



MINISTRY OF TRANSPORT &
COMMUNICATIONS
SULTANATE OF OMAN



JAPAN INTERNATIONAL
COOPERATION AGENCY

THE STUDY
ON
ROAD NETWORK DEVELOPMENT
IN
THE SULTANATE OF OMAN

FINAL REPORT
MAIN REPORT-1
ROAD NETWORK DEVELOPMENT PLAN

MARCH 2005



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PREFACE

In response to a request from the Sultanate State of Oman, the Government of Japan decided to conduct the Study on Road Network Development and entrusted the project to Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team headed by Dr. Hani Abdel-Halim at Katahira & Engineers International from January 2004 to February 2005.

The team held discussions with the engineers at Directorate General of Roads, Ministry of Transport and Communications, as well as other officials concerned, and conducted field surveys, data analysis, Master Plan formulation and Feasibility Study. Upon returning to Japan, the team prepared this final report to summarize the result of the study.

I hope that this report will contribute to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Sultanate State of Oman for their close cooperation extended to the study.

March 2005

Kazuhisa MATSUOKA,
Vice President
Japan International Cooperation Agency

Mr. Kazuhisa MATSUOKA
Vice President
Japan International Cooperation Agency

March 2005

Letter of Transmittal

Dear Sir,

We are pleased to submit herewith the Final Report of "The Study on Road Network Development in the Sultanate of Oman". The report includes the advices and suggestions of the authorities concerned of the Government of Japan and your agency as well as the comments made by the Ministry of Transport & Communications and other authorities concerned in the Sultanate of Oman.

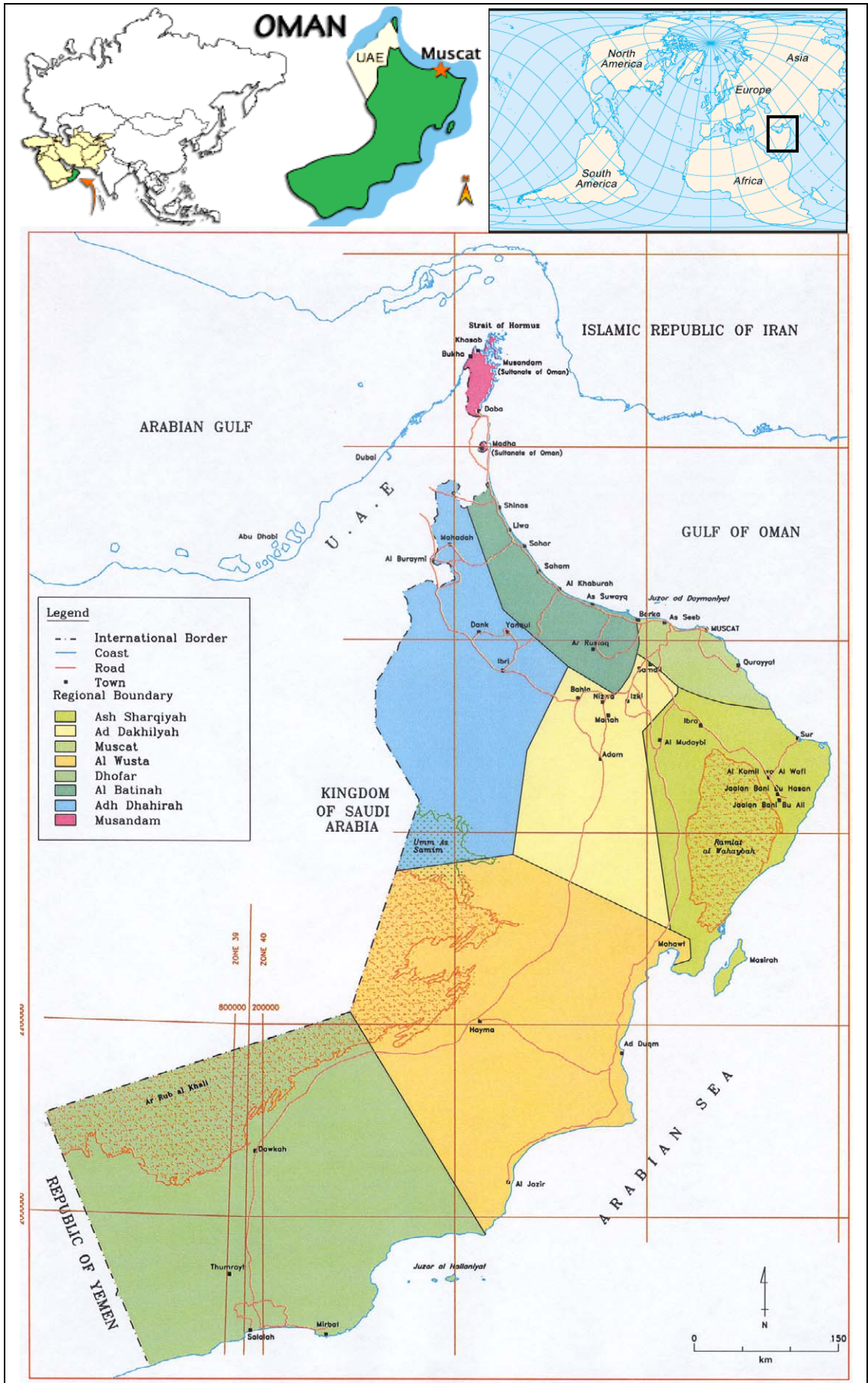
The report analyses the present and future conditions and demand of transport in the Sultanate. It comprehensively covers the road transport sector as well as the issues of institution, financing and environment.

The report presents the established road network development plan to the year 2030, and pre-feasibility study on high priority projects. The output of the Study concludes that the plan is technically, environmentally, economically and socially viable, and will contribute to the national and regional development in the Sultanate. In view of the urgency of developing the road network in the Sultanate, we recommend that the Government of the Sultanate of Oman implement the projects with high priority.

We wish to take this opportunity to express our sincere gratitude to your agency, the Ministry of Foreign Affairs and the Ministry of Land, Infrastructure and Transport. We also wish to express our deep gratitude to the Ministry of Transport & Communications, Directorate General of Roads as well as other Governmental Agencies concerned in the Sultanate of Oman for the close cooperation and kind assistance extended to us during the Study. We hope this report will contribute significantly to the development of the Sultanate of Oman.

Very truly yours,

Dr. Hani Abdel-Halim
Team Leader,
The Study on Road Network Development
in the Sultanate of Oman



Location Map

Report Composition

The Final Report of the Study is structured to meet the requirements of two user-groups, either for experts in-charge of planning or technical feasibility studies. It contains the following five volumes:

EXECUTIVE SUMMARY: is designed to address the decision-makers who do not have extensive information in technical and engineering aspects. It contains brief information on all the major aspects of the Study, and concentrates on input and output of each aspect. It contains also a more concentrated summary for the main conclusions.

MAIN REPORT – 1 “Road Network Development Plan”: is designed for planners, engineers and directors of DGR and concerned ministries and authorities, who need more technical information on the Master Plan formulation. It contains comprehensive information on the present conditions in sectors related to the Study, planning objectives and strategies, development and evaluation of alternatives, components of planned projects, prioritization in the planning process, evaluation results of the Master Plan and overall implementation plan. This report contains the Chapters from 1 to 16.

MAIN REPORT – 2 “Pre-Feasibility Study”: is designed to include technical and detailed studies carried out on significant projects selected in line with the policies and concept of the Master Plan. The report gives the objectives, preliminary design, cost estimate and project evaluation on the technical, environmental and economic viability of four road projects. In addition, it contains other detailed studies conducted on three projects on specific fields of environment, hydrology and management. This report contains the Chapters from 17 to 26.

APPENDIX: to contain necessary data, calculations and other information produced during the course of the Study.

DRAWINGS: to contain preliminary design drawings produced for the Pre-Feasibility Study projects.

MAIN REPORT – 1: ROAD NETWORK DEVELOPMENT PLAN

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ABBREVIATIONS

4WD	:	Four Wheel Drive
5YDP	:	Five-Year Development Plan
AADT	:	Annual Average Daily Traffic
AAGR	:	Annual Average Growth Rate
AASHTO	:	American Association of State Highway and Transport Officials
AC	:	Asphalt Concrete
ADT	:	Average Daily Traffic
amsl	:	above mean sea level
AP	:	Aden Port
ASFR	:	Age-Specific Fertility Rate
BAR	:	Bowshar – Al Armarat Road
B/C	:	Benefit/Cost Ratio
BC	:	Box Culvert
BOOT	:	Build, Operate, Own and Transfer
BOT	:	Build, Operate and Transfer
bpd	:	Barrel per Day
BS	:	British Standard
CC	:	Cement Concrete
DBST	:	Double-Layer Bituminous Surface Treatment
DD	:	Detail Design
DGC	:	Directorate General of Communications (in Dhofar)
DG	:	Director General
DGR	:	Directorate General of Roads
DGWRA	:	Directorate General of Water Resources Assessment
DNC	:	Do Nothing Case
DOT	:	UK Department of Transport
DST	:	Double Surface Treatment
EBH	:	Existing Batinah Highway
EIA	:	Environmental Impact Assessment
ESCWA	:	Economic and Social Committee for Western Asia
EIRR	:	Economic Internal Rate of Return
FFCO	:	Flood Frequency Curve of Oman
F/S	:	Feasibility Study
FIRR	:	Financial Internal Rate of Return
FPF	:	Flood Peak Frequency
FTZ	:	Free Trade Zone
FYDP	:	Five-Year Development Plan
GCCS	:	Gulf Co-operation Council Standard
GDP	:	Gross Domestic Products
GR	:	Grouted Riprap
GRDP	:	Gross Regional Domestic Products
GVA	:	Gross Value Added
ha	:	hectare
HCM	:	Highway Capacity Manual
HDM	:	Highway Design Manual

HUC	:	Highway User Cost
IB	:	Irish Bridge
ICC	:	Industrial Clarification Code
IEE	:	Initial Environmental Examination
IMF	:	International Monetary Fund
IR	:	Internal Regulation
ISIC	:	International Standard Industrial Classification
JICA	:	Japan International Cooperation Agency
LFPR	:	Labor Force Participation Rate
LNG	:	Liquefied Natural Gas
LOS	:	Level of Service
MAF	:	Mean Annual Flood
M/P	:	Master Plan
MCI	:	Ministry of Commerce and Industry
Mem	:	Million cubic meters
MD	:	Ministerial Decision
MOAF	:	Ministry of Agriculture and Fisheries
MOC	:	Ministry of Communications
MOCI	:	Ministry of Commerce and Industry
MOD	:	Ministry of Defense
MOE&W	:	Ministry of Electricity and Water
MOF	:	Ministry of Finance
MOG	:	Ministry of Oil and Gas
MOH	:	Ministry of Health
MOHC	:	Ministry of Heritage and Culture
MONE	:	Ministry of National Economy
MOT&C	:	Ministry of Transport and Communications
MRMEWR	:	Ministry of Regional Municipalities, Environment and Water Resources
MWR	:	Ministry of Water Resources
N.A., N/A	:	Not Available
NBE	:	New Batinah Expressway
NPV	:	Net Present Value
NR	:	National Road
NSA	:	National Survey Authority
OD	:	Origin-Destination
PC	:	Precast Concrete
PC	:	Pipe Culvert
P/C table	:	Production and Consumption Table
PCE	:	Passenger Car Equivalent
PCSG	:	Pre-stress Concrete Steel Girder
PCU	:	Passenger Car Unit
PDO	:	Petroleum Development of Oman
PFI	:	Private Finance Initiative
POT	:	Peak Over Threshold
PSS	:	Passing Sight Distance
R/A	:	Roundabout
RC	:	Reinforced Concrete

RCSG	:	Reinforced Concrete Steel Girder
RD	:	Royal Decree
RD/DGC	:	Road Department of DGC
RDI	:	Road Density Index
RO	:	Riyal Omani
ROP	:	Royal Oman Police
ROW	:	Right of Way
SCTP	:	Supreme Committee for Town Planning
SGRF	:	State General Reserve Fund
SPT	:	Standard Penetration Test
QSR	:	Quriyat - Sur Road
SSD	:	Stopping Sight Distance
ST	:	Surface Treatment
TEU	:	Twenty Feet Equivalent Unit
TFR	:	Total Fertility Rate
TOR	:	Terms of Reference
TRB	:	Transportation Research Board (USA)
TRL	:	Transport Research Laboratory
TTC	:	Travel Time Cost
UAE	:	United Arab Emirates
UK	:	United Kingdom
VCR	:	Volume/Capacity Ratio
veh	:	Vehicle
VOC	:	Vehicle Operating Cost
vpd	:	Vehicle per day
vph	:	Vehicle per hour

CHAPTER 1

INTRODUCTION

CHAPTER 1

INTRODUCTION

1.1 GENERAL

Oman is located in the southeastern quarter of the Arabian Peninsula and covers a total land area of approximately 309,000 square kilometers. The land area is composed of varying topographic features: valleys and desert account for 82 percent of the land mass; mountain ranges for 15 percent; and the coastal plain for 3 percent.

Since the assumption of the power of His Majesty Sultan Qaboos Bin Said in 1970, socioeconomic development has been greatly promoted in the Sultanate. As a part of his accomplishments, development of the transport sector is very remarkable. At present, the Omani transportation system includes an expanding highway network, two modern deepwater ports, as well as other ports for oil and liquid natural gas, and two international airports facilitating international, intraregional, and domestic service. Currently, there are about 9,600 kilometers of paved roads and 27,100 kilometers of unpaved roads, of which 7,613 and 15,970 kilometers are respectively under the jurisdiction of the Ministry of Transport and Communications (as for December 2003), in a contrast to 1970, when there was only one paved highway with a length of 10 kilometers.

The sultanate's modern transportation system links all significant populated places within Oman and gives access to some international destinations. A four-lane highway runs west from Muscat along the Gulf of Oman to Dubai in the UAE. A second major paved highway in the interior connects locations from just east of Al Ayn in the UAE to Salalah on Oman's south coast. Good land connections link Oman only with the UAE, as roads extend across the Saudi or Yemeni borders are still under improvement.

The transportation planning and administration of primary and secondary road networks, with the exception of highways in Muscat Governorate, are administered by the Ministry of Transport and Communications through the Directorate General of Roads (DGR) in Muscat and Directorate General of Communications (DGC) in Salalah.

Although the pavement conditions have been improved, the road network still has many problems such as the interruption of traffic at *Wadis* during and after rainfall. Efforts are still needed for improving both primary and secondary road networks to provide all-weather roads with standard width and to efficiently increase the paved ratio of roads

in the country. A well developed road network is required for the enhancement of the transport system in the country to cope with the diversification of industries and development sectors to transfer the country's economy from oil-oriented to non-oil-oriented.

In response to a request from the Government of the Sultanate of Oman, the Government of Japan decided to conduct the Study on Road Network Development in the Sultanate of Oman. Accordingly, the Japan International Cooperation Agency (JICA), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, is undertaking the Study. JICA has organized and dispatched a Study Team to the Sultanate of Oman to commence the Study in January 2004.

1.2 OBJECTIVES OF THE STUDY

The objectives of the Study are:

1. To prepare the Master Plan (M/P) of development of primary and secondary road network improvement, which covers the period from 2006 to 2030, in the Sultanate of Oman,
2. To carry out pre-feasibility study on high priority projects identified under the M/P; and
3. To pursue technology transfer to the Counterpart personnel in the course of the Study.

1.3 SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the Study covers the following:

1. Review and Analysis of the present situation of the road sector
 - 1-1 Review of existing laws and regulations related to road development, maintenance and environmental assessment
 - 1-2 Review of the past studies and the related development plans/ projects related to road development
 - 1-3 Review of other existing data and information related to the Study
 - 1-4 Identification and analysis of problems
 - 1-5 Traffic Survey (Origin/Destination survey, traffic volume counting, etc.)
2. Formulation of Master Plan (M/P)
 - 2-1 Collect and review the existing data and information relevant to the Study
 - 2-2 Analysis of socioeconomic framework and identification of development

potential in the region

- 2-3 Conducting supplementary surveys and analyses (e.g. road inventory, bridge inventory, and traffic survey)
 - 2-4 Forecast of the future traffic demand
 - 2-5 Formulation of road network development plan
 - 2-6 Establishment of the road construction/improvement/maintenance plan
 - 2-7 Rough cost estimate of road construction, improvement and maintenance
 - 2-8 Initial Environmental Examination (IEE)
 - 2-9 Evaluation of road links of proposed road network
 - 2-10 Economic analysis
 - 2-11 Financial analysis
 - 2-12 Selection of high priority projects for the period from 2006 to 2010 for pre-feasibility study
 - 2-13 Establishment of implementation plan
3. Pre-Feasibility Study
 - 3-1 Rough engineering design
 - 3-2 Rough cost estimation
 - 3-3 Rough economic analysis
 - 3-4 Preparation of draft of TOR for Environmental Impact Assessment (EIA)
 4. Overall Evaluation and Recommendations

1.4 SCHEDULE OF THE STUDY

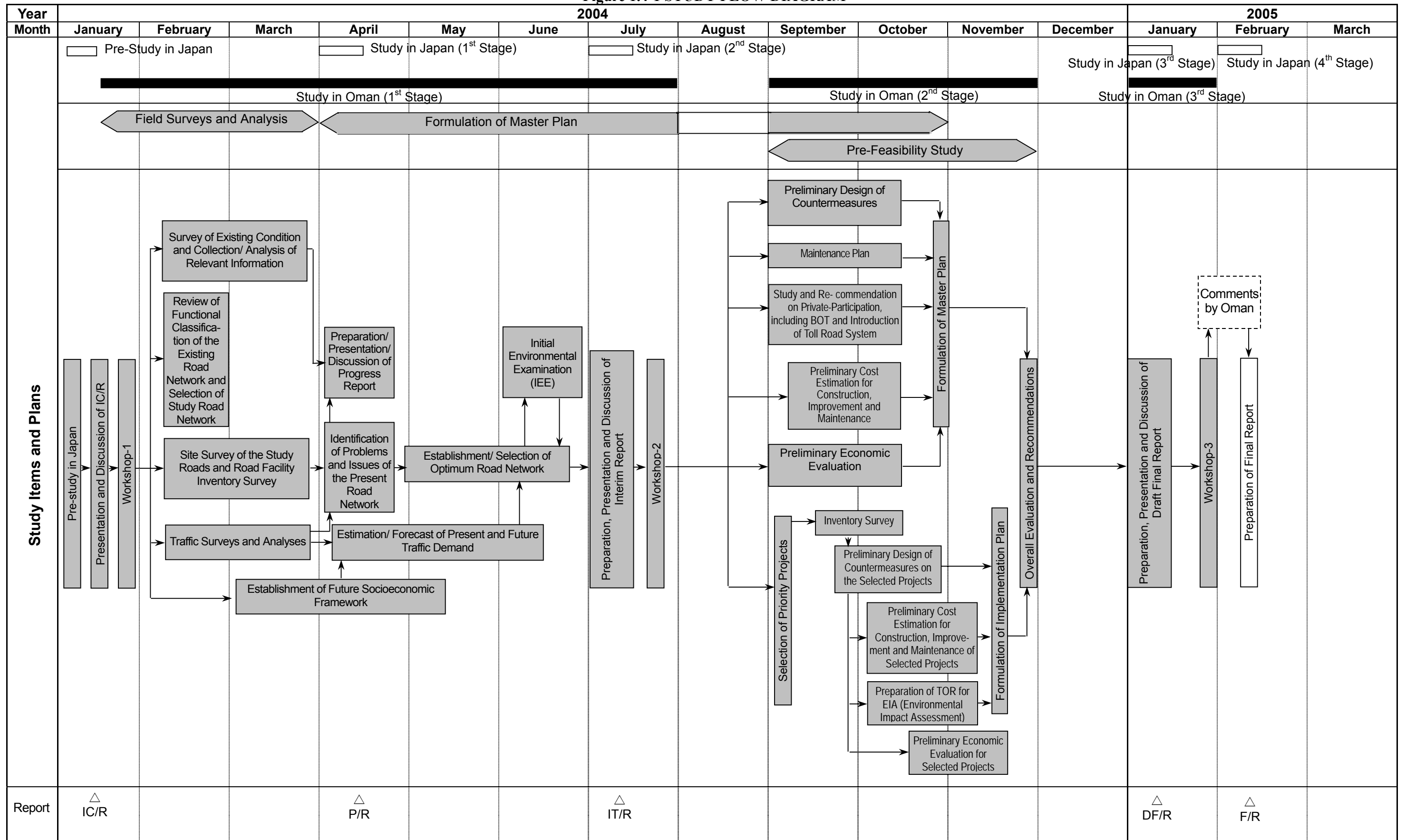
The Study is commenced in January 2004 and scheduled to be completed by February 2005. Figure 1.4-1 shows the Flow Diagram of the Study.

1.5 ORGANIZATION OF THE STUDY

The Study is carried out by the Study Team organized by JICA from Katahira & Engineers International, which is composed of the following members:

Dr. HANI Abdel-Halim	Team Leader / Road Policy
Mr. SAKURAI Tatsuyuki	Deputy Team Leader / Road Plan / Maintenance and Management
Mr. MIZUNO Iwane	Regional Plan
Mr. TANAKA Hajime	Transport Plan / Demand Forecast
Mr. UENO Ryuichi	Traffic Survey
Dr. Samir KOTOUB	Natural Conditions Survey / Hydrology

Figure 1.4-1 STUDY FLOW DIAGRAM



■ : Study in Oman □ : Study in Japan

Other activities include:

- Detailed discussions on the contents of the reports
- Extensive discussions on road network function and classification
- Participation in some activities of the initial environmental examination
- Training on applications by JICA STRADA model for the assignment of OD trips on the road network to develop traffic volumes on the road network.

In addition, the major task of JICA training in Japan for members of the counterpart team was held during the course of the Study. Two training schemes were considered, in which one trainee joined a Transport Planning course during September and October, 2004 while three other trainees participated in an individual course on December, 2004. Other official meetings and workshops include:

Steering Committee Meetings:

- 1st Steering Committee on Inception Report – January 27, 2004
- 2nd Steering Committee on Progress Report – April 27, 2004
- 3rd Steering Committee on Interim Report – July 25, 2004
- 4th Steering Committee on Draft Final Report – February 1, 2005

Workshops:

Workshop-1 on Inception Report, January 28, 2004

- Introductory of Japan International Cooperation Agency
- Observations on Road Network Development in Oman
- Outline of the Study
- Road Network Development in Japan

Workshop-2 on Interim Report – July 27, 2004

- Special Lecture: Preservation of Roads against Sand Drifting in Arid Area
- Road Maintenance in Oman
- Interim Results of the Study
- Effect of Road Improvement on Regional Development

Workshop-3 on Draft Final Report in Muscat, January 26, 2005

Workshop-3 on Draft Final Report in Salalah, January 29, 2005

- Special Lecture: Traffic Safety Measures in Japan
- Final Results of the Study

1.7 RELEVANT PLANS AND STUDIES

The relevant plans and studies are reviewed and summarized as presented in Appendix

1.1. Such plans and studies include the followings:

1. National Development Plans

- Long Term Strategies and Five-Year Development Plans
- First Long Term Strategy for Development (1970-1995)
- Five Year Development Plans under First Long Term Strategy
- First Five Year Development Plan (1976-1980)
- Second Five Year Development Plan (1981-1985)
- Third Five Year Development Plan (1986-1990)
- Fourth Five Year Development Plan (1991-1995)

2. Oman Vision 2020 and Recent Development Plans

- Oman Vision 2020
- Fifth Five Year Development Plan (1996-2000)
- Sixth Five Year Development Plan (2001-2005)

3. Road Development Plans

- Road Sector in Fifth Five-Year Development Plan
- Road Sector in Sixth Five-Year Development Plan
- Highway Master Plan 1985
- JICA Road Development Study - 1995

4. Regional and Urban Planning

5. Toll Road Studies

- New Batinah Expressway
- Qurayyat – Sur Highway
- Bowshar – Al Amrat Road

6. Port Development Studies [Sultan Qaboos Port - Salalah Port - Sohar Port - Khasab Port - Duqm Port]

PART I

**PRESENT CONDITIONS
IN
THE SULTANATE OF OMAN**

CHAPTER 2

PHYSICAL PROFILE

CHAPTER 2

PHYSICAL PROFILE

2.1 GENERAL

The Sultanate of Oman occupies the southeastern corner of the Arabian Peninsula and has a total area of 309,000 km². It is bordered in the northwest by the United Arab Emirates, in the west by Saudi Arabia and in the south-west by the Republic of Yemen. A detached area of Oman, separated from the rest of the country by the United Arab Emirates, lies at the tip of the Musandam Peninsula, on the southern shore of the Strait of Hormuz. The country has coastlines of almost 1,700 km, from the Strait of Hormuz in the north to the borders of Yemen in the south-west, overlooking three seas: the Arabian Gulf, the Gulf of Oman, and the Arabian Sea.

Oman is a country with different weather systems, which are dominating in particular seasons. Two distinct seasons are prevailing namely, winter (November to April), and summer (May to October), affected by various meteorological mechanisms throughout the country. The rainfall although scanty is the only source of natural water replenishment while groundwater is the essential natural source of water supply. Rainfall is ranging from 50 mm in the interior to 300 mm in the north, Oman Mountains, while the general average is about 100 mm.

All fresh groundwater and surface water in the Sultanate of Oman originate from local rainfall. The country's reserves of fresh groundwater are the Alluvium in the Northern Oman, and the Tertiary limestone in the south. Significant amount of fossil water are contained in aquifers underlying the Nejd Southern Oman.

The fresh saltwater interface was detected along most of Al Batinah coast, in north eastern Ash Sharqiyah, on the Salalah Plain, and in some areas of the Musandam Peninsula.

Traditionally most of Omani communities are evolved adjacent to Aflaj systems (very sensitive to contamination) which are channels originating from a mother well which intercepts the groundwater table or on the surface for collecting groundwater or natural spring water, in order to be led away by tunnel for different uses, mainly for irrigation.

Surface water flow in the Sultanate of Oman is rare, in nearly all wadis: It occurs only for short period of time, hours or few days after the storm, in the form of flash flood incidents. However, there are some cases of periods of two or more dry years with no runoff.

Twenty one major recharge dams have been built for recharge purposes, with three being constructed, which contribute for more than 77.88 Mcm, additional annual recharge to aquifers on average, through the estimated 300 Mcm of annual outflow to the sea and desert could be harvested. Knowledge of the location of proposed dams is of great importance in order to coordinate and amend any prospected roads development in the Sultanate.

The main non-conventional water resources in the Sultanate of Oman are desalinated water, and treated wastewater. There are nearly 54 desalination plants in all over the Sultanate; Muscat Governorate accounts for approximately 90% of the total production of the desalination plants. Approximately more than 23 Mcm/yr of treated wastewater is used for irrigation purposes.

Groundwater protection for future water use is one of main objectives of the country, aiming at protection of existing water resources from pollution, saline intrusion, and overabstraction of groundwater aquifers. Since most of the exploitable aquifers are vulnerable to contamination, therefore, wellfied protection zones have been established within each catchment area, and regulations have been adopted in the field of Aflaj protection measures, for any socio-economic activity to be implemented in the Falaj zone, which is ruled by laws restricting groundwater pollution. National Development of Roads and Construction is one of the subjects seriously dealt with. Among those are:

- Protecting the groundwater resources in qualitative, as well as quantitative terms; (from all national development programs such as roads and civil constructions).
- Constructing new groundwater recharge dams, 30 dams are proposed to be built until the year 2010. These dams along the coast will contribute indirectly to the protection of the existing roads such the case along Al Batinah Region.

The project's activities will introduce a new knowledge to be gained during the course of implementing the project by DGR's staff in the ministry. New findings and methodologies would be added to their experience by on the job training of Omani engineers in the field of preparation of the national development study, of roads in the country.

In order to fulfil ad hoc requirements, detailed assessments to the existing hydrological, hydrogeological, wadis characteristics, and geological conditions have been carried out, in order to delineate, a design flood to be utilized in the construction of bridges, culverts, Irish crossings, Irish bridges, channels, ditches, and storm water systems.

All available data, and reports, are being reviewed, analyzed, and evaluated, in order to achieve the ultimate tasks of the Study.

2.2 ADMINISTRATIVE REGIONS

The Sultanate is divided into eight main administrative regions as shown in Figure 2.2-1, each with an administrative centre.

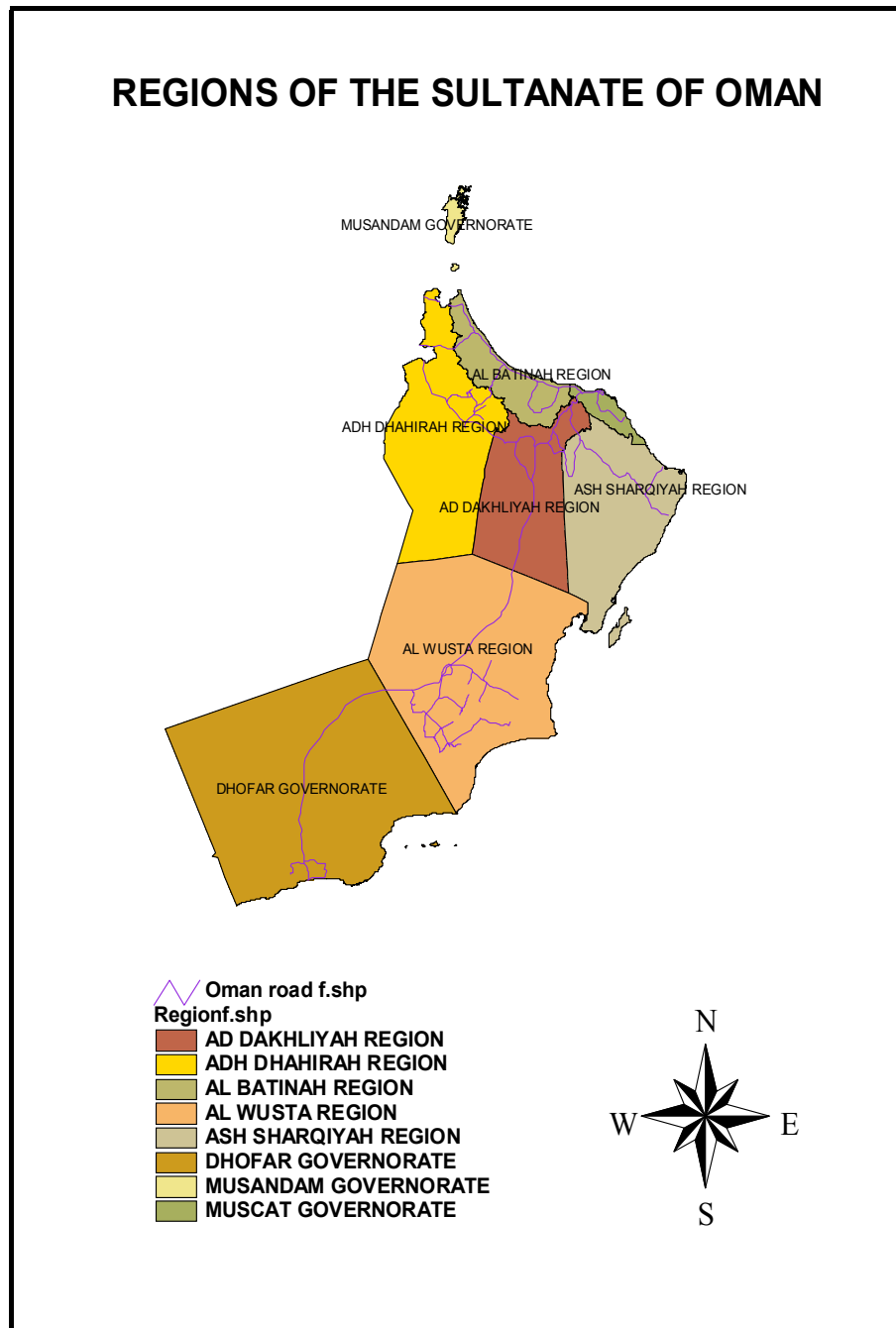


Figure 2.2-1 Regions of the Sultanate of Oman

The whole country is divided into 59 Wilayats, which are:

1) Muscat Governorate

This is the central administrative area of the Sultanate, and hence it is entrusted with the preparation, and formulation of projects, programmes, and plans aiming at realizing progress, and prosperity for the whole population and in all regions of the country. It is characterized by high population density. Main towns are Muscat the capital of the country, Mutrah, Bawshar, Qurayyat and As Seeb.

