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

FINAL REPORT
VOLUME 2

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SULTANATE OF OMAN

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

FINAL REPORT

**VOLUME 2
PRESENT SITUATION**

NOVEMBER 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

国際協力事業団

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VOLUME 2 PRESENT SITUATION

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CHAPTER 1

OUTLINE OF NATURAL SITUATION

CHAPTER 1 OUTLINE OF NATURAL SITUATION

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.

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 in the past five years (1985 to 1989) was 79 mm per annum, although there were large annual fluctuation, 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.

1.3 Geology

1.3.1 Outline of 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:

- (1) A basement of granites and gneisses, partly metamorphosed sediments and meta-volcanics. The basement was folded in the pre-Middle Permian orogeny.
- (2) 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.
- (3) 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.
- (4) The Hawasina Group -- a complex association of folded and 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.
- (5) The Samail Ophiolite -- a thick sheet of basic and ultrabasic rocks comprising peridotites, gabbros, diabases and spilitic lavas, which

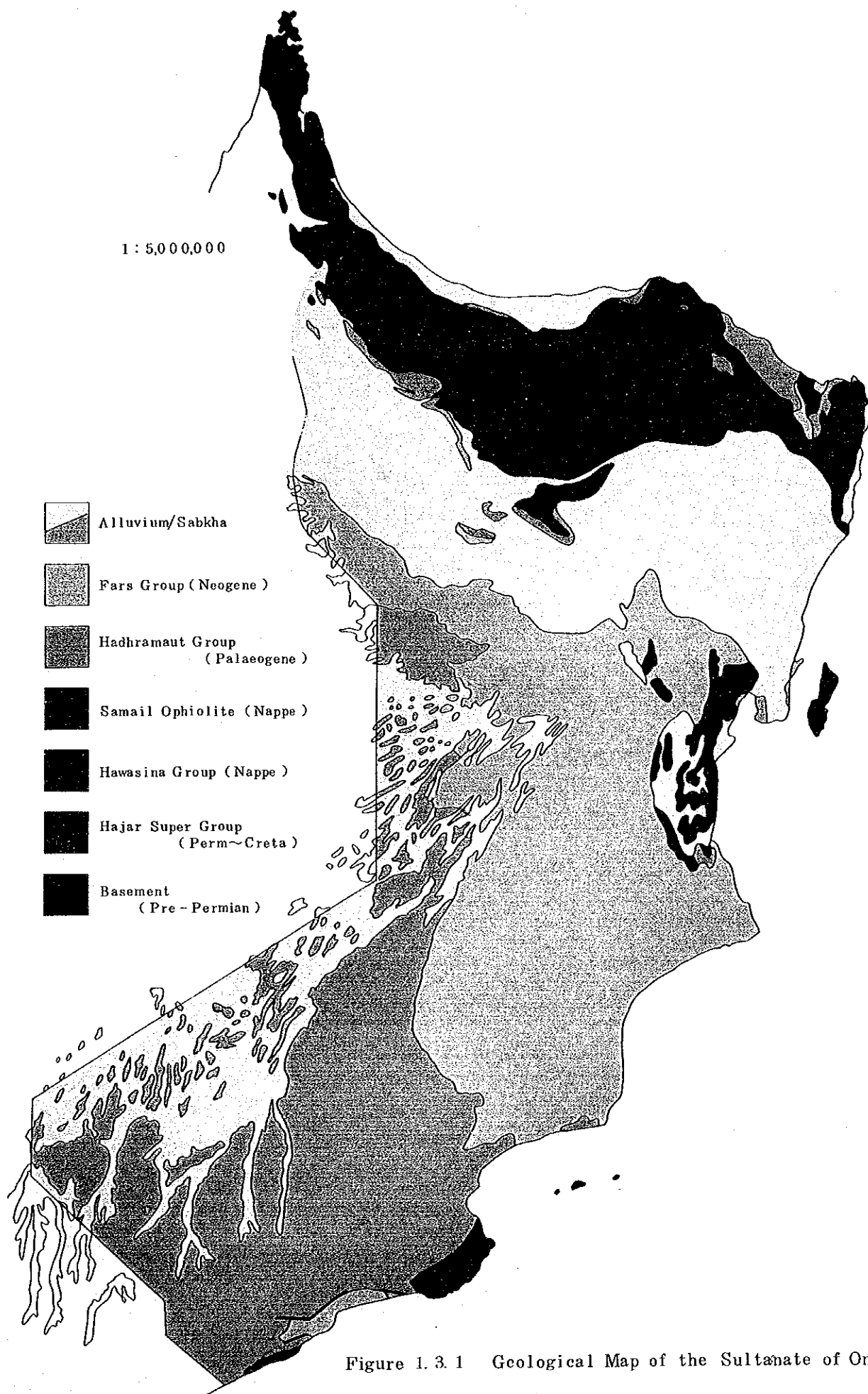


Figure 1.3.1 Geological Map of the Sultanate of Oman

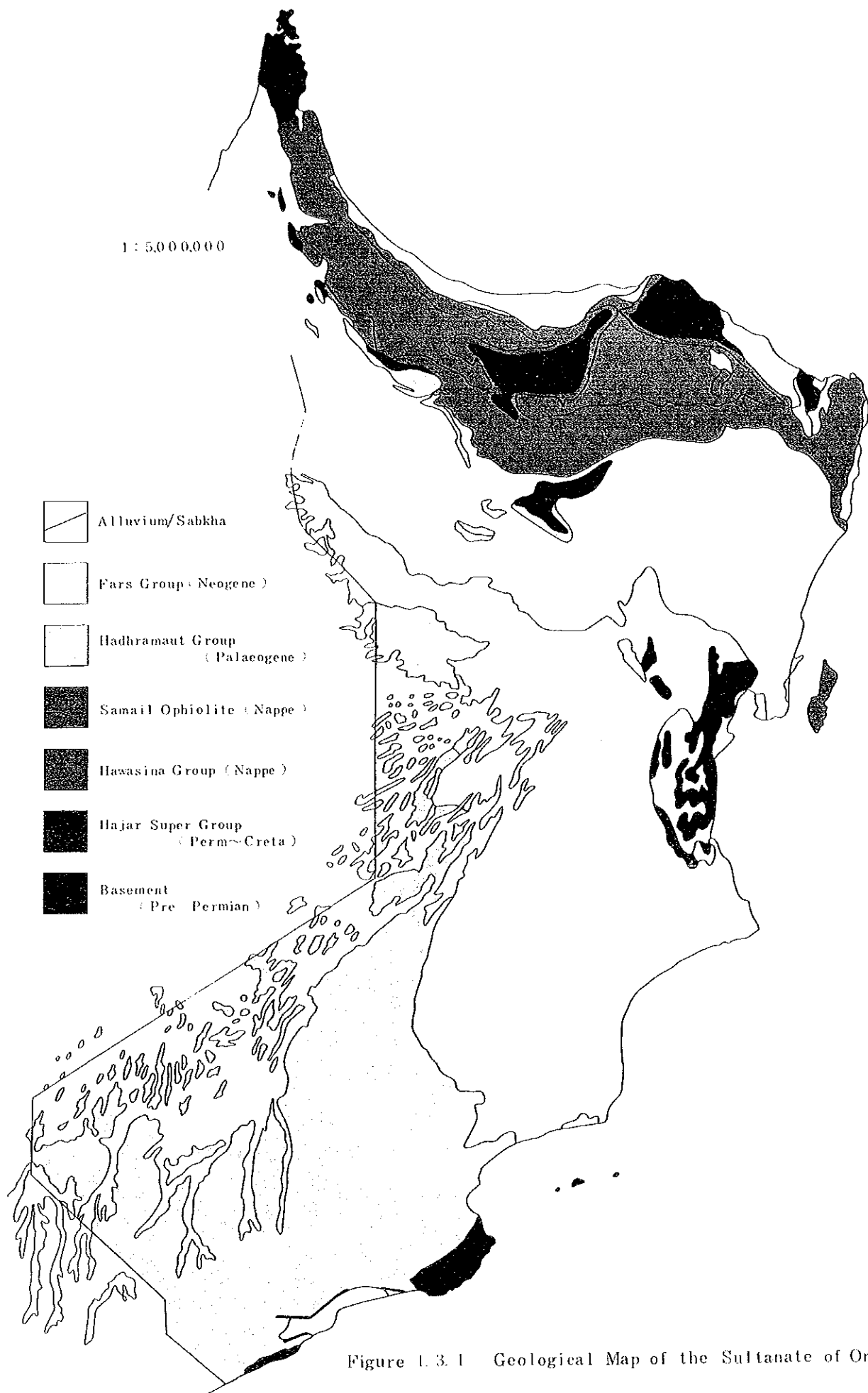


Figure 1.3.1 Geological Map of the Sultanate of Oman

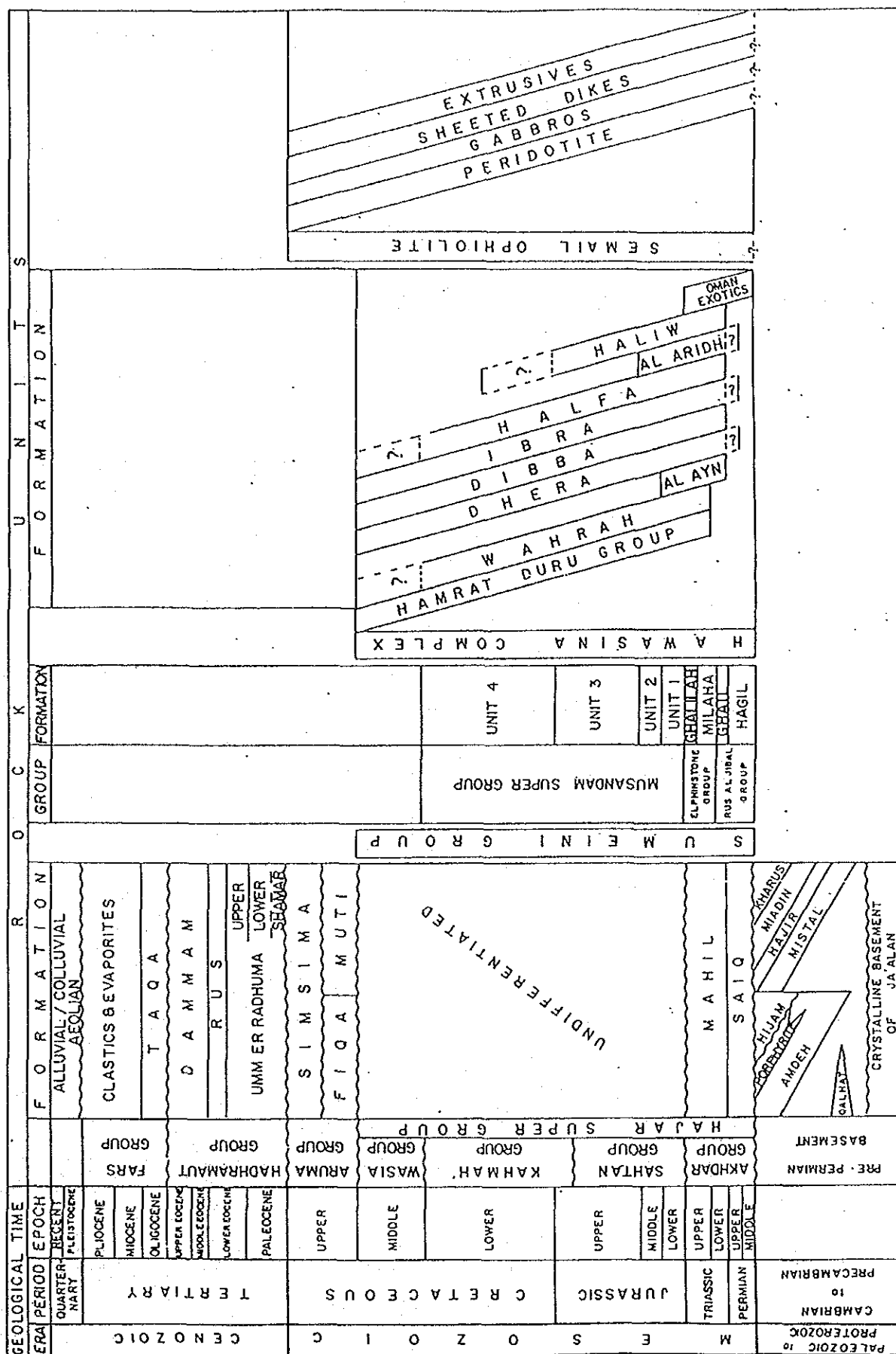


Figure 1.3.2 Geological Column for the Sultanate of Oman

overlies the Hawasina nappes with intermittent contact.

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

The Sumeini Group and the Hawasina Group are considered to be parautochthonous and allochthonous, respectively. The Samail Ophiolite is believed to have been formed by the obduction of a fragment of the Tethys oceanic floor. The high and steep slope of the Jabal Akhdar is primarily due to the presence of the Hajar Super-Group. Mountains composed mainly of Ophiolite, which comprise lithofacies susceptible to weathering, often show relatively gentle shapes. Distribution of the basement is identified at several windows which are characteristically bowl-shaped. As a consequence of vigorous mountain building, thick Quaternary sediments are found in the Batinah Coastal plain and the northern Interior plain.

The desert area in central Oman, which is situated on the southeast edge of the Arabian Sub-continent, is geologically stable. Allochthonous do not exist in the area although its major rock sequences are essentially the same as those of the Oman mountains. The outcrops of the Hajar Super-Group can hardly be identified in the South, and the basement is exposed east of Murbat and on Kuria Muria Island. In contrast, sequences of the Hadhramaut and the Fars Group are widespread in the center and the south of Oman. From the bottom to the top, they are as follows:

(1) The Hadhramaut Group:

- (a) The Umm er Radhuma Formation -- thick, continuous slightly dolomitic limestone with only minor argillaceous layers, but with a shale/marl unit forming the base and the Shammar Member. Common marine fossils indicate a shallow-marine environment, probably intertidal in part. They confirm formation during the Paleocene and Early Eocene ages.
- (b) The Rus Formation -- dominantly evaporite, gypsum or anhydrite, with associated variable dolomite and dolomitic marl. It was

probably deposited in a restricted lagoon, playa or sabkha setting. Judging from its widespread occurrence, it must reflect a regional sea-level fall from a stable shelf. Age is inferred, from the ages of bracketing formations, as Early Eocene.

- (c) The Damman Formation -- a unit consisting mainly of limestone, but with some variability in dolomitisation and minor marl interbeds. Sediment and fossils indicate a shallow-marine environment. Microfossils indicate formation in the Middle Eocene age, possibly Late Eocene.
- (d) The Andhur Formation -- a mixed, argillaceous-carbonate sequence involving shales and marls interbedded with variably-argillaceous limestone and dolomite beds. Fossiliferous facies indicate shallow-marine environments. Microfossil content gives evidence of formation during the Middle Eocene age.

(2) The Fars Groups:

- (a) The Taqa Formation -- a dominantly carbonate sequence, including chalky and porous marine limestone. Marine fossils, mainly microfossils, indicate shallow-marine environments and Oligocene to Miocene ages.
- (b) The Fars clastics and evaporites -- it is judged that this formation was formed in the Miocene and Pliocene ages. The lower formation is more exposed toward the south and the Umm er Radhuma Formation crops out in the Jabal al Qara in the south of Oman. The southern edge of Jabal al Qara is bound to the Salalah plains by a fault. The plains is spread over the Taqa Formation topography from central to southern Oman and use flat on the whole, except for the Jabal al Qara, which is high relief. The southern slope, formed by the fault, is especially steep. The Salalah Plains is underlain by terraces and alluvial deposits.

1.3.2 Hydrogeology

Reflecting the differences between geological provinces, aquifers of Oman are basically divided into two types, i.e. the northern type and the southern type. Aquifers in the north are mostly alluvial deposits of which the outline of distribution is clearly indicated by the topography. Directions of groundwater flow are almost the same as those of surface flow. The thickness of the alluvium in mountainous areas varies to about one hundred meters. The total thickness of the alluvium beneath the Batinah plain probably exceeds 600 m in most places. The alluvium spread in the Batinah plain is classified into three units as follows:

(1) Upper gravel

The upper gravel unit consists of a poorly-sorted boulder bed, gravel, sand and silt deposited in outwash fans by flood flows entering from the piedmont zone. In general, these beds of boulders, gravel and sand are relatively clean and constitute the primary aquifers in the Batinah plain.

(2) Clayey gravel

Beneath the upper gravel is the clayey gravel unit. Clayey gravel is marked by the appearance of brown and red marly gravel and clayey sand. This unit is frequently associated with decreased well yields and increased drawdowns as compared to the upper gravel.

(3) Cemented gravel

The cemented gravel under the clayey gravel sequence is identified by the appearance of white or gray gravelly marls and clay. Gravel content is not very noticeable during drilling, suggesting a relatively low pebble content and a higher proportion of calcium carbonate cement in the subsurface as compared to surface outcrops. Thin beds of uncemented gravel are often encountered within the cemented gravels, usually immediately below heavily cemented beds.

Major aquifers other than the alluvial deposits in northern Oman are as follows:

- (1) Natural springs-permeability of carbonates of the Hajar Super Group is increased by solutions. A number of springs, which come from them, are found at the foot of the mountains.
- (2) Tertiary Limestone underlies alluvial deposits. The groundwater contained there could be developed.
- (3) Huge caves have developed in the limestone of the Hadhramaut Group, and are widespread in the Sharqiya on Jabal Bani Jabir. Limestone caves, however, are not prospected as aquifers at present.

Most of the aquifers of southern Oman are the Tertiary Limestone type. The Taqa Formation of the Fars Group and the Umm El Radhuma Formation of the Madhramaut Group are especially important in this regard. The former is a major aquifer in the Salalah Plains. The latter provides springs in the southern slope of the Jabal Al Qara with large amounts of groundwater, and is an aquifer for fossil water in Nejd as well. It is rather difficult to discover the precise groundwater movement in the limestone, as it generally depends on geological structure. Alluvial deposits of the south are mostly distributed in the central Salalah Plain, which is also important from the viewpoint of water use.

1.4 Soil

1.4.1 General

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 with the mapping scale.

The regional characteristics of 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 brings 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 seawater 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 farmlands, 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 soil is 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 soil for agriculture is Yermosols derived from the limestone ranges. From them, the flood water brings weathered materials to these plains, and makes fine-textured soil.

(4) Sharqiya Region

Like the Dhahira Region, soil in the Sharqiya Region is formed mainly by alluvial and eolian processes. Again, the most suitable soil for agriculture is Yermosols, and the areas with Yermosols are almost completely 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 soil for agriculture, Yermosols, exist in the Salalah Plain. This soil is derived from northern jabal. Clay and silty soil with a well-developed structure exists in the jabal area, which are used as rangelands to maintain livestock.

In Nejd, the major soil is also Yermosols and the lands which are suitable for agriculture are composed almost entirely of Yermosols.

1.4.2 Soil Survey for Agriculture

(1) Soil Survey for Agricultural Development

Since the middle of the 1970's, soil surveys have been conducted in many specific areas. During the first two years of the Second Plan, all the survey results for soil and water resources obtained previously, were reviewed and summarized into one report with maps attached indicating the locations of the surveys. This report has been utilized for subsequent activities such as determining suitable areas for agricultural development and planning surveys. The areas studied in the soil survey are illustrated in Figure 1.4.1 - 1.4.2. These soil surveys can be categorized into preliminary reconnaissance, semi-detailed surveys and detailed surveys. In those surveys, classification of soil suitability, as well as, surveys of water resource conditions were conducted. Using these results, development potential was analyzed. In order to make a plan for a large scale agricultural development project in the area, which was judged promising in past surveys, feasibility studies for each project area were carried out in conjunction with detailed soil surveys. Soil surveys are summarized and enumerated below.

(a) Nation Wide Soil Survey

In 1982, on the basis of the LANDSAT MSS data analysis covering the entire country, the following ten areas were selected for further detailed investigation. These areas were identified as having the highest development potential (refer to Figure 1.4.1).

- (i) Batinah Region
Batinah Plain (3,470 sq. km)
- (ii) Dhahira Region
Buraimi (600 sq. km), Dank (300 sq. km) and Ibri (400 sq. km)
- (iii) Interior Region
Bahla (700 sq. km) and Nizwa-Adam-Izki (1,560 sq. km),
- (iv) Sharqiya Region
Wadi Andam (1,560 sq. km) and Wadi al Batha (1,640 sq. km)

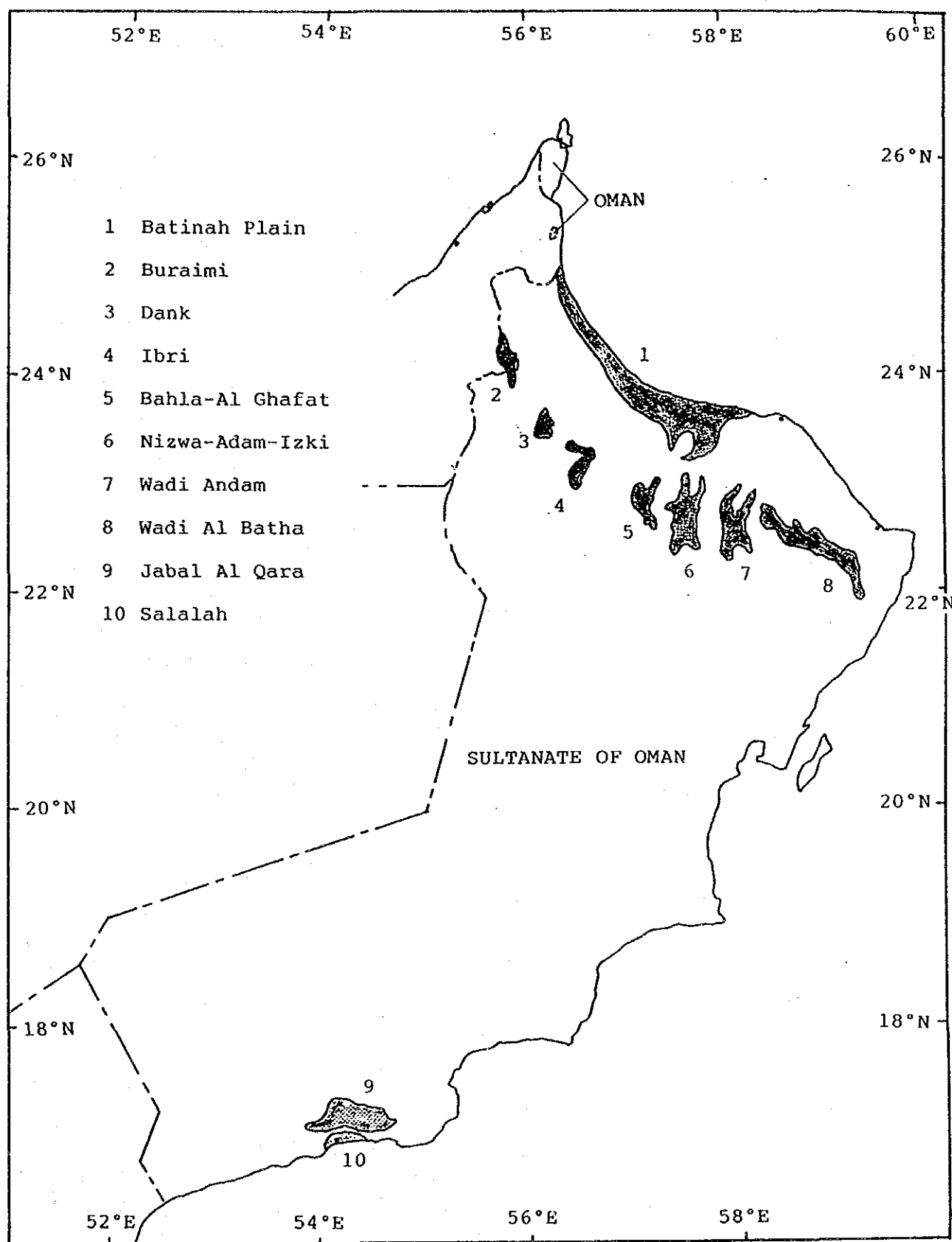


Figure 1.4.1 Ten major priority zones identified in 1982

(v) Southern Region

Salalah Plain (290 sq. km) and Jabal al Qara (1,425 sq. km)

(b) Batinah Region

As a result of the preliminary survey, conducted for a 3,500 sq. km area shown as "A" in Figure 1.4.2, suitable soil for agricultural development was selected. It comprised a total of 38,797 ha consisting of S1(8,920 ha), S2(11,601 ha) and S3(18,276 ha). The distribution of suitable soil and the potential of groundwater resources development did not always correspond, and a small amount of groundwater, matched with suitable soil was identified at only some wadis.

