

4.3 Industrial Development Policy

The sector development plan for the next five-year plan period is under preparation. The basic development concept and direction of the next five-year plan will not change significantly for the most of sectors.

4.3.1 Long-term Fundamental Goal of Development

The long-term fundamental goal set as the base of economic and social strategy from the beginning of the five-year development planning in the Sultanate, which is still applicable, is as follows¹:

- 1) Developing new sources of national income as a future replacement of existing oil revenues.
- 2) Enhancing the proportion of investments directed towards income generating projects, with particular emphasis on industry, mining, agriculture and fisheries.
- 3) Concentrating on the development and upgrading of local human resources thus enabling them to fulfill their role in the Omani economy.
- 4) Geographically distributing investments for benefit of all areas, with a particular focus on the less developed regions, in order to eliminate the disparity in the standard of living existing between the various regions.
- 5) Supporting and developing the present population centers and safeguarding them from the dangers of mass migration to the density populated areas.
- 6) Completing the building of basic infrastructures.
- 7) Recognizing the importance of water resources as a vital element in the growth of economic activities and environmental conservation.
- 8) Supporting the development of local commercial activity and the growth of vibrant and competitive markets, which have the necessary support structures, in terms of transport, storage, and the removal of commercial obstacles.
- 9) Completing the basis of establishing a national economy based on private sector activity in a competitive market with loan provision for vital projects in accordance with resources available to the state.
- 10) Increasing the efficiency of the State's administrative capability.

¹ Page 7, Ministry of Development, "The Fifth Five-Year Development Plan (1996-2000)". Underlined by the Study Team.

4.3.2 Sectoral Development Plan

The major sectors at the macro-economic level in the Sultanate consist of (1) Oil sector, (2) Non-oil commodity production sector, (3) Government services sector, and (4) Other services sector. The fundamental development strategy of the economy is "economic balance and sustainable growth", with the following supported strategies:

- 1) Human resource development
- 2) Economic diversification
- 3) Private sector development

Table 4.3.1 shows the sectoral relative shares to GDP as the qualitative indicators of the GDP. It clearly indicates the expected emergence of radical changes in the structure of Oman's economy in respect to the service and production sectors share of GDP.

Table 4.3.1 The Sectoral Relative Shares to GDP

(Unit: %, 1993=100)

	1995	2000	2020
Oil & gas sector	35.0	30.9	19.0
Oil	33.5	25.9	9.0
Gas	1.5	5.0	10.0
Non-commodity production sector	52.3	61.5	73.1
Government services sector	13.9	12.6	10.0
Other services sector (*)	-1.2	-5.0	-2.1
Gross Domestic Product	100.0	100.0	100.0

Note: (*) Educational services, medical distribution and presentation of films, repair of vehicles, washing and cleaning services, hairdressing and beautifications.

Source: Ministry of Development, "The Fifth Five-Year Development Plan (1996-2000)"

The most significant change expected is contraction of oil sector in its relative share to GDP. The expected structural change is characterized as follows:

Oil sector

	1995	2020
Crude oil extraction rate (bpd)	850,000	426,000
- Contribution to GDP (%)	33.5	9.0
- Annual change in value added (average %)		2.2

- 1) Depletion of the oil reserve, despite the expectation that this reserve will increase by 5 billion barrels in the coming years.
- 2) The expected major increase in the contribution of non-oil sectors

Gas sector

- 1) The substantial size of the currently confirmed natural gas reserves (16 tcf at present), in addition to the expected discovering additional reserves.
- 2) Government policies aiming at encouraging and motivating both national and foreign private sectors to participate in the utilization of this sector.
- 3) The establishment of industries that depend on natural gas as a basic input, such as LNG project, and others.

Government services sector

The decline in the government services sector is estimated to come as a result of the following:

- 1) Policies aiming at achieving economic stabilization and rationalizing public expenditures.
- 2) Enhancing the role of the private sector.
- 3) Enhancing economic diversification.
- 4) Human resources development.

The structural change in the non-oil commodities sector is given in 4.3.3.

4.3.3 Non-oil commodities sector

The industrial development direction, strategy and plan is basically the same as those indicated in the current five-year plan and Vision 2020, which are described in the following sections, according to the each Ministry concerned

(1) The Agriculture and Fisheries Sector

Agriculture

The expected structural change up to 2020 of the agriculture sector is as follows:

	1995	2020
Agriculture		
- Contribution to GDP (%)	3.0	3.1
- Annual change in value added (average %)		4.5

The development policy for the agriculture sector may be summarized as follows:

- 1) Increasing the cultivated area at rates that are consistent with available water resources.
- 2) Utilizing modern techniques that will contribute to raising productivity.
- 3) Rationalizing water use by expanding the introduction of modern irrigation techniques, and concentrating on mixed crops with low water requirements.
- 4) Upgrading the cultivation of the crops that have high comparative advantages.
- 5) Developing agriculturally based industrialization.

Regarding Dhofar region, the agricultural sector has consumed 80% of total supply of fresh water, and, thus, following points are particularly indicated in the current five-year development plan:

- Supporting the efforts to limit overgrazing in the Al-Jabel area of Dhofar region, which makes use of plant cover for the recharge of ground reservoirs in order to support the water situation in Salalah plain.
 - Allowing duty free import of forage and fodder, together with banning the export thereof, so as to discourage local cultivation.
 - Transferring the farms more than 20 feddans in Salalah plain, to desert areas where water with high salinity is available, which are suitable for growing grasses.
 - Growing seasonal crops in the areas where grasses are currently cultivated when these are transferred to the desert areas according to the above.

The crops which are particularly paid attention as those requiring less water, are grape tree, coffee, orange, and grape fruits for the mountain areas; while guava, grape tree, and dates for desert areas, and lady finger and cucumber for the plain areas. The small-scale trial had started in an experimental station on these crops in the mountain areas.

Fisheries

The expected structural change up to 2020 of the fisheries sector is as follows:

	1995	2020
Fisheries		
- Contribution to GDP (%)	1.1	2.0
- Annual change in value added (average %)		5.6

The development policy for the fisheries sector may be summarized as follows:

- 1) Utilizing modern and high value-added technologies in the development of traditional fishing boats and fishing methods. The infrastructure necessary for the fishing industry, such as fishing ports, and establishment of supply industries, like workshops and ice factories will also be completed.
- 2) Amending the policy of issuing commercial fishing licenses with the objective of increasing the value of locally unloaded fish, improving the composition of quality of the catch, processing and the canning of fish and by furthering the sector's forward linkage.

(2) Mining and Quarrying Sector

The expected structural change up to 2020 of the mining and quarrying sector is as follows:

	1995	2020
Mining & quarrying		
- Contribution to GDP (%)	0.6	2.0

The development policy for the mining and quarrying sector may be summarized as follows:

- 1) Completion of the geographical infrastructure; namely, basic documents, such as topographical, geophysical and geochemical maps.
- 2) Proven reserves of a number of minerals in high quantities, the most important of which are the following:

Available Reserves	
	Million tons
Copper (additional reserve)	15.0
Chromites	0.1
Coal (preliminary estimate only)	100.0
Silica	5.6

- 3) Encouraging the local and the foreign private sector to invest in exploration, processing and the export of minerals. These include the glass industry and copper alloy production industry.
- 4) The preparation of studies on the privatization of the Oman Mining Company.

(3) Manufacturing Sector

The expected structural change up to 2020 of the manufacturing sector is as follows:

	1995	2000	2020
Manufacturing			
- Contribution to GDP (%)	5.4		15.0
- Annual change in value added (average %)		7.3	

The development policy for the manufacturing sector may be summarized as follows:

- 1) Concentrating on capital-intensive industries that use advanced techniques and method of production.
- 2) Encouraging and promoting scientific research, development and the transfer of modern technology.
- 3) Encouraging and supporting the private sector in the industrial field, particularly in the small and medium scale industries.
- 4) Encouraging foreign capital investment in the industrial field.
- 5) Completing the building of infrastructure and the industrial zones in particular.
- 6) Concentrating on industries that utilize domestic inputs, such as natural gas, as well as export oriented industries.

The various industrial projects have been studied and promoted, on the basis of the above development policy direction. These include:

- 1) A large expansion in the petrochemical industry, based on gas as a feedstock.
- 2) The expansion of industries that are based on the utilization of crude oil, particularly oil refining.
- 3) The expansion of the production of local raw materials, particularly products of the agricultural, fisheries and mining sectors.
- 4) The establishment of assembly-line industries such as computers; and communication and information technologies.

(4) Trade and Tourism Sector

The expected structural change up to 2020 of the trade and tourism sector is as follows:

	1995	2020
- Contribution to GDP (%)	14.1	18.0
(Of which, tourism)	(0.8)	(3.0)
- Annual change in value added (average %)		3.9

The development policy for the trade and tourism sector may be summarized as follows:

- 1) Expansion of the size of the non-oil production base which will foster an increase in the volume of trade exchange.
- 2) Export orientation of the Omani economy, and the utilization of Oman's strategic location for increasing export, re-export and transit operations aimed at making Oman an international center for trade and financial services. In addition, policies for encouraging tourism are also proposed.
- 3) Upgrading the tourism sector to one of the most important economic sectors. This will be in conjunction with the conservation of natural resources, historical antiquities and social traditions.
- 4) Development of legal frameworks that will eliminate the restrictions and barriers to the elasticity of the market.
- 5) Completion of infrastructure relating to ports and telecommunications, and the enhancement and development of financial services.
- 6) Development of the internal and foreign tourism sector in a balanced and organized way.

The various policy measures and activities have been studied and promoted, on the basis of the above development policy direction. These include:

Trade sector

- 1) Reviewing the laws and regulatory frameworks and upgrading them in order to:
 - Simplify the procedures of registration in the Commercial Register and encourage the establishment of public liability companies.
 - Reconsider the commercial agencies system with the aim of abolishing constraints to freedom of contract and competition.
 - Face the problem of disguised trade and its negative impacts and increase the participation of Omanis in Commercial activities.
- 2) Training of Omani manpower in the fields of business and marketing

- 3) Joining the World Trade Organization.
- 4) Setting objective principles and criteria for establishing commercial and economic integration with other countries.
(Studying the feasibility of commercial and economic integration between the Sultanate and the countries such as: Iran, India, Pakistan, the Yemen Republic, and East African countries.)
- 5) Studying the options and alternatives for making the Sultanate an international center for re-export, shipping and storage. The most important options concerns competition with neighboring countries or achievement of integration with them.
- 6) Establishing OCIPED and enhancing the activities of the commercial representation offices and trade representatives in the countries that have close trade relations with the Sultanate. The activities related to trade and industrial exhibitions will also be rationalized.
- 7) Preparing a periodic competitiveness study of the national economy in comparison with the other countries so as to achieve the objective of the export strategy.

Tourism sector

- 1) Developing the institutional framework for the management of tourism.
- 2) Encourage the private sector to assume a major role in the investment and promotion of tourism, and privatizing the tourism facilities currently owned by the State.
- 3) Promoting tourist facilities and services together with the development of new style of tourist facilities and services. This includes the promotion of health and medical, sports, and conference tourism.

(5) Banks, Insurance and Financial Services Sector

The expected structural change up to 2020 of the banks, insurance and financial services sector is as follows:

	1995	2020
- Contribution to GDP (%)	7.9	8.0
- Annual change in value added (average %)	5.9	

The development policy for the banks, insurance and financial services sector may be summarized as follows:

- 1) The increasing need of the local market for the services of this sector in order to meet mounting funding needs; the increased volume of savings resulting from the high growth rates of the national economy; and the central role of the private sector in the development

process.

- 2) The need to develop the export orientation of these services through the utilization of the Sultanate's strategic location and the increased connection of Oman's economy with world economy.
- 3) The need to upgrade the capabilities of the sector through continued modernization and the adoption of advanced technologies.
- 4) The innovation of new financial, saving and investment means.

4.4 Port Development Policy

4.4.1 Historical Background

Oman has a long history of maritime trade dating back to the ninth century. In olden days, Sohar was the main port of Oman and helped make Oman a major seapower in the Indian Ocean until the 19th century. Maritime trade in the Indian Ocean has been a key factor in the economic prosperity of Oman, and that is expected to be the case in the coming century as well.

More recently, Port Sultan Qaboos was developed as the main port of Oman with modern facilities. Since its opening in 1974, Port Sultan Qaboos has been playing a significant role in supporting the Omani economy. Though the port continued to handle most of the import/export cargo thanks to its proximity to the capital Muscat, draft limitation and lack of sufficient marshalling yards came to be bottlenecks for further development in the 1980's. It became an urgent task to cope with the situation, and various countermeasures and new development projects were proposed thereafter.

4.4.2 Objectives of Port Development

Bearing in mind the underlying need for Oman to diversify its economy and decrease dependence on oil exports, port development is expected to play a very important role.

