

SULTANATE OF OMAN THE STUDY ON A MASTER PLAN FOR AGRICULTURAL DEVELOPMENT

FINAL REPORT
VOLUME 1 MAIN REPORT

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SULTANATE OF OMAN

**THE STUDY
ON
A MASTER PLAN
FOR
AGRICULTURAL DEVELOPMENT**

FINAL REPORT

**VOLUME 1
MAIN REPORT**

NOVEMBER 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

国際協力事業団

24991

P R E F A C E

In response to a request from the Government of the Sultanate of Oman, Japanese Government decided to conduct a study on a Master Plan for the Agricultural Development in the Sultanate of Oman and entrusted the study to the Japan International Cooperation Agency(JICA).

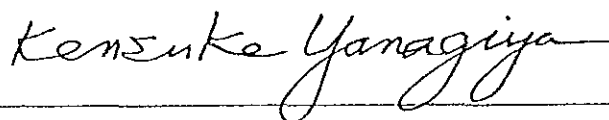
JICA sent to Oman a survey team headed by Mr. Hitoshi Nakajima, Japan Agricultural Land Development Agency, twice between October 1989 and August 1990.

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

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

I wish to express my sincerest appreciation to officials concerned of the Government of the Sultanate of Oman for their close cooperation extended to the team.

November 1990

A handwritten signature in cursive script, reading "Kensuke Yanagiya", is written over a horizontal line.

Kensuke Yanagiya

President

Japan International Cooperation Agency

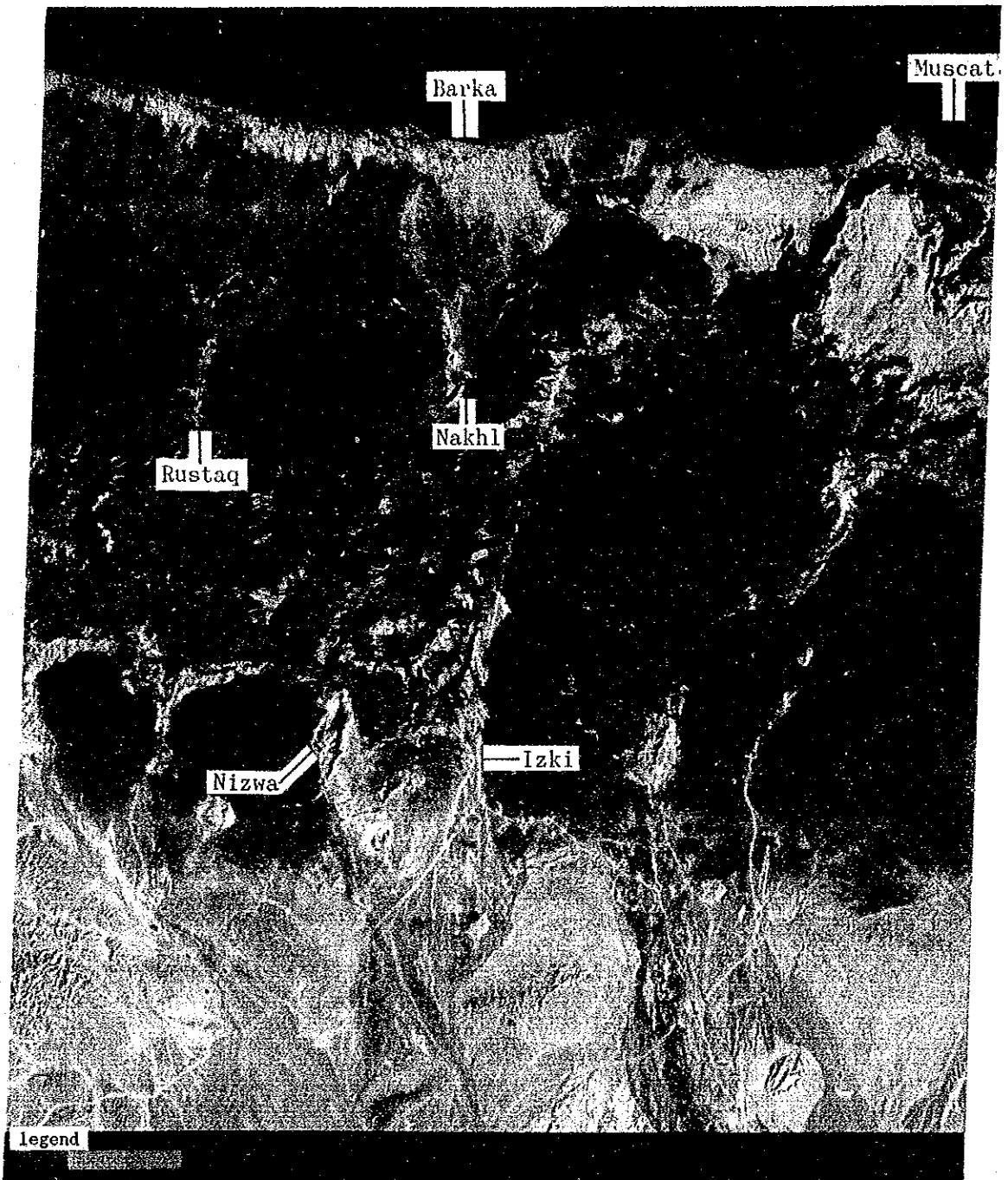


Plate 1. Distribution of vegetation and its changes from 1984/85 to 1986/87 in South Batinah, Dakhliya and Sharqiya Regions. (Scale 1:1,000,000)

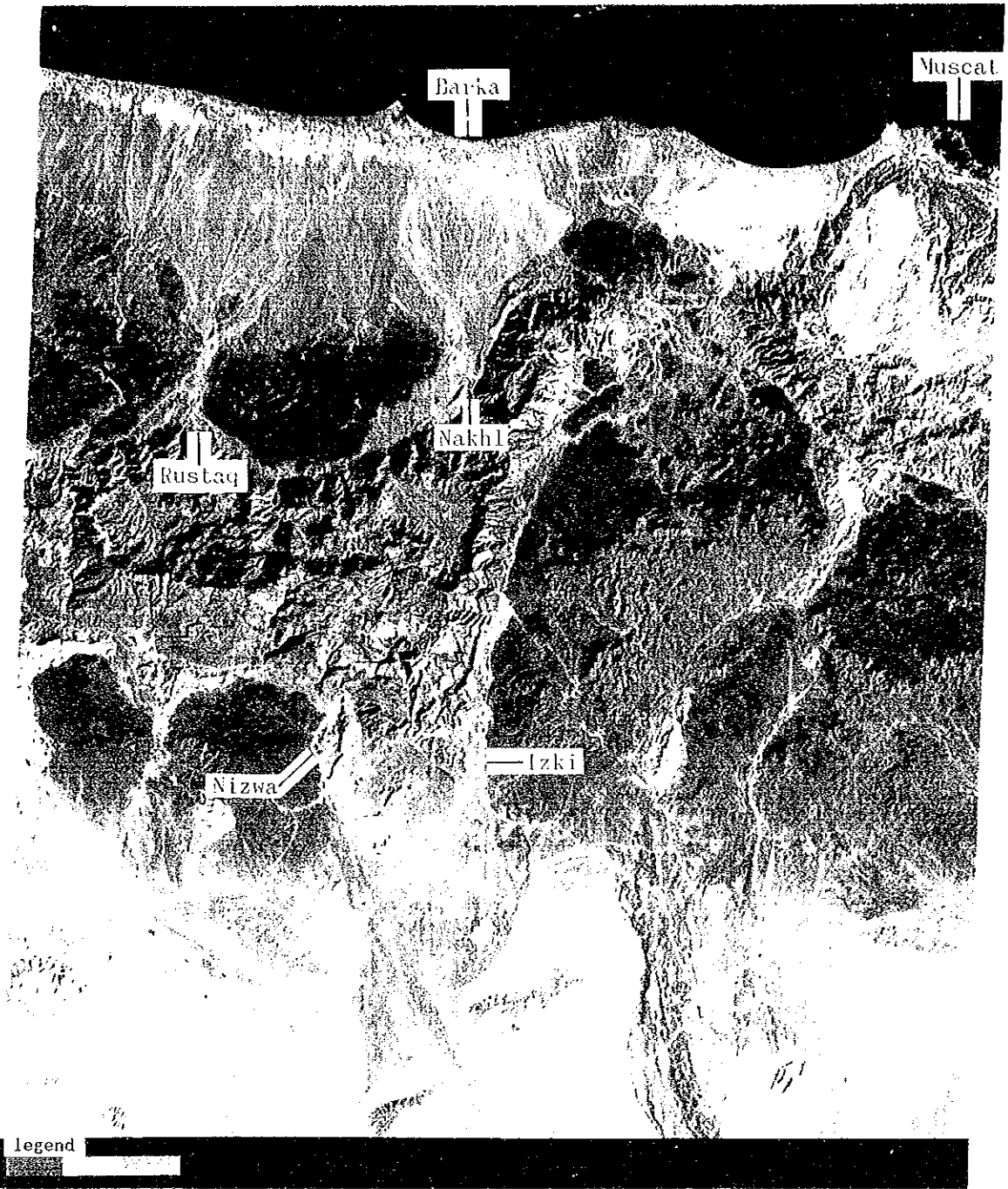


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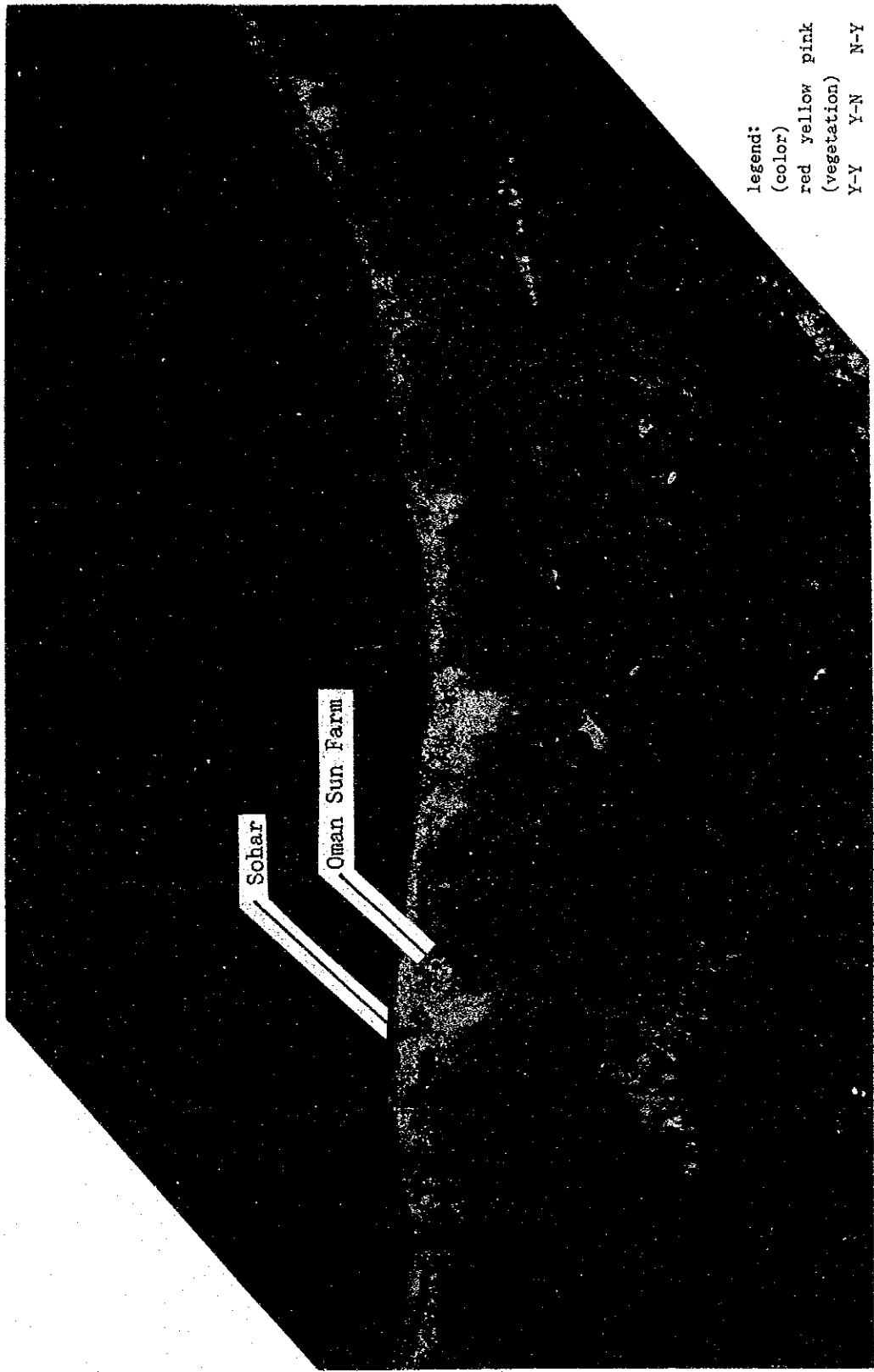


Plate 2. Distribution of vegetation and its change from 1984/85 to 1986/87
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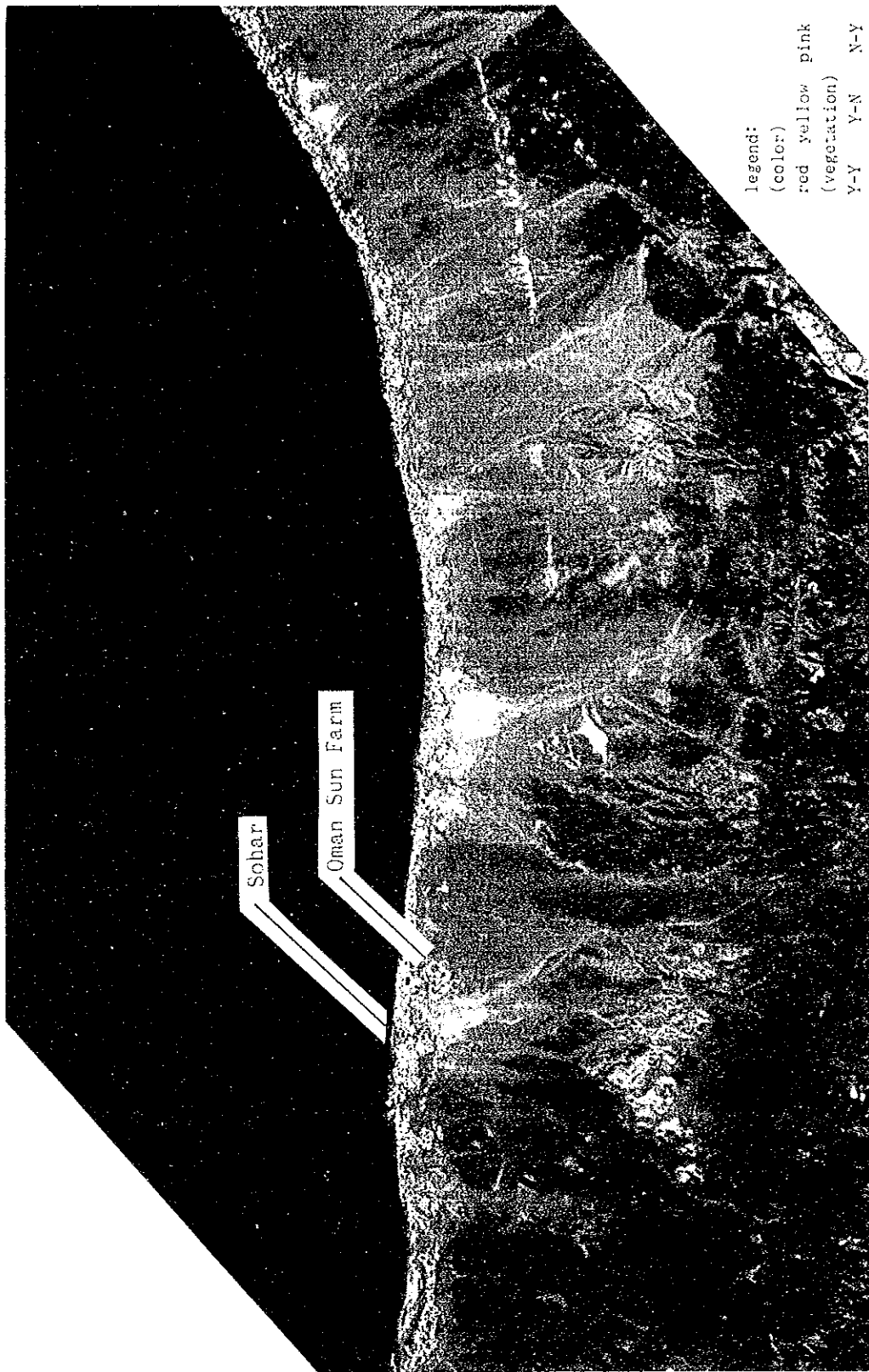


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[Explanation of Plate 1 and 2]

(1) These plates were derived from the data of LANDSAT image analysis.

