SULTANATE OF OMAN

THE PREFEASIBILITY STUDY FOR INDUSTRIAL DEVELOPMENT

NOVEMBER, 1978

JAPAN INTERNATIONAL COOPERATION AGENCY

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THE PREFEASIBILITY STUDY FOR INDUSTRIAL DEVELOPMENT

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PREFACE

The Government of Japan, at the request of the Government of the Sultanate of Oman, agreed to undertake a study in which prefeasibility of industrialization of Oman be examined, and entrusted its execution to the Japan International Cooperation Agency.

The Agency mobilized experts in the related fields and organized a survey team headed by Mr. Tan Hashida, and dispatched the team to Oman for a period of 25 days from 25th February to 21st March, 1978. The team made an extensive survey in Oman to collect data and information largely assisted by the Omani counterpart team.

The prefeasibility study is the result of the efforts of analytical and design work based on the data and information, which was conducted in Japan by the team over the past 5 months.

This report presents a conceptual framework for the industrialization of Oman and results of prefeasibility evaluation of fourteen strategic industrial projects.

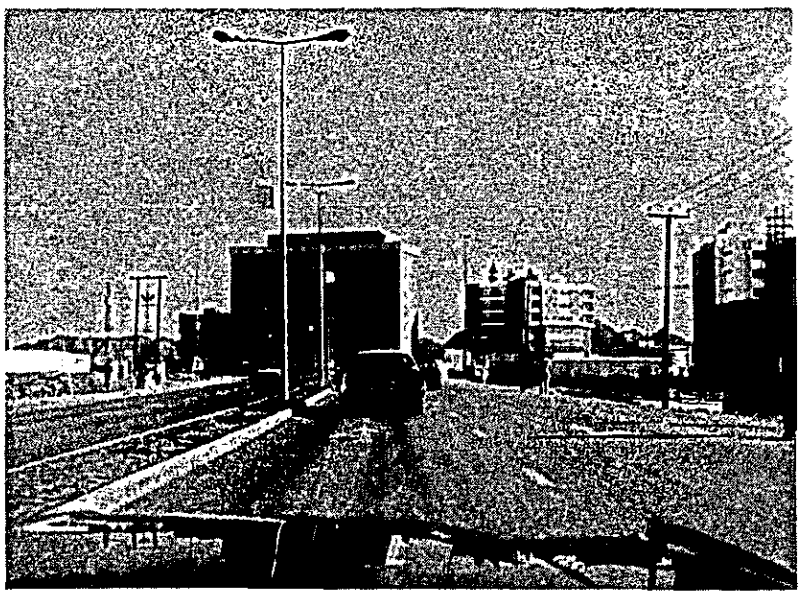
It is our sincerest wish that this report will be beneficial as well as informative to the industrial development of Oman, and that the technical cooperation as represented by this study will further solidify the close relationship already in existence between the two countries.

We would like to express our sincere gratitude to the Omani officials for extending hospitality to the survey team and providing cooperation to expedite its study. Out particular appreciation is directed to the Omani counterpart team members.

November, 1978

Shinsaku Hogen
President
Japan International Cooperation Agency

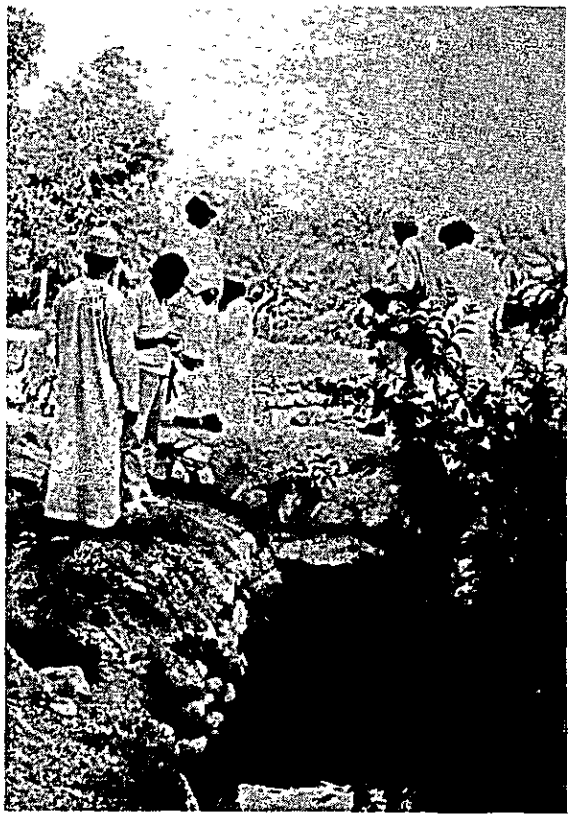
Typical Mountains in Northern Oman



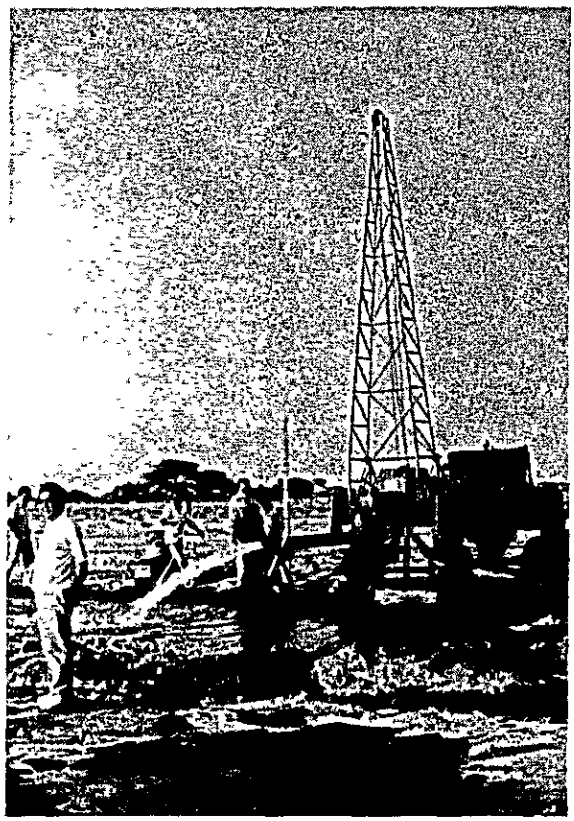
Modern Townscape of the metropolitan Area

Typical Scenery of Inland
Oasis - - Watch Tower and
Date Palm Trees

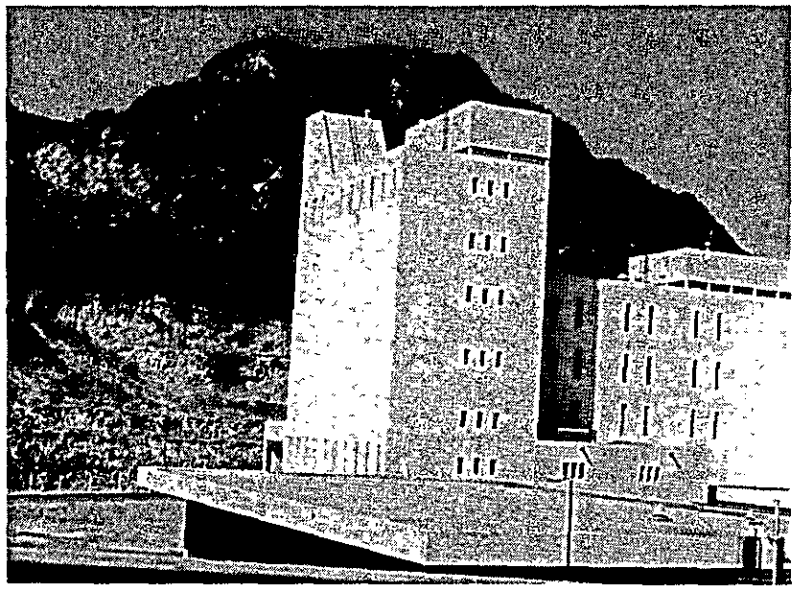
A Big Tree in Dhofar Mountains



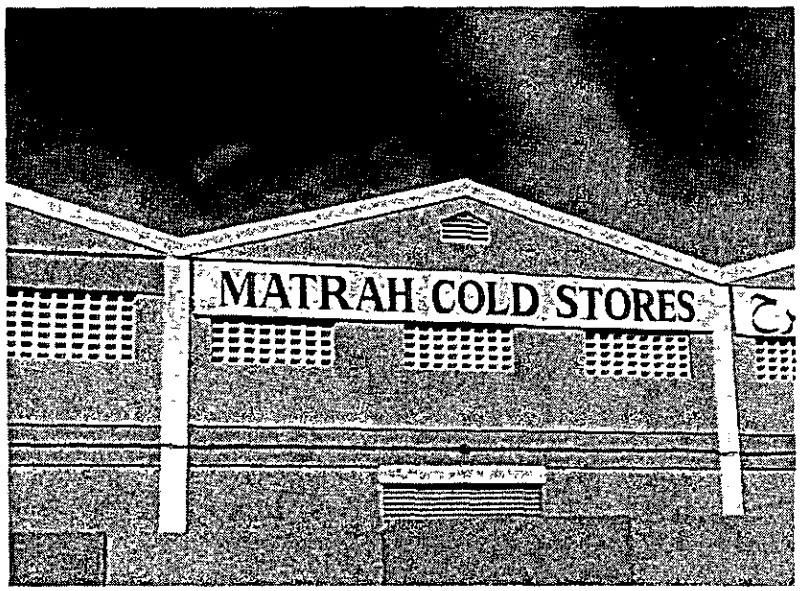
Traditional Irrigation System - - Falaj in Nizwa



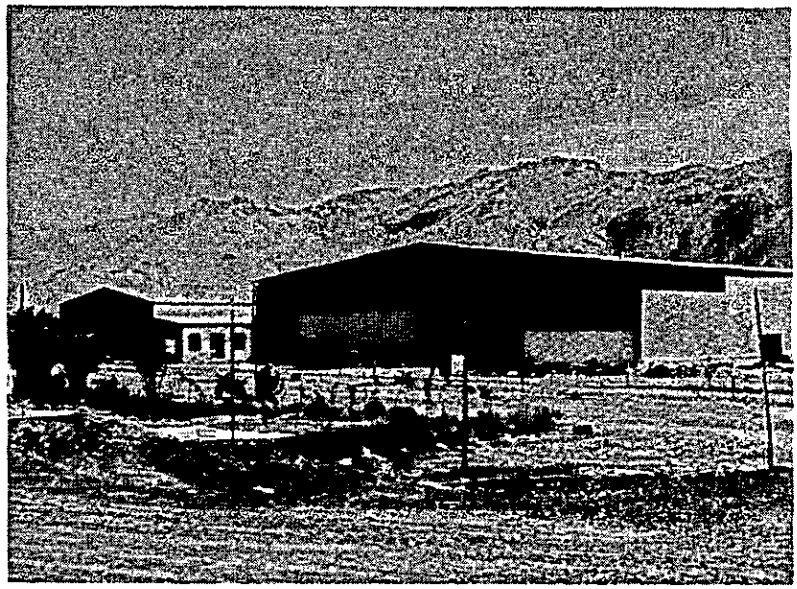
Effort for Water Resource Development - - World Bank Project Near Sohar