(c) Dhahira Region

As a result of the preliminary survey, for 400 sq. km shown as "B" in Figure 1.4.2, which was selected after a prescreening survey of 2,000 sq. km in Buraimi, some areas were identified as highly or moderately suitable for irrigated agricultural development (1,495 ha) while some areas were only marginally suitable (1,420 ha). Four areas totaling 500 ha in the vicinity of Buraimi (Huwayah South, Huwayah North, Sayh Darawisa and Auha Valley) shown as "b1", "b2", "b3" and "b4" in Figure 1.4.2, were covered by the detailed survey. As a result, S1(208 ha), S2(268 ha) and S3(23 ha) were identified as having suitable soil for irrigated agriculture. However, in these areas, water resource potential was not clearly identified at that time, and the need for further study was suggested.

Further, 356 ha of Wadi Safwan, shown as "b5" in Figure 1.4.2, was surveyed in detail. As a result, the area of both S1 and S2 (293 ha) was identified and 180 ha has been proposed for development as a commercial farm.

As a result of the preliminary survey for an area of 300 sq. km around Dank and 400 sq. km around Ibri, shown as "C" and "D" in Figure 1.4.2, a total of 7,028 ha, consisting of S1(461 ha), S2(4,267

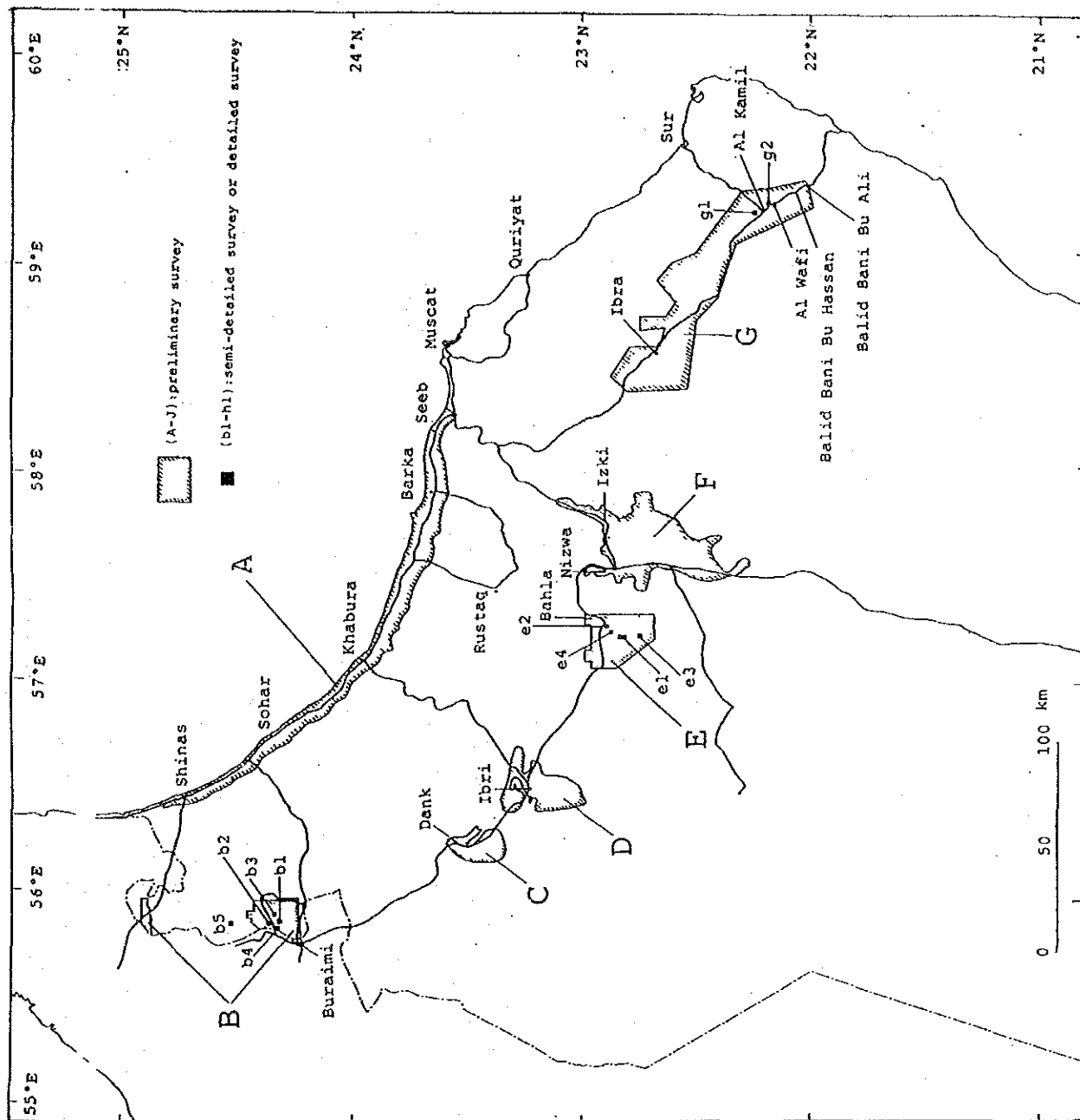


Figure 1.4.2 Location Map of Soil Survey since 1982

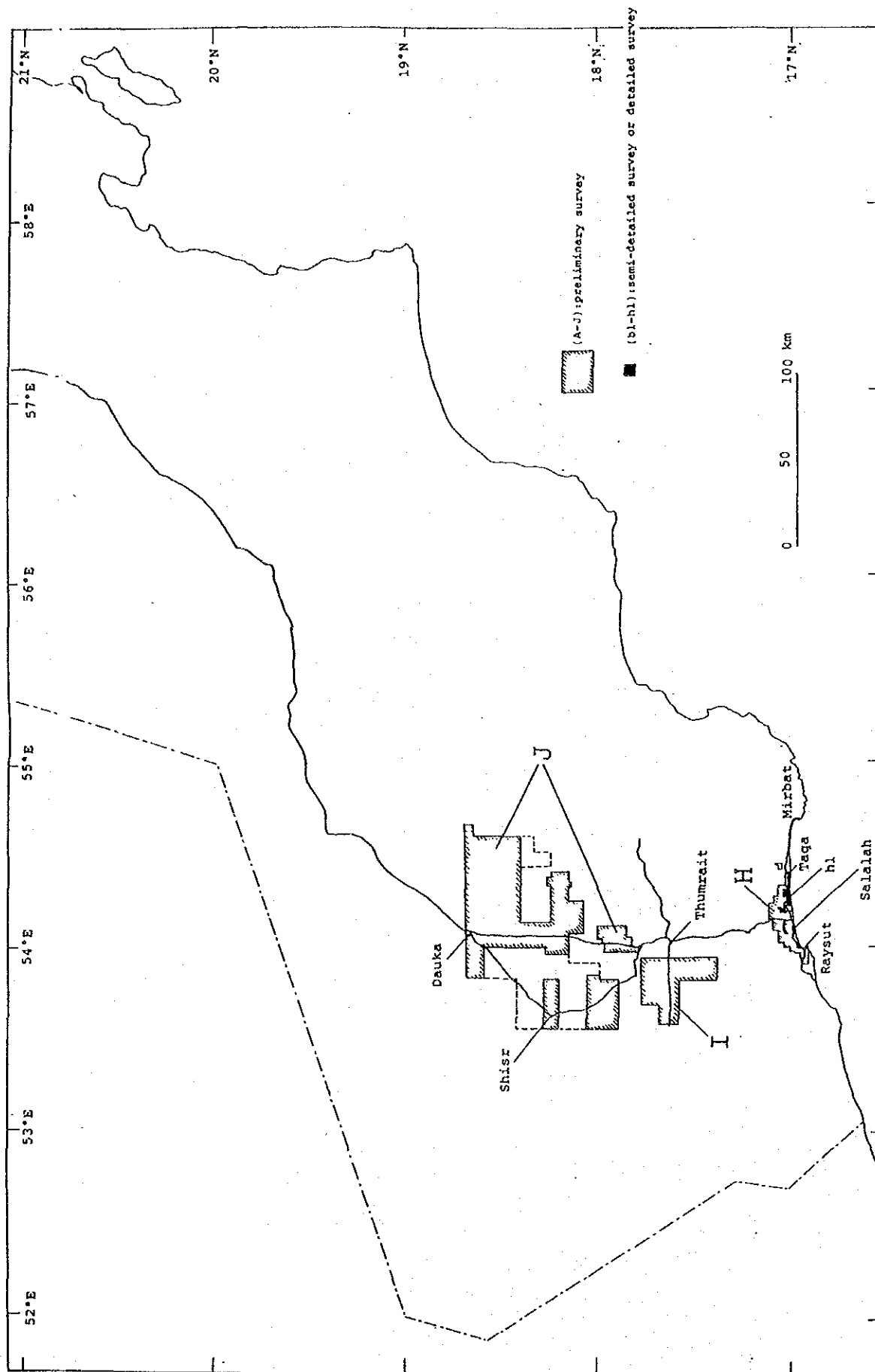


Figure 1.4.2 Location Map of Soil Survey since 1982 (continued)

ha) and S3(2,300 ha), and a total of 13,977 ha consisting of S1(496 ha), S2(7,191 ha) and S3(6,290 ha) were identified, in the vicinity of Dank and Ibri respectively, as suitable soil for agricultural development. Only part of these areas were identified as corresponding with water resources.

(d) Interior Region (including Wusta Region)

As a result of the preliminary survey conducted for 600 sq. km in Wadi Quriyat shown as "E" in Figure 1.4.2, S1 - S2(3,880 ha) and S3(2,610 ha) were identified. Of these, a detailed survey was conducted for 1,000 ha in total, shown as "e1", "e2" and "e3" in Figure 1.4.2, of which 840 ha in Quriyat-Lajrid Plain, 120 ha in Jimah area and 40 ha in Seed Farm, and subsequently 839 ha, 115 ha and 16 ha, respectively, were identified as the totals of S1-S3 for potential areas for irrigated agriculture. Among these, a feasibility study was conducted for Jimah (shown as "e2" in Figure 1.4.2), and the pilot agricultural scheme (24 ha) which consists of 8 pilot farms (3 ha each) and the Research Station (10 ha) are being developed. The development of the Pilot Production Farm has also been proposed for 56.3 ha in Lajrid Plain shown as "e1" in Figure 1.4.2. In addition, as a result of the detailed survey of 67 ha in Jabrin and Nattalah, shown as "e4" in Figure 1.4.2, a total of 32 ha for S1-S3 was identified. Of these, 26.5 ha is under development.

As a result of the preliminary survey conducted for 1,600 sq. km in the vicinity of Nizwa-Izki-Adam, shown as "F" in Figure 1.4.2, a total of 12,141 ha, consisting of S1(3,910 ha), S2(2,671 ha) and S3(5,560 ha) was identified. Only a portion of these areas was identified as corresponding with groundwater resources at that time.

(e) Sharqiya Region

As a result of the preliminary survey for 700 sq. km which was selected from 2,400 sq. km, shown as "G" in Figure 1.4.2, a total of 7 blocks of 400 sq. km, consisting of S1(10 sq. km), S2(220 sq. km) and S3(170 sq. km) were identified as having suitable soil for

agriculture. Further, it was proposed that a detailed survey be conducted after identifying the availability of water resources. The priority areas for the detailed survey were also proposed.

As a result of the detailed survey conducted for 700 ha in Al-Kamil and 200 ha in Al-Wafi, shown as "g1" and "g2" in Figure 1.4.2, respectively, a total of 680 ha, consisting of S1(200 ha) and S2(480 ha) for Al-Kamil, and a total of 198 ha, consisting of S1(28 ha), S2(113 ha) and S3(57 ha) for Al-Wafi, were identified as suitable soil for irrigated agriculture. Their development has also been proposed.

(f) Southern Region

As a result of the preliminary survey of 518.9 sq. km, which almost covers the entire area of the Salalah Plain, shown as "H" in Figure 1.4.2, soil of S2(3 sq. km), S3(2.8 sq. km) and SC(71.9 sq. km) was identified. Of these, a semi-detailed survey was conducted for 59.1 sq. km shown as "h1" in Figure 1.4.2. This result identified the development potential for 135 ha in Wadi Darbat, 525 ha in the Humran Area and 125 ha on the Adawnib Camp Plateau. Consequently, priority areas for further detailed surveys, a total of 76 sq. km consisting of 2 sq. km in Wadi Darbat, 36 sq. km in Humran-Arzat, 20 sq. km in Saada North, 9 sq. km in Wadi Thimrin and 9 sq. km in Adawnib Camp Plateau, were proposed.

In Nejd the preliminary survey was conducted for 929 sq. km (shown as "I" in Figure 1.4.2) which was selected by a reconnaissance survey of 2,200 sq. km. This result identified suitable areas for irrigated agricultural development of S2(9,435 ha) and S3(15,962 ha). However, promising water resources were not identified at that time.

Furthermore, in Nejd, the preliminary survey was conducted for Dauka, Shisur, Wadi Makhawrim, Hanfit and Qitbit, shown as "J" in Figure 1.4.2, a total of both S1 and S2 (18,905 ha) and S3(30,620 ha) was identified.

(2) FAO Soil Survey and Land Classification Project

This Survey Project, which began in 1989, will provide data for expansion of new farm lands and for the increase of productivity in existing farm lands by the the end of 1991. The results of the Survey will provide the government with the scientific basis for judging the suitability of soil when it distributes its land to Omani nationals. The salient points of the project are shown below.

(a) Soil survey required for the expansion of agricultural land

- (i) Preparation of a general soil map on a 1/250,000 scale on the basis of remote-sensing data analysis and rough soil surveys covering the entire country.
- (ii) Preparation of a soil map on a 1/20,000 scale and selection of suitable areas for development based on aerial photographic analysis and detailed soil surveys. The survey areas will be virgin lands of 10,000 ha which are identified and selected from the general soil map as high potential areas for agricultural development. One such survey has been conducted and completed for an area of 440 ha in the Sharqiya Region which had been classified by the MAF as a high potential area.

(b) An integrated survey aimed at increasing the productivity of cultivated land, which totals 50,000 ha, 44,000 dispersed in the Batinah Coast and 6,000 ha in the other four Regions.

- (i) Preparation of a soil map with a scale of 1/10,000 based on the analysis of aerial photographs and the soil survey.
- (ii) Preparation of the land use map with a scale of 1/10,000 based on the analysis of aerial photographs.

In addition to the above survey, preparation of a map of groundwater quality with a 1/10,000 scale, preparation of a monograph of each major crop, including its water requirements, and investigation of

farming systems and market analysis will also be undertaken. The basic development concept for an increase in cultivated land productivity will be proposed on the basis of the above survey. It will include cropping patterns, water-resources-management methods, research subjects, etc.

This project also includes an emergency operation project for irrigation on the Batinah Coast.

1.4.3 Soil Management

(1) Fertilizer and Its Application

In order to increase land productivity, a sufficient amount of fertilizer is normally required for soil in this country due to its low organic matter content, small cation exchange capacity and low nitrogen and potassium content. Furthermore, attention must be paid to the application method. It must be applied several times in order to avoid decomposition, eluviation and volatilization, as well as salt injury to the plants.

Since there is no chemical fertilizer factory in the country, all chemical fertilizers are imported. Table 1.4.1 indicates the net imported amount of fertilizer which is obtained from the subtraction of the exported amount from the amount imported. Based on this data, the amount, per ha, of nitrogen, phosphorus and potassium applied is estimated and shown in Table 1.4.2. However, this estimate may include some overestimates and underestimates due to the adoption of approximate maximum component content values and the exclusion of self-supplied manure, respectively.

In any case, the amount of nitrogenous fertilizer applied shows a rapid increase in the last five years. It is still, however, quite low considering that vegetables and fruit trees occupy most of the cultivated land. Further, the applied amount of phosphorus and potassium shows a gradual increase, but still remains at a low level

Table 1.4.1 Net Import Amount of Fertilizers and Estimated Contents of N, P₂O₅, K₂O in Each Fertilizer

CODE ('82-'86)	CODE ('87-'88)		NET IMPORT AMOUNT(KG)								estimation contents(%)		
			'82	'83	'84	'85	'86	'87	'88		N	P ₂ O ₅	K ₂ O
562.1		NITROGEN FERTILIZER TOTAL	1918202	1983412	6982420	8037696	7717278	11282822	12042475		25		
	31021000	UREA	N.A.	N.A.	N.A.	N.A.	N.A.	1615250	1918814		46		
	31022100	AMMONIUM SULFATE	N.A.	N.A.	N.A.	N.A.	N.A.	26702	500000		21		
	31022900	AMMONIUM SULFATE+AMMONIUM NITRATE	N.A.	N.A.	N.A.	N.A.	N.A.	0	1207191		28		
	31023000	AMMONIUM NITRATE	N.A.	N.A.	N.A.	N.A.	N.A.	0	850797		35		
	31024000	AMMONIUM NITRATE+INORGANIC SUBSTANCE	N.A.	N.A.	N.A.	N.A.	N.A.	245852	305780		20		
	31026000	CALCIUM NITRATE+AMMONIUM NITRATE	N.A.	N.A.	N.A.	N.A.	N.A.	0	32858		25		
	31028000	UREA+AMMONIUM NITRATE	N.A.	N.A.	N.A.	N.A.	N.A.	20000	10180		40		
	31029000	NITROGEN FERTILIZER NES	N.A.	N.A.	N.A.	N.A.	N.A.	9375018	7216855		20		
562.2	31039000	PHOSPHOROUS FERTILIZER	232847	153379	469461	607108	1213484	6531246	1316635		50		
562.3		POTASSIUM FERTILIZER TOTAL	364173	1631132	617520	120574	1644230	775890	584023			60	
	31042000	POTASSIUM CHLORIDE	N.A.	N.A.	N.A.	N.A.	N.A.	743461	420572			63	
	31043000	POTASSIUM SULFATE	N.A.	N.A.	N.A.	N.A.	N.A.	0	21399			54	
	31049000	POTASSIUM FERTILIZER NES	N.A.	N.A.	N.A.	N.A.	N.A.	32429	142052			60	
		FERTILIZER NES											
562.9		CHEMICAL NES	2320896	6921503	6364439	14855702	7082550	2170778	8066683				
271		CRUDE FERTILIZER	1336023	4522727	3634733	10098278	3501644	N.A.	N.A.		15	15	15
	31010000	ANIMAL AND VEGETABLE FERTILEZER	984873	2398776	2729706	4757424	3580906	N.A.	N.A.		6	3	3
	31051000	TABLETS ≤ 10KG	N.A.	N.A.	N.A.	N.A.	N.A.	1493988	7502941		6	3	3
	31059000	FERTILIZER NES	N.A.	N.A.	N.A.	N.A.	N.A.	630746	430131		15	15	15
								46044	133611		15	15	15

Table 1.4.2 Estimated Amount of Fertilizer Application

	1982	1983	1984	1985	1986	1987	1988
TOTAL KG	739,046	1,318,189	2,454,597	3,809,611	2,669,420	2,871,954	3,674,988
1KG/ha	18	30	54	80	54	55	67
P205							
TOTAL KG	346,373	827,062	861,832	1,961,018	1,239,416	3,411,961	967,967
1KG/ha	8	19	19	41	25	65	18
K20							
TOTAL KG	448,453	1,729,052	997,613	1,729,809	1,619,212	634,176	671,397
1KG/ha	11	40	22	36	32	12	12
AREA UNDER CULTIVATION (ha)	41,124	43,345	45,651	47,802	49,875	52,226	54,647

Table 1.4.3 Production Amount and Sales Amount of Organic Compost by Oman Organic Fertilizer and Chemical Industries

	1986	1987	1988	1989
				(JAN~NOV)
PRODUCTION AMOUNT	2,345	4,047	5,263	4,302
SALES AMOUNT	739	3,894	5,139	3,975

also.

(2) Organic Fertilizer

The extension centers recommend that farmers apply organic matter in addition to chemical fertilizers. Some farmers, who manage livestock and cultivate fruit trees, apply livestock manure to the fruit trees. Also, some farmers, without livestock, purchase compost from livestock holders.

In connection with organic fertilizers, both local and imported supplies are available on the market. The annual amount of imported organic fertilizers varies from 1,500 to 7,000 tons as shown in Table 1.4.1. These fertilizers are imported by traders and the owners of large farms.

Oman Organic Fertilizer & Chemical Industries, which is a private company that was established in 1986, produces local organic fertilizer. This fertilizer is manufactured with the the following materials: waste from households, markets, and supermarkets, mown grass from parks, green belts, etc. The materials are collected by the capital municipality of Muscat. Other materials such as sewage sludge are also suitable, but are not being used yet.

Until 1990, a government subsidy of 25 percent of the total price had been provided to farmers for purchasing organic fertilizer (as for chemical fertilizer). Thus, the price became 609 baisa per bag (25 kg): obtained from the subtraction of 203 Baisa (subsidy) from 812 Baisa (market price). Since the amount applied is still limited due to its higher price when compared with chemical fertilizer, the compost manufacturing plant is operated at 40 to 50 percent of its intended capacity. In 1990, the operation of this factory was suspended so the target of government subsidies was changed to manure pit construction.

Both the production and sales figures of the organic fertilizer in this factory are presented in Table 1.4.3. The sum total of the

sales amount and the imported amount suggests that between 5,500 and 12,500 tons are used in the country per annum, which corresponds to about 1,600 to 3,600 ha of the applied areas, assuming that the average application is 3.5 tons per hectare.

1.4.4 Salt Accumulation

The areas and the severity of salt accumulation on farmlands are not fully clarified, but they are going to be surveyed in the FAO Soil Survey and Land Classification Project. According to the FAO, salt-affected soil is widespread in the Batinah Coast. This is caused by:

- (a) capillary rise from shallow water table
- (b) marine parent material
- (c) salinization by saline irrigation water

Particularly, soil affected by (c) above is increasing.

In some cases, salt accumulates so much that it forms a thin layer on the top soil and in such farmlands, date palms suffer serious damage and some farm's are abandoned.

1.4.5 Progress of the Projects Concerning Soil in the Third Plan

In the Third Five-year Development Plan, the "Soil Survey and Analysis '100,000 hectares'" is having been carried out. It has been an on-going project since the Second Five-year Development Plan. Many of the above-mentioned soil surveys for agricultural development have been carried out within this budget. Planned total cost from 1986 to 1990 was 114,000 R.O. and actual total cost is 423,968 R.O. Of this, 419,331 R.O. was spent by 1989 and no budget is proposed for 1990. This means that $419,331 \text{ R.O.} - (423,968 \text{ R.O.} - 114,000 \text{ R.O.}) = 109,363 \text{ R.O.}$ has been spent in the Third Five-year Development Plan. This project came to an end in 1989.

1.5 NATURAL RESOURCES

1.5.1 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. Initial searches were unsuccessful after several dry wells had been drilled in a number of locations including a promising feature at Jabal Fahud. Finally 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, but it was in 1964 that the first major source was located at Fahud, after it was found that IPC had originally drilled just on the dry side of a geological fault. 1987 marked the 25th anniversary of the first commercial oil find at Yibal.

The discoveries at Fahud, Yibal and Natih in the same area were therefore the beginning of the oil industry on Oman. The first exports of oil from the Sultanate began in 1967. In the years that followed further discoveries of small fields were made in the north of the country. 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 southern Oman containing heavy oil became commercially viable.

Many of Oman's oilfields are small, since the oil-bearing formations are fragmented, and they are far from the coast, requiring lengthy pipelines. The oil from the south is piped northward through the main pipeline to the coast, for lack of natural harbors along the monsoon-swept southern seaboard coast. 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. Insurance rates on cargoes, crews

and ships are consequently lower.

Production of oil rose steeply in the years between 1967 and 1970, reaching 332,000 bpd, but a decline set in during the following five years until new discoveries in Central Oman were brought into production in 1975. By 1977 a further decline was threatening, and in 1980 production had fallen to 282,000 bpd. However, by the time oil had been discovered in commercial quantities in the south, the next five years saw an upsurge in production capacity which reached a peak of 600,000 bpd in 1986.

Falling of oil prices in early 1986 made it initially desirable to increase production, which resulted in a rapid rise in output during that period. Oman is not a member of OPEC or OAPEC, but has always kept in step with oil prices maintained by OPEC. When OPEC members agreed to implement oil production quotas in order to stabilize the world price of oil, Oman co-operated by voluntarily reducing production. Since 1986, reductions have been made in three stages from 600,000 bpd in that year to 536,750 bpd when the latest reduction was made in February 1988, of which 468,000 bpd was for export, the remainder being for domestic consumption.

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. Elf-Aquitaine Oman has been pumping oil on a limited scale from its Sahmah field in western Oman since 1980, and Oxy Oman became the third oil producer in 1984 with limited extraction from four wells at Safah in its Suneinah concession near Ibri in the north. It increased its output from 3,000 bpd to 9,900 bpd in 1987. In the field of exploration, some 23 oil companies from Canada, Australia, Japan, Britain, America and France, are involved in a total of eight areas. These companies have signed production-sharing agreements with the government, which place responsibility for financing exploration on the foreign consortiums.

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. Without such a technique the recovery of heavy viscous oil is extremely slow. In some fields like Fahud, Natih, and Yibal supplemental recovery methods are used by means of the injection of gas and water.

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. The oilfield's reserves are being evaluated, and should these prove positive, production could start in 1989.