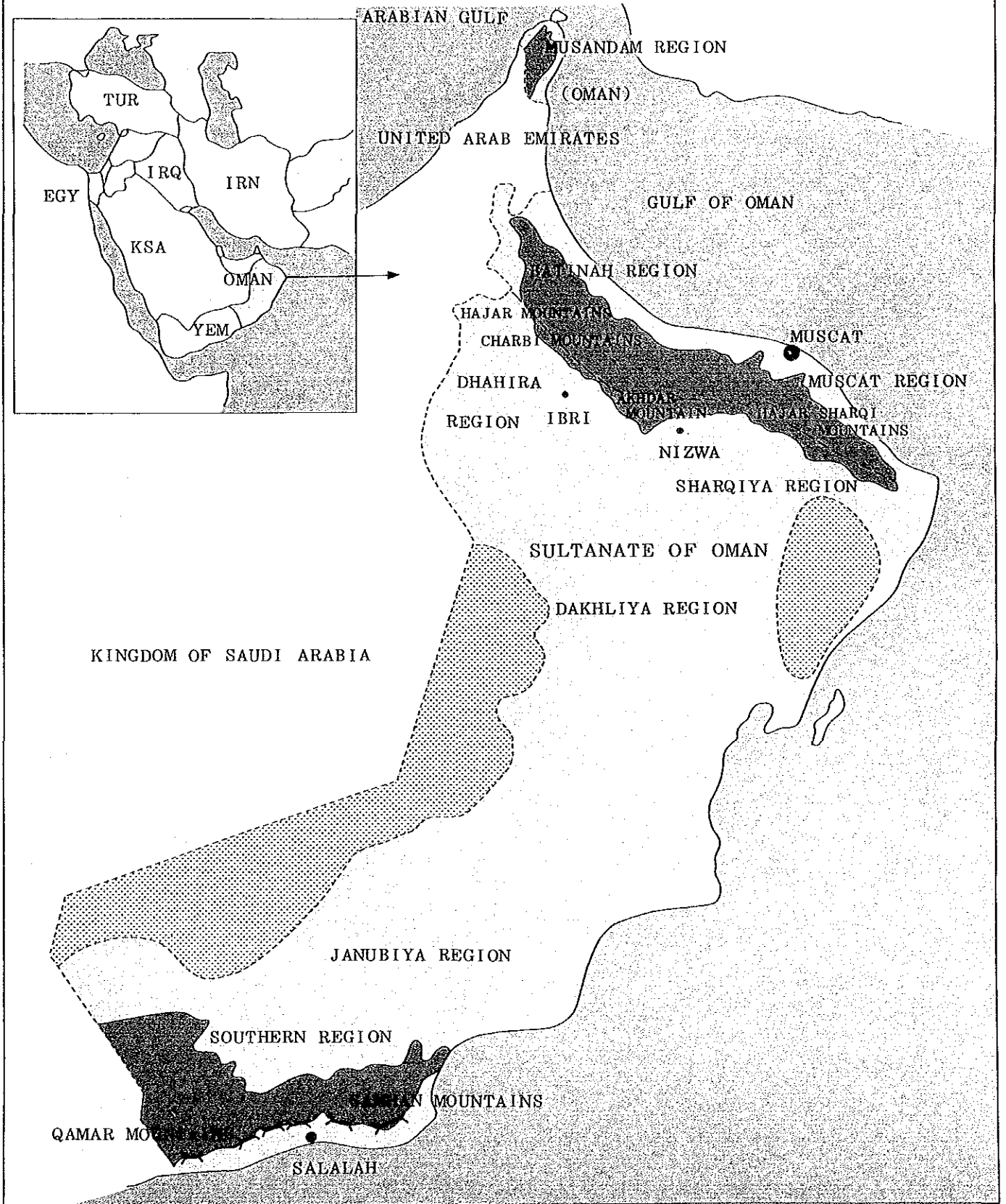
(2) The following data were employed:

	Path/Row Number	Timing			
		Former Term		Latter Term	
		Date y./m./d.	Sensor	Date y./m./d.	Sensor
Plate 1	158/044	1985/01/28	MSS	1987/01/18	TM
Plate 2	159/043	1984/01/09	MSS	1986/01/06	MSS

(3) Abbreviations in the legends represent changes of vegetation as follows:

	Former Term	Latter Term
Y-Y:	Yes	Yes
Y-N:	Yes	No
N-Y:	No	Yes

STUDY AREA



Basic Indicators																						
Land Area	300,000 km ²																					
Capital	Muscat																					
Major Cities	Nizwa, Sohar, Ibri, Ibra, Salalah																					
Population	1.5 million (1988 estimate)																					
Foreign Population	0.29 million																					
Language	Arabic																					
Religion	Islam (Majority: Ibad sect)																					
Type of Government	Monarchy																					
Head of State	H.M. Sultan Qaboos bin Said																					
Legislature	State Consultative Council (legislative power resides with the monarch)																					
Currency	Rial Omani: R.O. 1 = 1,000 Baisa																					
Exchange rate	US \$ 1 = R.O. 0.384 (31.12.1989)																					
(Buying)	¥ 100 = R.O. 0.2421 (31.12.1989)																					
GDP	R.O. 2,926 million (1988)																					
GDP per capita	R.O. 1,751 (1988)																					
Health	Annual Population Growth Rate: 3.5 % per annum Birth rate: 47.3 Mortality rate: 15.9 Infant Mortality Rate (age 0-1): 28 Average Life Expectancy: 52 years																					
Education System (1989/90)	<table border="1"> <thead> <tr> <th></th> <th>schools (NOS.)</th> <th>students (NOS.)</th> </tr> </thead> <tbody> <tr> <td>Primary school</td> <td>388</td> <td>242,994</td> </tr> <tr> <td>Preparatory school</td> <td>290</td> <td>61,778</td> </tr> <tr> <td>Secondary school</td> <td>74</td> <td>20,257</td> </tr> <tr> <td>Other school</td> <td>20</td> <td>5,707</td> </tr> <tr> <td>University</td> <td>1</td> <td>2,550</td> </tr> <tr> <td>Total</td> <td>773</td> <td>333,286</td> </tr> </tbody> </table>		schools (NOS.)	students (NOS.)	Primary school	388	242,994	Preparatory school	290	61,778	Secondary school	74	20,257	Other school	20	5,707	University	1	2,550	Total	773	333,286
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Major Natural Resources	Oil, Copper, Natural Gas Oil production: 640,000 bpd (1989) Oil reserves: 4 billion barrels																					
Major Industries	Agriculture (Major crops: date palms, limes, vegetables, fruit, livestock) Agricultural land area : 83,340 ha (1978/79) Farm households: 83,204 NOS. (1978/79) Average agricultural land area: 1 ha/household (1978/79) Mining (Copper processing) Petroleum (crude oil export, petroleum refining, gas generating)																					
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EXECUTIVE SUMMARY

1. Study Background

At present, oil income accounts for the majority of Omani national budget revenue. However, in light of the fact that the oil reserves in the country are limited, the government has set upon a course of stabilizing the economy through diversification of national income sources. This is to be achieved by promoting industries other than petroleum.

Diversification of industry is expected to be a mainstay of the fourth 5-year plan to commence in 1991. As a component of its diversification planning, Oman has focused special attention on the agricultural sector. In this regard, it requested the Japanese government to provide assistance in preparing a 10-year agricultural development plan for 2000.

The study to formulate such a master plan commenced in October, 1989. The field survey was completed in early August, 1990, and the Draft Final Report was submitted in September, 1990.

This Final Report has been prepared based on the Draft Final Report.

2. Current Status of Agriculture

Prior to 1970, agriculture was a principal sector of the Omani economy. However, with aggressive development of the petroleum industry subsequent to 1970, the relative share of the GDP contributed by the agriculture sector has declined. In 1988, the agriculture and fishery sectors accounted for just 3% of the total GDP, despite the fact that the farm household population accounts for over half the nation's total population.

Hence, the return of benefits of oil income to farmers through government-assisted promotion of agriculture has a large potential effect

on raising overall living standards throughout the country.

Cropped area has expanded yearly (average yearly expansion rate for 1984-1988 was 4.6%). As of 1988, 54,600 ha were under cultivation. The principal crop is dates, accounting for 44% of the total cropped area. Other major crops are pasturage, vegetables and fruits. Of the staples, rice is not cultivated at all, and wheat to only a small extent.

Although some fruit and vegetables (limes, dates, watermelons, tomatoes, etc.) are exported, over half of the food consumed in the country is imported.

57% of the cropped area is located in Batinah, a major growing area for vegetables, fruit and various field crops. Cropped area in the Southern Region is only 3% of the total, and produces coconut, papaya and other fruit suitable to a monsoon climate.

In the North, the cropping season is mainly from September to March, due to hot and arid conditions in the summer. In contrast, cultivation in the milder Southern Region is possible throughout the year.

Livestock products constitute a major staple of the Omani diet. However, productivity is low due to inadequate feed sources, lack of development of effective new breeds, inadequate marketing and distribution facilities and organizations.

In general, overall productivity of Omani agriculture is low compared to other Gulf countries. It is therefore anticipated that establishment of agricultural production infrastructures, and extension of appropriate farm technology to farmers will greatly increase agricultural productivity.

Farm management can be broadly divided into three types: (i) large-scale commercial farms; (ii) medium-scale farms (new farms), which focus on production of vegetables, fruit and feed crops; and (iii) small-scale farms engaged mainly in traditional date farming.

The large-scale commercial farms engage in highly productive farming

through investment in agricultural production infrastructures (irrigation facilities, etc.) and the introduction of modern farming technology. On the other hand, productivity of farming at the medium- and small-scale farm level is low due to inadequate investment in agricultural production infrastructures and low levels of technical knowledge among farmers. These farms are also characterized by farm management combining both cropping and animal husbandry.

Expansion of cropped area through increased use of pumps in recent years has resulted in over-drafting of groundwater and subsequent salt-water intrusion in the Batinah coast and a portion of the Salalah plain. To address this, the Ministry of Agriculture and Fisheries (MAF) has embarked on a program of recharge-dam construction to replenish aquifers. This planning by MAF for efficient water use will be the determining factor in water-resources policies for Oman, as over 90% of the country's water is used for agricultural purposes.

Distribution of farm products has expanded with development of the country's road network since 1970, as well as with general increased economic activity in the country and greater consumption accompanying population growth. What traditionally was direct-dealing between farmers and retailers has evolved to a stage in recent years where wholesalers are now active in moving products from the source of production to retail outlets.

In 1981, the Public Authority for Marketing Agricultural Produce (PAMAP) was established to ensure a stable supply to markets of farm products at appropriate prices, and to promote agricultural production. At present, private traders are estimated to move most of the farm products marketed.

One problem in the distribution structure in Oman is that a fair pricing system is not in operation. It is necessary to create wholesale markets where physical distribution and pricing are carried out in an equitable manner under established rules.

Also, farmers are unable to perform production, shipping and quality control in a manner responsive to market trends as there are no farmer

organizations to enable such planned management of farm products.

Processing facilities for farm products include plants for processing dates, limes and bananas, and pickling plants for vegetables.

Human resources development in the agricultural sector must focus on Omanization, as a large portion of not only research and extension personnel, but also farm laborers are foreigners.

3. Agricultural Development Targets

The following seven agricultural development targets were established based on socio-economic trends identified in Oman and a forecast of realistic agricultural development potential.

(1) Increase in Food Self-Sufficiency

The caloric supply per capita per day in Oman is estimated at 2,800 kcal.

The Omani diet is characterized by a very well balanced PFC (protein, fat, carbohydrate) ratio.

Considering the natural conditions in Oman, it is not realistic to expect full attainment of self-sufficiency over the entire agricultural production spectrum.

In formulating long-term supply and demand forecasts for farm products, the team made selective future-production estimates on a crop-wise basis taking into consideration a comprehensive range of factors including the present Omani diet, natural conditions, market trends and crop-wise development potential.

As a result, the goal for self-sufficiency is set at a rate of 55% by 2000, from the level of 44% achieved in 1988.

(2) Promotion of Agricultural Productivity

The population in the country in 2000 is estimated at 2.2 million. This corresponds to a 46% increase against 1.5 million in 1989 at an increase rate of 3.5% per annum.

Unfortunately, the arid climate of the country restricts the availability of water resources, precluding the potential for substantial horizontal expansion of cropped area. Consequently, focus must be placed on vertical expansion, in other words, increase of agricultural productivity.

(3) Development and Efficient Use of Water Resources

In arid areas like Oman, where rainfall is insufficient, the available volume of water is the dominant limiting factor in agricultural production, as well as in the daily lives of the people.

Water resources exist for the benefit of all of the population. Over 90% of groundwater is used for agricultural purposes, so infrastructures to include irrigation facilities for efficient water application and recharge dams to replenish aquifers will be established to develop, manage and conserve water resources on a national scale.

(4) Improvement of the Agricultural Structure

Agricultural management in Oman can be roughly classified into the following three types: (i) large-scale commercial management; (ii) medium-scale management on new farms, etc., where mainly vegetables are cultivated on cropped areas of about 10 feddan (4 ha); and (iii) small-scale traditional management where mainly dates are cultivated.

Under the Master Plan, first priority is given to improved management of medium- and small-scale farms.

However, large-scale commercial management should also be promoted through private capital in areas where natural, social and economic conditions are suitable.

Increased efficiency of agricultural investment in the future will also be pursued by establishing essential infrastructures such as irrigation facilities, etc., for which investment to date has been inadequate.

(5) Stimulation of Rural Socio-economy through Promotion of Agriculture

Rural areas play a vital role in economic production, Omani culture, and relaxation and recreation. However, the rapid economic growth of Oman has increased urban-rural economic disparity and stimulated migration of the younger generation to urban areas.

In order to achieve well balanced development of the entire country, it is essential to invigorate the rural socio-economy through overall promotion of agriculture, including the nurturing of agriculture-related industries and creation of employment opportunities outside the strictly farming sector.

(6) Human Resources Development

The level of technical skill among farmers will also be a determining factor in any attempt to improve agricultural productivity.

Human resources development to train and expand the numbers of Omani extension and research staff is necessary to bring new and practical farm technologies to the farmer. This will be of the highest priority.

Also, a vigorous program of Omanization should be pursued to fill the new jobs to be created with Omani personnel to the absolute extent possible.

(7) Achievement of a 6.3% Annual Average Growth Rate in the GDP

An annual average growth rate of the GDP for the agricultural sector of 6.3% is to be attained through the integrated implementation of the above objectives.

4. Agricultural Development Strategy

4.1 Principle of Development Strategy

- (1) Maintain consistency with the current, on-going third 5-year plan.
- (2) Generate maximum effect with minimum investment.
- (3) Use to the fullest extent possible the presently available resources.
- (4) Respect Omani society, culture, customs and lifestyle.
- (5) Focus on farmer self-reliance.

4.2 Basic Framework of Development Strategy

(1) Production Policy

Given the severe constraints on water resources, horizontal expansion of cropped area alone will not be sufficient to improve the self-sufficiency rate of food production with population increasing at an annual rate of 3.5%.

Accordingly, priority is to be given to increased productivity of existing cropped land. This is to be achieved through integrated implementation of (i) extension of researched and tested, appropriate forms of technologies, (ii) farmer training, and (iii) introduction of agricultural machinery suited to farm scale.

Selective expansion of farm production is to be done in consideration of long-term supply/demand forecasts for individual farm products.

(2) Structural Policy

Agricultural development planning in Oman must address the problem of the small-scale farmer who cultivates less than 1 ha, principally with

dates. Such farmers are estimated to account for 60-70% of all farm households, and to farm 15% of the cropped area in the country.

