necessary to make the capacity of port network flexible enough to cope with possible uncertainty in cargo traffic demand including land-bridge flow.

The speed and security of cargo handling should be provided to port users and reliability of delivery time and frequency of services will become more important from now on.

It is the most important matter to create the efficient port network to fit the overall future national requirement.

1.2 National Development Plan

1.2.1 National Development Plan

(1) The Second Economic and Cultural Development Five Year Plan

In Iran, "The First Economic and Cultural Development Five Year Plan" has been planned for the period 1989/90 - 1993/94. The Second Plan has been under consideration in the Parliament.

In the document of The Five Year Plan, major indexes for economic condition and foreign trade are shown in Table 2.1.3.1. These indexes are referenced to The Study.

Table 1.2.1.1 Major Indexes of The Second Five Year Plan

Year	1993/94	1998/99	Annual Rate of Growth
GDP (Bn. Rls.)	13,258	17,647	5.89
GDP Per Capita (1,000 Rls.)	220.97	262.21	3.48
Population (1,000)	60,055	67,330	2.31
Development Ratio of GDP (%)	14.11	17.77	
Product of Manufacturing (Bn. Rls.)	2,182.0	3,025.6	6.76
Total Import Value (Mn. US$.)	16,018.6	21,710.5	6.27
Total Import Ratio of GDP (%)	12	12	
Non-Oil Goods Ratio of Export (%)	16.75	26.89	
Oil Export Ratio of GDP (%)	12	19	
Non-Oil Export (Mn. US$.)	3,280.2	5,891.5	12.43
Non-Oil Export Ratio of GDP	2	3	

Source: Case-2 in Second Five Year Plan, P.B.O

1.2.2 Relevant Development Plan

(1) Anzali port

There are four big industrial and commercial areas near Anzali port. Rasht area, Qazvin area, Tehran area and Tabriz area.
Major industries are shown in the following Table.

Table 1.2.2.1 Industries near Anzali Port

	Rasht	Qazvin	Tehran	Tabriz
Distance	40km	217km	365km	450km
Power Station	Thermal 1 Water 1	Thermal 1 Water 2	Thermal 2	Thermal 1
Oil Refinery			Tehran 1	Tabriz 1
Petrochemical			Karaj 1	Tabriz 1
Metal Industry	Vehicle Machinery	Vehicle Machinery	Vehicle Machinery	Vehicle Machinery
Light Industry	Electrical Appliances			Carpet Textiles

(2) Khomeini port

Oilfields are mainly located in the south-west part of Iran. There are many oil related industries in this areas, such as oil refineries, natural liquid gas plant and petrochemical plant. There are two big industrial steel projects in this area. Ahvaz and Esfahan are important for their steel production industries.

Table 1.2.2.2 Major Industries near Khomeini Port

	Khomeini	Abadan	Ahvaz	Esfahan
Distance	0	100km	156km	940km
Power Station		Thermal 1 Water 2	Thermal 1 Water 1	Thermal 1
Oil Refinery		Abadan 1		Esfahan 1
Petro -chemical	Khomeini 3	Abadan 1		Esfahan 1
Gas Plant	Khomeini 3		Ahvaz 1	
Steel Plant			Ahvaz 2	Esfahan 2

(3) Major Development Projects of Iran

1) Mining Projects

a) Existing iron ore mines

Chadromloo Sangan Tarigan Mashirvan Chahdan Chah-gaz Gol-Gohr Chaghart Bafg

b) Projects

Chadoromloo
This project aims to supply Mobarakeh and Ahvas steel complexes. Preliminary work started in 1983 and it is expected to become operational in 1996. This project sited

200 km north east of Yazd. The plant will produce five million tons of concentrated iron ore.

Gol-Gohar
This project is in the south-west of Sirjan and aims to supply iron ore to Mobarakeh steel complex. This project will operate in 1994 and The plant will produce 2.5 million tons of concentrated iron ore.

Sangan
This mine is located at Sangan Khorassan province. This project will be expected to operate in 2000.