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. In January 1988 a new record was set when 2.73 million barrels of oil were loaded into the 403,000 ton Greek tanker Parthenon. This was made possible because Mina Al Fahal is one of the few loading points in the Gulf region with a deep draught moorage. Many tankers leaving the Gulf stop at Mina Al Fahal to top up with oil.

1.5.2 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. Gas is supplied to the power station in the Rusayl

Industrial Area, as well as to the Wadi Jizzi power station which serves the copper smelting facility, Sohar and the surrounding region. Gas is also supplied to the Sultan Qaboos University. PDO is the largest consumer of associated gas, which it requires for its power plants and equipment as well as for reinjection into oil reservoirs to maintain pressures and to sustain oil production.

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. This year R.O. 6 million is being invested in gas development in three production plants.

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. The LPG is taken by road tanker to a private sector bottling plant in the new industrial area at Salalah.

1.5.3 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. The ore is concentrated and smelted to produce copper which is then electrically refined to produce cathodes. Work started on this mining/metallurgical complex in 1979 and was completed in 1983, when the first shipment of copper cathodes was exported. Since then production of

cathode copper has increased; export sales totaled 15,490 tonnes last year.

Chromite is obtained from open pit mines in Wadi Rajmi; to date OMCO has exported approximately 7,000 tonnes. Recent exploration work in the Sultanate has revealed additional chromite reserves in excess of one million tonnes in the Rajmi and Samad areas.

In 1987, additional deposits of copper ore were identified in a south-east extension of the Lasail mine, amounting to over 1.5 million tonnes. At the present time exploration drilling for copper ore is continuing at Hayl a'Safil near Yankul, where a total reserve of 1.5 million tonnes has so far been identified.

Deposits of other minerals are known to exist in Oman and geological survey are continuing to identify their locations and potential commercial viability. In some cases the deposits lie in particularly inaccessible regions.

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.

CHAPTER 2

OUTLINE OF SOCIAL SITUATION

CHAPTER 2 OUTLINE OF SOCIAL SITUATION

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. Table 2.1.1 shows the population estimates by region and wilayat prepared by the government.

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 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.

One of the characteristics of the population structure in the Sultanate is the large number of foreign workers whose jobs range from the most highly skilled to unskilled; the same situation exists in the other oil exporting countries of the Gulf States. This situation arose when essential economic reforms started 20 years ago. The goal was to modernize the nation away from a subsistence agriculture and fishery economy. The number of expatriates registered in the DGLA is 29,535 in the public sector, 248,870 in the private sector, and a total of 278,405 in 1989 (refer to Tables 2.1.2 to 2.1.3).

Regarding urbanization, the concentration of population in the capital is remarkable: 20%, or approximately 300,000 inhabitants, of the entire Omani population live in the capital. The Batinah area, which extends from the northern part of Oman along the coast for almost 270 km and includes the capital, holds over 50% of the population. Accompanying the recent rapid economic growth, the demand increase for labor induced an internal intensive population movement from rural areas to urban areas, which resulted in the growth of the urban population share to 53.4% compared to the rural share of 46.6%.

Table 2.1.1.1 Basic Indicators by Region

REGION	WILAYAT	VILLAGE	POPULATION	SCHOOL	PUPILS	HOSPITAL	HEALTH CENTRES	BEDS	MAIN TOWN
T. MUSCAT	2	139	333,352	104	61,477	8	8	1,443	MUSCAT
2. AL-JANUBIAH	1	64	164,410	109	25,867	5	26	384	SALALAH
3. AL-DAKHILIAH	9	255	190,263	85	38,701	8	10	390	NIZWA
4. AL-SHARQIAH	11	371	218,089	112	41,083	10	17	456	SUR, IBRA
5. AL-BATINAH	12	594	436,476	196	93,308	9	15	379	SOHAR, RUSTAQ
6. AL-DHAHIRAH	5	302	135,585	83	30,078	4	8	174	IBRI, BURAIMI
7. MUSANDAM	4	172	23,825	14	4,220	3	2	90	KHASAB
TOTAL	44	1,897	1,500,000	703	229,934	47	86	3,316	

Table 2.1.2 Number of Expatriates

	1970	1971	1975	NUMBER OF EXPATRIATES (1970---1988)					1984	1985	1986	1987	1988
				1980	1981	1982	1983						
GOVERNMENT EMPLOYEES													
OMANIS	1,630	2,857	13,316	23,445	26,886	29,647	33,543	37,119	39,192	40,223	42,977	45,574	
EXPATRIATES	120	255	5,507	15,359	16,865	20,162	21,334	24,924	27,456	27,327	29,283	29,535	
TOTAL	1,750	3,112	19,123	38,840	43,751	49,809	54,877	62,048	66,648	67,550	72,260	75,109	
PERCENTAGE OF OMANI	93.1	91.8	71.2	60.4	61.5	59.5	61.1	59.8	58.8	59.5	59.5	60.7	
PRIVATE SECTOR EMPLOYEES													
EXPATRIATES	N/A	N/A	N/A	130,595	160,507	177,313	231,362	265,005	274,984	248,130	216,388	248,870	
TOTAL OF													
EXPATRIATES	120	255	5,507	145,990	177,372	197,475	252,696	289,929	302,440	275,457	245,671	278,405	

Table 2.1.3 Number and Percentage of Labor Cards Issued by DGLA to Non-Omanis Working in the Private Sector by Major Economic Activities

Code	Economic Activities	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	Agriculture & Fisheries	4,655	6,988	6,593	8,921	9,368	18,251	12,778	16,352	28,016
2	Mining & Quarrying	2,272	2,682	3,426	3,389	3,468	3,818	3,708	3,521	4,028
3	Manufacturing	3,876	8,096	8,034	8,477	5,558	7,150	7,687	11,974	13,468
4	Electricity, Gas & Water	723	478	423	195	185	141	258	485	471
5	Construction	33,393	48,532	46,279	59,822	64,441	67,271	52,489	73,758	81,228
61/62	Wholesale & Retail Trade	43,693	23,692	31,703	37,171	59,462	60,848	66,038	56,514	69,089
5/61/62	Construction & Trade Combined	26,548	49,487	66,611	89,793	99,694	100,912	98,689	10,627	8,987
63	Restaurants & Hotels	1,518	1,843	2,037	3,017	2,575	4,272	4,808	8,604	18,167
7	Transport, Storage & Communication	2,852	2,258	2,483	2,545	2,716	2,938	2,338	2,941	3,121
8	Financing, Insurance, & Real Estate	3,833	2,485	3,272	3,753	4,498	5,136	4,516	4,514	5,187
9	Community, Social & Personal Services	2,668	8,088	8,139	10,686	19,219	13,268	14,498	26,438	32,915
X	More than One Activity	3,678	9,966	7,345	7,478	6,824	7,892	7,519	378	194
0	Activity not stated	4,317	319	486	268	417	652	330	192	167
Total		132,618	163,934	186,821	235,645	269,418	284,333	267,545	216,388	248,878
Number of Labor Card Holders who left Oman		2,923	3,427	9,598	4,283	4,485	9,349	19,415	N.A.	N.A.
Net Total		130,595	160,507	177,313	231,362	265,885	274,984	248,130	216,388	248,878
Source: Statistical Yearbook 1988										

Percentage of Labor Cards Issued by DGLA to Non-Omanis Working in the Private Sector by Major Economic Activities

Code	Economic Activities	1980	1981	1982	1983	1984	1985	1986	1987	1988
1	Agriculture & Fisheries	3.5	4.3	3.5	3.8	3.5	3.6	4.8	6.1	7.5
2	Mining & Quarrying	1.7	1.6	1.8	1.4	1.3	1.3	1.4	1.3	1.5
3	Manufacturing	2.9	4.9	4.3	4.0	2.1	2.5	2.9	4.5	5.8
4	Electricity, Gas & Water	0.5	0.3	0.2	0.1	0.1	0.0	0.1	0.2	0.2
5	Construction	25.2	29.6	24.8	25.8	23.9	23.7	19.6	27.6	38.4
61/62	Wholesale & Retail Trade	32.9	14.5	17.0	15.8	22.1	21.4	24.7	21.1	25.8
5/61/62	Construction & Trade Combined	20.0	30.1	35.7	38.1	37.0	35.5	33.9	4.0	3.3
63	Restaurants & Hotels	1.1	1.1	1.1	1.3	1.0	1.5	1.8	3.2	3.8
7	Transport, Storage & Communication	2.2	1.4	1.3	1.1	1.0	1.0	0.9	1.1	1.2
8	Financing, Insurance, & Real Estate	2.3	1.5	1.8	1.6	1.7	1.8	1.7	1.7	1.9
9	Community, Social & Personal Services	1.6	4.9	4.4	4.5	3.8	4.7	5.4	9.9	12.3
X	More than One Activity	2.8	5.5	3.9	3.2	2.5	2.8	2.8	0.1	0.1
0	Activity not stated	3.3	0.2	0.3	0.1	0.2	0.2	0.1	0.1	0.1
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	88.9	93.8

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, as shown in Table 2.2.1 and Figure 2.2.1.

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. That can be considered to reflect the development of new farms which demands additional foreign workers. With regard to the future of Omanization, the dependence on foreign workers in the agricultural sector may still increase, because of the preference for urban centers of young Omani people living in rural areas and the continued promotion of efficient new farm construction.

Omanization in the public sector has advanced negligibly as far as the rate of Omani-expatriates is concerned, the number having dropped to approximately 79,000, in 1988. Further concentration on the policy is needed in order to promote Omanization in the public sector, through measures such as education and training to correspond with the new demands for human resources.

2.3 Education

The real developments in education in the Sultanate did not start until the First Five-year Development Plan. At first, the educational system comprised 3 schools for males, which held less than 1,000 students, and no building facilities except tents, 2 or 3 shift systems and a serious shortage of teachers who are recruited from neighboring countries such as Egypt, Sudan and Jordan. In the development process, the government completed the facilities and improved the educational system

Table 2.2.1 Number and Percentage of Labor Cards Issued by
DGLA to Non-Omanis Working in the Private Sector
by Major Economic Activities

Number of Labor Cards Issued by DGLA to Non-Omanis Working in the Private Sector by Major Economic Activities										
Code	Economic Activities	1980	1981	1982	1983	1984	1985	1986	1987	
1	Agriculture & Fisheries	4,655	6,988	6,583	8,921	9,368	10,251	12,778	16,352	
2	Mining & Quarrying	2,272	2,682	3,426	3,399	3,468	3,618	3,788	3,521	
3	Manufacturing	3,876	8,096	8,034	9,477	5,558	7,150	7,687	11,974	
4	Electricity, Gas & Water	723	478	423	195	185	141	258	485	
5	Construction	33,393	48,532	46,279	59,022	64,441	67,271	52,489	73,758	
5/61/62	Wholesale & Retail Trade	43,693	23,692	31,703	37,171	59,462	60,848	66,830	56,514	
63	Construction & Trade Combined	26,548	49,407	66,611	88,793	99,694	109,912	90,609	10,627	
7	Restaurants & Hotels	1,518	1,843	2,037	3,017	2,575	4,272	4,809	8,604	
8	Transport, Storage & Communication	2,852	2,258	2,463	2,545	2,716	2,930	2,330	2,841	
9	Financing, Insurance, & Real Estate	3,033	2,485	3,272	3,753	4,499	5,136	4,516	4,614	
X	Community, Social & Personal Services	2,068	8,088	8,139	10,606	10,219	13,260	14,490	26,436	
0	More than One Activity	3,678	9,066	7,345	7,478	6,824	7,692	7,519	370	
	Activity not stated	4,317	319	486	268	417	652	338	192	
Total		132,618	163,934	186,821	235,645	269,410	284,333	267,545	216,388	
Number of Labor Card Holders who left Oman		2,023	3,427	9,588	4,283	4,405	9,349	19,415 N.A.		
Net Total		130,595	160,507	177,313	231,362	265,005	274,984	248,130	216,388	
Source: Statistical Yearbook 1988										

Percentage of Labor Cards Issued by DGLA to Non-Omanis Working in the Private Sector by Major Economic Activities										
Code	Economic Activities	1980	1981	1982	1983	1984	1985	1986	1987	
1	Agriculture & Fisheries	3.5	4.3	3.5	3.8	3.5	3.6	4.8	7.6	
2	Mining & Quarrying	1.7	1.6	1.8	1.4	1.3	1.3	1.4	1.6	
3	Manufacturing	2.9	4.9	4.3	4.0	2.1	2.5	2.9	5.5	
4	Electricity, Gas & Water	0.5	0.3	0.2	0.1	0.1	0.0	0.1	0.2	
5	Construction	25.2	29.6	24.8	25.0	23.9	23.7	19.6	34.1	
5/61/62	Wholesale & Retail Trade	32.9	14.5	17.0	15.8	22.1	21.4	24.7	26.1	
5/61/62	Construction & Trade Combined	20.0	30.1	35.7	38.1	37.0	35.5	33.9	4.9	
63	Restaurants & Hotels	1.1	1.1	1.1	1.3	1.0	1.5	1.8	4.0	
7	Transport, Storage & Communication	2.2	1.4	1.3	1.1	1.0	1.0	0.9	1.4	
8	Financing, Insurance, & Real Estate	2.3	1.5	1.8	1.6	1.7	1.8	1.7	2.1	
9	Community, Social & Personal Services	1.6	4.9	4.4	4.5	3.8	4.7	5.4	12.2	
X	More than One Activity	2.8	5.5	3.9	3.2	2.5	2.8	2.8	0.2	
0	Activity not stated	3.3	0.2	0.3	0.1	0.2	0.2	0.1	0.1	
Total		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

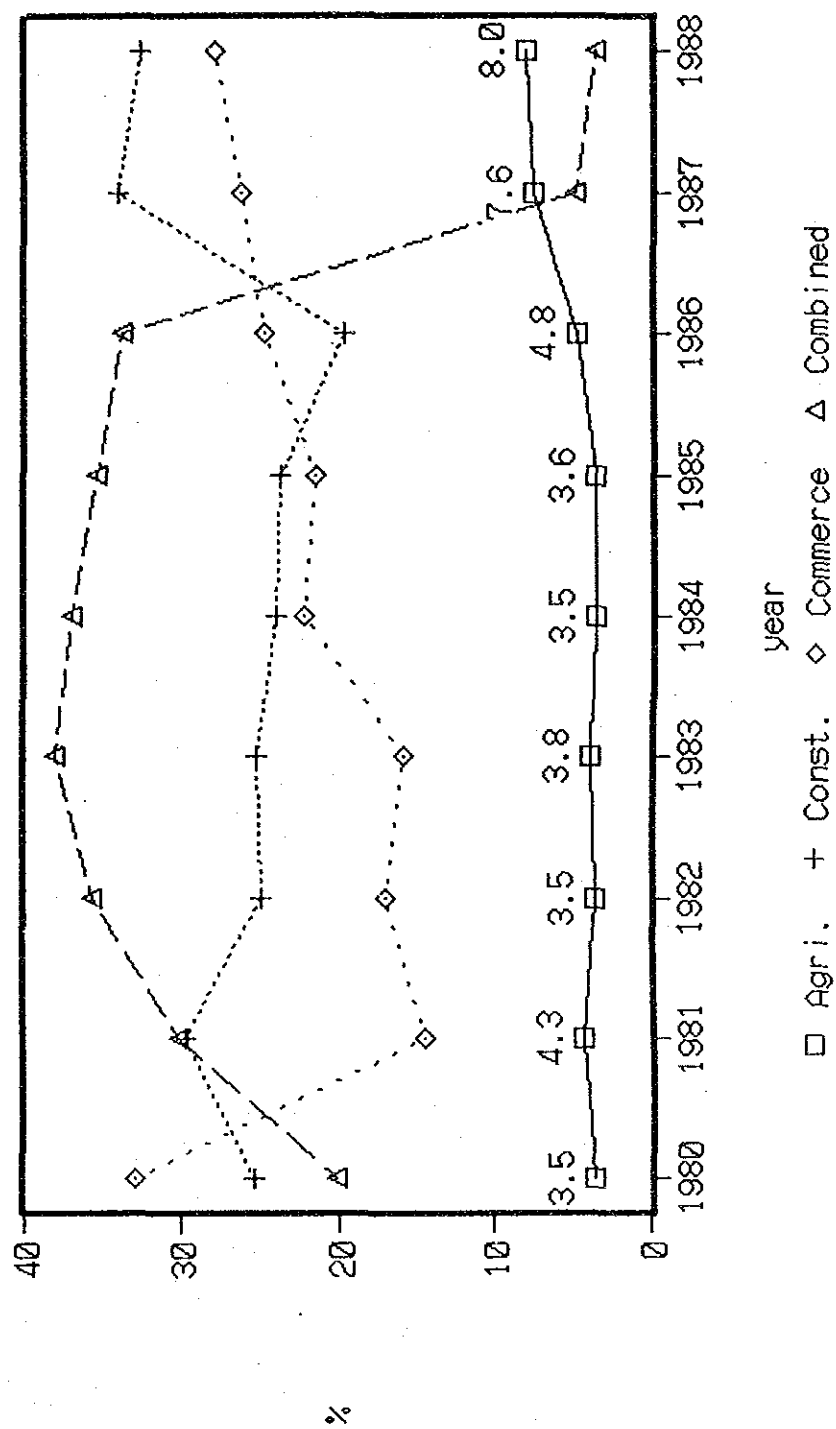


Figure 2.2.1 Foreigners' Share by Sector

step by step, from the primary level, to the preparatory level, and then to the secondary level (refer to Figure 2.3.1). The progress of educational development in Oman up to 1988, therefore, was dramatic. This is also shown in the increase of the number of government schools for general education which 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 (refer to Table 2.3.1). 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. From the viewpoint of Omanization, further development and improvement in educational facilities and systems will be required in the future.

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.

In spite of the re-evaluation of the Third Five-year Development Plan after the fall of oil prices in 1986, the medical sector budget was not cut and the planned projects were implemented on schedule. During the Third Plan, the government constructed medical centers in remote, inland areas. Moreover, the government placed importance on preventive measures and health education throughout the country and promoted a program for endemic eradication. Recently, preventive injections were widely carried out, as 81% of the population were given the preventive injection for tuberculosis, polio and diphtheria. As a result, some of the endemics have been controlled.

SULTANATE OF OMAN EDUCATION AND TRAINING STRUCTURE

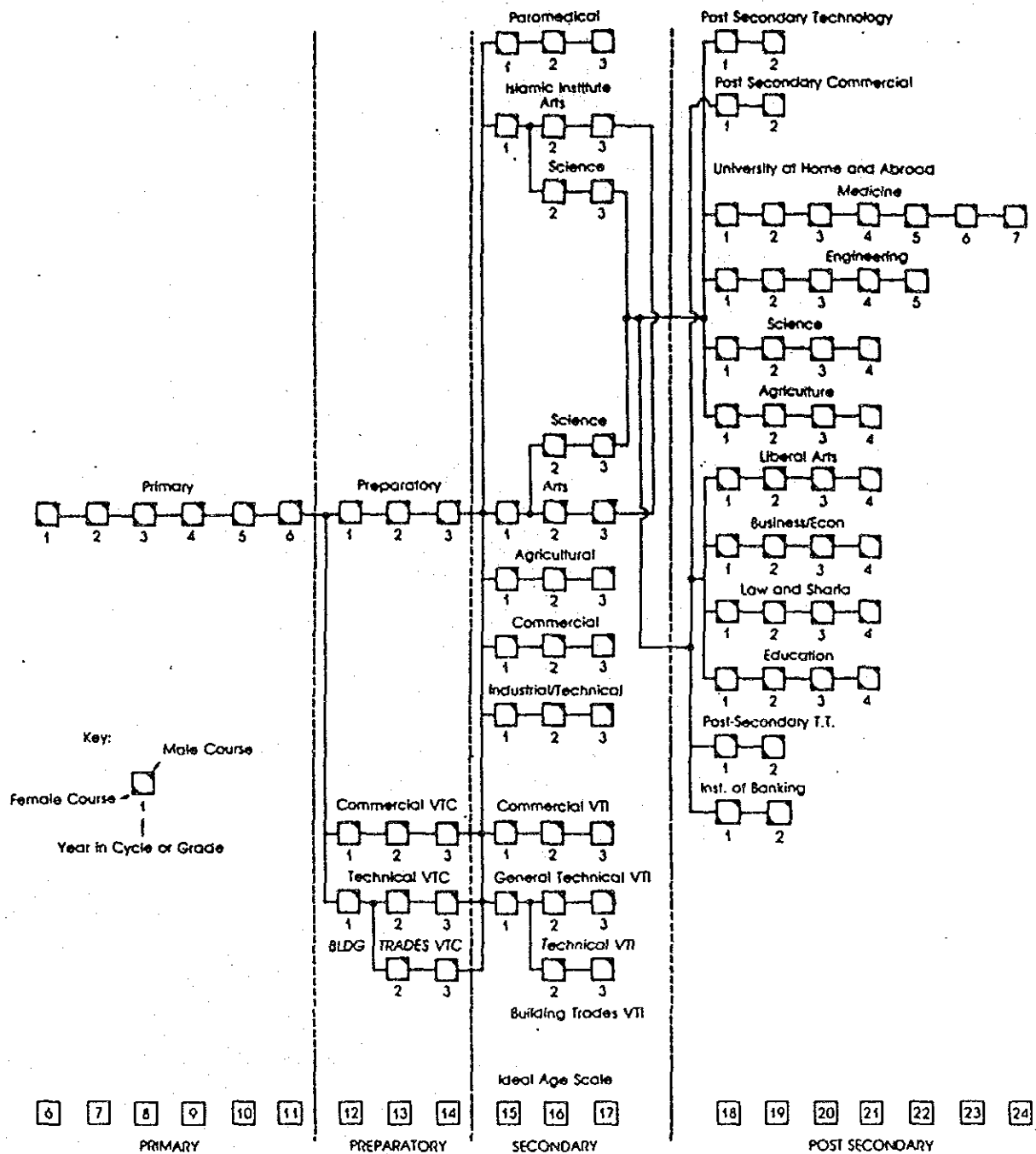


Figure 2.3.1 Education and Training Structure

Table 2.3.1 Increase in Number of Schools, Students and Teachers in

General Education during Academic Years

DESCRIPTION	1980/81 NUMBER	%	1983/84 NUMBER	%	1985/86 NUMBER	%	1988/89 NUMBER	%
GENERAL EDUCATION								
A. NUMBER OF SCHOOLS								
PRIMARY	373	100.0	499	100.0	588	100.0	678	100.0
PREPARATORY	175	46.9	300	60.1	326	55.4	367	54.1
SECONDARY	183	49.1	170	34.1	213	36.2	249	36.7
	15	4.0	29	5.8	49	8.4	62	9.2
B. STUDENTS								
MALE	106,932	100.0	164,316	100.0	218,914	100.0	268,722	100.0
FEMALE	71,742	(67.1)	101,353	(61.7)	126,578	(57.8)	148,509	(55.3)
PRIMARY	35,190	(32.9)	62,963	(38.3)	92,327	(42.2)	120,213	(44.7)
MALE	91,652	85.7	134,650	81.9	175,452	80.1	212,328	79.0
FEMALE	60,290	(65.8)	80,522	(59.8)	97,948	(55.8)	114,630	(54.0)
PREPARATORY	31,362	(34.2)	54,128	(40.2)	77,504	(44.2)	97,698	(46.0)
MALE	13,729	12.8	23,337	14.2	32,728	15.0	43,089	16.0
FEMALE	10,284	(74.9)	16,425	(70.4)	21,668	(66.2)	26,892	(72.4)
SECONDARY	3,445	(25.1)	6,912	(29.6)	11,060	(33.8)	16,197	(36.6)
MALE	1,551	14.5	6,339	3.9	10,734	4.9	13,305	5.0
FEMALE	1,168	(75.3)	4,406	(69.6)	6,971	(64.9)	6,987	(52.5)
C. TEACHING								
TEACHERS	383	(24.7)	1,923	(30.4)	3,763	(35.1)	6,318	(47.5)
ADMINISTRATORS	5,663		8,272		10,729		13,029	
PRIMARY	5,150		7,509		9,793		11,990	
TEACHERS	513		763		936		1,039	
ADMINISTRATORS	3,930		5,318		6,915		8,467	
PREPARATORY	3,756		5,013		6,539		8,080	
TEACHERS	3,174		305		376		387	
ADMINISTRATORS	1,537		2,451		2,837		3,301	
SECONDARY	1,255		2,086		2,449		2,879	
TEACHERS	282		356		388		422	
ADMINISTRATORS	196		503		977		1,261	
TEACHERS	139		410		805		1,031	
ADMINISTRATORS	57		93		172		230	

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 (refer to Table 2.4.1).

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. During the Third Five-year Development Plan, new power stations are planned for Raysut in the south and Manah in the interior.

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.