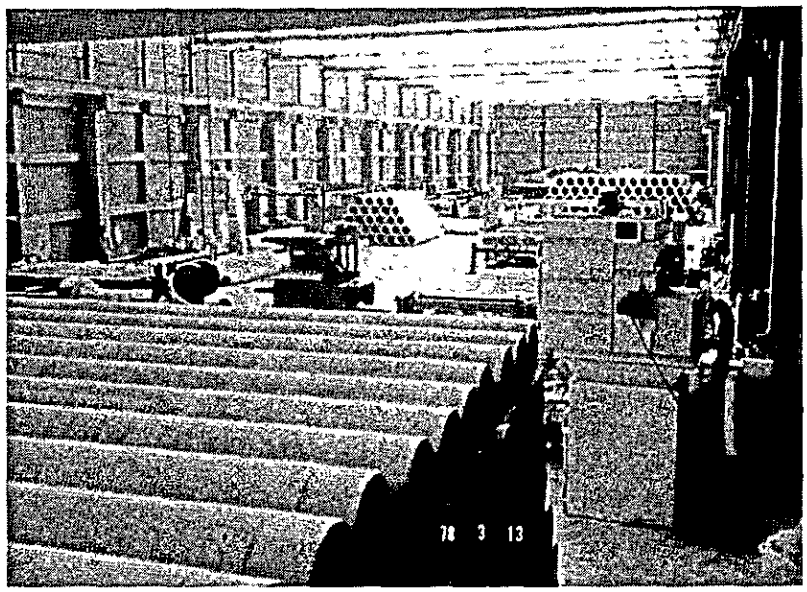
Flour Mill in Matrah - - A Successful Export Industry



***Matrah Cold Stores* - - A Support for Fisheries**

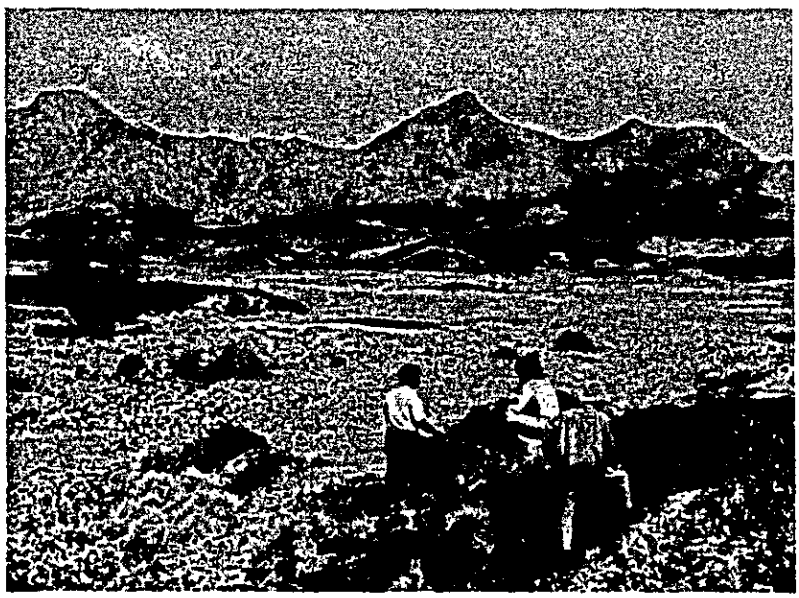


Date Processing Factory in Nizwa - - A
Foreign Currency Earner

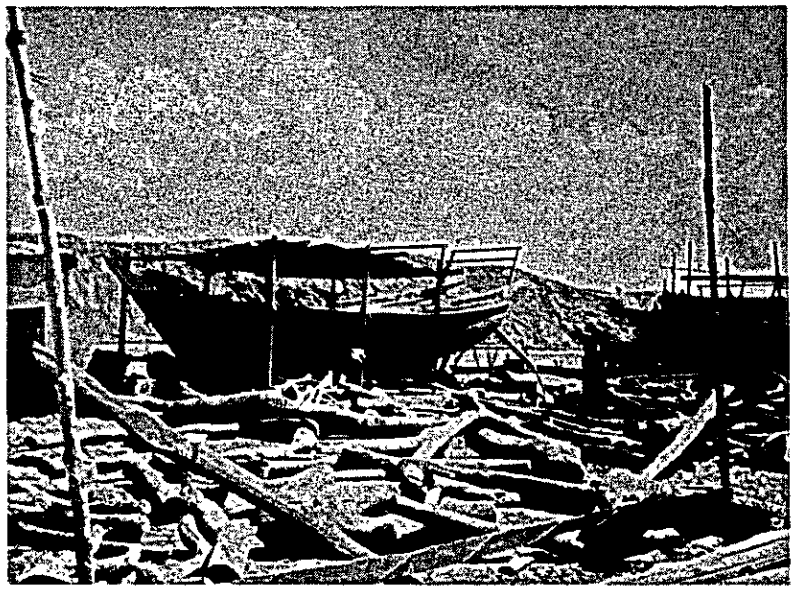


Asbestos-Cement Pipe Factory - -
Largest and Most Modern in Oman

Geological Survey - - Near
Bid Bid

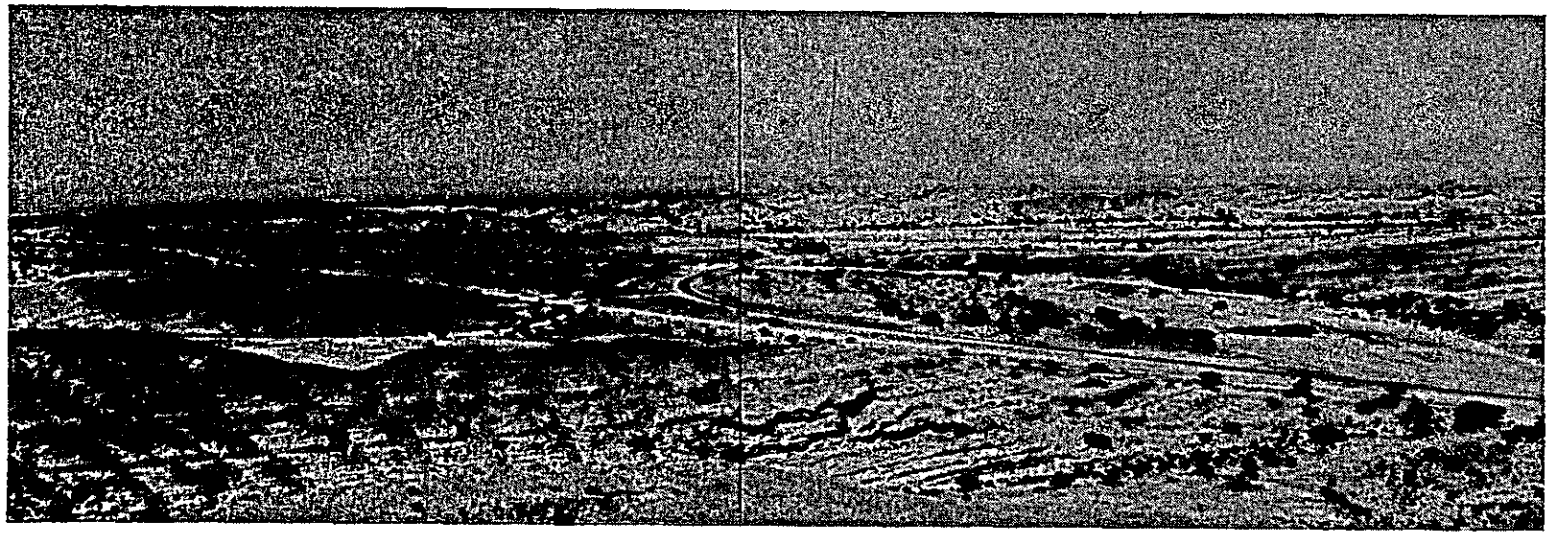


Visit to the Proposed Copper
Mine Site - - Near Sohar

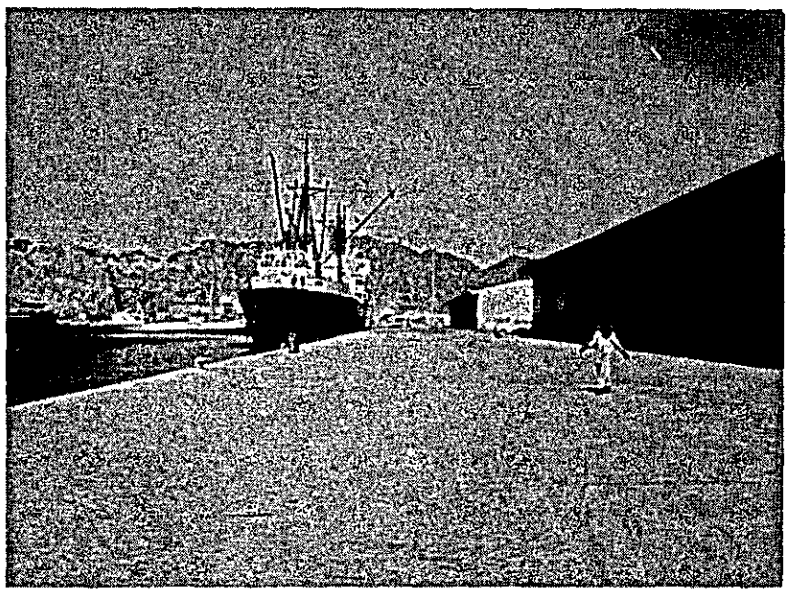


Traditional Shipbuilding in Sur

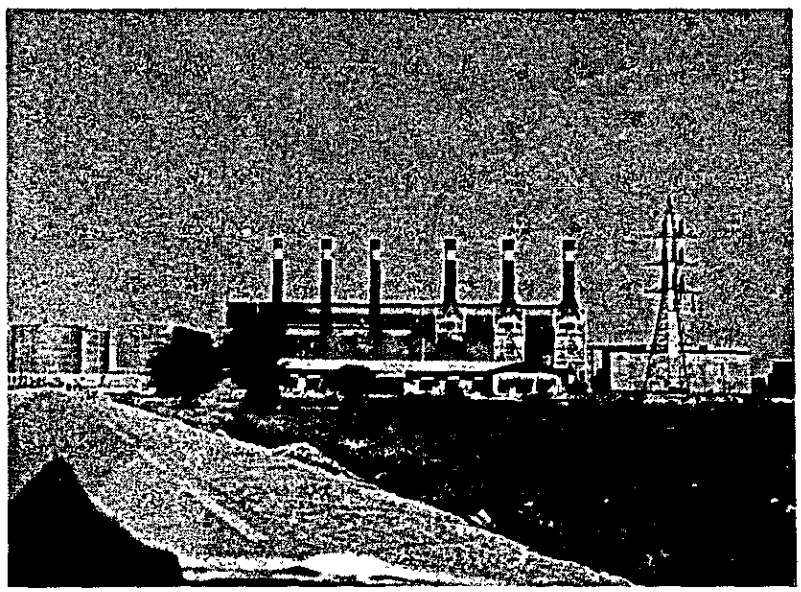
A Wokshop for Repair-
ing Outboard Engines for
Small Fishing Boats - - Salalah



Proposed Site of Industrial Area - - Near Rusayl

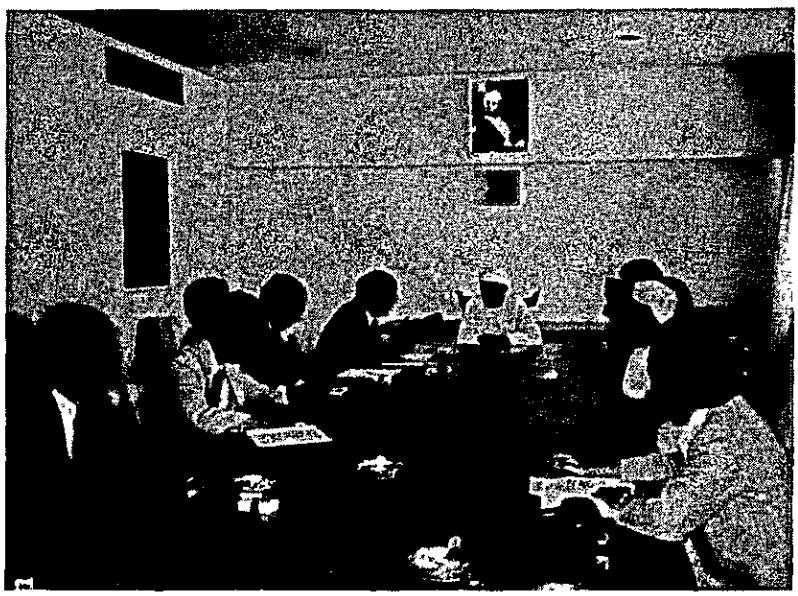


Mutrah Port



Al Ghubra Power Station and
Water Desalination Plant

School Children in Sur - -
Future Manpower



Presentation of the Interim
Report at Ministry of
Commerce and Industry

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INTRODUCTION

1. Background of Study

The Government of Sultanate of Oman submitted an official request to the Government of Japan in November, 1977, asking for its cooperation in industrial development planning of Oman. In response, the Japan International Cooperation Agency (hereafter abbreviated as JICA) organized a team to undertake a prefeasibility study of the development and dispatched it to a field survey in Oman from 25th February to 21st March, 1978. The JICA team consisted of nine members headed by Mr. Tan Hashida and made extensive survey of Oman assisted by a counterpart team of the Omani Government.