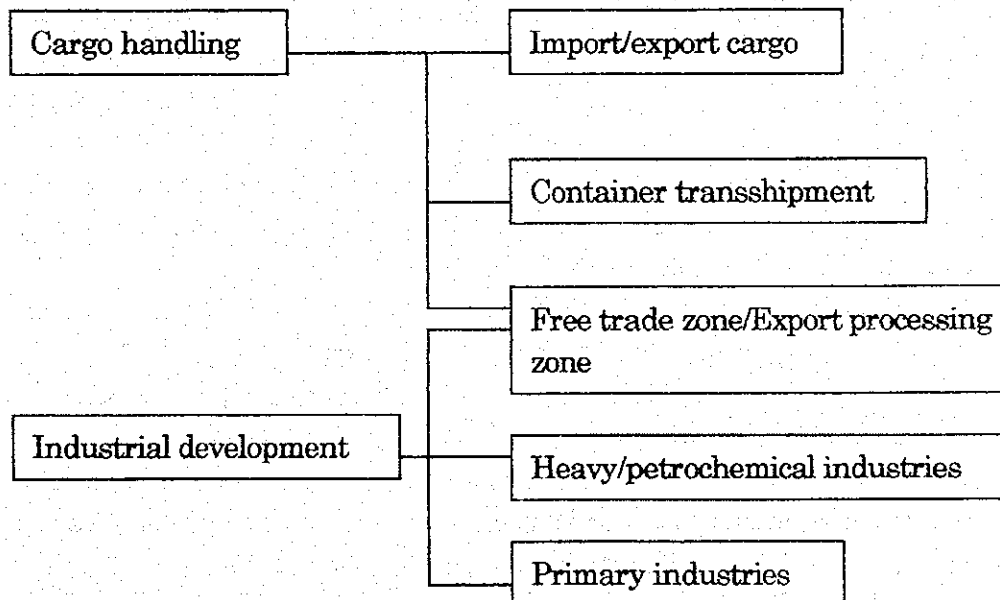


Figure 4.4.1 Conceptual Objectives of Port Development

The main targets of port development include the following goals: to handle increasing

import/export cargo, to act as an impetus for the development of new industries, and to develop a container transshipment hub.

Taking into account the limited government resource, it is very important to determine an appropriate distribution of roles among the ports.

4.4.3 Recommendations of the Previous JICA Study

A JICA study team implemented a master plan study and a feasibility study on the port sector in the northern part of Oman from 1989 to 1990. The study identified the bottlenecks of Port Sultan Qaboos and made several policy recommendations. The following are the main points: upgrading of Port Sultan Qaboos through construction of multi-purpose terminals with quay-side draft of 13 m, expansion of container yards and dredging of channels and basins, as well as development of a new port in northern Oman. The study concluded that a new port is needed to complement Port Sultan Qaboos, to create a regional container transshipment hub, and to provide an industrial base for regional development. It recommended Majis as the development site of a new port after comparing several alternative sites.

Those recommendations were basically accepted by the GSO, and correspond with the port development policy of the Fifth Five-Year Development Plan.

4.4.4 The Fifth Five-Year Development Plan

The Fifth Five-Year Development Plan clearly identifies the problem areas in the port sector and sets out the course of improvement. Table 4.4.1 summarizes the port development policy of the five-year plan.

The five-year plan envisions the port sector as a prospective base for economic development with less dependence on petroleum. In the plan, private sector participation is identified as a key factor to materialize diversification of the Omani economy. Those two principles are merged in the port development policy and private sector participation is strongly encouraged in upgrading of the existing ports as well as creation of a new port.

Majis is referred to as the construction site of a new port in the plan as recommended in the previous JICA study. Actually, the new port had two expected roles, to serve as a heavy industry base and a container transshipment hub. Sohar, about 10 km to the northwest of Majis, was later chosen as the site for the heavy industry base. Construction works are financed by JBIC (Japan Bank for International Cooperation) and are now under way.

A substantial amount of public funds is allocated to infrastructure improvement in the port sector in the five-year plan, but the amount shows a marked decrease from the previous five-year plan (See Table 4.4.2). Official investment for the port sector was later expanded to

embark on creation of an industrial port in Sohar and a container terminal in Salalah. Among the major sectors, only social structures sector is allocated an increased amount of investment fund in the Fifth Five-Year Development Plan compared with the previous plan.

Table 4.4.1 Port Development Policy of the Fifth Five-Year Development Plan

Problem areas	Measures to be taken
Technical factors hampering the maximum utilization of the existing ports	Expansion of the capacity of the existing ports through improvement and development of equipment and quays
Limited draft of Port Sultan Qaboos	Establishment of a new port at Majis to meet growing national economy requirements and to create a regional commercial center
Concentration of port services in one area	Establishment of a new port at Majis to meet growing national economy requirements and to create a regional commercial center
Inefficient operation and relatively high port service charges	Improvement of managerial and operational efficiency Increased role of the private sector in financing the upgrading of the existing ports as well as the proposed deep-sea port

Source: The Fifth Five-Year Development Plan, Ministry of Development

Table 4.4.2 Investment Allocation for the Port Sector in the Five-Year Plans

(Million R.O.)

Sector	Fourth plan allocation	Fifth plan allocation		
		Total	New projects	Ongoing projects
Port sector	19.4	3.5	2.6	0.9
Total infrastructure sector	653.0	287.0	220.0	67.0
Total sectors	1787.0	1226.0	947.0	279.0

Source: The Fifth Five-Year Development Plan, Ministry of Development

4.4.5 Current Port Development Policy

The GSO has elaborated on the port development policy established in the five-year plan taking into account the trends of international shipping and port development in the region. Current port development policy can be summarized as follows:

Maximum utilization of the geographical location

Port of Dubai currently functions as the regional container transshipment hub and is the world's 10th busiest container port with annual throughput of 2.8 million TEUs in 1998. Although Dubai enjoys established shipping services connecting virtually all the major destinations in the world, Oman has a clear geographical advantage over Dubai if the deviation time from the main shipping route is considered. As an example, a container vessel linking the Far East and Europe needs three days less to call at Port Salalah compared with Dubai.

Accordingly, the GSO intends to make Port Salalah a regional container transshipment hub with active participation of the private sector. In the highly competitive market of maritime container transportation, shipping companies are undergoing mergers and acquisitions to streamline the operation, and are exploring ports with strategic location to reduce transportation costs. In this environment, it is quite logical for the GSO to seek a feasible way to create a container transshipment hub in Oman.

Strategic investment in major ports

Apart from cargo handling, ports act as an impetus for regional development. In this context, ports should be developed in areas that need an economic boost. The GSO chose Sohar, Qaboos, and Salalah as development bases, representing the northern area, Muscat area, and Dhofar region respectively.

To maximize the return of investment, duplication of functions among the ports should be avoided. Accordingly, the GSO distributes port functions among the ports as follows:

- Sohar Port: an industrial port with emphasis on metal industries and petrochemical industries.
- Port Sultan Qaboos: a commercial port mainly handling import/export cargo.
- Mina Al Fahal: an oil terminal.
- Port Khasab: a port to support fishery and tourism
- Qalhat Port: a natural gas terminal.
- Port Salalah: a regional container transshipment hub with a free trade zone.

An overview of official investment in the port sector and the performance of each port are shown below. Creation of two new ports, Salalah and Sohar, was approved during the Fifth five-year plan. The official investment for the port sector grew far greater than originally expected in the plan, indicating its urgency and high priority.

Table 4.4.3 Official Investment by Ports

(thousand R.O.)

Port	Fourth five-year plan	Fifth five-year plan
Port Sultan Qaboos	17,829	-
Port Salalah		52,224
Sohar Port		96,000
Port Khasab		718
Total	17,829	148,942

Source: Ministry of Transport and Housing

Promotion of privatization

Privatization is one of the most emphatically pursued policies in the Vision for Oman's Economy-Oman 2020 as well as in the Fifth Five-Year Plan. The GSO is encouraging and promoting the privatization process in various sectors to create a sustainable source of development and employment. Privatization of port services is specifically encouraged in the five-year plan and the new container terminal in Port Salalah is the first successful result of this effort. Enhanced private sector participation in Oman is in line with the world trend in the port sector. In many countries around the world, governments are deregulating port services and port development in order to enhance competitiveness of their ports and lessen their financial burdens.

The privatization policy in Oman requires the GSO to keep control over the privatized sector through regulations in order to protect users' interests. In order to ensure that principle in the port sector, the GSO is contemplating to establish the Port Planning and Regulatory Committee (PPRC). This organization is expected to make plans and promote coordination in port-related activities in Port Salalah. A ministerial meeting is organized on an ad hoc basis to deal with important issues relative to port development.

Development of free trade zones

A free trade zone is not necessarily an integral part of a container transshipment hub. If properly established and operated, however, it can generate sustainable port demand and improve viability of a new port development project. Taking Dubai as an example, container throughput has shown a remarkable 350% increase over the last 10 years, of which import/export container also recorded a strong increase of 320%. It will also create a substantial number of jobs in the service sector as well as in the industrial sector.

For that reason, the GSO is planning to create free trade zones close to major ports. Creation of free trade zones is contemplated in Port Salalah, Sohar Port, and Port Khasab. Various incentives are needed to attract customers to a newly created free trade zone including such

measures as: tax exemption, foreign ownership of companies, and free remittance to overseas. The GSO is now finalizing a set of incentives paying due consideration to the successful operation of Jebel Ali Free Zone in UAE.

4.4.6 The Sixth Five-Year Development Plan

The GSO is currently preparing the next five-year plan and will finalize the plan toward the end of 2000. MOTH plans to request roughly 27 million R.O. of official investment for the planning period. Major projects envisaged in the plan are improvement of Port Sultan Qaboos, expansion of container terminal in Port Salalah, and upgrading of Port Khasab. Among them, construction of two additional container berths in Port Salalah will be the highlight of the next five-year plan.

Table 4.4.4 Projects Proposed for the Sixth Five-Year Plan

Port	Proposed projects	Official investment (million R.O.)
Port Sultan Qaboos	New gates, security fence work shop, and operation tower,	1
Port Salalah	Expansion of container terminal, extension of break water, and power installation	20
Port Khasab	Reclamation, floating pontoons, and extension of quays	6
Total		27

Source: Ministry of Transport and Housing

4.5 Labor Market

There are two major subjects of study in the field of labor supply and demand in the Sultanate, namely,

- 1) Possibility of labor supply to rely on that of expatriate labor to meet the increased demand for labor with industrial development, and
- 2) Possibility to provide job opportunity for Omani labor with industrial development

4.5.1 Outlook of Labor Supply and Demand

The labor supply of the Sultanate has substantially been dependent on that of expatriate labor. As indicated in the Vision 2020, the necessity to depend on the expatriate labor will not change dramatically in the future, although the Government has made enormous efforts to promote Omanization of labor, together with the efforts for human resource development of Omani people (Table 4.5.1).

According to the projection made by the Fifth Five-Year Plan¹ on the labor demand-supply balance, the required expatriate labor in the area of semi-skilled and un-skilled labor is forecast to increase by 23,000 to 406,000 by the year 2000, compared to 383,000 in 1995. The annual increase rate of 0.4% in this projection will have a minor impact on the expatriate supply, if one considers the abundant supply ability of labor in this area, particularly in Indian sub-continent². Actually, most of the firms, which are dependent on their large portion of labor supply on that of expatriates, do not worry about future supply even with their business expansion.

In the case of labor in the area of skilled and upper level, the Fifth Five-Year Plan estimated that the required expatriate labor would increase by 40,000 to 153,000 in the year 2000, compared to 113,000 in 1995. There is no significant influence from the increase so far, and will not cause any serious problems regarding their supply, assuming that the Government will ensure a favorable business environment for the expatriates to work in the Sultanate.

4.5.2 Need for Creation of Job Opportunity for Omani Labor

According to the Fifth Five-Year Plan, the available job opportunity for Omani labor during the plan period (1996-2000) will be 49.4% of the estimated Omani labor supply in the period. The labor market entrance ratio of Omani is estimated as low as 40% particularly for those of elementary dropouts, preparatory, and those with no formal education, who are expected to form (non-manual or non-office) semi-skilled workers or un-skilled workers. The ratio is

¹ Ministry of Development, "Basic Components and Main Indicators of the Fifth Five-Year Plan (1996-2000)", (January 1996)

² The future supply and demand balance will be further reviewed in the later stage of the Study, after formulating the development scenario of industry.

estimated as low as 43% for graduates of high school or equivalent, vocational training, and technical education, who are expected to form skilled workers.

Since Omani population by age group shows further increase in the younger age groups, which are not in the labor market yet, the above trend will continue for the near future, and thus, the important issue regarding the labor market will be the development of human resources to meet the needs of industry.

Table 4.5.1 Labor Supply and Demand Balance (1995 - 2000)

(Unit: '000)

		Estimates of total labor 1995	Output estimates of different educational systems during 1996-2000 (a)	Estimates of labor market entrants 1996-2000 (b)	(b/a) (%)	Total labor force projections 2000
Specialists (University Graduates)	Omani	19	11	9	81.8	28
	Expatriates	46				55
	Total	64				83
	Omanization %	29.7				33.7
Technicians (Graduates from special institutes and colleges)	Omani	15	11	8	72.7	23
	Expatriates	19				27
	Total	34				50
	Omanization %	44.1				46
Skilled Office Workers (High school or equivalent)	Omani	36	60	6	43.3	42
	Expatriates	20				25
	Total	56				67
	Omanization %	64.3				62.7
Skilled Manual Workers (High school or equivalent)	Omani	78		20		98
	Expatriates	29				46
	Total	107				144
	Omanization %	72.9				68.1
Semi Skilled Office Workers (Preparatory school or equivalent)	Omani	6	27	3	63.0	9
	Expatriates	89				113
	Total	95				122
	Omanization %	6.3				7.4
Semi Skilled Manual Workers (Preparatory school or equivalent)	Omani	1		14		15
	Expatriates	23				16
	Total	24				31
	Omanization %	4.2				48.4
Other Semi-skilled and Un-skilled Workers (Elementary school or informal education)	Omani	115	65	26	40.0	141
	Expatriates	271				277
	Total	386				418
	Omanization %	29.8				33.7
Total	Omani	270	174	86	49.4	356
	Expatriates	496				559
	Total	766				915
	Omanization %	35.2				38.9

Source: Ministry of Development, "Basic Components and Main Indicators of the Fifth Five-Year Plan (1996-2000)", (1996)

5. Present Conditions of Port Salalah and its Hinterland

5.1 Land Use

Salalah is located at the center of Dhofar Province and on the southern coast of Oman, more than 1,000km from Muscat. It is the second largest city in Oman.