Improved agricultural productivity will still not enable these farmers to earn a livelihood by agriculture alone. Under the Master Plan, traditional combined-farm management where both agriculture and animal husbandry are pursued is to be improved and promoted. Efforts will also be made to increase farm scale, as well as establish farm-product-processing industries to create off-farm employment opportunities in rural areas.

The backward state of the agricultural production infrastructure is a serious obstacle to improved agricultural productivity. To address this, construction of irrigation and recharge dam facilities will be emphasized.

(3) Price Policy

Price policy should cover only the temporary declination of farmer income occurring as a result of excess production. 1988 data for import/export and domestic prices for agricultural products, suggest that a price support policy is not needed for most crops. However, since these data are not conclusive, supplementary studies should be carried out. In assessing the merits of a pricing policy, close attention should also be paid to the degree of success achieved under the distribution policy, which attempts to provide a mechanism for marketing agricultural products at fair prices under market principles.

(4) Distribution Policy

Distribution policy will promote the complementary relationship between PAMAP and the commercial traders, and work to guarantee benefits for both producers and consumers.

Towards this end, wholesale markets will be established to determine fair prices for farm products based on supply and demand.

In addition, the collection and distribution system (particularly from the farm gate) is to be improved for smoother delivery to wholesale

markets.

Also, distribution-management techniques of PAMAP are to be improved to minimize losses occurring in the distribution process.

(5) Subsidy Policy

Farm inputs (fertilizer, seed, insecticide, agricultural machinery, etc.) are subsidized under present policy in order to lower production costs. Since in Oman the producer's price tends to be determined by the wholesaler, the subsidy system should be continued to ensure farmer profit.

Nevertheless, the focus of subsidization should be shifted from seed, fertilizer, agricultural chemicals, etc. to farm machinery and production infrastructure construction such as irrigation facilities.

On the other hand, in order to strengthen the producer's position, it is recommended that farmer associations capable of influencing producer pricing and wholesale markets be established.

4.3 Sector-wise Development Strategy

(1) Irrigation and Dam Facilities

It is estimated that over 90% of the water used in Oman is consumed for agricultural purposes. Consequently, the efficient development and use of irrigation water are essential.

In this sector, emphasis is to be placed on the construction of irrigation, recharge-dam and underground dam facilities to conserve groundwater resources, as well as on a program to monitor reserves.

Rehabilitation of traditional aflaj- and well-irrigation facilities, and soil-erosion prevention will also be carried out.

(2) Agriculture

Major crops covered by the agriculture development plan are to be selected, and target yields for each determined. Research facilities are to be established and research staff trained and increased to address the technical problems to be overcome in achieving target yields.

Emphasis will also be placed on extension activities to transfer developed technologies to the farmer. A model for farm-management improvement is proposed as an index for extension activities.

(3) Livestock

Livestock products are a traditional part of the Omani diet, and constitute an important part of agricultural production. Also, as present productivity is low, there is much potential for improvement.

The improved farm-management program combining both agriculture and animal husbandry is directed at the medium- and small-scale farmers.

A broad program has been formulated to raise the self-sufficiency rate of livestock products. The program comprises a farm-management-improvement plan including regeneration of rangeland for herders in the southern mountains, and some privatization of government functions.

(4) Distribution and Farm Product Processing

In light of the forecast increase in the amount of farm products in the distribution system, the establishment of wholesale markets is proposed for the exchange of goods at fair prices based on supply and demand. Collecting and shipping entities will also be created at the farm-gate level to ensure a stable supply of farm products.

In order to promote agriculture-related industries, the following facilities are proposed for construction pending the outcome of a feasibility study.

- (a) Combined processing plant for dates, limes and tomatoes
- (b) Date by-product plant
- (c) Vegetable- and fruit-pickling plant

- (d) Dried date plant
- (e) Coconut-processing plant

(5) Subsidy System

Under the Master Plan, priority for subsidization is to be given to the upgrading of social capital. Subsidies for agricultural inputs to medium- and small-scale farmers will be continued; however, future focus of subsidy-outlay will be shifted to the construction of production infrastructures such as irrigation facilities in order to promote greater farmer self-reliance.

Subsidy policies for seed and seedlings should be formulated in such a way as to promote production based on supply and demand forecasts for farm product items.

5. 10-Year Agricultural Development Plan

5.1 General Description

The JICA team formulated 3 alternatives for the agricultural development plan. These are (i) the full Master Plan, (ii) Alternative 1, and (iii) Alternative 2.

The full plan comprises the priority projects selected to achieve the above-described agricultural development objectives in line with the development strategy.

In selecting priority projects, the team based its criteria not only on development potential elicited through its own field survey, but also on the findings of various project studies implemented to date by the Omani government and on information obtained in discussions with concerned government officials of the Sultanate, including H.E. the Minister of Agriculture and Fisheries.

The required public budget for agricultural development under the full plan is R.O. 589 million, of which outlay from the budget of MAF is

R.O. 557 million and that from PAMAP is R.O. 31 million (Table 1).

This budget is characterized by a relatively heavy outlay for the irrigation and dam sector, due to the general backward state of the agricultural production infrastructure. This outlay is 61% of the total.

Budget outlay for extension, research and general farm-related activities, which contribute greatly to the vertical development of agricultural productivity, is 11%.

13% is to be allocated to the livestock sector, for which development potential is high.

Remaining outlay for the distribution sector, agricultural produce-processing sector and inter-sectoral projects are 5%, 2% and 7%, respectively.

A sectoral and regional breakdown of the budget outlay is shown in Figure 1.

Alternative 1 proposes a budget outlay necessary strictly in terms of macro-economics. The investment frame is R.O. 350 million (computed on the basis of ICOR). Priority projects are selected from within the full plan.

The budget for Alternative 1 is R.O. 404 million, of which R.O. 373 million is outlay by MAF and R.O. 31 million by PAMAP. However, this budget requires large-scale cuts in investment in agricultural production infrastructure and various urgent projects included in the full plan.

This budget total includes investment directly affecting the agricultural GDP referred to in this report as "agricultural investment", as well as "indirect investment" in such related sectors as service (PAMAP projects) and industry (agricultural produce-processing projects). These classifications of investment have been made solely for the convenience of economic calculation and analysis. In actuality, the MAF budget embraces both types of investment and is therefore different by definition from strictly agricultural investment.

Alternative 2 expands upon Alternative 1 by adding funding to those projects where investment is considered lacking, particularly in the irrigation and dam sector, and the livestock sector. Total budget is R.O. 480 million, of which R.O. 448 million is outlay by MAF and R.O. 31 million is to come from PAMAP. Budget shares for the irrigation and dam, agriculture, and livestock sectors are 54%, 13%, and 16%, respectively. (Table 1, Figure 2)

In order to strengthen investment efficiency in agriculture in the future, upgrading of farmer technology coupled with establishment of modern agricultural production infrastructures will be necessary. For this reason, the JICA team recommends the implementation of Alternative 2.

5.2 Human Resources Development

In order to achieve goals under the 10-year plan, human resources must be deployed in a variety of sectors including agriculture, livestock, irrigation and dams, etc.

Increased agricultural production will create demands for farm labor in 2000 estimated by the JICA team at 161,090 workers. Of this, 145,144 are expected to be Omani. As a result, it can be seen that the labor market in agriculture will readily be able to absorb in 2000 the estimated agricultural labor population at the time of 138,455.

Total increase in MAF-related professional jobs will be 1,487 (excluding distribution and agro-industry).

6. First 5-Year Agricultural Development Plan

The first 5-Year agricultural development plan comprises the projects to be implemented in the first 5-year period of the Master Plan, Alternative 2 as recommended by the JICA team.

Essential targets, priorities and sector emphasis are the same as

under the 10-Year Master Plan.

The required budget for agricultural development over the first 5 years is R.O. 278 million. Sectoral outlays (Table 2) are 49% for irrigation and dams, 13% for agriculture, 17% for livestock, 6% for distribution, 4% for agricultural produce processing, and 12% for inter-sectoral projects. Sectoral and regional outlays are indicated in Figure 3.

7. Recommendations

(1) Human resources development

Human resources development, i.e. education, training and technology transfers to Omani personnel, is perhaps the single most important factor that will determine the degree of success of the agricultural development plan. Programs to develop human resources have been formulated under the Master Plan, and it is recommended that these be vigorously pursued.

(2) Strengthening of MAF

In conjunction with human resources development, it is necessary to strengthen the organization and activities of MAF. This includes the regional structure of the agency which will deploy the extension personnel. The units to be established under the Master Plan will play a particularly important role in promoting crucial projects such as new irrigation schemes, etc.

(3) Farm organizations

Farm organizations will be essential to effective implementation of the agricultural development plan. Autonomous farm-level organizations will be expected to contribute in the areas of collecting and shipping of farm produce, implementation and operation of irrigation projects and creating an environment for effective extension activities.

(4) Integrated strengthening of both agricultural production and the rural

living environment

In principle, the Master Plan is primarily an agenda to stimulate agricultural production. However, to promote permanent settlement in rural areas, improved farmer income and the enhancement of health and disease control, nutritional and educational aspects of the rural living environment must be addressed.

In this regard, appropriate integrated rural development projects to integrate essential social infrastructure with the agricultural production infrastructures would be considered necessary in the future.

At present, women in rural areas play an important part in agricultural production. In the future, it is anticipated that their participation in the areas of health, nutrition and other aspects of improved day to day living will increase as well. Participation by women in these vital activities should be vigorously promoted.

(5) Natural environment

With the population increase, threats to the natural environment have intensified. Future development projects must give the most serious attention to their environmental impact.

In particular, it is essential that measures be considered to prevent groundwater contamination. This would include, among others, the study of toxicity and residual behavior of agro-chemicals, the formulation of standards for agro-chemical application, and the prohibition of specific substances.

(6) Coordinated effort among agencies

The Master Plan includes programs which would be difficult for MAF to implement alone. In such cases, coordinated efforts in planning and implementation must be maintained with all concerned agencies to effectively carry out the development plan.

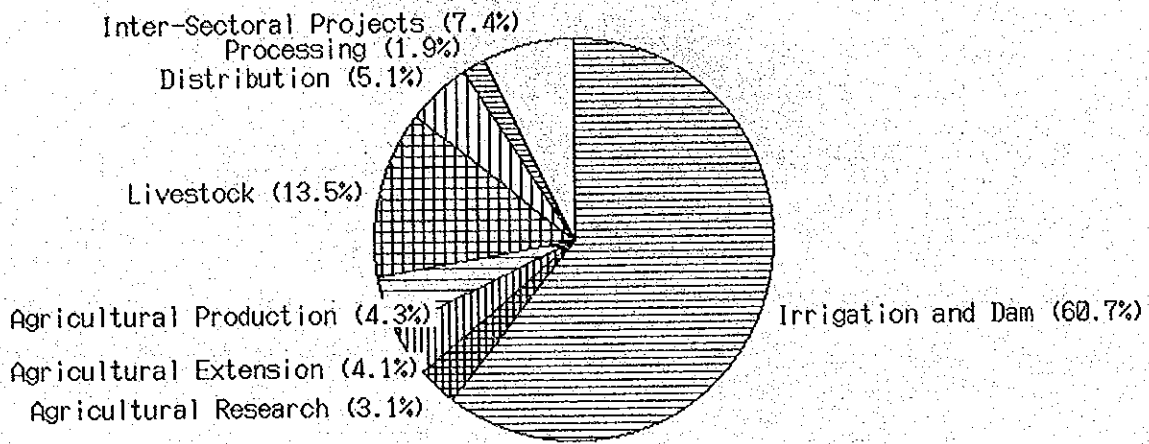
In executing programs, thorough dialogue and liaisons between MAF,

PAMAP(distribution), MWR(water resources), MRM(slaughterhouses), MH(land distribution) and MCI, for example will be extremely important.

Table 1 Comparative Description of 10-Year Plan
- Full, Alternative 1 and Alternative 2

SECTOR	PROJECT NUMBER	NAME OF PROJECT/PROGRAM	FULL (1000RO)	ALTERNATIVE	
				(1) (1000RO)	(2) (1000RO)
Irrigation and Dam		Subtotal	357,397	186,107	259,922
	NW-1	Improvement of Irrigation System and Centrally-Controlled Water-Distribution System	60,990	26,370	42,090
	NW-2	Subsidy for New Irrigation System Project	37,500	31,250	37,500
	NW-3	Legal Framework for Agricultural Water Use	250	250	250
	NW-4	Recharge Dams	86,633	79,240	81,645
	NW-5	Sub-surface (Underground) Dams	5,000	5,000	5,000
	NW-6	Aflaj	113,420	22,520	59,020
	NW-7	Wells	30,240	5,100	18,000
	NW-8	Springs	5,914	4,087	4,087
	NW-9	Erosion Control and Protection of Agricultural Land against Floods	11,510	6,510	6,510
	NW-10	Survey and Monitoring	5,940	5,780	5,820
Agricultural Research		Subtotal	18,200	18,200	18,200
	NAR-1	Support for Agricultural Research Stations	5,300	5,300	5,300
	NAR-2	Establishment of New Research Units and Laboratories	5,600	5,600	5,600
	NAR-3	Development and Establishment of Experimental Farms and Nurseries	2,000	2,000	2,000
	NAR-4	Forestry-Improvement Program	2,000	2,000	2,000
	NAR-5	Establishment of Locust Survey and Central Unit	2,000	2,000	2,000
	NAR-6	Soil Surveys	1,300	1,300	1,300
Agricultural Extension		Subtotal	24,000	23,050	23,050
	NAE-1	Improvement and Development of Extension Centers and Facilities	4,470	3,520	3,520
	NAE-2	Establishment of Development Support Communication Center(DSCC)	1,190	1,190	1,190
	NAE-3	Training of Researchers, Extension Staff and Statistics Staff	2,520	2,520	2,520
	NAE-4	Intensive Extension Guidance Program	15,820	15,820	15,820
Agricultural Production		Subtotal	25,060	21,860	21,860
	NAA-1	Collection and Organization of Agricultural Statistics	2,560	2,060	2,060
	NAA-2	Agricultural Exhibitions and Festivals	1,400	1,400	1,400
	NAA-3	National Project for Plant Protection and Aerial Spraying	10,000	7,500	7,500
	NAA-4	Agricultural Technology Transfer to Farmers Project	10,000	10,000	10,000
	NAQ-1	Development and Improvement of Plant Quarantine	1,100	900	900
Livestock		Subtotal	79,320	72,520	74,576
	NLL-1	Rangeland Revegetation Project in Southern Region	3,552	3,552	3,552
	NLL-2	Animal Health and Disease Control Project	31,423	29,367	31,423
	NLE-1	Livestock Extension Development Project	632	632	632
	NLR-1	Livestock Research Development Project	6,550	6,050	6,050
	NLM-1	Livestock Marketing Improvement Project	7,604	7,604	7,604
	NLL-3	Livestock Input Company Project	1,359	1,359	1,359
	NLL-4	Small Farm Development Support Project	25,899	21,655	21,655
	NLL-5	Livestock Specialized Services Program	2,301	2,301	2,301
	Distribution		Subtotal	30,067	30,067
ND-1		Establishment of Wholesale Market	18,326	18,326	18,326
ND-2		Supply and Demand Forecast of Agricultural Produce	444	444	444
ND-3		Establishment of Shipping Organization for Farmers	1,220	1,220	1,220
ND-4		Fortification of PAMAP	10,077	10,077	10,077
Agricultural Produce Processing		Subtotal	10,918	10,918	10,918
	NP-1	Establishment of Private Company for Agro-Industry and Supply of Agricultural Inputs and Services	5,100	5,100	5,100
	NP-2	Establishment of Agro-Industrial Complex for Processing of Dates, Limes and Tomatoes	1,410	1,410	1,410
	NP-3	Establishment of Pickling and Vinegar-Processing Plant	1,782	1,782	1,782
	NP-4	Establishment of Coconut-Processing Plant	2,626	2,626	2,626
Inter-Sectoral		Subtotal	43,644	41,144	41,144
	NI-1	Integrated Agricultural Development Project in Nejd	16,553	16,553	16,553
	NI-2	Improvement and Maintenance of MAF Facilities	20,991	20,991	20,991
	NI-3	Artificial Rainfall Project	2,500	0	0
	OI-1	Citizen's Compensation against Natural Crisis	3,000	3,000	3,000
	OI-2	Master Plan for Development of Date Palm Cultivation	600	600	600
Total			588,606	403,866	479,737
		MAF Budget	557,333	372,593	448,464
		PAMAP Budget	31,273	31,273	31,273
		Agricultural Investment	535,524	350,784	426,655