Table 2.4.1

DEATH PER 1,000 LIVE BIRTHS IN ASIA

	1960	1982
Afghanistan	230	200
Bhutan	190	150
Nepal	190	150
India	170	120
Laos	150	120
Pakistan	160	120
Burma	160	100
Papua New Guinea	170	100
Indonesia	150	90
Viet Nam	160	90
Philippines	110	50
Thailand	100	50
China	140	39
Sri Lanka	70	39
Korea (Rep. of)	80	30
Singapore	36	11
Japan	31	7

Note: Infant Mortality Rate (IMR) =
$$\frac{\text{No. of dead baby (0-12 Months)}}{1,000 \text{ live birth}}$$

Source: The State of the World's Children, 1985 UNICEF

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. In the Third Five-year Development Plan, the government promoted both the water conservation and the desalination program and supplemented these with installations of new wells in rural areas in an attempt to secure water supply.

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.

2.8 Communications

2.8.1 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.

2.8.2 Air

One of the first major projects in the modern development of Oman was the construction of the International Airport at Seeb, 35 km from Muscat. The facility conforms to the most modern international standards, and also serves military and police operations.

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.

2.8.3 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.

2.9 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.

In 1977, the government established the Oman Housing Bank (OHB) which provides long-term loans with preferential conditions to people who wish to construct their own houses. OHB expanded its function through several significant reforms in 1985. The maximum loan amount was raised to R.O. 35,000 from R.O. 25,000 and people expanding an existing house or finishing a house already under construction became eligible for loans. The loan period was also increased to 20 years from 15 years for the low income earners.

CHAPTER 3

OUTLINE OF ECONOMIC SITUATION

CHAPTER 3 OUTLINE OF ECONOMIC SITUATION

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 infra-structures 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 3.1.1 shows the trends of petroleum production and oil export value.

3.2 Gross Domestic Product (GDP)

(1) Growth of GDP

The trends of the GDP (both at current prices and constant prices) and its annual growth rate are illustrated in Table 3.2.1-3.2.2 and Figure 3.2.1. 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

Petroleum Production and Export Value

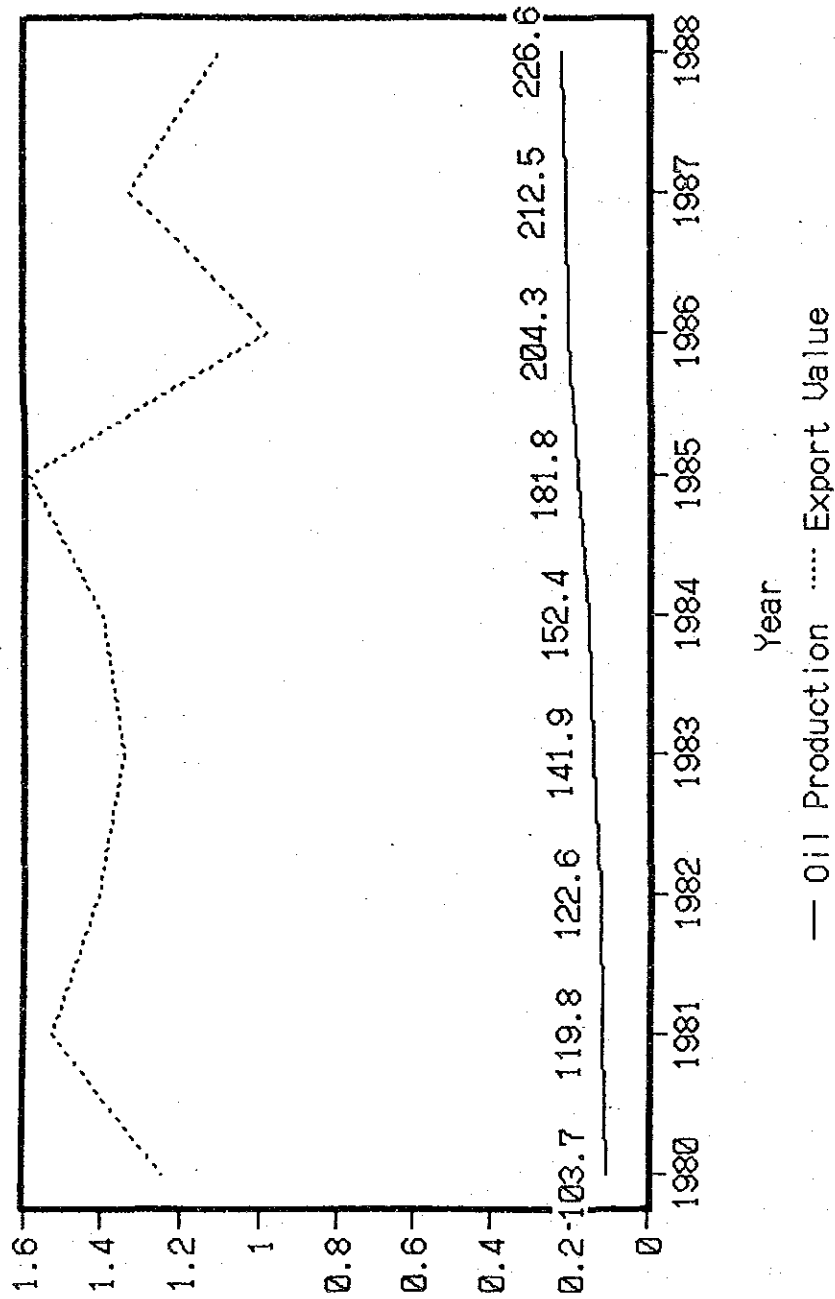


Figure 3.1.1 Petroleum Production and Export Value

Table 3.2.1 Gross Domestic Product at Current Prices by Industrial Origin

(in Mill. Rial Omani)

Activity	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Agriculture & Fishing	18.3	24.1	30.7	40.3	52.6	62.1	66.1	80.6	89.0	93.7	95.9	105.4	123.6
Mining (Crude Oil)	517.5	532.0	493.0	719.7	1,280.5	1,476.4	1,424.7	1,384.6	1,448.5	1,683.9	1,072.4	1,413.0	1,202.1
Manufacturing	4.3	6.7	8.5	11.5	15.6	27.0	39.6	67.1	91.2	82.3	103.1	111.5	122.7
Electricity & Water	6.4	9.2	10.5	11.1	16.0	18.7	21.3	24.0	32.7	36.8	48.3	43.5	46.2
Construction	88.5	78.0	71.4	86.1	117.8	144.9	169.8	187.4	228.9	242.2	228.8	137.0	119.4
Wholesale & Retail Trade	76.5	94.2	104.0	137.1	188.3	251.3	299.5	315.7	369.0	428.0	383.2	327.3	388.8
Transport & Communication	13.5	17.6	20.7	25.5	38.3	53.0	64.9	72.9	84.5	99.6	103.4	97.7	108.3
Banking & Real Estate	92.0	96.2	100.1	123.1	162.8	206.6	231.2	250.1	275.9	295.9	281.2	260.3	269.4
Services	4.4	5.8	7.6	9.6	13.0	16.9	20.7	25.4	31.6	36.8	38.5	48.4	45.7
Public Admin. & Defence	69.3	98.5	109.2	137.9	194.6	260.5	305.0	300.0	423.9	477.9	495.8	509.9	535.2
Less Imputed Bank Charges	-10.9	-12.9	-14.2	-19.0	-24.6	-39.0	-43.9	-49.6	-59.2	-63.6	-71.2	-70.3	-71.7
Total GDP at Prod. Values	879.8	942.2	942.3	1,282.9	2,054.9	2,479.2	2,598.9	2,718.2	3,015.0	3,412.7	2,763.4	2,975.7	2,889.7
plus Import Duties	4.5	4.6	4.6	7.0	8.6	11.3	14.7	21.7	31.7	41.1	37.0	26.9	29.6
Total GDP at Market Prices	884.3	946.8	946.9	1,289.9	2,063.5	2,490.5	2,613.6	2,739.9	3,046.7	3,453.8	2,800.4	3,002.6	2,919.3
Estimated Population (thousand)	888.7	900.0	932.4	965.9	1,000.7	1,048.7	1,094.9	1,145.3	1,197.9	1,253.0	1,310.7	1,371.0	1,434.0
Estimated GDP/capita (R.O.)	1,018.0	1,052.0	1,015.6	1,335.4	2,062.0	2,379.3	2,387.1	2,392.4	2,543.3	2,756.3	2,136.6	2,198.1	2,035.7

Note: (1) Data of year 1989 are provisional.

(2) Population in 1989 is assumed 1.5 million by Development Council.

(3) Assumed population increase rate: 3.6% per annum during 1985-88, 4.6% during 1980-87, cited from "World Development Report 1989", World Bank.

(4) Population includes foreign workers.

Source: Statistical Year Book

Table 3.2.2

Gross Domestic Product at Constant Prices by Industrial Origin

(in Mill. Rial Omani)

Activity	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Agriculture & Fishing	39.7	40.8	49.7	54.1	64.2	70.4	81.7	83.8	79.1	81.7	83.8	83.8	101.8
Mining (Crude Oil)	403.8	461.1	461.1	585.2	590.9	645.4	775.6	835.1	880.0	935.1	935.1	1,084.7	1,084.7
Manufacturing	8.5	10.5	10.5	18.5	12.6	28.6	38.2	47.8	67.6	67.3	81.0	84.3	87.2
Electricity & Water	18.5	18.5	18.5	14.0	16.7	18.4	26.3	29.9	44.8	47.5	70.0	95.4	116.2
Construction	71.4	71.4	107.1	142.3	91.4	107.1	142.3	174.7	221.4	239.3	235.4	144.5	122.0
Wholesale & Retail Trade	184.0	117.5	139.0	188.4	139.0	188.4	224.7	238.6	286.9	316.6	250.5	191.8	218.5
Transport & Communication	20.7	23.0	23.0	23.0	33.2	43.2	51.3	58.9	73.4	86.5	84.5	88.3	84.4
Banking & Real Estate	188.1	111.0	111.0	162.4	125.5	143.5	162.4	170.2	215.5	239.6	248.3	226.1	227.4
Services	7.6	9.4	9.4	12.1	12.1	14.5	18.3	22.8	29.5	34.8	34.7	36.1	40.7
Public Admin. & Defence	109.2	137.4	137.4	176.6	144.6	178.2	176.6	203.0	235.6	248.1	239.1	259.7	283.0
Less Imputed Bank Charges	-14.2	-18.4	-18.4	-35.3	-21.5	-32.2	-35.3	-40.7	-52.8	-58.1	-60.1	-57.0	-58.1
Total GDP at Prod. Values	842.3	981.4	1,048.8	1,355.1	1,048.8	1,217.5	1,355.1	1,579.1	1,837.0	2,078.2	2,161.4	2,079.2	2,199.0
plus Import Duties	4.6	6.0	6.3	11.0	6.3	8.1	11.0	16.3	24.5	27.0	23.0	16.2	15.6
Total GDP at Market Prices	946.9	987.4	1,047.1	1,366.1	1,047.1	1,225.6	1,366.1	1,595.4	1,862.1	2,105.2	2,175.2	2,095.4	2,214.6
Growth Rate of GDP		4.3	6.8	11.5	6.8	17.0	11.5	16.7	16.7	13.1	3.3	-3.7	5.7
Growth Rate of Agriculture		32.2	20.8	8.0	1.4	1.4	8.0	18.5	8.6	16.1	-3.2	6.8	21.5
Growth Rate of Mining		-4.9	-4.9	0.7	18.7	18.7	0.7	7.6	7.6	28.2	13.6	6.2	7.4
Growth Rate of Manufacturing		23.1	10.8	46.6	64.5	64.5	46.6	58.1	41.4	-8.4	20.3	4.1	3.5

Table 3.2.3 The Share of GDP at Current Prices by Industrial Origin

(%)

Activity	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Agriculture & Fishing	2.1	2.6	3.3	3.1	2.6	2.5	2.5	3.0	3.0	2.7	3.5	3.5	4.3
Mining (Crude Oil)	58.8	56.5	52.4	56.1	62.3	59.6	54.8	50.9	48.1	49.3	38.8	47.5	41.6
Manufacturing	8.5	8.7	8.9	8.9	8.8	1.1	1.5	2.5	3.0	2.4	3.7	3.7	4.2
Electricity & Water	0.7	1.0	1.1	0.9	0.8	0.8	0.8	0.9	1.1	1.1	1.5	1.5	1.6
Construction	10.1	8.3	7.6	6.7	5.7	5.8	6.5	6.9	7.5	7.1	8.0	4.6	4.1
Wholesale & Retail Trade	8.7	10.0	11.0	10.7	9.2	10.1	11.5	11.6	12.2	12.5	13.9	11.0	13.5
Transport & Communication	1.5	1.9	2.2	2.0	1.9	2.2	2.5	2.7	2.8	2.9	3.7	3.3	3.7
Banking & Real Estate	10.5	10.2	10.6	9.6	7.9	8.3	8.9	9.2	9.2	8.7	10.2	8.7	9.3
Services	8.5	8.6	8.8	8.7	8.6	8.7	8.8	8.9	1.0	1.1	1.4	1.4	1.8
Public Admin. & Defence	7.9	9.6	11.6	10.7	9.5	10.5	11.7	13.2	14.1	14.0	17.9	17.1	18.5
Less Imputed Bank Charges	-1.2	-1.4	-1.5	-1.5	-1.2	-1.6	-1.7	-1.8	-2.0	-1.9	-2.6	-2.4	-2.5
Total GDP at Prod. Values	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Annual Growth Rate

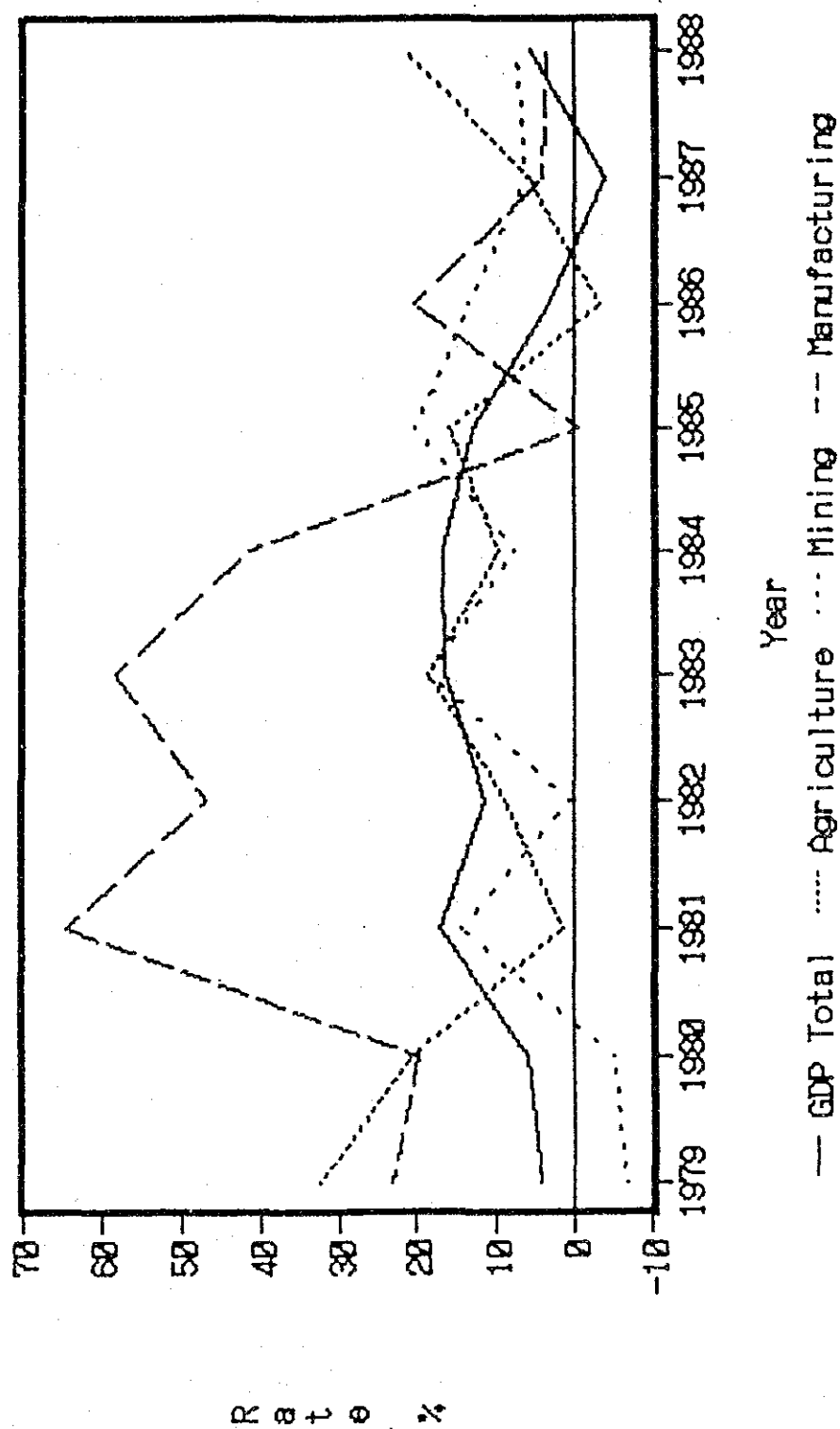


Figure 3.2.1 Annual Growth Rate of GDP by Industrial Origin

manufacturing, the manufacturing sector was profoundly influenced by the 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 due in large part to the fisheries sector's contribution. Although the importance of agriculture, which employs almost half of the Omani people, is recognized, its share in the GDP is surprisingly small --only 4.3% in 1988.

Table 3.2.3 and Figure 3.2.2 show the structural change of Omani industry from 1976 to 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

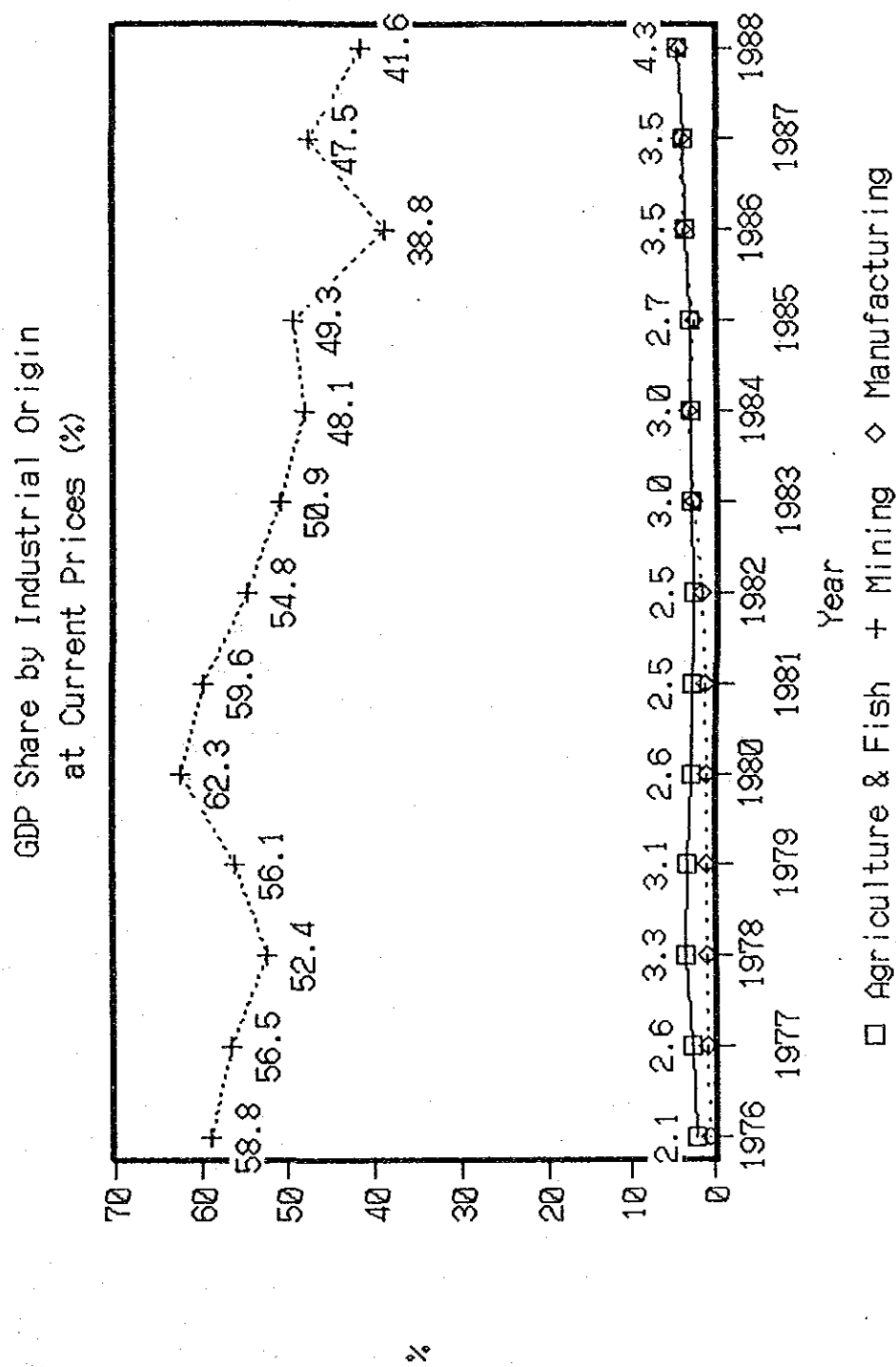


Figure 3.2.2 GDP Share by Industrial Origin at Current Prices

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. The economic growth rate must exceed the population growth rate by at least n (= approximately 3.5%), or else the living standard of Omanis will deteriorate.

Figure 3.2.3 shows the estimated trends of GDP per capita and population increase. It should be noted that the population estimate is based on information from the Development Council and the World Bank estimate described in "World Development Report in 1989".

3.3 Investment

Consumption and investment occupied 73% and 17%, respectively, of Gross Domestic Expenditure in 1988, as shown in Tables 3.3.1 and 3.3.2. Expenditure was characterized by the large contribution of the government to both consumption and investment, of (55.2% and 32% respectively). This indicates that this "nation-building" has been carried out primarily by decisive government leadership.

With respect to investment, sectoral investment value can be estimated from gross domestic expenditure as seen above. Government investment is shown in Table 3.3.3. From these ICOR (incremental capital output ratio), and I/dY where I equals gross domestic investment and dY equals GDP increase can be calculated. Table 3.3.4 and Figure 3.3.1 illustrate ICOR trends. As a denominator of the Harrod-Domar formula's warranted rate of growth ($=s/v$ where s equals saving rate and v equals ICOR), ICOR reveals investment efficiency.