Ministry of Transport & Housing is in charge of the land-use control in the whole country. Ministry of Transport & Housing in Salalah, under the Dhofar Governorate, is responsible for making the land use plan in Salalah area. It has adopted the "SALALAH STRUCTURE PLAN, namely the land use plan in SALALAH which was completed in November in 1998.

The structure plan deals with the existing land-use situation and land requirements in the future. The main contents of the existing land-use are as follows:

Table 5.1.1 Existing land-use situation (1995)

Land Use Category	Land Use Area (ha)	Share in Total Developed Area(%)
Residential	1,18033	8.30
Commercial	67.90	0.50
Industrial	810.29	5.70
Public & Semi-Public Facility	979.49	6.90
Transportation	3,784.83	26.60
Open Spaces	128.45	0.90
Special Uses	3,917.70	27.60
Agriculture	2,513.66	17.70
Wadi, Khawrs, Environmental/ Historical Sites	831.00	5.80
Total Development Area	14,214.65	100.00
Vacant Land Developable/ Undevelopable, Designated / Undesignated	48,885.35	
Total Study Area	63,100.75	

Source: Revision of SALALAH STRUCTURE PLAN (1995-2015), PHASE 5, FINAL STRUCTURE PLAN

The STRUCTURE PLAN provides the following projection on population growth and land needs in Salalah up to 2015.

The population in 2015 will reach 246 thousand, a 194% increase over the population in 1995. Work force in Salalah will be 82,295 in 2015. Proportion of the Omani labor to the total work force is estimated to be 25%, much higher than 17% in 1995.

According to the projection, residential use will need by far the largest portion of additional land. It is noteworthy that no major expansion of commercial and industrial land-use is envisaged in the plan. The plan therefore does not show the direction which Salalah should take to expand its economy and create job opportunity.

Table 5.1.2 Additional land requirement

Land Use	Area (ha)
Residential	2,250.00
Commercial	30.00
Industrial	25.00
Public & Semi-Public Facilities	328.00
Education	101.00
Health	38.00
Religion	53.00
Sports & Youth	55.00
Social & Cultural	13.30
Government uses	54.50
Transport services	14.00
Utilities	N.A
Open Spaces	31.00
Transportation (30% of all of the above)	700.30
Total	3,464.00

Source: Revision of SALALAH STRUCTURE PLAN (1995-2015),
PHASE 5, FINAL STRUCTURE PLAN

Figure 5.1.1 shows the proposed land use plan in 2015 in the SALALAH STRUCTURE PLAN.

5.2 Industrial Activities in the Hinterland

5.2.1 General

Dhofar industry is estimated to account for around 6 to 14 percent of the industrial activities in the Sultanate, according to the various data indicating the industrial activities, though very limited data is available regarding the industries in Dhofar Governorate (Table 5.2.1).

The most comprehensive statistics available on Dhofar industries is that of manufacturing industry. Table 5.2.2 shows the percent position of Dhofar manufacturing industry compared to that of the Sultanate total.

5.2.2 Manufacturing Industry

The manufacturing industry in Dhofar may be categorized into two types. One is those catering local market alone, and another is those covering both local and export markets. Major ones are those covering local and export markets. They are mostly established targeting export market, because of small size of the local market (214,000 populations including expatriates in 1998). Their raw materials are mostly imported, except for the non-metal mineral products industry, dairy products industry, and fish processing industry, which use non-metal mineral resources, fish and milk as their raw materials.

Most of manufacturers, at present, undertake the production of customary products employing conventional types of established process technologies transferred from abroad or based on product designs provided by foreign partners or buyers. The Omani products have been successful in certain export markets because of established reputation of their quality products, which may be attributable to the nature of Omani people. The Omani industries have pursued the middle class segment of consumers in the market with good quality and reasonable prices.

Textile and wearing apparel industries and wooden products industries do not exist in Salalah, though these industries are seen in North regions in the Sultanate.

The largest subsector of manufacturing industry in Dhofar is the **non-metallic mineral products industry**, accounting for almost 50% of total output of the manufacturing sector (Table 5.2.3). This subsector consists of 29 establishments. The largest among the establishments in this subsector is a cement manufacturing company, which is the largest exporter from Salalah. Most of other establishments in this subsector are those producing construction materials in small scale. These include the manufacturers of aggregate and sands for concrete production, concrete blocks, cement tiles, mosaic tiles, etc. Their major market is the local market in Salalah, with some exporting to Yemen.

The second largest subsector is the **food and beverage industry**, accounting for almost 30% of total manufacturing industry. There are 20 establishments in this subsector. Most of them cater for the local market in Dhofar. Major ones include a meat-processing company, two dairy products manufacturers, a vegetable oil manufacturer, a flourmill, and an animal feed manufacturers. In addition, there are many bakeries. Because of small size of the local market, the larger sized manufacturers, such as a vegetable oil manufacturer, a flourmill, and an animal feed manufacturer are exporting their products. The export value from Salalah accounts for 27% of the local production in the food and beverage subsector.

There is a fish canning factory, which is under construction, will be established totally for export. The fish processing industry is an export oriented and local-resource based industry. There were other few fish processing factories in and near Salalah, but they were closed. Their products were frozen fish and lobsters.

The next largest subsector in terms of gross output is **the basic metal industry and fabricated metal industry**, accounting for slightly less than 10% in total (estimate). The subsector includes an establishment for the basic metal industry, and 14 establishments for the fabricated metal industry. They import general steel or aluminum materials, and fabricate them into products through sheet metal working, welding, and painting, etc. They principally serve the construction and related industries locally. The export accounts for 35% of the gross output of these two subsectors.

Other manufacturers include an establishment in chemical and chemical products industry, an establishment in paper and paper products industry, 6 establishments in printed materials and recorded media industry, and 3 establishments in rubber and plastic products industry, etc. A paper products manufacturer is a manufacturer of stationary, mainly selling to the local market with some export. The plastics products manufacturers include that of plastics shopping bags, PVC pipes, and plastics consumer products.

There are two major industrial areas in Salalah. One is Raysut Industrial Estates and peripheral areas. Another is the industrial areas located adjacent to the Industrial Estates. Most of the representative manufacturers are located in these industrial areas.

5.2.3 Agriculture and Fishery Industry

Although Salalah is one of the largest areas, which is relatively rich in the natural water resources compared with other regions in the Sultanate, the major restricting factor of the agricultural expansion is the limited supply capacity of water.

There is no data about the **agricultural** produce in Dhofar. One of the major subsectors is daily farming. They supply their output to a dairy products factory located in Salalah. Other

subsectors are vegetable subsector. The major agricultural produce exported from Salalah includes garlic, onions, and tomatoes, etc. (Table 5.2.4). Others are the fruit subsector, but export of fruit is minor.

Fishing is classified into two types, namely, traditional fishing and commercial fishing. The government controls fishing license. The southeast coast of Oman down to Yemen is the high potential area in view of fishery resources, not only because of its continental shelf, but also because of reversing tide caused by monsoon. Composition of the fish available in the coast is similar to those consumed in Europe.

In addition, Oman is located conveniently for fishing of tuna and skipjack tuna, which migrate from the Atlantic Ocean to the Indian Ocean. The fish catch in 1998 in Dhofar is shown in Table 5.2.5. The unloaded fish is traded on the beach. The fish is exported either in fresh or frozen.

Lobster and abalone are the expensive seafood, and the Government controls their trading seasons.

5.2.4 Trading, Transportation and Tourism

The number of enterprises engaged in **trade** and industry is shown in Table 5.2.6. The number of enterprises in Dhofar constitutes 14% of total in Oman. Almost 90% of them are small in scale with their capital being less than 25,000 RO. They are mostly engaged in local trade.

Some of trading companies are engaged also in export. Most of the export from Salalah is for Yemen. The exported goods to Yemen are shipped mainly with Dhow boats, except for cement. A part of their export is done through Mazuyunah, by truck. A free trade zone was established in Mazuyunah at the end of 1999 to promote the trade with Yemen.

There is no data available regarding the situation of **transportation and storing subsector** in Dhofar, but there is a project to establish a warehousing company in Raysut Industrial Estate.

Regarding the **tourism**, the foreign visitors particularly those from European countries, have increased in recent years, as shown in Table 5.2.7. There are two types of foreign tourists in Salalah. One is the tourist group from Arabian countries, seeking for rain and green. They stay low cost hotels or flats. Another is the tourist group from European countries.

The increase in visitors may be attributable partly to increase in call of cruise ship. However, they spent minimum since they visit only one day without staying in hotels. A lot of efforts have been done to attract tourists from European countries, but it was not so successful as they

have expected.

There are 20 hotels in Dhofar in 1998 with 805 rooms and 1,361 beds, of which only one is the 4 star class hotel (another international class hotel was opened in 1999).

Table 5.2.1 Position of Industrial Activities in Dhofar

	Unit	Year	Dhofar		National Total
				% of National Total	
Agriculture					
● Cropped area	ha	National 1994 Dhofar 1992 ¹⁾			
Vegetables/ crops			236	2.9	8,173
Fruits			1,074	1.6	68,200
Perennial fodder			1,393	5.7	24,467
Fishery					
● Fish landed					
Traditional fishery	ton	1998 ⁴⁾	14,444	16.3	88,556
Commercial fishing	ton	1998 ⁴⁾	672	3.8	17,608
Manufacturing					
Gross output	'000 R.O.	1997 ³⁾	28,437	4.2	677,146
Value added	'000 R.O.	1997 ³⁾	12,731	5.5	233,295
Export					
Weight	'000 ton	1998 ²⁾	24.40	1.9	1,267.9
Value	Million R.O.	1998 ²⁾	4.57	0.7	692.6
Tourism					
Number of hotel and motel rooms		1998 ⁴⁾	805	17.3	4,657
Total capital of registered enterprises					
Multi economic activities	'000 R.O.	1998 ⁴⁾	37,702	12.4	303,356
Banking, insurance and business services			64	0.3	20,820
Transportation			82	6.9	1,190
Commerce, restaurants and hotels			987	8.5	11,600
Construction			46	1.3	3,655
Electricity and water			0	0.0	21
Manufacturing			529	12.3	4,316
Mining and quarrying			0	0.0	1,045
Agriculture and fisheries			6	8.1	74
Population					
Omani	'000	1998 ⁴⁾	143	8.5	1,685
Non-Omani			72	11.9	603
Total			214	9.4	2,288

Sources: 1) MAF, "Salalah Integrated Study, June 1992"

2) ROP, "Foreign Trade Statistics, 1998"

3) MCI, "Yearly Industrial Statistical Book, 1993" and "1997"

4) MNE, "Statistical Year Book, 1998"

Table 5.2.2 Position of Dhofar Manufacturing Industry in 1997

Sub-sector	Gross Output ('000 R.O.)			Gross Value Added ('000 R.O.)			Number of Establishments			Number of Employees		
	Oman Total	Dhofar	% of National Total	Oman Total	Dhofar	% of National Total	Oman Total	Dhofar	% of National Total	Oman Total	Dhofar	% of National Total
15 Food products/ Beverages	136,887	8,190	6.0	41,007	2,704	6.6	138	20	14.5	5,140	401	7.8
18 Wearing apparel; Dressed/ Dyed fur	39,555	0	0.0	20,738	0	0.0	20	0	0.0	5,236	0	0.0
20 Wood/ Products of wood/ Cork, ex. Furniture	9,135	0	0.0	4,596	0	0.0	80	0	0.0	891	0	0.0
21 Paper/ Paper products	6,172	x		2,248	x		6	1	16.7	344	x	
22 Printed materials/ Recorded media	12,519	779	6.2	7,018	390	5.6	30	6	20.0	1,401	85	6.1
23 Refined petro products	225,162	x		40,520	x		8	1	12.5	539	x	
24 Chemicals/ Chemical products	35,744	x		14,310	x		22	1	4.5	877	x	
25 Rubber/ Plastic products	14,071	x		5,283	x		23	3	13.0	915	x	
26 Other non-metallic mineral products	87,107	13,975	16.0	45,573	7,410	16.3	280	29	10.4	5,141	742	14.4
27 Basic metals	22,370	x		11,736	x		6	1	16.7	727	x	
28 Fabricated metal products	24,754	494	2.0	13,032	196	1.5	125	14	11.2	2,849	95	3.3
29 Machinery/ Equipment nec.	13,791	0	0.0	6,453	0	0.0	12	0	0.0	582	0	0.0
30 Office, Accounting/ Computing Machinery	x	0		x	0		2	0	0.0	x	0	
31 Electrical Machinery/ Apparatus nec.	20,477	0	0.0	5,395	0	0.0	9	0	0.0	587	0	0.0
33 Medical, Precision/ Optical instruments	x	0		x	0		1	0	0.0	x	0	
34 Motor vehicles, trailers/ Semi-trailers	x	0		x	0		2	0	0.0	x	0	
35 Other transport equipment	324	0	0.0	212	0	0.0	8	0	0.0	50	0	0.0
36 Furniture; Manufacturing nec.	21,539	x		11,629	x		30	3	10.0	1,750	x	
99 Other industries	5,841	0	0.0	2,363	0	0.0	10	0	0.0	505	0	0.0
Total	677,146	28,437	4.2	233,295	12,731	5.5	812	79	9.7	27,624	1,535	5.6

Note: "x" covered data to maintain its confidentiality.