2) Al Batinah Region

Al Batinah region is divided into two main areas:

1. The coastal plain occupies the frontier with the United Arab Emirates for a distance of 270 kilometers South East of Muscat Governorate. It is situated between the coast, and the Al Hajar Al Gharby mountain range.
2. The Al Hajar Al Gharby mountain range runs parallel to the coast from the United Arab Emirates in the North to the Wadi Al Maawil in the South. The highest peaks, up to 3,075 meters, lie to the North-West at Jabal Al Akhdar. The principal activities of the population in the area, are agriculture, and fisheries, it is one of the most densely populated areas of the Sultanate.

Main towns are Sohar and Ar Rustaq.

3) Musandam Governorate

This area is located in the northern most part of the Sultanate, and is separated from the rest of Oman by part of the United Arab Emirates. It has rough mountains reaching a height of 1,800 meters above sea level and which jut into the Straits of Hormuz. Main town are Khasab, Bukha, Deba and Lima.

4) Adh Dhahirah Region

This region is a semi-desert plain sloping from the Southern wings of Al HajrAl Gharby, in the direction of Ar Rub Al-Khali. It is bordered by the United Arab Emirates in the North and separated by Jebel Al-Koor in the South. Wadi dank and Wadi Al-Ayn is the two main Valleys, with high density of population. Main towns are Ibri and Al Buraymi.

5) Ad Dakhliyah Region

This is a central plateau running from Jabal Al Akhdar in the north towards the desert in the South. It is bordered on the West by Adh Dhahirah and on the east by Ash Sharqiyah. There are four main Valleys; Al-A Byadh, Halfein, Bahia and Samail. Samail and Al-Halfein together form a natural gap in the Al-Hajar mountain range, providing a traditional route between Muscat and the Ad Dakhliyah Region. Main towns are Nizwa, Bahla and Samail.

6) Ash Sharqiyah Region

This region can be divided into two areas:

- 1) The sandy plain is penetrated by Wadis, and located at the inner part of the Eastern Hajar mountain range. It is bordered by the Arabian Sea to the South East, and by Wahiba sand to the South.
- 2) The Eastern Al Hajar mountain range is the continuation of the main mountains of Oman from Samail gap, to Jabal Khamis in the East at a distance of 200 kms and is extending up to the coast in the North. The highest elevation is 2,100 m. The main island is Masirah Islands.

Main Towns are Sur and Ibra

7) Al Wusta Region

It is characterized by its abundant oil, and fisheries resources, which constitute the major export commodities of the Sultanate. Fishing and animal husbandry are the main occupation of its population. The region is also characterized by its unique and special environment, in particular, the Arabian Oryx sanctuary, with a total area of 34 thousand sq. km. and which was registered in the International heritage registries. Main town are Hayma, Wadi Say-Ad Duqm and Haj-Mahut.

8) Dhofar Governorate

This area occupies nearly one third of the Sultanate's total area and is one of the very few areas in the Arabian Peninsula with a wide range of topographic variations. It includes many historical monuments and cities such as Sumharam Port, and the graves of Prophet Ayoub and Hood. Its people are engaged in agriculture activities, and fishing. Main town are Salalah, Taqah and Raysut.

2.3 GEOGRAPHY AND TOPOGRAPHY

Oman can be divided into the following physiographic regions:

The whole coastal plain: The most important parts are the Batinah Plain in the north, which is the principal agricultural area, and the Salalah Plain in the south. The elevation ranges between zeros near the sea to 500 meters further inland.

The mountain ranges: Mountain ranges occupy about 15% of the total area of the country. The mountain range that runs in the north close to the Batinah Plain, is the Jabal Al Akhdar, with a peak at 3,000 meters. Other mountains are located in the Dhofar province, in the extreme southern part of the country, with peaks ranging from 1,000 to 2,000 meters.

The internal regions: The internal regions lie, between the coastal plain, and the mountains in the north and south, consisting of several plains, with elevations not exceeding 500 meters.

The northernmost area, Ruus al Jibal, extends from the Musandam Peninsula to the boundary with the United Arab Emirates (UAE) at Hisn al Diba. It borders the Strait of Hormuz, which links the Arabian Gulf with the Gulf of Oman, and is separated from the rest of the Sultanate by a strip of territory belonging to the UAE. This area consists of low mountains forming the northernmost extremity of the Al Hajar al Gharbi (Western Al Hajar) Mountains. Two inlets, Elphinstone (Khawr ash Shamm), and Malcom (Ghubbat al Ghazirah), cleave the coastline about one third the distance from the Strait of Hormuz, and at one point are separated by only a few hundred meters of land. The coastline is extremely rugged. The Elphinstone Inlet is sixteen kilometers long and surrounded by cliffs 1,000 to 1,250 meters high.

The UAE territory separating Ruus al Jibal from the rest of Oman extends almost as far south as the coastal town of Shinas. A narrow, well-populated coastal plain known as Al Batinah runs from the point at which the sultanate is re-entered to the town of As Seeb, about 140 kilometres to the southeast. Across the plains, a number of wadis, heavily populated in their upper courses, descend from the Al Hajar al Gharbi Mountains to the south. A ribbon of oases, watered by wells and underground channels (*falaj*), extends the length of the plain, about ten kilometres inland.

South of As Seeb, the coast changes character. For about 175 kilometres, from As Seeb to Ras al Hadd, it is barren and bounded by cliffs almost its entire length; there is no cultivation and little habitation. Although the deep water off this coast renders navigation

relatively easy, there are few natural harbours or safe anchorages. The two best are at Muscat, and Mutrah, where natural harbours facilitated the growth of cities centuries ago.

West of the coastal areas lies the tableland of central Oman. The Al Hajar Mountains form two ranges: the Al Hajar al Gharbi Mountains and the Al Hajar Ash Sharqi (Eastern Al Hajar) Mountains. They are divided by the Wadi Samail (the largest wadi in the mountain zone), a valley that forms the traditional route between Muscat and the interior. The general elevation is about 1,200 meters, but the peaks of the high ridge known as Al Jabal al Akhdar (Green Mountain)--which is considered a separate area but is actually part of the Al Hajar al Gharbi Mountains--rise to more than 3,000 meters in some places. Al Jabal al Akhdar is the only home of the Arabian *tahr*, a unique species of wild goat. In the hope of saving this rare animal, H.M. Sultan Qaboos bin Said has declared part of Al Jabal al Akhdar National Park. Behind the Al Hajar al Gharbi Mountains are two inland regions, Adh Dhahirah and inner Oman, separated by the lateral range of the Rub al Khali. Adjoining the Al Hajar ash Sharqi Mountains are the sandy regions of Ash Sharqiyah particularly in Jalan, which also border the desert.

The desolate coastal tract from Jalan to Ras Nuus has no specific name. Low hills and wastelands meet the sea for long distances. Midway along this coast and about fifteen kilometers offshore is the barren island of Masirah. Stretching about seventy kilometers, the island occupies a strategic location near the entry point to the Gulf of Oman from the Arabian Sea.

Dhofar region extends from Ras Ash Sharbathat to the border of Yemen. Its exact northern limit has never been defined, but the territory claimed by the country includes the Wadi Mughshin, about 240 kilometers inland. The south-western portion of the coastal plain of Dhofar is regarded as one of the most beautiful in Arabia Peninsula, and its capital is Salalah. The highest peaks are about 1,800 meters.

The cultivable area has been estimated at 2.2 million ha, which is 7% of the total area of the country. Over half the agricultural area is located in the Batinah Plain, in the north, which has a total area representing about 3% of the area of the country.

Topographically, Oman consists of three broad natural regions, namely the Oman Mountains to the north, the plateau of Interior Oman and Haushi-Huqf in the center, and Dhofar in the south.

The Oman Mountains region form an arc-shaped range along the edge of the Gulf of Oman, range from 50 to 130 km in width and are about 700 km long extending from Straits of Hormuz to Ras's Jibsh.

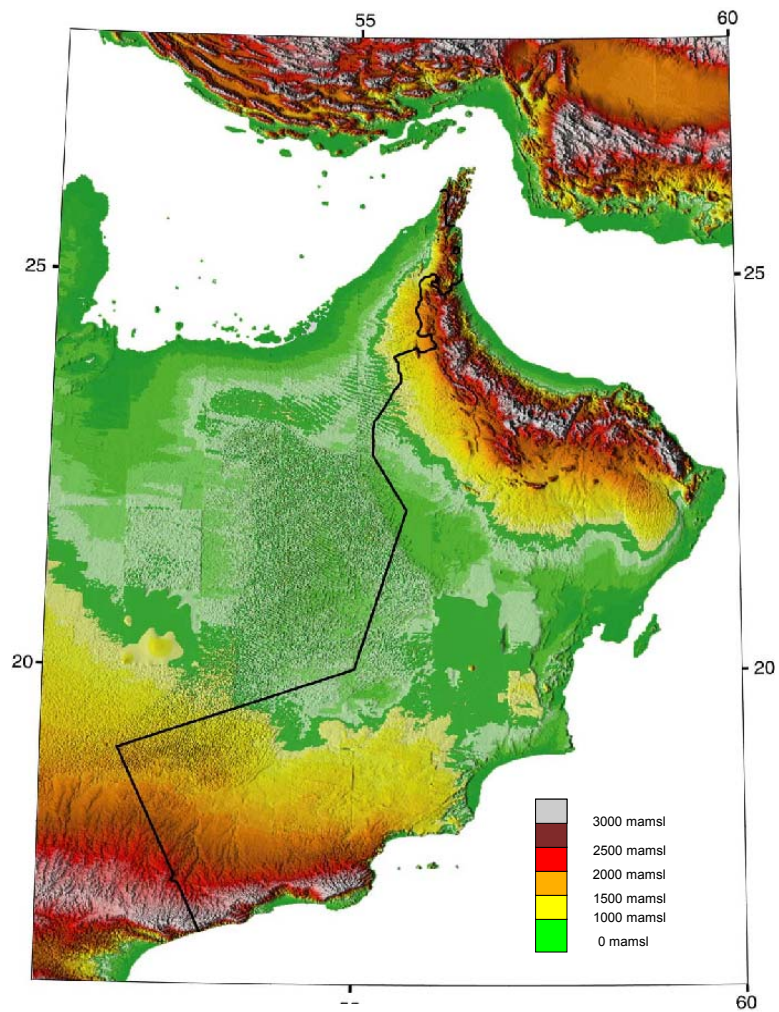


Figure 2.3-1 Main Physiographic Features of the Sultanate of Oman

The highest mountain is Jabal Akdar being 3,030 m where broad steep-sided antiforms. Musandam area in the north most area of Oman Mountains is characterized in ria coastal line. This region are bounded by narrow coastal plains, the Batinah plain to the north and Batain plain to the east, to the west and south are gravel plains passing into the interior plateau. The region is characterized in the meridian topographic feature, incised deeply and steeply eroded to valleys, and forms unique topography.

The Interior Oman Plateau region occupies most of the country, extending the Oman Mountains and Dhofar. It is a broad, low limestone plateau known as the Jiddat al Harasis; it partly covered by sands, to the northeast by the Wahiba Sands, and to the west by the Rub' al Khali. In the northwest of the plateau is the Great Sabkha (salt lake) of Umm as Samin, and on the eastern margin is the Haushi-Huqf depression.

The Dhofar region is characterized in a succession of mountains (Jabal al Qamar, Jabal Qara, Jabal Samhan), rising to more than 1,500 m and dominating a narrow, discontinuous, down-faulted coastal plain and the Arabian Sea.

The coastline of Oman, extending approximately 1,700 km long, consists of rocky reef, coral reef, sand and gravel beaches, and Khawr (inlet), mangrove swamps, etc. Several areas of coastal beach, rocky reef, and khawrs have been proclaimed as protection areas for the conservation of topography and wildlife. Main islands in Oman, including Juzor ad Daymaniyat, As Sawadi, Masirah, Juzor al Hallaniyat, are scattered in Oman Bay and Arabian Sea.

Slope failure: Relatively small-scaled slope failures are locally found in the cut slope along the roads, which are located Muscat area and Oman

Mountains region: The phenomenon occurs restrictively in case of high gradient, high slope more than 5 m, and fractured or altered zone.

2.4 CLIMATOLOGICAL CONDITIONS

The climate of Oman differs from one region to another. It is hot, and humid during summer in the coastal areas, and hot and dry in the interior regions with the exception of some higher lands and the southern Dhofar region, where the climate remains moderate throughout the year. In the north and centre of Oman, rainfall occurs during the winter (November-April), while in the south and some internal parts of the country it is a result of seasonal summer storms (June-September). Average annual rainfall has been estimated at 55 mm, varying from less than 20 mm in the internal desert regions to over 300 mm in the mountain areas, as shown in Figure 2.4-1.

Tropical cyclones originating in the Indian Ocean enter the Arabian Sea quite regularly. One of the most extreme storms in recent years was that of June 1977. It crossed Masirah Island, where 430 mm of rain was recorded. Ad hoc storms hit the Arabian coast on average once every three years and occasionally result in a very heavy precipitation. (300 mm of rain fell at Muscat in one day in June 1980).

Northern Oman:

The present climate of Northern Oman in Figure 2.4-2 is classified as 'arid province' (Schyfsma 1978) and is characterized by dry warm winters, very hot and sometimes humid summers, low and erratic rainfall, large variations in relative humidity

and high rates of evapotranspiration. Monthly mean temperatures for the Al Batinah Region are taken with reference to the nearest Meteorological Station. Monthly temperatures are significantly very high during the summer months, averaging over 35⁰ C during the months of May to October. The winter spell is from November to April when temperatures are around 20⁰ C (General Soil Map of Oman). Precipitation is highly variable in space and time.

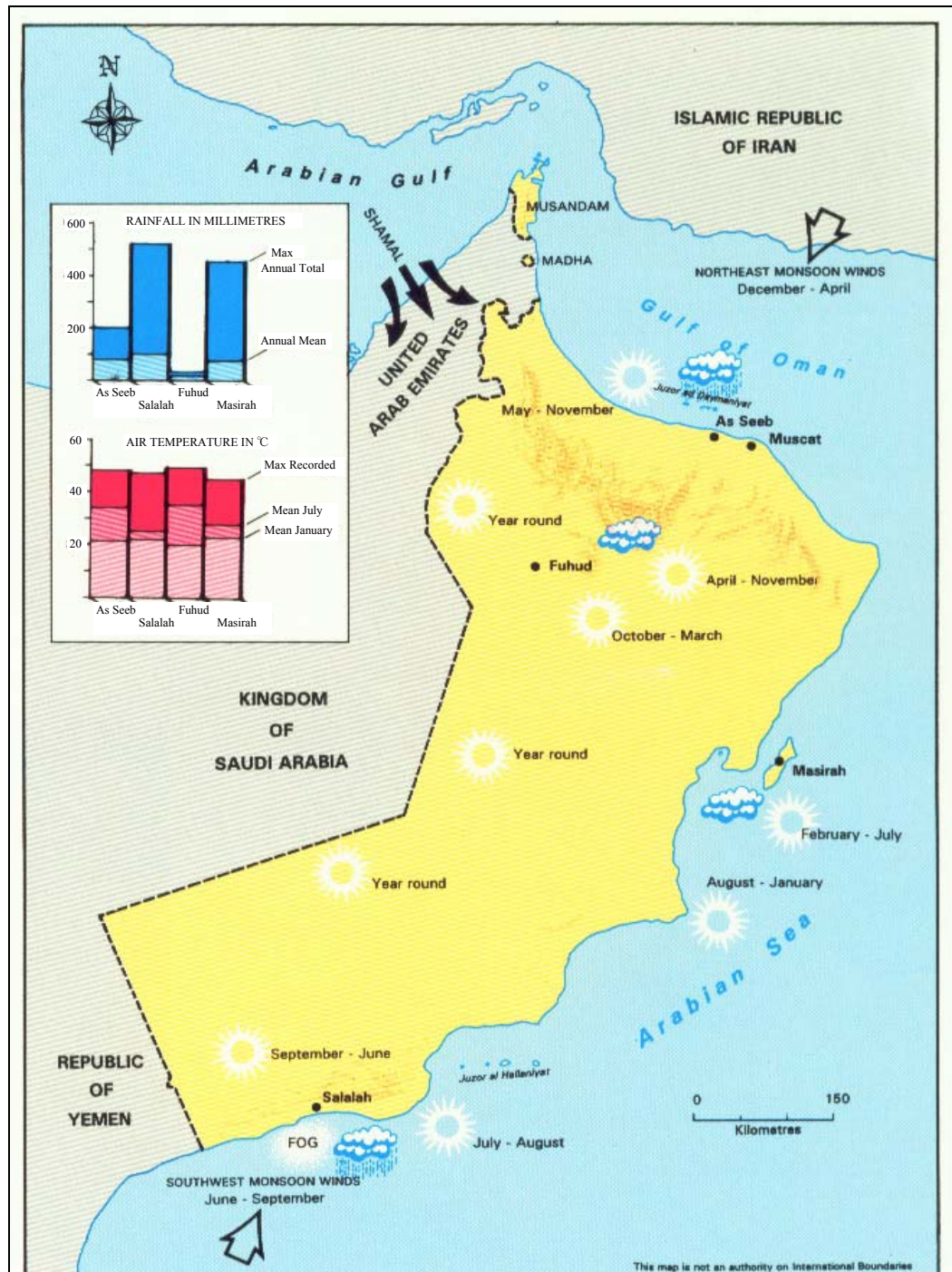


Figure 2.4-1 Generalized Climate Map

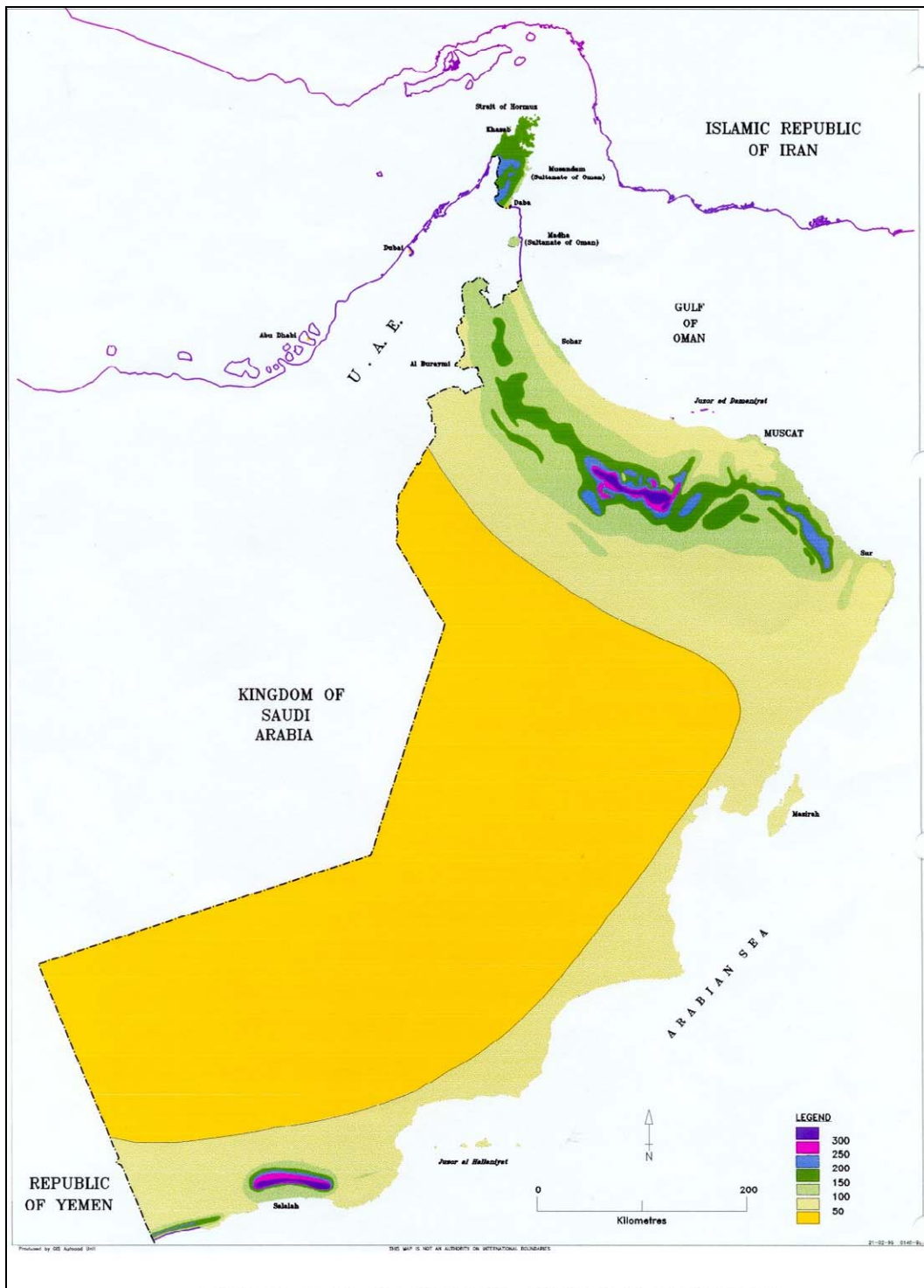


Figure 2.4-2 Mean Annual Rainfall Isohyets of Sultanate of Oman

Salalah Region:

Mean annual rainfall at Salalah region is ranging from 94 mm/yr at Robot to 553 mm/yr at Tawi Attair, while the general average is about 244 mm/yr. The climate of the region is

characterized by dry desert, hot and humid coastal area, hot and dry interior and strong southwest summer monsoon (May to September) in far south. The resultant South West monsoon brings heavy precipitation to the Qamar Mountains of Dhofar. 40% of Nizwa rainfall occurs during the summer due to the monsoon effect.

2.5 GEOLOGICAL CONDITIONS

At different locations in Oman, outcrops ranging in age from 800 million years to recent formations can be encountered with varying characteristics of metamorphic, igneous to sedimentary rocks. The stratigraphic sequence in Oman includes deposits that originated in two different glacial periods. The surface geology is shown on Figure 2.5-1.

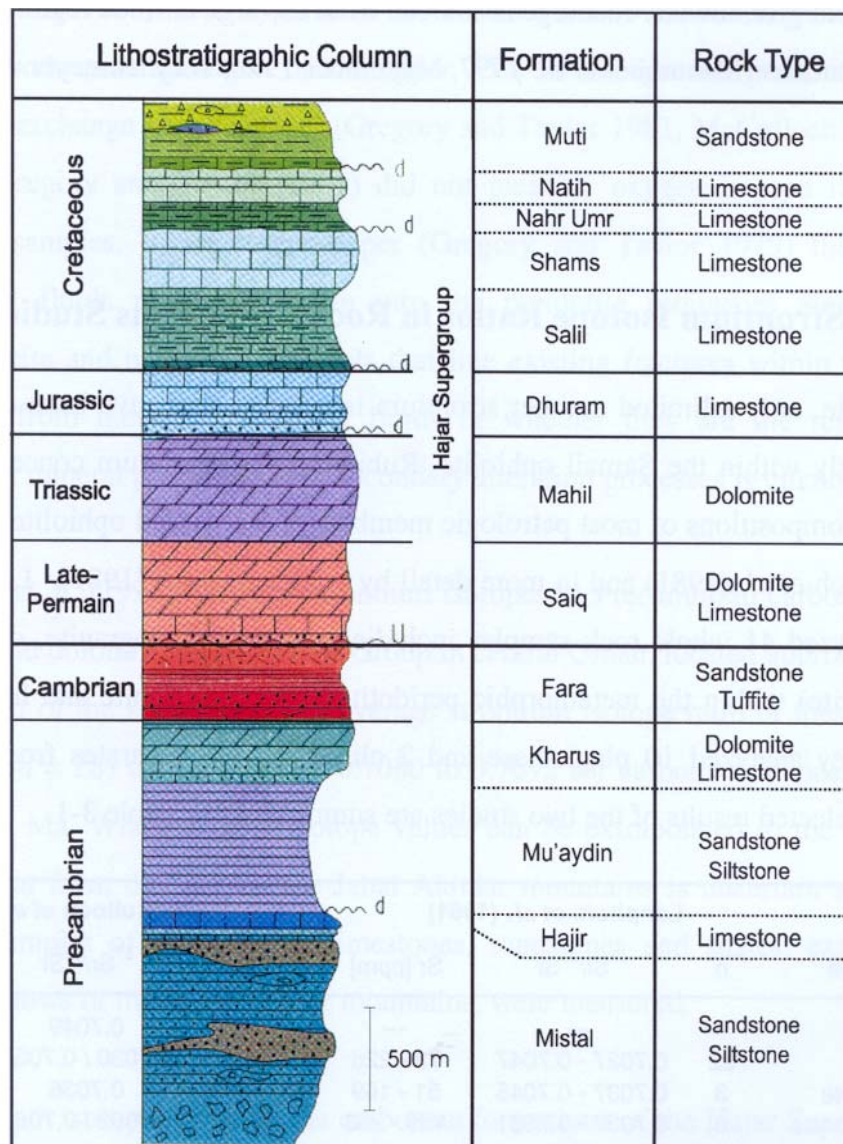


Figure 2.5-1 Simplified Stratigraphy of Jabal Akhdar

Oman lies near to the north-eastern edge of the Arabian Plate. In the late Cretaceous period Hawassina bed formed the bed of the Ocean. During the Jurassic, and early Cretaceous, limestone and dolomites were formed and deposited over most of Oman. The prevailing geology of south and central Oman comprises of the Mesozoic and Cenozoic formations, overlying the pre-Permian basement. These formations consist mainly of limestones, marls, sandstones and evaporate. Faults trends are generally NE-SW and numbers of salt diapirs are encountered. The prevailing outcrop rocks in the central desert platform are Oligo/Miocene. At the Anticlines of Hufg on the eastern coast and at the Qamar Mountains, older formations are exposed including the basement.

Starting in the late Cretaceous, the continental crust and the Oman Margin were formed. The mantle and the crust units together comprise the Semail Ophiolite, which is the world's largest, intact and best exposed abduction Ophiolite. This makes the northern Oman Mountains.

Beneath the Ophiolite lie complicated assemblages of deep-sea sediments, volcanic sand melange, emplaced as thrust sheets termed the Hawassina Complex. These are underlain by shelf carbonate deposits, the Sumeini group, which is a part of the Middle East hydrocarbon-rich province.

The Hawassina, and Semail nappes were emplaced during the late Cretaceous, following this emplacement a period of marine transgression with deposition of the lower Tertiary, Maastrichtian limestones, marls, conglomerates, and sandstones on an eroded basement of the Hawassina, Semail Hajar, and pre-permian formations. Subsequently, uplift and erosion have produced the Northern Oman Mountains. These form an arcuate chain, 700 km long and up to 120 km wide, stretching from the Arabian Gulf and the Strait of Hormuz in the north, to the Arabian Sea in the southeast. This chain is the south-eastern margin of the Arabian continental plate.

The sequence has been folded into a major anticline, in the centre of which is exposed Paleozoic and Precambrian rocks, in Al Hajar al Gharbi Mountains. Jabal Akhdar is a distinctive feature of the region, consisting of a large anticline which rises up to 3,000 meters at the summit of Jabal Shams. The core of the anticline is essentially composed of highly fractured and faulted pre-Permian siltstone formations (phyllite, shales, calcite and dolomite). The limbs of the anticline are made up of Hajar Supergroup, a sequence of shallow marine carbonates (limestones, and dolomites) and thin sandstone layers, which were deposited between the Permian basements. Erosion has removed the crest of the anticline and created several topographically low bowls or tectonic windows, where the underlying pre-Permian rocks are exposed. Figure 2.5-2 presents the geological map of the Sultanate of Oman.

The rugged, mountainous terrain of the Jabal Akhdar is bare and rocky with little or no vegetation except for regions where local springs provide water for agriculture.

The carbonates of the Hajar Supergroup that form the limbs of the Jabal Akhdar Mountains are highly fractured and karsts features are found throughout most of the sequences. Numerous springs within these carbonates provide evidence for significant, well constraint groundwater circulation. Several boreholes, some as deep as 660 m, have been drilled into different formations of the Hajar Supergroup. While some boreholes did not locate any groundwater, numerous productive fracture zones were discovered throughout the area, mostly within dolomite lithologies large regional differences in the groundwater table of several hundred meters suggest that these fractures are not effectively hydraulically connected.

Several wadis cut deeply into the Jabal Akhdar massif. The wadis are generally dry with ephemeral streams forming during and after heavy rainstorm events when wadis are subject to flash flooding, thereby transporting eroded rock material from the mountains towards the coast. As a result, thick alluvial sequences have accumulated in major wadi channels and on the coastal plain during the late Tertiary, and Quaternary.

Late Pliocene and early Pleistocene deposits comprise extensive layers of cemented conglomerate, cemented wadi gravels, and the fossil dunes of Wahiba and UAE. Between Sur and Qurayyat and behind Medinat Qaboos there are marine platforms of Pleistocene age.

Recent sediments are of wadi gravels. Along the coast carbonate dunes, sabkhas and lagoonal sediments are prevailing. An extensive sand dune occurs along the Saudi/Oman border and in the Wahiba. Inland Sabkhas comprise the Um Al Sammin southwest of Fahud, and the Sabkha Saidat.