Share by Sector



Share by Region

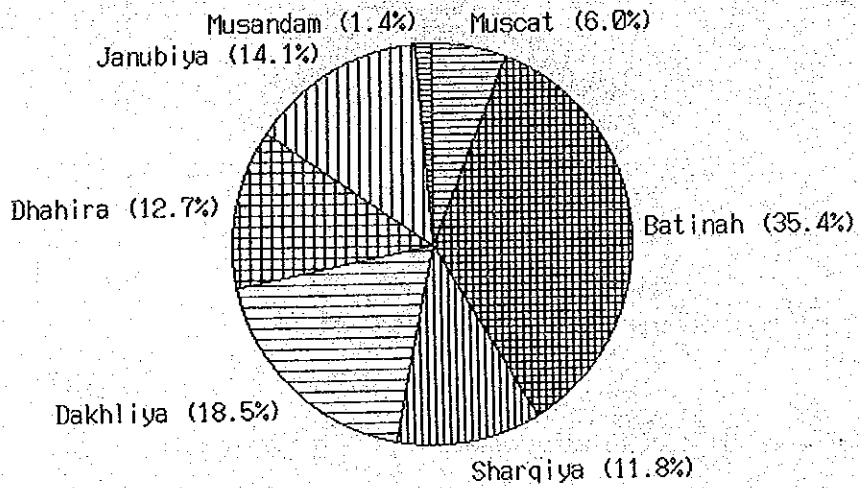
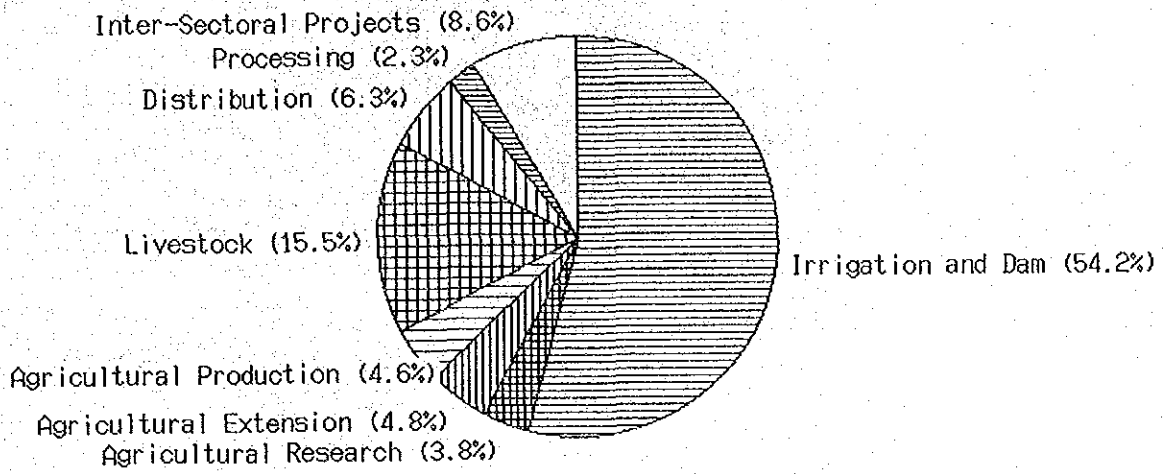


Figure 1 Sectoral and Regional Breakdown of the Budget Outlay for the 10-Year Agricultural Development Plan

Share by Sector



Share by Region

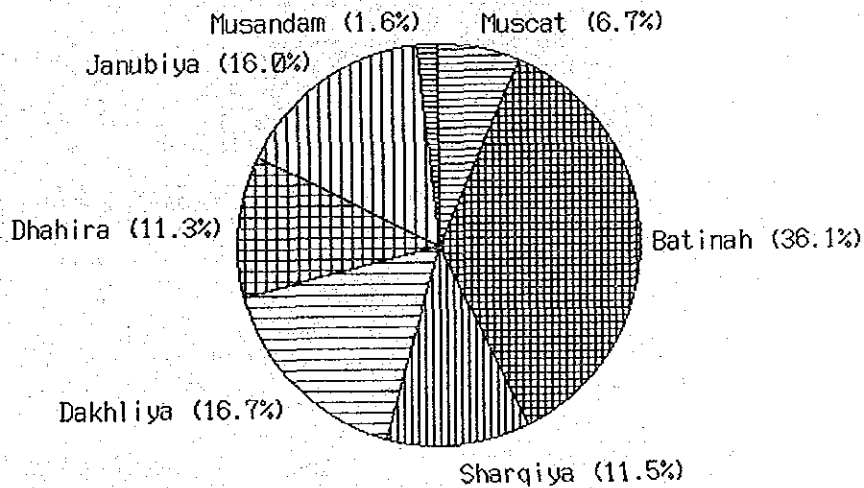
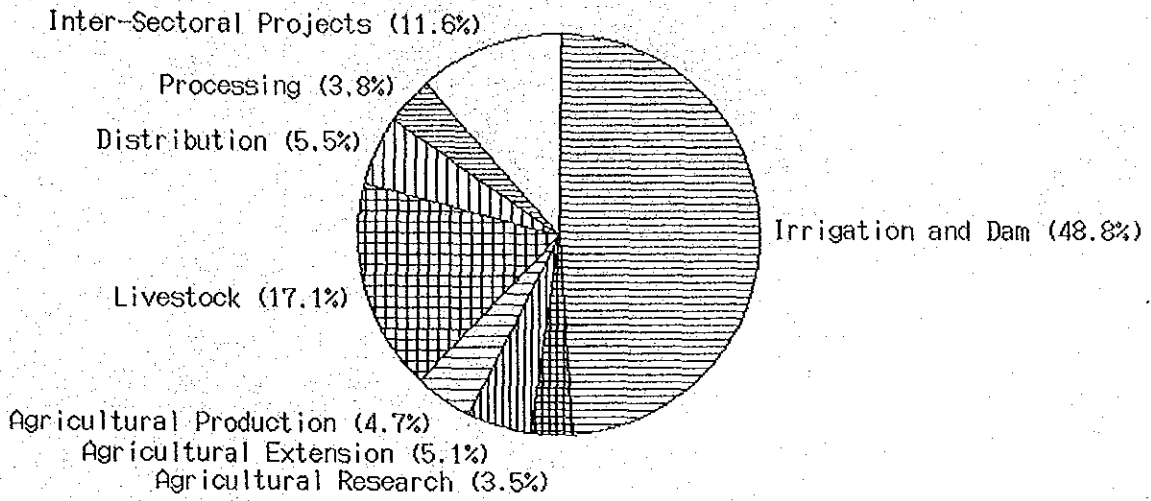


Figure 2 Sectoral and Regional Breakdown of the Budget Outlay for the 10-Year Agricultural Development Plan (Alternative 2)

Table 2 Budget Total - 5-Year Plan

SECTOR	PROJECT NUMBER	NAME OF PROJECT/PROGRAM	TOTAL BUDGET (1000RO)
Irrigation and Dam	NW-1	Improvement of Irrigation System and Centrally-Controlled Water-Distribution System	19,800
	NW-2	Subsidy for New Irrigation System Project	16,250
	NW-3	Legal Framework for Agricultural Water Use	170
	NW-4	Recharge Dams	48,025
	NW-5	Sub-surface (Underground) Dams	2,500
	NW-6	Aflaj	29,670
	NW-7	Wells	9,000
	NW-8	Springs	1,969
	NW-9	Erosion Control and Protection of Agricultural Land against Floods	3,870
	NW-10	Survey and Monitoring	4,264
Agricultural Research			9,625
	NAR-1	Support for Agricultural Research Stations	2,710
	NAR-2	Establishment of New Research Units and Laboratories	3,075
	NAR-3	Development and Establishment of Experimental Farms and Nurseries	1,040
	NAR-4	Forestry-Improvement Program	1,000
	NAR-5	Establishment of Locust Survey and Central Unit	1,000
Agricultural Extension	NAR-6	Soil Surveys	800
			14,123
	NAE-1	Improvement and Development of Extension Centers and Facilities	3,520
	NAE-2	Establishment of Development Support Communication Center(DSCC)	1,190
Agricultural Production	NAE-3	Training of Researchers, Extension Staff and Statistics Staff	1,503
	NAE-4	Intensive Extension Guidance Program	7,910
			12,960
	NAA-1	Collection and Organization of Agricultural Statistics	1,360
Livestock	NAA-2	Agricultural Exhibitions and Festivals	700
	NAA-3	National Project for Plant Protection and Aerial Spraying	5,000
	NAA-4	Agricultural Technology Transfer to Farmers Project	5,000
	NAQ-1	Development and Improvement of Plant Quarantine	900
			47,546
Distribution	NLL-1	Rangeland Revegetation Project in Southern Region	2,352
	NLL-2	Animal Health and Disease Control Project	16,425
	NLE-1	Livestock Extension Development Project	482
	NLR-1	Livestock Research Development Project	4,050
	NLM-1	Livestock Marketing Improvement Project	6,371
	NLL-3	Livestock Input Company Project	1,359
	NLL-4	Small Farm Development Support Project	15,285
	NLL-5	Livestock Specialized Services Program	1,222
Agricultural Produce Processing			15,397
	ND-1	Establishment of Wholesale Market	3,656
	ND-2	Supply and Demand Forecast of Agricultural Produce	444
	ND-3	Establishment of Shipping Organization for Farmers	1,220
Inter-Sectoral	ND-4	Fortification of PAMAP	10,077
			10,474
	NP-1	Establishment of Private Company for Agro-Industry and Supply of Agricultural Inputs and Services	5,100
	NP-2	Establishment of Agro-Industrial Complex for Processing of Dates, Limes and Tomatoes	1,134
Total	NP-3	Establishment of Pickling and Vinegar-Processing Plant	1,614
	NP-4	Establishment of Coconut-Processing Plant	2,626
Total			32,333
	NI-1	Integrated Agricultural Development Project in Nejd	13,242
	NI-2	Improvement and Maintenance of MAP Facilities	16,991
	NI-3	Artificial Rainfall Project	0
	OI-1	Citizen's Compensation against Natural Crisis	1,500
	OI-2	Master Plan for Development of Date Palm Cultivation	600
Total			277,976

Share by Sector



Share by Region

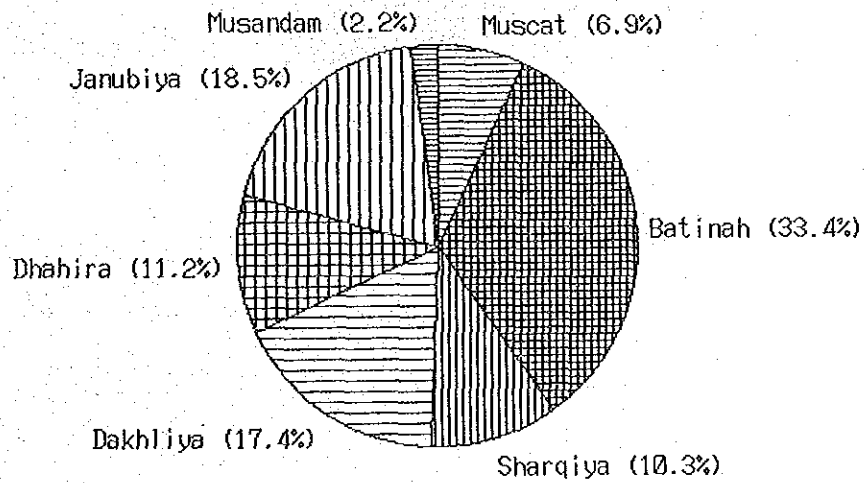


Figure 3 Sectoral and Regional Breakdown of the Budget Outlay for the 5-Year Development Plan

VOLUME 1 MAIN REPORT

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ABBREVIATIONS

Abbreviation	Full Word
AUE	Animal Unit Equivalent
bpd	barrel per day
CCEPP	Council for Conservation of Environment and Prevention of Pollution
CCEWR	Council for Conservation of Environment and Water Resources
CCPP	Contagious Caprine Pleuropneumonia
CVIL	Central Veterinary Investigation Laboratory (at Rumais)
DAW	Department of Animal Wealth
DC	Development Council
DCC	Dhofar Cattle Company
DGI	Directorate General of Irrigation Affairs
DGLA	Directorate General of Labor Affairs
DGSR	Directorate General of Agriculture and Fisheries for Southern Region
ETS	Education /Training System
FRMD	Forestry and Rangeland Management Department
GCC	Gulf Cooperation Council
GGC	Government Gas System
ICOR	Incremental Capital Output Ratio
LFPR	Labor Force Participation Rate
MAF	Ministry of Agriculture and Fisheries
ME	Ministry of Environment
MEW	Ministry of Electricity and Water
mgpd	million gallons per day
MCI	Ministry of Commerce and Industry
MH	Ministry of Housing
MLAM	Ministry of Land Affairs and Municipalities
MLVT	Ministry of Labor and Vocational Training
MRM	Ministry of Regional Municipalities
MSA	Ministry of Social Affairs
MSCF	million standard cubic feet (one barrel of oil=6 MSCF of gas)
MWR	Ministry of Water Resources
NGC	National Gas Company

OAJCETC Omani-American Joint Commission for Economic and
 Technical Cooperation
 OAPEC Organization of Arab Petroleum Exporting Countries
 OBAF Oman Bank for Agriculture and Fisheries
 OCC Oman Cement Company
 ODB Oman Development Bank
 OFM Oman Flour Mills
 OMC Oman Mining Company
 OPEC Organization of Petroleum Exporting Countries
 ORC Oman Refinery Corporation
 PAMAP Public Authority for Marketing Agricultural Produce
 PAWR Public Authority for Water Resources
 PDO Petroleum Development Oman
 PDRY Peoples' Democratic Republic of Yemen
 PU(MAF) Planning Unit
 RCC Raysut Cement Company
 RIA Rusail Industrial Authority
 RIE Rusail Industry Estate
 RO Rial Omani
 ROP Royal Oman Police
 SGRF State General Reserve Fund
 SITC Standard International Trade Classification
 tpd ton per day
 tpy ton per year
 UAE United Arab Emirates
 WRC Water Resources Council
 YAR Yemen Arab Republic

GLOSSARY

1. Arabic Glossary

aflaj	the plural form of "falaj"
falaj	traditional method developed centuries ago of delivering water for irrigation and domestic purpose
gelbah	outlining plot of water interception
gunat	underground tunnel
Jabel	mountain
souq	local market
wadi	watercourse dry except in the rainy season
wali	local governor of willayat
willayat	governorate under the jurisdiction of a wali

2. Measurements

Length

mm	millimetre
cm	centimetre
m	metre
km	kilometre

Area

sq .cm	square centimetre
sq .m	square metre(s)
sq .km	square kilometre
ha	hectare
fd	feddan = 0.42 ha
MSM	million square metre

Volume

l	litre
cu .m	cubic metres
MCM	million cubic metres
bal	1 barrel = 36 U.K. gallons
gal	1 U.K. gallon = 4.546 litres

Weight

mg	milligram
g	gram
kg	kilogram
ton	metric ton

Others

EC	electric conductivity
EL	elevation above mean sea level
sec	second
min	minute
hr	hour
Min	minimum
Max	Maximum
%	percent
FY	fiscal year
GDP	gross domestic product

3. Exchange Rate (November, 1989)

RO (Rial Omani)	RO 1 = US\$ 2.604 = JY 375.0
US\$(US Dollar)	US\$1 = JY 144.0 = RO 0.384
JY(Japanese Yen)	JY 1 = RO 0.00267 = US\$ 0.00694

CHAPTER 1

INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 Background of the Study

After his Majesty Sultan Qaboos ascended the throne in 1970, the economy of Oman made rapid progress as the government developed the domestic economy with the support of external income generated by crude oil exports.

In particular, the social infrastructure (freeways, schools, hospitals, etc.) in the capital district centered around Muscat has been well established.

However, the sudden fall of international oil prices in 1986 greatly affected the economy, as the revenue of the country depended mostly upon oil export income. As a result, the economic situation has worsened.

The Fourth Five-Year Development Plan (1991-1995) is to be formulated with an aim to stabilizing the country's economy through diversification of national income by promoting alternative industries, particularly in light of the fact that the country's oil resources have been found to be limited.