Source: MCI, "Yearly Industrial Statistical Book, 1997"

Table 5.2.3 Production and Export of Manufacturing Industry in Dhofar

	Local Production			Export from Salalah	B/A
	Gross Output		Gross Value Added		
	TRO (A)	% of Total	TRO	TRO (B)	(%)
15 Food Products/ Beverages	8,190	28.8	2,707	2,201	26.9
18 Wearing Apparel; Dressed/ Dyed Fur				16,745	
20 Wood/Product of Wood/ Cork, Furniture				2	
21 Paper/Paper Products (*)	598	2.1	182	384	64.2
22 Printed Materials/ Recorded Media	779	2.7	390		
23 Refined Petro Products (*)	482	1.7	147		
24 Chemicals/ Chemical Products (*)	1,608	5.7	569	2,460	153.0
25 Rubber/ Plastics Products (*)	139	0.5	40	1,940	1,395.7
26 Other Non-metallic Mineral Products	13,975	49.1	7,410	1,181	8.5
27 Basic Metals (*)	2,129	7.5	1,075	910	34.7
28 Fabricated Metal Products	494	1.7	196		(combined total of 27 and 28)
31 Electrical Machinery/ Apparatus				9,579	
33 Medical, Precision/ Optical Instruments				113	
34 Motor Vehicles, Trailers				7,533	
36 Furniture; Manufacturing nec. (*)	43	0.2	15	1,542	3,586.0
Total	28,437	100.0	12,731	44,593	156.8

Notes: (*) Data is not available to maintain confidentiality, and these figures on "Gross Output", and "Gross Value Added" are estimated by the JICA Study Team.

Sources: MCI, "Yearly Industrial Statistical Book, 1997"
 ROP, "Foreign Trade Statistics, 1998"

Table 5.2.4 Export of Agricultural Produce in Dhofar, 1998

HS Code		'000 R.O.	Ton
06020000	Mushroom & spawn	13.2	7.8
06031000	Cut flowers & flower buds	0.4	0.1
07020000	Tomatoes	28.5	45.9
07031000	Onions & shallots	31.3	309.2
07032000	Garlic	228.1	1,774.1
07134000	Dried lentils	6.0	25.6
07135000	Dried broad beans	14.0	45.0
08021000	Almonds	10.4	6.6
08025000	Pistachios	3.5	1.8
08041020	Dried dates	0.6	0.4
08053010	Fresh lemons & limes	5.0	36.0
08081000	Apples	3.2	12.5
09020000	Tea	479.6	424.3
09060000	Cinnamon	36.6	68.9
09083000	Cardamoms	24.6	17.3
09101000	Ginger	28.3	32.1
09109100	Mixed spices	169.6	206.1
12140000	Forage products	34.7	456.4
	Total	1,117.6	3,470.1

Source: ROP, "Foreign Trade Statistics, 1998"

**Table 5.2.5 Fish Unloaded by Traditional Fishery
in Dhofar, 1998**

	Ton	'000 R.O.
Large pelagics		
Yellowtail tuna	11,307	6,393
Longtail tuna	4,379	2,705
Kingfish	3,143	3,817
Large jacks	1,922	1,676
Others	7,605	3,358
Sub-total	28,356	17,949
Small pelagics		
Sardine	15,872	2,816
Indian oil sardine	4,778	1,627
Indian mackerel	1,994	1,624
Small jacks	2,957	1,393
Others	4,455	1,430
Sub-total	30,056	8,890
Demersal		
Emperor	6,453	2,649
Seabream	2,505	998
Grouper	5,214	4,040
Others	8,418	3,536
Sub-total	22,590	11,223
Sharks & rays		
Sharks	4,237	1,727
Others	173	51
Sub-total	4,410	1,778
Crustaceas		
Lobster	338	1,312
Cuttlefish	2,282	1,903
Abalone	32	1,704
Others	496	1,892
Sub-total	3,148	6,811
Total	88,560	46,651

Source: Directorate General of Fisheries Resources,
"Annual Statistics Reports for 1998".

Table 5.2.6 Number of Registered Enterprises by Capital, Trading Sector at the End of 1998

Unit: Number

Capital '000 R.O.	Total Oman		Dhofar	
		% of total		% of total
Under 5	33,283	34.7	2,779	21.1
5 - 10	17,843	18.6	4,914	37.3
10 - 25	28,659	29.9	3,842	29.2
25 - 50	5,912	6.2	876	6.7
50 - 100	5,911	6.2	447	3.4
100 - 250	3,148	3.3	216	1.6
250 - 500	643	0.7	46	0.3
500 - 1,000	242	0.3	21	0.2
1,000 - 2,000	128	0.1	9	0.1
2,000 - 3,000	52	0.0	3	0.0
3,000 - 4,000	31	0.0	-	-
4,000 - 5,000	17	0.0	-	-
& Over	83	0.0	9	0.1
Total	95,952	100.0	13,162	100.0

Source: MNE, "Statistical Year Book, 1998"

Table 5.2.7 Number of Tourists In Dhofar

Year	Total	% Change	Oman	G.C.C.	Arab countries	Africa	Europe	Asia	Others
1994	43,132	29.24	16,036	17,437	4,692	214	2,122	1,922	709
1995	33,761	-21.73	14,999	14,102	930	267	2,153	1,398	812
1996	50,730	50.26	24,609	20,928	1,365	455	1,301	1,668	404
1997	56,106	10.60	25,539	26,924	694	128	1,104	1,495	222
1998	87,805	56.50	43,130	40,852	946	122	774	1,834	147
1999	113,920	29.74	44,088	52,821	4,770	404	2,822	4,051	4,964
Total	385,454		167,501	173,064	13,397	1,590	10,276	12,368	7,258

Source: DG of Tourism, MCI

5.3 Natural Resources around the Hinterland

5.3.1 General

In Oman, metallic mineral resources are mainly found in the northern mountain area, as well as Masirah Island. No metallic mineral resources are reported in and around the Hinterland area.

Dhofar is rich in non-metallic mineral resources. The major ones are limestone and gypsum, and they are used for cement production, and some are exported to UAE. There is a few number of development project of non-metallic mineral resources in Dhofar. However, none of them will be the major one.

5.3.2 Limestone

Limestone is one of the most abundant resources available in Oman, widely found in the country. The limestone is mined and used by cement manufacturers, and quick lime producers, as well as copper smelting. The cement manufacturers have increased their production in the recent years. Nevertheless, the limestone reserves in the country are still more than sufficient.

In general, limestone is used for steel making, construction, and calcium carbonate, other than cement and quick lime. There is a large demand for steel making in Australia (more than 1 million tons annually). While the country has yet to secure low-cost transport to compete with other exporting countries, which use large ships on return trip, existing port and harbor facilities are rather small to meet such requirements. On the other hand, production for other uses including as aggregates is not highly profitable.

Large-scale quarries are operated by Raysut cement mills around the Hinterland. In addition there are some other prospective resources in the region. These include:

Wadi Hiza limestone

The deposit is located in a mountain at an altitude of 400m - 500m, behind Salalah and part of the northern mountain range, which can be reached via Raysut Cement Co.

Rock is essentially re-crystallized limestone of high grade with 55.7% CaO, and would have been used as marble if there was no fissure or crack. Unfortunately, small cracks in reddish brown color would result in a poor production yield. The area is covered with greens. Although limestone is widely distributed throughout the mountain, no quarrying permit has been issued.

Rakoob limestone

It is located approximately 15km northwest of Wadi Hiza, at an altitude of 500m above the sea level. There are pasture areas nearby for livestock and camels, with many trees covering wide

areas. The site can be reached by driving northward from Wadi Hiza, passing a plateau at an altitude of 1,030m, and then going down along the ridge in a southwest direction to the slope facing the south. It forms a karst plateau where the road ends. The deposit is generally recrystallized high-grade limestone (99% CaCO₃) having an estimated ore of 13 million tons.

Tagah stone (Arzat miliolite)

This is coarse sandstone containing limestone in the Quaternary period, located on the coast 15m east of Salalah. The deposit forms small hills with relative height of 2 - 5m and is used as construction materials in Salalah. At present Noor Al-Jazeera Trad and Cont E.S.T. are quarrying the stone. The ore reserve is small. Since the mountain range on the north side of Salalah is entirely made of limestone, sand on the beach is mostly limestone. This is a very special type of sandstone containing 48.3% CaO and 9.41% SiO₂.

As for the export, market opportunity arises if the shipping facility is upgraded to allow large-lot transportation, since feasibility of limestone exports is governed by transportation cost.

5.3.3 Dolomite

There are some dolomite resources around the Hinterland area. Among these resources, Hatab dolomite has high grade sufficient for industrial use, but those from other sources has low MgO content and is not suitable as industrial materials. All the dolomite resources are still left unmined at present. This is because the country does not have industries that consume dolomite-based products, such as plaster, magnesia fertilizer, and glass. On the other hand, there is also little export potential since dolomite is available in most of countries.

Hatab dolomite

The deposit is located approximately 40km from Salalah along the Thumrait - Salalah road. On a 4 - 6m high slope on the east side of the road, it is sedimented roughly horizontally (with a slope of 3-degree NNE). The dolomite layer constitutes the lowest stratum of the Rus formation, the Eocene epoch of the Tertiary period, below which limestone in the Umm Redhuma formation lies. It is 6m thick with little variation to cover a 2km x 5km area. To mine the deposit, the removal of a surface layer made of recrystallized or weathered limestone is necessary to 2 - 4m in depth. Stratification is very clear. The limestone is brittle and chalky, susceptible to weathering, but has high grade.

5.3.4 Gypsum

Gypsum is widely distributed in the east coast; from the Shuwaymiyah deposit to the Thumrait deposit located approximately 90km of Salalah. At present, two mining sites in Thumrait are mined, and they are mainly supplied to 2 cement mills. According to a boring survey conducted in the Shuwaymiyah deposit, presence of very high-grade gypsum (90 - 98%) was

identified in reserves exceeding 100 million tons.

In general, potential use of gypsum is gypsum board. There are huge export markets worldwide (more than 3.5 million tons in Japan), and proximity of the deposits to the coast (1km) may make the country competitive in the international marketplace. Following are the potential sources of gypsum in and around the Hinterland area.

Shuwaimiyah gypsum

Shuwaimiyah is located along the coast, approximately 200km northeast of Salalah. A white cliff made of limestone rises 250m in front of the beach, extends 20 - 30km east and west to form a shore terrace of 1 - 1.5m wide. In the middle of the beach, there is a village consisting of around 40 houses. Starting from 10km west of the village, the gypsum deposit extends approximately 11km westward, and 1 - 1.5km wide. Distance from the center of the deposit to the beach is around 1km. The deposit belongs to the Rus formation in the Eocene epoch of the Tertiary period. It has a strike running roughly east and west, and a dip of 3 - 5 degrees northeast. The Rus formation is divided into 5 sub-formations. Lower two sub-formations are particularly important and contain 0.5 - 2m thick chalky dolomite layers. There is no topsoil coverage, except local coverage of sand and gravel layer formed in the Quaternary period. Thus, the deposit is mostly exposed. The deposit is 90m thick throughout the Rus formation, of which around 40m can be mined. The ore reserve is estimated to consist of a 10,000m strike, 500m wide north and south, 40m thick, multiplied by specific gravity of 2.5 and safety factor of 0.7.

Thumrait gypsum

The deposit is only one productive gypsum deposit, mined by Raysut Cement Co. and Oman Cement Co. It is located 55km north of Salalah and faces a paved road passing through a desert. At present, three pits are in operation, from the south, Raysut Cement Company's pit, ATT's pit, and a new pit northwest of the ATT pit. While crystallized gypsum is high grade, the stripe ore (centimeter wide) contains relatively large amounts of insoluble materials and iron. The ore reserve is considered to be sufficient for commercial exploitation.

5.4 Inland Transport Network

5.4.1 General

Transport system in Oman consists of road, air, pipe and sea. Road and pipeline are the major transportation means, road being used for freight transportation and pipeline for oil and natural gas. In the northern part of Oman and eastern part of UAE (United Arab Emirates) which is the most densely populated area, road is the dominant mode for local passenger and freight transportation. Air transportation is used to connect between Muscat and faraway and remote places such as Salalah City, Khasab City and Masirah Island. Sea transportation is utilized for domestic petroleum product transport, ferry service between Hilt in Masirah Island and An Nakdah City by RNO, and reach to isolated areas on the southeast coast.

5.4.2 Road Transport

(1) Road Network In Oman

1) General

There are about 7,700km of asphalt-paved roads and about 25,000km of graded roads in Oman as of 1999. (See Table 5.4.1) The public roads are planned, constructed and maintained by Directorate General of Road, MOTH and Muscat Municipality. In addition PDO (Petroleum Development Oman) and MOD (Ministry of Defense) are responsible for roads in exclusive use areas.