2.6 GEOTECHNICAL PROPERTIES OF OMAN FORMATIONS

1) Pretertiary Formation:

- It forms areas of high relief and little development.
- Around Muscat, Mutrah, and Ruwi, Benching is always required as a precaution against minor rock falls. Joints survey is recommended as a precursor to slope design.
- Hajar group is characterized with the prevailing fractures.
- At the junction between the basal tertiary deposits, and the underlying Peridotite, the predominating thin clay layers are slickenside, and are possibly expansive.

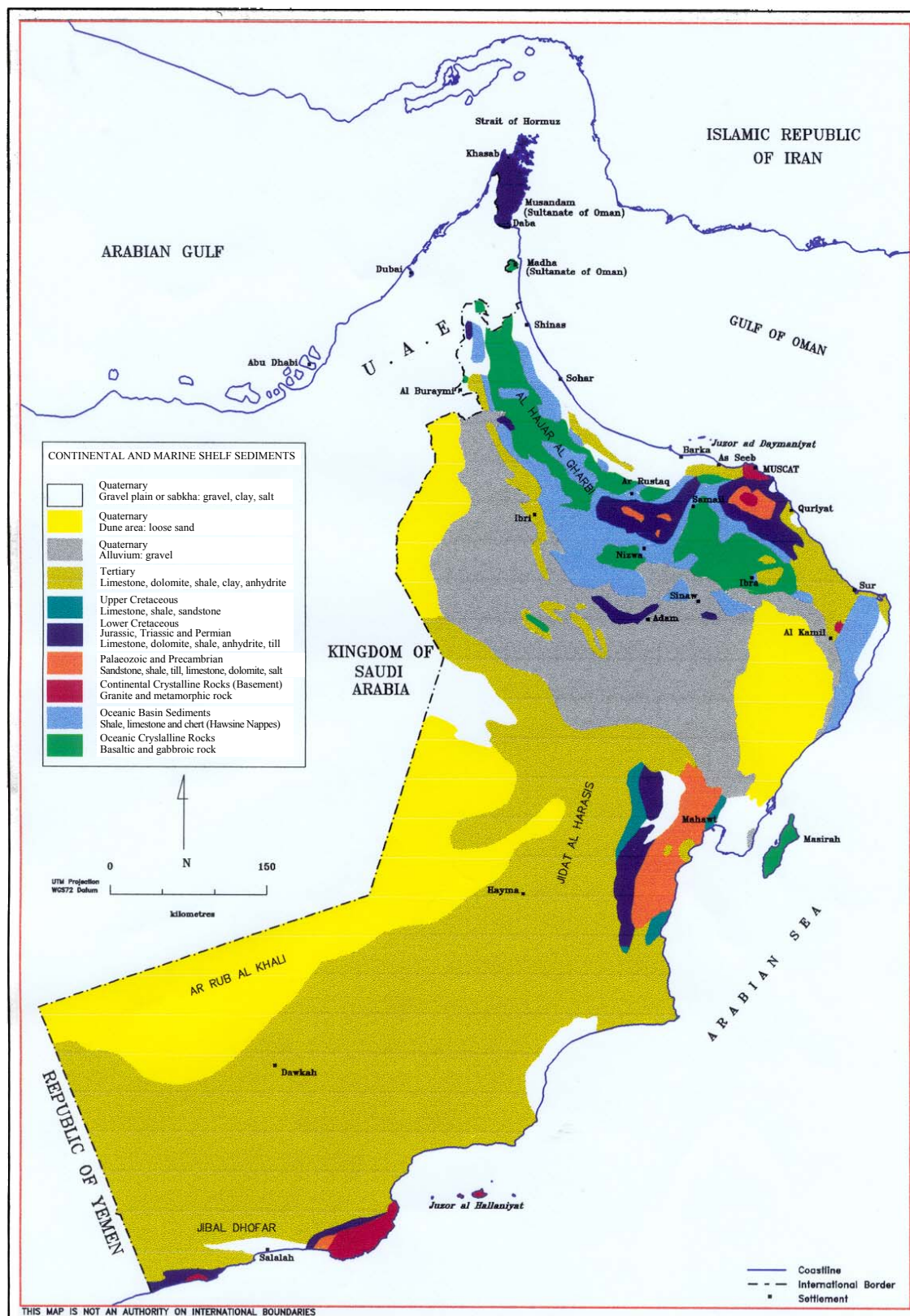


Figure 2.5-2 Simplified Geology of the Sultanate of Oman

2) Tertiary Formations

- Clay makes up a significant part of the succession, which may be 50 m thick and are easily eroded of dendritic drainage pattern, this clay proved to be highly expansive, and where close to the ground surface is a serious foundation problem.
- Karstification in some of the limestone beds seems to be fairly well developed and small sinkholes are encountered. Joints are locally filled with red/brown residual soil, which is commonly rich in sulphates.
- Prevalence of Alluvial silts & clays
- Have low to moderate plasticity, and low dry density, the soil structure is metastable, and exhibits limited collapse on saturation.
- Along the Batinah region dry densities as low as 1 gm/cm^3 and porosities as high as 65%. These are metastable and when preloaded can collapse upon wetting up. Geotechnical site investigation is needed.

3) Alluvial gravels

It forms a sound foundation. Moderately high bearing pressure ($150 - 400 \text{ kn/m}^2$).

4) Coastal Dunes & Associated Sediments

The most extensive tract of coastal dunes along the eastern Batinah occurs in the area between Qurum, and Azaiba to the west of Muscat. The thickness of the dunes varies from a few meters near the coast to over 60 m around Baushar, resulting in a significant increase in the observed SPT values.

5) Ground Subsidence

Abandoned wells and the increasing numbers of abandoned falajes upstream of many of the villages can act as a potential hazard for ground subsidence. If it remains, it may cause damage to the roads or structures.

6) Seismicity

North of Oman line (Diba), the Musandamm Peninsula is estimated to be subsiding at a rate of about 6 mm each year. Historically it is recorded two earthquakes in Northern Oman, the first at Sohar in AD879, and the decline of the city at Qalhat is attributed to seismic activity. More recently, an earth tremor was recorded in 1950 that was at a sufficient intensity at Muscat to affect the people stability on the ground.

2.7 HYDROLOGICAL CONDITIONS

The Ministry of Regional Municipalities, Environment and Water Resources (MRMEWR) has established well distributed Hydrometric Network throughout the Sultanate covering rainfall, climatological wadi flow stations, falajis, and groundwater

boreholes. It is known that wadi flow measurements in the Sultanate are difficult due to its wideness, high sediment loads and variable flow channels. Flash floods, which are relatively rare and characterized by high velocities, can damage flow measurement instruments, and difficulties in accessing the site adds some error in recording wadi flows.

Most of the gauges are concentrated in the most populated areas north of the country. Rating Curves, based mainly on slope area method, except for a few gauging stations at culverts, where theoretical culverts flow can be used. Direct current meter, crest gauges are installed at most wadi gauges to verify the records peak stage, and for computation purposes using slope-area methods after each significant flood event.

The Sultanate of Oman is deprived of perennial wadis flowing to the sea, but few wadis are perennial in part of their upper and middle reaches. Generally, surface water flow in Oman is rare; it lasts few hours or days following a storm and flooding.

Due to the transitional conditions of the surface flows, rainfall is resulting in shortage of rechargeability of the alluvial. The government has built many recharge dams to retain a portion of the peak flows, in order to give a chance for gradual release of water to the lower reaches allowing more opportunity for recharge, and to protect the lower catchments communities from the potential hazards.

Part of the floods feed some of the perennial Ghayli Aflaj¹, for local village supplies. Due to the flashy mechanism, most of the water flows to the sea or to the desert. Therefore, the application of artificial recharge techniques is becoming indispensable for the conservation of ground water resources, and integrated management. Most of the water is brackish and fossil water, meaning that there is no, or very little, recharge to the aquifer in the present day, as it derives from a past age when the climate was much wetter. Therefore, any development has to be carefully controlled. The Ministry has made significant progress in planning, and development of schemes to increase recharge, enhance surface water storage, and to improve aflaj water use efficiency. Recharge dams are designed to intercept flood flows in wadis, which would otherwise run to waste in the sea or inland into the desert.

Sixteen dams have so far been completed and several small dams and water structures have been built in Jabal Akhdar. Monitoring networks of rain gauges, wadi flow gauges and boreholes are installed at strategic sites behind and downstream of the dams. When there have been significant periods of wadi flow, water levels in boreholes downstream of the dams rise significantly. Over periods of many months, observations of water levels

¹ See Figure 2.9-1 for explanation of this word.

from over the net work show that this recharged water diffuses to other zones in the aquifers.

The Ministry of Agriculture and Fisheries prepared a master plan for building recharge dams in 1986. The original intention was to build 58 dams in preliminary identified sites, mostly on the coastal and interior sides of the northern mountains. During each 5-Year Development Plan period, progress towards this aim is assessed, and modifications are made in the light of experience. Broadly speaking, the master plan is still being followed, and discussions are now under way for the next 5-Year Plan period. The feasibility of building water conservation structures and their potential for successful operation is fully evaluated before building begins.

It is reported that for small catchment areas, ad hoc floods can be as intense as almost anywhere in the world causing severe damages. Factors contributing to this flood severity comprise occasional cyclones, steep mountain ranges in the north and south, the impervious layers or rocks, and narrowness associated with wadi gorges.

Several studies have been implemented in the field of flood control and risk assessment in order to assess the impact of such incidents on the national development plan in these areas, prone to potential flooding hazards under the Omani climatological conditions. Ad hoc events encountered, for example, in Sohar, Salalah and Muscat, could be avoided in future.

The MRMEWR has exerted great efforts in the studies of surface hydrology. Special emphasis has been made on the characteristics of floods and derivation of frequency curves for Oman. The methodologies are being updated by the ministry periodically. This subject will be discussed comprehensively in the following sections.

The Sultanate of Oman is prone to severe road disasters as a result of flash flood events throughout the Sultanate. The implication of repeat of the event precludes any prospected development in the vicinity of ad hoc areas, and affects the final design parameters of infrastructures such as roads.

Most of the villages in the interior part of the Sultanate are located in narrow long gorges or along the wadis, where no alternative road is available. These routes are acting as a flash flood courses in the mean time. Therefore, great care has to be exerted in order to avoid any damage to the roads by costly design.

Flood zones are the utmost prevailing problems to the projected planning and development in these areas. General design criteria pertaining to the flood-water-related

structures have been established by a special study to be undertaken by the MRMEWR. These studies are subjected to an ongoing regular development, and modification, which require continuous updating and monitoring before usages.

Consequently, the ministry has prepared flood risk assessment's catalogues using flood frequency curves, associated with topographic information and routing models, which resulted in a flood zoning maps for all major populated regions. Maps are completed, and published for AlBatinah, Sohar, Bukha, Al Buraimi, Daba, Madha, Muscat, Nizwa, and Salalah. An example of one of these maps at reduced scale is shown in Figure 2.7-1.

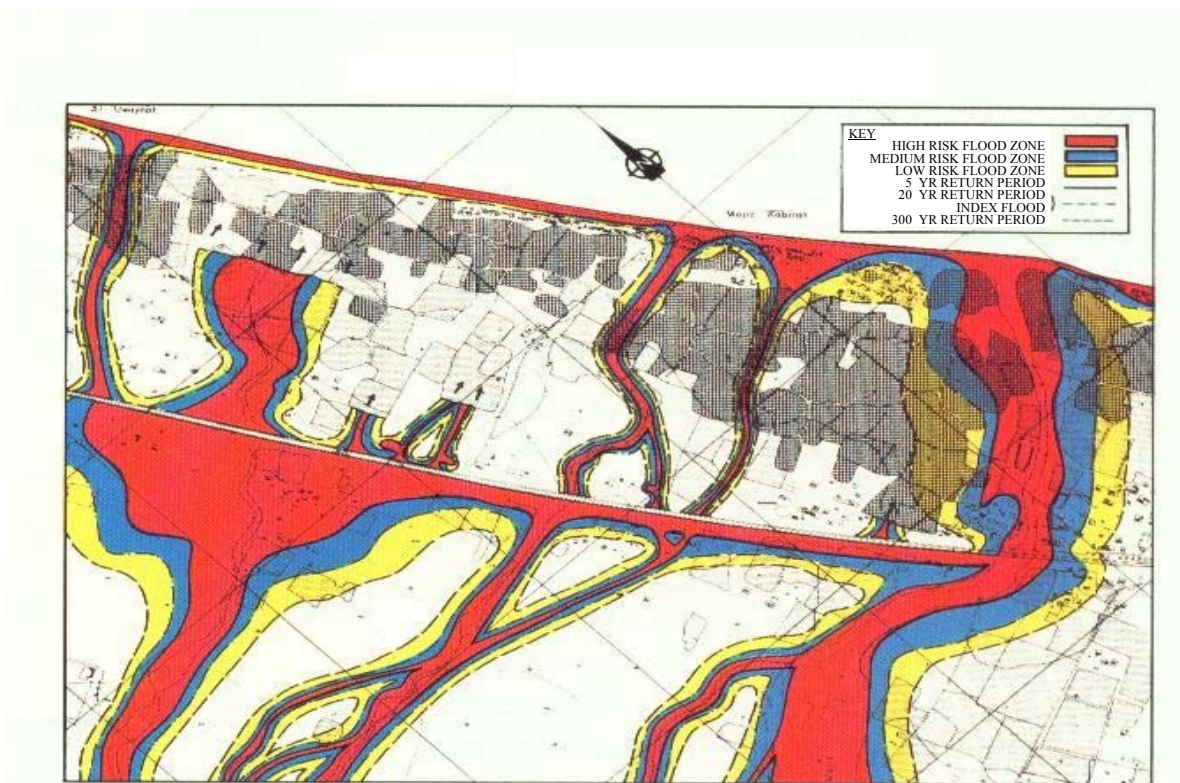


Figure 2.7-1 Flood Risk Assessment Map

2.8 HYDROGEOLOGICAL CONDITIONS

2.8.1 Musandam and Madha Region

The Musandam and Madha region occupies the northern part of Oman, separated from the rest of the country by part of UAE. The mountainous areas rise up to 1,800 m above mean sealevel. The main towns in the region are Khasab, Daba, Bukha, Kumzar and Lima. Madha is a part of governorate, enclaved within UAE.

Musandam is a region characterized with wet climate, average rainfall lies within the range of 180 mm. It is reported that flash flood is a major problem encountered in the region for the down catchment's living communities, at the outlets of the wadis.

Due to the overdevelopment of groundwater resources in the region, saltwater intrusion has resulted in a very severe deterioration of the resources in the coastal area.

At Khasab's municipal wellfield, recharge by Wadi Khasab flood protection dams, constructed in 1986, has resulted in protecting the ground water from declination. Daba wellfield is being threatened by the saltwater intrusion due to the excessive pumpage.

The major water sources at Madha rely on the existing Aflaj, which are prone to successive decline in water flow from both surface and groundwater resources. Several small recharge/ flood control dams are being evaluated in the region to study the feasibility and reliability of ad hoc sources for sustainable development.

2.8.2 Al Batinah Region

Al Batinah region is lying in the northern part of the Sultanate extending from UAE border to Muscat along the sea, comprising the most significant coastal plain in the region. This plain has been divided into two zones, the piedmont and the coastal plain.

The piedmont zone comprises of several alluvial terraces, of fluvial origin of limited extent. The major water bearing formation is located in the modern wadi gravels, which reaches 50 m in thickness. It acts as major conduits to the upper catchment's reaches in the plain. At the lower reaches, the wadi fans are prevailing, forming the coastal plain along Al Batinah coast. It is reported that the coastal alluvium extends up to the depth of 600 m, and consists of poorly sorted gravels, sands and silts. Hydrgeologically, the alluvium can be divided into upper gravels, clayey gravels, and cemented gravels.

The upper gravels comprise the main aquifer of clean, poorly sorted layers of boulders, gravels, sands and silts. The specific yield increases specifically with the increasing saturated thicknesses towards the sea at a rate of 500 cubic m/d/m. The underlying clayey gravels, up to 100 m thick, are becoming less permeable compared to the upper part.

The cemented gravels are of poor aquifer, specified with low specific capacities of wells averaging of 10 cubic m/d/m. The Alluvium forms a complex system of water bearing formations extending along the whole length of Al Batinah. It contains fresh water of good quality which flows gently to the coast.

Water quality of the region is generally good except at the areas adjacent to the coast, which has been affected by the overdevelopment of the groundwater resources in the region, marking the most stringent problem and critical situation in recent times. Saltwater intrusion has been encountered at several locations in the region. Several consequent and detailed studies of the existing hydrogeological network has revealed the area-wide changes of the water quality vertically and horizontally due to the prevailing over pumping practiced very badly in the region. An example of this phenomenon is shown in Figure 2.8-1. Al Batinah coast, between Wadi Maawil to Wadi Taww, shows the different salinity zones prevailing in the region as a result of saltwater intrusion.

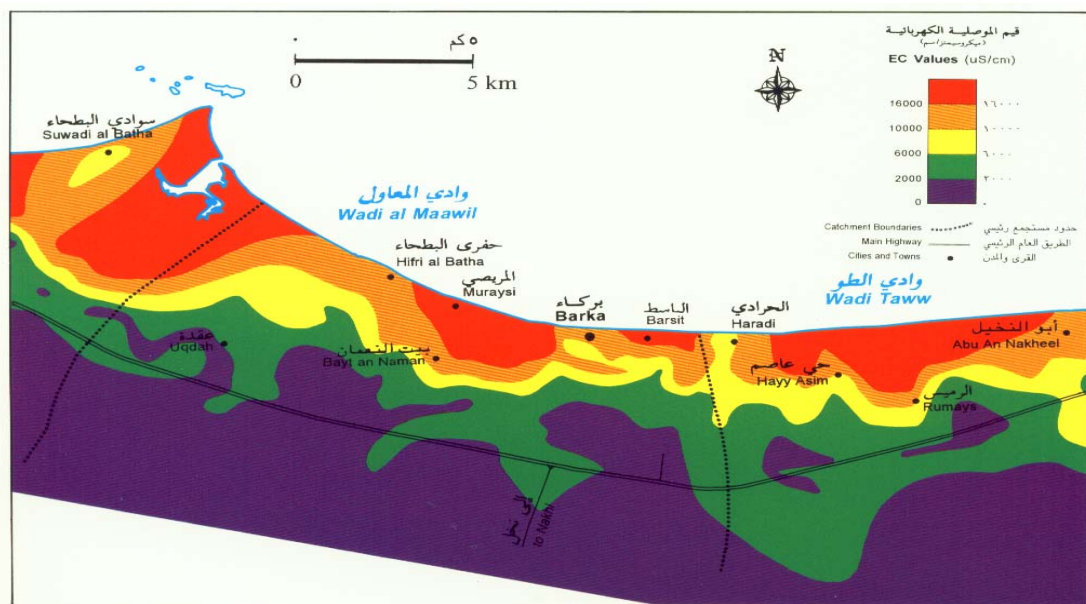


Figure 46 Groundwater quality, Wadi Maawil to Wadi Taww, Al Batinah

Figure 2.8-1 Saltwater Intrusion in Al Batinah Region.

Average long-term decline in the groundwater level is in the order of 0.5 metres per year. Similar maps have been produced for the Salalah coastal plain, where saline intrusion is also increasing. Similar investigations formed part of the studies of the feasibility of recharge dams in wadis Samail, and Rusayl. National well inventory data together with preliminary assessments of the southern Batinah, completed early last year, have also helped to define the landward extent of saline and brackish waters, and the amount of groundwater abstractions in excess of recharge. These studies confirmed that saltwater intrusion along the Batinah is generally increasing. Management options that have been proposed to alleviate the situation include the removal of large fodder farms from the Batinah, the introduction of metering to measure water use, continued well inventory work, improved monitoring and several engineering initiatives that will control use and the intrusion it causes.

Saline water may cause potential problems in road construction such as corrosion, subsidence, and adverse effect on the soil particles. High cost may be needed to avoid prospected problems. Knowledge of groundwater levels is necessary for proper road planning and design.

2.8.3 Adh Dhahirah and Ad Dakhliyah Regions

The areas lie west and south of the Northern Oman Mountains. Wadis draining from the upper catchment's reaches dominate their geomorphology. The main aquifers are formed from the narrow wadi channels originating from the mountain's pediments, the surrounding rocks play significant role in the field of water resources storage in the prevailing fissure and joint system. Traditional water development was based on Aflaj, which has been converted recently into boreholes and wells as an important substitute device for water supply. Moving southward and westward away from the mountainous region, the foothills give way to broad alluvial plain, stretching at Adh Dhahirah towards the UAE border and southwestwards towards the central plateau, as shown in Figure 2.8-2. In the braided area, the channels control the quality and availability of water.

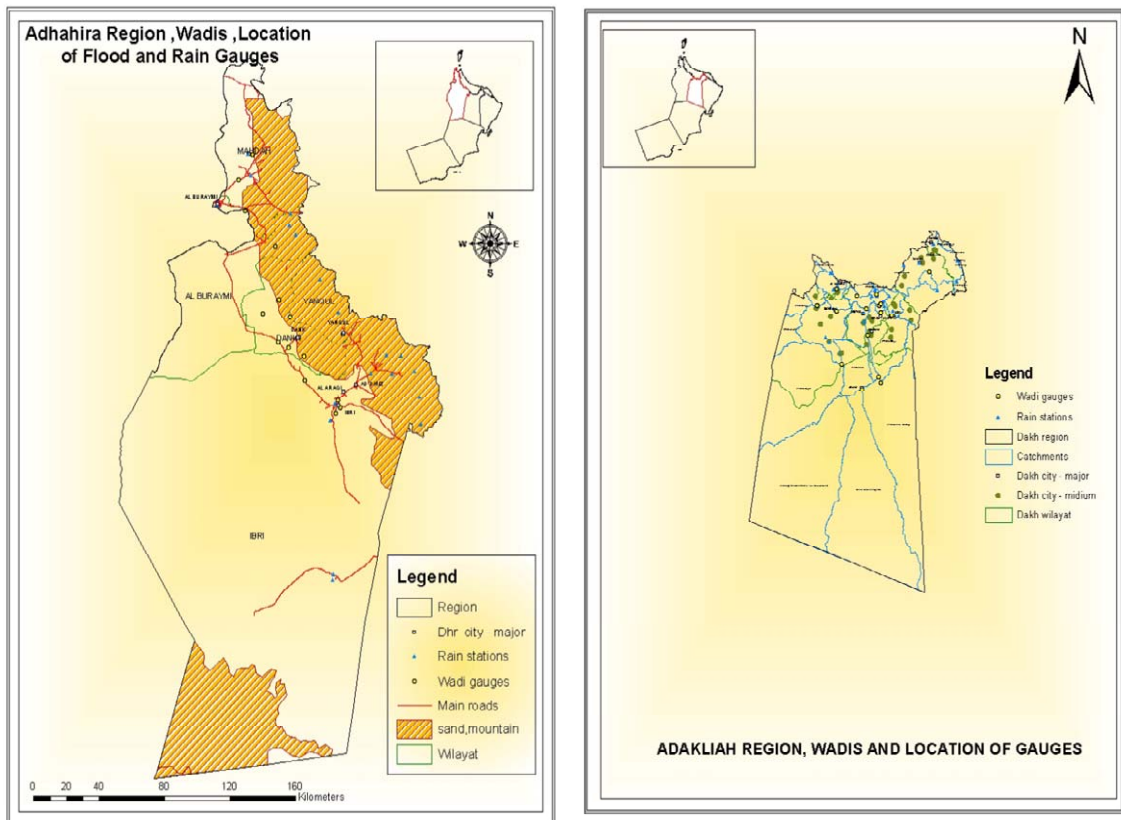


Figure 2.8-2 Adh Dhahirah and Ad Dakhliyah Regions

2.8.4 Ash Sharqiyah Region

Ash Sharqiyah region lies 100 km to the south of Muscat, on the southern ridges of Al Hajar Ashsharqi mountain chains, covering an area of 40,000 km², comprising the sand sea of the Ramlat al Wahaybah. Two major wadis are drained, namely, Wadi Andam and Wadi Batha, along long basins, emerging from the Ophilitite Mountains and flowing to the Arabian sea. The depth to the water table exceeds 50 m. In the middle of the Wadi Al Batha, the thickness of alluvium ranges from 50 m to 500 m. Ramlat Wahayba migration processes has affected the distributions and features of the existence of Aflaj in the region.

The Ramlat al Wahaybah is a sand sea covering an area of over 9,000 km², extending northward from the coast near Masirah Island to the north edge, against the Wadi Al Batha. The area of high dunes forms curved pattern of braided appearance, running from the south to the north, indicates continual presence of shallow groundwater. Moreover, maintained by the infrequent floods passing along the wadi floor. It is thought that the aeolianite underlies the sand in most areas of the Ramlat al Wahaybah, underlain by alluvial gravels, or soft sandy limestone of Fars Group.

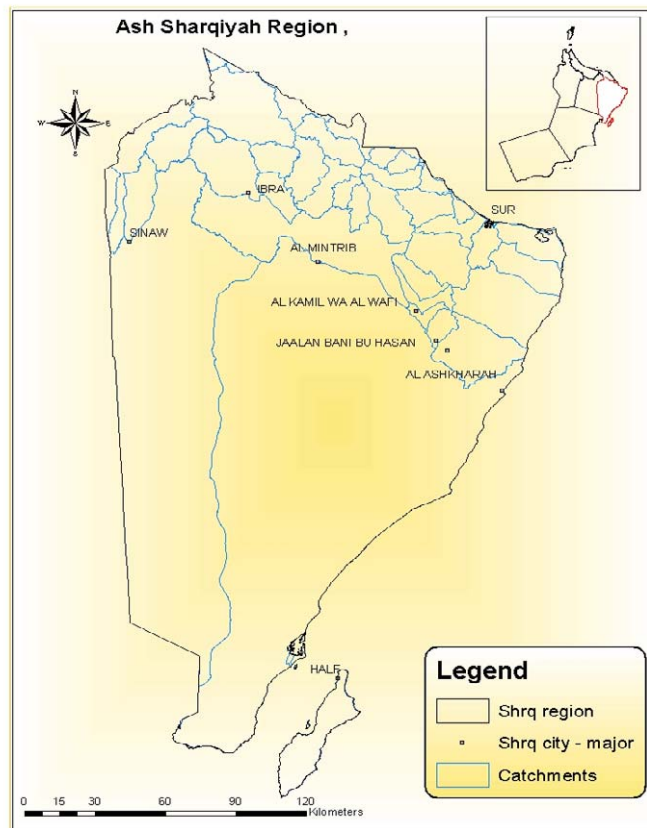


Figure 2.8-3 Ash Sharqiyah Region

The eastern margin of the Northern Oman Mountains in the eastern Ash Sharqiyah consists of series of wadis draining into the Gulf of Oman. The principal town in the area is Sur which is obtaining its water supply from Wadi Falayj. It has been reported that brackish water has been encountered to the south west of Sur due to the overdevelopment of groundwater.

2.8.5 Salalah Plain

Salalah is the main town located at the coastal area of Dofar region, which is considered the main residential and commercial center of the region. Agricultural activities have been expanded in the coastal strip north and east of the town. Mean annual rainfall at Salalah area is ranging from 94 mm/yr at Robat to 553 mm/yr at Tawi Ater, while the general average is about 244 mm/yr.

The main water supplies are from the existing wellfields of the groundwater, and the spring falajs emerging from the foot of the jabal (mountain). Groundwater is extensively encountered in the alluvium and limestones of varying aquifer characteristics.

Surface water flow in Salalah is rare in nearly all wadis. It occurs only for short period of time, hours or few days after the storm, in the form of flash flood incidents. However, there are some cases of periods of two or more dry years with no runoff. There is one recharge dam which was built in 1983, on Wadi Sahalnawt, north of Salalah city.

Salalah plain depends mainly on the existing fresh water tongue, with more brackish water extending to the east and west of its edges. An important element of the water resources of Salalah Plain is the 'occult' precipitation resulting from interception of monsoon mists by rock faces and vegetation of jabal scarps. It accounts for 78% of total precipitation. Recent development of the existing groundwater resources has resulted in a very vulnerable situation of saltwater intrusion due to overpumpage and local conditions.

Groundwater system in Salalah area is heavily over-exploited mainly for irrigation purposes. The result of over-abstraction is a deterioration of water quality due to saltwater intrusion from the coast and upcoming of more saline water from the deeper aquifers. Abstraction is currently almost more than the natural recharge to the aquifers. The proportion of the abstraction that exceeds replenishment has resulted in an accumulating groundwater deficit. Current over-abstraction is estimated at 8.7 Mm³/yr. The sustainable resource is estimated at 69.5 Mm³/yr. Unless remedial action is taken, in order to conserve the remaining fresh groundwater reserves, both agriculture and domestic water supply, which is relying on groundwater for supply, will suffer the consequences.

The government is undertaking several major actions including utilization of treated sewage effluent and implementation of sewerage system to maximize the effluent inputs, relocation of existing highly consumptive irrigative farms, transport of water, construction of additional desalination plants or wellfield to supply 18.5 Mm³/yr, and construction of recharge and storage dams to be taken into consideration as well.

Several hydrogeological and hydrological studies and surveys of Salalah area were carried out, covering years of monitoring and sampling of wells. The reports delineated the hydrogeological conditions of the area. Some agricultural crops on Salalah coast are deteriorating in performance due to salinization of soils. In Salalah, the prevailing over-abstraction of water resources and application of inorganic fertilizers and pesticides have resulted in the overall nonpoint pollution hazards in the region.