Based on the information and data collected both in Oman and in Japan, the Agency executed a development prefeasibility study of industrialization of Oman, and prepared a draft of this report. The draft was submitted to the Omani Government for its review and commentary in order to finalize this report.

2. Field Survey

The survey team consists of nine experts as shown below:

Tan HASHIDA	Head of the Survey Team Senior Industrial Economist (Administration and Industrialization Programme)
Hidetomi ASOH	Deputy Head of the Team Senior Economist (Investment Analysis)
Shusaku IKEDA	Senior Geologist (Evaluation of Metallic Mineral Resources)
Koji TANAKA	Senior Chemical Engineer (Industrial Project Analysis)

Yoshihisa HIROSE	Senior Geologist (Evaluation of Non-Metallic Mineral Resources)
Tetsuo WAKUI	Development Economist (Analysis of National Economy, Development Plan and Infrastructure)
Toshio KUROKAWA	Chemical Engineer (Industrial Project Analysis)
Masaki KOBAYASHI	Regional Planner (Analysis of Regional and Urban Plans, and Industrial Location)
Eiichi SEKI	Official of Industrial Division, Mining and Industrial Planning and Survey Department, JICA

The basic objectives of the field survey were set forth as follows:

1) Natural resources and raw materials availability
2) Market identification
3) Manpower (technology) availability
4) Identification of the existing level of industrial development

The team worked out an interim report based on the above-mentioned activities and submitted the report to the Government of Oman at the end of its field survey.

A list of visits made by the team during the stay in Oman is shown in the following:

SURVEY ITINERARY

Date	Time	Place of Visit, Persons Interviewed
Feb. 25 (Sat)	9:30	Ministry of Foreign Affairs Mr. M.H. Ali (Director of Technical Cooperation) Mr. D. Al-Handon
	10:30	Ministry of Commerce & Industry Mr. B. Al-Lamki (Director General, Dept. of Industry)
	13:30	Documentation Center of Development Council
Feb. 26 (Sun)	10:00	Development Council Mr. S. Lotfy (Vice-president) Mr. A.A. Rahman (Director General, Planning & Follow-up)
Feb. 27 (Mon)	10:00	Ministry of Public Works Mr. A. Jaafer (Director General, Technical Affairs) Mr. H.M. Osman (Chief Architect) Mr. T. Khairy (Chief Quantity Surveyor)
	11:15	Ministry of Commerce & Industry Mr. Malik (Director of Petroleum Products) Mr. Saddique (Adviser)
	13:00	Ministry of Finance Mr. Moosa (Undersecretary)
Feb. 28 (Tue)	10:00	National Statistical Department Mr. Downie (Economic Statistician) Mr. Sarin (Economic Statistician)
Mar. 1 (Wed)	9:00	Port Service Corp. Ltd. Mr. A.S. Al-Shanfari (Director General)
	9:00	W.J. Towell Co. Mr. K. Sultan (General Director)
	10:45	Ministry of Communication Mr. H.M. Awad (Director General, Water)

Date	Time	Place of Visit, Persons Interviewed
Mar. 1 (Wed)	11:30	Ministry of Commerce & Industry Mr. B. Lamki Dr. Faisal Mr. Saxina
	12:00	Ministry of Communication Mr. A.A. Bakathir (Director General, Electricity)
Mar. 2 (Thur)	8:00	Ministry of Agriculture, Fisheries, Petroleum & Minerals Mr. K. Al-Hinai (Director of Techinical Affairs) Mr. A. Abu-Risheh (Geophysicist) Dr. I.M. El-Boushi (Geologist)
	9:00	Department of Fisheries Mr. Shanfari (Director General) Mr. M.A. Al-Barwani (Director of Fisheries Research)
	9:00	Department of Agriculture Dr. R.L. de Jong (Secretary, Water Resource Council)
Mar. 4 (Sat)	Day Trip to Nizwa	
	9:45	Lv. Muscat
	11:30	Ar. Nizwa
		Ministry of Agriculture Extension Center
	12:00	Dates Processing Factory
	13:00	Extension Center
	15:00	Director's House
	17:00	Lv. Nizwa
	19:30	Ar. Muscat
Mar. 5 (Sun)	Day Trip to Sur	
	6:20	Lv. Muscat

Date	Time	Place of Visit, Persons Interviewed
Mar. 5 (Sun)	11:30	Ar. Sur
		Ministry of Agriculture, Fisheries, Petroleum & Minerals (Sur Office)
	13:00	Ice Plant
	14:00	Small Fishing Boat Workshops Port of Sur
	16:00	Tarmac Crushing Plant
	20:15	Ar. Muscat
Mar. 6 (Mon)	Day Trip to Sohar	
	9:00	Lv. Muscat
	11:30	Ar. Sohar
	12:00	Agriculture Extension Center Dr. K.A. Khamfar
	13:00	Sohar Dairy Farm
	13:00	Prospection Ltd. Mr. A.J. Russell (General Manager) Mr. N. Firth (Engineer)
	17:00	World Bank Water Drilling Project Site
	20:30	Ar. Muscat
Mar. 7 (Tue)	8:30	Ministry of Commerce & Industry Dr. Faisal Mr. Saxina
	9:00	Mr. A. El-Shaily (Director General, Commerce)
	9:00	Petroleum Development Oman Mr. Lavers (Technical Director)
	9:00	National Bank of Oman Mr. H. Rizvi
	13:00	British Bank of the Middle East Mr. John (Deputy Manager)
	10:00	P.D.O. Yibri Plant

Date	Time	Place of Visit, Persons Interviewed
Mar. 8 (Wed)	7:00	Prospection Ltd. Mr. A.J. Russell
	8:30	Ministry of Commerce & Industry Mr. Malik
	10:00	Sogex International Ltd. Mr. K. Mourad (Manager)
	10:00	Ministry of Fisheries Mr. M.A. Al-Barwan
	10:45	Central Bank of Oman Mr. H.S. Hassim (Vice-President)
	11:00	Sun Oil Mr. L.L. Hodge (Acting Resident Manager)
	11:30	Al Ghubra Desalination Plant Mr. T.T. Thaath (Manager)
	11:30	Development Council Mr. A. Rahman
	12:00	Ministry of Commerce & Industry Mr. M.B. Suleman (Director)
	12:30	British Petroleum Limited Mr. E.G. Thomas (Manager)
Mar. 9 (Thur)	9:30	Development Council Mr. A. Rahman
	10:00	ELF Aquintaine Oman Mr. M. Nazac (Managing Director)
	10:30	Cement Marketing Co. Mr. Sethumadhavan
	11:00	Ministry of Commerce & Industry Mr. M. Baqer (Director of Industry)
	11:30	Mr. M.A. Siddiqui (Industrial Expert)
	11:30	BP Arabian Agencies Ltd. Mr. Sandison (Area Manager)

Date	Time	Place of Visit, Persons Interviewed
Mar. 9 (Thur)	12:00	National Beverages Co. Mr. K.A. Al-Shahani (Plant Manager)
	12:30	Oman Telecommunications Co. Mr. S.K. Al-Sail (Manager)
	16:30	Transport Services Oman Mr. A.A.R. Macki (Managing Director)
Mar. 10 (Fri)	Trip to Salalah	
	11:35	Lv. Seeb Airport
	13:00	Ar. Salalah
		Ministry of Commerce & Industry (Salalah) Mr. A. Al-Ghasani (Director) Mr. T.A. Ibrahim (Deputy Director) Mr. M.A. Al-Rawas Mr. M. Omer
	16:00	Jabal (Water Resource)
	17:00	Taqa (Fishing Village)
Mar. 11 (Sat)	Salalah	
	10:00	Ministry of Agriculture, Fisheries, Petroleum & Minerals Mr. A. Al-Dheab (Deputy Director, Agriculture)
	10:30	Farmer Center Mr. M. Yunis (Garden Superintendent)
	11:00	Royal Farm
	12:00	Ministry of Commerce & Industry (Salalah) Mr. A. Al-Ghasani
	13:00	Port of Raysut Mr. A. Riyami (General Manager)
	13:30	Petroleum Depot (Shell)
	17:00	Jabal
Mar. 12 (Sun)	9:30	Ministry of Agriculture, Fisheries, Petroleum & Minerals (Salalah Office)

Date	Time	Place of Visit, Persons Interviewed
Mar. 12 (Sun)		Mr. Shanfari (Director, Fisheries)
	11:30	Salalah Qaboos Hospital
	13:50	Lv. Salalah
	14:10	Ar. Muscat
Mar. 13 (Mon)	Muscat	
	9:30	Ministry of Communication Mr. W. Bargawi (Technical Adviser)
	10:00	Ministry of Commerce & Industry Mr. M. Baqer
	10:00	Taylor Woodrow Towell Mr. Tobin (Area Manager)
	10:00	Ministry of Land Affairs & Municipality Mr. K. Ismail (Director of Town Planning)
	12:00	Mutrah Cold Store, (MOAFPM) Mr. R. Al-Barwani (Director)
	12:30	Amiantit Oman Mr. W. Haensli (General Manager) Mr. A. Maarkesh (Sales Manager)
	14:30	Rusayl Industrial Area
	15:00	Oman Flour Mills Ltd. Mr. A. Murei (General Manager)
Mar. 14 (Tue)	10:00	Ministry of Education Mr. Ayedook (Director of Administration & Finance)
	10:00	Ministry of Communication Mr. S.H. Al-Ghasani (Director, Road Dept.)
	10:30	Shell Market (Middle East) Ltd. Mr. H.H. Evers (Manager)
	15:30	Zubair Furnishing Co. Factory Mr. D. Gough (Engineer)

Date	Time	Place of Visit, Persons Interviewed
Mar. 14 (Tue)	17:00	Getco Mr. K. Daud (Chairman)
Mar. 15 (Wed)	9:00	Ministry of Social Affairs & Labour Mr. H. Suleman (Director General) Mr. H. Nasser (Assistant)
	9:00	Chamber of Commerce Mr. A.M. Bin Ameir Mr. S. El-Barrad Mr. A.M. Kamal
	9:30	Quintana International Ltd. Mr. E.F. Montgomery (Petroleum Engineer)
	12:00	Ministry of Communication Mr. S.H. Al-Ghasani (Director)
	17:00	Yahaya Enterprises Mr. M.H. Sommer (Project Manager)
Mar. 16 (Thur)	10:00	Al-Ghubra Desalination Plant Mr. T.T. Thaath (Plant Manager)
	16:00	Mazoon United Co. Mr. M.H. Salman (Proprietor) Mr. S.M. Khetani (Tech. Director & Administrator)
Mar. 18 (Sat)	12:00	Presentation of Interim Report Mr. A. Dawood (Undersecretary, MOCI)
Mar. 19 (Sun)	9:00	Ministry of Commerce & Industry Mr. M. Baqer (Director of Industry)
	9:00	Ministry of Agriculture, Fisheries, Petroleum & Minerals Mr. M.H. Kassim (Director of Minerals) Mr. O. Elamin (Geologist)
	11:00	Zubair Industries Ltd. Mr. Smith (General Manager)
Mar. 20 (Mon)	8:00	Ministry of Commerce & Industry Mr. M. Baqer

Date	Time	Place of Visit, Persons Interviewed
Mar. 20 (Mon)	10:00	Development Council Mr. B. Downie (Economic Statistician) Dr. M.M. El-Shazly
	10:00	Ministry of Agriculture, Fisheries, Petroleum & Minerals Mr. M. Kassim Mr. O. Elamin
	16:00	Oman Aluminium & Venetian Blinds Mr. N.M. Shammas Mr. K.K. Jobbour
Mar. 21 (Tue)	9:00	Development Council Mr. B. Downie
	11:00	Central Bank Mr. H. Sangore (Vice-President)
	12:00	Bank of Oman, Kwait & Bahrein (O.S.C.) Mr. A.R. Jadel (Manager)
	13:00	Ministry of Commerce & Industry Mr. B. Lamky
	14:00	Development Council Mr. Lotfy

SUMMARY AND CONCLUSION

1. Assessment of Natural Resources

1) Agricultural Products

It is estimated that future cultivable land is approximately 30,000 ha. in addition to the existing cultivated area of 36,000 ha. Current use of water for irrigation is estimated at 420 million cubic meters per year and further efficient use of existing water supply and exploitation of new water sources will insure development of the new 30,000 ha.