Table 5.4.1 Length of Road by Type

(Unit : Km)

Type of Road Year	Asphalted Carriageway					Graded Roads
	Total	Dual	Single			
			Total	Public	Others	
1975	714	0	714	714	0	4,894
1980	2,192	55	2,137	2,058	79	9,169
1985	3,768	380	3,388	3,206	182	13,501
1990	4,976	418	4,558	4,372	186	18,689
1991	5,208	418	4,790	4,604	186	18,922
1992	5,566	426	5,140	4,907	233	20,663
1993	5,760	428	5,332	5,016	316	23,375
1994	5,937	461	5,476	5,160	316	23,941
1995	6,257	510	5,747	5,431	316	24,287
1996	6,591	550	6,041	5,554	487	24,800
1997	7,407	550	6,857	6,291	566	25,266
1998	7,771	566	7,205	6,527	678	25,249

Source : Statistical Year Book

The major road network in Oman has been completed and attention has now turned to improving and widening the existing roads (dualisation of congested roads), and to linking towns and villages of the interior to main road under a local road scheme. MOTH has constructed and maintains about 5,000km of paved road and about 15,500km of graded road, and these roads are the most important to local area.

2) Main Road Network in Oman

The major road routes connecting central city in each region are as follows.

-Route 1 and Route 5 (Batinah Highway (Muscat -- Sohar -- Al-Wadiyat) -- (Dubai))

This route which connects Muscat and Dubai is one of the most important road in Oman; a dual multi-lane highway passes through the most densely populated area in Oman. Dubai government constructed route 5 with the consent of the Omani Government; the road under Oman's jurisdiction is maintained by MOTH at present. The traffic volume on this route is steadily increasing and improvement plans that include private sector involvement are being studied.

-Route 15 (Seeb -- Nizwa)

This route connects two major cities, Muscat and Nizwa, and two Industrial estates, Rusayl and Nizwa. Rusayl-Nizwa dual carriageway project was started in 1995 and is scheduled to be completed by June 2001.

-Route 21 (Nizwa -- Ibri -- Al-Buraymi -- (Abu Dhabi or Dubai))

This route connects the cities located on the southern side of Al Hajar and Al Jabar Akhdar (the mountain area in the northern part of Oman), and Abu Dhabi or Dubai. Nizwa is the gateway to the southern part of Oman through route 31 at present.

-Route 23 (Bidbid -- Sur)

This road which passes through the southern side of Al Hajar Ash Sharq is the only paved road connecting Muscat and Sur. The road length between Muscat and Sur through this route is 337km even though the distance between the two cities is only about 160km on map. The improvement of the existing seaside graded road between Sur and Quriyat (about 100km) was studied for future development, considering the industrial projects now taking shape in Sur.

-Route 31 (Nizwa -- Hayma -- Thumrayt -- Salalah)

This road is the only paved road connecting northern part and southern part of Oman. The total travelling length between Muscat and Salalah is 1,023km through route 15 and 31, and ONTC (Oman National Transport Co.) operate limousine service twice a day. It takes about 12 hours with two stops. Whole road on this route is maintained by DG of Road, MOTH is responsible for ensuring good traffic condition, which can be difficult since a certain part of the route in the desert area is subjected to sandstorms.

(2) Road Network in Dhofar and Salalah

1) Dhofar Governorate

All roads in Dhofar are constructed and maintained by D.G of Communication, Dhofar Governorate. Major roads are Route 31(Nizwa - Hayma - Thumrayt - Salalah) and Route 49 (Salalah - Taqah – Marbat), Route 47 (Salalah - Raysut - Mughsayl – Surfeit), as well as the roads inside and around Salalah city.

In the mountain area (Jabal al Qara) on Route 31, a lot of traffic accidents, especially with heavy vehicles, occur during the Khareef period (from Jun to August) due to the heavy downpours. Currently a 50km long improvement program is being implemented, including widening, slope easing and installation of additional guardrails. Several alternatives of routing were also studied by D.G of Communication, considering the result of a topographic survey and future development of industrial area in Salalah.

On Route 49, a stretch of about 70km (Salalah - Taqah – Marbat) was already paved, and improvement plan between Marbat, Sath and Hadbin are now being studied. On Route 47, dual carriage road between Salalah and Raysut, and the paving of the road from Raysut through Mughsayl and Surfeit to 19km inside of Yemen has already been completed.

2) Yemen

In April 1997 a major road construction agreement was signed between Oman and Yemen for a 245km paved road between Al-Ghaidha in Yemen and Shahn on the border. This project, funded by Oman, is one of several bilateral agreements with Yemen, expected to bring economic benefits to both countries. Al-Mazyunah Free Trade Zone located near the border of Yemen is serving as a gateway of the trade in the beginning of the year 2000, and MOTH has carried out studies on a toll road between Thumrait and Al-Mazyunah for private sector construction.

3) Salalah Town

The town area of Salalah is expanding to the east and west between the coastal line of the Arabian Sea and the mountain area (Jabal al Qara). The major roads in the central area are Al Rubat Street, 23rd July Street, Al Muntazah Street and Sultan Qaboos Street in the east west directions, while Al Matar Street and Al Nahdah Street are the important links running north and south. The major linkages from Salalah to the other parts of Oman by road are Salalah-Thamarit-Muscat Road and Ittin Road to the north, Salalah-Taqah-Mirbat Road to the east and Salalah-Mughsayl-Surfeit Road to the west.

According to the Salalah Structure Plan (Phase 5) Study, roadside count survey carried out in 1995 showed that 23rd July Street is operating at capacity more than 1 of V/C Ratio, and Al Salaam Street and Al Matar are operating at very near capacity. Feasibility Study of

Salalah By-Pass Road was finished in 1989 and Design & Supervision of Salalah By-Pass, with a total length of 32km, was prepared by MOC in 1998. The By-Pass is planned to be located on the outskirts of the urban area of Salalah and will be connected to every major linkage road from Salalah and Salalah Free Zone. It is proposed that the By-Pass will be extended to join with the Salalah-AlMughsail Road. Salalah Structure Plan (Phase 5) Study also shows the construction of the By-Pass will improve the road traffic condition in the central area of Salalah but some additional improvement are required at 23 July Street and Al Robot Street. Most of the origin/destination of cargo from/to port are located outside of the city central area and therefore vehicles from/to port will not adversely affect traffic conditions.

In order to promote good road traffic condition in the port and Free Zone area, it is essential that the connection between the Salalah By-Pass including Route 31, and Salalah Port and Free Zone access road should be well coordinated considering the future cargo volume from/to the area to/from Salalah City and Dhofar region.

5.4.3 Air Transport

(1) Air Network

Oman has six public air ports : Seeb (Muscat), Salalah, Sur, Masirah Khasab and Diba. Seeb airport is the only one international airport. Sur and Diba can only take light aircraft. PDO (Petroleum Development Oman) and MOD (Ministry of Defense) have several of their own airports, and those airports could be used by the public on request.

Table 5.4.2 Domestic Flight Schedule

Name of Airport		Flight Schedule
Seeb (Muscat)	Salalah	2 flights daily
Seeb (Muscat)	Khasab	1 flight on Sat. Sun. Mon. Tus. Wed.
Seeb (Muscat)	Masirah	1 flight on Sat. Sun. Mon. Wed.
Seeb (Muscat)	Diba	1 flight on Sun. Tue.
Seeb (Muscat)	Sur	1 flight on Sat. Mon. Wed.

Source : Oman Aviation Service

(2) Seeb Airport

The old airport in Muscat was located in the confined space of Bait al-Falaj. The new site was chosen some 17km out of Muscat and opened in 1973. The main runway is 3,585m and passenger terminal capacity is 3,000 persons. The airport is served by 26 airlines and has 40 to 58 flights a day currently.

(3) Salalah Airport

Salalah Airport is located near the central area of the city along with the well-field protection zones and is forming the northern boundary of the urban area. The airport area is about 1,410 ha including the Civil Terminal, Military Terminal, Aircraft maintenance and service facility, Fuel Depot, Cargo Terminal, Meteorological Station and 3,330m runway. Oman Air operates two or three daily domestic flights to/from Muscat and seasonal international flights from Dubai. The airport is also used for Military flights, training flights, Diwan flights, diplomatic flights, chartered flights and so on but the frequency is unknown. As per the DGCA (Salalah), the existing facilities are sufficient to handle international flights and handle international traffic within the foreseeable future.

According to Salalah Structure Plan (Phase5) Study, there are concerns that the airport could impact the health and safety of the population due to its location. The issue of relocation was studied in RDP/SRLUP but it was concluded that relocation of the airport was unnecessary by the year 2010. For the long term development plan of the Region, however, a site was reserved in Adownib plateau which is located outside of the city area to the west.

The following observations and recommendations for air transport are made in respect of port development. (a) Considering the port expansion plans and air-sea transshipment operations, although the present airport is not ideally located, the relocation to Adownib plateau will only have an adverse impact. (b) There is no apparent need for expansion of the existing airport area. There is sufficient land available within the airport area and to the north of it, if the need arises. (c) To facilitate the anticipated air-sea cargo transshipment operation, a direct access should be provided from the proposed By-Pass to the airport. This will avoid passage of heavy traffic through the residential areas. Separate facilities may be created to handle the cargoes at a suitable location. (d) The airport, in term of services and its location, will be an important aspect of future development, covering social, physical and economic issues.

(4) Other Airport

Upgrading Sur airport and a new airport in Sohar and Al-Buraimi were studied. A suitable site has been identified and land acquisition has begun in Sohar and land has been reserved at Al-Kamil within easy reach of Sur.

(5) Volume of Passenger and Cargo

Volume of passenger and cargo in each airport is shown in Table 5.4.3.

Table 5.4.3 Volume of Passenger and Cargo in Airport (in 1998)

Name of Airport	International Passenger (Persons)			Domestic Passenger (Persons)		International Cargo (Ton)		Domestic Cargo (Ton)	
	Arrival	Departure	Transit	Arrival	Departure	Unloaded	Loaded	Unloaded	Loaded
Seeb	1,121,925	1,129,480	208,151	149,179	147,310	32,868	19,407	202	472
Salalah	9,759	11,745	571	78,801	81,373	37	0	468	201
Diba				104	196			0	0
Khasab				2,087	1,698			2	0
Sur				444	244			0	0
Masirah				1,429	1,131			1	0
Bahja				4,770	4,583				
Fahud				17,954	18,189				
Hazar				59	77				
Alkhuwayr				1,776	1,773				
Marmul				13,766	14,525				
Nimr				10,569	10,809				
Qarn Alam				7,501	6,960				
Rima				3,263	3,370				
Saham				153	145				
Saih Rawl				3,321	2,995				
Yibal				1,313	1,111				

Source : Annual Report 1998 (Civil Aviation and Meteorology)

5.4.4 Pipeline

(1) Oil

Oman's oil production in 1998 from more than one hundred fields increased to around 900,000 barrels a day and was marginally higher than production in 1997. The Government made a decision to cut PDO (Petroleum Development Oman) oil production by 30,000 barrels per day from the beginning of May 1998. In July 1998, a further reduction of 20,000 barrels per day was made to stabilize oil prices on the world market and then the daily average production volume was 810,000 barrels per day. At the beginning of 1999, total recoverable oil stood at 5.5 million barrels. It is the policy of Ministry of Oil and Gas that annual production volume be restricted to less than 6.5% of the remaining reserve. All crude products were transported to Mina al-Fahal by crude oil pipeline. In 1998 about 300 million barrels were exported from Al-Fahal port oil terminal and 24 million barrels were refined in Oman Refinery at Mina al-Fahal for domestic consumption.

(2) LPG

LPG is produced in Yibal plant (25,000t.p.a), Mina Al-Fahal plant (40,000t.p.a) and Saih Rawl (40,000t.p.a) which came on stream at the end of 1999. The total domestic demand

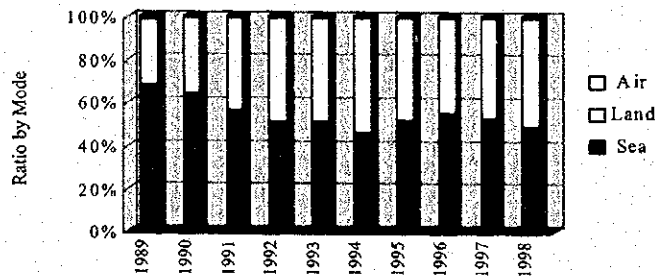
of LPG will be about 100,000 tons in the year 2000, and hence the supply capacity will satisfy the domestic demand. LPG produced in Yabil plant is transported to Muscat by gas pipeline.

(3) LNG

Three natural gas fields were discovered in central Oman between 1989 and 1991. The current expectation of total reserves in Oman stands at about 29 trillion cubic feet, of which 25 t.c.f are non-associated reserves. The gas will be transported from Saih Rawl processing plant to Qalhat (Sur), a distance of about 360km, by a 48 inch diameter pipeline and will be exported to Korea and Japan.