2) Metal projects

(Steel)

a) Existing steel complex

Ahvas steel complex
Isfahan steel complex
Mobarakeh steel complex

b) Projects

Khorasan : Steel complex
Kerman : Steel complex
Hormozgan : Steel complex
Qeshm island : Sponge iron factory of one million tons

(Aluminium)

a) Existing Aluminium plant

Arak Aluminium Company

b) Projects

Jajoum Bauxite Plant
Place : 150 km northeast of Tehran
Capacity : Design capacity 150,000 tons/year
Product : The plant to produce alumina of bauxite
The plant will be operating in 1995
Materials : The plant will supply the aluminum smelters in Arak and B.Abbas and be supplied by minerals from bauxite mine near Jajoum

Al-Mehdi Aluminum Plant
Place : B.Abbas

Capacity : Design capacity 220,000 tons/year next phases 330,000 tones/year
Product : Alumininm products
The plant will be built from 1994
Investment : US$ 1.25 billion

3) Oil projects

a) Existing oil refineries

Refineries 6 : Abadan, Tabriz, Isfahan, Shiraz, Teheran, Baakhtaran
Treatment 1 : Lavan

b) Projects

Arak refinery
Place : 20 km from Arak
Investment : US$ 1,600 million
Commissioned : 1991

B.Abbas refinery
Place : B.Abbas
Investment : US$ 1,700 million
Commissioned : 1991

B.Taheri refinery
Place : B.Taheri
Investment : US$ 200 million
Commissioned : 1993

4) Gas projects

(Natural liquid gas plants)

a) Existing plants

Plants 8: AghaJari, Marun, Ahvaz, Paznan, Gachsaran, Bibi-Hakimeh, Qeshm, B.Mahshahr, Khangiran
Treatment 3: Bid-Boland, Vali-Asr, Shahid Hasheminezhad

b) Projects

Vali-Asr natural gas plant
Place : Kangan
Investment : US$ 200 million

Other gas plant
Khorasan province 2 sites

Hormozgan province 1 site

(Gas pipelines)

a) Existing lines

pazanan plant--Isfahan--Kashan--Tehran--Qazvin--Astara
khangiran plant------ Mashhad
gachsaran plant----- Shiraz

b)Projects

Qeshm------- B.Abbas power station 70 km
Sarakhs------ Neka power station 800 km
Sarkhun------ Sarcheshmeh, Kerman 400 km
Hamedan---- Malayer
Tehran------ Tabriz
Marun-------- Gondomkar

5) Petrochemicals

a) Existing petrochemical complex

Complex 7
Shiraz : Chemical fertilizer
Razi : phosphate, azote fertilizer
Abadan : PVC, DDB
Kharg : liquid gas, sulphur
Farabi : softener materials for plastic
Isfahan : benzene, toluen, orthxylene
Tabriz : polyethylene, polystyrene, rubber

b) Projects

Arak petro-chemical complex
Place : vicinity of the Arak refinery
Investment : US$ 2,000 million
Commissioned : 1991

6) Power stations

a) Existing plants

Shahid Rajaee power station	Qazvin	4x260 MW
Fars thermoelectric power station	Shiraz	4x250 MW
Guilan power station	Guilan	1350 MW
Siah-Bisheh (water)	Tehran	

Gharb thermoelectric power station	Hamedan	4x25 MW
Ramin power station	Ahvaz	4x300 MW
Shahid Mohammad Montazeri	Isfahan	1600 MW

reconstructed station

Zargan power station	Ahvaz	140 MW
Tabriz thermoelectric power station	Tabriz	432 MW

b) Project

Neka power station	Sari	4x300 MW
Giant power station	Tehran	?
Shahzand power station	Arak	1100 MW
Karkheh -0 dam Mussian (water)	Ilam	650 MW
Karun -3 dam (water)	Khuzistan	2000 MW
Marun-3 dam (water)	Khuzistan	140 MW
Bushehr nuclear power station	Bushehr	?