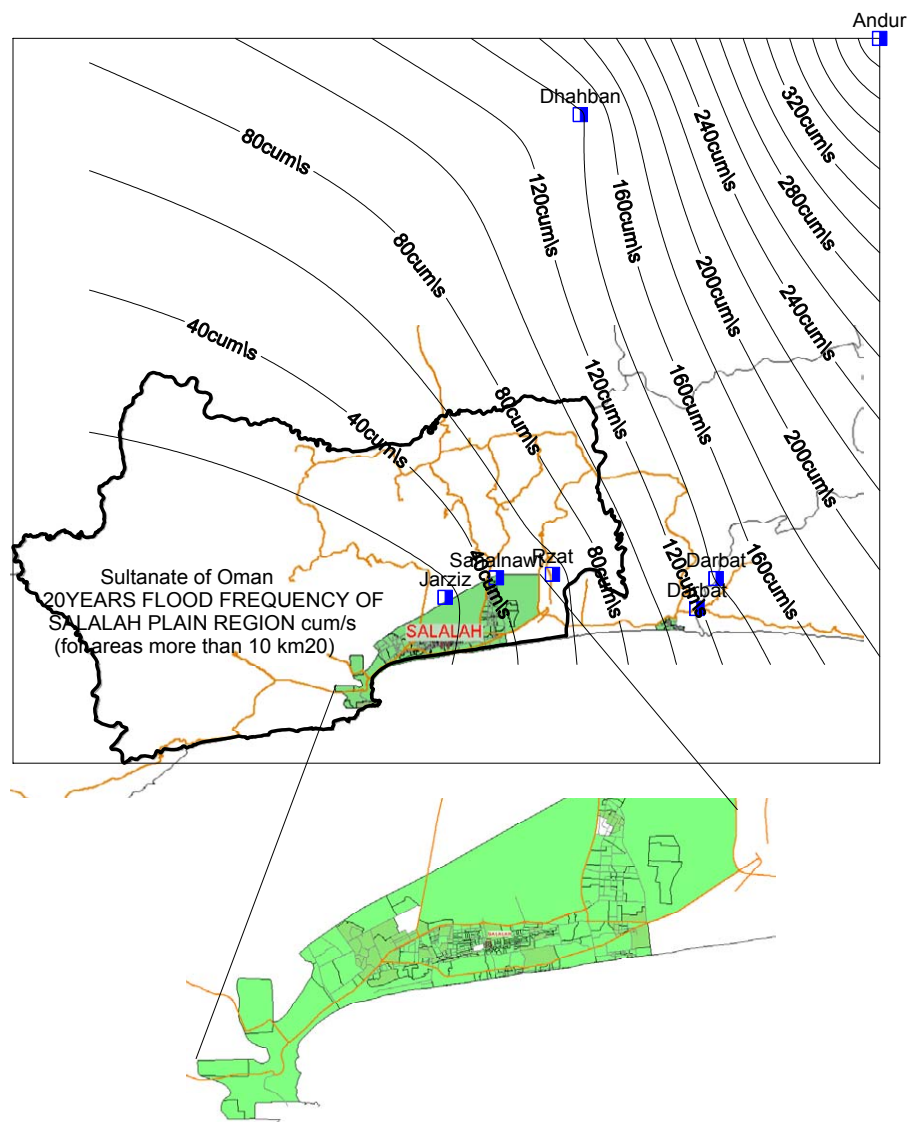


Figure 2.8-4 Salalah Region

The proportion of the abstraction that exceeds replenishment has resulted in 8.7 Mm³/yr water deficit. The lower coastal plain of Salalah area, has led to successive decline in levels and quality deterioration of ground water and soil degradation within 2 km from the coast.

Measures are being taken for water management and conservation. The government has recently initiated programmes to relocate some of the large-scale farms in Salalah Plains, where the water resources are over-utilized, to areas with under-utilized water resources. Several water conservation initiatives have been developed, like leakage control in municipal water supply schemes, and the improvement of irrigation methods through subsidy programs.

2.8.6 Al Wusta Region

As shown in Figure 2.8-5, Al Wusta region comprises four distinct areas:

- Al Huqf
- Central Plateau
- Ar Rub Al Khali Sandsea
- Umm as Samim Sabkha

Al Wusta region is a hot and dry desert with an annual average rainfall ranging from 10 to 50 mm, with Umm ar Arduma (UAR) Formation as the main regional aquifer in the region. Recharge to the aquifer takes place in the northern and southern mountainous areas of Oman.

Groundwater in much of the desert regions is saline, and brines with salinities of over 100,000 ppm have been encountered. Scattered perched water of good quality could be found where local recharge takes place.

2.9 AFLAJ SYSTEM

Traditionally, most of Omani communities are evolved adjacent to Aflaj systems, which are channels originating from a mother well which intercepts the groundwater table or on the surface, for collecting groundwater or natural spring water, in order to be led away by tunnel for different uses, mainly for irrigation. The annual requirement of agricultural sector is 1,487 Mm³ (86%), which irrigate 72,000 hectares in all over the Sultanate. The aflaj system is providing 32% of the above while 54% is obtained from wells.

Overdevelopment has resulted in the deterioration of water quality, and declination of water quantity. Classification of Aflaj water resources suitability for irrigation purposes is becoming indispensable in order to achieve maximum revenue of cultivated areas and rationalization of available water resources under different cropping patterns of different water salinity.

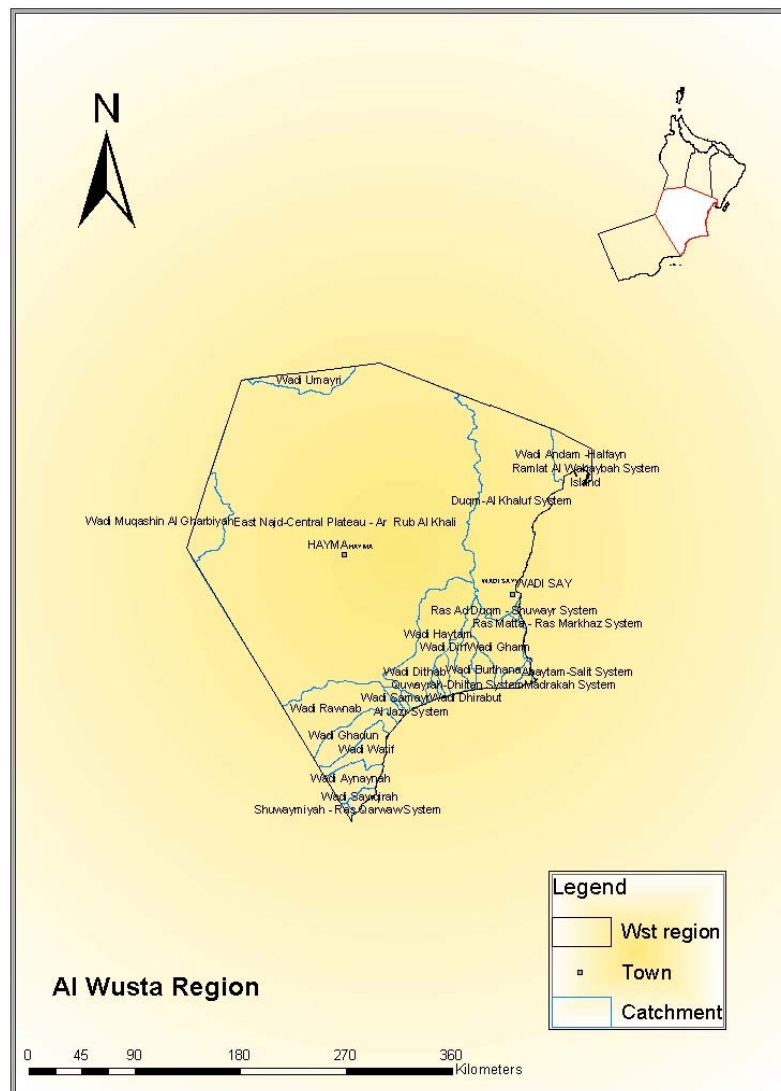


Figure 2.8-5 Al Wusta Region

The falaj system ('aflaj' in the plural) is the traditional method developed centuries ago for supplying water for irrigation and domestic purposes. Many of the systems currently in use are estimated to be over a thousand years old. The falaj comprises the entire system; the source which might be a qanat, a spring or the upper reaches of flowing wadis from which water is diverted; the conveyance system which is usually an open earth or cement-lined ditch; and the delivery system. The falaj has assumed social significance, and well-established rules of usage, maintenance, and administration have evolved. National Falaj Inventory (NFI) Programme has categorized aflaj by wilayat and type, but survey on quality is rarely undertaken. NFI has determined approximately 4,112 aflaj of which 3,017 are operational.

Date palm is the main crop grown in Oman, occupying about half the total cropped area. Other crops are fodder crops (mainly alfalfa), other fruit trees (citrus, bananas, mangoes,

coconuts), vegetables and cereals (mainly barley, wheat and sorghum). No reliable information on the area salinized by irrigation is available. A study on the salinity of soils in general in Oman done in 1994 states that an area of 11.7 million ha, which is 35% of the total area of Oman, is affected by salinity. No drainage is practiced.

The falaj demand area in Oman is given as 26,300 ha, of which the cropped area is 17,500 ha (66.5%), the developed land is 1,000 ha (2.5%) and the undeveloped land is 7,800 ha (29.7%). The Batinah together with Dakhliyah and Sharqiyah have the largest areas of land cropped using falaj water. Some of Dawoodi Aflaj (see Figure 2.9-1) have recorded sever declination of water flow and deterioration of water quality.

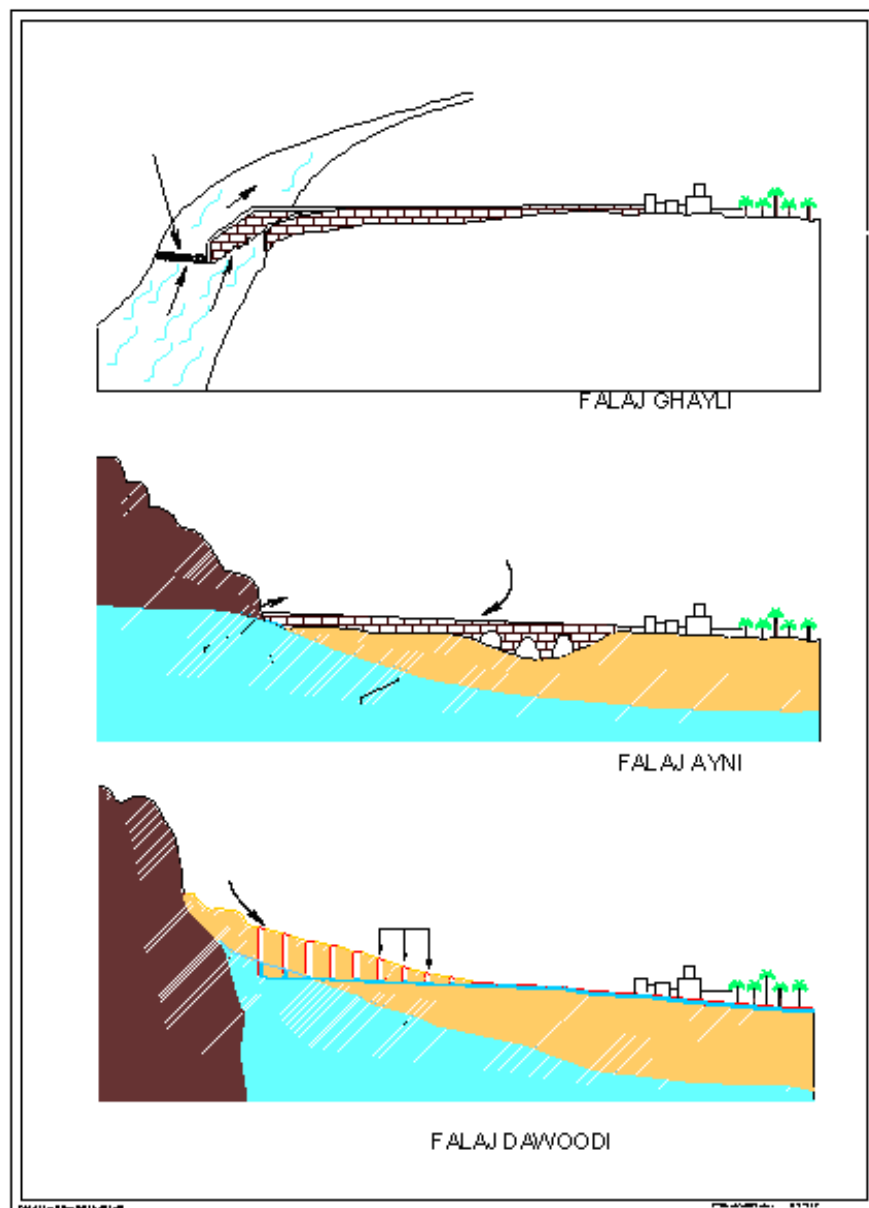


Figure 2.9-1 Types of Aflaj

Aflaj protection area's program was established in order to conserve ad hoc catchments from pollution and overdevelopment. In addition several guidelines have been disseminated in case of road construction to be taken into account to avoid any prospected damage to the qanats or its annexes. Schematic diagrams and sketches are also published in order to be adopted. Figure 2.9-2 illustrates the various crossing points with aflaj conditions which could be encountered.

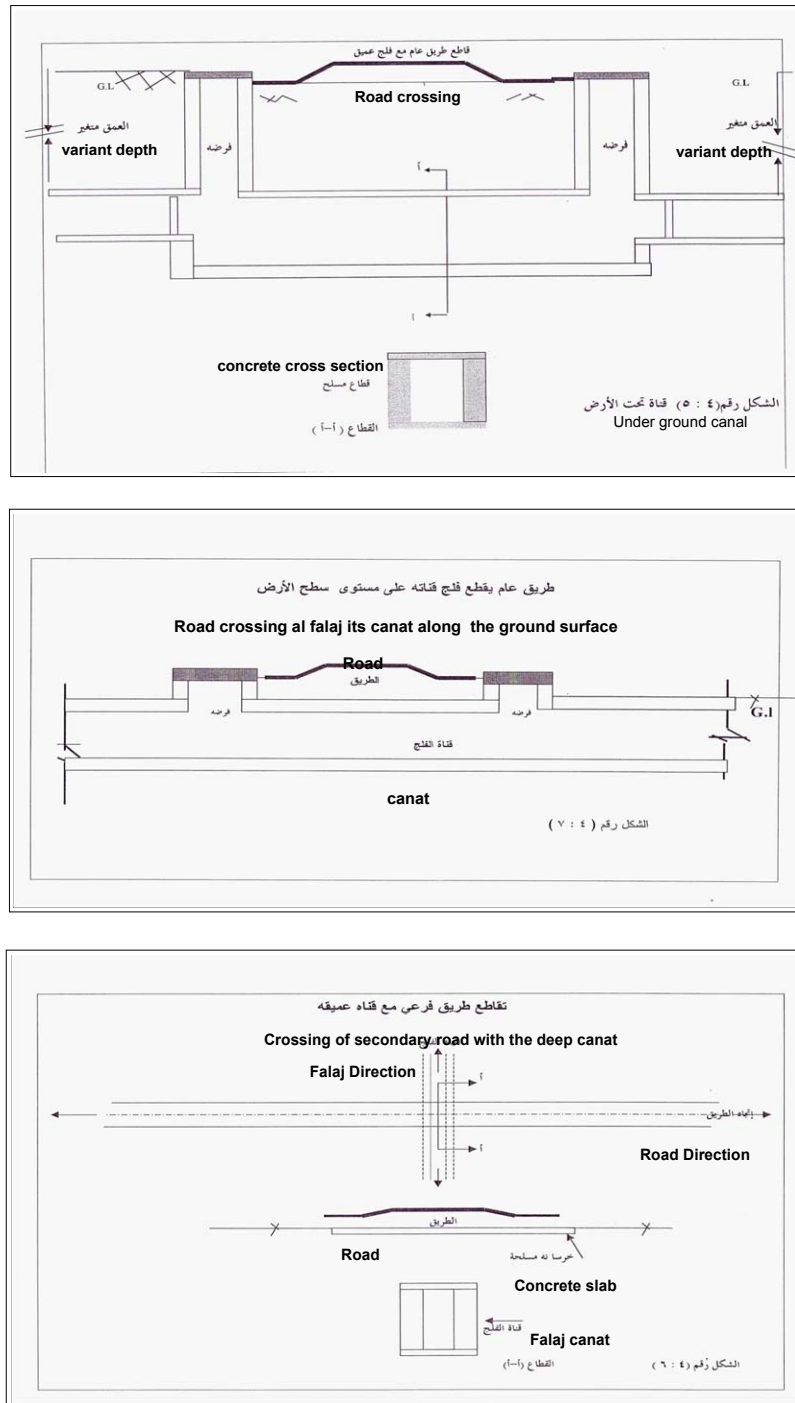


Figure 2.9-2 Crossing Conditions of Deep Falaj with Roads

2.10 HYDROLOGICAL CONSIDERATIONS IN ROAD PLANNING AND DESIGN

Due to the severe road disasters as a result of flashflood events throughout the Sultanate, and the ambient arid environment, the following issues should be carefully considered in the planning and design stages of the road network:

- Most of the villages in the interior part of the Sultanate are located in narrow long gorges or along the wadis, where no alternative road is available. These routes are acting as a flash flood courses in the mean time. Therefore, great care has to be exerted, in order to avoid any damage to the ad hoc roads by costly design.
- Flood zones are the utmost prevailing problems to road project planning and development in these areas. Established design criteria pertaining to the flood water related structures through a special study by the MRMEWR are subjected to ongoing regular development and modification, which require continuous updating and monitoring before usages.
- The protection of well fields during any prospected development seeks to preserve the existing underground freshwater from contamination of different sources, including road constructions, which may cause natural hazards. In any protection plan there has to be a balance between the strict requirements which ensure adequate protection of the existing commercial and social activities. The safeguards/best practice either proposed by the developer or stipulated by the relevant authority must be checked and approved at the planning stage, during construction and upon completion.
- The prevailing sand dunes in the south and south western parts of the Sultanate is a major problem in roads construction and maintenance, which require the application of proper countermeasures, such as high embankment and windbreak shelters, to overcome such problems.
- The prevailing Sabkhas located along the coastal areas, and in the interior, are of potential problems in roads design and construction leading to an increase in costs, and extensive maintenance program.
- Shallow groundwater levels are encountered in the coastal regions of Oman, reaching up to 0.5 meter at some places which may cause potential problems in road construction, and increasing the costs due to the saline water, and its corrosion impact, subsidence, and effect on the soil particles. High cost materials are needed to avoid prospected problems. Knowledge of groundwater levels is necessary for proper roads planning, and design.
- Aflaj protection program was established in order to conserve its catchment's from pollution and collapse of roads. Precautionary measures have to be taken into account in case of road construction in order to avoid prospected damage or disaster

to the Aflaj. Schematic diagrams and sketches have been published by MRMEWR in order to be used in roads planning and design.

- Hyper turbulent flow with mean velocities sometimes in excess of 5m/s and high sediment flux rates are a feature of torrential wadis.
- The impact of constructing projected dams with significant storage on the wadi gauging stations, thereby having the effect of reducing the natural flows and altering calculated peak floods frequencies in the interim.

CHAPTER 3

SOCIOECONOMIC PROFILE

CHAPTER 3

SOCIOECONOMIC PROFILE

3.1 DEMOGRAPHY

3.1.1 Population Size and Growth Trend

In Oman, the first population census (General Census of Population, Housing and Establishments) was conducted in December 1993. The second census was carried out in December 2003 and the preliminary results were made public in January 2004.

The total population of the country is 2,331,391 in 2003, an increase of 313,317 from 1993 at an annual average growth rate (AAGR) of 1.45%. 23.7% of the total population, equivalent to 552,073, are expatriates and 76.3%, 1,779,318, are Omanis. The number of expatriates increased a little by 17,225 from 1993 to 2003, while that of Omanis increased by 296,091 at an AAGR of 1.84% during the same period (see Table 3.1-1).

Table 3.1-1 Population Change between 1993 and 2003 by Region

Governorate/ Region	Population						Annual Average Growth Rate (%)		
	1993			2003			1993-2003		
	Omani	Expatriate	Total	Omani	Expatriate	Total	Omani	Expatriate	Total
Oman Total	1,483,226	534,848	2,018,074	1,779,317	552,073	2,331,390	1.84	0.32	1.45
Muscat	295,641	253,509	549,150	380,092	250,939	631,031	2.54	-0.10	1.40
Al-Batinah	472,065	92,612	564,677	563,833	88,834	652,667	1.79	-0.42	1.46
Musandam	22,461	6,266	28,727	20,380	7,883	28,263	-0.97	2.32	-0.16
A'Dhahirah	135,140	46,084	181,224	147,973	56,276	204,249	0.91	2.02	1.20
A'Dakhiliyah	199,401	30,390	229,791	235,187	29,896	265,083	1.66	-0.16	1.44
A'Sharqiyah	219,251	39,093	258,344	264,090	48,618	312,708	1.88	2.20	1.93
Al-Wusta	13,654	3,413	17,067	16,968	6,090	23,058	2.20	5.96	3.05
Dhofar	125,613	63,481	189,094	150,794	63,537	214,331	1.84	0.01	1.26

Source: General Censuses of Population, Housing and Establishments, 1993 and 2003

The Ministry of National Economy (MONE) made a mid-year population projection (Omanis and expatriates) after 1993, based on the 1993 Census results. The projected mid-year populations have been used for various planning purposes as the official estimation, for example, calculating GDP per capita. The preliminary results of the 2003 Census revealed that this projection was considerably overestimated than the actual one (see Table 3.1-2). The projected population was more than 2.4 million in 2000.

According to MONE, the projection was prepared by the use of the "Component Method" for Omani population and the immigration data for expatriate population. It was assumed that the net migration rate of Omani population was 0, which means that the Omani population changes depending on the assumed fertility rates and death rates

only. The fact that the actual 2003 population is smaller than the projected one indicates that the fertility rate might be declining at a faster pace than expected. As educated women are increasing and they want to work, it can be a possible assumption. And also the death rate (or survival rate) assumptions adopted might be a little different than the actual. When the sex-age structure of 2003 population is made public, these will become clear.

Table 3.1-2 Estimated Mid-year Population by Nationality, 1993-2002

Year	Population ('000)			AAGR (%)		
	Omani	Expatriate	Total	Omani	Expatriate	Total
1993	1,465	535	2,000			
1994	1,512	538	2,050	3.21	0.56	2.50
1995	1,557	574	2,131	2.98	6.69	3.95
1996	1,602	612	2,214	2.89	6.62	3.89
1997	1,642	613	2,255	2.50	0.16	1.85
1998	1,685	602	2,287	2.62	-1.79	1.42
1999	1,729	596	2,325	2.61	-1.00	1.66
2000	1,778	624	2,402	2.83	4.70	3.31
2001	1,826	652	2,478	2.70	4.49	3.16
2002	1,870	668	2,538	2.41	2.45	2.42

Source: Statistical Yearbook 2003

3.1.2 Population Distribution and Density

As shown in Table 3.1-3, more than half of the population (1,283,698) of Oman is concentrated in the northern coastal governorate/region of Muscat and Al-Batinah, which constitute only 5% (16,400 km²) of the whole land area of the country (309,500 km²). The national average population density is as low as 7.5 persons/km², while Muscat has the highest density of 161.8 persons/km² followed by Al-Batinah's density of 52.2 persons/km². On the contrary, Al-Wusta Region has the smallest population of 23,058 with the lowest population density of 0.3 person/km². The land area of this region is 79,700 km², occupying around one fourths of the country, most of which is covered by desert.

In Muscat, Omani population has increased by 84,451 from 295,641 in 1993 to 380,092 in 2003 at an AAGR of 2.54%, while expatriate population decreased by 2,570 from 253,509 in 1993 to 250,939 in 2003. The expatriate population still occupies nearly 40% of the governorate population in 2003 (see Table 3.1-1). Al-Batinah Region has the largest population of 652,667 in 2003, but expatriate population is only 88,834, which occupies 13.6% of the total.

Table 3.1-3 Population Distribution and Densities by Region, 2003

Governorate/ Region	Area (km ²)	Regional Distribution of Area (%)	2,003 Census Population	Regional Distribution of Pop.(%)	Population Density (psns/km ²)
Oman Total	309,500	100.0	2,331,390	100.0	7.5
Muscat	3,900	1.3	631,031	27.1	161.8
Al-Batinah	12,500	4.0	652,667	28.0	52.2
Musandam	1,800	0.6	28,263	1.2	15.7
A'Dhahirah	44,000	14.2	204,249	8.8	4.6
A'Dakhilayah	31,900	10.3	265,083	11.4	8.3
A'Sharqiyah	36,400	11.8	312,708	13.4	8.6
Al-Wusta	79,700	25.8	23,058	1.0	0.3
Dhofar	99,300	32.1	214,331	9.2	2.2

Source: 2003 Census

Figure 3.1-1 shows the Regional and Wilayat boundaries with the locations of Wilayat Centers, and land areas by Wilayat measured on the map. Figure 3.1-2 shows the population size and density by Wilayat. Muttrah in Muscat is most densely populated with a population density of 1,590.9 persons/km², or 15.9 persons/ha. A'Seeb in Muscat has the largest population of 223,267 with the second highest population density of 428.5 persons/km². Baushar in Muscat has a similar density of 361.1 persons/km². Al-Swaiq and Barka in Al-Batinah Region both have densities of a little higher than 100 persons/km². Regional centers of Sohar (Al-Batinah Region), Nizwa (Ad Dakhliyah Region), Sur (A' Sharqiyah Region) and Salalah (Dhofar Governorate) have population densities of 40-50 persons/km². Among them, Salalah is the largest city with a population of 156,587.

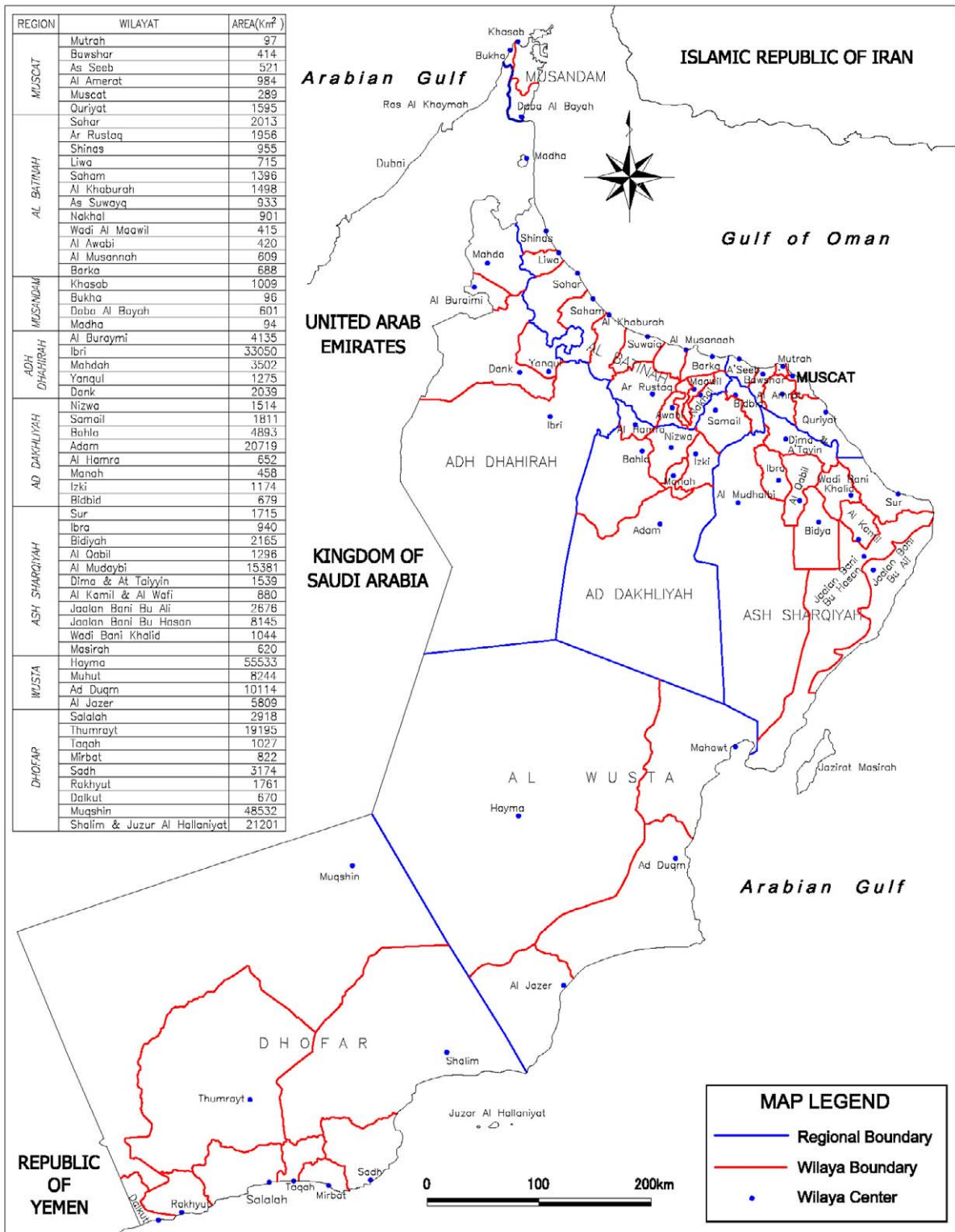


Figure 3.1-1 Wilayat Boundary and Location of Wilayat Center

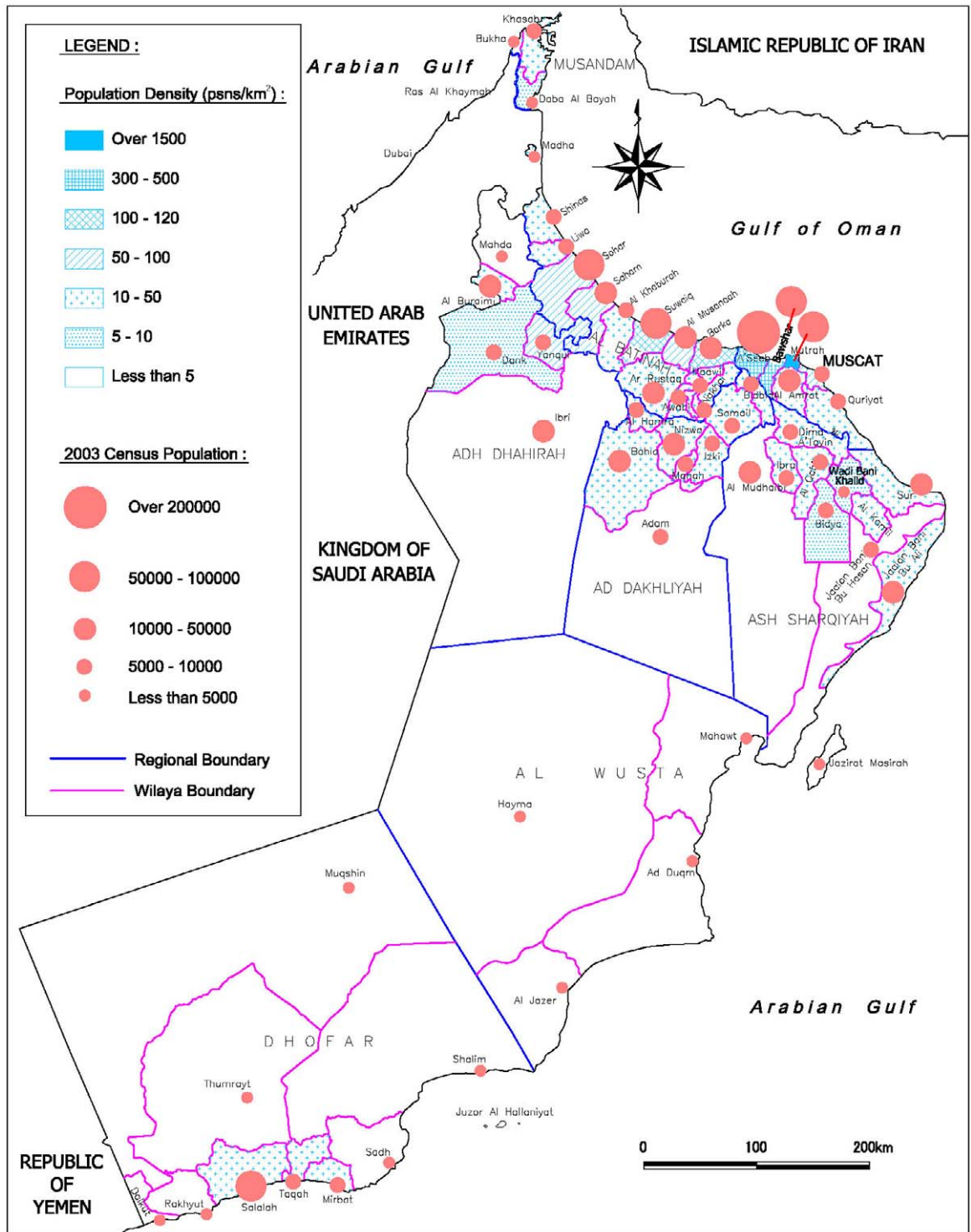


Figure 3.1-2 Population Size and Density by Wilayat, 2003

3.2 GROSS DOMESTIC PRODUCT (GDP)

3.2.1 Overall Trend

From 1990 to 2002, the Omani economy grew by 4.7% on annual average at current prices and 4.6% at 1988 constant prices. GDP per Capita rose from RO 2,765 in 1990 to 3,173 in 2002 at current prices by 1.2% on annual average. This GDP per Capita is calculated by use of a revised estimated population based on the results of 2003 General Census. The official value of GDP per Capita at current prices in 2002 is RO 3,077, a little lower than the Study Team estimates. It is because the official calculations are based on the estimated mid-year population prepared before the 2003 Census, which revealed that the official estimated population was larger than the actual. GDP per Capita in real terms rose by 1.0% annually during the same period.