According to the movement of ICOR in the three major production sectors, the manufacturing sector was at the lowest level, meaning the highest efficiency, despite sharp deterioration in 1985. The agriculture sector, on the other hand, was relatively stable and demonstrated a high

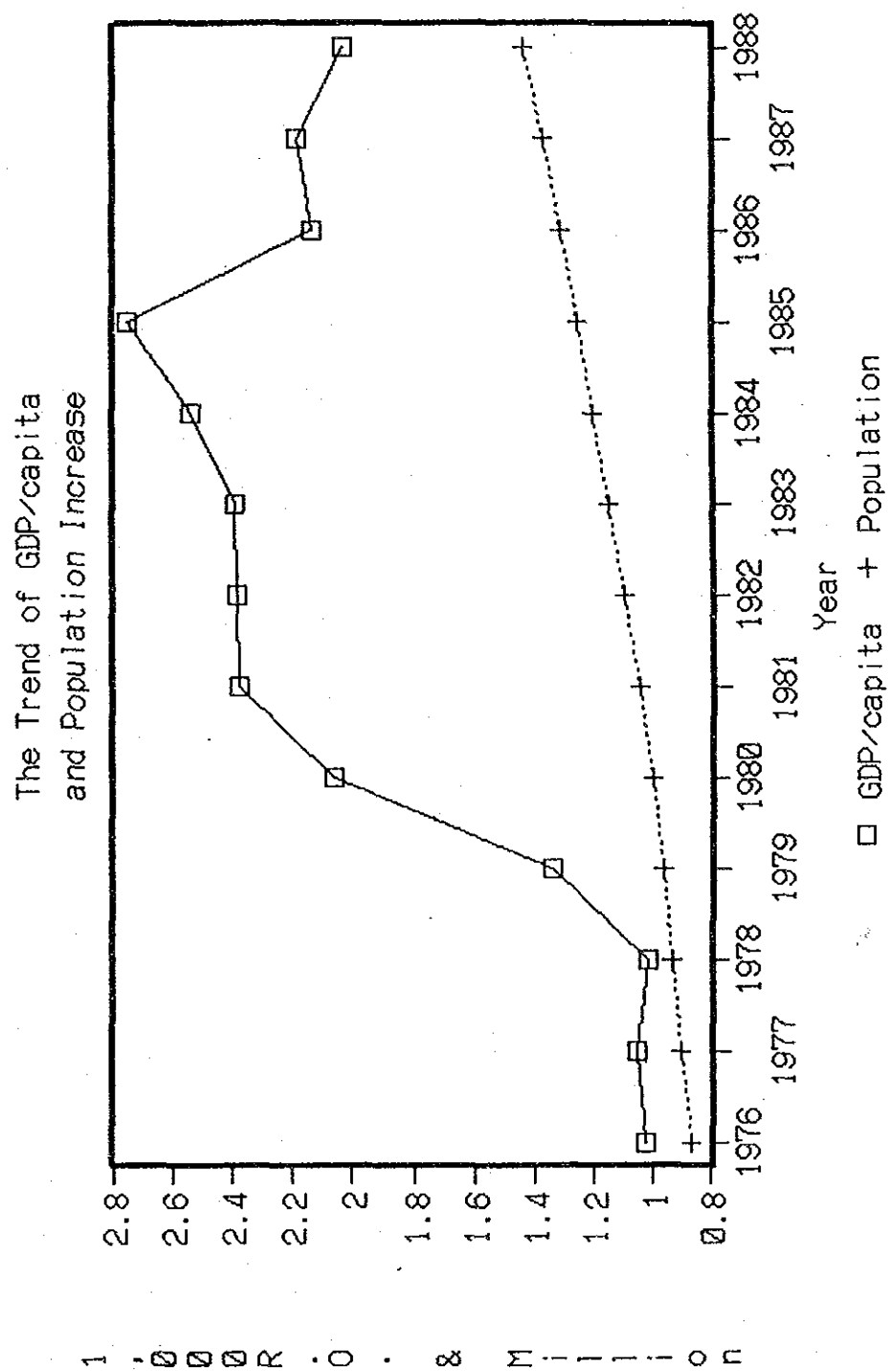


Figure 3.2.3 GDP per capita and Population Increase

Table 3.3.1 Expenditure on GDP at Current Prices

Item	(in Mill. Riel Omani)										
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
GDP	884.3	946.8	948.9	1,289.9	2,063.5	2,490.5	2,613.6	2,739.9	3,046.7	3,453.8	2,800.4
Consumption											
Private			316.3	337.4	576.8	590.0	794.7	802.2	938.5	1,125.8	1,020.0
Government			272.3	354.7	489.2	656.4	715.2	779.8	888.0	938.1	829.0
Subtotal			582.6	692.1	1,078.0	1,247.0	1,509.0	1,582.0	1,746.5	2,083.7	1,849.8
Investment			87.4	119.7	158.9	193.9	224.5	207.8	269.7	251.4	246.5
Private			87.4	119.7	158.9	193.9	224.5	207.8	269.7	251.4	246.5
Government			186.1	215.7	305.8	389.6	482.2	529.9	652.5	781.7	651.9
Subtotal			273.5	335.4	465.7	583.5	706.7	736.9	913.2	953.1	898.4
Exports, GNFS			552.0	787.0	1,295.0	1,625.0	1,532.0	1,475.0	1,532.0	1,717.0	1,893.0
Imports, GNFS			461.2	525.8	773.2	965.0	1,135.0	1,854.0	1,145.0	1,162.0	980.0

Item	(in Mill. Riel Omani)										
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
GDP	884.3	946.8	948.9	1,289.9	2,063.5	2,490.5	2,613.6	2,739.9	3,046.7	3,453.8	2,800.4
Consumption											
Private			316.3	337.4	576.8	590.0	794.7	802.2	938.5	1,125.8	1,020.0
Government			272.3	354.7	489.2	656.4	715.2	779.8	888.0	938.1	829.0
Subtotal			582.6	692.1	1,078.0	1,247.0	1,509.0	1,582.0	1,746.5	2,083.7	1,849.8
Investment			87.4	119.7	158.9	193.9	224.5	207.8	269.7	251.4	246.5
Private			87.4	119.7	158.9	193.9	224.5	207.8	269.7	251.4	246.5
Government			186.1	215.7	305.8	389.6	482.2	529.9	652.5	781.7	651.9
Subtotal			273.5	335.4	465.7	583.5	706.7	736.9	913.2	953.1	898.4
Exports, GNFS			552.0	787.0	1,295.0	1,625.0	1,532.0	1,475.0	1,532.0	1,717.0	1,893.0
Imports, GNFS			461.2	525.8	773.2	965.0	1,135.0	1,854.0	1,145.0	1,162.0	980.0

Table 3.3.2 Expenditure on GDP at Constant Prices

Item	(in Mill. Riel Omani)										
	1975	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
GDP			946.9	987.4	1,047.1	1,225.6	1,367.1	1,595.4	1,862.1	2,105.2	2,175.2
GDP(2)			946.9	963.0	852.7	1,190.5	1,311.0	1,514.6	1,783.8	2,068.1	0.0
Consumption											
Private			310.3	300.0	369.8	375.7	533.0	532.0	621.1	771.8	0.0
Government			272.3	316.3	320.1	417.5	479.6	517.1	534.7	589.0	0.0
Subtotal			582.6	617.2	689.9	793.2	1,012.6	1,049.1	1,155.8	1,300.8	0.0
Investment			87.4	100.2	127.3	148.2	178.0	166.6	221.3	213.0	0.0
Private			87.4	100.2	127.3	148.2	178.0	166.6	221.3	213.0	0.0
Government			186.1	180.0	243.4	297.7	384.0	426.5	554.0	594.5	0.0
Subtotal			273.5	280.0	370.7	445.9	562.0	593.1	775.3	807.5	0.0
Exports, GNFS			552.0	514.6	459.8	640.2	583.9	662.5	716.8	898.0	0.0
Imports, GNFS			461.2	449.6	587.7	688.8	848.3	700.1	884.9	944.2	0.0

Table 3.3.3 Sectoral Distribution of Government Investment from
1978-1988

(in Mill. Rial Omani)

Sectors	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Commodity Production Sectors											
Crude Oil	33.7	63.7	77.8	76.7	106.8	86.8	91.1	96.2	163.4	99.5	69.3
Natural Gas	4.4	2.2	4.8	7.5	1.1	5.1	9.7	15.3	17.6	9.3	28.2
Other Minerals	0.9	0.4	9.8	20.3	26.6	11.7	3.6	2.1	1.7	2.3	8.5
Agriculture	2.9	3.6	4.3	5.2	6.8	5.0	8.4	9.4	7.4	3.5	4.4
Fisheries	0.7	1.4	1.9	1.3	1.2	1.1	1.8	3.6	5.7	3.1	1.8
Industry	0.0	0.2	6.7	31.2	25.6	10.5	3.5	5.7	7.8	5.8	5.8
Subtotal	42.6	71.5	185.3	142.2	167.3	120.2	118.1	132.3	283.9	114.5	103.8
Service Production Sectors											
Housing	5.6	7.7	3.8	4.2	20.4	25.6	23.2	25.2	18.9	10.2	10.0
Commerce & Tourism	0.5	0.1	0.4	7.4	8.9	25.5	36.2	46.1	17.3	7.3	11.7
Electricity	12.7	12.3	19.5	19.6	35.0	34.4	33.9	17.8	36.8	25.5	20.7
Water	4.7	7.4	5.4	13.1	16.8	14.0	15.6	34.4	11.7	5.7	3.6
Post & Telecommunication	5.2	3.4	2.4	2.0	4.4	14.8	41.1	31.0	29.5	25.1	28.4
Financial Institutions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	28.7	30.9	31.5	46.3	84.7	113.5	158.0	154.5	114.0	79.8	68.4
Infrastructure											
Irrigation & Water Resources	0.7	1.2	1.7	5.2	8.4	6.2	12.0	16.1	7.7	1.9	4.4
Roads	18.0	49.4	45.6	66.6	44.0	42.7	47.3	81.0	60.5	38.6	12.0
Ports	8.1	8.3	9.2	3.5	6.1	4.0	1.6	8.2	0.7	0.1	8.1
Airports	2.6	5.0	5.2	2.2	1.4	1.4	3.5	8.5	4.7	1.3	9.4
Municipal Services	2.8	7.2	17.2	19.1	16.7	14.8	22.1	38.4	19.5	19.1	20.1
Education	6.5	4.2	5.4	8.4	35.6	29.3	41.5	48.8	47.2	19.8	15.5
Vocational Training	0.7	3.7	3.2	2.7	6.0	7.6	6.9	2.1	8.3	8.1	0.2
Health	3.8	3.3	4.1	5.9	5.9	11.9	21.9	26.1	43.2	32.8	11.9
Information, Culture, & Religion	4.0	2.1	5.3	3.1	8.8	13.3	21.9	14.0	9.3	8.8	7.5
Social Service Centers	0.6	1.2	1.8	2.1	2.1	3.4	3.2	1.8	1.3	0.8	0.8
Government Administration	67.0	27.7	69.4	81.1	86.1	161.6	202.5	178.7	141.9	98.1	83.7
Subtotal	114.0	119.3	169.0	281.1	230.1	296.2	384.4	414.9	336.3	285.4	183.5
Grand Total	186.1	215.7	385.8	389.6	482.1	529.9	652.5	701.7	653.9	393.7	332.9
Main Sectors											
Agriculture	4.3	6.2	7.9	11.7	13.6	12.3	22.2	29.1	20.8	8.5	18.6
Mining	39.0	66.3	92.4	104.5	134.5	103.6	104.4	113.6	182.7	182.1	91.2
Manufacturing	0.0	0.2	6.7	31.2	25.6	10.5	3.5	5.7	7.8	5.8	5.6
Percentage of Main Sectors to Grand Total of Gov. Inv.											
Agriculture	2.3	2.9	2.6	3.0	2.8	2.3	3.4	4.1	3.2	2.1	3.2
Mining	21.0	30.7	30.2	26.8	27.8	19.6	16.8	16.2	27.8	25.5	27.4
Manufacturing	0.0	0.1	2.2	8.0	5.3	2.0	0.5	0.8	1.2	1.5	1.7

Table 3.3.4 Estimated ICOR by Industrial Origin

Item	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Estimated Sectoral Investment (Current Prices)											
Agriculture	6.3	9.6	12.0	17.5	19.9	17.1	31.1	39.5	28.6	12.0	15.0
Mining	57.3	103.1	140.7	156.5	197.2	144.1	146.1	154.3	251.0	144.1	134.4
Manufacturing	0.0	0.3	10.2	46.7	37.5	14.6	4.9	7.7	18.7	8.2	8.3
Estimated Sectoral Investment (Constant Prices)											
Agriculture	6.3	8.1	9.6	13.4	15.9	13.8	26.4	33.5	0.0		
Mining	57.3	86.3	112.0	119.6	157.0	116.0	124.0	138.7	0.0		
Manufacturing	0.0	0.3	8.1	35.7	29.9	11.8	4.2	6.8	0.0		
ICOR (Current Prices)											
Agriculture		1.0	1.0	1.8	5.0	1.2	3.7	8.4	13.0	1.3	9.9
Mining		0.5	0.3	0.8	-3.8	-3.6	2.3	0.7	-0.4	0.4	-0.8
Manufacturing		0.1	2.5	4.1	3.0	0.5	0.2	-0.9	0.5	1.0	0.7
ICOR (Constant Prices)											
Agriculture		0.8	1.1	19.2	3.6	1.4	4.3	3.0			
Mining		-2.6	-4.9	1.9	44.3	1.2	2.7	1.0			
Manufacturing		0.1	3.9	4.4	3.1	0.7	0.2	-23.8			
Smoother by 3 Year Average											
Agriculture			7.0	8.0	8.0	3.1	2.9				
Mining			-1.9	13.7	15.0	16.1	1.7				
Manufacturing			2.8	3.8	2.7	1.3	-7.6				

ICOR

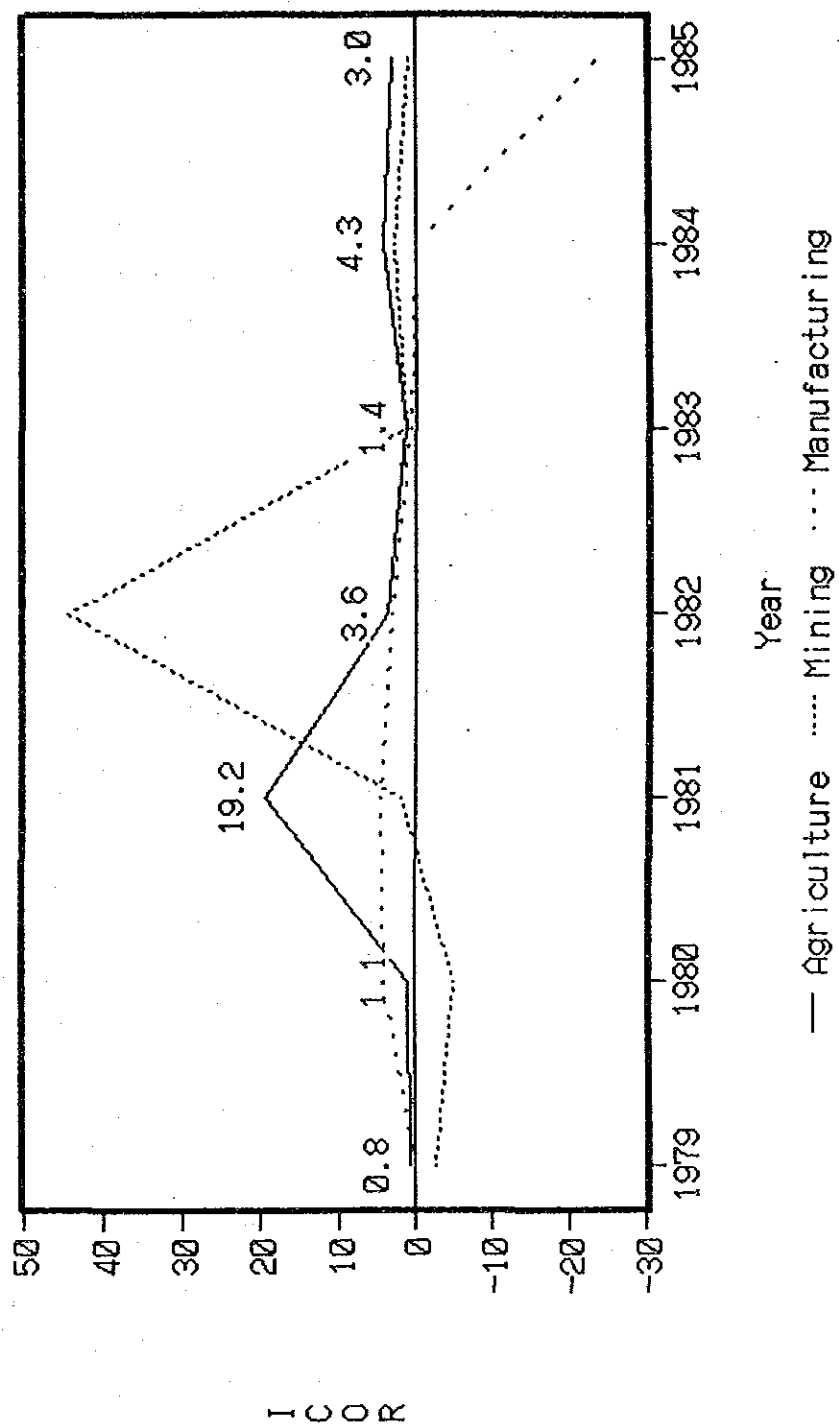


Figure 3.3.1 Estimate of ICOR

level of investment efficiency. From this it is likely that entrepreneurs will be able to expect sufficient return from investments in the agricultural sector unless the present governmental policies on the sector are changed.

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 9 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. Tables 3.4.1-3.4.2, and Figures 3.4.1-3.4.3 show the values and trends of Omani exports and imports during the last 9 years.

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 (see Figure 3.4.4-3.4.5). It should be noted that the reason for the decrease in the export share of the agricultural sector can be attributed

Table 3.4.1

Omani Domestic Exports by SITC Code
(in thousands of Omani Rials)

SITC Export	1980	1981	1982	1983	1984	1985	1986	1987	1988
0 Food & Live Animals	4,545.3	6,549.5	7,355.7	8,475.8	10,496.6	15,587.5	16,854.1	19,580.8	28,958.9
00 Live Animals	30.6	67.0	356.3	1,120.5	73.4	1,296.9	2,259.2	4,975.1	5,755.0
03 Fish & Prep.	2,002.6	2,619.2	3,746.7	4,388.1	6,289.5	8,763.6	9,720.6	11,804.2	18,921.6
04 Cereals & Prep.	999.6	838.6	850.0	664.3	561.5	1,210.1	645.8	24.4	0.0
05 Fruits & Vegetables	1,511.9	2,850.6	2,270.0	1,888.9	3,192.4	3,679.3	3,960.7	2,254.7	3,903.3
08 Feed for Animals	0.6	174.1	132.7	414.0	379.8	637.6	267.6	522.4	379.0
1 Beverages & Tobacco									
12 Tobacco & Manuf.	18.2	18.5	322.5	196.2	377.3	380.3	364.7	385.2	496.8
2 Crude Materials, Inedible, etc. Fuels									
28 Metalliferous Ores & Metal Scrap	0.0	15.0	59.9	85.3	611.5	305.0	232.9	16.5	80.9
29 Crude Animal & Vegetable Mat. NES	0.0	0.0	0.0	0.0	587.0	296.9	221.2	0.0	0.0
	0.0	15.0	59.9	85.3	24.5	8.1	11.7	16.5	80.9
3 Mineral Fuels, Lubricants & REL. MAT.									
32 Coal, Coke, & Briquettes	0.0	0.0	0.4	0.0	0.0	0.6	0.0	0.0	0.0
4 Animal & Vegetable Oils & Fats	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5 Chemicals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6 Manufactured Goods									
69 Non-Ferrous Metals	0.0	0.0	0.0	1,947.8	5,741.0	6,560.3	9,147.4	9,589.1	17,396.4
7 Machinery & Transport Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 Miscellaneous Manufactured Articles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 Commodities & Transactions NEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9,488.4	15,961.6
Subtotal (thousands R.O.)	4,563.5	6,583.8	7,738.5	10,705.1	17,226.4	22,833.7	26,599.1	39,060.0	62,894.6
Subtotal (million R.O.)	4.6	6.6	7.7	10.7	17.2	22.8	26.6	39.1	62.9
Oil Export (million R.O.)	1,244.6	1,526.4	1,409.6	1,346.6	1,401.0	1,597.0	981.0	1,328.0	1,101.7
Re-export (million R.O.)	45.3	88.9	109.5	110.0	109.4	97.4	85.1	84.9	92.1
Total (million R.O.)	1,294.5	1,621.9	1,526.9	1,467.3	1,527.6	1,717.2	1,092.7	1,451.9	1,256.7
Trade Gap (million R.O.)	696.2	931.6	600.4	606.4	578.4	628.3	176.0	751.2	410.3

Source: Statistical Yearbook 1988

Table 3.4.2

Recorded Imports by SITC Code
(in million of Omani Rials)

SITC Imports	1980	1981	1982	1983	1984	1985	1986	1987	1988
0 Food & Live Animals	72.9	84.7	100.1	107.1	119.8	124.1	129.9	138.5	144.1
00 Live Animals		1.6	2.8	4.6	2.5	3.3	3.1	5.2	5.7
01 Meat & Meat Preparations		14.9	16.8	17.0	20.7	20.3	21.7	20.4	20.8
02 Dairy Products & Eggs		13.9	17.1	17.3	18.6	19.6	21.1	21.9	23.3
03 Fish & Prep.		0.8	0.8	0.8	1.1	0.9	1.1	0.8	0.9
04 Cereals & Prep.		18.2	23.7	22.5	24.7	25.5	24.0	25.4	33.1
05 Fruits & Vegetables		18.8	22.5	26.5	30.0	32.8	34.5	31.9	35.3
06 Sugar, Sugar Preps. & Honey		5.6	4.4	4.8	5.1	4.2	5.5	4.7	6.4
07 Coffee, Cocoa, Tea, Spices, etc.		6.3	6.2	6.4	8.1	8.5	8.0	10.1	10.2
08 Feed for Animals		1.2	2.1	1.7	3.4	2.2	3.2	1.4	1.4
09 Misc. Food Preparations		3.4	3.7	4.9	5.6	6.8	7.7	8.7	7.0
1 Beverages & Tobacco	14.8	19.4	14.9	16.2	18.4	17.9	16.9	14.6	15.7
11 Beverages		7.3	8.9	9.3	10.9	9.9	9.0	7.7	7.3
12 Tobacco & Manuf.		12.1	6.9	6.9	7.5	8.0	7.9	6.9	7.9
2 Crude Materials, Inedible, etc. Fuels	9.9	11.4	13.3	12.6	13.2	14.6	12.8	8.9	14.5
24 Wood, Lumber, and Cork		8.1	10.8	8.9	9.4	9.8	8.8	3.7	6.8
2X Other		3.3	3.3	3.7	3.8	4.8	5.2	5.2	7.7
3 Mineral Fuels, Lubricants & REL. MAT.	64.6	103.3	96.7	14.1	15.1	19.7	26.3	20.9	13.0
33 Petroleum & Petroleum Products		101.2	94.0	12.2	13.5	18.2	25.3	19.7	12.2
34 Gas Natural & Manufactured		2.1	2.7	1.8	1.6	1.5	0.9	1.2	0.8
3X Other			0.0	0.1	0.0	0.0	0.1	0.0	
4 Animal & Vegetable Oils & Fats	3.2	2.6	2.3	3.0	4.4	4.5	2.3	2.8	3.6
5 Chemicals	20.8	27.4	28.8	31.6	35.8	43.1	42.7	48.3	51.7
6 Manufactured Goods	96.3	146.2	182.1	166.8	196.7	240.9	175.7	120.3	163.9
7 Machinery & Transport Equipment	235.7	312.6	390.1	386.2	392.7	455.0	377.3	255.4	283.0
8 Miscellaneous Manufactured Articles	45.1	57.2	69.6	82.5	106.0	140.9	107.3	78.9	101.8
9 Commodities & Transactions NEC	34.8	25.5	28.6	30.8	47.1	28.2	26.3	20.1	55.1
Total	598.2	790.3	926.5	860.9	949.2	1,088.9	916.7	700.7	846.4

Source: Statistical Yearbook 1989

Trend of Omani Export
(billion R.O.)