Introduction of farm mechanization and modern irrigation systems is recommended for newly developed farms, since saving of manpower and water is essential for agriculture in Oman. Proper selection of crops for each region of Oman is also recommended, since it will become necessary to grow cash-yielding crops including fruits in order to foster agro-related industries.

In view of favourable conditions for feeding cattle in the Dhofar mountains, it is possible to develop agro-industries based on cattle, namely frozen meat and skin.

2) Fisheries Products

Oman is known to be blessed with abundant fish resources. According to the results of a few surveys so far conducted, the yearly yield of demersal fish is estimated at approximately 800,000 tons and that of pelagic fish is about 2,300,000 tons. The present catch is only 210,000 tons per year which is small compared with the above-mentioned potential yield.

Offshore fishing has just started and coastal fishing is currently undergoing modernization. It is emphasized that development of fisheries is to be directed toward better utilization of catch and selective or novelty fishing for increased income of fishermen. Among fish-related industries, frozen fish, canned fish and fish meal processing may become feasible provided that constant catch of a certain

type of fish is secured.

Exportation of fish products including frozen fish will be possible when proper marketing and distribution channelling are performed.

3) Hydrocarbon Resources

Estimated oil reserve in Oman ranges between 3,000 to 6,000 million barrels. Oil findings in the south will not appreciably influence magnitude of the reserve. Hence oil production is predicted to decrease gradually from the present level of about 340,000 barrels per day.

Gas reserve in Oman is relatively abundant. In current estimation non-associated gas reserve amounts to be not less than 4 trillion (4×10^{12}) cubic feet. Although this will not ensure large-scale development including an LNG project, the reserve seems to be enough to fuel many industrial projects in the vicinity of the gas pipeline. However one exception is use of gas as petrochemical feedstock. Due to its low ethane content ethylene production does not seem to be very attractive.

4) Mineral Resources

Copper is by far the most important metallic mineral in Oman. Copper mineralization is widely distributed in the mountains of northern Oman as represented by numerous ancient mines. In addition to the current on-going copper development project, it will be possible to develop other copper mines after detailed geological survey is completed. Chromium is expected to be an important mineral next copper, while economically exploitable occurrence of chrome ore is still to be proved. Other metallic minerals including iron, nickel, manganese, lead and zinc are reported to occur in various parts of Oman. Economic importance of these minerals which ensures development is also to be proved by active exploration.

Carbonate rocks including limestone, marble and dolomite is the most abundant mineral resource in Oman. Exploitation of these rocks has just started as typified by the cement project. Development of industries based on these resources is strongly recommended, since many products can be exported as well as consumed domestically. Occurrence of other non-metallic minerals including quartzite, asbestos and coal have been reported and some deposite were already explored, but reserves of economic importance are yet to be located.

In general, Oman is bestowed with variety of minerals and some of their deposits are commercially exploitable. Processed products of these minerals will make important export items substituting crude oil in future.

2. Assessment of Industrialization Process and Policies

The industrialization has vitually just started as represented by industrial sector of GDP, 2.5 million R.O. or 0.33% of total GDP in 1975. According to the Five Year Plan the industrial sector is expected to grow to 25 million R.O. or 3% of the total GDP projection in 1980.

The current industrial development is directed to import substitution and large number of projects are financed by private sector. Typical private industrial projects include foods, consumer goods and building materials. Important and large-scale projects are primarily financed by the Government, example of which include flour mill, cement and copper development. It is desirable that the existing pattern of industrialization will persist in the future, since industrial capital formation in Oman will stay slow.

Development of import-substitution type industries is preferably carried out by private sector, while resource development is to be carried out primarily by the Government. In some cases joint financing by private and public is possible.

Clear industrialization policy is yet to be formulated. Financial basis of the policy will be solidified at the start of the Development Bank operation. Since foreign capital is expected to play a major role in the industrialization process, the policy is to be directed to invite foreign investment.

The Government is advised to assist industrialization by investing in infrastructure development such as industrial estate, power and water supply and so on, which are essential to improve project feasibility and thus to promote private and foreign investment.

As a part of long-term objectives of industrial development of Oman, training Omani manpower is also to be undertaken by the Government.

3. Assessment of Market for Industrial Products

Oman's estimated population of 850,000 does not constitute a stable market for various industrial goods. Major import items of Oman include food, textiles, durable consumer goods (electrical appliances and motorcars) petroleum products, rolled steels and machinery. Among these, manufacture of some food products and consumer goods has already started and domestic production of many other important items such as petroleum products and rolled steel are in process of planning.

The import substitution will certainly have a limit due to small domestic market size, even if the high per capita GDP estimated at $3,800 U.S. is taken into consideration. Protection of domestic industry by means of tariff system is adopted by the Gulf countries.

Exportation of some industrial products to the Gulf countries is possible, if the products have competitiveness over imported products from other parts of the world. Products made in Oman could be made competitive with those of other make by utilizing inexpensive natural resources which occur in Oman. Also effective is to secure markets for export as typically represented by the cement project and to take advantage of the economy of scale in order to improve feasibility of projects.

Such international commodities as copper and chromium could be marketed worldwide provided that prices are competitive. It is, therefore, important to locate large reserves of rich ores in Oman to make the processed minerals competitive enough.

4. Master Plan for Industrialization

The main objectives of industrialization of Oman are summarized as a) import substitution, b) natural resources exploitation and c) development of export-oriented industries.

Projection of general and sectoral economic growth is shown on Table 1. Economic growth up until 1980 is expected to be slow and after early 1980's Oman will be able to achieve a steady growth of economy. Industrial development is predicted to contribute to Omani economy considerably only after 1985.

Table 1 Production of GDP by Industrial Origin

(Unit: MM Rials Omani, 1976)

	1976	1980	1985	1990
Agriculture and Fisheries	21	30	42	57
Petroleum and Mining	530	456	581	580
-- (Copper)	-	-	(6)	(6)
Manufacturing	4	18	38	58
Building and Construction	83	55	65	87
Transportation and Communication	26	22	30	34
Electricity and Water	5	12	15	18
Commerce	50	48	59	73
Banking	11	14	16	20
Ownership of Housing	14	26	34	39
Public Administration and Defence	71	99	110	121
Service and Other Sectors	11	20	30	40
T O T A L	827	800	1,020	1,127

(Source) Development Council, JICA MISSION

Total investment in industrial sector which will be required to achieve the above-mentioned industrial development target is estimated as follows:

1976 to 1980	166 million R.O. (1976 price)
1981 to 1985	120 million R.O. (1976 price)
1986 to 1990	143 million R.O. (1976 price)

Employment in the industrial sector is estimated as shown on Table 2. Unlike the petroleum and gas industry which is capital-intensive rather than labour-intensive, the industrial or manufacturing sector is expected to require considerably large number of manpower. By 1985 employment in industry will number approximately 17,000 which is about four times of that in 1977.

Table 2 Sectoral Value Added Per Capita and Employment

(Unit: Men Rial Omani, 1976)

Sector		1976*	1980	1985	1990
Petroleum and Mining	Value Added	70,242	64,800	69,780	69,780
	Employment	7,436	7,040	8,330	8,310
Manufacturing	Value Added	1,037	1,890	2,200	2,800
	Employment	3,857	9,520	17,270	20,710

(Note) * National Statistical Department

(Source) JICA MISSION

Gross industrial output and its contents are shown on Table 3. Import substitution will reach a limit by the end of 1980's and, in the meanwhile, processing of Omani natural resources to supply intermediate goods both to foreign and domestic markets will be in progress.

Table 3 Target Gross Industrial Output

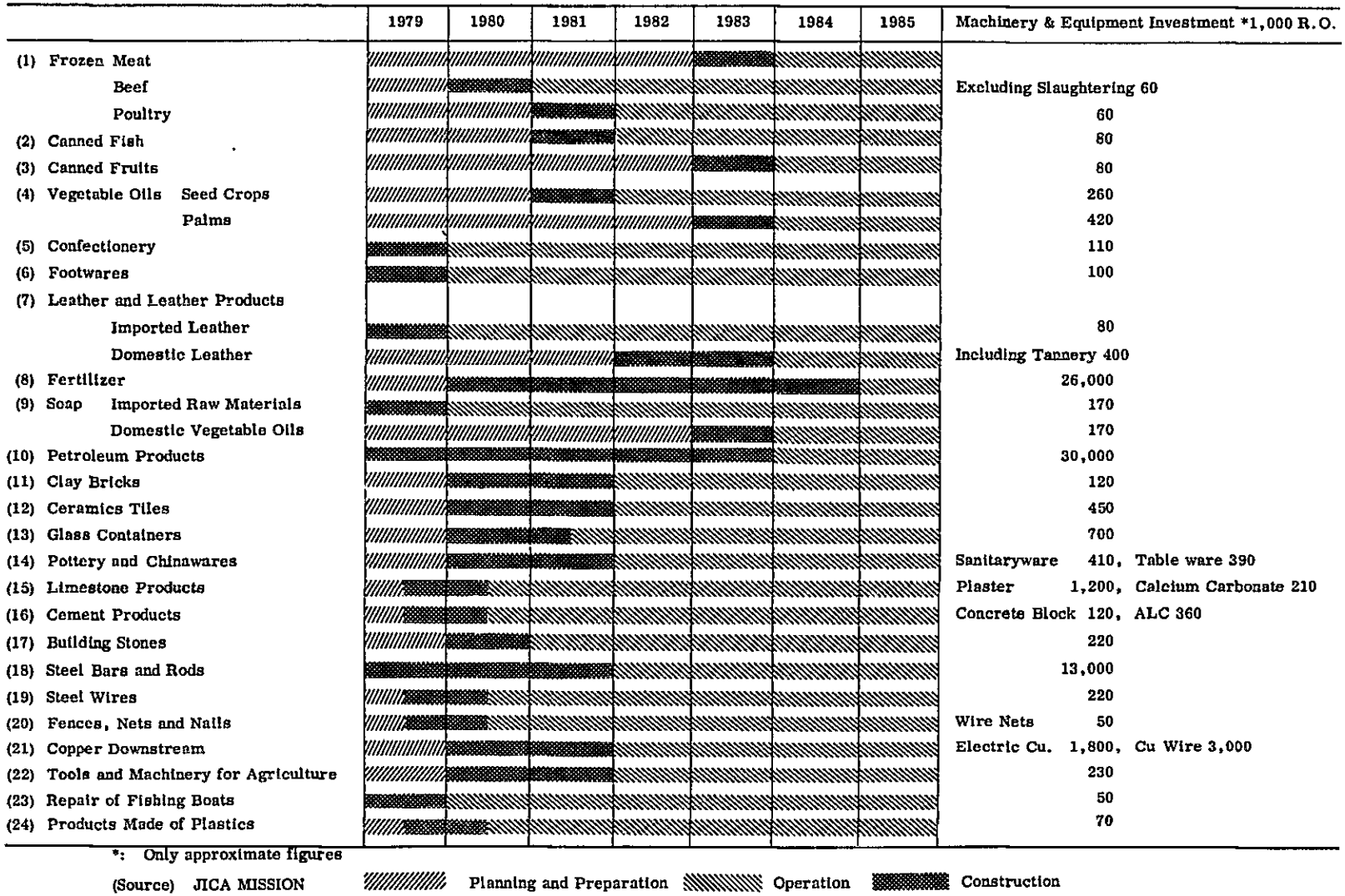
(Unit: MM Rials Omani, 1976)

	1976	1980	1985	1990
Consumer Goods	(7)	20	39	51
Intermediate Goods		9	38	72
Durable Consumer and Capital Goods		1	7	12
Total	7	30	84	135

(Source) JICA MISSION

Industrial development objectives are only accomplished through implementation of development projects. Taking into consideration of industrial projects applied to the Ministry of Commerce and Industry so far, development schedule for strategic industrial projects as shown on Figure 1 is to be implemented. It is very important that the development be materialized on schedule even if allowing yearly modification, in view of declining oil production in Oman and rapid industrialization in the Gulf countries.