Table 3.2-1 Growth of GDP and GDP per Capita, 1990-2002

	Gross Domestic Product (RO million)					Annual Growth Rate (%)			
	1990	1999	2000	2001	2002*	1999-00	2000-01	2001-02	1990-02
GDP at Current Prices									
1. Oil Sectors	2,144.4	2,365.8	3,717.7	3,264.4	3,257.4	57.1	-12.2	-0.2	3.5
2. Non-oil Sectors	2,348.6	3,674.8	3,921.5	4,406.0	4,551.7	6.7	12.4	3.3	5.7
2.1 Goods Production	402.2	649.7	804.8	1,055.7	1,025.7	23.9	31.2	-2.8	8.1
2.2 Services	1,946.4	3,025.1	3,116.7	3,350.3	3,526.0	3.0	7.5	5.2	5.1
Total GDP	4,493.0	6,040.6	7,639.2	7,670.4	7,809.1	26.5	0.4	1.8	4.7
GDP per Capita (RO)	2,765	2,675	3,297	3,207	3,173	23.2	-2.7	-1.0	1.2
GDP at Constant Prices									
1. Oil Sectors	1,407.6	1,873.8	1,978.9	1,971.4	1,886.0	5.6	-0.4	-4.3	2.5
2. Non-oil Sectors	2,191.4	3,481.8	3,670.6	4,102.2	4,290.7	5.4	11.8	4.6	5.8
2.1 Goods Production	427.9	661.6	760.4	889.4	924.0	14.9	17.0	3.9	6.6
2.2 Services	1,763.5	2,820.2	2,910.2	3,212.8	3,366.7	3.2	10.4	4.8	5.5
Total GDP	3,599.0	5,355.6	5,649.5	6,073.6	6,176.7	5.5	7.5	1.7	4.6
GDP per Capita (RO)	2,215	2,372	2,438	2,539	2,510	2.8	4.1	-1.2	1.0

* Provisional

Source: MONE

As shown in Figure 3.2-1, economic growth of this country has been fluctuating, especially in the case of GDP at current prices. This is mainly due to the fluctuation of oil prices. In years 1991, 1998 and 2001, annual average prices of crude oil fell from those of the previous years. In 1998, the price fell sharply by US\$ 7 from US\$ 19 per barrel in 1997 to US\$ 12 per barrel (see Figure 3.2-2). In addition, the financial crisis in Asian countries made the imports from Oman retracted. After 1998 on the contrary, the oil price realized a continuous steep rise from US\$ 12 per barrel to US\$ 17 per barrel in 1999 and US\$ 27 per barrel in 2000. And the price fell to US 23 per barrel in 2001.

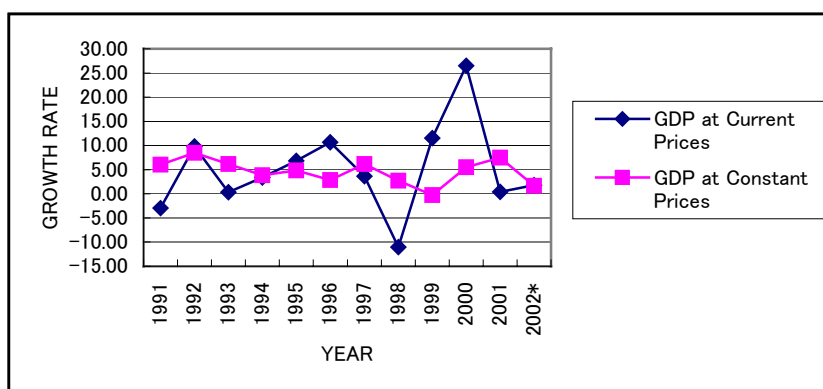


Figure 3.2-1 Past Trend of GDP Growth Rates

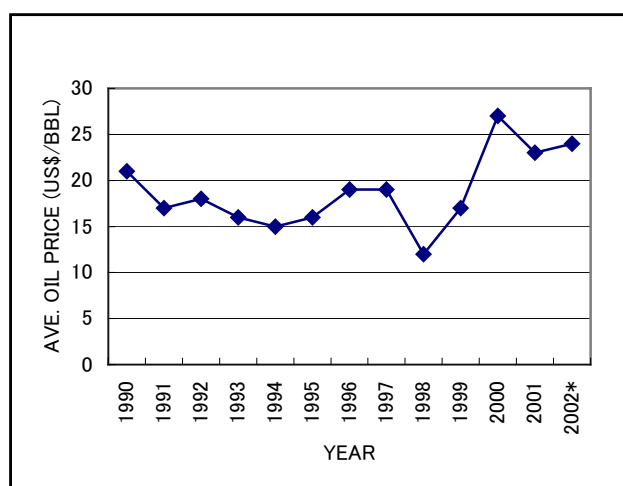


Figure 3.2-2 Past Trend of Oil Prices

This fluctuation of the oil price directly affected the Oman economy. The oil sector registered a great increase of 57.1% in 2000 and decreased by 12.2% in 2001 at current prices. In 2001, however, the non-oil sectors, especially goods production activities (agriculture & fisheries and industries) made a considerable growth of 31.2%. As a result, GDP at current prices increased by 0.4%.

Despite such frequent ups and downs, the Omani economy is considered to have been growing steadily as GDP at constant prices keeps its annual growth rate at around 4.5%. Figure 3.2-1 shows this trend of annual growth rates of GDP at constant prices comparing that of GDP at current prices. Although GDP per Capita in nominal terms fell by 2.7% in 2001, GDP per capita in real terms rose by 4.1% during the same year (see Table 3.2-1). The reason why it was possible is that GDP deflators can be set for reflecting the real value of commodities and services under a low inflation trend, which

was kept by the Oman government's monetary policy and management of government reserve funds. The rate of inflation, as measured by the change in the Muscat consumer price index, is generally very low. In 2002, consumer price index was 114.7 (1988 = 100) and annual average change rate was -0.9% from 118.1 in 1999. Reflecting it, GDP deflators applied for the estimation of GDP at 1988 constant prices were 112.8 in 1999 and 126.4 in 2002. On the other hand, sectoral deflators of 125.9 in 1999 and 172.2 in 2002 were applied for gross value added (GVA) at constant prices of oil sectors.

Oman's monetary policy focuses on maintaining low inflation and protecting the Omani Rial's peg to the US dollar. Price controls on electricity and water contribute to the low inflationary environment. The rate of exchange for Omani Rial (RO) against the US dollar was US\$ 1 = RO 0.3457 between 1974 and 1985, and since 1986 it has been maintained at US\$ 1 = RO 0.3845. This stable exchange rate has helped to limit the impact of imported inflation.

As for government reserve funds, the government established the State General Reserve Fund (SGRF) in 1980. And during the Forth Five Year Plan period (1991-1995), the State Contingency Reserve and the Oil Reserve Fund were established. Source of these funds is gross oil revenue. The rules about transfer from gross oil revenue to the funds might vary according to oil prices at the time of preparation of the Five Year Development Plans or yearly State General Budget. In the existing Sixth Five Year Plan, 98% of gross oil revenue based on the planned oil price of US\$ 18 per barrel was to be accounted as net oil revenue in the State General Budget, and the remaining 2% should be transferred to the Oil Reserve Fund. Transfer to the State Contingency Reserve was, at its creation, 7.5% of oil revenues in the case of realized oil prices varying between US\$ 18 and 20 per barrel and 10% in the case of realizing a price that exceeds US\$ 20 to US\$ 22 per barrel. Any increase that might occur in oil prices above these levels up to US\$ 25 per barrel shall be distributed among the different uses according to the ratios decided by the Council of Ministers. All further increases above this price shall go to the SGRF.

During the Forth Five Year Plan period (1991-1994), the accumulated fiscal deficit reached RO 2,355 million. This deficit was financed by the withdrawal of government reserve funds, issuance of development bonds, net borrowing, net foreign aid and temporary borrowing, with amounts of RO 1,651 million, RO 377 million, RO 8 million, RO 21 million and RO 298 million, respectively. The temporary borrowing is usually met through withdrawal from the SGRF in the following fiscal year. Despite the unplanned withdrawal of the government reserve funds totaled RO 1,651 million, the positive aspects are represented by the fact that the withdrawal was directed towards covering investment expenditure in general. It also led to the reduction in the amount of

dependence on borrowing from the international financial markets, and the avoidance of deficit financing or the need to resort to foreign aid. The most prominent positive elements that occurred, due to the method by which the deficit was financed, are demonstrated in the declining of inflation rates.

Figure 3.2-3 shows the shares all sectors in GDP, explained in the following sections, for the year 2000.

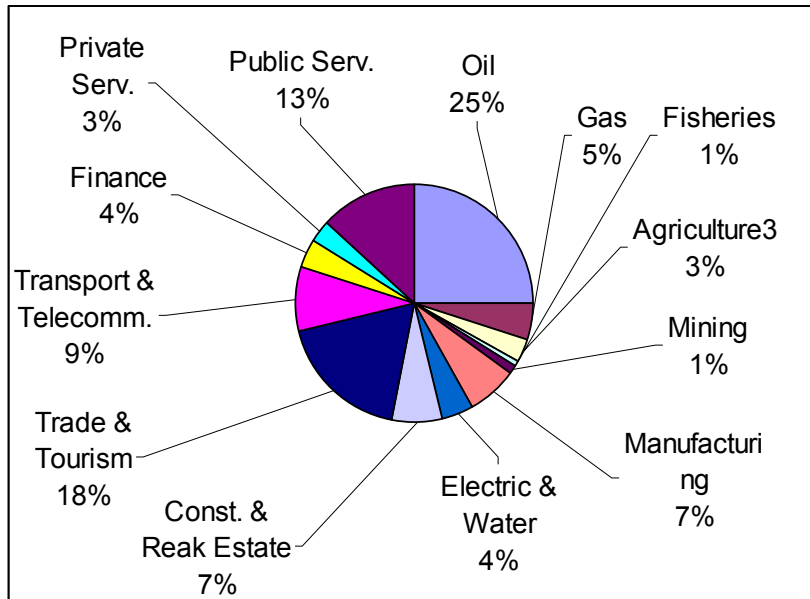


Figure 3.2-3 Shares of GDP - 2000

3.2.2 Recent Sectorial Growth Trends

Table 3.2-2 shows the recent sectorial growth trends of gross value added (GVA).

1) Extraction of Crude Oil

Due to the hike of oil price, the GVA of crude oil sector registered a remarkable increase of nearly 60% in 2000. However, it turned to decrease along with the drop of oil price in 2001. In 2002, crude oil production decreased by 6% from 349 million barrels in 2001 to 328 million barrels. However, the GVA at current prices marked a slight drop of 1% only. This was a result of the increase in average Omani oil price by 5.6% from US\$ 23 per barrel in 2001 to US\$ 24.3 per barrel in 2002. This activity still occupies an important position in the Omani economy, as it contributed 38.7% of GDP and 81.2% of total merchandise exports of Omani origin. Oil revenue contributed 73.1% of government revenue during 2002.

2) Incidental Services to Oil and Gas

This activity involves the services related to oil and gas fields, including drilling, erecting drilling and pumping towers, as well as the related activities of such services. Although the GVA of the sector continued to decrease from 1999 to 2001, it increased by 26.0% to RO 65.5 million in 2002 compared to RO 52.0 million in 2001.

3) Natural Gas

The GVA of natural gas activity continued to increase since 1999 until 2002. The growth rate during 2001 and 2002 was 5.6%. The growth in this activity is due to increase in the value added generated from the upstream of the government owned LNG project. Until the end of 2002 this project contributed a value added of RO 83.14 million, a growth rate of 4.7% during the same period.

The growth in this activity is also due to increase in quantities consumed by Government Gas System by 6.6%.

Table 3.2-2 Recent Growth Trends of Sectoral Gross Value Added, 1999-2002

Economic Activity	Gross Value Added (RO m)				Growth Rate (%)		
	1999	2000	2001	2002*	1999-00	2000-01	2001-02
1. Total Petroleum Activities	2,365.8	3,717.7	3,264.4	3,257.4	57.1	-12.2	-0.2
1.1 Crude Petroleum	2,299.2	3,616.1	3,105.5	3,089.6	57.3	-14.1	-0.5
- Extraction of Crude Oil	2,224.5	3,552.8	3,053.5	3,024.1	59.7	-14.1	-1.0
- Incidental Services to Oil & Gas	74.8	63.3	52.0	65.5	-15.4	-17.9	26.0
1.2 Natural Gas	66.6	101.6	158.9	167.8	52.6	56.4	5.6
2. Total Non Petroleum Activities	3,789.7	4,079.4	4,555.1	4,718.3	7.6	11.7	3.6
2.1 Agriculture & Fisheries	159.0	149.4	157.3	162.9	-6.0	5.3	3.6
A. Agriculture	106.7	100.7	106.3	104.9	-5.6	5.6	-1.3
B. Fisheries	52.3	48.7	51.0	58.0	-6.9	4.7	13.7
2.2 Industry Activities	490.7	655.4	898.4	862.8	33.6	37.1	-4.0
C. Mining & Quarrying	15.8	18.2	20.7	16.4	15.2	13.7	-20.8
D. Manufacturing	262.3	414.7	638.4	601.5	58.1	53.9	-5.8
- Manufacturing of Refined Oil	31.5	35.5	46.1	54.4	12.7	29.9	18.0
- Manufacturing of LNG	0.0	130.7	331.7	278.5		153.8	-16.0
- Other Manufacturing	230.8	248.5	260.7	268.6	7.7	4.9	3.0
E. Electricity & Water Supply	71.4	77.7	79.7	77.6	8.8	2.6	-2.6
F. Building & Construction	141.2	144.8	159.6	167.3	2.5	10.2	4.8
2.3 Services Activities	3,140.0	3,274.6	3,499.3	3,692.6	4.3	6.9	5.5
G. Wholesale & Retail Trade	773.4	815.9	882.3	928.3	5.5	8.1	5.2
H. Hotels & Restaurants	52.0	54.0	56.8	57.2	3.8	5.2	0.7
I. Transport & Communication	436.0	450.9	499.9	542.2	3.4	10.9	8.5
J. Financial Intermediation	255.2	256.4	286.3	321.4	0.5	11.7	12.3
K. Real Estate & Business Activities	423.0	421.9	432.9	443.4	-0.3	2.6	2.4
L. Public Administration & Defence	688.2	715.9	757.8	773.4	4.0	5.9	2.1
M. Education	287.0	318.6	336.2	368.0	11.0	5.5	9.5
N. Health	115.5	123.1	128.0	135.0	6.6	4.0	5.5
O. Other Social Services	93.6	101.6	102.6	106.9	8.5	1.0	4.2
P. Domestic Services	16.2	16.5	16.5	16.5	1.9	0.0	0.0
Less: Indirect Financial Services	-195.2	-204.0	-207.6	-226.8	4.5	1.8	9.2
GDP at Producers Prices	5,960.3	7,593.1	7,611.8	7,748.9	27.4	0.2	1.8
Plus: Import Taxes	80.3	46.1	58.6	60.2	-42.6	27.1	2.7
GDP at Market Prices	6,040.6	7,639.2	7,670.4	7,809.1	26.5	0.4	1.8

Source: MONE

4) Manufacturing

Recently the GVA of the Oman Oil Refinery continued to increase despite a fall of 13.5% in 1999. It increased by 18.0% in 2002. This growth is attributable to the increase in the company's sales (17%), which is as a result of increase in its exports.

The basic chemicals industry (liquefied natural gas) started its production in 2000. GVA of the industry increased to more than 2.5 times from 2000 to 2001. Sales quantities of Oman LNG increased from 5,809 thousand tons in 2001 to 6,545 tons in 2002. In spite of this, however, the prices of its final products decreased by 15.5%. And the company's production costs increased. As a result, the GVA of LNG industry decreased by 16.0% in 2002. Hence, the share of the industry in the total manufacturing dropped from 52% in 2001 to 46% in 2002. The other manufacturing activities made a growth of 3.0% in GVA during the same period.

In general, the drop in GVA of LNG industry affected the total value of the manufacturing activity, which marked a 5.8% decrease in 2002.

5) Agriculture

As shown in Table 3.2-2, the growth of agricultural activity fluctuates recently. This is a direct result of yearly variation of crop production (see Table 3.2-3). In 2002, the GVA at current prices of agriculture sector recorded a slight drop of 1.3%. This decrease is mainly attributable to a sharp drop in productivity of fruit production. In this country, fruits (mainly dates) are produced through compact plantation system. The cropped area of fruits decreased only by 0.5% in 2002, but productivity fell sharply by 15.9% from 8.5 tons/ha in the previous year to 7.2 tons/ha.

The total volume of agricultural production decreased by 8.1% from 1,326 thousand tons in 2001 to 1,219 thousand tons in 2002. Reflect this decrease in production, the GVA at constant prices of this sector dropped by 5.2%.

6) Fisheries

In Oman, fishing activities are carried out by fishermen of coastal Wilayats (traditional fishing) and by fishing companies (commercial fishing). There are five fishing companies. As shown in Table 3.2-4, landing volume by traditional fishing is prominent. However, the fishing companies purchase fish of around 20 thousand tons from fishermen every year.

Table 3.2-3 Agricultural Production, Cropped Area and Productivity by Crop, 1999-2002

	1999	2000	2001	2002
Production (ton)				
Vegetables	166,914	151,727	172,242	161,937
Field Crops	24,464	24,842	25,785	24,792
Fodder Crops	747,441	692,204	765,439	728,822
Fruits	347,816	344,982	362,933	303,551
Total	1,286,635	1,213,755	1,326,399	1,219,102
Annual Growth Rate (%)				
Vegetables	0.2	-9.1	13.5	-6.0
Field Crops	35.2	1.5	3.8	-3.9
Fodder Crops	2.2	-7.4	10.6	-4.8
Fruits	23.8	-0.8	5.2	-16.4
Total	7.5	-5.7	9.3	-8.1
Cropped Area (ha)				
Vegetables	7,195	6,591	6,824	6,710
Field Crops	6,357	6,182	6,377	6,301
Fodder Crops	17,805	17,875	18,173	18,024
Fruits	42,028	42,145	42,598	42,372
Total	73,385	72,793	73,972	73,407
Annual Growth Rate (%)				
Vegetables	1.0	-8.4	3.5	-1.7
Field Crops	7.0	-2.7	3.2	-1.2
Fodder Crops	2.1	0.4	1.7	-0.8
Fruits	0.5	0.3	1.1	-0.5
Total	1.5	-0.8	1.6	-0.8
Productivity (ton/ha)				
Vegetables	23.2	23.0	25.2	24.1
Field Crops	3.8	4.0	4.0	3.9
Fodder Crops	42.0	38.7	42.1	40.4
Fruits	8.3	8.2	8.5	7.2
Total	17.5	16.7	17.9	16.6
Annual Growth Rate (%)				
Vegetables		-0.8	9.7	-4.4
Field Crops		4.4	0.6	-2.7
Fodder Crops		-7.7	8.8	-4.0
Fruits		-1.1	4.1	-15.9
Total		-4.9	7.5	-7.4

Source: MAF

Table 3.2-4 Fish Landing by Fishing Type, 1999-2002

	1999	2000	2001	2002
Landing (ton)				
Traditional	96,664	108,019	125,275	116,598
Commercial	12,145	12,402	4,629	27,359
Total	108,809	120,421	129,904	143,957
Composition (%)				
Traditional	88.8	89.7	96.4	81.0
Commercial	11.2	10.3	3.6	19.0
Total	100	100	100	100
Growth Rate (%)				
Traditional	9.2	11.7	16.0	-6.9
Commercial	-31.0	2.1	-62.7	491.0
Total	2.5	10.7	7.9	10.8

Source: MAF

The GVA of fisheries sector continued to increase except in 2000. It increased significantly by 13.7% to RO 58 million in 2002. The unloaded fish of commercial fishing increased by 491% compared to 2001. Such significant increase in the quantity of landing is attributable to the suspension of the fishing ban, which was in effect through the period July-November 2001. In addition, the rise was due to increase in number of ships operating in the commercial fishing.

7) Tourism

Economic value of tourism activities is expressed considerably by the GVA of the hotels & restaurants sector. Figure 3.2-1 shows the historical and tourism locations. The list of locations is presented in Appendix 3-1.

Recently the GVA of hotels & restaurants sector is increasing steadily. However, the GVA of hotel activity decreased by 5.5% in 2002, due to the drop in number of foreign guests, especially Europeans and others (see Table 3.2-5). A sharp drop in bookings followed the September 11th 2001 attacks in New York and Washington, which increased Western fears over travel to the Middle East. Growing hostility between the US and Iraq during 2002 also had a negative impact on arrival numbers.

According to MONE, however, the restaurant activity marked a sound growth of 5.1% in value added. In total, the hotels & restaurants activity realized a slight growth of 0.7% in 2002.

8) Mining & Quarrying

In Oman, the most important product of non-oil mining and quarrying activities is building materials. It occupies about 65% of total value and 85% of total volume of production in the sector. Other main products of the sector are limestone, marble, gold, chromite, salt, laterite and gypsum. The GVA of this sector increased until 2001 but dropped to RO 16.4 million in 2002. This was a decrease of 20.8% from 2001. The decrease was attributable to the decrease in revenue of mineral processing (non-ferrous metal ores), in addition to the decrease in quantity of limestone produced by 3.4% in this year.

9) Building and Construction

After a drastic drop in 1999, construction activity continued to improve its GVA until 2002. The growth is attributable to the increase in residential building process on the one hand, and to the increase in government development expenditure on the other hand.

The government development expenditure increased due to the implementation of some construction projects such as roads, water network, and other projects.

Table 3.2-5 General Indicators of Hotel Activity, 2001 & 2002

	Value		%
	2001	2002	2001-02
No. of Hotels	115	124	7.8
No. of Rooms	5,729	6,078	6.1
No. of Beds	8,649	9,208	6.5
No. of Guests	855,058	862,819	0.9
Omani	207,738	219,493	5.7
Foreigners	647,320	643,326	-0.6
- Arabs	178,666	197,598	10.6
- Asians	102,884	132,061	28.4
- European & Others	365,770	313,667	-14.2
No. of Nights	951,255	960,375	1.0
Omani	207,069	221,416	6.9
Foreigners	744,186	738,959	-0.7
- Arabs	188,571	217,297	15.2
- Asians	146,170	162,590	11.2
- European & Others	409,445	359,072	-12.3
Room Occupancy Ratio (%)	42	41	-2.4
Beds Occupancy Ratio (%)	45	37	-17.8
No. of Employees	4,282	4,333	1.2
Omani	1,575	1,645	4.4
Non Omani	2,707	2,688	-0.7
Wages & Salaries (RO '000)	13,071	13,851	6.0
Omani	4,518	4,908	8.6
Non Omani	8,553	8,943	4.6
Revenues (RO '000)	46,180	43,680	-5.4
Room Rent	19,559	17,719	-9.4
Sales of Food & Beverages	20,104	20,059	-0.2
Other Revenues	6,517	5,902	-9.4
Value Added (RO '000)	26,078	24,636	-5.5

Source: MCI and MONE

Table 3.2-6 GVA of Non-Oil Mining & Quarrying, 1999-2002

	(RO m at Current Prices)			
	1999	2000	2001	2002*
GVA				
Mining & Quarrying Total	15.8	18.2	20.7	16.4
Non-Ferrous Metal Ores	2.4	2.9	4.8	2.3
Other Mining & Quarrying	13.4	15.3	16.0	14.1
Annual Growth Rate (%)				
Mining & Quarrying Total		15.2	13.7	-20.8
Non-Ferrous Metal Ores		20.8	65.5	-52.1
Other Mining & Quarrying		14.2	4.6	-11.9

* Provisional

Source: MONE

10) Wholesale and Retail Trade

Wholesale and retail trade assumes a major role in the Omani economy. It contributed 11.9% of the GDP and 19.7% of non-oil activities' GVA in 2002. After a 7.9% fall in 1999, the GVA of this sector continued to grow to RO 928.3 million in 2002. From 2001 to 2002 it increased by 5.2%. This increase is attributable to rise in recorded

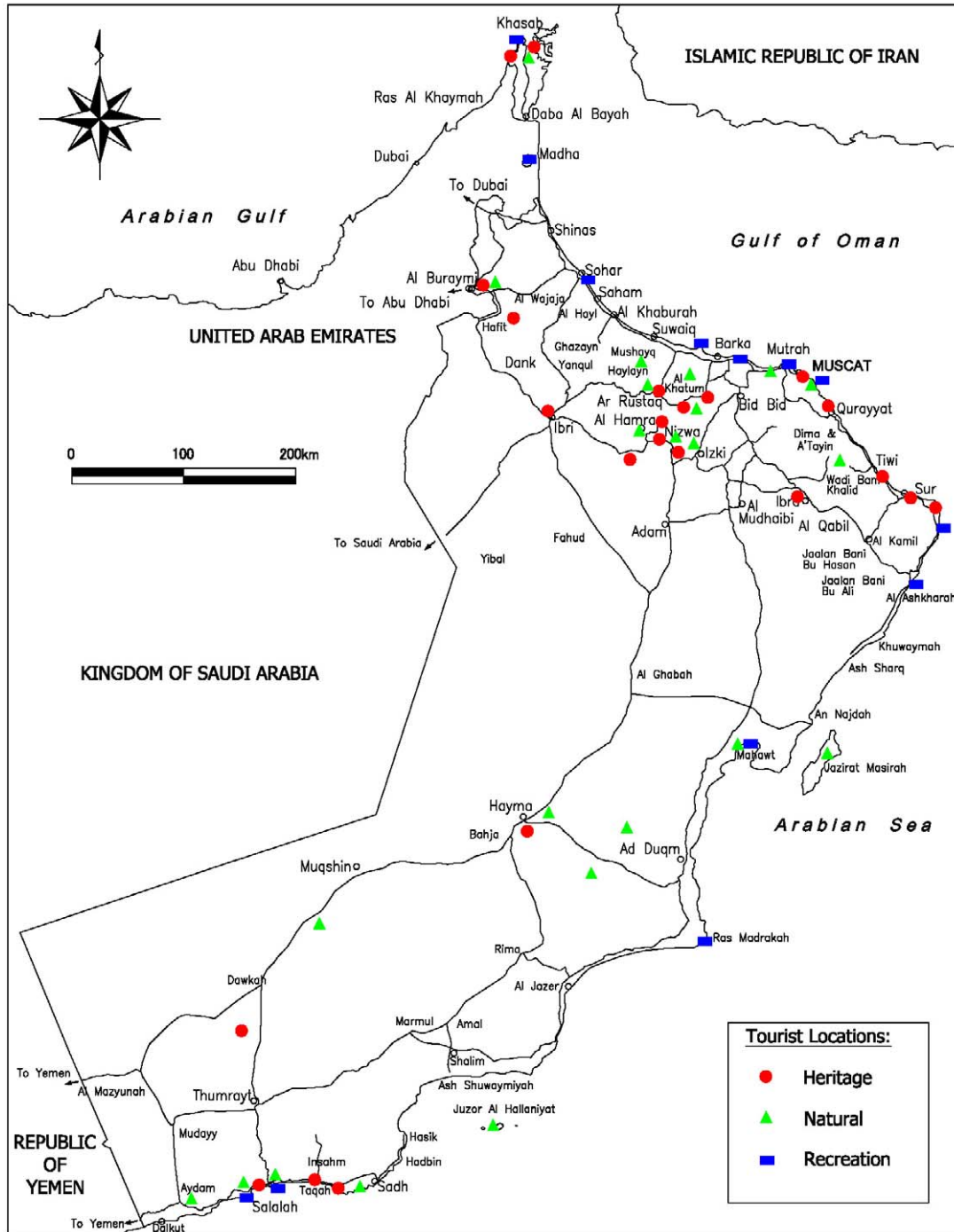


Figure 3.2-4 The Historical and Tourism Location Map

import's volume by 3.6% to RO 2,308.8 million (see Table 3.2-7). It is also due to rise in manufacturing output and fisheries' production.

Table 3.2-7 Recorded Imports by Commodity Group, 2001 and 2002

Commodity Group	(RO m)			
	2001	2002	Change %	Share %
Animal and animal products	121.6	112.7	-7.3	4.9
Plant products	94.4	94.3	-0.1	4.1
Food, bev. & tobacco products	255.8	249.3	-2.5	10.8
Mineral products	107.2	102.1	-4.8	4.4
Chemical products	134.5	142.6	6.0	6.2
Textiles and textile products	82.9	86.8	4.7	3.8
Metals and metal products	173.4	173.8	0.2	7.5
Elec. mach., mech. equipment	486.5	536.8	10.3	23.3
Transport equipment	402.9	428.0	6.2	18.5
Others	370.1	382.4	3.3	16.6
Total	2,229.3	2,308.8	3.6	100.0

Source: Directorate General of Customs

3.3 HOUSEHOLD INCOME AND EXPENDITURE

3.3.1 Household Income

MONE conducted the Household Expenditure and Income Survey (HEIS) for the first time during the period 20th May 1999 through 19th May 2000. The number of households in this survey was 3,479 (2,558 Omani and 921 expatriate households), equivalent to 1.2% of the estimated total number of households of 289,338.