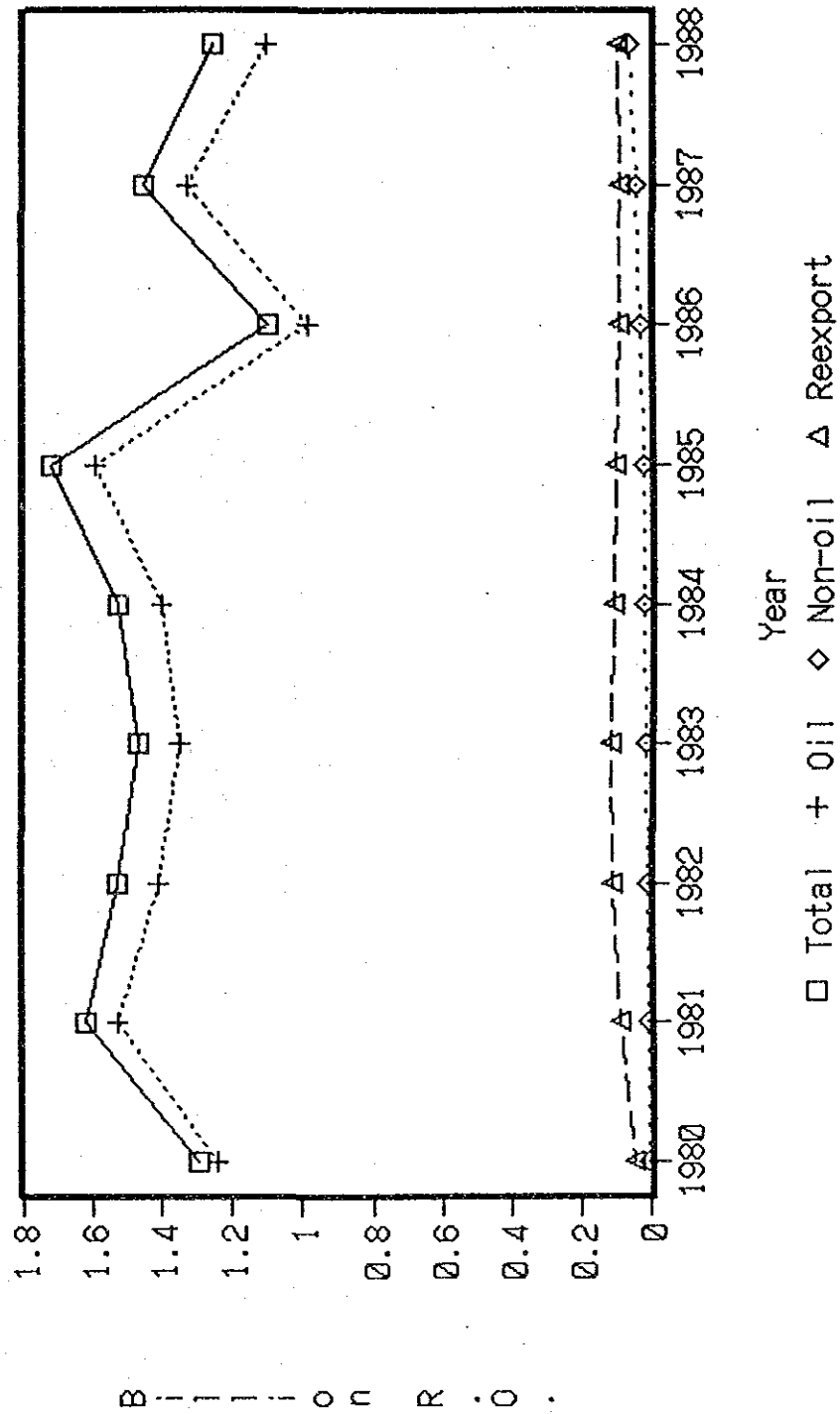


Figure 3.4.1 Omani Exports

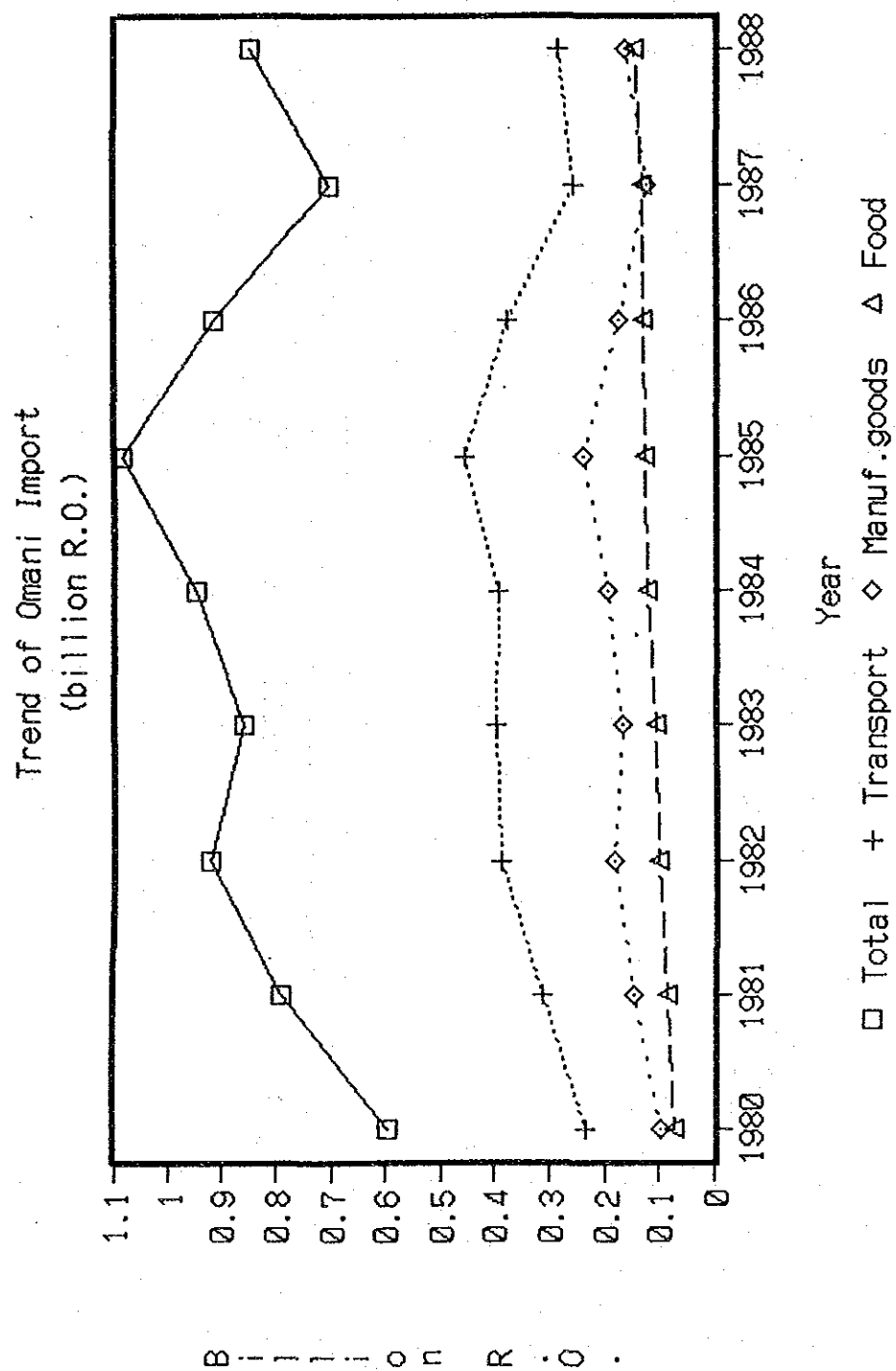


Figure 3.4.2 Omani Imports

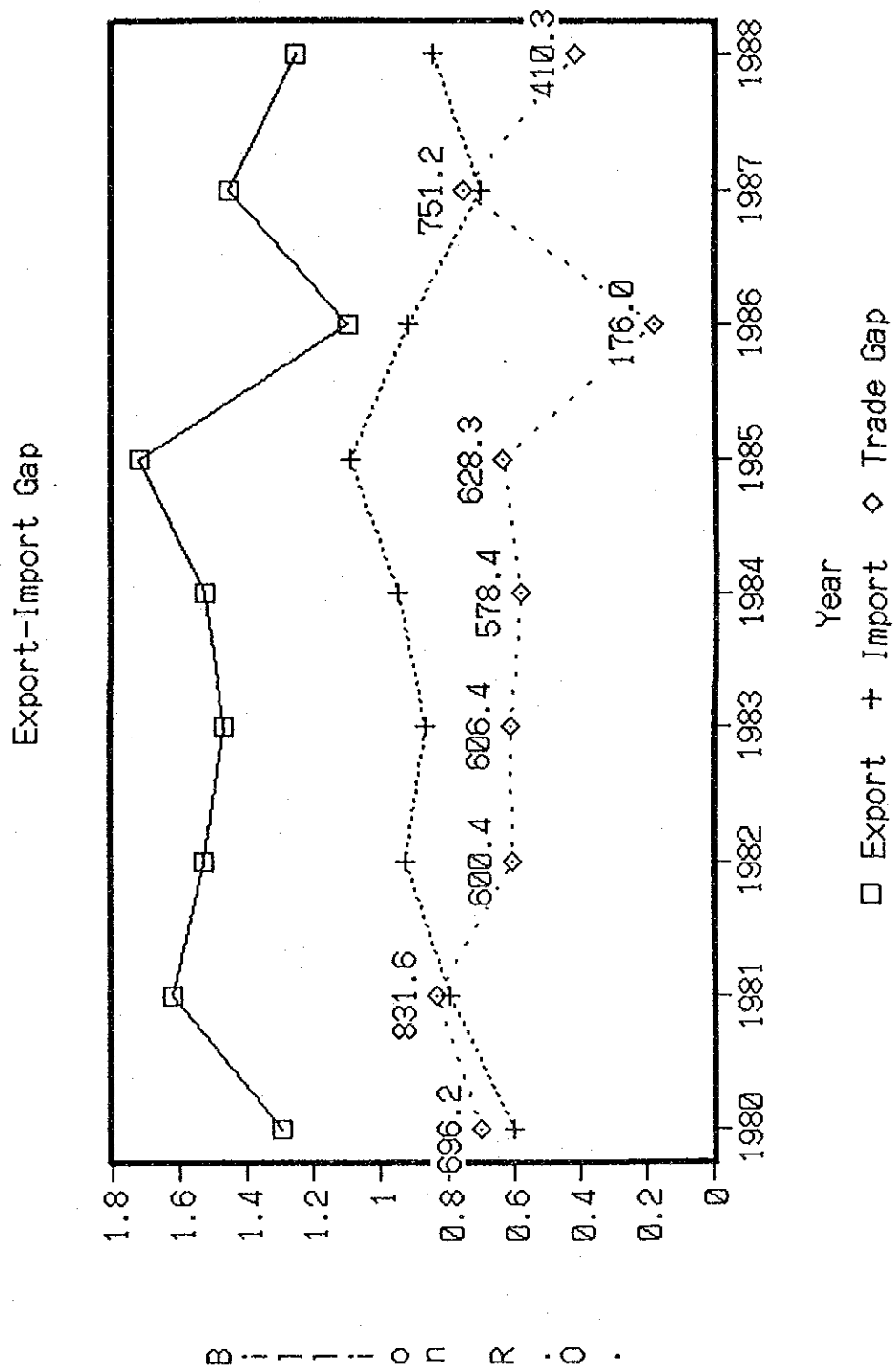


Figure 3.4.3 Export-Import Gap

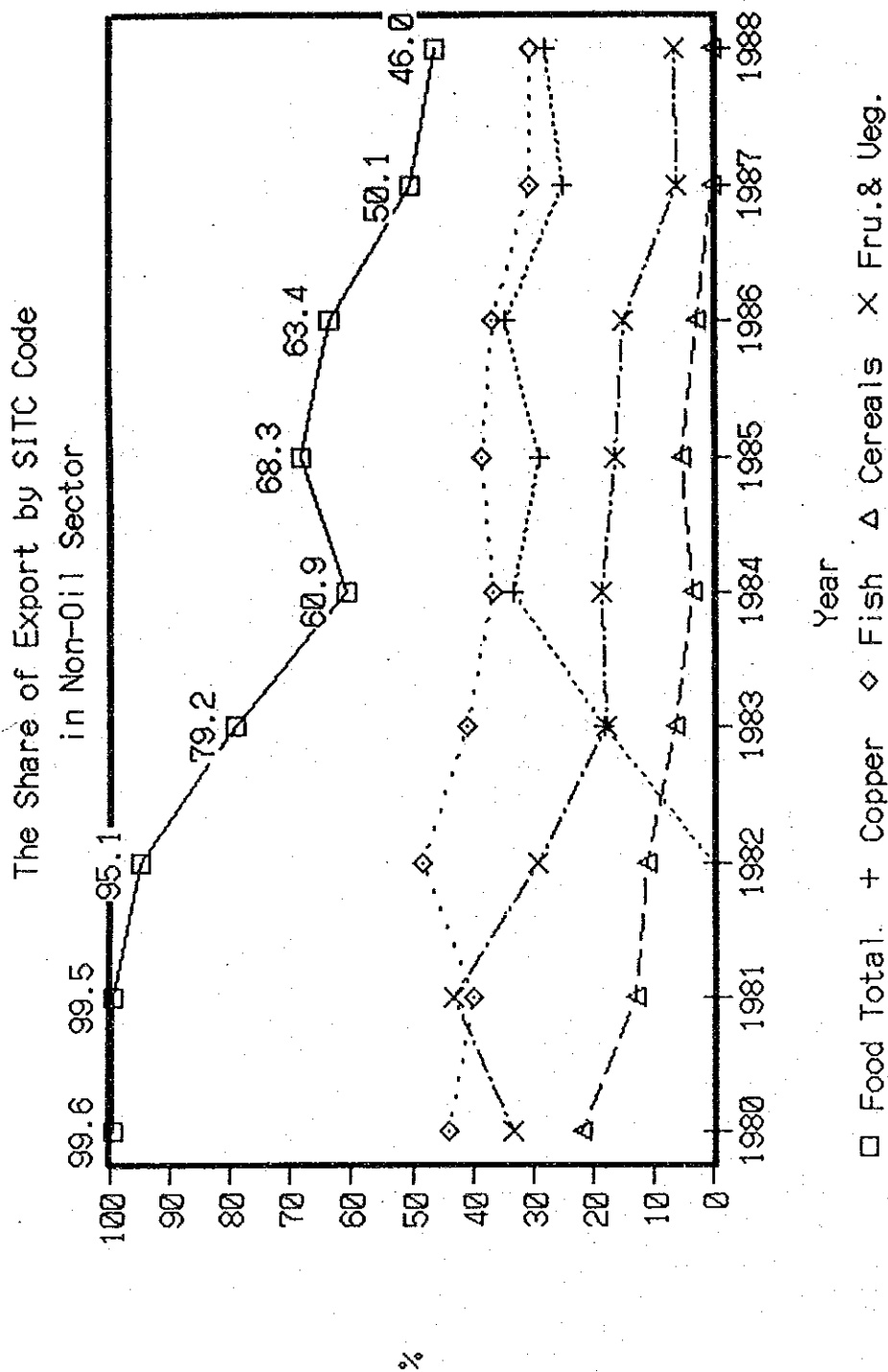


Figure 3.4.4 Share of Export by SITC Code in Non-Oil Sector

The Share of Import by SITC Code

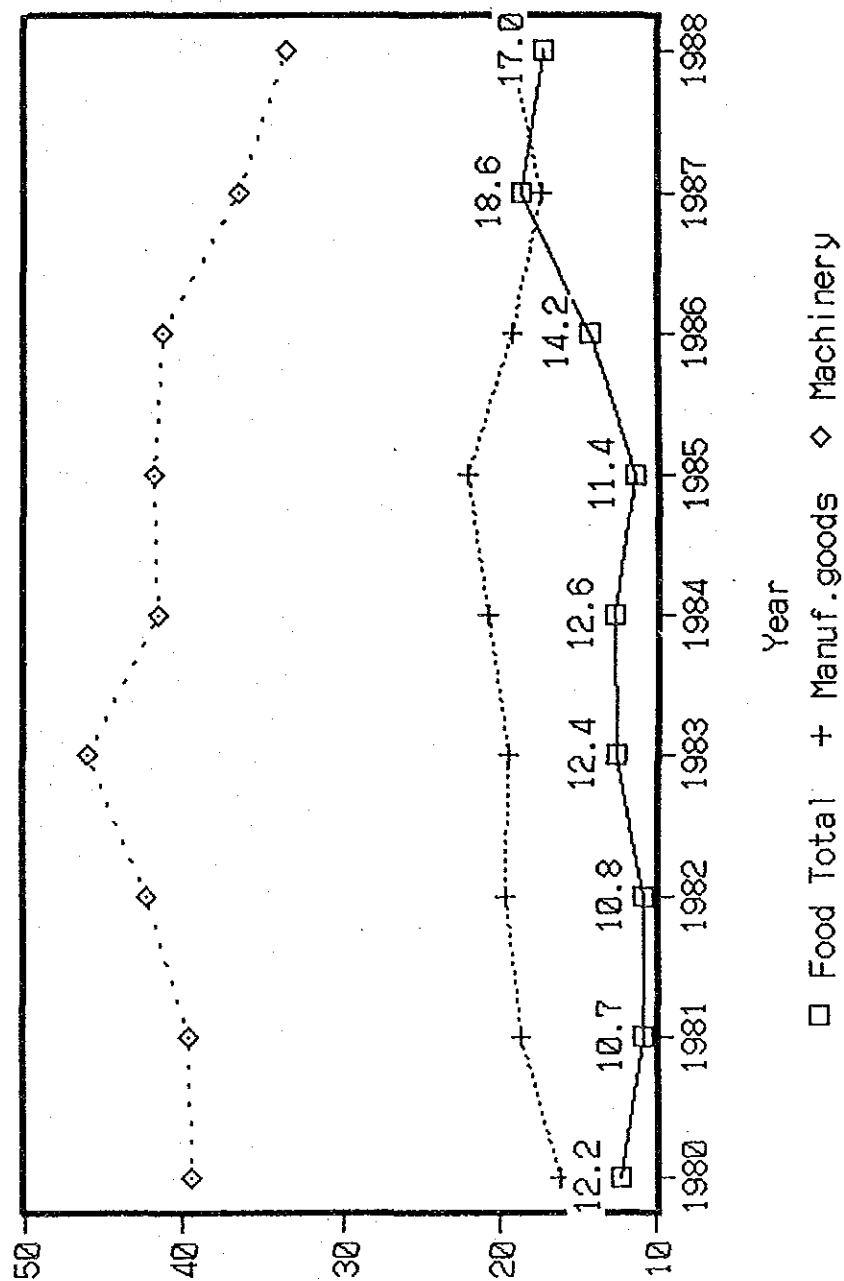


Figure 3.4.5 Share of Import by SITC Code

Percentage of Export over Import
for Major Food

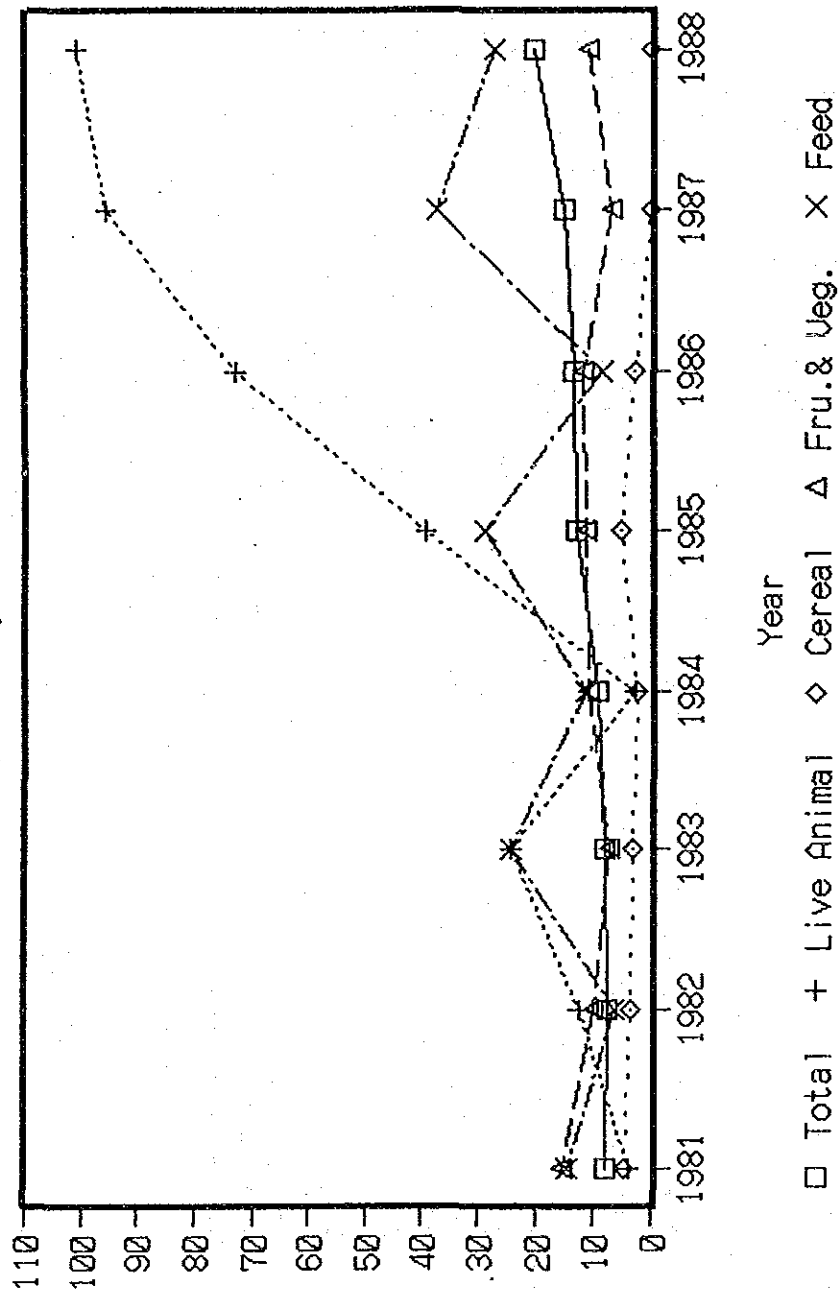


Figure 3.4.6 Percentage of Export over Import for Major Foods

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 3.4.6, 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 intensive manners, and which have comparative advantages in both domestic and external markets have been promoted whereas products which are cultivated in an extensive manner, like cereals, have been gradually phased out. In the future, it is expected that the export/import ratio in agricultural products will be improved by strengthening the production of crops biased towards garden-farming and promoting the fisheries sector.

3.5 Public Finance

The government budget is principally classified into two types, namely development budget and recurrent budget. The development budget is utilized for government investment and recurrent budget for the operation of ministries and governmental organizations. Since the two budgets are not clearly demarcated, the diversion of a part of recurrent budget for development budget often occurs in order to complement shortages. The outline of public finance is shown in Table 3.5.1.

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 reason 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.

The average annual growth rate of revenue was 0.6% during the past 9

Table 3.5.1 Public Finance

Public Finance (Million R.O.)

Items	1980	1981	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	1,510.8	828.9	1,194.9	993.6
Gas Revenue	14.0	18.1	18.9	20.2	34.4	36.7	37.9	39.8	44.2
Custom Duties	8.6	11.3	14.7	21.7	31.6	41.1	37.8	26.8	29.6
Corporate Income Tax	6.5	10.5	11.4	18.7	20.4	28.4	25.6	21.2	23.4
Interest from Investments	19.8	38.6	14.2	9.2	21.3	18.6	25.1	30.5	8.5
Other Revenue	43.5	58.3	58.9	76.5	100.9	120.2	133.5	166.8	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	1,512.8	1,247.8
Expenditures									
Defence & Security	486.8	521.9	581.3	670.7	728.2	744.8	665.4	583.6	589.2
Civil Recurrent	271.2	335.1	388.9	440.6	507.2	599.8	648.2	848.5	681.3
All Ministries	214.8	272.5	315.7	362.7	409.4	489.8	508.8	589.1	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	58.5	62.8	72.3	66.5	62.7
Development Expenditure	246.7	317.4	395.2	377.1	464.7	533.7	532.4	328.8	280.2
All Ministries	168.9	241.0	289.8	290.7	374.8	433.7	363.1	230.8	203.8
Gov. Share in Operating expenditure of PDO	77.8	76.4	105.2	86.4	90.7	96.0	163.3	90.5	69.6
Exploration for Gas	0.0	0.0	0.0	0.0	0.0	4.8	6.0	8.3	6.8
Support to Private Sector	8.7	5.5	19.2	22.8	13.6	14.8	18.7	11.8	15.9
Industrial Sector	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
International, Regional & Local Organization	0.0	0.0	0.6	9.7	2.6	2.5	1.3	0.7	12.1
Oman Housing Bank	6.2	0.7	14.6	8.2	4.0	9.0	7.1	7.0	2.8
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	38.1	37.2	0.0
Total Expenditures	949.8	1,223.8	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

years, while that of expenditures was 6.5%, over ten times more than that of revenue. 1986 was especially serious, when the annual deficit reached over R.O. 600 million.

The average annual amount of both development and recurrent budget for MAF are approximately R.O. 24 million and R.O. 11 million, respectively. The trend for the MAF's recurrent budget during 1986-89 is shown in Table 3.5.2, and that of the MAF's development budget is indicated in Chapter 7. Generally, the Diwan General of the Ministry is allocated a large part of the recurrent budget, followed by Directorate General of Agriculture and Fisheries in the Southern Region and Directorate General of Agriculture.

The share of MAF's recurrent budget in the nation's recurrent civil expenditure is only 2% as shown in Table 3.5.3. Approximately R.O. 8.5 million or 80% of MAF's recurrent expenditure is allocated for salaries and wages with an increasing trend of its share by year.