The government has realized that the agricultural sector will play a central role in diversifying and stabilizing the nation's economy. This is particularly true given such factors as the large population employed in the agricultural sector, increasing migration of farm labor to urban areas, disparity in levels of development between rural and urban areas, and growing imports of agricultural products.

To address the above issues, a comprehensive agricultural development policy is essential, covering a broad range of concerns including effective use of limited natural resources -- particularly water -- improvement of food self-sufficiency, development of human resources, invigoration of the regional economy, stemming of the flow of population from the countryside into urban areas, and a sufficient level of government participation in the market through price adjustments and

subsidies, whereby the producing sector is adequately protected and at the same time the consumer does not bear an excessive share of the cost for agricultural production.

Accordingly, the Omani government has urgently requested the Japanese government to extend technical cooperation in formulating such an agricultural plan.

In response, the Japanese government dispatched a project-identification mission in March, 1989, to confirm the contents of the study requested by the Omani government. In July, 1989, the Japanese government sent a preliminary survey mission and came to an agreement with the Ministry of Agriculture and Fisheries of Oman regarding the scope of work for the preparation of a Master Plan for Agricultural Development in the Sultanate of Oman.

1.2 Objectives of the Study

The objectives of the present study are as follows:

- 1) to formulate a Master Plan for Agricultural Development for the purpose of achieving harmonious socio-economic and physical development, taking into full account previously established National Development Plans;
- 2) to formulate suitable programs and to identify priority projects within the context of the purposes mentioned above.

The study area encompasses the entire Sultanate.

1.3 Implementation of the Study

An extremely tight study-implementation schedule was formulated in order that study findings would be available for incorporation into the Fourth Five-Year Development Plan to commence in 1991.

The study progressed in two phases consisting of three and two

stages, respectively. Study components for each phase are discussed below. The work schedule, including timing for report submittal is depicted in Figure 1.1.

(1) Phase 1

- a) Submission of Inception Report
- b) Stage 1: Analysis of the present situation.

Identified the comparative advantages of agriculture in Oman on the one hand, and current constraints on its development on the other.

- c) Stage 2: Identification of development potentials.

Identified the most promising development sectors, and related development sectors by evaluating their potential for increased agricultural productivity, and their interrelation.

- d) Submission of Progress Report I

- e) Stage 3: Establishment of development targets.

Formulated the prospect of long-term national food supply and demand, set up socio-economic, practical and sectoral development frames of reference, and formulated a long-list of development projects with rough cost estimates.

- f) Submission of Interim Report

(2) Phase 2

- g) Stage 4: Establishment of development strategies.

Established development strategies on the basis of development targets formulated in Stage 3.

- h) Stage 5: Formulation of 10-year agricultural development plan and

Study Item	FY 1989												FY 1990											
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
I. Preliminary Preparation in Japan																								
II. Phase 1																								
1. Study in Oman																								
2. Study in Japan																								
3. Presentation of Interim Report																								
III. Phase 2																								
1. Study in Oman																								
2. Study in Japan																								
3. Presentation of Final Draft Report																								
4. Completion of Final Report																								
(Submission of Reports)																								
(1) Inception Report																								
(2) Progress Reports (1, 2)																								
(3) Interim Report																								
(4) Final Draft Report																								
(5) Final Report																								

Explanatory notes : Preliminary preparation term Operation term in Oman Operation term in Japan Presentation of reports Other operations

Figure 1.1 Work Schedule

identification of priority programs and projects.

Systematized development targets, strategies, and policies; established sectoral development programs; prepared a short-list of high-priority projects and procedure for development phasing for the Fourth Five-Year Development Plan; and formulated alternative budget plans for development projects.

- i) Submission of Progress Report II
- j) Submission of Draft Final Report
- k) Submission of Final Report

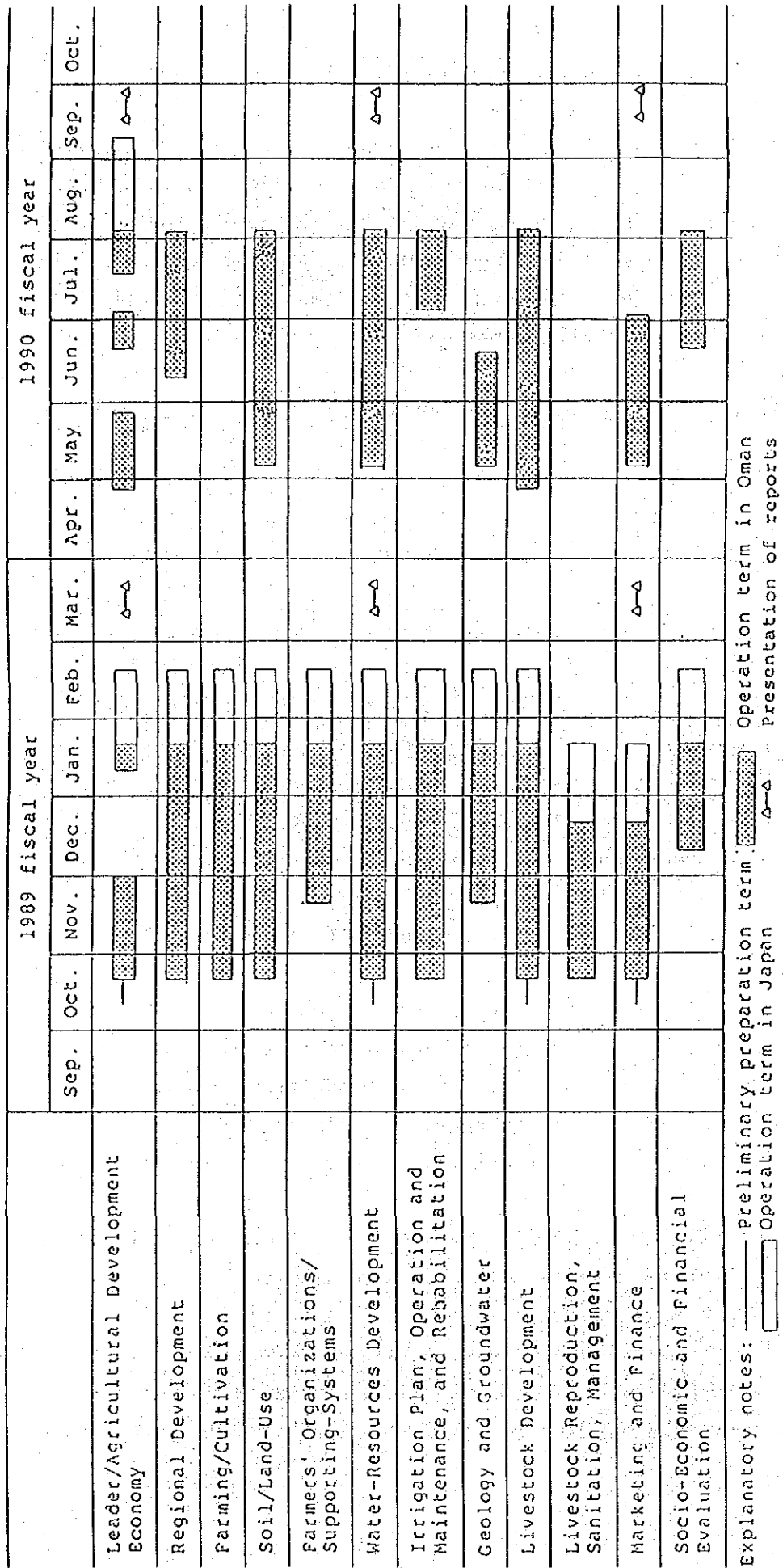
The JICA team, consisting of 12 experts was grouped as follows to address the multi-sectoral nature of the study.

- (1)Basic planning - Agricultural development economy
- Regional development
- (2)Water resources - Water-resources development
development and - Irrigation
irrigation - Geology and groundwater
- (3)Agriculture - Farming and cultivation
- Soil and land use
- Supporting systems
- (4)Livestock - Livestock development
- Livestock reproduction, sanitation and management
- (5)Economy and - Marketing and finance
marketing - Socio-economic and financial evaluation

Overall coordination of the study was performed by the Basic Planning group. Staffing schedule is shown in Figure 1.2.

Field study under Phase 1 began on October 23, 1989, and that for Phase 2 concluded on 2 August 1990. As can be seen, the study activities were compressed into an extremely short period, requiring maximum

Figure 1.2 Staffing Schedule



efficiency in the use of time available.

At the request of the Omani government, the study team has expanded Progress Report II to assure a more detailed nature of the Draft Final Report. This request by the Omani side was based on a need that as much of the body of study results and recommendations as possible be collected and made available for the planning of the Fourth Five-Year Development Plan.

During Phase 1, field reconnaissance was implemented in the Interior, Salalah plain and especially the most important agriculture zone, Batinah, in order to best understand Omani agriculture. The team selected representative examples of farmers in these areas and studied current conditions of agriculture. The team also visited agricultural research centers, extension centers, livestock research center, marketing facilities for agricultural products, agro-industry factories, and organizations and agencies relating to the study.

The study team collected, collated and analyzed data on natural conditions, socio-economic conditions, agricultural production and agro-related government policy, and then applied its findings to identify agricultural development targets under the Master Plan.

In Phase 2, results from Phase 1 formed the basis for a development strategy to achieve targets. Discussions were held with the Minister of Agriculture and Fisheries (MAF) and other concerned officials in the government on agricultural policy and projects proposed in the Interim Report. Views elicited in these discussions have been given the utmost consideration in the preparation of this report. The 10-year and 5-year Agricultural Development Plans ultimately adopted will have a shaping effect on the entire national development policy, and the study team has accorded the highest priority to thorough dialogue with MAF, the Development Council and other concerned policy-making bodies throughout the course of the study. The resultant Master Plan reflects their aspirations to the maximum extent possible.

His Majesty Sultan Qaboos has taken a leading role in promoting

agriculture in the Sultanate, and designated 1988-1989 as Agricultural Years. The team most deeply welcomes this stance at the forefront of the government's effort at development in this important sector.

Farming is an inherently difficult sector to develop rapidly. The farmer must grapple with the vicissitudes of the natural environment, and in the case of Oman these are formidable: limited water resources and extremely high temperatures. Given the general lack of familiarity on the part of Omani farmers with modern agricultural practices, considerable investment in terms of time and funding will be necessary to achieve the goals which have been set. However, given the Omani experience in significant economic development over the past 20 years, it is anticipated that application of this to the agriculture sector under the envisaged 10-year development program will bring about a great leap forward in Omani agriculture.

The 10-year Agricultural Development Plan basically builds on previous agricultural policy. However, it places particular emphasis on efficient use of the limited water resources, and upgrading of farmer technical levels to achieve agricultural production targets.

Ultimately, of course, the success of the Master Plan will rest on the degree to which it can nurture Omani self-reliance in all aspects of agriculture as an extension of the government's high priority Omanization policy.

1.4 Structure of Final Report

The Final Report is composed of 5 volumes as follows:

volume 1. Main Report

volume 2. Present Situation

volume 3. Ten-year Master Plan for Agricultural Development

volume 4. First Five-year Agricultural Development Plan

volume 5. Appendix

volume 5 Appendix contains the GDP forecast, prospect for demand and

production for agricultural products, description of project/program in the 10-year Master Plan for Agricultural Development, and an improvement plan for cultivation and farming.

Some chapters in volume 4 (First 5-year Agricultural Development Plan) are repetitions of those in volume 3 (10-year Master Plan for Agricultural Development). For convenience if using the report, volume 4 contains all items concerning the 5-year Agriculture Development Plan. Readers can understand the details of the 5-year Agricultural Development Plan through volume 4 alone.

CHAPTER 2

PRESENT SITUATION

CHAPTER 2 PRESENT SITUATION

2.1 Outline of Natural Situation

2.1.1 Topography

The Sultanate of Oman is situated on the extreme southeastern corner of the Arabian Peninsula and has an area of 300,000 km² with a coastline which extends for 1,700 km. The backbone of the country is the Hajar mountain range, running down the center of northern Oman and reaching a height of 3,075 m at Jabal Akhdar. This range stretches from Ras Al-Hadd near the town of Sur in the southeast across to the Musandam Peninsula in the north. The Musandam Peninsula protrudes out into the Strait of Hormuz in the north.

Between the Hajar mountain range and the Gulf of Oman is the most fertile cultivated area of Oman known as the Batinah coastal alluvial plain. This stretches northwest of Muscat towards the UAE border. Southwest from Ras Hasik, near the Khuriya Muriya Islands, through to the border with Yemen, the Jabal Samhan, Qara and Qamar mountain ranges climb to nearly 1,500 m (Dhofar Mountains) and border the coastal plain of Salalah. A great desertic flat land, Rub'al-Khali (the empty Quarter) lies between the Hajar and Dhofar Mountains. Smaller hills are found in the inland plains which slope away from the two main mountain ranges.

2.1.2 Climate

The Sultanate generally has an arid desert climate, with some variations. Along the Batinah coast, it is hot and humid during the summer months, while in the Interior, the climate tends to be hot and dry all year round. In the northern mountainous areas and the Southern Region, the climate is typically more temperate in both summer and winter.

(1) Winds

Oman is located from 16° 37' N to 26° 30' N latitude, and from 51° 50' E

to 59°40' E longitude, and is therefore under the influence of the equatorial convergence zone. This is a belt of converging trade wind systems that encircles the earth near the equator. In summer, this system reaches southern Oman and brings monsoon conditions to the Dhofar Mountains. In winter, the system moves south of the equator. The predominant airflow in winter is from the north, while in summer it is from the south. The former brings significant rainfall to the north of the country. The latter creates a monsoon-based, near-tropic climate in the south.

(2) Rainfall

Rainfall is generally irregular, except in the Southern Region which receives the annual monsoons between June and October, and does not typically exceed 250mm per annum in most areas of the country. The Hajar mountains and the Dhofar mountains receive rainfall from the winter northerly winds and the summer southerlies associated with the monsoons in southern Oman, respectively. These higher and more regular rains in the catchment areas are the main water resources for the aquifers under the Batinah plains and the Salalah plains.

Rainfall on the Batinah plain itself is essentially confined to the winter, with little rainfall during the summer months, which demand peak water consumption. This summer dry period is the result of a rainshadow formed by the Hajar mountains.

In the Salalah plain, average rainfall in the past five years (1985 to 1989) was 79 mm per annum, although there were large annual fluctuations, as in most areas of the country. Rainfall increases rapidly with ascending altitude to the ridge of the Dhofar mountains where precipitation is estimated two-to-three times that on the Salalah plain. Seasonal mists also accompany the monsoon season and are in large part responsible for the lush vegetation found in the southern Jabal.

(3) Temperature

Average monthly temperature is the lowest in January and the highest

in June. It varies from 20°C in winter to 35°C in summer. Coastal temperatures are more moderate owing to the influence of cool offshore winds in summer. Salalah has a more temperate climate with a mean temperature variation from 23°C in January to 30°C in June. Temperatures in the mountains are naturally lower. Average monthly temperatures at Saiq, 1,750 m above MSL, are 10°C in January and 25°C in June. Inland from the mountains, the temperatures exhibit contrasts typical of a desert climate: from 50°C in the summer to freezing on winter nights.

(4) Humidity

In the northern coastal part of Oman, high mean monthly percentage relative humidities are generally recorded in summer and in winter. While the lowest value is given in May, the downward tendency begins in September or October. Inland, the fluctuation pattern of mean monthly relative humidities (MMRH) throughout the year is virtually identical to that in the northern coastal area, although its values are lower than the coastal area. In Salalah, MMRH peaks in summer and bottoms out in winter.

In the past five years, MMRH varied from 13 % in May to 88 % in August at Seeb, 39 % in May to 95 % in September at Sohar, and 23 % in July to 89 % in January at Sur. Maximum relative humidity reached 100 % for a number of months and went down 1 % at Buraimi and Saiq. At Salalah the variation of MMRH went from 27 % in February and November to 98 % in August.

(5) Cloud Cover

Average cloud coverage in Muscat, varies from 0.6 oktas in May and October to about 2.5 oktas in January and July.

In the Salalah area, during the monsoons in July and August, maximum coverage peaks at almost 8 oktas. By June the value has risen to about 6 oktas from the general value at 1 to 3 oktas.