Table 3.3-1 shows the average monthly household income by nationality and by Governorate/Region. The average monthly household income of Oman is RO 606.13 and per capita income is RO 87.57. Comparing Omani households with expatriate households, the average monthly household income of Omani households is RO 637.53, around RO 100 higher than that of expatriate households of RO 531.58. The monthly per capita income, however, is RO 74.86 for Omani households and RO 169.92 for expatriate households, due to the difference of the average household size.

Households in Muscat Governorate receive the highest average income of RO 787.17, while those in A'Sharqiyah Region the lowest average income of RO 431.29. For Omani households, the average household income of Dhofar Governorate is the highest of RO 868.34 but the per capita income is the second highest of RO 89.46 next to Muscat due to the largest average household size of 9.71.

Observing Table 3.3-1, it can be said that the per capita income of expatriate households is nearly double that of Omani households and the per capita income of Muscat is around double those of the other regions except Dhofar. Dhofar is positioned at an intermediate level.

Table 3.3-1 Average Household Income by Region, 1999/2000

Nationality	Governorate/ Region	Average HH Size	Average Monthly HH Income (RO)	Av. Monthly Per capita Income (RO)
Total Household	Oman Total	6.92	606.13	87.59
	Muscat	6.00	787.17	131.21
	Al Batinah	8.09	476.94	58.98
	Musandam	6.78	454.11	67.01
	A' Dhahirah	7.44	525.70	70.68
	A' Dakhliyah	7.77	517.13	66.55
	A' Sharqiyah	6.28	431.29	68.63
	Al Wusta	6.52	463.52	71.06
Omani Household	Dhofar	7.70	702.57	91.19
	Oman Total	8.52	637.53	74.86
	Muscat	7.92	824.78	104.08
	Al Batinah	9.13	500.95	54.88
	Musandam	7.53	484.13	64.27
	A' Dhahirah	9.02	570.90	63.30
	A' Dakhliyah	8.83	567.88	64.34
	A' Sharqiyah	7.83	493.88	63.11
Expatriate Household	Al Wusta	7.56	493.69	65.30
	Dhofar	9.71	868.34	89.46
	Oman Total	3.13	531.58	169.92
	Muscat	3.24	733.29	226.17
	Al Batinah	3.05	360.82	118.36
	Musandam	3.22	312.97	97.08
	A' Dhahirah	3.94	425.73	108.10
	A' Dakhliyah	2.78	277.39	99.77
A' Sharqiyah	2.34	271.19	115.80	
Al Wusta	2.28	340.04	149.44	
Dhofar	3.40	346.57	101.83	

Source: Household Expenditure and Income Survey (HEIS), 1999/2000

As shown in Table 3.3-2, the composition or distribution of sources of household income varies depending on the nationality. Omani households have mainly four sources of household income; wages & salaries, employer or own account revenues, imputed rent, and transfers. On the other hand, the main source of expatriate household income is wages & salaries, although some households operate their own businesses. "Current Transfers" include; government cash assistance (social security, health and education), social insurance compensations (pensions), and other current transfers, such as assistance in cash from individuals, insurance companies' returns, transfers from abroad etc.

Table 3.3-2 Distribution of Sources of Income (%)

Source of Income	Omani	Expatriate	Average
Wages & Salaries	66.82	95.20	74.20
Own Account Revenue	13.04	4.04	10.70
Property Incomes	0.10	0.00	0.07
Imputed Rent	9.24	0.24	6.90
Current Transfers	10.80	0.52	8.13
Total	100.0	100.0	100.0
Average Income (RO)	637.53	531.58	606.13

Source: HEIS, 1999/2000

"Imputed Rent" means the estimated rent of owned house or residence rent value. As shown in Table 3.3-3, 86% of Omani households are living in houses they own. This is the reason why "Imputed Rent" occupies a considerable percentage in the composition of sources of household income.

Table 3.3-3 Distribution of Household by Type of Tenure

Type of Tenure	Omani	Expatriate	Average
Owned by the Household	86.00	1.24	60.83
Rented	11.27	42.44	20.53
Provided by Employer	0.53	56.21	17.06
Others	2.20	0.10	1.58
Total	100.00	100.00	100.00

Source: HEIS, 1999/2000

On the other hand, 56% of expatriate households are provided houses by their employers and most of the rest are living in rented houses.

Table 3.3-4 shows the average monthly household income by industry of the household head's workplace.

Table 3.3-4 Average Monthly Household Income by Industry

Industry of Household Head	Average Household Income (RO)			Ratio to the Total Average		
	Omani	Expatriate	Average	Omani	Expatriate	Average
Agriculture & Fisheries	473.34	142.14	347.58	0.78	0.23	0.57
Mining & Quarrying	848.44	1,542.06	1,002.51	1.40	2.54	1.65
Manufacturing	559.09	549.67	553.24	0.92	0.91	0.91
Electricity & water	600.92	606.74	603.61	0.99	1.00	1.00
Construction	648.91	424.48	480.45	1.07	0.70	0.79
Trade, Hotels & Rest.	678.25	396.05	476.84	1.12	0.65	0.79
Transport & Commun.	538.46	585.48	547.25	0.89	0.97	0.90
Finance, Real Estate	1,015.03	733.06	867.66	1.67	1.21	1.43
Public Ad. Social Serv.	751.66	745.51	750.39	1.24	1.23	1.24
All Industries	637.53	531.58	606.13	1.05	0.88	1.00

Source: HEIS, 1999/2000

For Omani households, household heads belonging to the financing sector receive the highest income of RO 1,015.03 equivalent to 1.67 times the average followed by the mining & quarrying (oil sector). Expatriate household heads working for the oil sector receive the highest income of RO 1,542.06 equivalent to 2.54 times the average. The agriculture & fisheries sector is extremely low income producing, especially for expatriate households.

3.3.2 Household Expenditure

As shown in Table 3.3-5, the average monthly household consumption is RO 456.40 and per capita consumption is RO 65.99. Comparing Omani households with expatriate households, the average monthly consumption of Omani households is RO 496.58, about RO 130 higher than that of expatriate households of RO 361.25. The monthly per capita consumption, however, is RO 58.31 for Omani households and RO 115.48 for expatriate households.

Households in Muscat consume the highest amount of RO 581.73 on average, while those in Al-Wusta the lowest amount of RO 321.23 on average. Omani households in Muscat pay the highest amount of RO 629.80, while expatriate households in A'Dakhliyah the lowest amount of RO 149.62. As for the monthly per capita consumption, however, expatriate households in Muscat pay the highest amount of RO 158.24, nearly double that of Omani households in Muscat (RO 79.48). In almost all Regions the per capita consumption of expatriate households exceeds those of Omani households, due to the smaller household sizes.

The share of food consumption in the total household consumption (Engel's coefficient: EC) is generally considered as an indicator of living standard of the household. The official booklet explaining the results of HEIS gives a brief description based on this coefficient. The EC is sometimes used for the evaluation of living standard of a country or region setting 20% as a line to judge rich or poor. According to Table 3.3-5, only expatriate households in Muscat are below the 20% level. As for ECs of Omani households, EC of Muscat is the lowest of 26.3%, while that of Al-Wusta is the highest of 49.9%.

However, the absolute value of EC does not reflect the real living standard of households in Oman, and possibly for other oil producing Islamic countries, as there are some differences in life style and social system from European countries. It could be used as a relative indicator for comparing the living standard of Regions in the country.

Table 3.3-6 shows the average monthly per capita consumption by nationality and group of commodities and services. For food consumption, an expatriate individual pays nearly RO 3 on average for food from restaurant, while an Omani individual pays only RO 1 for the same item.

Table 3.3-5 Average Household Consumption by Region, 1999/2000

Nationality	Governorate/ Region	Average HH Size	Average Monthly HH Consumption (RO)	Av. Monthly Per capita Consumption (RO)	Av. Monthly Food Consumption (RO)	Share of Food in Total Consumption (%)
Total Household	Oman Total	6.92	456.40	65.99	138.43	30.3
	Muscat	6.00	581.73	97.02	137.42	23.6
	Al Batinah	8.09	370.63	45.83	133.07	35.9
	Musandam	6.78	409.43	60.41	125.28	30.6
	A' Dhahirah	7.44	460.01	62.09	159.59	34.7
	A' Dakhliyah	7.77	375.15	48.28	142.26	37.9
	A' Sharqiyah	6.28	349.91	55.68	124.68	35.6
	Al Wusta	6.52	321.23	49.24	157.55	49.0
Omani Household	Dhofar	7.70	444.35	57.68	158.45	35.7
	Oman Total	8.52	496.58	58.31	161.44	32.5
	Muscat	7.92	629.80	79.48	165.74	26.3
	Al Batinah	9.13	407.83	44.68	148.14	36.3
	Musandam	7.53	456.15	60.55	137.67	30.2
	A' Dhahirah	9.02	526.55	58.38	186.00	35.3
	A' Dakhliyah	8.83	422.89	47.91	160.72	38.0
	A' Sharqiyah	7.83	409.03	52.27	146.98	35.9
Expatriate Household	Al Wusta	7.56	361.79	47.85	180.59	49.9
	Dhofar	9.71	550.98	56.76	197.42	35.8
	Oman Total	3.13	361.25	115.48	83.94	23.2
	Muscat	3.24	513.03	158.24	96.94	18.9
	Al Batinah	3.05	190.74	62.57	60.18	31.6
	Musandam	3.22	189.73	58.85	67.04	35.3
	A' Dhahirah	3.94	315.88	80.21	102.40	32.4
	A' Dakhliyah	2.78	149.62	53.81	55.07	36.8
A' Sharqiyah	2.34	198.65	84.83	67.66	34.1	
Al Wusta	2.28	155.33	68.26	63.28	40.7	
Dhofar	3.40	215.40	63.29	74.77	34.7	

Source: HEIS, 1999/2000

Except this item, there is no much difference between the total amount of food consumption of expatriates and that of Omanis (around RO 20 on average), although quantities of consumed commodities vary each other.

As for non-food consumption, however, there is a great difference between Omanis and expatriates. The total non-food consumption of an expatriate individual (RO 89) is more than double that of an Omani individual (RO 39).

35% of non-food consumption of an expatriate is housing cost. Expatriates have to pay rent for houses they live in, while most of Omanis own their houses and their payment per capita for housing is only 11% of non-food consumption. "Imputed Rent" is the rent value of the owned house, the same amount of which is accounted as an item of the household income. Expatriates have to pay also higher domestic costs (furniture & utensils and household operation) and higher transport & communication costs (including costs of traveling abroad). These costs might be compulsory expenditure as expatriates in this country. Expenditure on education & culture may reflect partly the minimum education cost and partly the expenditures attributed to life style and sense of values.

Table 3.3-6 Average Monthly per Capita Consumption by Nationality

Group of Commodities & Services	Omani	Expatriates	Total
Food consumption			
Cereals & products	2.520	3.227	2.615
Meat & poultry	3.384	3.233	3.364
Fish & sea products	1.110	1.234	1.127
Dairy products and eggs	2.003	3.261	2.172
Oil & fats	0.462	0.699	0.494
Fruits	2.124	2.168	2.130
Vegetables	1.644	2.804	1.799
Dry & canned leguminous	0.242	0.299	0.249
Nuts	0.057	0.199	0.076
Salt & spices	0.239	0.384	0.259
Sugar, sugar products & honey	0.728	0.781	0.735
Tea, coffee & cocoa	0.317	0.403	0.328
Beverages (non alcoholic)	1.233	1.918	1.325
Other food preparations	0.139	0.211	0.148
Food from restaurant	1.144	5.943	1.789
Own produced food consumed	1.610	0.071	1.404
Total food consumption	18.956	26.831	20.015
Non-food consumption			
Clothing & footwear	4.509	6.594	4.790
Housing alternative	4.416	30.627	7.937
Furniture & utensils	2.369	3.451	2.514
HH operation	1.696	2.184	1.762
Medical care	0.438	1.913	0.636
Transport & communications	11.820	18.455	12.712
Education & culture	2.706	10.115	3.740
Personal care	1.802	2.369	1.878
Tob./cigarettes & alcoholic beverages	0.205	1.553	0.386
Costs of travelling abroad	1.032	4.299	1.471
Other non-food expenditure	1.005	6.432	1.734
Non-food products	0.436	0.257	0.412
Imputed rent	6.918	0.400	6.043
Total non-food consumption	39.352	88.646	45.976
Total consumption	58.308	115.475	65.990

Source: HEIS, 1999/2000

Considering the above-mentioned facts, the lower EC of expatriates could mainly be due to the compulsory non-food consumption, while the higher EC of Omanis might be a result of the less non-food consumption they can enjoy with low land prices and Islamic life style.

3.4 EMPLOYMENT

The overall employment data is available only for 1993, from the 1993 General Census. After 1993 Census, two Labor Force Surveys were conducted for Omanis in 1996 and 2000. For expatriates, the number of employed persons by sector is made public annually.

3.4.1 Labor Force Status in 1993

1) Omanis

Table 3.4-1 shows the labor force status of population 15 years and over in 1993. For Omani males, the overall labor force participation rate (LFPR) was 68.1%. The highest

LFPR was found in the age group 25-29 years and it gradually declined as becoming older until 59 years old. After 60 years old, LFPR showed a sharp drop. For the younger age groups, 22.4% of the male population of 15-19 years wanted to work but 44.7% of them could not find their workplaces. The LFPR of the age group 20-24 years was 84.5% and unemployment rate was 13.1%. These high unemployment rates in young age groups might be attributable to the gaps between the requests from the demand side (employers) and those from the supply side (young job seekers). The unemployment rates of middle-aged males were 5-9%.

The overall LFPR of Omani females was 6.7%. The age group 20-24 years had a highest LFPR of 16.5% followed by the age group 25-29 years of 11.9%. 3% of the female population aged 15-19 years had intentions to work, but about 3/4 of them stayed at home. It might be due to the traditional social customs, which are reluctant for young women to work outside. As shown in Table 4.3-2, about 67% of the female population of the age group 15-19 years was student and about 30% were housewives. And 72% of the female population of the age group 20-24 was married. Such early marriage and the social customs requiring for women to stay home appear to be the main causes of the low labor participation of Omani women.

Table 3.4-1 Omani Labor Force by Age Group, Employment Status and Sex, 1993

Age Group	Total Population	Economically Active Population			LF Particip. Rate (%)	Unemp'ment Rate (%)
		Employed	Unemployed	Total		
Male						
15-19	90,319	11,186	9,047	20,233	22.4	44.7
20-24	57,920	42,514	6,431	48,945	84.5	13.1
25-29	40,642	36,919	2,229	39,148	96.3	5.7
30-34	31,989	29,287	1,427	30,714	96.0	4.6
35-39	28,297	25,562	1,408	26,970	95.3	5.2
40-44	23,324	20,559	1,158	21,717	93.1	5.3
45-49	21,330	17,970	1,149	19,119	89.6	6.0
50-54	21,107	15,836	1,344	17,180	81.4	7.8
55-59	13,439	9,176	952	10,128	75.4	9.4
60-64	14,949	6,792	1,062	7,854	52.5	13.5
65+	22,212	5,553	1,260	6,813	30.7	18.5
Not stated	153	90	6	96	62.7	6.3
Total	365,681	221,444	27,473	248,917	68.1	11.0
Female						
15-19	84,990	688	1,969	2,657	3.1	74.1
20-24	52,490	6,286	2,388	8,674	16.5	27.5
25-29	40,139	4,426	347	4,773	11.9	7.3
30-34	33,108	2,352	93	2,445	7.4	3.8
35-39	32,406	1,599	52	1,651	5.1	3.1
40-44	23,576	1,068	20	1,088	4.6	1.8
45-49	20,965	841	23	864	4.1	2.7
50-54	19,549	606	17	623	3.2	2.7
55-59	11,003	262	13	275	2.5	4.7
60-64	12,124	201	10	211	1.7	4.7
65+	21,987	199	12	211	1.0	5.7
Not stated	87	8	0	8	9.2	0.0
Total	352,424	18,536	4,944	23,480	6.7	21.1

Source: 1993 General Census

2) Non-Omanis

Table 3.4-3 shows the labor force situation of non-Omanis in 1993. Except the age group of 15-19 years, almost all of male population was labor force and had their workplaces. Unemployment rate was 0.4%. Also, the LFPR of female population was as high as 55% with an unemployment rate of 1.3%. This situation reflects the fact that they came to this country to work and the Omani economy requires their labor force for its continuous development.

Table 3.4-2 Omani Non Labor Force by Age Group, Type of Activity and Sex, 1993

Age Group	Student	House-wife	Retired	Income recipient	Unable to work	Total
Male						
15-19	76.5	0.0	0.0	0.3	0.9	77.6
20-24	13.9	0.0	0.1	0.3	1.2	15.5
25-29	1.3	0.0	0.4	0.7	1.3	3.7
30-34	0.4	0.0	0.8	1.2	1.5	4.0
35-39	0.1	0.0	1.4	1.6	1.6	4.7
40-44	0.0	0.0	2.3	2.5	2.1	6.9
45-49	0.0	0.0	3.4	3.9	3.1	10.4
50-54	0.0	0.0	4.9	5.9	7.7	18.6
55-59	0.0	0.0	6.7	7.3	10.6	24.6
60-64	0.0	0.0	14.4	10.7	22.3	47.5
65+	0.0	0.0	11.4	11.3	46.6	69.3
Not stated	19.5	0.0	1.7	3.4	12.7	37.3
Total	21.3	0.0	2.4	2.5	5.7	31.9
Female						
15-19	66.5	29.7	0.0	0.2	0.5	96.9
20-24	10.8	72.0	0.0	0.2	0.4	83.5
25-29	1.1	86.5	0.0	0.1	0.4	88.1
30-34	0.3	91.7	0.0	0.1	0.5	92.6
35-39	0.1	94.1	0.0	0.1	0.5	94.9
40-44	0.0	93.8	0.0	0.3	1.3	95.4
45-49	0.0	93.0	0.1	0.4	2.4	95.9
50-54	0.0	87.9	0.2	1.0	7.8	96.8
55-59	0.0	82.9	0.3	1.5	12.9	97.5
60-64	0.0	69.3	0.4	1.9	26.7	98.3
65+	0.0	46.1	0.4	2.6	50.1	99.0
Not stated	14.2	48.2	0.0	5.7	22.7	90.8
Total	17.8	69.6	0.1	0.5	5.4	93.3

Source: 1993 General Census

Table 3.4-3 Non-Omani Labor Force by Age Group, Employment Status and Sex, 1993

Age Group	Total Population	Economically Active Population			LF Particip. Rate (%)	Unemp'tment Rate (%)
		Employed	Unemployed	Total		
Male						
15-19	3,400	892	157	1,049	30.9	15.0
20-24	28,810	28,180	324	28,504	98.9	1.1
25-29	83,977	83,470	299	83,769	99.8	0.4
30-34	92,453	92,021	272	92,293	99.8	0.3
35-39	81,631	81,299	180	81,479	99.8	0.2
40-44	53,586	53,371	119	53,490	99.8	0.2
45-49	27,308	27,197	53	27,250	99.8	0.2
50-54	12,834	12,725	40	12,765	99.5	0.3
55-59	4,371	4,299	25	4,324	98.9	0.6
60-64	1,623	1,492	14	1,506	92.8	0.9
65+	830	506	29	535	64.5	5.4
Not stated	521	509	0	509	97.7	0.0
Total	391,344	385,961	1,512	387,473	99.0	0.4
Female						
15-19	2,969	291	71	362	12.2	19.6
20-24	9,831	5,839	131	5,970	60.7	2.2
25-29	19,916	11,640	110	11,750	59.0	0.9
30-34	19,940	10,877	115	10,992	55.1	1.0
35-39	13,991	7,967	87	8,054	57.6	1.1
40-44	7,413	4,369	47	4,416	59.6	1.1
45-49	3,493	2,077	13	2,090	59.8	0.6
50-54	1,612	712	9	721	44.7	1.2
55-59	823	269	7	276	33.5	2.5
60-64	567	97	1	98	17.3	1.0
65+	672	38	3	41	6.1	7.3
Not stated	186	158		158	84.9	0.0
Total	81,413	44,334	594	44,928	55.2	1.3

Source: 1993 General Census

3.4.2 Employed Persons by Nationality (Omani and Non-Omani) in 1993

As Omani economy required expatriate labor force, many expatriates came into the country and had obtained jobs of about 430 thousand in 1993, which occupied 64% of total employment opportunities. As shown in Table 3.4-4, however, dependency on foreign labor force varies according to the industrial sector. Almost all of private household employees were expatriates, men as janitors and drivers and women as maids. In main private sector activities such as construction, manufacturing, trade and hotels & restaurants, expatriate labor force occupies 90-95% of total employment. In agriculture, around 40 thousand expatriate workers were engaged in production activities. In education and health sectors, about half of total jobs were conducted by foreigners. In the private sector, financial sector is comparatively less dependent on expatriate labor force. Except fishing sector, public administration sector was the least dependent on foreign labor force (16.1%). The number of expatriate employed persons, however, amounted to more than 24 thousand.

Table 3.4-4 Employed Persons by Nationality, Industrial Sector and Sex, 1993

Industrial Sector	Sex	No. of Employed Persons			% of Omani	% of Non-Omani
		Omani	Non-Omani	Total		
Agriculture	Male	12,730	40,168	52,898	24.1	75.9
	Female	879	16	895	98.2	1.8
	Total	13,609	40,184	53,793	25.3	74.7
Fishing	Male	8,011	565	8,576	93.4	6.6
	Female	2	2	4	50.0	50.0
	Total	8,013	567	8,580	93.4	6.6
Mining	Male	7,679	5,890	13,569	56.6	43.4
	Female	357	95	452	79.0	21.0
	Total	8,036	5,985	14,021	57.3	42.7
Manufacturing	Male	3,411	50,970	54,381	6.3	93.7
	Female	931	4,787	5,718	16.3	83.7
	Total	4,342	55,757	60,099	7.2	92.8
Electricity	Male	918	3,468	4,386	20.9	79.1
	Female	16	11	27	59.3	40.7
	Total	934	3,479	4,413	21.2	78.8
Construction	Male	4,483	102,978	107,461	4.2	95.8
	Female	66	181	247	26.7	73.3
	Total	4,549	103,159	107,708	4.2	95.8
Trade	Male	10,612	76,713	87,325	12.2	87.8
	Female	540	869	1,409	38.3	61.7
	Total	11,152	77,582	88,734	12.6	87.4
Hotels & restaurants	Male	834	13,101	13,935	6.0	94.0
	Female	91	369	460	19.8	80.2
	Total	925	13,470	14,395	6.4	93.6
Transport & Comm.	Male	10,780	12,724	23,504	45.9	54.1
	Female	415	264	679	61.1	38.9
	Total	11,195	12,988	24,183	46.3	53.7
Financial	Male	3,417	2,130	5,547	61.6	38.4
	Female	1,341	233	1,574	85.2	14.8
	Total	4,758	2,363	7,121	66.8	33.2
Real estate	Male	954	8,647	9,601	9.9	90.1
	Female	116	301	417	27.8	72.2
	Total	1,070	8,948	10,018	10.7	89.3
Public & defense	Male	130,126	24,317	154,443	84.3	15.7
	Female	4,058	1,348	5,406	75.1	24.9
	Total	134,184	25,665	159,849	83.9	16.1
Education	Male	10,477	10,687	21,164	49.5	50.5
	Female	6,903	8,197	15,100	45.7	54.3
	Total	17,380	18,884	36,264	47.9	52.1
Health & Social	Male	4,558	3,756	8,314	54.8	45.2
	Female	2,235	5,491	7,726	28.9	71.1
	Total	6,793	9,247	16,040	42.4	57.6
Private households	Male	205	12,171	12,376	1.7	98.3
	Female	25	20,960	20,985	0.1	99.9
	Total	230	33,131	33,361	0.7	99.3
Others	Male	12,249	17,676	29,925	40.9	59.1
	Female	561	1,210	1,771	31.7	68.3
	Total	12,810	18,886	31,696	40.4	59.6
Total	Male	221,444	385,961	607,405	36.5	63.5
	Female	18,536	44,334	62,870	29.5	70.5
	Total	239,980	430,295	670,275	35.8	64.2

Source: Study Team Estimates based on 1993 General Census

Table 3.4-5 summarizes the number of employed persons by nationality in public and private sectors. The public sector includes the government owned companies and other

public organizations. From this table, it can be said that the percentages of Omani employed persons (so called Omanization rates) in 1993 were 75.1% for the public sector and 14.7% for the private sector, respectively.

Table 3.4-5 Employed Persons by Nationality, Sector and Sex, 1993

Sector	Sex	No. of Employed Persons			% of Omani	% of Non-Omani
		Omani	Non-Omani	Total		
Public Sector	Male	160,953	44,562	205,515	78.3	21.7
	Female	13,495	13,161	26,656	50.6	49.4
	Total	174,448	57,723	232,171	75.1	24.9
Private Sector	Male	59,004	339,266	398,270	14.8	85.2
	Female	4,850	30,815	35,665	13.6	86.4
	Total	63,854	370,081	433,935	14.7	85.3
Other	Male	834	1,435	2,269	36.8	63.2
	Female	59	149	208	28.4	71.6
	Total	893	1,584	2,477	36.1	63.9
Not stated	Male	653	698	1,351	48.3	51.7
	Female	132	209	341	38.7	61.3
	Total	785	907	1,692	46.4	53.6
Total	Male	221,444	385,961	607,405	36.5	63.5
	Female	18,536	44,334	62,870	29.5	70.5
	Total	239,980	430,295	670,275	35.8	64.2

Source: 1993 General Census

3.4.3 Changes in Labor Force Status of Omanis from 1993 to 2000

In 1996 and 2000, MONE conducted Labor Force Surveys for Omanis. The surveys were sample surveys and results were enlarged based on the estimated population for 1996 and 2000. However, the estimated population might be overestimated according to the results of the 2003 Census. Therefore, the absolute number of the report should be treated carefully, but ratios or rates can be compared to the results of 1993 Census.

Table 3.4-6 shows the LFPRs and unemployment rates by age group and sex, comparing 1993, 1996 and 2000. The overall LFPR of males dropped from 68.1% in 1993 to 59.3% in 2000, while that of females rose from 6.7% in 1993 to 12.7% in 2000. For the male, LFPRs of all age groups decreased considerably from 1993 to 2000. Generally, unemployment rates of younger generations of 15-34 years, especially 15-24 years, increased remarkably. Due to this, the overall unemployment rate of male labor force increased from 11.0% in 1993 to 14.2% in 1996 and 19.3% in 2000.

Table 3.4-6 Omani Labor Force Status by Age Group and Sex, 1993, 1996 and 2000

Sex	Age Group	LF Participation Rate (%)			Unemployment Rate (%)		
		1993	1996	2000	1993	1996	2000
Male	15-19	22.4	24.0	17.3	44.7	54.1	69.4
	20-24	84.5	81.8	77.6	13.1	22.1	37.4
	25-29	96.3	96.6	96.1	5.7	9.1	11.4
	30-34	96.0	96.2	95.9	4.6	5.2	5.4
	35-39	95.3	93.9	92.8	5.2	6.2	3.8
	40-44	93.1	87.6	85.0	5.3	4.0	4.5
	45-49	89.6	83.4	77.9	6.0	5.7	4.9
	50-54	81.4	70.5	64.1	7.8	2.3	2.7
	55-59	75.4	61.0	58.8	9.4	4.6	2.6
	60-64	52.5	38.3	37.0	13.5	3.9	0.8
65+	30.7	22.6	18.4	18.5	3.5	2.1	
	Total	68.1	64.2	59.3	11.0	14.2	19.3
Female	15-19	3.1	6.1	5.9	74.1	87.1	86.1
	20-24	16.5	25.8	28.8	27.5	46.4	53.2
	25-29	11.9	18.1	27.4	7.3	13.7	20.8
	30-34	7.4	9.4	12.7	3.8	7.9	9.0
	35-39	5.1	4.9	7.7	3.1	6.5	13.4
	40-44	4.6	6.5	6.0	1.8	0.0	3.3
	45-49	4.1	3.6	4.3	2.7	0.8	0.0
	50-54	3.2	3.4	5.3	2.7	0.0	0.0
	55-59	2.5	3.5	2.2	4.7	0.0	0.0
	60-64	1.7	1.4	2.3	4.7	0.0	0.0
65+	1.0	1.1	1.6	5.7	0.0	0.0	
	Total	6.7	10.0	12.7	21.1	37.0	40.0

Source: For 1993 from General Census and for 1996 and 2000 from Labor Force Survey

For the female, LFPRs of age group 15-34 years increased remarkably. For the non labor force of age groups 15-19 years and 20-24 years, the percentages of housewives decreased more than increases in those of students. Composition of "Housewife" in the non labor force of the age group 15-19 years decreased from about 30% in 1993 to about 20% in 1996 and 14% in 2000. And that in the age group 20-24 years also decreased from 72% in 1993 to about 57% in 1996 and 70% in 2000, as presented in Table 3.4-7.

Table 3.4-7 Percentages of Students and Housewives in Younger Generations of Omani Females

Age		1993	1996	2000
15-19	Student	66.5	72.1	77.6
	Housewife	29.7	20.6	14.0
20-24	Student	10.8	15.0	21.2
	Housewife	72.0	57.3	46.8
25-29	Student	1.1	1.4	1.3
	Housewife	86.5	79.4	69.8
30-34	Student	0.3	0.0	0.0
	Housewife	91.7	89.3	85.0

Source: For 1993 from General Census and for 1996 and 2000 from Labor Force Survey

Thus, female labor force (women who wanted to work) increased, but the job opportunities did not increase to the extent sufficient to meet their intentions. As a result, unemployment rates of these age groups jumped.

As described above, unemployment of young labor force of both sexes is an important one of issues and concerns about employment.

3.5 LAND USE

3.5.1 Outline of Land Tenure and Land Use Survey in Oman

Topographically, 82% (253,790 km²) of the total land area of the country (309,500 km²) is sand and desert; 15% (46,425km²), mountain; and only 3% (9,285 km²) is plain. Most of the deserts and mountains are national properties. Private lands are distributed in the plain, where there are also many national lands. Agricultural lands (holdings) are mainly privately owned and urban lands such as residential, commercial, industrial and other uses are mixture of private and national properties. Traditionally owned private lands have been kept as they were. At present some of national lands are subdivided as residential or other purpose plots by the Government (the Ministry of Housing) in accordance with the land use zoning, and are transferred to individuals or private establishments by lot at considerably low prices.

According to the national housing policy, the government provides a residential plot at nominal rate to the persons satisfying the following criteria.

- Omani male citizens over 21 years of age
- Omani male citizens under 21 years of age (special case)
- Omani female heads of the household (widows/divorcee)

The average plot size may vary by region, but around 600 m², with a general dimension of 30 m X 20m. This housing policy is sometimes criticized as the following:

- Per capita residential land is one of the highest in the world, without corresponding economic justifications
- Supply of residential plots should relate to the genuine housing demand
- Land release should be phased to correspond with expected population growth and availability of utilities
- Allocation of plot should be related to household formation
- Smaller plot sizes should be considered
- All un-built plots, after a certain time period from allocation, should be

automatically forfeited to the government

Some of new agricultural plots are also transferred to farmers by the similar way. There is no private development company that purchases a large-scale land, subdivide it into a considerable number of residential or other plots and sell them out to public at higher prices.