Figure 1 "Desirable" Development Schedule for Strategic Industrial Projects in Oman



*: Only approximate figures

(Source) JICA MISSION

Planning and Preparation Operation Construction

Selection of industrial project sites is an important factor. This should be judged from the viewpoint of industrial decentralization and regional development. Possible locations for strategic industrial projects are presented on Table 4. If industrial decentralization from the Metropolitan area is to be accelerated, it is desirable to designate industrial areas and also to develop industrial estates which are provided with such infrastructure as power and water. Development of the Rusayl Industrial Area is, therefore, very important for materializing industrial projects.

5. Industrial Development Strategies

Apart from initiative taken by the Government by means of investing in major projects, it is necessary to invite private and foreign investment in industrial projects. Strategies and measures to attain the objective are summarized in Table 5.

Table 4 Possible Location of the Strategic Industrial Projects

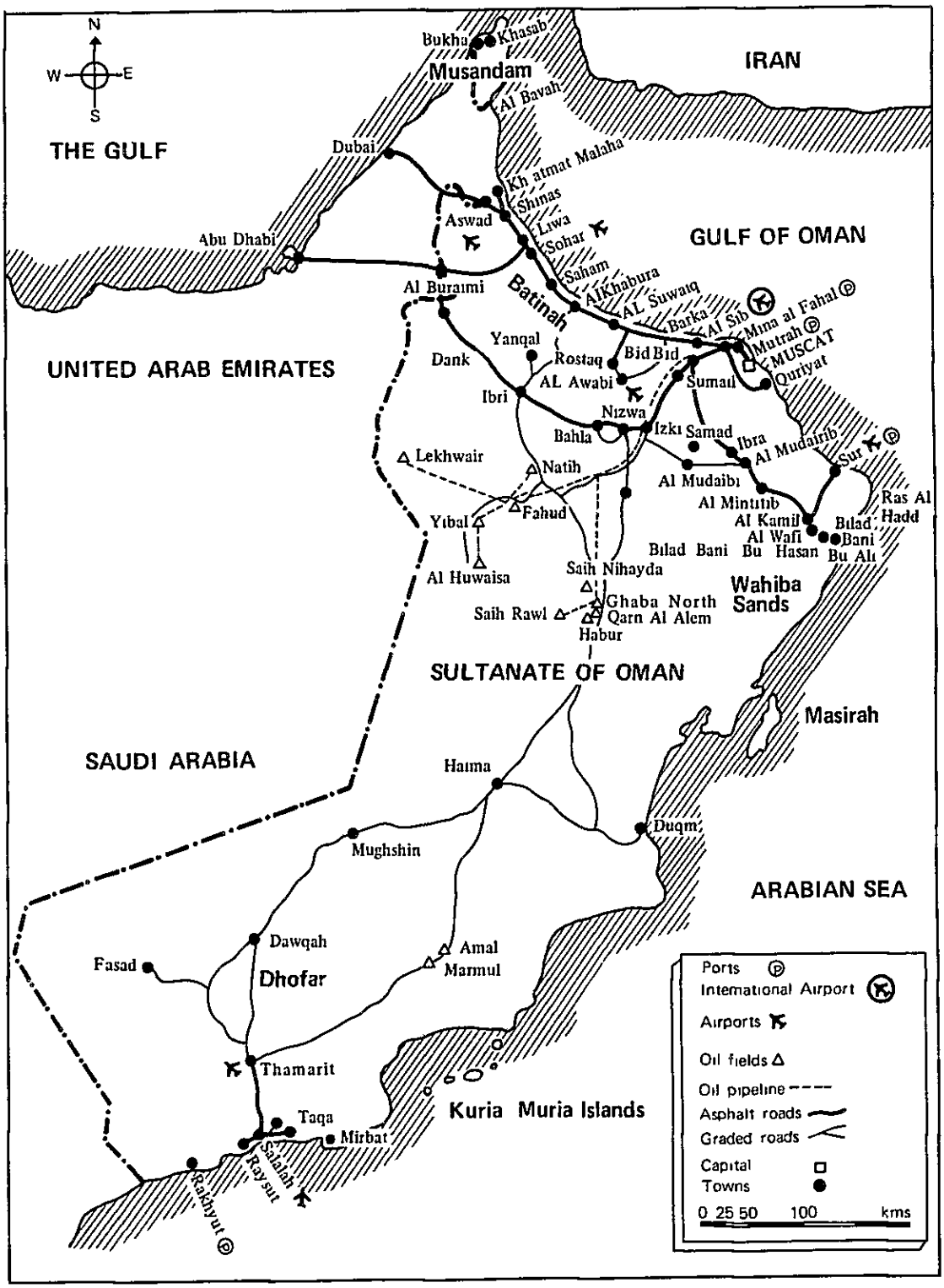
	1. Muscat Metropolitan	2. Seeb-Rusayl	3. Sohar	4. Nizwa	5. Sur	6. Salalah
Frozen Meat		O	O			O
Canned Fish	O		O		O	O
Canned Fruits			O	O		O
Vegetable Oil		O	O	O		O
Confectionery	O	O				
Footware	O	O				O
Leather and its Products	O		O	O		O
Fertilizer	O	O	O			
Soap	O	O				
Petroleum Products	O					
Clay Bricks		O		O		O
Ceramics Tile		O		O		O
Glass Container	O	O				
Pottery & Chinaware		O		O		O
Limestone Product		O	O			
Cement Product		O				O
Building Stone		O	O	O		
Steel Bar and Rod		O				
Steel Wire		O				
Fences, Net and Nail	(O)	O	O			O
Copper Downstream		(O)	O			
Agricultural Tool and Machinery	O	O	(O)			(O)
Repair of Fishing Boat	(O)		(O)		O	O
Products Made of Plastics	O	O	(O)			

( ) : Possible in Future (Source) JICA MISSION

Table 5 Industrialization Strategies and Measures

Strategy	Measures
1. Financial Incentives	°Direct Government Investment in Big Projects °Expansion of the Development Bank Functions °Subsidy to Industrial Projects Feasibility Study
2. Development of Institution and Organizations for Industrialization	°Statistical Information °Development of Organizations for Promoting Industrialization - Industrial Estates, Decentralization of Industry and so forth
3. Infrastructure Development	°Designation of Industrial Area and construction of Industrial Estate °Securing Power and Water Supply °Improvement of Government Services
4. Market Expansion	°Improvement of Distribution Network °Trade Arrangements with Neighbouring Countries °Development of Export Functions °Preferential Use of Omani Products in Government Projects
5. Intensification of Industrial Linkage	°Designation of Strategic/Pioneer Industries °Fosteration of Repair/Maintenance Industries
6. Promotion of Manpower Development	°Technical Training School and Student OJT °Employee OJT
7. Raising of Technical Level	°Mineral Surveys and Processing Technology °Industrial Standards
8. Government Assistance	°Exemption from Custom Duty on Important Equipment and Raw Materials °Export Assistance

(Source) JICA MISSION



SOURCE: Middle East Economic Digest

6. Selective Prefeasibility Studies of Strategic Industrial Projects

The following industrial projects were selected for preliminary assessment:

* Secondary cement products
* Marble
* Lime and dolomite products
* ALC products
* Ceramic tiles
* Bricks
* Glass products
* Porcelain products
* Copper products
* Plastic products
* Petroleum products
* Products made from natural gas
* Products made from brine
* Small fishing boats

The assessment is primarily based on resource availability, market size and technology.

1) Secondary Cement Products

Precast concrete panels and slabs for prefabricated building are selected as promising secondary cement products to be manufactured in Oman.

Other promising products of less importance include ready-mixed concrete and high strength standardized concrete blocks.

2) Marble

Marble resources in Oman has a high potentiality for development. Although magnitude of reserves and their quality are yet to be investigated, exportation of Omani marble seems very encouraging since high-quality stones are being sought throughout the world.

Terrazo manufacturing is also a promising project due to abundance of resources and raw materials, and to simple manufacturing technology.

3) Limestone and Dolomite Products

The two resources occur abundantly in various parts of Oman. Manufacture of quick and/or slaked lime, calcium carbonate powder and dolomite plaster is recommended, provided that effort should be made for marketing these products in Oman and the Gulf countries.

4) ALC (Autoclaved Lightweight Concrete) Products

The findings of Renardet I.C.E. study on ALC products has been found still applicable to the present condition. The study only overestimated medium-term future market size for these products. Specific effort is needed to promote the use of ALC products.

5) Ceramic Tiles

The Whitehead report on ceramic tiles described the project as promising. Quick evaluation of domestic and export markets for this products revealed relatively high feasibility of this project. However, there remains a problem of raw material (clay) availability which is yet to be proved.

6) Glass Products

Sheet glass manufacturing is not strongly recommended since it involves large capital outlay and its market is too small to warrant normal operation of a factory.

Manufacture of glass containers is possible if sizable portion of products can be exported. Small scale glassware production could be easily started when product types are identified. In the case of glass container, however, low cost quartz source must be further explored and secured.

7) Pottery

Due to limited domestic market and also to uncertainty of domestic raw materials supply, it is not recommended to start the project at this stage.

8) Copper Products

The final product of the on-going copper project in Oman, fire refined copper, is expected to have limited market. The planned process may be better changed

to ordinary combination of smelter and refinery to produce electrolytic copper, which has by far larger market.

Copper products include wire bar, wire rod, and electric wire and cable. Among these, wire bar and wire rod could find their market in the Gulf countries for their electric wire manufacturing provided that the current electrification throughout the country continues.

9) Plastic Products

Blow moulding of polyethylene to produce medium (20 L) to large (2 m^3) water tanks is conceived. Though demand for these containers is somewhat limited, climatical condition of Oman will allow the market to grow considerably in the near future.

10) Petroleum Products

Domestic production of petroleum products will curtail foreign currency outflow (currently 7% of the total import value) from Oman. Domestic demand which will support a refinery will develop by 1985. There will be a problem of price competition with importation of products from large refineries in the Gulf countries.

11) Products from Natural Gas

Ethylene production from natural gas was dismissed on the ground that ethane content in the gas is insufficient and domestic small market for its derivatives will not justify economies of the projects.

LNG project will not make sense because it would result in the exhaustion of natural gas resources.