(6) Evaporation

A number of factors such as location, time of year, cloud cover and humidity levels affect evaporation. Evaporation rates usually peak in the summer when temperatures and winds are high and humidities are low. These rates are many times the mean annual rainfall rates throughout the country. The annual open water evaporation rate in South Batinah is 1,411 mm; at Al Ayn, it rises to around 2,360 mm; rates at Ibra are estimated to be 2,216 mm. Obviously these figures (20-30 times the mean annual rainfall) highlight the critical need for suitable irrigation methods in order to promote and maintain agriculture.

2.1.3 Geology

Oman basically consists of two geological regions. One is the Oman Mountains and their adjacent area in the north; the other is the desert area and southern mountains in the south. The differences between them are clearly identified by topography and climate.

The Oman Mountains form part of the Alpine range, and are located on the southeastern edge of the Arabian Sub-continent, adjacent to the Gulf of Oman. Within these mountains, six major rock sequences are found. From bottom to top, they are as follows:

- i) A basement of granites and gneisses, partly metamorphosed sediments and meta-volcanics. The basement was folded in the pre-Middle Permian orogeny.
- ii) The Hajar Super-Group and the Aruma Group - a relatively simple sequence of mainly shallow-marine carbonates that range in age from the Middle Permian to the Late Cretaceous.
- iii) The Sumeini Group - local-thrust sedimentary sequences comprising mainly calcareous rocks that range in age from Permo-Triassic to Middle Cretaceous. These sequences are stratigraphically overlain by Middle Cretaceous rocks.
- iv) The Hawasina Group - a complex association of folded and

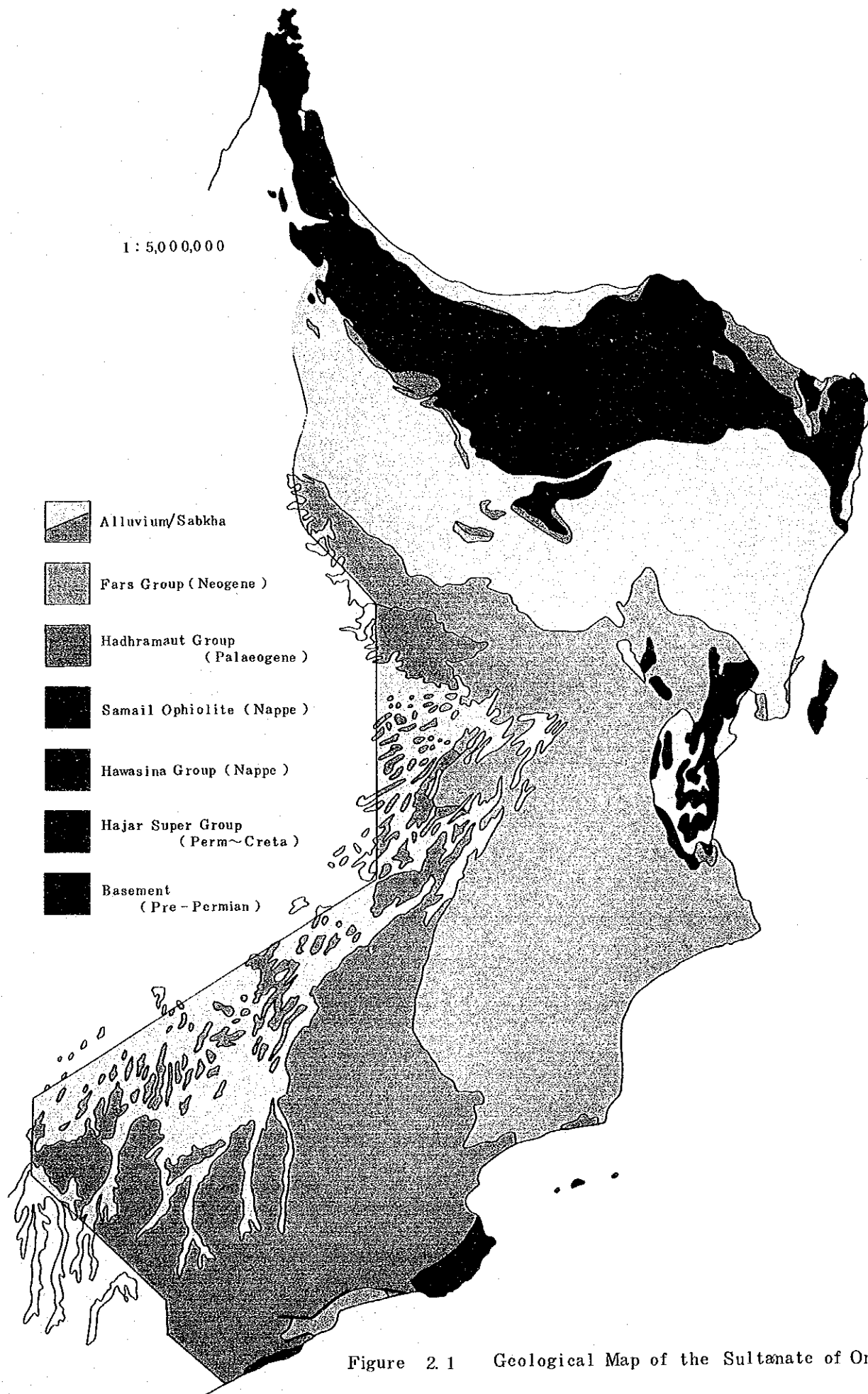


Figure 2.1 Geological Map of the Sultanate of Oman

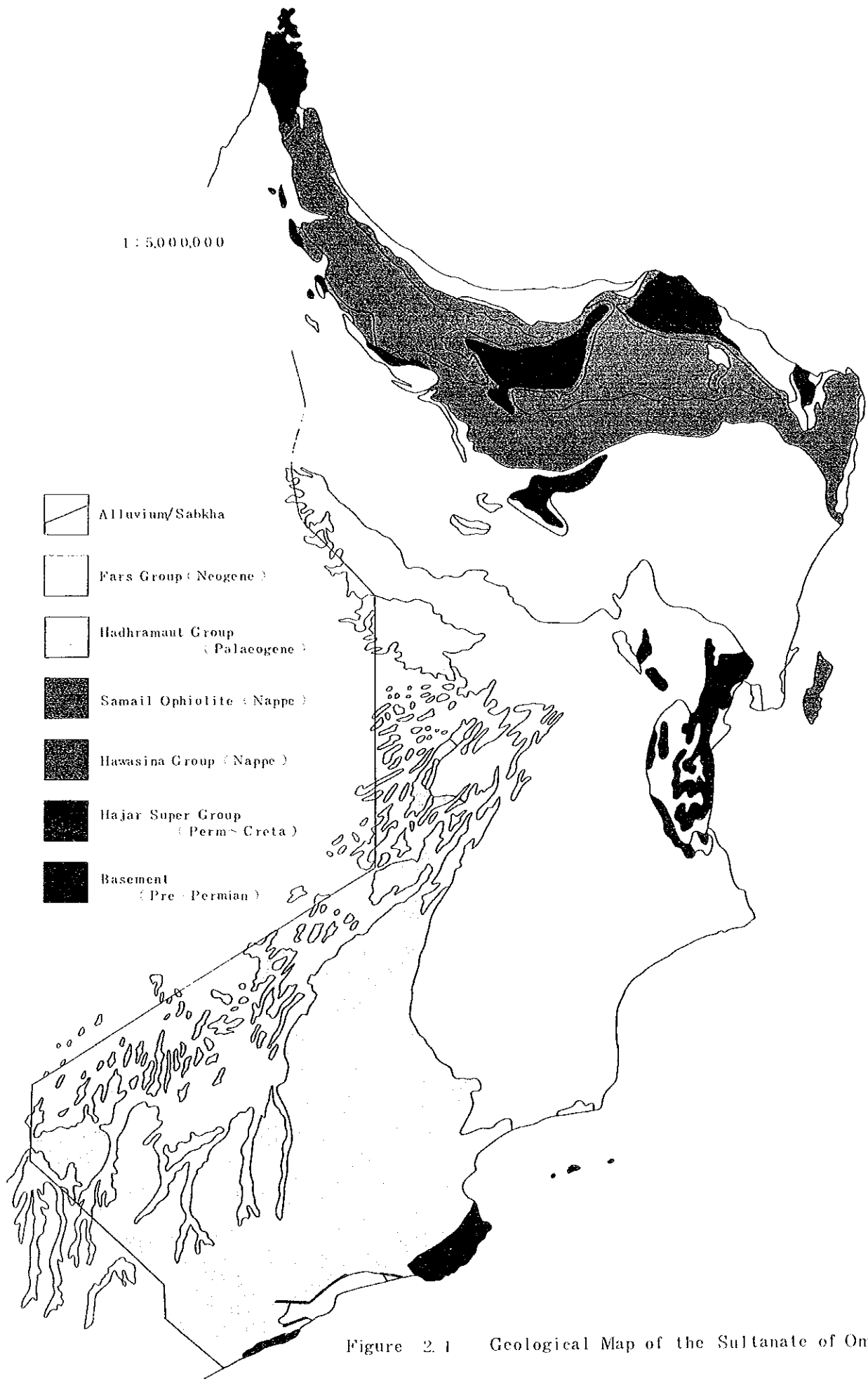


Figure 2.1 Geological Map of the Sultanate of Oman

faulted lithological sequences comprising quartz sand and carbonate turbidites, silicified limestone and radiolarian cherts containing fossils from the Triassic through Middle Cretaceous age, and shallow-marine limestone of the Permian and the Triassic ages that are either associated with deeper-water sediments or have a substrate of sheared basaltic pillow lavas.

v) The Samail Ophiolite - a thick sheet of basic and ultrabasic rocks comprising peridotites, gabbros, diabases and spilitic lavas, which overlies the Hawasina nappes with intermittent contact.

vi) The Hadhramaut Group and Fars Group - a sequence of mainly shallow-marine carbonates, locally conglomeratic, which overlies all older sequences without conforming precisely to them.

2.1.4 Soil

There are two different soil maps which deal with the Sultanate of Oman based on the United Nations Food and Agriculture Organization (FAO) Soil Classification System. The first one, "Soil Map of the World", has a scale of 1:5,000,000 and was drawn up by the FAO in 1977. According to this map, Oman is mostly made up of two types of soil, Yermosols and Lithosols. Only in certain areas can Solonchaks and Regosols be found. Generally speaking, in northern Oman, there are Haplic Yermosols in the coastal areas, Lithosols in the mountainous areas and Calcic Yermosols in inland areas. In southern Oman, there are mainly Calcic Yermosols and some Gypsic Yermosols in inland areas.

The other map, called the "Agricultural Resources Map", was drawn up in 1988 utilizing LANDSAT imagery. The scale of the map is 1:250,000. According to it, there are seven types of soil in Oman: Yermosols, Arenosols, Fluvisols, Regosols, Solonchaks, Solonetz and Lithosols. Some are indicated as being a mixture of two of those soil types because of limitations of the mapping scale.

The regional characteristics of the soil are shown as follows:

(1) North Batinah and South Batinah Region

In this region, soil is formed by an alluvial process. The most suitable lands for agriculture exist on the accumulation plain, where flood water from the mountains carries fine-textured materials and deposition occurs. This area comprises Yermosols of silt and fine sands and most farm lands are in this region which means that it has the most development potential for agriculture. However, in some areas near the sea, salt accumulation occurs in the soil because of sea water intrusion. Therefore, some farms have been abandoned. Recently, new farm lands have been expanding to the inland area in a search for good soil for agriculture. Interfluvial plains are covered with gravel and these areas are generally considered to have low suitability, but, because of a recent increase in the need for new farm lands, some of these areas are used for agricultural production using new irrigation systems.

(2) Dhahira Region (including Buraimi Region)

Soil in this area is formed mainly by alluvial and eolian processes. The most important soils are medium-to-fine-textured Yermosols which can be found on the limestone alluvial fans.

(3) Interior Region (including Wusta Region)

The most agriculturally important areas in this region are the alluvial plains in the north. The most suitable soils for agriculture are Yermosols derived from the limestone ranges. From them, the flood water brings weathered materials to these plains, and makes fine-textured soils.

(4) Sharqiya Region

Like the Dhahira Region, soil in the Sharqiya Region is formed mainly by alluvial and eolian processes. Again, the most suitable soils for

agriculture are Yermosols, and the areas with Yermosols are almost entirely under cultivation. The areas which are considered to have the highest potential for agricultural development are interfluvial plains with Arenosols.

(5) Southern Region

The most important soils for agriculture, Yermosols, exist in the Salalah Plain. These soils are derived from the northern jabal. Clay and silty soils with a well-developed structure exist in the Jabal area, which are used as rangelands for livestock.

In Nejd, the major soils are also Yermosols and the lands which are suitable for agriculture are composed almost completely of Yermosols.

2.1.5 Natural Resources

(1) Oil

Exploration for oil and gas continues in Oman, and five new oil finds were reported by Petroleum Development Oman (PDO) in central and southern Oman during 1987. Today the company has 50 producing oilfields.

The search for oil in the Sultanate goes back to 1924. It was not, however, until 1954 that a serious and methodical start was made by the Iraq Petroleum Company (IPC) operating from its base at Duqm on the south-east coast of Oman. IPC withdrew and the concession was granted to PDO, of which Shell was the major shareholder, the minority shareholders being Compagnie Francaise des Petroles and Partex. In 1962 the first oil find was made at Yibal.

The first exports of oil from the Sultanate began in 1967. In more recent years oilfields have been discovered in south and central Oman. As the world price of oil rose steeply in the 1970s, so the Sultanate's smaller fields in south Oman containing heavy oil became commercially viable.

The Iraq-Iran conflict highlighted the strategic advantage of Oman's outlet at Mina Al Fahal on the Gulf of Oman where tankers were able to call in safety.

Production of oil rose steeply in the years between 1967 and 1970, reaching 332,000 bpd, but by 1980 production had fallen to 282,000 bpd. However, by this time oil had been discovered in commercial quantities in the south, and the next five years saw an upsurge in production capacity which reached a peak of 600,000 bpd in 1986.

Oman is not a member of OPEC or OAPEC, but has always kept in step with oil prices maintained by OPEC.

PDO, in which the government now holds a 60% stake, remains the country's main oil producer, but there are a number of other oil companies either producing or prospecting for oil in the Sultanate.

All Oman's oil is pumped into the main pipeline from Marmul to Mina Al Fahal. Oil from the southern fields is piped from Marmul to the main pipeline at Nahada. PDO has introduced enhanced oil recovery (EOR) methods in some of its fields. At Marmul, steam injection is used to recover heavy crude oil, the first of its kind in the Middle East.

An offshore discovery of oil has been made by the International Petroleum Corporation (IPC) also known as the Lundin Group, in their concession area off the west coast of the Musandam Peninsula.

An oil refinery was constructed at Mina Al Fahal and went into operation in 1982 to fulfill the requirements of the domestic market. It originally had a capacity for refining 50,000 bpd, but with the continuous increase in the usage of refined products in the Sultanate its production capacity was increased to 80,000 bpd in 1987.

New discoveries of oil are maintaining the level of proven reserves, which at the beginning of 1988 was approximately 4 billion barrels.

(2) Gas

Oman has large reserves of natural gas which are playing an increasingly important role in the development of the country and its industries. At the beginning of 1988 reserves of associated and non-associated gas were estimated to be 2.70 and 6.63 trillion cubic feet, respectively. Natural gas is being used most notably in the development of the Rusayl Industrial Estate, saving valuable fuel oil. The government gas system was started in 1978 with the construction of a gas pipeline linking Yibal with the Al Ghubra power station and desalination complex near Muscat.

The government gas system is wholly owned by the State and operated by PDO. In order to increase reserves to meet industrial demand well into the 21st century, the government has financed a PDO gas exploration program which started in 1984. This program has resulted in confirmed discoveries of major quantities of gas, notably at Yibal in the Khuff formation below the earlier developed oilfield, where significant quantities were found as well as, coincidentally, an oil reservoir.

A natural gas liquids (NGL) plant at Yibal started operating in 1979, and similar plants are now in production at Fahud and Saih Nihayda to clean gas and extract light hydrocarbon liquids as additives to improve the quality and quantity of crude oil. In 1980 a liquid petroleum gas (LPG) plant was added at Yibal to extract butane and propane, so "flaring" has now been significantly reduced.

(3) Minerals

The existence of copper ore in the north of Oman has been known about for centuries. Three thousand years ago the ore was being mined at Magan -- as Oman was then known -- and processed and exported to the Sumerian Empire to the north. Now it is being mined once again from some of the same deposits in the Wadi Al Jizzi area near Sohar, at the Bayda and Lasail mines.