7) Machinery

Arak Machine Manufacturing Company
place : Arak
production : 30,000t machinery steam boilers, cranes
investment : Rls 9,000 million
employees : 3,300

Zar Abb
place : Arak
production : 25,565t steam boilers,equipment for refinery
investiment : Rls 3,000 million

Tabriz Machine Manufacturing Company
place : Tabriz
production : 10,000t milling and lathing machines
investment : Rls 9,000 million
employees : 3,120

8) Automotives

(Tehran)
Iran Khodro : Peugeot 405, minibuses, buses
Saipa : Renaults-5, Nissan picup,
Zamyad Company : gearbox, engines
Pars Khodro Company : jeep

(Tabriz)

Charkheshgar Company	: engines, gearboxes
San's Company	: engines
Idem,Iran Diesel Engines Company	: Benz diesel engines
Iran Tractor Manufacturing Company	: tractor

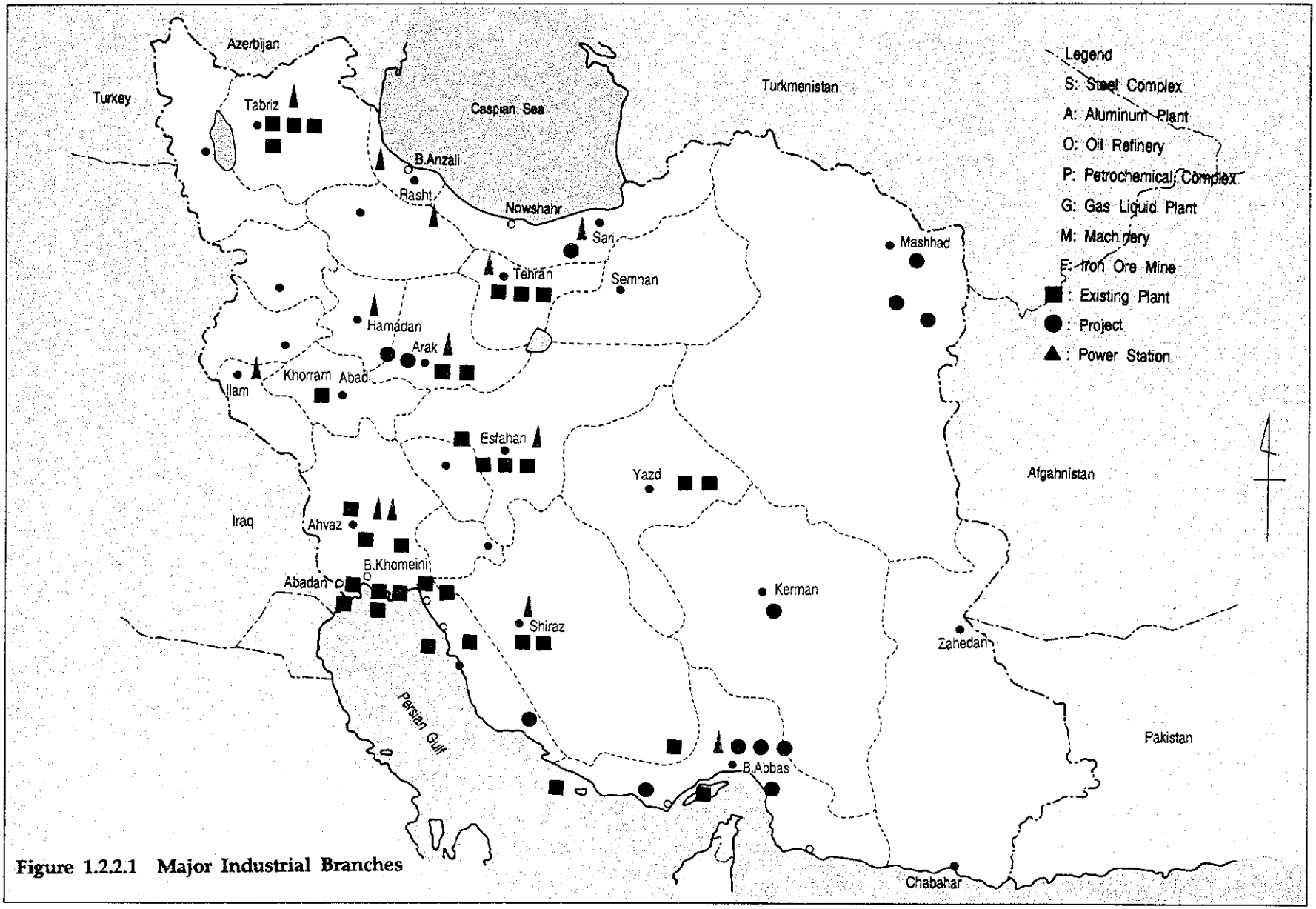


Figure 1.2.2.1 Major Industrial Branches