Ammonia/Urea manufacturing could become possible only when export markets are secured under long-term arrangements.

12) Products from Brine

Though the desalination plant warrants adequate supply of raw material brine, most of products including magnesium, caustic soda, chlorine and bromine have difficulty in finding export market as well as domestic one.

Price competitiveness of these products are feared to be low. There may be little advantage in establishing this industry in Oman at present.

13) Small Fishing Boats

There is an active programme to modernize small coastal fishing boats in Oman. Building of FRP and/or aluminium boats may not be feasible, because total number of boats to be built is limited.

On the other hand, repairing and maintenance of boats and engines will become sizable industry.

Table 6 summarizes results of the prefeasibility study conducted on the above-mentioned strategic industrial projects.

7. Recommendations on the Future Studies

The industrial project investigated include varied types of problems to be solved in the course of project implementation. Table 7 shows these problems and measures to be taken.

Among the strategic industrial projects, a few promising projects, in which raw materials supply is secured and sizable markets are in existence, could be further studied to examine feasibility. These are shown on Table 8.

In order to materialize these industrial projects, it is recommended that effective steps are to be taken as shown on Figure 2. Emphasis should be placed on formation of concrete financial and managerial bases of organizations or companies which will be in charge of implementing the projects.

Table 6 Summary of Prefeasibility Study Findings

Group	Project	Product	Scale	Facility/ Technology	Employment	Raw Materials	Market/Demand Scale	Problem
Building Materials	Secondary Cement Products	Concrete Panels and Slabs	Small, $5 Mill. U.S.	Medium/Small Simple Tech.	50 - 90	Currently imported; 1 mil. ton/yr. cement plant will start operating in about 1983.	Small, Prelim. plan: 10 to 20 5-story, 30-unit apartment houses to be built per year.	Competition with products of existing Co. (Amiantit)
		ALC Products	50 thous. M^3/Yr	Medium/Small; Med. Level Tech.		Abundant (silica sand, cement, quick lime); need good quality water	30 - 40 thous. M^3/Yr (1985)	
	Marble	To be decided by discovered deposit grade	Small 10 thous. ton/Yr. $1 Mill. U.S.	Simple Fac., High Tech.	30 - 40	Domestic; at least several 100 thous. tons of reserve	Small, 2 thous. ton/Yr.; Competitive export market	Size of deposit is yet to be proved.
	Limestone	Lime	18 Thous. Ton/Yr $6 Mill. U.S.	Fair level of Tech.	50 - 60	Abundant	Small, 1976 import 123 Thous. RO	
		Calcium Carbonate Powder	3 Thous. Ton/Yr. $1 - 1.2 Mill. U.S.	- ditto -	15 - 20	Abundant	Almost none	Market in the Gulf area small
	Dolomite	Dolomite Plaster	10 - 20 Thous. Ton/Yr.; $5-6 Mill. U.S.	Small, Simple Tech.	50	Abundant	1976 import 3.2 Thous. R.O.; Depend on building demand	Need of market development
		Dolomite Fertilizer						
Ceramics, Glass, Brick and Refractory	Glass	Glass Containers	Medium/Small 10 Thous. Ton/Yr.	Relatively easy		Suspected if volume adequate	Middle size market in Gulf area	A private firm is starting
		Sheet Glass	Large	High & complicated facility and techn.		- ditto -	Small; 11,000 M^2/Yr.	No inter'l competitiveness
	Procelain	Ceramic Tiles	Small; several 100 Thous. M^2/Yr. $3-4 Mill. U.S.	Relatively easy	50 - 100	Clay reserve unproven (limited by use)	$5 Mill./Yr. for all ceramics; for tiles, 500 Thous. M^2/Yr. or less	
	Bricks	Refractory bricks		Complicated; Large Scale			Almost none	No domestic demand until cement plant operation start

(Cont'd)

Group	Project	Product	Scale	Facility/ Technology	Employment	Raw Materials	Market/Demand Scale	Problem
		Ordinary Bricks		Simple: Small Scale		Clay reserve unproven	50 Thous. M^3/Yr or less	Competition with concrete blocks
		Other Procelain (Tableware, etc)		Varied		Unproven		
Metal/ Plastic Fabrication	Copper Smelting/Fabrication	Cathode Copper	20 Thous. Ton/ Yr ; $8 Mill U S.	Simple; Medium Size	30	Abundant	Domest. and Export; Domest., 2 Thous Ton/ Yr. Cables, 200 Ton/ Yr. rolled copper	Inter'l Compet.; Electric wires to compete with Gulf countries
		Wire Rod	20 Thous. Ton/ Yr, $10 Mill. U.S	Complicated; Medium Scale	20			
		Copper Cables (Vinyl Insulated)	1,200 Ton/Yr $3.5 Mill. U S	Complicated; Small Scale	20			
	Plastic	Containers	3,000 pcs/Day; $200 Thous. U.S.	Easy	5	Import	Demand estimated fairly high for water containers	Compt. with Imports
Petroleum/ Natural Gas	Petroleum-Based	Petroleum Products	50 Thous bbl/day; $80-120 Mill U S	Big Plant; High Tech		Abundant	30,000 bbl/day (domestic; 1985)	Internat'l Compet. still questionable
	Gas-Based	Ethylene and Derrivatives		Big Plant; High Tech.		Insufficient	Over-supplied in the Gulf area	Compet with Saudi Arabian products
		Ammonia/Urea	1,000 Ton/Day	- ditto -		Abundant	Small	Compt. with Gulf area projects
Seawater	Brine-Based	Recovery of Common salt, magnesium, bromides; Mfg. of caustic soda and chlorine	130 Thous Ton/ Yr. Caustic Soda; 17 Thous. Ton/Yr Magnesium Oxide	Big Plant; High Tech.		Abundant	Almost no domestic market	Low export compet.
Fisheries	Small fishing boat manufacturing	FRP Boats, Aluminium Boats	Small	Some Tech needed		Import	Small, 2,000 - 3,000 in all	Domestic market oppressed by imports
	Repairing	Repairing	Small (Several shops at fishing villages)	Simple, Easy	10/shop	Imported parts	Large; 1,000 boats/Yr.	Need techn. train. guidance

(Source) JICA MISSION

Table 7 Problems and Possible Solutions of the Industrial Projects

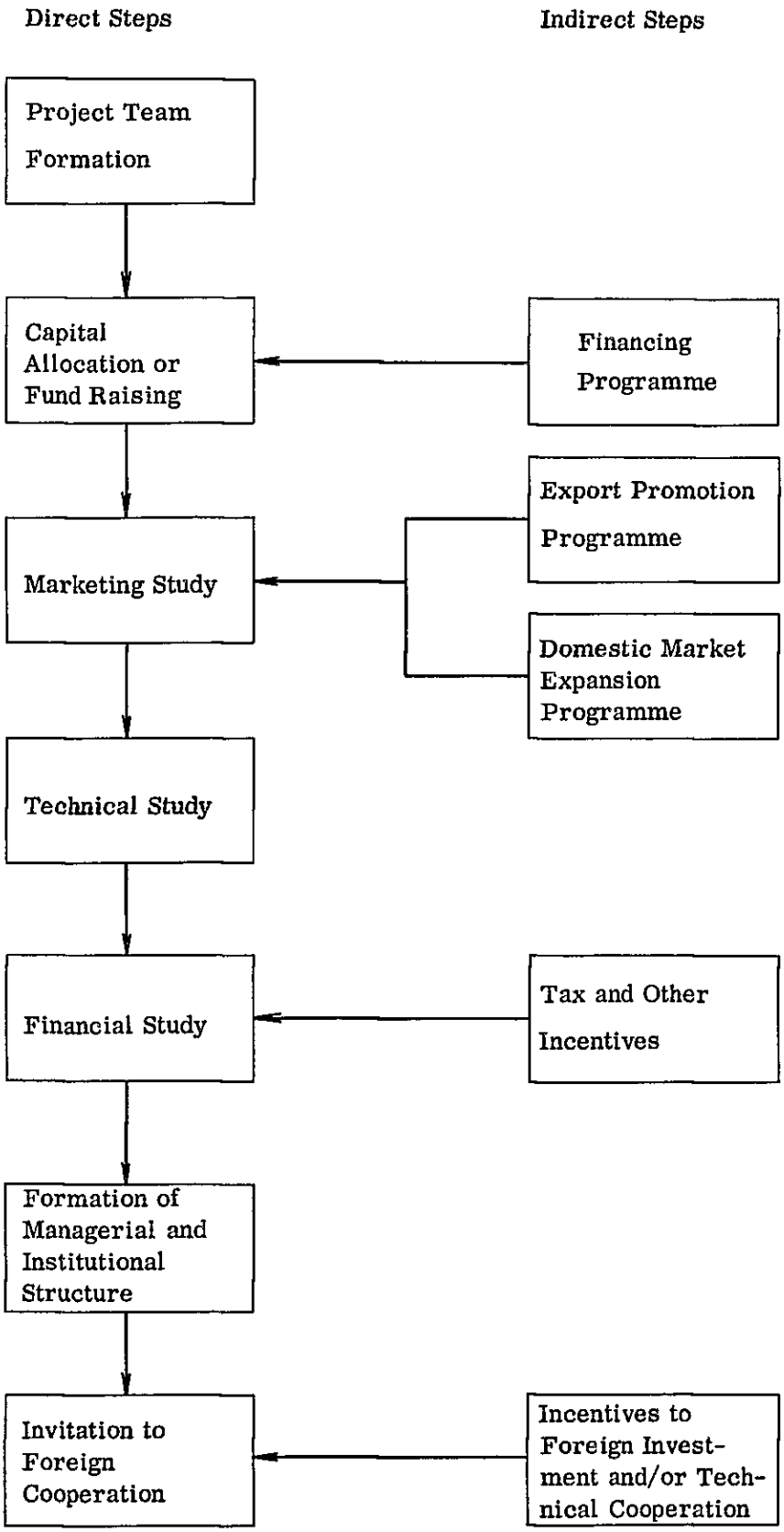
Projects	Problems	Possible Solutions
Lime	°Small market size	°Domestic and export marketing
Calcium Carbonate	°Availability of pure lime stone	°Careful geological survey
	°Small market size	°Exploitation of the use
		°Export marketing in the Gulf countries
Dolomite Plasters	°Small market size	°Demonstration of effective use of plasters
		°Export marketing in the Gulf countries
Electrolytic Copper and Copper Wire	°Small market size	°Export marketing in the Gulf countries, especially those which have established manufacturing of electric copper wires and cables
Insulated Copper Wires	°Small market size	°Electrification in Oman
		°Simplification of sizes of electric wires to be produced
		°Export marketing
Petroleum Products	°Small domestic markets for residual oils	°Export marketing including bunker oil market
Ceramic Tiles	°Availability of clay of good quality	°Geological survey designed for locating clay deposit
	°Small market size	°Export marketing in the Gulf countries
Clay Bricks	°Availability of clay in quantity	°Geological survey designed for locating clay deposit
(Porcelain Products)	°Availability of high-quality clay, feldspur, Kaolin, quartz and so on	°Extensive geological survey
Nitrogenous Fertilizers	°Small market size	°Export marketing, preferably on the Government to Government purchase agreement
Secondary Products of Cement	°Small domestic markets	°Promotion of use of precast and/or prefabricated concrete products in the Government-financed projects such as water supply and housing
Plastic Containers	°Small market size	°Export marketing in the Gulf countries