Chromite is obtained from open pit mines in Wadi Rajmi. Recent

exploration work in the Sultanate has revealed additional chromite reserves in excess of one million tones in the Rajmi and Samad areas.

In 1987, additional deposits of copper ore were identified in a south-east extension of the Lasail mine, and at the present time exploration drilling for copper ore is continuing at Hayl a'Safil near Yankul.

Gypsum, of which large quantities occur in Dhofar in the south, and limestone are being exploited for the cement factories at Raysut in the south and Rusayl in the north. High quality marble is being quarried at several locations, and marble products are being exported by private companies to neighboring countries.

The Ministry of Petroleum and Minerals has no plans at present to exploit mineral resources other than copper and chromite. However, the private sector is encouraged to utilize all these deposits, including industrial minerals and rocks such as limestone, gypsum, marble and the iron laterites which are found in abundance throughout the Sultanate. At present the Sultanate has a number of industries making use of industrial minerals which are related to the construction industry including cement, lime-silica bricks, fiber cement and others.

2.2 Outline of Social Situation

2.2.1 Population

The population of Oman is not precisely known because a census has never been conducted. Therefore, the government and international institutions estimate it independently.

The population figure utilized in the Five-year Development Plans is increasing naturally: from 1.5 million in 1974 (for the First Five-year Development Plan) to 2 million in 1984 (for the Third Five-year Development Plan). However, the Development Council has decided to set the population at 1.5 million at the end of 1989 and its growth rate at 3.5% per annum for 10 years as the basic figure for formulations in the Fourth Five-year Development Plan.

2.2.2 Labor Force

Omanization, given high priority by the government as an important national policy, was not achieved sufficiently until 1985 when the number of foreign workers in the private sector reached a maximum of 280,000, in connection with high economic growth in the Sultanate. After 1985, the number of foreigners decreased slowly.

From a sectoral point of view, the largest declines in the number of foreign workers were in the construction sector and commercial sector. The foreigners working in other sectors tended to increase. Even in the agricultural sector, the number of foreign workers rose from less than 5,000 in 1980 to more than 16,000 in 1987.

2.2.3 Education

The number of government schools for general education reached 678 in 1988/89 compared to 373 in 1980/81. Also, the number of students and teachers, respectively, increased from 106,932 and 5,663 in 1980/81 to

268,722 and 13,970 in 1988/89. The development of Omani education culminated with the opening of the Qaboos University in September, 1986. Technical schools have been established in the fields of agriculture, industry, commerce, etc. since 1979.

2.2.4 Medical Care

The public medical care system has progressed from 2 to 3 clinics in 1970 to 47 hospitals, 86 medical centers and 3 maternity hospitals, as well as 94 private surgeries by the end of 1988. Although all the doctors and nurses employed were from overseas in the initial phase of the development, the government endeavored to educate and train Omani students in foreign countries or newly established nursing schools. Because the Qaboos University has a faculty of medical science, a number of Omani doctors educated in the country can be expected to graduate in the 1990s.

The most eloquent indicator of the progress of medical care is the infant mortality rate. The rate in Oman decreased remarkably from 44 per 1,000 in 1983 to 28 per 1,000 in 1988 after an investigation of the infant mortality rate. This means the target of 30 per 1,000 by 1990 has already been achieved.

2.2.5 Electricity

In 1989, Oman was supplying electricity to 211,405 households. This is difficult to imagine since before 1970 the only source of electricity in the Sultanate was a small generating station. Electricity supply is now taken for granted everywhere, with the exception of two of the most remote wilayats, and the demand continues to increase. By the end of 1988, the supply had been increased to 787 MW in the Muscat area, 95 MW in Dhofar and 360 MW in the remaining areas of the country.

The principal sources of electricity are power stations at Al Ghubra, which has a capacity of 285 MW, the Rusayl Industrial Area, with a 500 MW capacity, and Wadi Jizzi, with a 166 MW capacity.

2.2.6 Water Supply

The water sector has developed remarkably in recent years. In 1970, the volume of water produced from deep wells in the capital area was 156 million gallons. After the completion of a water desalination station in Ghubra, the production of water increased to 8,759.4 million gallons in 1988. In the Southern Region, water production rose from 439.6 gallons in 1977 to 1,757.5 million gallons in 1988. During this time, the government was extending pipelines for water distribution among several towns and is continuously adding lateral facilities to existing water networks. Also, it installed public water taps in some villages and supplied others with water transported by trucks.

The distribution of water produced from desalination plants is limited to the Muscat area, Salalah and the Kuria Muria Islands, though small-scale desalination plants were installed in rural areas. In rural areas, however, falaj water has traditionally been utilized as drinking water and even now, those people depend principally on wells and aflaj.

2.2.7 Posts and Telecommunication

The rapid progress in the economy and social affairs of the nation was facilitated by the development of the communication sector, since communication media are the means of access to the world. This sector improved and is improving remarkably in modern Oman. The number of post offices increased from 2 in 1970 to 70 in 1988, while the number of telephone lines increased from 557 in 1970 to 83,032 in 1988.

2.2.8 Communications

(1) Roads

In view of the fact that Oman is the second largest country on the

Arabian Peninsula, roads are one of the most important infrastructures necessary for economic development, particularly in the interior and rural areas. For this reason, roads absorbed the largest single share of government development expenditure. As a result, in 1988 the total length of asphalt roads reached 4,247 km of which 401 km were four-lane roads; a remarkable development from the mere 8 km of paved road in 1970.

The main multi-lane roads are the principle routes for transportation and marketing. In particular, the roads leading to the UAE road network, which were first completed from Muscat to Khatmat Al Malaha in 1983, have been contributing to the economic expansion of the Sultanate.

(2) Air

In recent years, large-scale extension programs have been carried out. Seeb International Airport is now rated as one of the major international airports in the region, due to its modern installations, its efficiency and high standards of operation. It serves 21 international scheduled air carriers and 14 international non-scheduled operations, in addition to various cargo charters.

Salalah Airport was the second major airport to be constructed in the Sultanate. Work on the terminal building was completed in 1986 and the airport became operational a few months later. It is capable of accommodating 250 arrivals and departures per hour.

Oman has a 25 percent share, as do the UAE, Qatar and Bahrain in the international airlines Gulf Air, which operates services to Western Europe, the Gulf, the Indian Sub-continent, Africa, the Far East and the U.S.A.

(3) Sea

Before 1970, Oman had no modern port facilities, so all cargoes had to be uploaded by lighters in Muttrah Bay. Among the first major government projects was the construction of the new deepwater port of Muttrah, named Mina Qaboos. Construction was completed in 1974, providing

a vital step forward in the development of the country.

The ever-increasing volume of imports and exports in succeeding years has required continual expansion and additional facilities such as the construction of a container terminal, a modern warehouse, engineering workshops and a deepwater wharf. During the Iraq/Iran conflict Mina Qaboos and the oil terminal at Mina Al Fahal acquired considerable importance in Gulf commerce. Situated outside the Strait of Hormuz and the Gulf, tankers and cargo ships calling there enjoyed considerably lower insurance rates than those entering the Gulf danger zone. Consignments unloaded at Mina Qaboos were transported overland to the other Gulf States in safety.

2.2.9 Housing

Urbanization, which accompanied economic development in Oman, has caused a housing shortage. Houses in the capital, for Omani people coming from both rural areas and foreign countries, were desperately needed, along with an increase in the quality of existing houses. Moreover, the population increase induced by the drop in the infant mortality rate will sharpen the housing shortage problem in the future.

The government has continuously made efforts to construct new houses and had completed 6,265 houses by the end of 1988. In particular, it emphasized the necessity of housing for low income earners. In the Third Five-year Development Plan, supplying houses to rural areas became important as a way of controlling the inflow to urban areas.

2.3 Outline of Economic Situation

2.3.1 Trend of Economic Growth

Oman is a relatively small oil exporter with modest known oil deposits. Until oil production started in 1967, the country subsisted on traditional small-scale agriculture and fisheries. Since 1970, Oman has promoted economic development by utilizing oil revenue.

The First Five-year Development Plan (1976-80) and The Second Five-year Development Plan (1981-85) focused on the improvement of physical infra-structures, which were at a rudimentary level. Priority was also given to improving the most delayed sector, i.e. private economic activities, in order to free the country from its heavy dependence on oil exports. With the quadrupling of oil prices in 1973-74, a remarkable economic and social transformation took place. Today, the country has considerably improved its infrastructures and maintained steady growth in both public and private production sectors.

However, unfavorable trends recorded during the Second Five-year Development Plan were sharply accelerated by the dramatic decrease in oil prices from US\$ 27/barrel to US\$13.5/barrel in 1986. Despite production increases of over 11%, oil revenues dropped approximately 40% from R.O. 1,510 million in 1985 to R.O. 925 million in 1986. Figure 2.3.1 shows the trends of petroleum production and oil export value.

2.3.2 Gross Domestic Product (GDP)

(1) Growth of GDP

The trends of the GDP and its annual growth rate are illustrated in Figure 2.3.2. It can be seen that the Omani economy developed at a high rate up until 1985, was shaken in 1986, and then stagnated.

Of the three major production sectors, namely mining, agriculture and manufacturing, the manufacturing sector was profoundly influenced by the

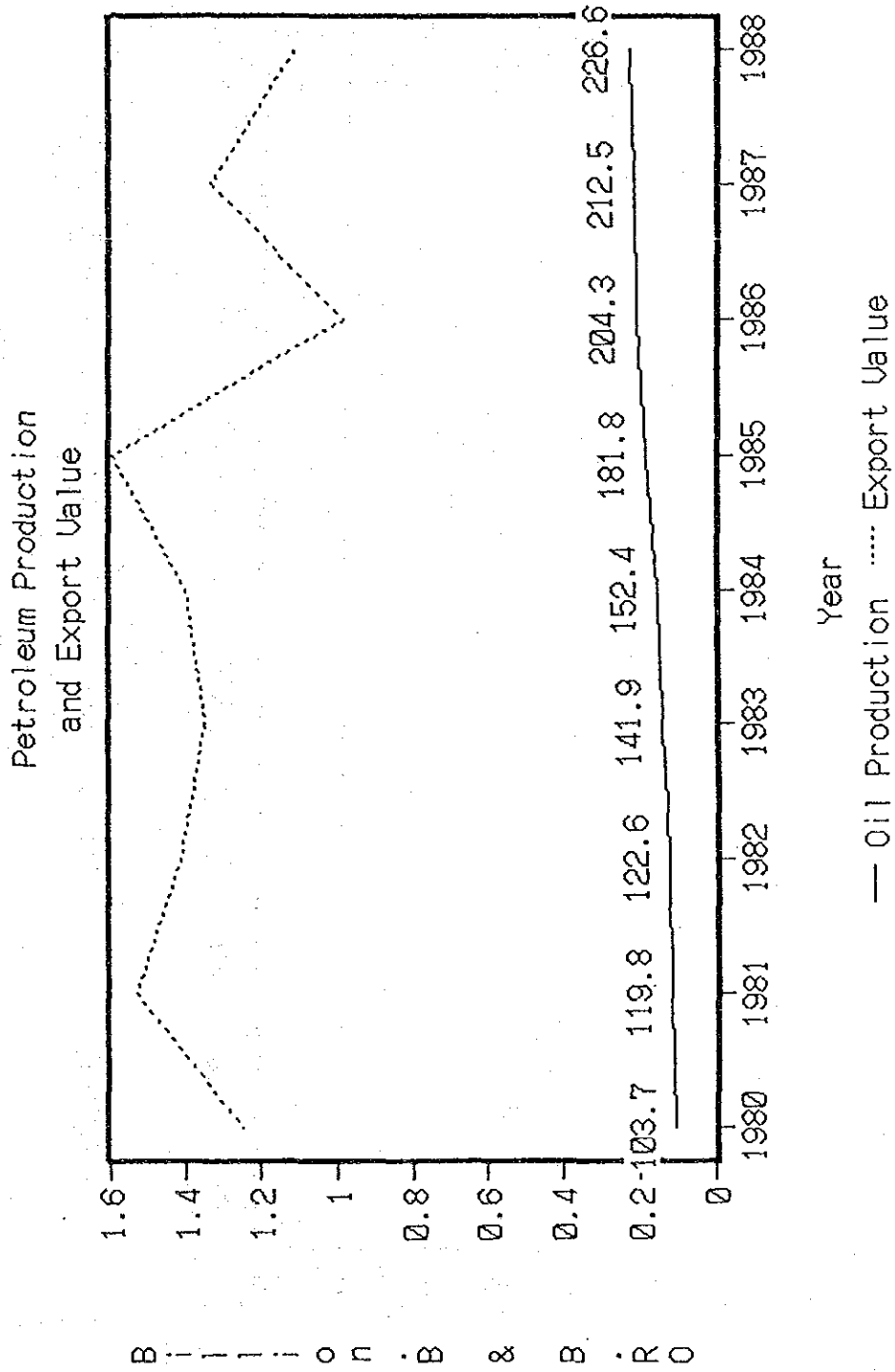


Figure 2.3.1 Petroleum Production and Export Value

Annual Growth Rate

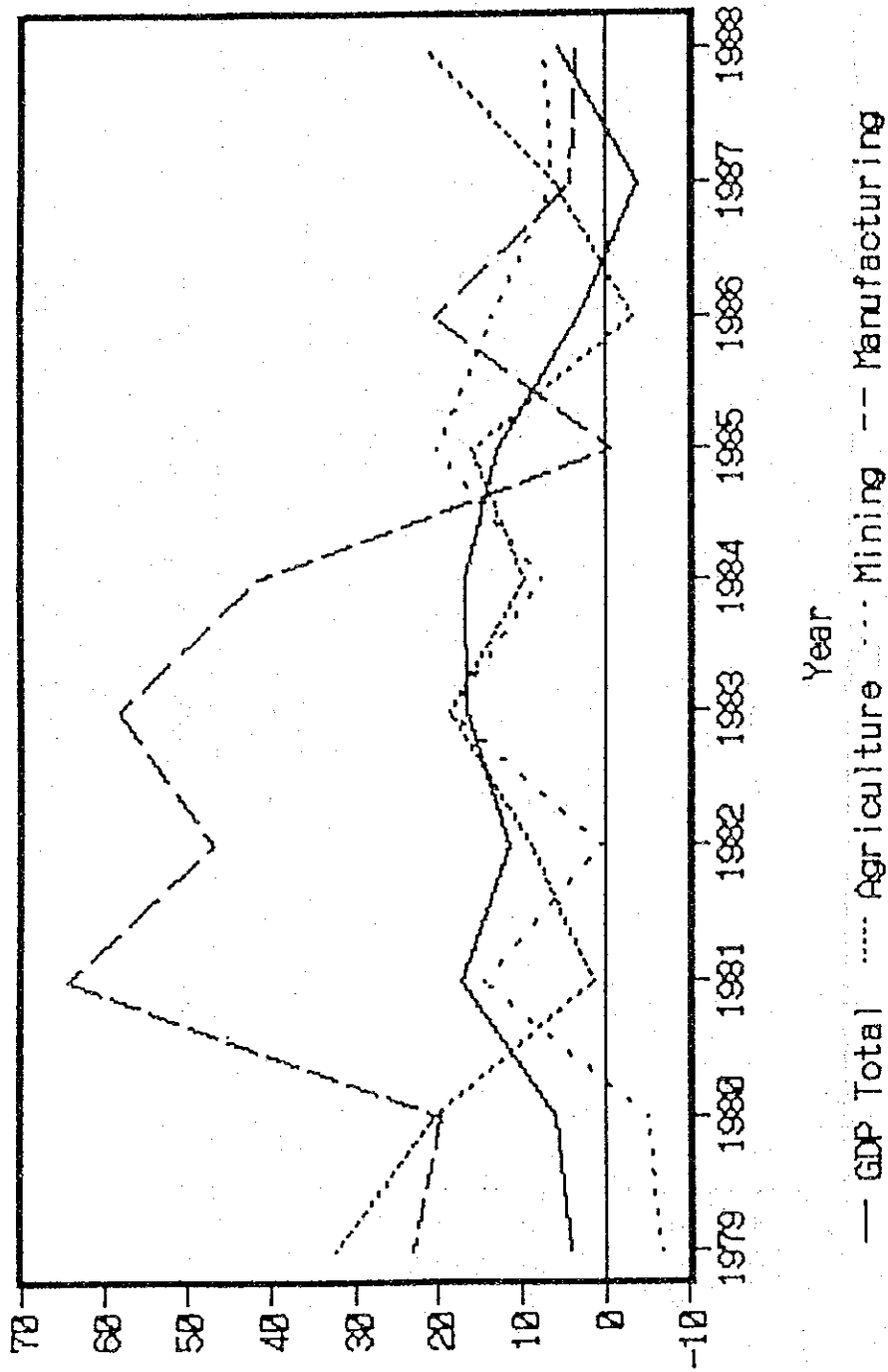


Figure 2.3.2 Annual Growth Rate of GDP by Industrial Origin

R a t e %

economic turmoil, despite the relatively moderate impact on the agricultural and mining sectors. After 1987, when negative economic growth was registered for the first time, the Omani economy regained its positive momentum by means of an oil production increase and efforts towards production diversification.