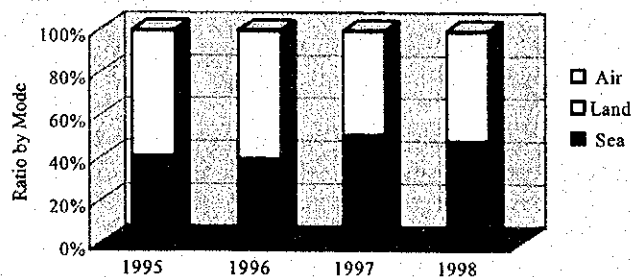
5.4.5 Foreign Trade by Transport Mode

According to foreign trade statistics of Oman (excluding oil and gas), the share of import foreign trade volume by sea has been about 50%, and that of export by sea has been about 40% for the past several years. On the other hand, the share of import foreign trade value by sea was more than 55% and that of export by sea was more than 60% except in 1998. This means high-value cargoes are being transported by sea.



Source : Foreign Trade Statistics (ROP)

Fig. 5.4.1 Import Foreign Trade Share by Mode



Source : Foreign Trade Statistics (ROP)

Note : Trade volume by Seeb airport passenger is not included

Fig. 5.4.2 Export Foreign Trade Share by Mode

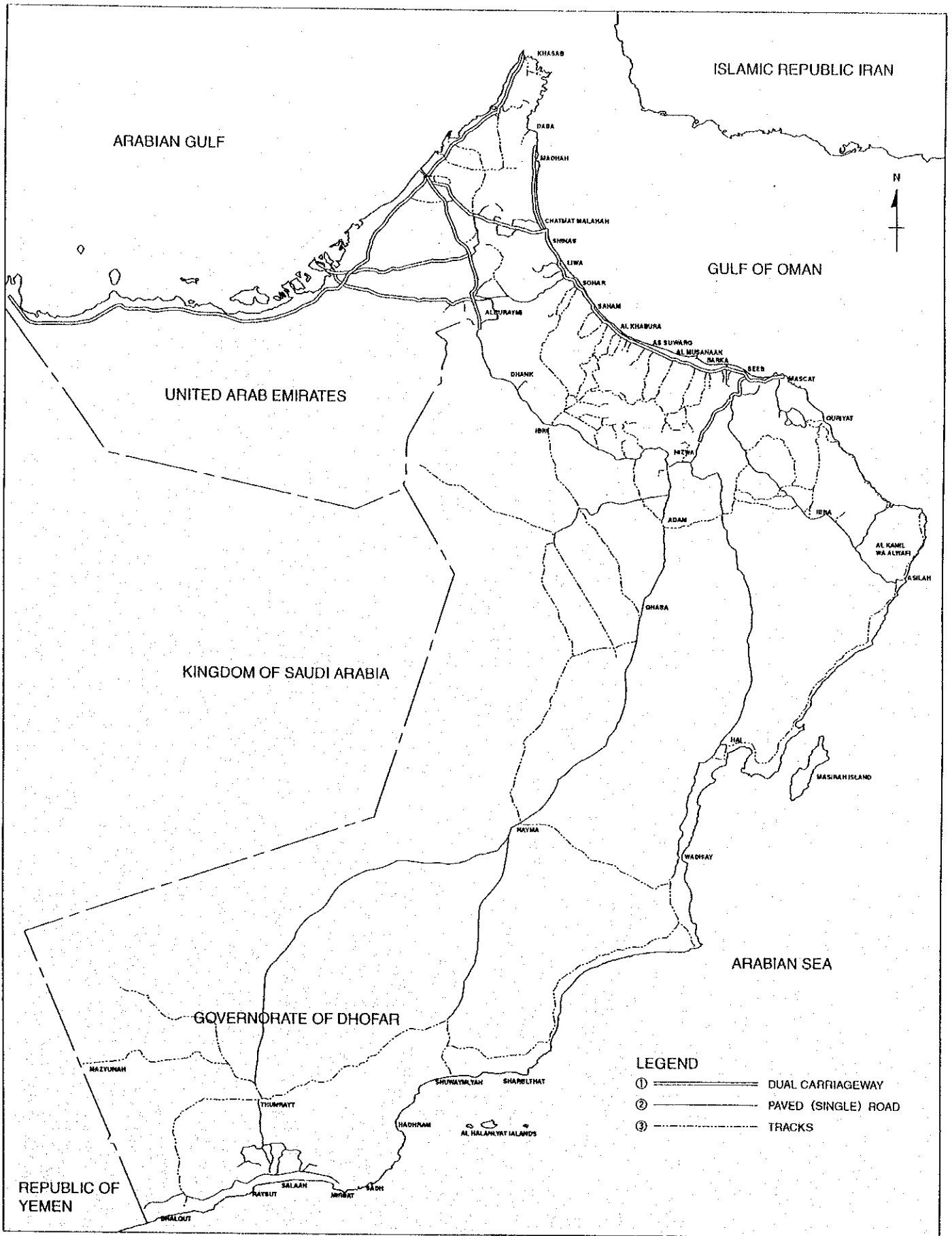
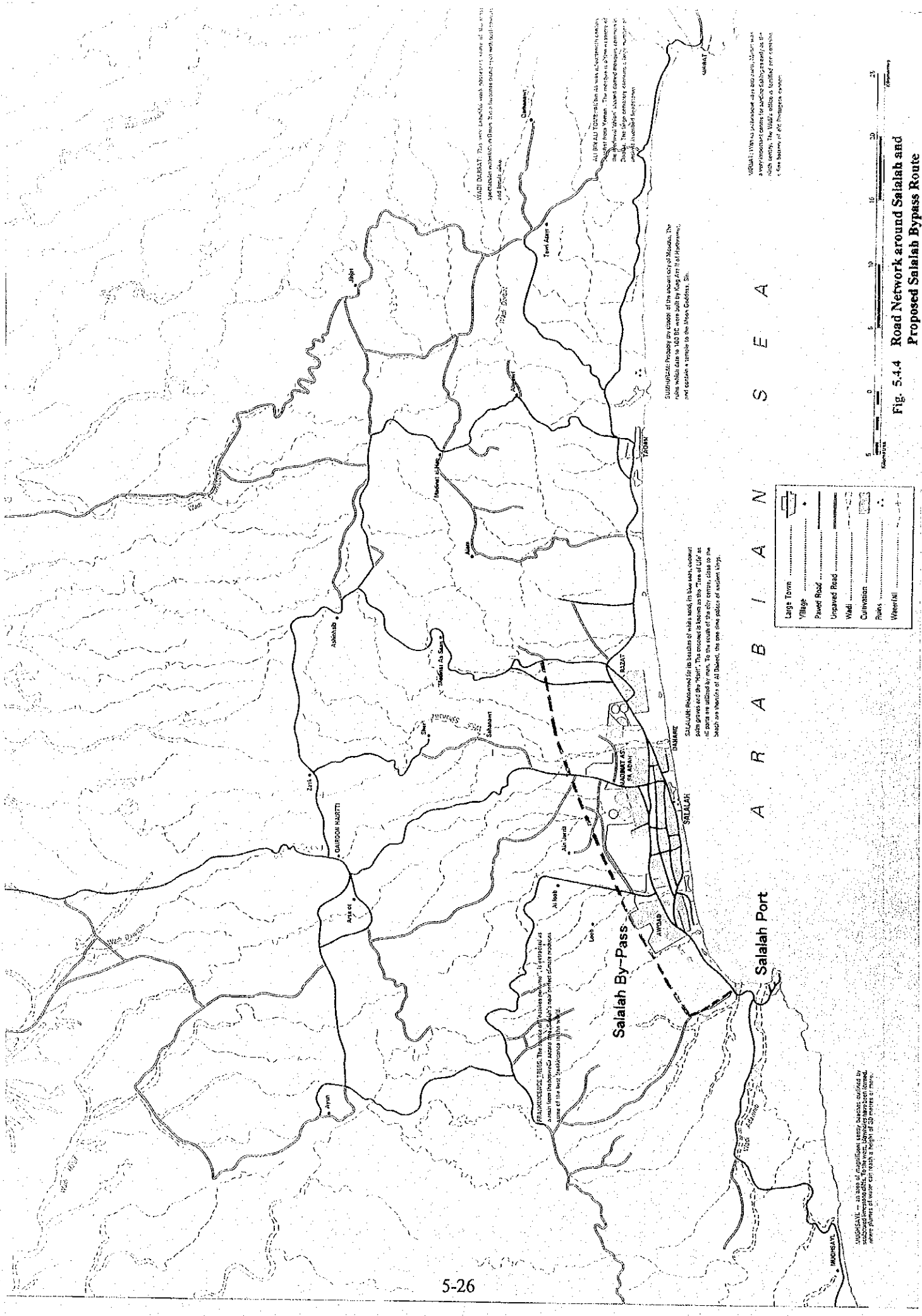


Fig.5.4.3 Road Network in Oman



WADI DIBBAT: This wadi, like the wadi, is a seasonal stream, and its water is used for irrigation and domestic purposes.

AL-BALAH: This is a small town, and its water is used for irrigation and domestic purposes.

Subsidiary: Probably on the coast of the emirate of Muscat, the road which leads to the city of Salalah is a very important one for the emirate of Muscat, and it is a very important one for the emirate of Muscat.

Salalah: Recommended for the location of Salalah, for the best of the road, for the best of the road, for the best of the road.

FRUITS: The fruits of the Salalah region are very good, and they are very good, and they are very good, and they are very good.

WATER: The water of the Salalah region is very good, and it is very good, and it is very good, and it is very good.