(Source) JICA MISSION

Table 8 Finally Selected Industrial Projects

Status	Project Package	Project	Production	Investment	Market
Prefeasible	· Products from Carbonate Rocks	· Marble	10,000 tons/year	1 million US$	Domestic 2,000 tons/year Export 8,000 tons/year
		· Lime	18,000 tons/year	6 million US$	Domestic small
		· Dolomite Plasters	15,000 tons/year	million US$	Domestic 5,000 tons/year Export 10,000 tons/year
		· Calcium Carbonate	3,000 tons/year	1.2 million US$	Domestic small
Prefeasible	· Secondary Products of Cement	· Precast Concrete Panels (Prefabricated Housing)	3,000 units/year	5 million US$	Domestic 2,000 units/year
		· ALC Products	50,000 m^3/year		Domestic 40,000 m^3/year
Prefeasible	· Copper Products	· Electrolytic Copper	20,000 tons/year	8 million US$	Domestic 2,000 tons/year Export 18,000 tons/year
		· Wire Rod	20,000 tons/year	10 million US$	Domestic 2,000 tons/year Export 18,000 tons/year
		· Insulated Copper Wire	1,200 tons/year	3.5 million US$	Domestic 1,000 tons/year
Prefeasible	· Petroleum Refinery	· Petroleum Products	50,000 bbl/day	100 million US$	Domestic 31,000 bbl/day(1985)
Conditional	· Ceramic and Related Products	· Red Bricks	30,000 m^3/year	1 million US$	Domestic 30,000 m^3/year
		· Ceramic Tiles	300,000 m^2/year	4 million US$	Domestic 500,000 m^2/year
		· Porcelain Products	3,000 tons/year	2 million US$	
Conditional	· Nitrogenous Fertilizers	· Ammonia/Urea	1,000 tons/day	85 million US$	
	· Others	· Plastic Water Tanks	3,000 pcs/year	0.2 million US$	
		· Repair of Small Fishing Boats	1,000 boats/year		Domestic 1,000 boats/year

Figures 2 Typical Project Promotion Steps



PART ONE

INDUSTRIALISATION OF OMAN

– ITS BASES AND STRATEGY –

I. THE SOCIETY AND THE ECONOMY OF OMAN: PRESENT AND FUTURE PROSPECT

1. Geography/Natural Environment

1) Territorial Land

The Sultanate of Oman is located on the southeastern tip of the Arabian peninsula. Oman occupies a territorial land of approximately 300,000 square kilometres extending for about 1,000 kilometres roughly from north to south with a breadth of from 300 to 500 kilometres, and has a coast line of nearly 2,000 kilometres (see Figure I-1).

More than 80% of the territory is covered by desert, about 15% is mountainous, and only the remaining 3 or 4% is low plains. The northern and the southern parts of the nation are particularly mountainous; in the north, the mountain range runs parallel to the shore line on the Gulf of Oman and the highest of which reaches 3,100 metres above sea level.

Dry highland rising about 300 metres above sea level continues in the central and the Interior parts and extends into desert which slowly declines toward Rub Al Khali of Saudi Arabia. In the southern part, ranges run from east to west and parallel to the coast line and form a highland area.

Census has never been taken of the Omani population, which is roughly estimated to be 850,000 in 1978 based on the World Bank estimate of 750,000 in 1974 and the estimated annual rate of population increase of about 3%.

2) Regional Features

The national territory of Oman can be topographically classified into three regions: northern, central, and southern. The centre of political and economic activities is found in the northern region. The least developed is the central region, which is predominantly a desert land.

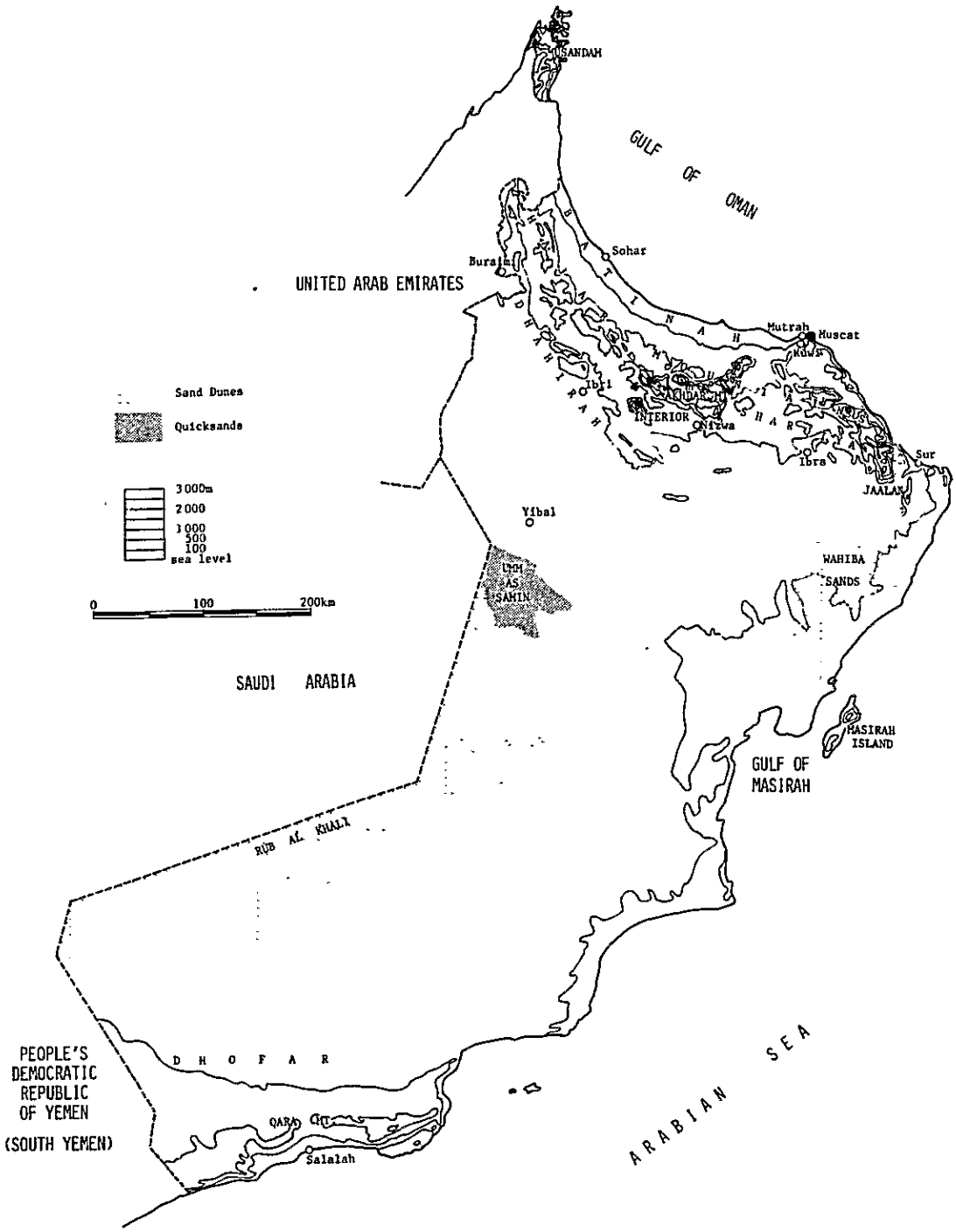


Figure I-1 The Sultanate of Oman (Natural Geography)

The mountains that run through the northern region from north to southeast in the shape of an arc for the total extension of about 650 kilometres is called the Hajar. The range of the Hajar Mountains is separated into the northwestern part and the southeastern part by Sumail Gap--a large valley which runs from Bid Bid through Sumail to Izki. The capital city of Muscat, which is located at about the middle of the northern coast, occurs on the northern end of the southeastern part of this range and is protected by sea on the north and by rocky mountains on the other three sides.

The northwestern part of the Hajar, on the other hand, represents almost the entire part of the northern region of Oman. Here, much agricultural activities are seen on both sides of the Hajar. The Interior side or the strip of land extending for about 300 kilometres from Muscat toward north is called Batinah, which is known as a major agricultural area of the nation for the high production of dates, vegetables, and citrus fruits. The cultivated part of Batinah forms a belt of a width of from a several to 10 kilometres lying close to the shore.

The central area of the Hajar is called Akhdar, and the steep hillsides of this heavily vegetated highland area have been cultivated into small farming lots, one on the top of the other in the shape of steps.

A sandy desert of Wahiba extends on the south of Sharqiya area, and a plain covered by a layer of gravels extends on the west of a series of dunes of Wahiba. A several oil wells are found in the west-central and southern part of this central plain, and the petroleum is being transported to the port of shipment in the metropolitan area in the north via a pipeline with a total extension of 700 kilometres. Nothing much more than these oil wells and roads connecting them with each other are found in this dry land.

The southern region of Oman, where climate is different from that of the northern region and where rain is abundant, is called Dhofar. Dhofar is a highland where a series of mountains lie in parallel to the shore line. The three mountains of about 1,000 metres above sea level lie in parallel to the shore line for about 300 kilometres from east to west and form a moderately sloped highland. The Plain of Salalah extends for a length of 100 kilometres and a width of 10 kilometres between the mountains and the sea, and Salalah, the centre of Dhofar, is

situated on the sea in the centre of this plain.

3) Climate

Oman has a complex climate map because the territory is situated at the interface of the Mediterranean and monsoon climates and due to the relatively low temperature sea current that flows along the shore and also to the substantial influence of cyclones. The northern coastal area, the mountainous area, and the southern region have significantly different climates from each other.

In winter northeasterly trade wind blows, but because its intensity is low, much rain is caused by depression which travel down from the Mediterranean Sea accompanying a cold front. Rainfalls are practically limited to winter in the northern region of Oman, where about 90% of the annual precipitation of from 100 to 150 millimetres is concentrated in the months of January and February. In this region, temperature is from 15° to 20° centigrade in winters. In the southern region, on the other hand, average temperature is from 20° to 23° centigrade because, there, the southward travel of cold air masses is obstructed by the trade wind.

In summer trade wind blows from south into depressions on the west of India and hot and humid wind blows through the entire territory of Oman. Due to the up-surge of relatively low temperature sea water from below up to surface, sea water temperature along the southern coast of Oman declines in summer to even below the winter temperature in extreme cases. This phenomenon is particularly remarkable off the coast of Salalah, and due to this, temperature in the southern part of Dhofar drops to about 26° centigrade in summer, when a fog sets in frequently and precipitation is high in Salalah area. In contrast, high temperature and high humidity persist in the northern region; in the Batinah Plain and the vicinity of Muscat, temperature sometimes exceeds 35° centigrade and humidity approaches 95% in summer.

Spring and fall seasons are short in Oman, when the change of trade wind occurs and, therefore, wind is weak and unstable and weather is also changing.

As seen in the above, Oman, due to its geographical location, has fairly diverse climates by region; temperature varies substantially from summer to

winter in the Interior, while the southern region has a mild climate with warm winters and cool summers with the temperatures ranging only by from 5° to 7° centigrade through the year. Precipitation is low with an average of about 100 millimetres, but is typically higher in the mountainous parts of both the northern and the southern regions.

2. History/Society

1) Omani History

It was in 1970 that Oman was united into a nation in the strict sense of the word. Confrontations and struggles, as well as alliances, between the tribes of southeastern part of the Arabian peninsula represent the history of Oman.

The record of human activities in this part of the peninsula can be traced back to about 12,000 B.C. Recovered pieces of pottery prove that this part had evolved from stone age to earthenware age by about 3,000 B.C. Omani civilisation in this period resembled that of Mesopotamia and of southern Iran, and it is believed that a fair amount of traffic moved between this part and the area north of the Arabian Sea. Omani civilisation in about 2,000 B.C. displayed a strong influence of Indus civilisation, indicating that greater trading activities took place between the two areas.

A record of trade in the Orient in this period reported the existence of an area called Magan as being rich in copper and other mineral ores. Because Sohar and the vicinity in the northern part of Oman used to be called Mazun, it is suspected that Magan was Oman. Also, the fact that frankincense, which was an important trade item in those days, is a major product of the area now known as Dhofar indicates that Oman occupied an important position in trade. Oman's excellent shipbuilding techniques and vigorous maritime trade activities coincide with the recorded characteristics of the people of Magan.