When one development project is implemented, the executing agency generally makes a lease contract about the required lands with the Government and pay rent. Private lands can be bought and sold freely among Omani people, but foreigners cannot purchase land. To meet the housing demand of expatriates arriving into Muscat, real estate companies have been developing apartment houses or residential accommodation blocks in residential zones in the City. "Buy to Let" is to buy a plot and build an apartment house or to buy an apartment, and to let an apartment to an expatriate. It is generally considered as a safe investment. Although recently it needs more careful study about demand/supply to implement the investment plan, building activities in urban areas will continue in future.

According to the institutional framework for urban and regional planning, the Supreme Committee for Town Planning (SCTP) formulates policies, long-term programs and priorities. Planning for urban areas is the responsibility of the Ministry of Housing. According to the General Policy on Town Planning formulated by the SCTP, the planning process in the country is recommended to be carried out at four levels:

1. National Plan
2. Regional Plans
3. Town Structure Plans
4. Local Area Plans

The National Plan prepared by the Development Council every five years outlines economic forecasts and development programs. It provides the basic framework for the Regional Development Plans (RDPs). The RDP intends to show a spatial pattern of economic development and distribution of population based on a planned hierarchy of settlements.

The Town Structure Plans are prepared for selected towns, for example, large towns like Muscat and Salalah, and small towns like Bahla and Samail in Ad Dakhliyah Region. These plans provide a framework for the growth of urban areas form the basis for the preparation of detailed local plans. Local Area Plans, prepared within the framework of Town Structure Plans, show in detail the land use zoning within the planning area,

reservation of land for various purposes, extent and boundaries of acquisition proposed etc.

The land use survey is carried out at the Town Structure Plan and Local Area Plan levels. Accordingly, the existing land use (maps and tables of areas by use) is available only for the selected towns, where the Town Structure Plans were prepared.

3.5.2 Agricultural Land

The first overall survey on agricultural land is the 1993 Agricultural Census. Since then no such surveys have been carried out. According to the Ministry of Agriculture and Fisheries, however, the next Agricultural Census will be conducted in November 2004.

Table 3.5-1 shows the number of holdings and total areas by land tenure and Region. There were 95,145 holdings in 1993. Of this total number, 32,734 holdings (34.4%) were without land. Most of them are livestock holdings. 99.7% of total holdings in Al-Wusta Region and 92.4% of total holdings in Dhofar Region were livestock holdings.

Table 3.5-1 Number of Holdings and Area by Land Tenure and Region

Region	No. of Holdings with Land								No. of Holdings without Land	Total
	Owned		Rented		Owned and Rented		Total			
	No. of Holdings	Area (ha)	No. of Holdings	Area (ha)	No. of Holdings	Area (ha)	No. of Holdings	Area (ha)		
Muscat	3,290	3,375	2	1	6	13	3,298	3,389	365	3,663
Al-Batinah	24,674	55,015	92	303	72	326	24,838	55,644	7,120	31,958
Musandam	1,522	1,022	9	3	23	30	1,554	1,055	835	2,389
A'Dhahirah	7,851	13,844	12	29	24	177	7,887	14,050	961	8,848
A'Dakhliyah	10,807	10,731	21	102	11	59	10,839	10,892	929	11,768
A'Sharqiyah	12,739	11,154	32	40	8	27	12,779	11,221	5,945	18,724
Al-Wusta	5	70	1	4	0	0	6	74	1,967	1,973
Dhofar	1,114	4,639	56	71	40	312	1,210	5,022	14,612	15,822
Total	62,002	99,850	225	553	184	944	62,411	101,347	32,734	95,145

Note: Holdings without land contain livestock holdings and holdings less than 42 m²

Source: 1993 Agricultural Census

Total area of agricultural lands was 101,347 ha, of which 99,850 ha (98.5%) were owned lands. Comparing the topographical distribution data, the agricultural lands occupy about 11% of the plain (9,285 km²). 55% (55,644 ha) of the agricultural lands are located in Al-Batinah Region, while only 74 ha in Al-Wusta Region. The average size of holding is 1.6 ha in the country. In Regions of Al-Wusta and Dhofar, although the numbers of cropping holdings are small, the average sizes of holding are large; 12.3 ha and 4.2 ha, respectively. Among the other Regions, the average size of holding in Al-Batinah (2.2 ha) is the largest.

In Oman, the compact plantation of fruits is the most prominent agricultural land use, as can

be seen in Table 3.5-2. It occupies 42% of the total agricultural land. Except Al-Batinah and Dhofar almost all plantations are for date palms. In Al-Batinah, the total area of date palm plantations is about 16,700 ha, the largest in the country, but there are a considerable number of plantations for other fruits such as lemon, banana and mango. In Dhofar, more or less the half of plantation area is for banana and the other half for coconut.

The category "Others" includes land for scattered fruit trees, land prepared for cropping, buildings like livestock shelters, poultry houses, and stores, and land used for holder's household including its residence. The real land area of this category is a little larger than the figures shown in the table, as there is some double counting in land areas for vegetables, field crops and fodder crops, due to cropping in succession and in association.

The pasture for livestock occupies the second largest share of cropland. However, one thirds of the land is inter-cropped with other crops. About 60% of the total is located in Al-Batinah.

More than 70% of lands for vegetable cultivation are located in Al-Batinah, which is playing a role of production and supply base of daily food for the country especially for Muscat. Covered cultivation is observed for vegetable production, although the percentage is still at a low level.

A considerable area in A'Dhahirah, as well as in Al-Batinah, is devoted to field crops like maize, barley and wheat.

Table 3.5-3 shows the number of agricultural plots allotted by the Ministry of Housing. According to the table, about 100 agricultural plots have been allotted annually. Accumulated number amounts to about 8 thousand at the end of 2002. More than 60% of plots have been allotted to Al-Batinah. This fact shows that agricultural land is steadily increasing annually in area, although total land areas of allotted plots are not made public.

Table 3.5-2 Area of Agricultural Land by Crop and Region

Region	Vegetable crops	Field crops	Fodder crops	Compact Plantation	Others	Total
Muscat	72	109	729	2,465	14	3,389
Al-Batinah	4,082	2,543	10,497	22,960	15,562	55,644
Musandam	38	89	71	599	258	1,055
A'Dhahirah	455	1,626	2,344	5,001	4,624	14,050
A'Dakhliyah	366	606	1,071	4,852	3,997	10,892
A'Sharqiyah	261	313	806	6,156	3,685	11,221
Al-Wusta	5	0	7	1	61	74
Dhofar	455	43	1,435	888	2,201	5,022
Total	5,734	5,329	16,960	42,922	30,402	101,347

Source: 1993 Agricultural Census

Table 3.5-3 Number of Agricultural Plots Allocated

Region	1998	1999	2000	2001	2002	End of 2002
Muscat	5	6	6	1	3	450
Al-Batinah	61	77	61	54	71	5,201
Musandam	6	3	1	1	4	43
A'Dhahirah	11	3	6	7	5	912
A'Dakhliyah	1	37	26	21	11	848
A'Sharqiyah	11	6	3	4	4	415
Al-Wusta	2	0	0	0	0	2
Dhofar	3	9	1	0	0	352
Total	100	141	104	88	98	8,223

Source: Statistical Yearbooks

3.5.3 Urban Land Use

According to Table 3.5-4, 8,000-9,000 plots for urban use are allotted by the Ministry of Housing annually. Since this system started, about 244 thousand plots had been allotted until the end of 2002. About 96% of allotted plots are for residential use, including plots for commercial/residential use and for government residents. Although Muscat have received the largest number of plots, recently Al-Batinah and A'Sharqiyah are receiving more plots than Muscat.

The number of plots shown in the table demonstrates a recent urbanization trend by Region. The present urban areas are composed of two types of urban lands: a) new urban land formed by allotted plots and provided infrastructure (including roads, public facilities for education and social services, parks, etc.) and b) old urban land historically formed before this system started. In Muscat, the old urban land occupies a large part of the urbanized areas.

Table 3.5-4 Number of Urban Plots Allocated by Type of Use and Region

Region	Type of Use	1998	1999	2000	2001	2002	End of 2002
Muscat	Residential	2,009	1,248	1,134	1,415	1,580	58,753
	Commercial	49	22	40	26	42	1,892
	Com./Residential	182	92	70	143	114	1,215
	Industrial	18	18	37	28	22	1,627
	Govt. Residents	0	0	0	0	0	2,783
	Total	2,258	1,380	1,281	1,612	1,758	66,270
Al-Batinah	Residential	1,618	2,142	1,220	1,339	2,247	51,315
	Commercial	63	5	21	14	33	3,571
	Com./Residential	55	10	185	135	35	1,672
	Industrial	5	0	0	173	51	1,001
	Govt. Residents	0	0	0	0	0	543
	Total	1,741	2,157	1,426	1,661	2,366	58,102
Musandam	Residential	98	94	153	76	97	3,234
	Commercial	0	0	7	5	1	74
	Com./Residential	4	1	20	3	7	73
	Industrial	0	3	0	4	2	82
	Govt. Residents	0	0	0	0	0	285
	Total	102	98	180	88	107	3,748
A'Dhahirah	Residential	751	613	837	903	693	20,507
	Commercial	6	0	5	9	5	1,167
	Com./Residential	1	1	9	20	9	217
	Industrial	0	1	0	3	2	82
	Govt. Residents	0	0	0	0	0	265
	Total	758	615	851	935	709	22,238
A'Dakhliyah	Residential	1,716	1,632	1,604	839	715	26,945
	Commercial	0	5	21	25	26	1,029
	Com./Residential	1	11	34	58	42	434
	Industrial	0	1	1	3	0	462
	Govt. Residents	0	0	0	0	0	506
	Total	1,717	1,649	1,660	925	783	29,376
A'Sharqiyah	Residential	1,295	1,742	1,957	1,932	1,929	30,973
	Commercial	94	10	11	123	42	1,861
	Com./Residential	3	6	11	36	29	299
	Industrial	0	0	0	3	3	474
	Govt. Residents	0	0	0	0	45	500
	Total	1,392	1,758	1,979	2,094	2,048	34,107
Al-Wusta	Residential	48	205	160	105	91	1,095
	Commercial	6	2	0	3	8	59
	Com./Residential	0	1	0	0	1	2
	Industrial	2	0	0	0	0	26
	Govt. Residents	0	0	0	0	216	284
	Total	56	208	160	108	316	1,466
Dhofar	Residential	672	277	139	411	467	25,326
	Commercial	14	2	33	231	634	1,408
	Com./Residential	181	0	1	0	0	188
	Industrial	18	0	27	48	1	1,977
	Govt. Residents	0	0	0	0	0	86
	Total	885	279	200	690	1,102	28,985
Total	Residential	8,207	7,953	7,204	7,020	7,819	218,148
	Commercial	232	46	138	436	791	11,061
	Com./Residential	427	122	330	395	237	4,100
	Industrial	43	23	65	262	81	5,731
	Govt. Residents	0	0	0	0	261	5,252
	Total	8,909	8,144	7,737	8,113	9,189	244,292

Source: Statistical Yearbooks

The average areas of plots by type of use are shown in Table 3.5-5. These data were obtained from the distribution of plot sizes by type of use for which building permits were issued during the period 2000-2002. In Musandam, the average plot size for residential use is the smallest of 561.6 m², while in Adh Dhahirah the largest of 732.1 m². In Muscat 650.5 m² is the average size. The average plot size for mixed use (mainly commercial/residential) is almost the same as that for residential use. The sizes of plots for non-residential use are around 1,000 m². By using these data, the total areas of allotted plots are estimated. The results are shown in Table 3.5-6. These areas are considered as the core private plots that occupy 50-60% of the new urban land. The other 40-50% of the new urban land include social facilities such as schools, hospitals, mosques, etc., transportation land such as roads, bus terminals, etc., parks and open spaces, public utilities and government offices.

Accordingly, the new urban land of about 30,000 ha has been developed in the country since this system was established. And about half of these new urban areas have been developed in the Muscat - Al-Batinah North Coastal Belt Zone.

Table 3.5-5 Average Plot Sizes by Type of Use and Region

Region	Residential	Non-Residential	Mixed
Muscat	650.5	1,093.5	640.2
Al-Batinah	689.0	1,010.6	780.0
Musandam	561.6	1,075.6	577.8
A'Dhahirah	732.1	1,024.5	732.5
A'Dakhiliyah	666.6	790.3	751.7
A'Sharqiyah	686.3	937.8	606.0
Dhofar	629.0	1,321.3	671.1

Source: Study Team Estimates

Table 3.5-6 Estimated Total Areas of Plots by Type of Use and Region (ha), end of 2002

Region	Residential	Commercial	Com./Residl	Industrial	Govt. Residts	Total
Muscat	3,822	207	78	178	181	4,466
Al-Batinah	3,536	361	130	101	37	4,165
Musandam	182	8	6	9	16	220
A'Dhahirah	1,501	120	16	8	19	1,665
A'Dakhiliyah	1,796	81	33	37	34	1,980
A'Sharqiyah	2,126	175	18	44	34	2,397
Al-Wusta	75	6	0	2	19	103
Dhofar	1,593	186	13	261	5	2,058
Total	14,630	1,143	293	641	347	17,054

Source: Study Team Estimates

3.5.4 Muscat and Salalah

1) Muscat

The final report on the Muscat Area Structure Plan (1990-2010) was submitted by the contracted consultants to the Ministry of Housing in July 1991. This plan was authorized as the official Structure Plan for the Muscat Area and still effective at present. The Muscat Area covers the whole area under the administration of Muscat Municipality except Qurayyat. At that time Wilayat of Qurayyat belonged to the Muscat Region but was not included in the Muscat Municipality. In Oman, the word "Municipality" has a special meaning. It is considered as a responsible and implementing body for carrying out the various routine works and projects institutionalized and planned by the central government. The Muscat Municipality places Directorate General Offices of the Municipality at the level of Wilayat. At present five Directorate General Offices are placed under the Muscat Municipality; Greater Mutrah (for Wilayats of Mutrah and Muscat), Baushar (for Wilayat of Baushar), As Seeb (for Wilayat of Seeb), Al-Amarat (for Wilayat of Al-Amarat) and Qurayyat (for Wilayat of Qurayyat). Generally, the municipalities are under control of the Ministry of Regional Municipalities and Environment. However, the Muscat Municipality is under the Diwan of the Royal Court (the Palace).

For the preparation of the Structure Plan, a land use survey was carried out in 1989. The results are shown in Table 3.5-7. Out of the total Study Area of 2,300 km², 150 km² was developed. Of the developed area; 1/4 is residential, 1/4 is under transportation uses and 1/5 is governmental uses (special use and governmental institutions).

Most of the commercial (especially traditional type) and business activities are concentrated in Greater Mutrah (Mutrah, Ruwi-Hamriya, and Business District) reflecting a greater area of residential/commercial and commercial land uses. Modern commercial areas are located in Baushar (Qurm, Madinat Qaboos and Al-Khuwair).

Most of the industrial activities in Muscat Area are of service and repair type. Industrial activity in Greater Mutrah is at Wadi Kabir and in Ruwi commercial area. In Baushar, a large industrial area is located at Ghala. The Rusayl Industrial Estate is located in Seeb.

Public administrative offices are mostly located in Greater Mutrah and Baushar. In Seeb, there are a few regional offices, Diwan's offices, RGO headquarters, MOD headquarters, etc.

Table 3.5-7 Land Use Area by Category and Wilayat in Muscat, 1989

Land Use Category	Land Use Area by Wilayat (ha)					% in Dev'd Area
	Gr. Muttrah	Baushar	Seeb	Al Amarat	Total	
Residential	540.10	973.60	1,735.57	281.28	3,530.55	23.7
Residential/commercial	179.40	22.48	42.28	1.14	245.30	1.6
Commercial	21.55	46.52	20.41	3.70	92.18	0.6
Industrial	177.54	1,013.18	374.83	60.62	1,626.17	10.9
Facilities	169.95	281.02	159.08	26.22	636.27	4.3
Public Utilities	37.89	62.64	30.05	10.17	140.75	0.9
Special Use	65.34	495.81	956.44	3.75	1,521.34	10.2
Governmental Institutions	34.40	222.24	1,379.24	6.32	1,642.20	11.0
Transportation	191.50	240.40	3,206.50	127.40	3,765.80	25.3
Agriculture	5.82	329.12	1,288.80	69.27	1,693.01	11.4
Total Developed Area	1,423.49	3,687.01	9,193.20	589.87	14,893.57	100.0
% in Total Planning Area	3.7	8.9	17.6	0.6	6.5	
Total Planning Area	38,600	41,400	52,100	98,400	230,500	

Note: "Transportation" of Seeb includes the Airport Area covering about 2,800 ha.

Source: Muscat Area Structure Plan, except the Total Study Area measured by Study Team

2) Salalah

The final report on the Salalah Structure Plan (1995-2015) was submitted by the contracted consultant to the Ministry of Housing in November 1998. This plan is the present authorized Structure Plan for the Planning Area of Salalah. The Planning Area extends from Al Mughsail in the west to Khawr Sawli in the east. It is bounded by the Jebel al Qara Mountain Range in the north, and by the Arabian Sea in the south, stretching over a length of more than 60 km while the depth available from the coastline varies from 6 to 14 km.

The total area measures 620.50 km², occupying around 21% of Wilayat of Salalah. A land use survey for the Planning Area was carried out in 1995. The results are shown in Table 3.5-8. The total developed area is 14,213.65 ha, which occupies about 23% of the Planning Area. The remaining 77% is vacant. The largest component of total land use is "Special Uses", followed by "Transportation" and "Agriculture". Residential land is only about 8.5% of the total developed area. "Industrial" and "Public/Semi-public Facilities" are about 6% and 7%, respectively.

Salalah being Oman's one of the most important towns, comprises various special uses under the Ministry of Defense, Royal Oman Police and Diwan of Royal Court (The Palace). In 1995, special uses occupied 3,918 ha in area, the largest share in the existing land use composition.

Table 3.5-8 Land Use Area by Category in Salalah, 1995

Land Use Category	Land Use Area (ha)	% in Total Developed Area
Residential	1,180.33	8.3
Commercial	67.90	0.5
Industrial	810.29	5.7
Public/Semi-public Facilities	979.49	6.9
Transportation	3,784.83	26.6
Open Spaces	128.45	0.9
Special Uses	3,917.70	27.6
Agriculture	2,513.66	17.7
Wadi & Env./Historical Sites	831.00	5.8
Total Developed Area	14,213.65	100.0
% in Total Planning Area	22.9	
Total Planning Area	62,050.00	
% in Total Wilayat Area	21.3	
Total Wilayat Area	291,800.00	

Source: Salalah Structure Plan (1995-2015)

In 1995, area under agricultural use was about 2,500 ha. Nearly half of the agricultural area is used for growing fodder. In recent years, the agricultural activity has been adversely affected by increasing salinity of ground water, which is caused by over-abstraction of water for fodder cropping and recharge deficit.

Of the "Industrial" use of about 800 ha, 43% was under mining activity. So, about 460 ha were for manufacturing and service industries. There are two distinct industrial areas in Salalah. One is the New Industrial Area (280 ha) in Awqad and the other is the Raysut Industrial Estate (125 ha). The New Industrial Area is not fully developed yet. Also, it comprises many large automobile showrooms, warehouses and commercial establishments. There are empty plots with only boundary walls. The Raysut Industrial Estate is still in initial stages of development. Out of the total area, only about 30 ha are developed.

Residential areas are roughly classified into two types. One is old settlements and their organic expansion/outgrowths such as Haffa, Dahriz, Middle and East Salalah, where the residential areas are densely built, congested with commercial uses and haphazard growth. The other is planned residential areas such as New Salalah, North Awqad and Madinat Al-saada with houses on individual plots, laid out in grid pattern, conforming to various building regulations. In residential areas of the second type, a large number of residential plots (30-50% of total residential plots planned in an area) remain unbuilt for many years. This is mainly due to the national housing policy.

3.6 VEHICLE REGISTRATION AND CAR OWNERSHIP

3.6.1 Vehicle Registration

Table 3.6-1 shows the number of vehicles at the end of each year and annual growth rates by type of registration. The type of registration does not correspond to the type of vehicle. Buses and trucks for business use are involved in the category "Commercial" but those used by household are included in the category "Private".

Until 2000, the number of "vehicles registered" and the number of "vehicle cancelled & exported" were made public annually. The number of vehicles registered during 1996 was 37,995, while the number of vehicles cancelled & exported during the same year was 18,014. The number of vehicles on the road was 300,238 at the end of 1995. The official number of vehicles on the road for the end of 1996 was 317,429. This value is near to the expected value of 320,219 ($300,238 + 37,995 - 18,014 = 320,219$). However, after 1997 until 2000, the number of vehicle on the road was calculated only by adding the number of vehicles registered during the year to the previous number of vehicles on road, neglecting the number of vehicles cancelled & exported. In 2001 some number was subtracted from the sum of the yearend number of vehicles in 2000 and the number of vehicles registered during 2001. The fact that the growth rates of 1995-96 and 2000-01 were lower than the other years in Table 3.6-1 is attributable to the above. Accordingly, it is not easy to grasp the real number of vehicles used in the country. The data of the number of vehicles on the road should be treated carefully.

Table 3.6-1 Number of Vehicles on Road by Type of Registration, 1995-2002

Type of Registration	Number of Vehicle							
	1995	1996	1997	1998	1999	2000	2001	2002
Private	166,085	176,637	200,183	229,029	254,214	280,977	309,217	335,771
Taxis	13,390	15,494	19,639	24,014	29,246	35,159	20,901	23,639
Commercial	89,256	92,002	101,223	110,717	117,615	124,582	132,920	140,270
Government	22,349	23,525	24,641	25,250	25,983	26,804	27,788	29,175
Others	4,793	5,525	7,758	10,705	15,263	23,342	24,905	26,011
Motor Cycles	4,365	4,246	4,436	4,660	4,853	5,050	5,195	5,436
Total	300,238	317,429	357,880	404,375	447,174	495,914	520,926	560,302
Type of Registration	Annual Growth Rate (%)							
	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	Average
Private	6.4	13.3	14.4	11.0	10.5	10.1	8.6	10.6
Taxis	15.7	26.8	22.3	21.8	20.2	-40.6	13.1	8.5
Commercial	3.1	10.0	9.4	6.2	5.9	6.7	5.5	6.7
Government	5.3	4.7	2.5	2.9	3.2	3.7	5.0	3.9
Others	15.3	40.4	38.0	42.6	52.9	6.7	4.4	27.3
Motor Cycles	-2.7	4.5	5.0	4.1	4.1	2.9	4.6	3.2
Total	5.7	12.7	13.0	10.6	10.9	5.0	7.6	9.3

Source: Statistical Yearbooks 2001 and 2002

3.6.2 Car Ownership

In the Household Expenditure & Income Survey 1999-2000 (HEIS 1999-2000), information about the number of private cars owned by household was obtained. Table 3.6-2 is a special tabulation by MONE about the distribution of households by number of private cars owned and income group. According to the table, 61% of total households possess at least one private car and many households in the income group of more than RO 700 per month have three cars or more. In addition to this information, MONE estimated the number of cars owned by income group. The total number of private cars was estimated at 247 thousand for the survey period of 1999-2000. Comparing this number with the number of registered private vehicles of 254 thousand at the end of 1999, the difference between both is relatively small.

By using these data, car ownership by income group was estimated. Table 3.6-3 shows the results. The average household car ownership is 0.85 vehicles per household. Households with monthly income of more than RO 500 possess more than one car on average. Even of the households in income group of RO 100-199 per month, nearly 1/3 possesses their private cars. Car ownership per 1,000 persons was calculated considering that the higher income group the larger household size. The average ownership is 123.5 vehicles /1,000 persons (one car for every 8 persons). The ownership of the lowest income group is 32.8 vehicles/1,000 persons (one car for every 30 persons) and that of the highest income group is 188.7 vehicles/1,000 persons (one car for every 5 persons)

Table 3.6-2 Distribution of Households by Number of Private Cars Owned

Income Group	Number of Private Cars Owned				Total
	0	1	2	3+	
<100	21,841	2,146	265	0	24,252
100-199	28,008	8,719	803	201	37,731
200-299	20,417	16,862	1,869	28	39,176
300-399	17,175	19,235	1,738	107	38,255
400-499	9,584	16,555	3,335	123	29,597
500-599	4,304	16,456	3,204	902	24,866
600-699	3,161	10,768	3,167	738	17,834
700+	8,290	33,641	23,585	11,873	77,389
Total	112,780	124,382	37,966	13,972	289,100

Source: MONE, Special Tabulation of HEIS, 1999/2000

Table 3.6-3 Car Ownership by Household Income Group

Income Group	No. of Household	Average HH Size	No. of Cars Owed	Vehicle per Household	Vehicle per 1000 psns
<100	24,252	3.37	2,677	0.11	32.8
100-199	37,731	5.26	10,928	0.29	55.1
200-299	39,176	6.32	20,684	0.53	83.5
300-399	38,255	6.90	23,034	0.60	87.2
400-499	29,597	7.62	23,594	0.80	104.6
500-599	24,866	7.82	25,572	1.03	131.5
600-699	17,834	8.27	19,634	1.10	133.1
700+	77,389	8.27	120,823	1.56	188.7
Total	289,100	6.92	246,946	0.85	123.5

Source: MONE Special Tabulation of HEIS and Study Team Estimates

3.7 OMANIZATION

The "Omanization" is one of major issues and concerns of the Oman government. Every recent Five Year Plan mentioned about it, and set targets of the percentages of the number of Omani employed persons in the public and private sectors. As shown in Table 3.7-1, "Omanization" in the public sector is progressing steadily. After 2000, the percentage of Omani employees is increasing by 2.3 percentage points every year from 74.0% in 2000. If this trend will continue until 2005, the targeted percentage of 84% will be achieved.

Table 3.7-1 Trend of Employment by Nationality in Public Sector, 1995-2002

	1995	1996	1997	1998	1999	2000	2001	2002
Government Employees	110,529	102,064	103,575	106,162	108,210	110,498	114,370	118,632
Civil Service	86,202	78,277	79,195	80,968	82,905	84,662	87,652	91,237
Omani	59,728	53,038	54,242	55,858	59,774	63,934	68,496	73,766
- Men	47,535	40,688	41,218	41,290	43,272	45,293	47,550	49,702
- Women	12,193	12,350	13,024	14,568	16,502	18,641	20,946	24,064
Expatriate	26,474	25,239	24,953	25,110	23,131	20,728	19,156	17,471
- Men	16,154	15,420	15,245	14,881	13,621	11,260	9,467	8,688
- Women	10,320	9,819	9,708	10,229	9,510	9,468	9,689	8,783
Dean of Royal Court	17,004	16,906	17,418	18,057	17,915	18,280	18,963	19,334
Omani	10,848	10,657	11,228	11,530	11,808	12,243	12,891	13,324
- Men	10,351	10,184	10,728	11,167	11,237	11,644	12,262	12,675
- Women	497	473	500	363	571	599	629	649
Expatriate	6,156	6,249	6,190	6,527	6,107	6,037	6,072	6,010
- Men	6,036	6,134	6,079	6,446	6,007	5,937	5,970	5,916
- Women	120	115	111	81	100	100	102	94
Public Corporations	7,323	6,881	6,962	7,137	7,390	7,556	7,755	8,061
Omani	5,176	4,876	5,036	5,181	5,418	5,602	5,822	6,132
Expatriate	2,147	2,005	1,926	1,956	1,972	1,954	1,933	1,929
Public Sector								
Omani Total	75,752	68,571	70,506	72,569	77,000	81,779	87,209	93,222
Expatriates Total	34,777	33,493	33,069	33,593	31,210	28,719	27,161	25,410
Omanization Rate (%)	68.5	67.2	68.1	68.4	71.2	74.0	76.3	78.6

Source: Statistical Yearbook 2002

In the private sector, the "Omanization" rate is very low, as described in Section 3.4. However, the comprehensive data about the percentage of Omani employees in the

private sector is not available after 1993 General Census. In 1996 and 2000 two Labor Force Surveys were conducted for Omanis, but their absolute numbers were the results of enlargement based on the official population projections for each year, which might be overestimated judging from the results of 2003 Census.

In the official evaluation of the Fifth Five Year Development Plan, the actual Omanization rates of the private sector were estimated at 14.7% in 1995 and 16.6% in 2000, respectively. The percentage of 14.7% for 1995 is the same as that of 1993 Census. The rate of 16.6% for 2000 might be an estimate based on the 2000 Labor Force Survey for Omani employees and yearly estimation of the number of expatriate employees. For more reliable data, it is inevitable to tabulation results of 2003 Census.

For the private sector Omani employees, the numbers of employees registered with public authority for social insurance are published every year. The number is increasing year by year, as shown in Table 3.7-2. However, their coverage was about 57% in 2000.

The promotion of "Omanization" in the private sector is important. But the low rate of it is mainly attributable to the inconsistency between the needs of business world and the government policy. In addition, intentions of youths are more sophisticated than the real world expects them. It is feared that the more educated and trained under the Human Resources Development policy, the higher unemployment rate would be among younger people.

Table 3.7-2 Trend of Employment by Nationality in Private Sector, 1995-2002

	1995	1996	1997	1998	1999	2000	2001	2002
Total	518,300					592,900		
Omani Total	76,190					98,420		
Registered for S. I.	24,690	29,122	34,004	46,171	50,660	55,671	60,487	65,879
- Men	21,058	24,687	28,675	38,569	41,910	45,623	49,584	53,787
- Women	3,632	4,435	5,329	7,602	8,750	10,048	10,903	12,092
Others	51,500					42,749		
Expatriates	442,100	484,000	494,000	483,000	475,000	494,480	530,000	547,000
Omanization Rate (%)	14.7					16.6		

Source: Sixth Five Year Plan Document and Statistical Yearbook 2002

3.8 TAXATION SYSTEM

3.8.1 National Revenue

National revenue of 2004 estimated for State General Budgeting purpose is shown in Table 3.8-1.

Table 3.8-1 National Revenue of 2004

Items	Estimate in million RO
Oil Revenue	1,654
Surplus in sales of oil concentrates	160
LNG and oil concentrates	255
Natural Gas	95
Other current revenue	744
Capital revenue	5
Capital reimbursement	12
Total	2,925

Share of other current revenue, tax income is included in this kind of revenue, is only 24% of total revenue and oil/gas related revenue is, in comparison of that, 75% of the total. The importance of tax revenue to the national revenue is definitely smaller comparing to other non oil producing countries.

Hereafter, it is referred to the taxation system limited in what has influence on car ownership and vehicle operating cost, because of the limited impact of tax to the National Finance.