Classifying the annual GDP growth rate by industrial origin reveals that the mining sector, the pillar of the Omani economy, developed at 10.9% between 1980 and 1988 as a result of compensating for declining oil prices by production increases. However, in spite of its high growth rate, the GDP share of this sector decreased quickly from a high of 62.3% in 1980 to only 41.6% in 1988. The drop by 20.7% during those 8 years, was due to the diversification of the economy.

The manufacturing sector, on the other hand, has grown considerably over the past 8 years, at an average annual growth rate of 27.5%. This sector, negligible in the 1970s, surpassed the agricultural sector in contributions to the GDP in 1986.

The agricultural sector increased at a modest, but stable rate, in comparison to the industrial sector. Its average annual growth rate of 9.6%, is outstanding considering the long gestation period of investment in that sector. Its growth rate in 1988 reached 21.5%, however this was done in large part to the fisherie sector's contribution. Although the importance of agriculture, which employs nearly half of the labour force of Omani nationality, is recognized, its share in the GDP is surprisingly small -- only 4.3% in 1988.

(2) GDP per capita

The Omani GDP per capita increased remarkably in the first half of the 1980s, because the economic growth rate of Oman exceeded the population growth rate quite considerably. Unfortunately, entering the second half of the 1980s, the GDP per capita of Oman staggered, owing to a low economic growth rate caused by depressed oil prices. Unless oil prices turn for the better in the near future, other measures will be necessary, such as increasing the production levels of non-oil sectors,

substituting foreign workers for Omanis, controlling the population increase, etc., in order to raise the GDP per capita.

Figure 2.3.3 shows the estimated trends of GDP per capita and population increase.

2.3.3 Investment

Consumption and investment occupied 73% and 17%, respectively, of Gross Domestic Expenditure in 1988. Expenditure was characterized by the large contribution of the government to both consumption and investment, (55.2% and 32% respectively). This indicates that this "nation-building" has been carried out primarily by decisive government leadership.

2.3.4 Trade Balance

In the field of international trade, Oman's exports have usually exceeded its imports because of its oil resources. Trade peaked in 1985 when export value amounted to R.O. 1.7 billion and import value was R.O. 1.1 billion. The annual average trade values for nine years between 1980 and 1988 were R.O. 1.4 billion in exports, R.O. 0.8 billion in imports. The result was an export surplus of R.O. 0.6 billion.

Although Omani exports depend heavily on crude oil, the share of oil in total exports has gradually decreased from 96% in 1980 to 88% in 1988, because of economic diversification undertaken in the Sultanate. The fluctuation of oil prices, however, still affects the economy so strongly that the sharp fall in oil prices in 1986 resulted in the lowest export value and surplus in a decade. Thus, still more efforts to diversify export items than were made in previous years seem to be imperative in order to stabilize trade activities.

With respect to imports, two items, machinery and transport equipment and manufactured goods share more than 50% of the total.

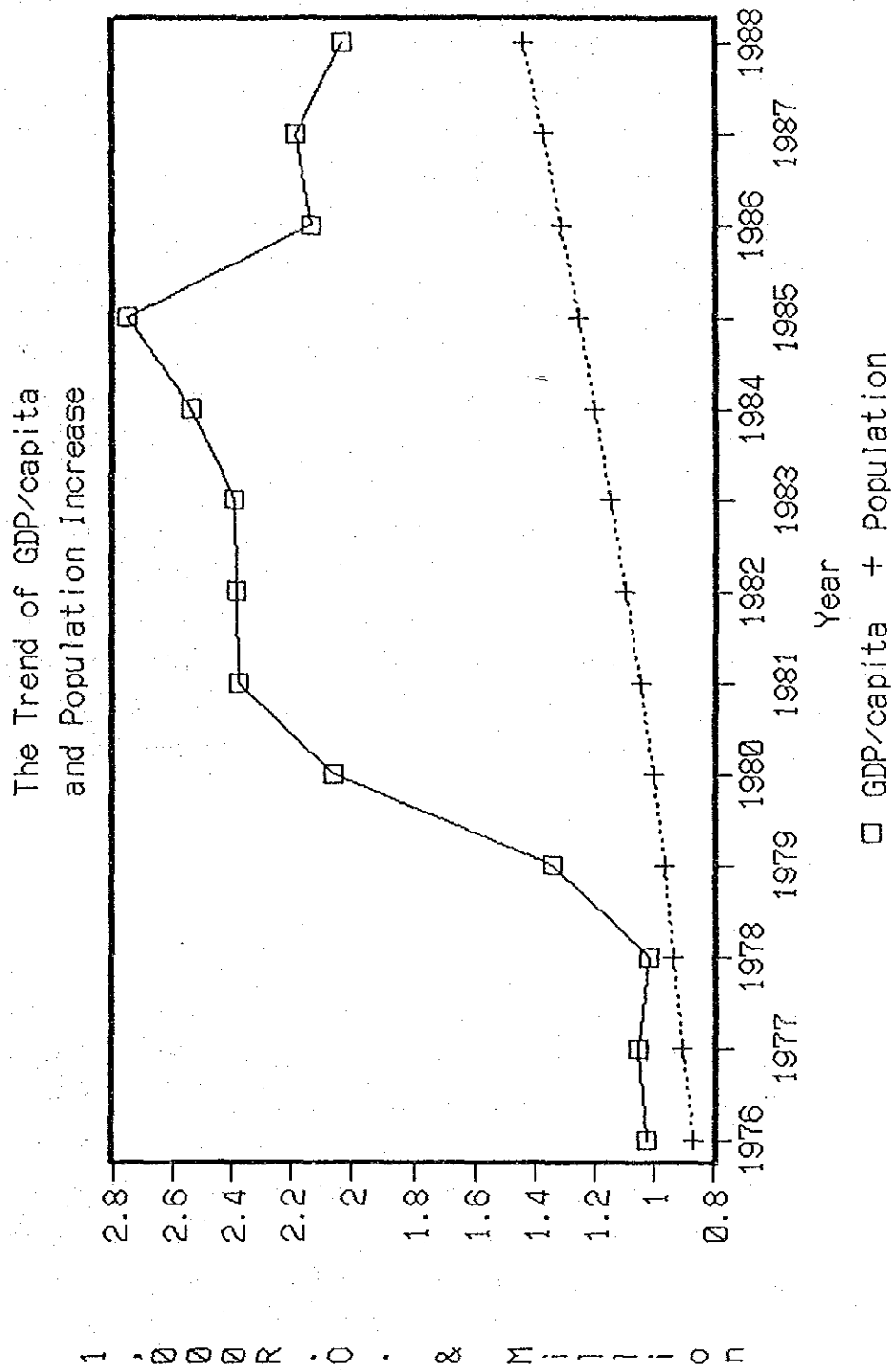


Figure 2.3.3 The Trend of GDP per Capita and Population Increase

The agricultural sector, from the trade point of view, had a value of R.O. 29 million in exports and R.O. 144 million in imports in 1988. The import value is 5 times larger than that of exports in this sector. The share of the agricultural sector, which includes fisheries as non-oil exports, decreased to 46% in 1988 from nearly 100% in 1980. Its share in imports, on the other hand, increased to 17% in 1988 from 12.2% in 1980. It should be noted that the reason for the decrease in the export share of the agricultural sector can be attributed to the promotion of other sectors' exports, like copper which began to be exported in 1983. In fact, the export of agricultural products has been increasing year by year and reached a peak in 1988. As shown in Figure 2.3.4, the percentage of exports over imports for total agricultural products has increased in general. This is especially true in the fisheries sector, where a significant jump can be seen. The export/import ratio of other products fluctuated considerably, with the increasing propensity, however, of cereals to fade out and finally reach zero in 1988. This means that the products which are cultivated in an intensive way, and which have comparative advantages in both domestic and external markets have been promoted whereas products which are cultivated in an extensive way, like cereals, have been gradually phased out. In the future, it is expected that the export/import ratio of agricultural products will be improved by strengthening the production of crops biased towards garden-farming and promoting the fisheries sector.

2.3.5 Public Finance

The government budget of Oman is principally classified into two types, namely development budget and recurrent budget. The development budget is utilized for government investment, and the recurrent budget for the operation of ministries and governmental organizations. Since the two budgets are not clearly demarcated, the diversion of a part of the recurrent budget for the development budget often occurs in order to complement shortages. The outline of public finance is shown in Table 2.3.1.

Judging from the trend of actual government revenues and expenditures

during the past 9 years (1980-88), it is clear that the government budget was in the red in 1982, and deteriorated gradually until the deficit peaked in 1986, even though government revenue exceeded expenditures in the beginning of the 1980s. The reasons for the worsening budgetary situation are the steady increase of recurrent expenditures caused by enlargement of governmental functions, and the oil revenue decrease caused by the sharp drop in 1986, and continuing low levels, of oil prices.

Percentage of Export over Import
for Major Food

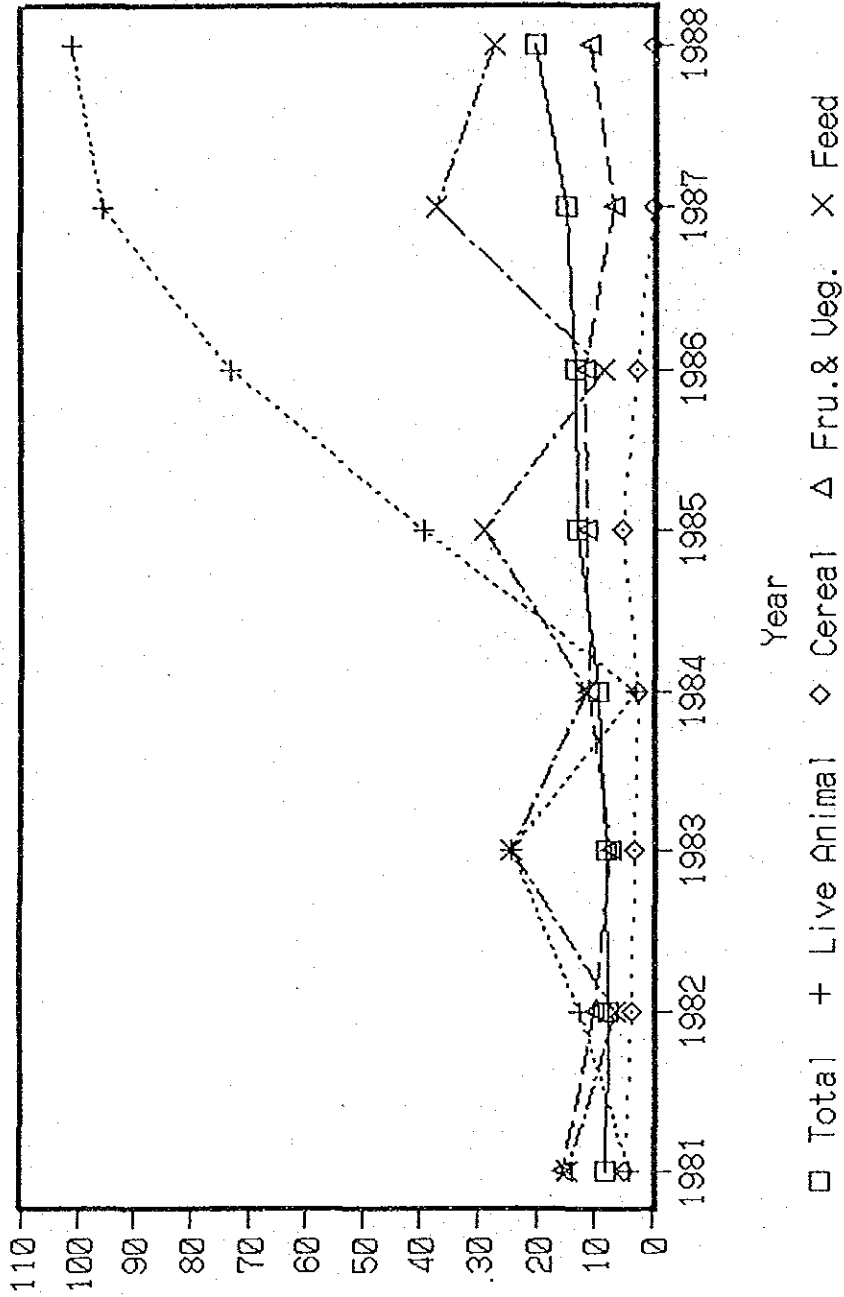


Figure 2.3.4 The Percentage of Exports over Imports for Total Agricultural Product

Table 2.3.1 Public Finance

Public Finance (Million R.O.)

Items	1988	1989	1982	1983	1984	1985	1986	1987	1988
Revenues									
Oil Revenue	1,095.5	1,341.3	1,215.7	1,277.5	1,304.6	1,510.0	928.9	1,194.3	993.6
Gas Revenue	14.0	18.1	18.9	20.2	34.4	36.7	37.9	39.0	44.2
Custom Duties	8.6	11.3	14.7	21.7	31.6	41.1	37.0	26.0	28.6
Corporate Income Tax	6.5	10.5	11.4	18.7	20.4	26.4	25.6	21.2	23.4
Interest from Investments	19.8	38.6	14.2	9.2	21.3	19.6	25.1	30.5	8.5
Other Revenue	43.5	58.3	58.9	76.5	100.9	129.2	133.5	168.8	141.5
Repayment of Loans to the Government	N.A.	N.A.	N.A.	N.A.	N.A.	13.2	32.8	32.7	6.8
Total Revenue	1,187.9	1,478.1	1,333.8	1,423.8	1,513.2	1,776.2	1,220.8	1,512.0	1,247.6
Expenditures									
Defence & Security	486.8	521.9	581.3	670.7	728.2	744.9	665.4	583.6	589.2
Civil Recurrent	271.2	335.1	388.9	440.6	507.2	599.0	648.2	648.5	681.9
All Ministries	214.8	272.5	315.7	362.7	409.4	489.0	500.0	509.1	535.2
Interest on Government Loan	21.1	15.5	17.5	19.2	39.3	47.1	75.9	72.9	84.8
Gov. Share in Operating expenditure of PDO	35.3	47.1	55.7	58.7	68.5	62.9	72.3	66.5	62.7
Development Expenditure	246.7	317.4	396.2	377.1	464.7	533.7	532.4	328.8	280.2
All Ministries	168.9	241.0	289.0	290.7	374.0	433.7	363.1	230.0	283.8
Gov. Share in Operating expenditure of PDO	77.8	76.4	106.2	86.4	90.7	96.0	163.3	90.5	69.6
Support to Private Sector	0.0	0.0	0.0	0.0	0.0	4.0	6.0	8.3	6.8
Industrial Sector	0.7	5.5	19.2	22.0	13.6	14.0	10.7	11.0	15.9
International, Regional & Local Organization	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Oman Housing Bank	6.2	0.7	14.6	8.2	4.0	0.0	7.1	7.0	2.0
Oman Development Bank	2.5	0.0	4.0	0.0	3.0	0.5	2.0	2.1	1.3
Oman Bank for A.F. in	0.0	4.8	0.0	4.9	4.0	2.0	0.3	1.2	0.0
Gov. Loans & Participation in Local & Foreign Enterprises	16.4	43.9	28.3	35.7	46.6	36.7	30.1	37.2	0.0
Total Expenditures	949.8	1,223.0	1,412.9	1,546.9	1,760.3	1,928.3	1,886.8	1,609.1	1,567.2
Balance	238.1	254.3	-79.1	-123.1	-247.1	-152.1	-666.0	-97.1	-319.6