Large Town
Village
Paved Road
Unpaved Road
Wadi
Cuncheon
River
Waterfall



Fig. 5.4.4 Road Network around Salalah and Proposed Salalah Bypass Route

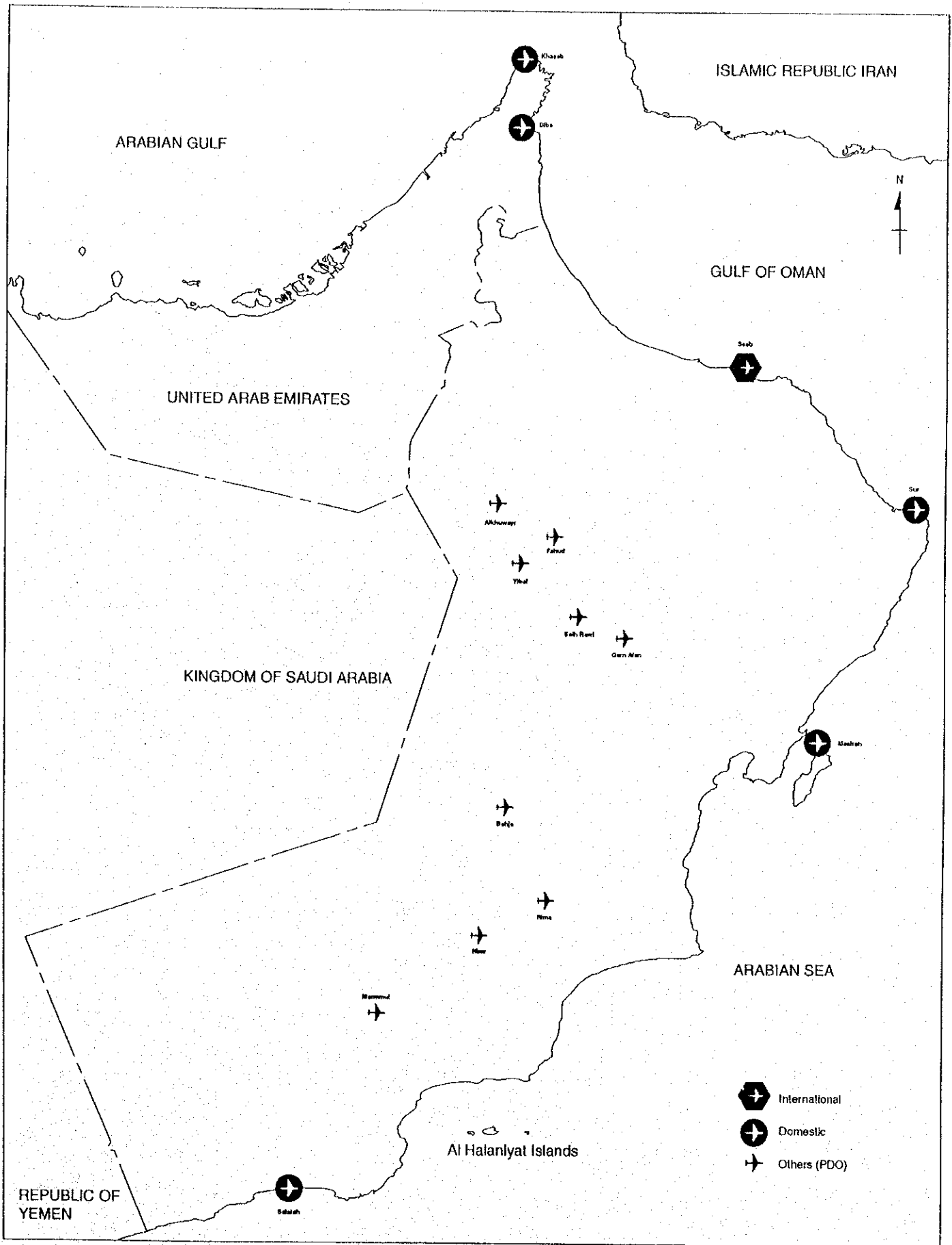


Fig.5.4.5 Location Map of Air Port

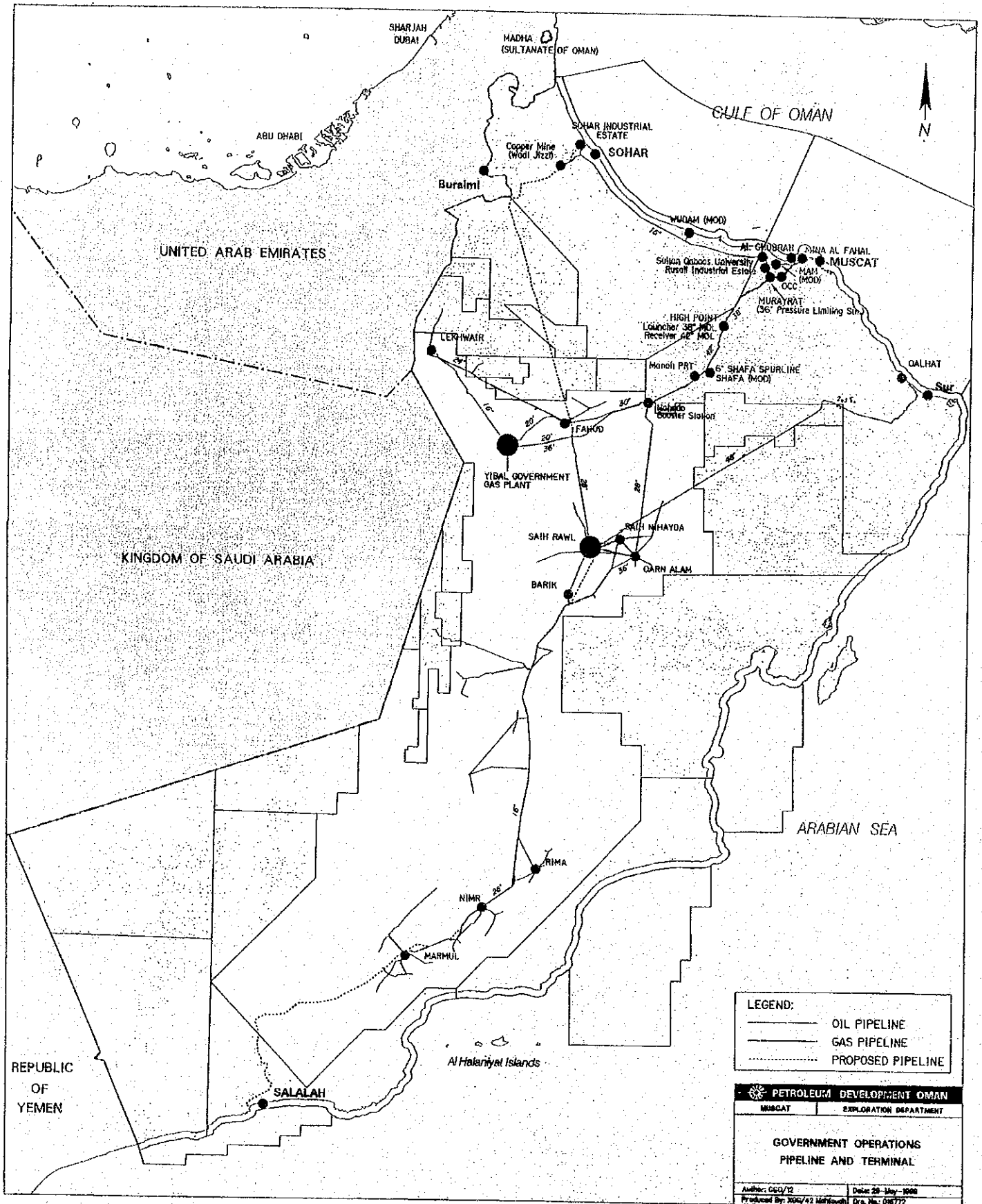


Fig. 5.4.6 Oil and Gas Pipeline Network in Oman

5.5 Industrial Infrastructure in the Hinterland

5.5.1 Present Capacity

5.5.1.1 Electric Power

Electric power is generated by means of gas turbines and diesel engine generators using natural gas and/or oil in Oman. In the case of Dhofar region, it is generated using gas oil, since gas pipeline is not connected to the region. There is one power plant in Salalah, whereas three plants (two plus Raysut "C") are in Raysut and some small plants in other districts of the region (See Table 5.5.1). The Oman government operates all of these plants. The installed power generation capacity as of 1998 accounts for 57.2 MW (Megawatt) in Salalah, 93.1 MW in Raysut. In addition, a new plant Raysut "C" with a 30 MW capacity was installed and commenced power generation in September 1999.

A 33 kV grid (See Fig. 5.5.1) integrates the aforesaid power plants of Salalah and Raysut whose capacities totaling to 180 MW. Since it is not connected to any power system in other regions, there is no export nor import of power to be discussed.

The consumption level of the power, according to the Table 5.5.1, in Salalah in 1998 was 39% of the estimated maximum generation capacity, whereas 59.0% in Raysut, assuming that both plants can be operated continuously through 24 hours a day for 365 days a year¹. Although those figures for Raysut "C" has not been published yet, it has evidently resulted in a considerable reduction. The capacity to maximum load is discussed in the following paragraph. The large part of the consumption in Oman comes from residential use, while industrial sector consumed 4% only in the total (See Table 5.5.2). According to the monthly consumption pattern in terms of percentage to the estimated production capacity, is the highest in May with the rate being 59.9% (See Table 5.5.3).

Fig. 5.5.2 illustrates total power generation capacity in Salalah area expanded to cope with increasing demand for power (shown in maximum load curve) in the grid, keeping allowance to peak demand. The tabulation at the bottom shows that the allowance in the capacity to maximum load, as of End/1999, exists by about 47 MW or about 26% of the installed capacity. The grid to date is provided with a level of the said allowance higher than ever due to start-up of G. T. Raysut "C". The second highest allowance was recorded in 1995 and 1996, by about 25% (upon installation of G. T. Salalah in April 1995).

For coming demand for electric power, there is a construction plan of a new 200 MW power plant, which is to be financed and operated by a private entity. The plant commissioning is

¹ No loss nor operation stop is taken into account

scheduled for April 2002. It will have a 30 MW reserve in design capacity, making an increase by 230 MW to the region. Part of it may replace existing power plants in Salalah and Raysut by about 150 MW, resulting in about 80 MW net increase, according to Director of Privatization, Ministry of Electricity and Water.

Related to the said project, a plan of natural gas transportation system for supplying to gas turbine generator with an approx. 500 km pipeline is under evaluation. Desalinated water system, probably required for the new plant, is not settled yet but may be evaluated in near future.

5.5.1.2 Water

In Oman, water is supplied with desalinated water, and freshwater that comprises well water from aquifer and surface water.

This report discusses water demand and supply balance in Dhofar within the region only, since no water transportation line to or from other regions exists.

In Dhofar region no water desalination plant exists, and there is no finalized plan to build it at the stage of writing, according to Ministry of Water Supply and Transportation. The estimated supply capacity of freshwater is almost balanced with the current consumption in Salalah, except for a deficit of recharge to the aquifer being observed since years. Sources of water inlet to aquifer are penetration of surface water and seawater depending on relative water levels. Demand and supply tabulated in Table 5.5.4 shows that water about 15 to 20 % higher than required has been supplied in the last years.

The Governorate of Dhofar is operating a 1,500m³/d waste water treatment plant supplying irrigation water. In addition, a new 20,000m³/d sewage treatment plant with drinking water specification to be recharged to the aquifer is under construction. Only its pipeline work stays behind (the treatment plant is ready for commissioning) and the system is scheduled to complete in July 2000. Both these treatment plants handle in majority household water and do not collect direct industrial waste water. Industries are requested to make primary treatment of waste water when they apply for collection of it.

About water consumption in Dhofar, it should be noted that consumption in industries to date is not significant. The water consumption has sometimes exceeded the supply capacity, when many tourists have visited Salalah. The consumption for agricultural use accounts for around 80% of the total, while the industrial sector consumed very minor portion.

The current fifth five-year development plan supports the efforts to limit overgrazing, and recommends to transfer the farms in Salalah plain to desert areas where water with high salinity

is available, which are suitable for growing grasses.

In the case of industrial sector planning, the industries to be promoted are necessary to be limited to those, which can rely on desalinated water.

5.5.1.3 Telecommunications

The Government statistics indicate a high growth of installed telephone number especially in recent years, particularly with the conspicuous increase in GSM (hand phone). The number has increased not only in terms of per capita, but also per million R.O. of GDP. (See Table 5.5.5.)

In Dhofar Region, about 17 thousand lines fixed telephones are connected to eight exchange stations with several hundred lines capacity each.

Raysut Telephone Exchange Station, covering Salalah and Raysut and expected to serve for the Hinterland upon implementation of the Study, has a capacity of 626 lines, and 360 of them are working to date. The capacity of the said station can be expanded to three times of the existing capacity as required, but there is no demand for the expansion at this moment.

The development work of digital lines using fiber cable, its completion being scheduled for the end of this year, is in progress covering all the areas in the region, according to the Ministry of Telecommunications.

5.5.1.4 Natural Gas

The major use of natural gas in Oman is supply to power station, and that to oilfield for fuel (See Table 5.5.6.). However, gas is not available in Salalah since gas pipelines are not connected yet.

Construction project of the gas pipeline to Salalah is under planning as noted in paragraph 5.5.1. Many existing factories are waiting for gas supply to convert the current use of oil. Many industrial projects are also planned to use gas, which has caused a significant delay in project implementation.

5.5.1.5 Land for Industrial Use

In Salalah most of medium and large-scale industries are located in areas (1) Raysut Industrial Estates, peripheral areas adjacent to the port Salalah, and (2) near to city area. In recent years, most of factories select the industrial estates for their establishment site, since the estates can provide a well-developed infrastructure and public services. The factories, which had

established before the industrial estate was planned, are located in an industrial area outside of the industrial estates

The Raysut Industrial Estates has 103.7 ha. of planned area, consisting of 3 Phases:

- Phase I: Existing (the construction completed in Apr. 1993) 17.39 ha
Utilized: 6.21 ha
Available: 11.18 ha
- Phase II: Projected: 23.09 ha
- Phase III: Under planning. Expansion will take place accordingly with needs.
Projected: 27.07 ha

It involves, in addition to administrative center, utilities and auxiliaries, an area of 158 lots for individual industries adding up to 68.16 ha. At the time of the Study, 21.17 ha have been assigned to entrepreneurs, out of which 10.39 ha are in operation.

In addition, the estates provide 300,000m² of the land for warehouses, and the area reserved for factories of hazardous items, which include tanneries and organic fertilizer manufacturing.

The area (2) noted above is composed of workshop- nature small-scale industries, i.e. wooden furniture manufacturing, carpentry, car repair, car distributor, non-metal building materials manufacturing, and so forth.

5.5.1.6 Road Construction

Besides the road construction, which will be recommended as the outcome of the Study, there are major road construction plans such as Salalah bypass, Paved road connecting route 31 and Salalah Port and so forth.

5.5.1.7 Airport

The Salalah Structure Plan formulated by MOTH recommends that the existing airport should be developed as the international airport considering for the future operation. The new airport area is shown in The Structure Plan, which is located at the western part of planning area. The relocation plan, however, is not included in the development plan up to 2015 of MOTH.

**Table 5.5.1 Installed Capacity, Production and Consumption of Electric Power
in Dhofar Region**

Year	1995	1996	1997	1998
Installed Capacity ^{*1)} (MW)				
Salalah	59.4	59.4	57.2	57.2
Raysut ^{*3)}	93.2	93.2	93.1	93.1
Others	11.4	11.5	14.2	15.6
Total	164.0	164.1	164.6	166.0
Estimated Full Generation Capacity ^{*2)} (GWh) (a)				
Salalah	520.2	520.3	501.5	501.5
Raysut	816.3	816.4	815.5	815.5
Others	99.8	100.7	124.6	136.9
Total	1,436.2	1,437.5	1,441.5	1,453.8
Production (GWh) (b)				
Salalah	184.3	157.7	153.3	199.1
Raysut	376.4	398.4	468.2	481.3
Others	22.8	23.2	28.0	35.9
Total	583.5	579.3	649.5	716.3
Consumption (GWh)				
Salalah	177.2	149.8	145.3	191.0
Raysut	349.2	370.9	437.3	448.7
Others	21.0	21.1	25.6	33.3
Total	547.4	541.8	608.2	673.0
Estimated Capacity Utilization Rate (%) (a/b)				
Salalah	35.4	30.3	30.6	39.7
Raysut	46.1	48.8	57.4	59.0
Others	22.9	23.0	22.5	26.2
Total	40.6	40.3	45.1	49.3

Source: Statistical Year Book 1999 / The Study Team

Notes:

*1) Installed capacity of government power stations

*2) Assuming 24 hours operation a day for 365 days a year

*3) Raysut "C" is not counted in the statistic yet

Table 5.5.2 Consumption of Electric Power by Sector *1)

Sector	1992	1993	1994	1995	1996	1997	1998	Ratio, 1998
Residential	2,497.8	2,871.2	3,080.7	3,125.2	3,042.5	3,246.1	3,671.6	58.9
Commercial	231.8	257.4	300.9	452.1	750.4	834.7	924.7	14.8
Industrial	100.7	124.0	128.8	140.4	153.2	181.8	222.9	3.6
Government	1,088.3	1,203.0	1,256.7	1,299.1	1,264.0	1,264.3	1,299.2	20.8
Others *2)	28.5	64.4	52.3	69.8	92.3	96.1	117.4	1.9
Total	3,947.1	4,520.0	4,819.4	5,086.6	5,302.4	5,623.0	6,235.8	100.0

Notes: 1) Representing the net actual consumption of electric power which is different than the figures mentioned in the remainder of this chapter.