3.8.2 Income Tax

Income tax is generally divided into two, corporate income tax and personal income tax. Corporate income tax has two types of application, which is for local company and for foreign company. The local company is defined as local share is majority and the foreign company definition is vice versa. The tax rates are summarized in Table 3.8-2. As for personal income tax, it is not charged to any person.

3.8.3 Import Tax

The Sultanate of Oman has joined into the custom union composed of the Arab Gulf Countries.

The custom union is based on the following principle;

- a. Unified custom tariff towards the outside world
- b. A unified custom union
- c. Similar custom regulations and procedures

Table 3.8-2 Tax Rates (% p.a.)

Taxable Income	Local Company	Foreign Company
Up to RO 5,000	0	0
More than RO 5,000 and up to RO 18,000	0	5
More than RO 18,000 and up to RO 30,000	0	10
More than RO 30,000 and up to RO 35,000	12 (in excess of RO 30,000)	10
More than RO 35,000 and up to RO 55,000	12 (in excess of RO 30,000)	15
More than RO 55,000 and up to RO 75,000	12 (in excess of RO 30,000)	20
More than RO 75,000 and up to RO 100,000	12 (in excess of RO 30,000)	25
More than RO 100,000	12 (in excess of RO 30,000)	30

Table 3.8-3 summarizes custom duties. Some of goods, exempted from custom duty according to the united custom system law and bilateral agreement are not filed in the Table.

Table 3.8-3 Custom Duties

Type of Goods	Duty (%)	Note
Tobacco and its derivatives *	100	
All kinds of alcoholic drinks *	100	
Special kinds of meat and its derivatives *	100	Noted as pork in parentheses
Dry Lemon **	100	Protection duty ended in 2005
Dates and Bisoor **	20	Protection duty ended in 2005
Fresh Bananas **	25	Protection duty ended in 2005
Other Goods *	5	

*: unified

**: valid in Oman

Any vehicle belongs to “Other Good”. It means import duty of any vehicle is 5% of import price in flat.

3.8.4 Other National Duties

Value added tax, sales tax, vehicle (holding) tax, other asset holding taxes, or other annual duties are not levied.

3.8.5 Municipal Tax

Municipality charges sales tax to hotels and restaurants (5% in the Governorate of Muscat), and collects administration handling charges from some of permission such as building permission fee, advertisement sign board permission fee and so on. But any taxes/charges do not apply to buy and hold vehicles.

3.8.6 Depreciation

Depreciation rate of vehicles and heavy machinery including tractor are set as fixed rate without residual value in three years. It means annual depreciation value is 33 and 1/3 percent of the purchased value.

3.9 RELEVANT DEVELOPMENT PLANS

3.9.1 National Development Plan

Since 1976, six Five Year Development Plans have been prepared in Oman. At present, the Sixth Five Year Development Plan (2001-2005) is being implemented. These development plans were considered as the five-year implementation plans of two long-term strategies for development. The first long-term strategy was for the period 1970-1995, and the second one for the period 1996-2020. The first four development plans were prepared under the policies of the first long-term strategy, while the recent two plans under the second long-term strategy, Oman Vision 2020.

3.9.2 Oman Vision 2020

For addressing the challenges which were clarified before preparing the Fifth Five Year Plan, the "Vision for Oman's Economy: Oman 2020" was prepared. It was adopted as the second long-term development strategy for the period 1996-2020 on January 1 1996, in accordance with the Royal Decree No (1/96). The Fifth Five Year Plan was

considered as the first implementation program for the achievement of the primary dimensions of the "Vision".

The primary aim of the Oman Vision 2020 was to maintain at least the current level of per capita income in real terms, and to strive to double it by 2020. This would be achieved through treating the Fifth Five Year Plan period (1996-2000) as a transitional stage during which the government would attempt to achieve a balance between revenues and expenditures by the end of the Plan. The Vision also aimed at providing suitable conditions for economic take off. The government would strive to use the proceeds of oil and gas for sustainable economic diversification and it will accept full responsibility for promoting basic health, education and training for Omani citizens, in addition to adopting policies that promote their standard of living.

The Vision adopted the "Achievement of Economic Balance and Sustainable Growth" as the basic strategy, and the following three as the main strategies for assisting it.

1. Human Resources Development
2. Economic Diversification
3. Private Sector development

3.9.3 Sixth Five Year Development Plan (2001-2005)

This plan is considered as the second implementation plan of Oman Vision 2020. The plan includes "Human Resources Development" as social development plan, and "Economic Diversification" as economic development plan. The following is the summary of these plans.

1) Human Resources Development

The existing social development plans are included in the "Human Resources Development" in the Sixth Five Year Development Plan (2001-2005). The following is a summary of the above.

a. Population Projections in the Plan

For the preparation of the population projections, two major population groups were identified in the country. Those were Omani population and expatriate population. The projection for each of these two groups was conducted separately and independently.

For the preparation of the projections of the Omani population, the MONE adopts the

"Component Method". The expatriate population projections were prepared by using demand forecasts for expatriate labor force and dependency rates of expatriate population.

Taking 2000 as the base year, the total population size of the country was estimated at about 2.4 million. Omanis constitute about 74% of the total population, while the expatriates form about 26%. The gender distribution varies between Omanis and non-Omanis. The distribution of Omani population is 50.8% males and 49.2% females. That of non-Omani population, however, is 79.9% males and 20.1% females. The age structure of Omani population is similar to that in developing societies where the population pyramid is distinguished by a wide base that gradually narrows. These indicate the increase in fertility and birth rates and thus increase in the percentage of children in the population. More than 43% of the total Omani population were estimated in the age group of less than 15 years. For the non-Omani population, this ratio was estimated at 11.6%.

On the assumption of total fertility rate of 3.9 births/female, it is expected that the Omani population will grow at an average annual rate for the Plan period of about 2.64%. This will increase the Omani population from 1,778.0 thousand in 2000 to 2,025.7 thousand in 2005. Regarding the expatriate population, based on demand forecasts for expatriate labor force and their estimated economic dependency ratio (0.16% in 2000), their number is expected to increase from 624.0 thousand in 2000 to 632.9 thousand in 2005. Accordingly, the total population is expected to increase from 2,402 thousand in 2000 to 2,658.6 thousand in 2005, at an average annual rate of 2.05% (see Table 3.9-1).

Table 3.9-1 Population Projections for Sixth Five Year Plan

	Base Year 2000	Sixth Five Year Development Plan					AAGR (%)
		2001	2002	2003	2004	2005	
Omanis	1,778.0	1,822.7	1,871.6	1,921.7	1,973.2	2,025.7	2.64
Expatriates	624.0	671.5	712.0	730.6	678.5	632.9	0.28
Total	2,402.0	2,494.2	2,583.6	2,652.3	2,651.7	2,658.6	2.05

Source: Sixth Five Year Development Plan (2001-2005)

b. Labor and Omanization Sector

b-1 Labor Force Supply

The forecasts for the labor force supply during the Plan period were prepared based on the Omani population projections by age group and sex. The forecasts depended on the results of the 1993 Census and the economic activity rates, which were derived from the results of the Labor Force Survey in 2000 for the different age groups and males and females. It is not expected that these rates will change during the relatively short plan years.

By applying the assumed economic activity rates by age group and sex, the overall supply of labor force during the Plan period was estimated as shown in Table 3.9-2.

Table 3.9-2 Estimates of Labor Force Supply by Omanis during Sixth Five Year Plan

('000)

	Base Year 2000	Sixth Five Year Development Plan				
		2001	2002	2003	2004	2005
Total Population	1,777.7	1,822.7	1,871.5	1,921.7	1,973.1	2,025.7
Males	903.3	926.8	951.7	976.7	1,002.8	1,029.5
Females	874.4	895.9	919.8	945.0	970.3	996.2
Pop. 15 Years +	1,008.9	1,045.2	1,089.2	1,138.2	1,184.4	1,230.9
Males	512.7	530.7	552.7	577.1	600.2	623.4
Females	496.2	514.5	536.5	561.1	584.2	607.5
Labor Force	365.9	409.4	430.7	452.0	473.6	495.3
Males	301.5	338.7	356.2	373.9	392.0	410.4
Females	64.4	70.7	74.5	78.1	81.6	84.9

Source: Sixth Five Year Development Plan (2001-2005)

The Table indicates that the Omani labor force will increase 129.4 thousand during the period 2000-2005.

b-2 Labor Force Demand

Labor force forecasts in the Plan were prepared according to the following assumptions:

- The targeted AAGR of the non-oil sectors is 4.5%
- The AAGR of improvement of the overall productivity 1.5%.

Thus, it is expected that the overall demand for labor force will increase by AAGR of about 3%. The total volume is expected to increase from about 703 thousand employees in 2000 to about 813 thousand employees in 2005. This means that the Plan will provide 109 thousand additional employment opportunities.

From the sectoral viewpoint, the five sectors of highest contribution to provision of additional employment opportunities (according to rank) are "construction", "education", "trade", "manufacturing" and "transport, storage and communications".

b-3 Balance between Supply and Demand

As a result of the above, the overall balance of supply and demand is estimated to be in excess of about 20 thousand. Full employment of new entrants to the labor market could have been achieved through substitution of the huge numbers of the expatriates labor force. However, due to the inconsistency between the structures of supply and demand for labor force and the realities of labor market situation, this could not be realized.

b-4 Targets of Labor and Omanization Sector

In view of the previous analysis of labor force demand and supply, and assuming realistic Omanization ratios that are consistent with the labor market status, it is expected that the employment in both the civil public and private sector will take the following status:

- Provision of 109,235 new employment opportunities. This will raise the total employment from 703,433 workers in 2000 to 812,668 workers in 2005 at an AAGR of about 3% during the Plan period
- The majority of the additional employment opportunities will be provided by the private sector. The private sector is expected to provide about 93.2 thousand additional employment opportunities.
- Through filling new employment opportunities and the Omanization process, the Omani labor force is expected to acquire 99,033 employment opportunities in the Plan. This will result in increasing its total volume from 180,015 in 2000 to 279,048 in 2005. The total additional employment opportunities for the expatriate labor force are not expected to exceed 10,202. This will increase the total number of expatriate workers from 523,418 in 2000 to 533,620 in 2005.
- The public sector is expected to absorb a number of educational and health profession outputs to satisfy the necessary requirements of the sector. The total number of Omanis who will be employed is estimated to be about 24.6 thousand, of this number 16 thousand are additional employment opportunities while the remaining 8.6 thousand are opportunities created by the replacement.
- The Omanization in private sector is expected to increase from 16.6% in 2000 to 25% by the end of the Plan. This is as a result of the policies and measures that will be implemented. In the civil public sector, the rates are expected to increase from

74% to 84% due to the expected substitution in the education and health sectors and particularly in the general education sector.

The summary of the above is shown in Table 3.9-3.

Table 3.9-3 Target of Employment and Omanization
in Sixth Five Year Plan

	Employment		Additional
	2000	2005	2000-05
No. of Employed			
Total	703,433	812,668	109,235
Omanis	180,015	279,048	99,033
Expatriates	523,418	533,620	10,202
Omanization (%)			
Public Sector	74	84	
Private Sector	16.6	25	

Source: Sixth Five Year Development Plan (2001-2005)

c. Other Sectors

For other sectors relating to human resources development, the Plan sets various quantitative targets. Main quantitative targets are as follows:

For education and training sector:

1. Increasing the enrollment rate for the first class of the primary education from 75.4% to 85% for males and from 74.7% to 84% for females.
2. Reducing the illiteracy rate among population of the age group 15 years and above from 28.5% to 26.7%.
3. Increasing the Omanization rate among teachers in the general education from 62.4% to 97%.
4. To increase the rates of admission of general secondary outputs in the higher education institutions from 43.1% to 52.4%.
5. Increasing the Omanization rates for teaching staff in the teachers training colleges from 7.6% to 40% by the end of the Plan period.
6. Increasing the number of registered students from 8 thousand to 11 thousand by the end of the Plan in Sultan Qaboos University.
7. Increasing the Omanization rates among the teaching staff of PhD holders from 16% to 43%.
8. Increasing the numbers of those enrolled in the technical industrial colleges from 4,500 to 6,000 students.
9. Raising the Omanization rate of teaching staff in the technical industrial colleges from 14% to 28%

10. Raising the Omanization rate of the teaching staff in the vocational training centers from 33% to 66%

For health sector:

1. reducing the infant mortality rate from 17.6 to 14 per thousand live births
2. Reducing the rate of deaths of children less than 5 years old from 21.5 to 17 per thousand live births.
3. Reducing birth rate from 30 to 26 per thousand populations.
4. Increasing the Omanization rate in the sector as a whole from 24.4% in 1999 to 42.4% by the end of the Plan.

2) Economic Diversification

The sectoral plans related to economic development of Oman are summarized in the Plan Document Volume III "Development of the Economic Diversification Sectors" The following is an extract from the Document.

a. Oil Sector

a-1 Major Objectives

For accomplishing the targeted strategy for the oil sector in the Oman vision 2020, the Plan seeks to achieve the following objectives:

1. To increase the average daily production of crude oil to reach 907.8 thousand barrels.
2. To maintain the volume of proven reserve of oil until the end of the Plan period (5.8 billion barrels). This can be achieved by increasing the oil reserve of PDO to be, as or more than the quantity of oil produced annually. Also by working towards increasing the general total reserve by the participation of all oil companies operating in the country.
3. To increase the production capacity of oil, but to maintain the annual production so that it will not exceed 6.5% of the remaining reserve of the oil.
4. To increase Omanization rate from 79.7% in 2000 to 93.5% in 2005.

a-2 Targeted Economic Indicators

Based on the approved sectoral objectives in the Plan, the Plan aims to achieve the following improvements in the quantitative and qualitative indicators of the sector:

1. The value added for crude oil sector

As the Plan adopted US\$ 18 per barrel as an average price of oil, it is expected that the value added for the crude oil sector will retract at an annual rate of 7.1% on average.

2. The operating costs

It is expected that the annual average operating costs for PDO remain at the level of RO 132 million. Regarding the other producing companies, it is expected that the annual average operating costs will increase from about RO 21.6 million in 2000 to RO 31.4 million.

3. Production cost per unit in PDO

It is expected that the production cost per unit in PDO would decrease for the government from RO 5.2 per barrel in 2000 to RO 4.8 per barrel in 2005, while for the company increase from RO 3.5 per barrel to RO 3.9 per barrel.

4. It is anticipated that PDO will add to its oil reserves during the Plan period, through the new explorations and revision of the reserve estimates, about 354.8 million barrels on average per year. Also, it is expected that the other working companies will implement the exploration programs and appraising of reserve estimates. Accordingly, it is expected that the proven reserve of oil remain at its actual level of 2000 until the end of the Plan period, which is estimated to be 5.8 billion barrels, regardless of the targeted increase in the levels of production of crude oil.

5. Omanization

It is expected that the total workforce in the oil companies will increase from 4,152 employees in 2000 to about 4,790 employees in 2005. The total Omani workforce is expected to increase from 3,310 employees in 2000 to 4,481 in 2005. Accordingly, the Omanization rate will increase from 79.7% in 2000 to 93.5% in 2005.

b. Gas Sector

b-1. Major Objectives

In accordance with the vision for the natural gas sector, the major approved objectives include:

1. To increase the natural gas reserves through prospection and exploration and proving the reserve.
2. To increase the value added of the natural gas, and production of 72 thousand

barrels per day of oil condensates and pursuing the processing of these condensates.

3. To provide employment opportunities for the Omanis in the sector. The Omani workforce annual growth rate will attain 14.1% on average for the Plan period and Omanization rate will become 90.4% by the end of the Plan period.

b-2 Targeted Economic Indicators

The Plan aims at increasing the major economic indicators of the sector as:

1. The growth of the proven non-associated gas during the Plan period at an annual rate of 0.5% and the expected reserve by annual rate of 1.9%. Therefore, it is expected that the proven non-associated gas reserve will increase from about 19.0 trillion cubic feet in 2000 to about 19.5 trillion cubic feet by the year 2005. Also, an increase of the expected reserve from 26.6 trillion cubic feet in 2000 to about 29.2 trillion cubic feet in the year 2005.
2. The annual demand for the natural gas is expected to grow from about 694.9 million cubic feet per day in 2000 to about 1,848.7 million cubic feet per day in 2005. It is expected that the average annual growth of demand for the natural gas to reach 21.6% for the Plan period.
3. GVA of the sector will grow by an average rate of 16.6% to reach RO 218.7 million in 2005.
4. The workforce in the sector will grow from 174 employees in 2000 to 218 employees in 2005. Also, the number of Omani workforce in the sector will increase from 102 to 197. The Omanization rate rises from 58.6% in 2000 to 90.4% in 2005.
5. To meet the increasing demand for natural gas, it is expected that 0.3 trillion cubic feet of gas will be purchased from Gulf Stream Company with a total cost of RO 38.7 million

c. Industry Sector

This sector's major objectives and targeted economic indicators are as follows:

1. To achieve an average output growth rate of the sector, including the petrochemicals and oil refining activities, of 11.7%
2. To support the balance of payments through increase of exports to achieve an average growth rate in industrial exports of 16.3% and the lowering of imports.
3. To achieve an annual average growth rate of 7% for the Omani workforce in the sector and provision of high rank jobs for Omani graduates from universities and institutes.

4. To achieve Regional balance in the industrial development

d. Tourism Sector

This sector's major objectives and targeted economic indicators are as follows:

1. To achieve an average annual growth rate of 6.1%
2. To activate the private sector role and increase its contribution to the sector's development
3. To maintain the social, environmental and cultural factors to accomplish the sector's sustainable development.
4. To achieve Regional balance in tourism development.
5. To develop Omani workforce to meet the expected increase in the demand for labor in the sector and to increase the rate of Omanization to 50%.
6. To arrange self-funding resource for the projects aiming for sector development.

e. Agriculture and Livestock Sector

This sector's major objectives and targeted economic indicators are as follows:

1. To achieve an average annual growth rate of 2.6% in the output of the sector during the Plan period.
2. To maximize the benefit from the water and soil resources to achieve a greater efficiency in their use and guarantee increased production and achieve the food security and increase of national income.
3. To maximize the economic, water, social and environmental returns from growing date palms in the country at individual and national levels.
4. To maximize the benefit of small producers from Oman Development Bank.
5. To train targeted groups on the new technology in the agriculture and fisheries sectors, and to train and motivate youth to work and invest in these sectors.
6. To provide the required infrastructure for sector development.
7. To develop the livestock sector with the aim of increasing its contribution to national economy's diversification.
8. To achieve an average annual growth rate, in Omani workforce in the sector, of 3.5% during the Plan period.

f. Fisheries Sector

This sector's major objectives and targeted economic indicators are as follows:

1. To achieve an average annual growth rate of 3.9%.
2. To maintain and develop the marine resources and fisheries.
3. To accomplish a sound administration for fisheries and coastal areas.
4. To organize marine fishery surveillance.
5. To improve post fishing activities and trading, and to achieve an average growth rate of 11.5% in the exports.
6. To complete the infrastructure.
7. To secure productive employment opportunities in the fishing villages and to raise the level of fishermen income.
8. To raise the average consumption of fish and its products.
9. To further the role of the private sector in the sector development and to broaden its activities.

g. Mining Sector

This sector's major objectives and targeted economic indicators are as follows:

1. To achieve an average annual growth rate of 4.5%.
2. To achieve an average annual growth rate of 10% in the Omani workforce in the sector.
3. To activate the private sector to take a major role in the sector investments and to encourage international companies to invest in the sector.
4. To promote the optimal utilization of the mineral wealth and to increase the value added.
5. To concentrate on exploitation of industrial rocks and minerals for industrial development and increased inter-sectoral linkages.
6. To achieve Regional balance between development of the sector and conservation of environment.

h. Trade Sector

This sector's major objectives and targeted economic indicators are as follows:

1. To raise the economic efficiency and its contribution to the GDP, and to raise the efficiency of internal trade. The value added for the sector is expected to grow an annual average rate of 3.6% during the Plan period.
2. To achieve maximum benefit from the strategic location of the country so as to become an international center for re-export, and to work towards furthering the export trend through activation of exports.
3. To increase Omani participation in the trade activity.

4. To work towards preparing the country to face the issues of globalization and the new international economic system.
5. To work towards maximizing the country's benefit from its commercial relations.

3.10 NEIGHBORING COUNTRIES

3.10.1 Outline of GCC States

Oman is a member of the Gulf Cooperation Council" (GCC). The GCC was founded in 1981 by six member countries; Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates (UAE). Table 3.10-1 shows population and GDP data of GCC states comparing to those of Oman.

Population of Oman is larger than both the government official estimation of 2,538 thousand and 2003 Census result of 2,331 thousand. GDP data are expressed in terms of purchasing power parity US dollar. Applying the pegged exchange rate of US\$ 1 = RO 0.3845 to the provisional 2002 GDP at current prices of RO 7,809.1 million, 2002 GDP in term of US dollar is equivalent to US\$ 20.31 billion. This value is a little smaller than US\$ 22.40 billion in the table. Considering the low inflation rate of Oman in addition to these facts, Oman's GDP per capita in term of purchasing power parity US dollar might be around US\$ 9,000.

From the viewpoint of population size, Saudi Arabia is prominent, with a population of over 24 million. Kuwait, UAE and Oman are in the group of around 2 million. Bahrain and Qatar are in the group of less than 1 million. Every country involves a considerable ratio of expatriates, especially Kuwait and UAE. Although the ratio is relatively low, more than 5.5 million of expatriates are living in Saudi Arabia.

Regarding GDP per capita, Qatar and UAE are more than US\$ 20,000 and not far below the leading West European countries. Bahrain and Kuwait are positioned at the middle level, and Saudi Arabia and Oman at the lowest.

Table 3.10-1 Population and GDP of GCC States

	Population (July 2003 est)		Pop Growth Rate (%)	GDP (2002 est) (ppp US\$ b)	GDP per Capita (ppp US\$)	GDP Growth Rate (%)
	Total	%, Expatriates				
Bahrain	667,238	35.2	1.61	9.91	15,100	2.9
Kuwait	2,183,161	59.2	3.34	36.85	17,500	-2.0
Qatar	817,052		2.87	15.91	20,100	4.6
Saudi Arabia	24,293,844	23.0	3.27	268.90	11,400	1.0
UAE	2,484,818	64.6	1.57	53.97	22,100	1.8
Oman	2,807,125	20.6	3.38	22.40	8,300	2.2

Source: The World Factbook

Note: Data for Oman are not revised based on 2003 Census or Official GDP

Every country enjoys the existence of petroleum and natural gas. However, Bahrain is at the crisis of depletion of petroleum. Saudi Arabia has the largest proved reserves of petroleum in the world. Its reserves of 267.1 billion barrels account for 26% of the total proved reserves of 1,077.5 billion barrels at the end of 2000 in the world. Kuwait and UAE have 97.7 billion barrels and 80.3 billion barrels, respectively. Qatar's oil reserves are 14.5 billion barrels but proved reserves of natural gas amount to 17.9 trillion cubic meters, which is the third largest in the world. Comparing to them, the Oman's situation about petroleum and natural gas is not optimistic.

Table 3.10-2 Oil and Natural Gas Situation of GCC States

	Petroleum		Natural Gas	
	Proved reserves (million bbl)	Production (2001 est) (million bbl/day)	Proved reserves (billion cu m)	Production (2001 est) (billion cu m)
Bahrain	62	0.043	460	8.9
Kuwait	97,680	2.117	1,548	9.5
Qatar	14,510	0.864	17,930	32.4
Saudi Arabia	261,700	8.711	6,339	53.7
UAE	80,310	2.566	5,892	44.9
Oman	5,703	0.964	846	13.8

Source: The World Factbook

Note: Data of Oman are not revised based on official data about oil and gas

3.10.2 Brief Description about GCC Member States

The following is based on descriptions of "The World Factbook" about GCC countries.

1) Bahrain

Bahrain's small size and central location among Arabian Gulf countries require it to play a delicate balancing act in foreign affairs. Facing declining oil reserves, Bahrain has turned to petroleum processing and refining and has transformed itself into an international banking center. In Bahrain, petroleum production and refining account for about 60% of export revenues, 60% of government revenues, and 30% of GDP. With its highly communication and transport facilities, Bahrain is home to numerous multinational firms with business in the Gulf. Bahrain is dependent on Saudi Arabia for oil granted as aid. A large share of exports consists of petroleum products made from refining imported crude. Construction proceeds on several major industrial projects. Unemployment, especially among the young people, and the depletion of oil and underground water resources are major long-term economic problems.

2) Kuwait

Kuwait was attacked and overrun by Iraq on 2 August 1990. Following several weeks of aerial bombardment, UN coalition began a ground assault on 23 February 1991 that liberated Kuwait in four days. Kuwait spent more than US\$ 5 billion to repair oil infrastructure damaged during 1990-91. Kuwait is a small, rich, relatively open economy with proved crude oil reserves of about 98 billion barrels, 10% of world reserves. Petroleum accounts for nearly half of GDP, 95% of export revenues, and 80% of government income. Kuwait's climate limits agricultural development. Consequently, with the exception of fish, it depends almost wholly on food imports. About 75% of potable water must be distilled or imported. Kuwait continues its discussions with foreign oil companies to develop fields in the northern part of the country. Oil production declined by an estimated 8% in 2002 but is expected to return to the 2001 level in 2003.

3) Qatar

In 2001, Qatar resolved its longstanding border disputes with both Bahrain and Saudi Arabia. Oil and natural gas revenues enable Qatar to have a per capita income not far below the leading industrial countries of Western Europe. Oil and gas account for more than 55% of GDP, roughly 85% of export earnings, and 70% of government revenues. The proved reserves of petroleum of 14.5 billion barrels should ensure continued output at current levels for 23 years. Production and export of natural gas are becoming increasingly important to the economy. Qatar's proved reserves of natural gas exceed 17.9 trillion cubic meters, more than 5% of the world total and third largest in the world. Long-term goals feature the development of offshore natural gas reserves. Since 2000, Qatar has consistently posted trade surpluses largely because of high oil prices and increased natural gas exports, and Qatar's economy is expected to receive an added boost as it begins to increase liquid natural gas exports.

4) Saudi Arabia

The discovery of oil in the 1930s formed a base of the present status of the country. Following Iraq's invasion of Kuwait in 1990, Saudi Arabia accepted the Kuwaiti royal family and 400,000 refugees while allowing Western and Arab troops to deploy on its soil for the liberation of Kuwait the following year. A burgeoning population, aquifer depletion, and an economy largely dependent on petroleum output and prices are all major governmental concerns.

This is an oil-based economy with strong government controls over major economic

activities. Saudi Arabia has the largest reserves of petroleum in the world (26% of the proved reserves), ranks the largest exporter of petroleum, and plays a leading role in OPEC. The petroleum sector accounts for roughly 75% of budget revenues, 45% of GDP, and 90% of export earnings. About 25% of GDP comes from the private sector. Roughly 4 million foreign workers play an important role in the Saudi economy, for example, in the oil and service sectors. The government in 1999 announced plans to begin privatizing the electricity companies, which follows the ongoing privatization of the telecommunications company. The government is supporting private sector growth to lessen the kingdom's dependence on oil and increase employment opportunities for the swelling Saudi Population. Priorities for government spending in the short term include additional funds for the water and sewage system and for education. Water shortage and rapid population growth constrain the government's efforts to increase self-sufficiency in agricultural products.

5) United Arab Emirates (UAE)

In 1971, six states of the Persian Gulf coast merged to form the United Arab Emirates (UAE). They were joined in 1972 by another state. The UAE's per capita GDP is not far below those of leading West European nations. Its generosity with oil revenues and its moderate foreign policy stance have allowed the UAE to play a vital role in the affairs of the region. The UAE has an open economy with a high per capita income and a sizable annual trade surplus. Its wealth is based on oil and gas output (about 33% of GDP), and the fortunes of the economy fluctuate with the prices of those commodities. Since 1973, the UAE has undergone a profound transformation from an impoverished region of small desert principalities to a modern state with a high standard of living. At present levels of production, oil and gas reserves should last for more than 100 years. The government has increased spending on job creation and infrastructure expansion and is opening up its utilities to greater private sector involvement.

3.11 CONSIDERATIONS FOR FUTURE SOCIOECONOMIC FRAMEWORK

3.11.1 Future Social Development

The Sixth 5-Year Development Plan is based on official population projections, which are prepared using the results of the 1993 General Census as the base and several population indicators derived from the changing trends. The social development plan depends greatly on the population size, sex-age structure, labor force participation and changing trends of population indicators such as total fertility rate, death rates, etc. Therefore, it is necessary to revise the population projections utilizing the new results of 2003 General Census and recent changing trends of population indicators especially total fertility rate.

An intermediate evaluation of the Plan based on the revised population projections and actual social indicators is required for the establishment of more realistic plan targets. For the future social development of the country, the following should be taken into consideration:

1. To apply the data of 2003 Census, in order to grasp the real present situation of population size, sex-age structure, labor force status of population 15 years and over, etc.
2. To evaluate the Oman Vision 2020 and the Sixth Five Year Plan targets based on the results of the Census analysis and actual social indicators.
3. For the realization of the targets related to the human resources development, to strengthen the efforts to make consensus among leading sectors for the education and training of young generations to meet the needs of social and economical fields. .
4. For the regionally balanced development, to establish a target on the transport and communication systems that will promote for the related domestic sectors to be located in remote Regions, and to implement related projects.

Considering the above issues, a future population projection is prepared for this Study based on the changes which occurred between 1993 and 2003. And two to three development scenarios are prepared.

After evaluating the development scenarios and discussions with the Omani side, one scenario is selected and a socioeconomic framework corresponding to the scenario is prepared.

3.11.2 Future Economic Development

The Sixth Five Year Development Plan is based on the planned oil price of US\$ 18 per barrel, despite the expectations that it would be above US\$ 20 per barrel (it reached over US\$ 35 by the end of the Study). It might make possible for the government to control the fiscal balance relatively on the safe side. However, it is necessary to evaluate the Plan intermediately based on the actual oil prices and economic growth. In the Plan, various sectoral targets and policies are described. They are inter-related with each other. For the future economic development of the country, the following should be taken into consideration:

1. To accelerate the analysis of 2003 Census, in order to grasp the real present situation of population size, sex-age structure, labor force status of population 15 years and over, etc.
2. To evaluate the Oman Vision 2020 and the Sixth Five Year Plan targets based on the actual economic indicators and the results of the Census analysis
3. For the realization of the targets related to the economic diversification, to strengthen the efforts to introduce foreign investments to the key sectors with a system for them to be convinced to obtain reasonable profits from their investment projects.
4. For the Regionally balanced development, to establish a target on the transport and telecommunication systems, this will promote the domestic and foreign investors to locate in remote regions, and to implement the related projects.

Considering the above situations, two to three long-term development scenarios are prepared and studied under this Study. After evaluating the development scenarios and discussions with the Omani side, one scenario is selected and a socioeconomic framework corresponding to the scenario is prepared.