Table 3.5.2 Recurrent Expenditure of MAF

Number (in 1989)	Title	1986		1987		1988		1989	
		Revenue	Recurrent	Revenue	Recurrent	Revenue	Recurrent	Revenue	Recurrent
11101	Diwan General of the Ministry	6,603	1,832,752	8,000	1,650,750	8,600	2,060,024	15,800	1,753,689
11102	Directorate General of Irrigation Affairs	700	662,134	200	1,097,688	300	604,523	4,100	568,608
11103	Directorate General of Agriculture	189,395	1,403,252	216,500	1,378,156	194,900	1,026,687	188,000	926,365
11104	Directorate General of Agriculture & Fisheries in the Southern Region	54,300	1,744,972	40,000	1,662,134	41,500	1,691,731	35,700	1,610,955
11105	Directorate General of Fisheries	731,620	677,274	776,112	566,057	836,411	721,782	897,850	679,234
11106	Fisheries Department in Salalah	2,720	270,694	3,220	273,892	3,720	280,983	4,440	263,616
11107	Agriculture Department in Wusta Region	0	168,651	0	96,696	0	168,594	6,240	160,169
11108	Irrigation Affairs Department in Salalah	46,219	733,810	83,147	666,103	89,100	705,842	30,350	135,543
11109	Agriculture Department in South Batinah	77,744	513,364	110,763	445,353	131,200	784,300	74,198	670,561
11110	Agriculture Department in North Batinah	33,684	832,220	29,810	785,038	36,465	795,328	31,968	778,018
11111	Agriculture Department in Oman Interior	20,505	326,848	28,895	290,136	34,200	314,505	31,500	310,663
11112	Agriculture Department in Dhahira Region	17,598	518,232	18,888	476,572	21,540	577,445	13,254	566,996
11113	Agriculture Department in Sharqiya	31,100	134,410	40,000	114,016	31,940	180,558	29,100	171,538
11114	Animal Health Research Department	4,330	510,320	4,500	516,056	0	546,890	2,000	524,228
11115	Agriculture Research Department	0	291,736	0	293,606	0	304,580	0	289,362
11116	Marine Science and Fisheries Center	400	148,006	0	140,953	0	151,800	0	144,216
11117	Veterinary Laboratory in Rumais	12,000	84,808	8,000	75,959	6,500	75,805	6,000	72,021
11118	Veterinary Quarantine in Raist	0	48,073	0	46,995	2,800	49,139	1,500	46,687
11119	Veterinary Quarantine in Seeb	0	424,712	0	380,095	0	344,855	0	306,318
11120	Fisheries Development Project	0	120,180	0	0	0	0	0	0
	Agriculture Cooperatives								
	Banana Project in Salalah								
	Mashirah Fisheries Project								
	Buraimi Fisheries Project								
Total		1,228,918	11,446,448	1,368,035	11,103,521	1,439,676	11,528,041	1,372,000	10,722,883
11121	Date Factories		160,434		132,496		132,496		123,117
Total Budget			11,606,882		11,236,017		11,660,537		10,846,000

Source: Finance Department in MAF

Table 3.5.3 Recurrent Civil Expenditure by Ministries and Government Organizations

Ministries	1985	1986	1987	1988
Diwan of Royal Court	65.4	53.8	68.1	74.6
Health	47.3	48.6	53.4	61.4
Education and Youth	83.1	97.1	100.1	104.6
Communication	21.6	19.8	16.1	18.1
Electricity and Water	81.0	87.4	88.7	96.7
Agriculture and Fisheries	11.6	11.1	9.7	10.3
Petroleum and Minerals	5.2	6.2	5.9	5.0
Social Affairs and Labor	20.9	22.3	22.4	22.6
Sultan Qaboos University	1.9	5.2	10.3	12.8
Others	151.0	148.6	134.4	129.1
Total	489.0	500.1	509.1	535.2
Share of MAP (%)	2.4	2.2	1.9	1.9

Source: Statistic Yearbook 1989, Development Council

CHAPTER 4

OUTLINE OF REGIONS

CHAPTER 4 OUTLINE OF REGIONS

4.1 Classification of Regions

Oman is divided administratively into 44 wilayat, each governed by a wali (local head). All 44 wilayat are classified into 7 regions, namely Muscat, Al Janubiya, Al Dhahira, Al Batinah, Al Dakhliya, Al Sharqiya and Musandam. MAF divided agriculture productive areas into 9 areas. South Batinah, North Batinah, Al Sharqiya, Oman Interior, Wasta, Al Dhahira, Buraimi, Musandam, and Southern Region. The outline of each region is described below.

(1) Muscat Area

Muscat area includes the capital area consisting of Muscat and its vicinity and wilayat Quriyat. The capital area is the political and economic center where most of the population exists. Since the area is extensive, the position of deputy wali is allocated to Muttrah, Seeb and Bausharl. In total the Muscat Region comprises some 3,630 km² of which Muscat area make up 2,300 km² and Wilayat Quriyat approx. 1,300 km².

In the west the Muscat Region shares the boundary with the Batinah Region and in the south west and south east with Al Dakhliya Region and the Sharqiya Region respectively.

In the north and the north east the region is confined by the Gulf of Oman.

The population of the area is 304,000 in 1988 and most of them engage in the second and third industry, with foreign workers whose number in the area is highest in all the regions.

The Muscat Area is by far the largest urban agglomeration in the Sultanate of Oman. Here the main economic activities in the trade and manufacturing sectors as well as public administration are concentrated. All other areas in the region and in a wider range are

socio-economically highly inter-related with the capital and have developed in close association with the Muscat Area or have dependence on agriculture, livestock or fisheries.

Basically two distinct areas can be defined in the Muscat Region

- the northern coastal strip with the adjacent Al Hajar Bowl which include the urbanized zone of the Muscat Area
- the mountainous areas of southern Muscat Area and the Wilayat Quriyat

This classification reflects at the same time the socio-economic zoning of the Muscat Region.

The government provided a great share of development expenditure to the area in the First and the Second Plan for the modernization of urban infrastructure and socio-economic system. As a result, the social infrastructure such as education, health and medical care, welfare, electricity, drinking water, roads, communication and public houses has been rapidly improved. Nevertheless, the polarized investment to the capital area caused the expansion of difference with other areas in the aspect of such as infrastructure development. Accordingly the government declared as one of important targets in the Third Five-year Development Plan to implement large-scale regional development in the fields of social infrastructure and public services considering geographical distribution.

Wilayat Quriyat is located 88 km east of Muscat, across from the Hajar mountains along route 17. This area faces the Gulf of Oman and the dominant industry is agriculture and fisheries. Despite a part of the capital area, the remoteness limits investment for development.

(2) Al Janubiya (Southern Region)

The southern region covers 1/3 of the entire area in Oman and has a 500 km coastline. Traveling north to south, the region consists of

the desert of the Empty Quarter, the flat and sparsely populated plateau of the Nejd, the populous mountains of the Jabals, and the Salalah coastal plain where the majority of the population are located. The center of economic activities is coastal plain extending 8 km width around the core city Salalah. The plain is blessed with good natural conditions, i.e. fertile alluvial soil, the rain rich climate influenced by monsoon from June to September, the misty are in 1,500 m class mountains and the grass rich pasture in plateau. The north east of the area borders with the Kingdom of Saudi Arabia in deserts.

Prior to 1970, the people of the region were occupied in a traditional subsistence economy with some international sea-faring trade. Agriculture, livestock and fishing were the backbone of the economy. Civil strife and then the rapid rate of new development from the mid 1970's have moved the economy away from its traditional equilibrium and isolation.

The new prosperity in the region is marked by new roads, an international airport, a modern port, new health and education facilities, new development projects and a range of governmental services. Inevitably, this rapid pace of development has disoriented some aspects of the regional economy. Perhaps the two most significant are:

- (i) The new income within the country has enabled the population to start purchasing imported goods. This has created competitive difficulties for the local traditional industries - particularly agriculture, livestock and fishing and which have had to face world competition;
- (ii) The rapid rate of development has necessitated deployment of inexpensive expatriate labor mostly from Asia. This has created competitive difficulties within the local labor market.

Although progress of regional development in the area is retarded in comparison with that of Muscat area and Batinah coast, the

development based on the abundant natural conditions has been promoted under the newly established ministry which is responsible for the development of the Southern Region.

(3) Al Dhahira

This region is divided into west and south. The south represented by the core city Ibri is characterized by semi arid plain, which declines geographically from the south slope of West Hajar mountains to Rub Al Khali desert. The people inhabit mainly in two wadis, i.e. Wadi Dank and Wadi Al Ayn. The northernmost area of Dhahira plain is located between UAE and West Hajar mountains. The core city of this area is Buraimi. Since Buraimi borders on UAE, the government recognized the importance of the area and has been implementing intensive regional development in the Second and the Third Five-year Development Plan. Thus, there occurred intra-regional difference within both areas relating to regional development.

The strong links between Al Dhahira and the UAE are significant. Some data has estimated that some 37% of the Al Dhahira workforce are employed in the UAE while retaining their permanent residence in the region. Much of Al Dhahira's agriculture and livestock production is marketed in the UAE. The future prospects for the workforce are therefore to a large extent bound-up with the prospects for growth in the UAE. Alternatives to this employment within Al Dhahira cannot be easily generated.

(4) Al Batinah

The Batinah Region is located in the north-east of the Sultanate of Oman including the administrative areas of Northern Batinah, Southern Batinah and Western Hajar.

Batinah plain, bordering on UAE and surrounded by West Hajar mountains, extends from north west to south east with 270 km length and 10 to 60 km width along the Gulf of Oman. Further the area is socio-economically divided in 2 parts, namely the north represented

by the core city Sohar and the south represented by Barka. Al Batinah is one of the most populous areas in Oman, because the area produces the highest volume of agricultural products in the Sultanate. Though cultivated area is limited to coastal plain extending 3 to 5 km width, company owned farms and newly established farms are concentrated in the plain along route 1 in particular.

In the area covering the foot of Hajar mountains, whose peak reaches 3,073 m of Jabal Akhdar, there are many villages depending on falaj irrigation system for producing dates and garden farm products. The center of the area is regarded to Rustaq.

The region is declining from the mountains towards the coast forming three distinct zones parallel to the coast line.

- (i) The Batinah coastal plain constitutes the most important zone in terms of economic activities and potential as well as of size. The coastal area provides fertile soils and possibilities for fishing. The plain includes the coastal sand-dune strip as well as the adjacent alluvial soil deposition complex.
- (ii) The wadi fan complex which mainly consists of gravel. This area is still flat and contains numerous wadi courses running in west to east direction. Consequently this area is to a big extent liable for floods. The wadi fan complex makes up some 75% of the total area.
- (iii) The mountainous areas of the Oman mountain range which offer only a few economic potentials. Poor soil coverage and fragile ecological conditions are limiting considerably agricultural activities and inadequate access as well as lack of known mineral resources contributed to the low grade of development.

Due to an extensive horizontal agricultural development since the early seventies based exclusively on irrigated cultivation, with motor-pumps and a very high pump density due to small farm units, the

ground water balance is considerably disturbed. This means that for the time being more water from the existing aquifers is extracted than is recharged from drainage water. Consequently, saline groundwater from the seaside enters the fresh water aquifers with the effect that soils, especially at the coast which is irrigated with the affected groundwater, become increasingly salinized. The present pumping capacities installed along the coast and present groundwater extraction rates suggest a continuing inland movement of soil salinization.

The wilayats of Liwa, Khabourah, and Barka are especially affected as here the salinized zone already intruded some 5 km and 10 km respectively.

(5) Al Dakhliya (Oman Interior)

This area covers the hills extending from Jabal Akhdar in the north to southern deserts, including 4 big wadis, namely Basah, Halfayn, Bahla and Samail. Wadi Halfayn and Wadi Samail join in West Hajar mountains and formulate valley which has been utilized historically as a main route connecting Interior with Muscat area. In the Interior, traditional agriculture based on falaj system installed along wadis is dominant and there exists a number of villages dispersed in the remote area in West Hajar mountains.

These are steep and dissected limestone ranges rising to more than 3000 meters. They are considerably colder and wetter than the lower ranges and alluvial plains, but there is little soil, so their agricultural potential is limited. To the south and east of the Jabal Akhdal are a series of lower-level ranges, including the mountainous area to the east of Samail Gap. These ranges receive less rain than higher slopes, and again there is insufficient soil for agriculture. The importance of the mountains lies in the fact that they are water catchment grounds for the plains. Some of the rocks on the fringes of the mountains have degraded into silt and fine sands and when washed down to the plains they form deposits which constitute a rich agricultural potential - providing that

groundwater is available. The most valuable deposits occur at Wadi Quriyat south-west of Bahla, and in smaller areas south of Nizwa and Manah.

(6) Al Sharqiya

The topography of northern Al Sharqiya is dominated by the presence of the Al Hajar Ash Sharqi mountains, which exceed 2,000 meters altitude in places. These mountains form the major rainfall catchment of the region. Average rainfall in the mountains varies between 80 and 130 mm per annum depending on location. As topsoil and vegetation are generally minimal, run-off to the lower alluvial plains is rapid.

Most agricultural activity is concentrated in the alluvial plains to the south of the mountains. The rainfall on these plains is generally less than 100 mm per annum. The only renewable groundwater resources in the area lie under the drainage channels.

Still further south lie the Wahiba Sands, of natural history interest but with no agricultural potential and a mainly nomadic population. Much of Al Sharqiya's 500 km long coastline lies on the fringe of the Wahiba Sands. Fisheries resources are rich and support numerous coastal communities. Fishing is not possible during the monsoon season, however, so these communities are all but deserted for four months of the year.

The traditional agriculture dependent on the falaj system is also dominant in the region. This area is hindered by the improvement of infrastructure. The main cities are Ibra and Sur. The former is the center of agriculture located inland and the latter is historically famous for ship building.

(7) Musandam

The Musandam peninsula is the northernmost part of Oman. This area is separated by UAE from mainland of the country and faces the Holmus

Strait. The area consists of steep mountains some of which reaches to 1,800 m and the coast is formulated like fiords. These geographical difficulties restrict the production of agriculture severer than that of mainland. The government is intensively implementing the improvement of infrastructure such as roads, water securing, etc. in the region. The main cities are Khasab and Bayah.

4.2 The Present Situation of Regional Development

(1) Governmental Organization

The regional development in Oman is carried out by various ministries, related government agencies and public entities according to the regulations provided for their functions. The main organizations concerned with regional development are:

- Governorate of Muscat (GOM)
- Ministry of Health (MH)
- Ministry of Education and Youth (MEY)
- Ministry of Interior (MI)
- Ministry of Communication (MC)
- Ministry of Social Affairs (MSA)
- Ministry of Labor and Vocational Training (MLVT)
- Ministry of Commerce and Industry (MCI)
- Ministry of Agriculture and Fisheries (MAF)
- Officer of the State and Wali of Dhofar (OSWD)
- Ministry of Housing (MOH)
- Ministry of Regional Municipalities (MRM)
- Ministry of Environment (ME)
- Ministry of Water Resources (MWR)
- Ministry of Post, Telegraph and Telephone (MPTT)
- General Telecommunication Organization (GTO)
- Ministry of Electricity and Water (MEW)
- Ministry of Petroleum and Minerals (MPM)
- Public Authority for Marketing and Agricultural Produce (PAMAP)
- Regional Development Committee (RDC)

Musandam Development Committee (MDC)

The Development Council (DC) examines and coordinates projects and programs related to development policy submitted by ministries, in order to formulate long term targets for development and the Five-year Development Plans.

(2) Regional Development Committee

As examples of integrated regional development projects, the Musandam development, conducted by MDC and the Buraimi development, conducted by RDC are quite typical. RDC prepares detailed plans with cooperation from various related agencies. Thereafter, DC examines the plan. In the implementation of the plan, the related ministries advise and technically support RDC in an effort to smoothly resolve any difficulties. When the development has reached a certain level, the maintenance and administration of the plan are transferred to the appropriate ministry. Table 4.2.1 shows the projects related to Buraimi development in the Third Five-year Development Plan.

MAF participates in the agricultural sector of regional development by planning, constructing and improving facilities such as extension centers, recharge dams and falaj systems.

(3) The Present Situation of Infrastructural Development by Region

The overview of progress in the development of infrastructures by regions is shown in Table 4.2.2 and Figure 4.2.1. The Muscat area has 22.3 % of the entire population and infrastructural improvement has been high. On the other hand, improvement of infrastructures in rural areas, which have 77.7% of the population, has tended to be slow. Other comparatively well improved regions, besides the capital area, are Al Janubiya and Musandam. Based on social indicators, the retardation of improvement of medical facilities in Batinah is obvious. Consequently, the government must correct differences not only between the capital and other regions, but also intra-regions.

Table 4.2.1 Projects Related to Braimi Development in the Third Plan

On Going Projects :-

Name of Project
Agriculture Sector
1. Supply of Agriculture and Veterinary materials
2. Reclamation of 200 hectares
3. Expansion of Agriculture and Veterinary Centre
Irrigation and Water Resources Sector
4. Repairs and Maintenance of Al Falajs and Wells
Roads Sector
5. Al Burami Village Roads
6. Al Burami City Roads
7. Guard Rails for Flooding Protection
8. Roads Equipments
Housing Sector
9. 75 Social Houses
Electricity Sector
10. Electrical Distribution Network
11. Warehouse and Yards to Electricity Building
12. 33 K.V. Line Al Burami / Mahda
13. Wadi Al-Jizi Power Expansion
14. 132 K.V. Line Wadi Al-Jizi / Al Burami
15. Electrical Equipments
16. Electrical Generators
Water Sector
17. Wells and Water Pipeline at Al Buraimi
18. Water Supply to other Regions
19. Expansion of Water System
20. Wells for Southern Areas
21. Water Equipments
22. Mahdah Water Supply
23. Al Burami Water Supply

New Projects :-

Name of Project
Agriculture Sector
34. Supply of Agriculture and Veterinary Materials
Phase 1
Phase 2
35. Reclamation of 200 hectares
36. Model Agriculture Station at Sunaynah
37. Model Agriculture Station at Mahdah
38. Drilling of 30 wells for Agricultural Purposes
Phase 1
Phase 2
Irrigation and Water Resources Sector
39. Al Falajs Repair
Phase 1
Phase 2
Roads Sector
40. Al Burami Roads
41. Guard Rails for Flooding Protection
42. Maintenance of Graded Roads
43. Maintenance of Asphalted Roads
Electricity Sector
44. Electrical Distribution Network
45. Electricity Distributions Expansion
Phase 3
46. Mahdah Electrical Supply
Phase 1
Phase 2
Water Sector
47. Al Burami Wells
48. Rural Water Supply
49. Al Burami Distribution Expansion
Town Planning and Municipalities Sector
50. Town Planning
Phase 1
Phase 2
51. Al Burami Sewerage
52. Mahdah Market
53. Sewage Drain Equipments
54. Minor Works for Municipality
Information, Culture and Islamic Affairs Sector
55. Beautification of Al-Khandaq Castle
Government Administration Sector
56. Administrative Centre
57. Police Centre
General Consultancy Studies Sector
58. Estimate Study for Portable Water Project

Table 4.2.2

AN INDEX OF SOCIAL INFRASTRUCTURE BY REGION

NAME OF REGION	SCHOOLS PER 1,000 PERSONS	PUPILS ONE SCHOOL	PUPILS (%) /POPULATION	HOUSING PER 1,000 PERSONS	HOSPITALS POPULATION PER ONE HOSPITAL	BEDS PER 1,000 PERSONS ONE HOSPITAL	TELEPHONE PER 1,000 PERSONS
CAPITAL AREA	0.31	591	18.4	8.1	41,669	4.3	180
NONE CAPITAT AREA	0.51	390	20.0	3.0	29,914	1.6	48
AL-JANUBIAN	0.67	277	15.9	3.6	32,482	2.4	77
AL-DAKHILIAH	0.44	455	13.6	2.2	23,783	2.0	49
AL-SHARQUIYA	0.51	367	18.8	5.2	21,809	2.1	46
AL-BATINAH	0.45	476	21.4	1.3	48,497	0.9	42
AL-DHAHIRAN	0.61	302	22.2	4.5	33,896	1.3	44
MUSANDAM	0.58	315	18.6	9.4	7,942	3.8	30
AVERAGE	0.47	420	19.7	4.2	31,915	2.2	70
							55

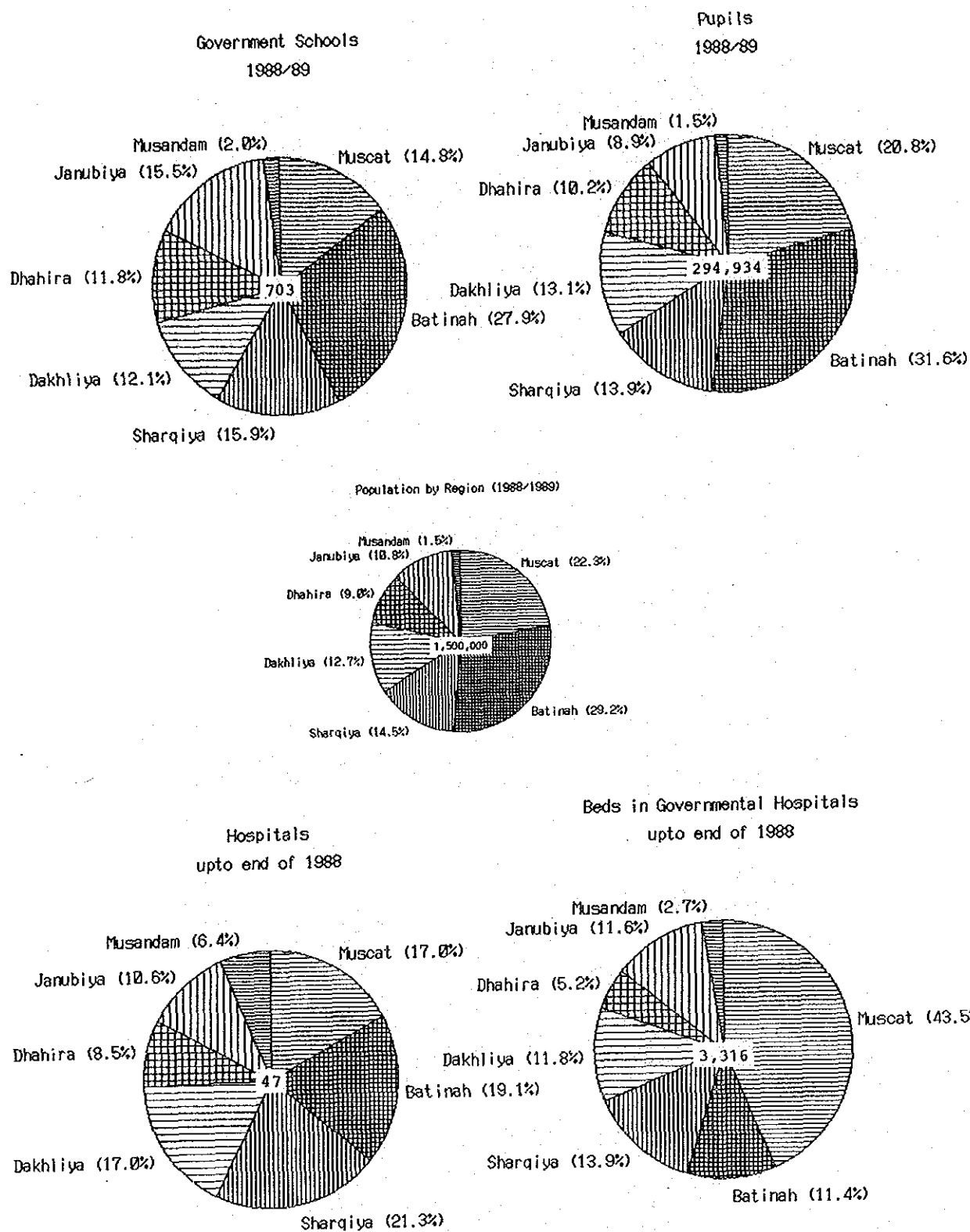
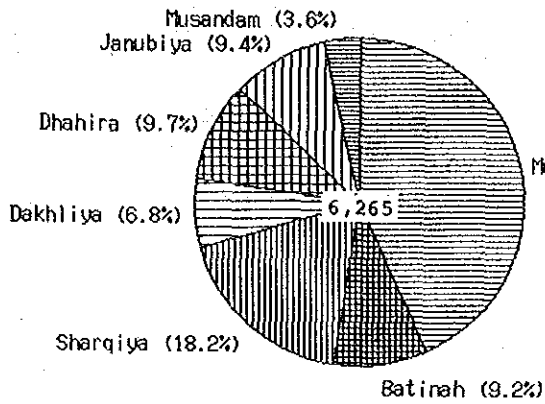
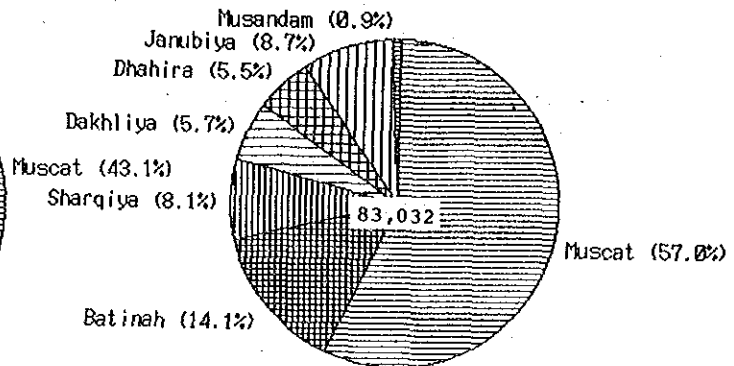


Figure 4.2.1 Social Infrastructure by Region

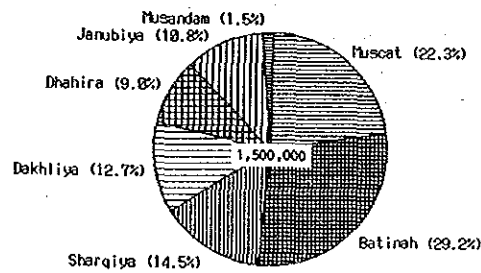
Social Housing
upto end of 1988



Telephone Lines Installed
upto end of 1988



Population by Region (1988/1989)



Gross Production of Governmental
Power Station 1988

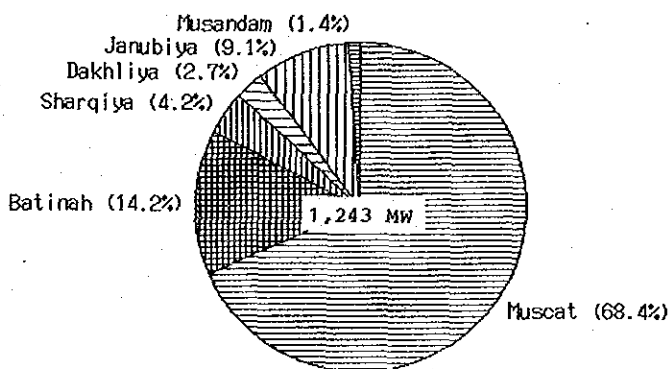


Figure 4.2.1 (continued)

CHAPTER 5

OUTLINE OF AGRICULTURAL SECTOR

CHAPTER 5 OUTLINE OF AGRICULTURAL SECTOR

5.1 Land Use

5.1.1 Land Use and Land Distribution Institutions

(1) Regulations Relating to Land

With respect to land regulation, Royal Decree No. 5/80 was established in 1980. Following this decree, Ministerial Decree No. 17/80 was established in the same year by the Ministry of Land Affairs and Municipalities, later named the Ministry of Housing (MH) to enforce the royal decree.