2) Others Include: Agriculture, Fisheries, Hotels & Tourism Sectors.

Source: Statistical Year Book 1999

Table 5.5.3 Monthly Change in the Pattern of Electric Power Consumption, Dhofar

(Million kWh)

	1995	1996	1997	1998	% to installed capacity *) as of 1998
January	30.8	35.3	31.9	38.3	32.0
February	32.4	34.6	33.8	41.9	35.1
March	40.7	49.1	46.6	53.8	45.0
April	52.4	53.4	52.4	63.4	53.0
May	60.1	63.7	66.1	71.6	59.9
June	58.4	58.3	64.1	69.6	58.2
July	45.7	44.4	56.4	59.6	49.9
August	45.5	37.3	48.1	61.0	51.0
September	50.6	44.0	55.4	53.1	44.4
October	51.0	46.7	56.3	60.0	50.2
November	41.9	40.5	55.6	52.9	44.3
December	37.9	34.5	41.5	47.7	39.9
Total	547.4	541.8	608.2	672.9	

Note: *) Installed capacity in full operation= 166.0 MW (Table 5.5.1) x 24 h/d x 30 d/m =119.52 GWh/month.

Source: Statistical Year Book 1999

Table 5.5.4 Production and Consumption of Water in Dhofar Region

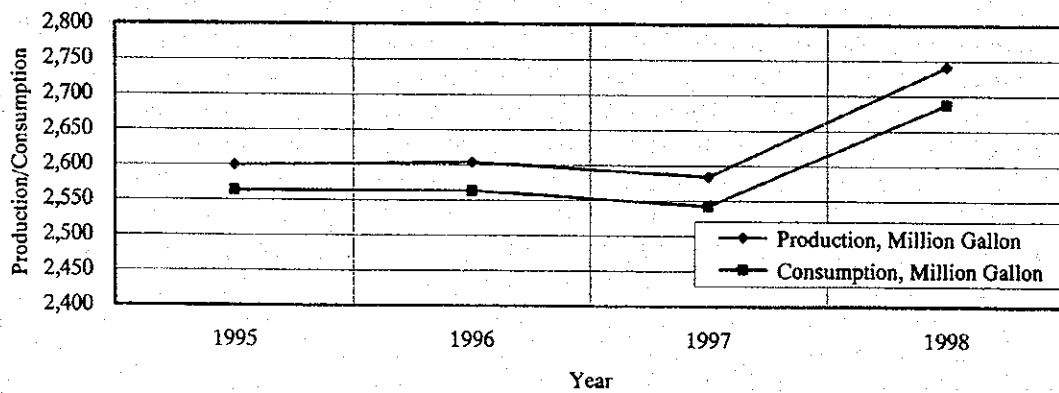
(Million Gallon)				
	1995	1996	1997	1998
Production, Million Gallon	2,599.4	2,603.9	2,583.8	2,740.9
Consumption, Million Gallon	2,563.3	2,563.3	2,542.1	2,687.3

Source: Statistical Year Book 1999

1 gallon = 4.546 litres

(Million l/y)				
	1995	1996	1997	1998
Production	11,816.9	11,837.3	11,746.0	12,460.1
Consumption	11,652.8	11,652.8	11,556.4	12,216.5

(Million l/d)				
	1995	1996	1997	1998
Production	32.37	32.43	32.18	34.14
Consumption	31.93	31.93	31.66	33.47



Source: Statistical Year Book 1999

Table 5.5.5 Number of Telephone lines Installed

	1993	1994	1995	1996	1997	1998
Fixed Telephone						
Muscat	71,080	76,539	82,114	93,318	96,257	102,605
AL Batinah	31,444	32,818	34,711	38,415	39,540	41,867
Musandam	989	983	2,420	2,831	2,772	2,854
ADH Dhahirah	8,445	8,905	9,445	9,964	12,013	13,010
AD Dakhliyah	12,366	13,490	14,473	15,728	18,891	21,531
ASH Sharqiyah	11,394	12,044	12,604	15,356	15352	14,936
Al'Wusta					97	146
Dhofar	12,066	12,483	13,836	14,943	15,835	17,409
Total	147,784	157,262	169,603	190,555	200,757	214,358
Mobile Telephone (GSM)					53,318	98,363
Cellular Phones	5,545	6,751	8,052	21,176	6,462	4,669
Total	5,545	6,751	8,052	21,176	59,780	103,032
Grand Total	153,329	164,013	177,655	211,731	260,537	317,390
Installed number/GDP (Million R.O.)	34.9	35.9	37.1	39.4	52.9	60.7

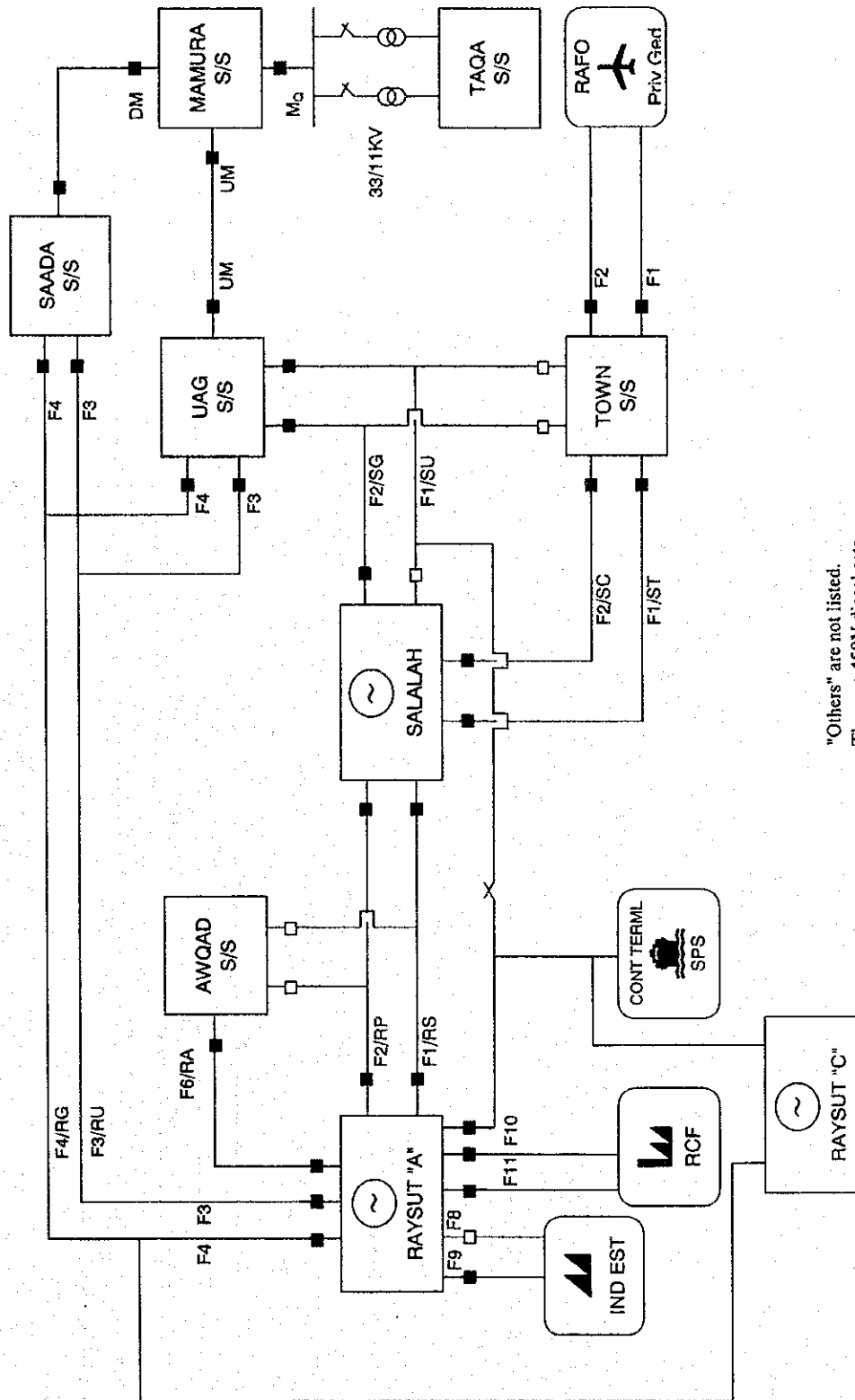
Source: Statistical Year Book 1999

Table 5.5.6 Production and Usage of Natural Gas

	(Unit)	1995	1996	1997	1998
Production					
- Associated Gas	Million SCF	160,695	164,281	247,491	237,653
- Non-Associated Gas	Million SCF	81,571	92,588	116,046	132,508
Total	Million SCF	242,266	256,869	363,537	370,161
Uses					
Government Gas System	Million SCF	83,190	87,015	99,744	111,520
-Power Stations	Million SCF	75,677	76,268	79,622	88,049
-Others and Waste	Million SCF	7,513	10,747	20,122	23,471
Oil Fields:	Million SCF	102,268	119,231	183,245	164,896
-Fuel	Million SCF	42,226	50,025	58,798	50,618
-Re-injection	Million SCF	60,042	69,206	124,447	114,278
Purchases of Gas Co. (LPG)	Ton	53,703	60,646	55,375	68,261
-From Fields	Ton	17,462	25,948	26,525	31,580
-From Refinery	Ton	36,241	34,698	28,850	36,681
Total					
Gas	Million SCF	185,458	206,246	282,989	276,416
LPG	Ton	53,703	60,646	55,375	68,261
Flared	Million SCF	12,704	13,328	34,146	28,506

Source: Statistical Year Book 1999

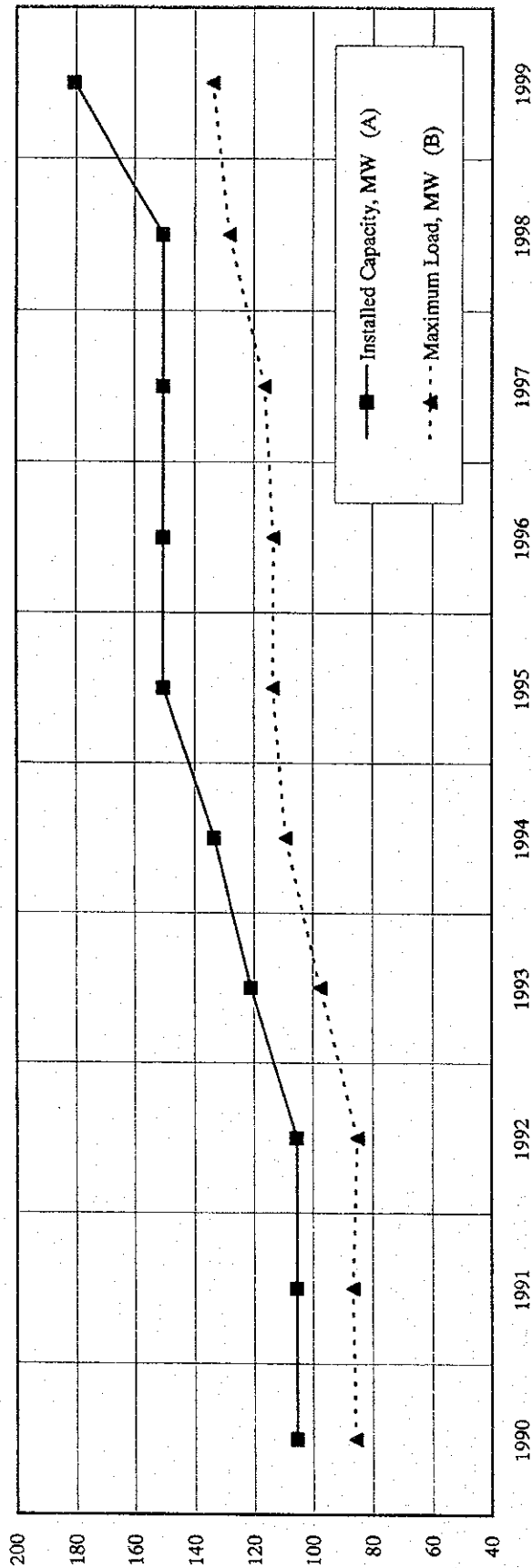
Fig. 5.5.1 33KV GRID SYSTEM



"Others" are not listed.
They are 450V diesel sets.

Source: D.G. of Electricity, Dir. of Dhofar/IICA Study Team

Fig. 5.5.2 Salalah Electric Power Plant Capacity and Load Growth



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Installed Capacity, MW (A)	105.422	105.422	105.422	121.022	133.384	150.584	150.584	150.584	150.584	180.584
Maximum Load, MW (B)	85.70	86.50	85.00	97.40	109.10	113.40	113.20	116.20	128.10	133.90
Capacity Allowance, MW (A-B=C)	19.7	18.9	20.4	23.6	24.3	37.2	37.4	34.4	22.5	46.7
Capacity Allowance, % (100 x C/A)	18.7	17.9	19.4	19.5	18.2	24.7	24.8	22.8	14.9	25.9

Source: DG of Electricity, Governorate of Dhofar - tabulated for the latest ten years by The Study Team