Subsequently from about 500 B.C. on, the rule of Achaemenid and Sassanid Persia continued for over one thousand years. It was during this Persian-rulled decade of centuries that falajs were constructed throughout the land of Oman.

Presently the population of Oman is predominantly Arabs, who reportedly started to immigrate from Yemen areas through the south and to settle in Oman area in about 200 A.D. The Arab population of Oman started to increase rapidly at the opportunity of the rise and spread of Islam in the 7th century.

It is believed that Islam reached Oman toward the end of the 7th century, when the religion broke into three sects: Orthodox Sunni, Shia, and Ibadhi.

Almost all of the Omani population was originally of Ibadhi, but the population of coastal cities where trade activities were high were influenced by Sunni and Shia and the number of Sunnis and Shias increased in these cities. Thus religious confrontation was added to the social and economic gap which had existed between the prosperous coastal population and non-prosperous Interior inhabitants.

The first Imam of Oman was elected in the middle of the 8th century, since when Oman continued to maintain its independence even though destoroyed by caliphs of the Islamic Empire on a number of occasions. The Imamate continued through the middle of the 12th century, when a historical blank started for about 250 years due to the chaos brought about by tribal confrontation in the nation. In or about the 10th century, a commercial prosperity was achieved centering around Sohar, which was said to have been the greatest port within the Islamic sphere, and the range of such activities reportedly reached the east coast of Africa. The power struggles between tribes continued for about 300 years from the 11th century through the 14th, during which the rise and fall of tribes resulted in chaos in Oman.

Despite the chaotic situation, however, the people of Oman continued to play an important role in maritime trade. The position of Oman as a maritime state in the Indian Ocean basin remained unshakable until the 16th century, when Europeans began their activities in the area.

The first Europeans to appear in the scene was the Portuguese, who came to blockade the trade in Red Sea and to occupy the strait of Hormuz. They plundered and eventually brought the Gulf area under control. The Portuguese rule lasted for about one hundred years until the end of the 16th century, when the Dutch, British, and the French people also started to pay attention to the Indian Ocean trade, and the Portuguese lost Muscat in the middle of the 17th century, when Imam Nasir, who regained Muscat, joined hands with East India Company of England. This was the beginning of Oman's close tie with the Britich which lasted for the subsequent three centuries.

Then, at the beginning of the 18th century, struggle between candidates for Imam resulted in the nation's break up and fall, and Muscat was occupied by the Persians for about ten years. The nation was reunited under the Al bu Said dynasty in the latter half of the 18th century, by which time antagonism between

the tribes which occupied Muscat and other coastal parts and the tribes of the Interior had already been deep-rooted.

In those days, trade between the Persian Gulf nations and India was carried out by the Europeans and the Arabs. Merchants of Muscat, who played a central role in the trade, are said to have made attractive profits. The influence of Oman reached East Africa, and Zanzibar remained a territory of Oman for about 200 years from the middle of the 17th century to the middle of the 19th.

After the middle of the 19th century, however, the role which Omani merchant ships played in the trade between the Gulf area and India diminished decisively and became non-existent in several years due to rapid increase of steamships operated by British shipping companies.

The rapid decay of Oman after the mid 19th century can be attributed, for one, to the dwindling slave trade due to the abolishment of slavery and other changeover in the content of trade. It can also be attributed to the changeover in those who carried out maritime trade due to the increase of steamships and to change in trade routes due to the opening of the Suez Canal. Internally, the degeneration of Muscat resulted in the eruption of overt antagonism between Muscat and the Interior Oman and in rapid financial deterioration of Muscat. The loss of trade revenue was a fatal damage to Muscat. Thus, the development of Oman had stopped since the late 19th through the first half of this century. The rigid thrift and austere measures and the national isolation policy taken for the national conservation and security by Sultan Said ibn Thaimur, who was enthroned in 1932, resulted in the gradual restoration of financial health but also in a substantial oppression on the people's living.

In this way Oman had come to be forgotten by the world for a long time, and it was the discovery of oil in the 1960's that attracted the world's attention to Oman again. Then, Sultan Said, who had continued on the isolation policy without considering effective administration of oil revenue, was finally ousted by Sultan Qaboos ibn Said in July 1970.

In 1971 the internal disunity was dissolved, the name of the nation was officially changed from "Muscat and Oman," which symbolised the confrontation between Muscat and the Interior, to the "Sultanate of Oman," and the nation was

recognised by the United Nations and other international organizations.

Under the rule of Sultan Qaboos, Oman has gone through a quick transfiguration during the short period from 1970 to date; the nation's modernisation has been accomplished with an extremely high speed through the construction and development of roads, ports and harbours, as well as of electric, water, educational, medical, and other facilities, and government reorganization and development. The hasty process of modernisation, however, was inevitably accompanied by a variety of problems and conflicts, and it is believed that greater care should be taken in further modernisation and development in the future.

2) Society and Culture

A predominant majority of the estimated 850,000 population of Oman today are Arabs, while it is estimated that some 70,000 expatriates from India, Pakistan, Iran, and other countries are in the coastal, particularly in the urban, areas of the northern region. Most of those expatriates are unskilled labourers who have come from India or Pakistan. On the other hand, manpower from Egypt, Lebanon, and India is being depended upon for more than 90% of agricultural and industrial engineers, as well as teachers and physicians required to man the rapidly increasing schools and hospitals. This reliance on imported labourers and experts is to be tolerated at present in view of the scarcity of educated and qualified Omanis, even though it will in fact constitute a hindrance to the development of domestic industries. The shortage of manpower, particularly of skilled engineers, teachers, and physicians, is a serious problem yet to be solved.

While the low educational level of the people is currently the greatest domestic problem of Oman as seen in the above, the spread of education has been at a very quick pace under the educational development programme of Sultan Qaboos, and the number of schools has increased from three in 1970 to over 260, and the number of students from 900 males (no females) in 1970 to 47,000 males and nearly 19,000 females in 1977. Included in the total are not only primary, but also 45 preparatory and three secondary schools. As of 1976, the rate of school enrollment among the children of primary school age was 30%.

This educational advancement has been supported by foreign teachers, as stated before. A 1977 statistics shows that the Omani teachers numbered 403 or only 14% of the total of 2,878 teachers, while the Egyptian teachers counted the highest at 1,692, followed by 465 Jordanians and over one hundred of Sudanese and Saudis each.

In view that the expeditious development of a technical training system is essential to industrial development in Oman, the importance of education centering around vocational training and specialised schools is being advocated. However, an excessive bias toward technical education can result in the mistake of fostering youths into those who are equipped only with specialised technical skills but without fundamental primary education. Technical training and general primary education seem to be two conflicting targets in the current situation in Oman, and choice between the two is a difficult question. It appears that the current dependence on foreign engineers for assistance and guidance should be continued for the time being until the spread of general education has reached an acceptable level, when emphasis should be shifted for the first time to the technical and specialised education of Omanis. Basic general education should never be neglected in the stream of hurried modernisation.

3. Government and Foreign Affairs

1) Government Structure

Under the central government, the nation consists of 45 wilayats (provinces). A sultan-appointed Wali (governor) is in charge of the administration of each province, and some provinces have a number of towns in them. These wilayata as local jurisdictions are governed by the Minister of the Interior of the central Government. A regional government is established in the Metropolitan area (Muscat and surrounding areas) and in Dhofar Region in the south for the administration of wilayats in each jurisdiction.

As for the central government organization, under Sultan are 18 ministries, one department, and two councils. Sultan Qaboos, who retains the right to appoint his cabinet members, also serves in the office of premier, foreign minister, and defense minister.

For these ministries that have been organized, the field of their competence, adjustment between them, and many other matters are yet to be worked out. It is possible that the central government will further be reorganized in the future. Although each ministry has accomplished an important task in the process of the rapid development of Oman during the past several years, coordination between the ministries has come up as a major issue. Against this background, the Development Council, which is to oversee the formulation of the overall development plans concerning every ministry, will be required to perform an important role.

2) Political Affairs

When Sultan Qaboos gained power in July 1970, the greatest problem was the Civil War in Dhofar. The rebel army, which rose in 1965 in protest against the extremely conservative government of former Sultan Said and his stern control over the people's living, few years later came to be lead by a communist faction under a revolutionary ideology, to receive aids from communist countries, and to be known as "People's Front for the Liberation of Oman (and the Arabian Gulf)" and continued to oppose the Omani Government particularly under the strong assistance of South Yemen.

When Sultan Qaboos assumed the throne in 1970, he first appealed to P.F.L.O. for peace, but in vain. Then, the rapid buildup of the Omani Army began under the assistance of the British Forces. As the government invested large sums in social capital and improved the living environment for the inhabitants of Dhofar, P.F.L.O. was gradually isolated and its activities took on the aspect of guerrilla warfare. Finally in 1973, the Iranian and the Jordanian armies were mobilised for reinforcement, and the guerrillas started to surrender to the Omani Army with the last group of the guerrillas withdrawing back to South Yemen. The Omani Government declared cease-fire in 1976, and the Dhofar War came to an end by the mediation of Saudi Arabia and others on the condition that foreign armies pull out from Oman. An acceptable level of stability is being maintained in Dhofar district at present with intense border guarding by the troops.

Internally, on the other hand, the construction of roads, airports, ports and harbours, and other infrastructure has been completed in accordance with a plan, as social and economic development progressed rapidly, and schools and hospitals are now being constructed. It is noteworthy that, even though the defense budget has been weighing heavily on the coffers, the tempo of the modernisation and the development of social capital has been so fast. Since 1974, the Development Council has planned and coordinated important development projects for a higher investment efficiency. Currently defense expenses represent about 40% of the total government expenditures.

Oman already had diplomatic relations with the United Kingdom and India under the regime of former Sultan Said ibn Thaimur, but they are on the Consular level. It was not until 1971 that ambassadors were exchanged under the regime of the present Sultan. Also in 1971, Oman was admitted to the Arab League and to the United Nations. In 1972, Oman entered into diplomatic relations with the United States, Iran, Egypt, Saudi Arabia, and Jordan, and later, with France and the United Arab Emirates. By 1977, the number of countries having a diplomatic mission stationed in Oman reached 14, while Omani ambassadors were stationed in 18 countries and Omani missions had been dispatched to a total of 25 countries. Japan recognised Oman in 1971, but neither of them has a diplomatic mission stationed in each other.

Conflicts with neighbouring Arabian countries which were caused by tribal rivalry and the Dhofari War had gradually been eliminated under the friendly diplomacy of Sultan Qaboos, and Oman currently maintains very amicable relations with all the Arabian countries except South Yemen. Oman's position among the Arabian nations has been ameliorated, and it receives grants in various fields from Saudi Arabia, the United Arab Emirates, Qatar, Bahrain, Iran, Jordan, and Egypt. Oman's tie with Saudi Arabia has been particularly strengthened since the latter's mediation to end the Dhofari War, and Oman receives financial aids for various development projects from the latter. Sultan Qaboos has taken a positive attitude toward the Arabian nations ever since his enthronement, visited Egypt, Jordan, and Saudi Arabia in person, and promoted exchange of visits on ministerial level; his diplomatic policy can be called a complete turnabout from the previous diplomatic attitude of Oman.

Also, in the area of social and economic development, Sultan Qaboos has been welcoming technical aids and consultations from not only the United Kingdom but also foreign nations at large, and a fair number of foreign advisers are now found within the government organization. A large number of engineers and teachers have been invited from the Arabian countries and engaged in business and production activities, as well as in the emphatic education of Omanis. About 100 Omanis are conversely dispatched yearly to the Arabian nations, the United Kingdom, and the United States for study. Thus, Oman now has vigorous human exchanges with the world.

Under the fairly strict immigration control which requires a guarantee by an Omani host for a visa, however, the entry into Oman of foreigners other than labourers, government advisers, and consultants is currently practically non-permissible.