These decrees prescribed the utilization of land in general, including agricultural land, the definition of the qualifications of the people to whom the land should be distributed, its priorities with regard to distribution procedures, etc.

Furthermore, MH is preparing regional development plans which include land use plans for each sector such as agriculture, industry, commerce, housing, etc. Land uses plans for major towns in each region will also be clearly formulated.

(2) Agricultural Land Distribution Regulation

Since 1970, the government has distributed land to Omani nationals at a low price to promote the agricultural sector. Under the Decrees, all Omani professional farmers qualify, although, in practical terms, farmland can be distributed to any nationals who intend to use it for agriculture.

MH is in charge of the procedure for distribution, while the technical judgment for the suitability of soil for agriculture, the quality and quantity of water resources and the preservation of the environment of the proposed land come under the jurisdiction of MAF, MWR and ME, respectively.

There are two types of actual distribution procedures: one for large-scale commercial management and one for small-scale farm management. The present limit for both is 10 feddan. The details of the two types are described below.

(a) Less Than 10 Feddan

The farmer selects the region and makes a request to MH for the distribution of the agricultural land. In response to the request, MH selects the required area of land from the government land, suitable for agriculture, in the appropriate region, and at the same time, determines an exact location. Following this, MH asks MAF if the soil conditions of the proposed area are suitable or not. After MAF judges the suitability, MWR is requested to judge the adequacy of water quality and quantity. If these are adequate, ME is finally requested to judge the environmental aspects. On the basis of these three ministries' technical judgments, the said area is distributed.

At first, the area is leased for three years at the rate of R.O. 3 per feddan per annum. When more than 75 percent of the area has been continuously cultivated, and it is approved by MAF, the title of the area is transferred to the farmer by the government at a cost of R.O. 50 per feddan. If the area was not cultivated for the 3 years for any reason, the lease can be extended for another 2 years. Following this, the agricultural land title can be transferred to the farmer if he has been cultivating the area for at least 3 of the 5 years.

(b) More Than 10 Feddan (Particularly Commercial Farms)

The applicant selects the region (such as Batinah, Interior, Dhahira, Sharqiya, etc.) and requests distribution of the agricultural land from MAF. In response to the request, MAF specifies the Wilayat and directs the applicant to conduct a feasibility study to determine the financial aspects of agricultural farm management in that Wilayat. If MAF approves the feasibility study, the applicant requests distribution of the land from MH. The subsequent steps are the same

as described in the preceding situation.

Since the agricultural suitability of the land has been surveyed, MAF has requested that MH reserve the identified suitable areas for agricultural use only and not distribute them for other uses. Accordingly, MH has selected the land for distribution based upon the information provided by MAF. Since such information did not cover the entire area applied and requested for, some of the areas which had been distributed were not necessarily appropriate for agriculture from the aspects of soil and/or water resource conditions. They may have been left without cultivation due to salt accumulation resulting from the high salt content of irrigation water.

In order to cope with the above problem, the government suspended distribution of agricultural land except to commercial farms, and has been conducting a study on soil and water resource potentials for agricultural land since January 1987. MAF is responsible for determining soil potential, and the results of the aforementioned soil survey project, conducted by FAO, will be utilized.

Table 5.1.1 shows the wilayats and agricultural lands which were distributed before the end of 1986 and before the above suspension. This table shows the area finally approved under lease or transferred title to be 10,349 ha (24,641 feddan), and the area completed under the preliminary survey, for which MH specified the location and for which further coordination among the three ministries is needed, to be 16,800 ha (39,999 feddan). The distribution procedure for about 17,000 ha of agricultural land is scheduled to be drawn up.

The amount of agricultural land to be distributed was 3 feddan at first, but was increased to 5 feddan, and finally, to the present 10 feddan, except in plain areas of the Southern Region where 5 feddan, due to limited land resources, is used. It should be noted that the number of wells approved for drilling in such distributed lands is limited to one.

Since the construction of buildings which exceed a prescribed size is

Table 5.1.1 NUMBER OF HOLDINGS, AREA OF FARM LANDS, AREA OF FARM LAND DISTRIBUTION AND AREA UNDER CULTIVATION (in ha)

REGION	WILAYAT	No	NAME	FARM LAND DISTRIBUTION ('70-'88)			NUMBER OF HOLDINGS (78/79)	AREA OF FARM LANDS (78/79)	FARM LAND AREA UNDER CULTIVATION (78/79)	AREA UNDER CULTIVATION (1988)
				TOTAL (1)	FINAL (2)	PRELIMINARY SURVEY (3)				
1 SOUTH BATINAH		10		12468.79	6153.02	6315.77	16720	23187.68	1.39	10245.84
			1 SEEB & MUSCAT	26.67	13.76	12.92	1694	2217.38	1.31	1313.62
			2 WADI MAANIL	759.26	147.90	611.35	-	-	-	-
			3 AL AWABI	2.10	0.00	2.10	680	506.22	0.77	294.36
			4 BARKA	6858.05	3744.75	3113.30	2398	4629.46	1.93	2000.02
			5 NAKHAL (INCLUDED IN WADI MAANIL)	-	-	-	1386	603.24	0.44	498.3
			6 AL MUSANAA	2198.42	852.60	1345.82	1430	4211.68	2.95	1406.02
			7 AL SUWAIQ	1616.73	929.42	687.31	2420	7995.02	3.30	2756.6
			8 AL RUSTAQ	321.89	64.84	257.05	4334	1514.26	0.35	1161.82
			9 BURIYAT	337.48	113.35	224.13	2244	1501.50	0.67	801.24
			10 MASIRAH	348.19	286.40	61.79	154	18.92	0.12	13.86
2 NORTH BATINAH		5		4520.40	2034.17	2486.23	12188	27072.54	2.22	13273.92
			11 AL KHAURA	550.13	277.10	273.03	1892	5328.18	2.82	1074.26
			12 SARAH	1914.48	942.48	972.00	3036	8217.20	2.05	2042.92
			13 SOHAR	-	-	-	3564	6495.94	1.82	4424.42
			14 LIWA	665.95	282.12	403.83	1298	3002.12	2.31	1615.46
			15 SHINAS	1389.84	552.46	837.38	2398	6029.10	2.51	4116.86
3 SHARQIA		10		4607.15	1003.34	3604.23	14696	6252.84	0.43	4705.14
			16 WADI BANI KHALID	7.14	2.94	4.20	550	79.42	0.14	69.3
			17 IBRA	1005.10	176.61	828.49	902	623.26	0.69	310.86
			18 BANI ABU HASSAN	371.07	70.73	300.34	1210	581.80	0.48	350.46
			19 AL QABIL	494.68	190.18	304.50	748	482.46	0.65	345.62
			20 WADI DIMA	17.64	3.78	14.28	1958	374.66	0.19	364.76
			21 KAMIL & WAFI	294.03	79.97	214.06	824	677.16	0.73	548.02
			22 BANI ABU ALI	64.68	0.00	64.68	2266	395.78	0.17	354.64
			23 SUR	280.39	128.56	151.83	1804	842.82	0.47	631.4
			24 AL MUDHAIBY	1348.24	128.60	1219.64	3498	1724.80	0.49	1268.96
			25 BIDIYA	724.18	221.97	502.21	836	470.58	0.56	461.12
4 OMAN INTERIOR		6		3366.90	905.91	2460.99	6842	10920.36	1.60	3054.26
			26 BAHLA	962.94	243.92	719.01	2068	3452.46	1.67	1075.58
			27 WIZWA	1529.04	413.31	1115.73	2288	5585.80	2.44	881.54
			28 AL HAMRA	27.98	1.26	26.72	968	946.00	0.98	664.84
			29 MANAH	617.58	199.96	417.62	660	465.52	0.71	181.5
			30 ADAM	229.36	47.46	181.90	374	264.00	0.71	120.56
			31 JABAL AKHDAR	-	-	-	484	206.58	0.43	130.24
5 MUSTA		3		1242.48	247.78	994.70	4444	3574.56	0.80	2112.44
			32 IZKI	611.25	121.66	489.59	1628	1265.44	0.78	867.68
			33 SUMAIL	558.53	93.74	464.79	2024	1662.98	0.82	856.68
			34 BIDBID	72.70	32.38	40.32	792	646.14	0.82	388.08
6 DAHIRAH		3		1229.76	287.35	942.40	6402	7202.36	1.13	3303.08
			35 DHANK	372.10	38.75	333.35	836	681.56	0.82	445.94
			36 IBRI	495.69	159.80	335.89	4488	6082.78	1.36	2480.72
			37 YANQUL	361.97	88.80	273.17	1078	438.02	0.41	376.42
7 BURAIMI		2		N.A.	N.A.	N.A.	2024	1312.52	0.65	885.50
			38 AL BURAIMI	N.A.	N.A.	N.A.	1276	771.76	0.60	447.48
			39 MHADHA	N.A.	N.A.	N.A.	748	540.76	0.72	438.02
8 MUSANDAH		3		N.A.	N.A.	N.A.	2420	1120.46	0.46	1030.04
			40 HASAB	N.A.	N.A.	N.A.	1342	562.98	0.42	545.6
			41 AL BIYA	N.A.	N.A.	N.A.	638	321.20	0.50	311.96
			42 BUKHA	N.A.	N.A.	N.A.	440	236.28	0.54	172.48
9 SOUTHERN REGION		1		N.A.	N.A.	N.A.	17468	2706.66	0.15	2413.62
			43 DHOFAR	N.A.	N.A.	N.A.	-	-	-	-
TOTAL		43		27435.48	10631.57	16804.33	83204	83359.98	1.00	41023.84
										54641.00

explanatory notes:

1: (1),(2) and (3) are obtained from the Ministry of Housing (Regional allocation was calculated by the JICA study team according to the present agricultural region)

2: (4),(5),(6) and (7) are obtained from 1978-1979 agricultural census (Regional total was calculated by the JICA study team according to the present agricultural region)

3: (8) is obtained from the Department of Agricultural Statistics of MAF

not approved for agricultural land, it is practically impossible to sell the distributed agricultural land for any purpose except agriculture. Neither subsidies nor loan financing from the government is available for purchasing farm lands. But as the dealing of farm lands is not regulated, farmers who want to expand their land can do so by purchasing land from a neighbor. However, if he wants to expand the area by more than 10 feddan by the distribution of government land, it will only be provided if he follows the same procedures as mentioned above, which include preparing a feasibility study.

5.1.2 Present Land Use for Agriculture

Table 5.1.1 shows the number of holdings, the area of farmlands under cultivation in each agricultural region obtained from the 1978/79 census, and the area under cultivation in 1988, as provided by the Department of Agricultural Statistics of MAF.

According to the 1978/79 census, approximately 60 percent of the agricultural land is concentrated in North and South Batinah. The area of agricultural land per holding in North Batinah is about 2.2 ha. This is the largest of all holdings and those of each wilayat in North Batinah are the same size. In South Batinah, the average holding area is 1.4 ha. Compared with this, farm lands in such wilayats as Barka, Al Musanaa and Al Suwaiq are large (2 or 3 ha), but in most other wilayats the area is less than 1 ha. All of the average areas in other regions are small (less than 1 ha), except for in Bahla and Nizwa in the Interior Region, and Ibri in the Dhahira Region where they are 1.7, 2.4 and 1.4 ha, respectively. Although the latest data on the area of agricultural land has not been obtained, the sizes must have increased. Present area conditions do not differ much from the trends mentioned above, considering that the recent distribution of government land has been concentrated in the Batinah Region.

The total area under cultivation has increased by 13,600 ha in the last ten years. Considering that the data of the 1978/79 census included

temporarily fallow lands and that those of 1988 do not, the actual number is probably larger. Viewed according to region, cropped area of about 6,400 ha has been added in South Batinah (the most marked increase among all the regions), followed by about 3,900 ha in Sharqiya, 2,600 ha in the Interior, 1,400 ha in Dhahira (including Buraimi) and 1,300 ha in North Batinah Region. The Wasta Region shows no increase while the Southern Region shows a 900 ha decrease. However, taking into account the temporarily fallow lands, there might still have been an increase in the Southern Region also.

Tables 5.1.2 and 5.1.3 show crop trends. Viewed from a nationwide perspective, cropped areas of vegetables, alfalfa and date palms show marked increases. In the fruit tree category, date palms are followed by mangoes. In vegetables, tomatoes, watermelons and cabbage also show marked increases of more than 700 ha. They are followed by cucumbers and melons. Onions, garlic, okra and potatoes show only slight increases and occasional decreases. Regionally, vegetables show marked increases in South Batinah, Sharqiya, North Batinah and Dhahira, in that order. Alfalfa increased by more than 1,000 ha in the North Batinah, Sharqiya and Interior regions, and 700 to 800 ha in the South Batinah and Dhahira Regions. Date palms increased by more than 1,000 ha in the South Batinah, Sharqiya and Dhahira Regions. Mango decreased in North Batinah, but rose more than 1,000 ha in South Batinah. Banana crops also show a significant decrease in North Batinah, but a remarkable increase in South Batinah. These decreases in mango and banana crops led to a drop in the total from 1978 to 1988 in North Batinah. There was also a drop in the total area of vegetables in the Southern Region from 1978 to 1988. This came from mainly tomatoes, potatoes and watermelons.

5.1.3 Development Potential

(1) Development Potential for Soil

In Oman, only a portion of the land, where the development potential was considered to be high, has been surveyed for soil conditions. The results of these limited surveys still show that, with respect to soil,

Table 5.1.1.2

Area under Cultivation of Each Crop in 1978/79
derived from the Agriculture Census 1978-1979

CROPS	(in ha)						
	REGION N. BATINHAS.	BATINHAS.	WASTA	INTERIOR	HAIRA	SOUTH R.	MUSANDAM
1. VEGETABLES	468.16	279.62	92.40	120.78	415.36	211.20	346.06
TOMATO	87.56	7.26	14.52	25.52	26.18	24.86	145.42
CHILI PEPPER	0.00	9.24	1.54	2.86	188.54	0.22	20.46
ONION	198.00	67.10	15.40	37.62	89.10	124.30	5.06
GARLIC	24.42	2.64	21.56	39.38	84.26	31.02	0.44
OKRA	3.74	10.56	0.00	0.00	0.44	0.00	23.76
WATERMELON	128.04	156.42	20.02	3.30	17.38	27.72	56.32
S. MELON	0.00	19.58	2.42	0.00	0.00	1.98	5.06
CABBAGE	0.44	2.86	0.44	1.98	2.20	0.00	24.42
CUCUMBER	0.00	0.88	0.66	0.00	0.00	0.00	7.92
POTATO	25.96	3.08	15.84	10.12	7.26	1.10	57.20
2. FIELD CROPS	711.48	1068.98	852.94	310.86	567.82	586.74	288.42
WHEAT	4.40	38.72	0.00	3.30	120.78	134.42	0.00
ALFALFA	307.56	1030.26	852.94	307.56	447.04	451.66	288.42
TOBACCO	399.52	0.00	0.00	0.00	0.00	0.66	0.00
3. FRUITS	9893.40	7868.08	3208.26	1413.72	1179.03	2397.78	647.90
DATES	5627.82	6419.82	2855.60	1200.76	1029.16	2170.96	60.06
LIMES	1001.88	524.48	177.54	64.02	115.33	144.10	18.70
MANGO	1951.18	730.40	103.18	41.14	18.92	64.90	3.30
BANANA	1311.86	191.40	71.50	107.36	15.62	17.60	264.66
COCONUT	0.66	1.98	0.44	0.44	0.00	0.22	301.18
4. OTHER CROPS	163.90	295.46	147.40	42.24	289.03	201.74	289.52
TOTAL	11236.94	9512.14	4301.00	1887.60	2451.24	3397.46	1571.90
5. TEMP. FALLOW	2036.98	733.70	404.14	224.84	603.02	791.12	841.72
GRAND TOTAL	13273.92	10245.84	4705.14	2112.44	3054.26	4188.58	2413.62
							1030.04
							41023.84

explanatory notes:

Regional total is calculated by the JICA study team according to the present agricultural region

Table 5.1.3 Estimated Area under Cultivation of Each Crop in 1988

according to the Department of Agriculture Statistics, MAF (in ha)									
CROPS	REGION N. BATINHAS.	BATINHAS.	WASTA	INTERIOR	DHAHIRA	SOUTH R. MUSANDAM	TOTAL		
1. VEGETABLES	1,354	1,699	998	309	784	759	137	N.A.	6,040
TOMATO	343	280	202	70	169	125	23	N.A.	1,212
CHILI PEPPER	148	233	89	28	61	36	15	N.A.	610
ONION	109	112	83	32	85	131	8	N.A.	560
GARLIC	4	8	13	18	63	44	0	N.A.	150
OKRA	6	33	4	2	4	2	2	N.A.	53
WATERMELON	257	347	192	38	151	240	25	N.A.	1,250
S. MELON	209	222	102	14	32	34	12	N.A.	625
CABBAGE	139	226	94	51	151	79	30	N.A.	770
CUCUMBER	95	171	213	54	64	53	20	N.A.	670
POTATO	44	67	6	2	4	15	2	N.A.	140
2. FIELD CROPS	1,879	1,806	2,065	450	1,738	1,388	321	N.A.	9,647
WHEAT	12	25	85	25	178	143		N.A.	468
ALFALFA	1,458	1,781	1,980	425	1,560	1,245	321	N.A.	8,770
TOBACCO	409	0	0	0	0	0	0	N.A.	409
3. FRUITS	9,155	11,268	4,753	998	2,577	2,906	646	N.A.	32,303
DATES	6,392	7,811	4,177	829	2,197	2,689	75	N.A.	24,170
LIMES	857	901	193	70	213	144	22	N.A.	2,400
MANGO	1,342	2,012	205	87	67	62	5	N.A.	3,780
BANANA	564	544	178	12	100	11	216	N.A.	1,625
COCONUT	0	0	0	0	0	0	328	N.A.	328
4. OTHER CROPS	2,217	1,829	799	352	520	550	384	N.A.	6,651
TOTAL	14,605	16,602	8,615	2,109	5,619	5,603	1,488	N.A.	54,641

* "OTHER CROPS" includes PAPAYA, CARROT, SWEET POTATO, RADISH, EGGPLANT, SQUASH, PUMPKIN, CAULIFLOWER, BEETROOT, TURNIP, BEAN, LETTUCE, PEA, BARLEY, SORGHUM, CHICKPEA, LUBIA, LEMON, SWEETLIME, FIG, GUAVA, GRAPE, POMEGRANATE, ALMOND

many areas are suitable for agriculture. As far as the preliminary survey is concerned, the total area of land where soil is judged suitable for agriculture is about 198,000 ha for the entire S1, S2 and S3, and about 97,000 ha for S1 and S2. Regional distribution of suitable land is roughly as follows:

(a) Batinah Region

S1-S3(39,000 ha), S1-S2(21,000 ha)

(b) Dhahira Region

S1-S3(24,000 ha), S1-S2(14,000 ha)

(c) Interior Region

S1-S3(19,000 ha), S1-S2(10,000 ha)

(d) Sharqiya Region

S1-S3(40,000 ha), S1-S2(23,000 ha)

(e) Southern Region

S1-S3(76,000 ha), S1-S2(29,000 ha)

The Southern Region has the largest area of suitable soil. Of this area, in the Salalah Plain there are only 600 ha or the sum of S1, S2 and S3, and an additional 8,000 ha, if the conditionally suitable area (SC) is included. Most of the areas are located in Nejd.

(2) Use of Soil Survey Results

As was previously discussed in the "Present Situation", soil surveys of several levels have been conducted in various areas, and a considerable amount of the valuable data has been obtained and stocked. Furthermore, a nationwide soil survey is being conducted by the FAO, and a detailed soil survey, focusing on the Batinah Region which is regarded as the most vital area for national agricultural production, is also being conducted. Therefore, the volume of soil-related data in Oman will increase significantly and more systematic data covering the whole country will be available in the near future.

In order to carry out effective and systematic selection of suitable agricultural land and to provide technical guidance for farmers on the basis of basic data, a data base should be prepared to manage, retrieve,

process and utilize it effectively. The data base will also be of use in the area of research for several purposes, such as soil surveys of Oman's agricultural land and classification of land productivity.

(3) Soil Management

In Oman, soil contains small amounts of organic matter, has low cation exchange capacity, and low nutrient contents. In order to cope with such disadvantages, careful management of fertilizer application is needed. In addition, the application of organic matter will be effective as a long-term measure to increase productivity by improving soil fertility. Attention must be paid to avoid salt accumulation in the soil which does serious damage to irrigated agriculture in arid zones.

(a) Management of Fertilizer

Since the farmers' understanding of soil and fertilizer is not yet sufficient in Oman, the amount of fertilizer applied is small and the timing of application to different soil and crops is not proper. Therefore, the extension services, through on-the-job training, should focus on providing farmers with opportunities to obtain knowledge and techniques about the application of fertilizer, and thereby how to improve the soil. It would definitely contribute to the maintenance of high productivity. Furthermore, enthusiastic joint activity between the extension and research services will enable them to provide guidance to the farmers regarding careful application of fertilizer on the basis of scientific data.

(b) Utilization of Organic Matter

Application of organic matter is effective for soil improvement. There are several sources of organic matter in the country such as self-supplied fertilizer, imported fertilizer and organic compost produced by Oman Organic Fertilizer & Chemical Industries. This compost is utilized to a limited extent, even if it is subsidized, because of its slow effect compared with chemical fertilizers. However, the organic matter enriches the soil fertility after long-

term applications and contributes to high and stable productivity. If fertilizer efficiency and application methods of organic matter are examined more precisely, it may be possible to use organic matter more effectively through the extension services. Sludge produced in the sewage treatment plant in the capital area is dumped, at present, but could be utilized as nitrogen fertilizer; although, nitrogen efficiency is different from other fertilizers and research should be done on the application method.

(c) Salt Accumulation

Salt accumulation is a big problem for agriculture in arid zones, not only in Oman, but worldwide. Salt accumulation is closely related to soil properties, in addition to the quality of irrigation water and the groundwater level. Particularly, it is unavoidable when water with a high salt content is used to irrigate soil with poor drainage. In general, and also in the Batinah Coast, the salts are mainly composed of sodium salts, and when they increase in the soil solution, they also increase osmotic pressure which results in reductions of the water absorption capacity of crops and the nutrient absorption capacity of crops by disturbing their ion balance. Furthermore, the absorbed sodium adversely affects crops, and increased exchangeable sodium in the soil disperses clay particles which reduce water permeability. In order to cope with the salt accumulation, several countermeasures can be considered, such as improvement of irrigation and drainage, leaching, soil dressing, etc., in addition to measuring by the cultivation method.

However, once salt accumulation occurs, a considerable amount of money and labor is required to remove it. Therefore, it is vital to prevent the salt accumulation in order to maintain agricultural productivity. This is to say, that the possible salt accumulation should be carefully monitored in each area, and the collection and analysis of basic data regarding the relationship between soil properties and salt accumulation should be conducted.

(4) Land Use

The potential for agricultural development in the country is determined mainly by the availability of soil and water resources. The newly-developed agricultural areas greatly influence the environment and the existing water resources. Therefore, it is a pre-requisite that the procedure being carried out, by the concerned ministries, for the distribution of agricultural land continue. In order to systemize the procedure based on more scientific data, the concerned ministries are suspending land distribution and conducting studies. They are expected to benefit by smoother procedures for farmland distribution.

Priority should be placed on agriculture for the land-use plan because of its complexity compared with other new developments such as industry, commerce and housing. Agriculture is severely restricted by natural conditions, such as suitable soil, water resources and climates, as well as human resources and other social factors. They make it difficult to find alternative land. It is, of course, necessary to consider nationwide economic balance in planning land-use for the entire country. However, in order to maintain agricultural development in the future, emphasis needs to be placed on agriculture which takes into account the above-mentioned difficulties. Land, once judged suitable for agriculture, should be reserved for agricultural use and be strictly protected by regulation. In particular, in the future, the urban areas will increase and the conversion of agricultural land to other uses may be required. Therefore, necessary countermeasures should be considered in advance.

With respect to sufficient food production, both suitable land for agriculture and suitable seasons for cropping are limited in this country. Therefore, land use plan should be prepared on the basis of a crop production plan which considers where, when and how much should be produced. Particular emphasis should be placed on the production share in southern Oman and northern Oman, where natural conditions differ considerably.