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**The East Coast Of The United Arab Emirates: An
Evaluation Of Economic Activities
And Future Prospects**

By

Saif Salim Hassan Saif

B.A., Economic Geography

M.Sc., Agricultural Geography

A thesis submitted in fulfilment of the requirements
for the degree of Doctor of Philosophy

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Department of Geography
The University of Durham, England

1992



| 2 DEC 1992

In the name of Allah

The compassionate

The Merciful

*In memory of my beloved mother
who died when I was young*

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Abstract

The United Arab Emirates with its coastal land from the western borders with the state of Qatar and the Saudi Arabia to the Omani borders in the east has many economic activities which the recent studies have not covered.

The UAE has two coasts the western and the eastern. The coastal area of the western coast has rich oil deposits, whilst the area on the eastern coast has no oil deposits. This has led the inhabitants at the eastern coast to develop other alternatives.

Fishing and farming became the main economic activities for the inhabitants of this coast, especially during the pre-oil period. Also, since the East Coast does not have the oil deposits, some of the people of the East Coast prefer to work in other oil rich Emirates, especially Abu Dhabi and Dubai. At the same time the oil wealth from the other Emirates has played major role in developing the East Coast in terms of financing the construction of the new facilities, seaports, airport and the other facilities.

As a result of the latest government attention paid to the East Coast in terms of building new facilities as well as exploiting natural resources derived from the Hajar mountains, a lot of new manufacturing, eg rockwool, has come to play a major role in the area. The government of the area is in the process of exploring the geostrategic location of the East Coast with a view to it playing an important role in the future shipping industry in the area.

The study evaluates the economic activities during the pre- and post-oil eras and gives a comparison between the two periods as well as exploring future prospects to develop these activities. It examined some of the area's problems as a result of the new development and future alternatives to be developed. It also evaluates and explores the importance of the area's geostrategic location in terms of future industry, eg export and re-export industry.

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I. Introduction

- A. Significance of the study**
- B. Aims of the study**
- C. Review of literature**
- D. Study method**
- E. Problems occurring during this study**
- F. Structure of the thesis**

Endnotes to Chapter One

I. Introduction

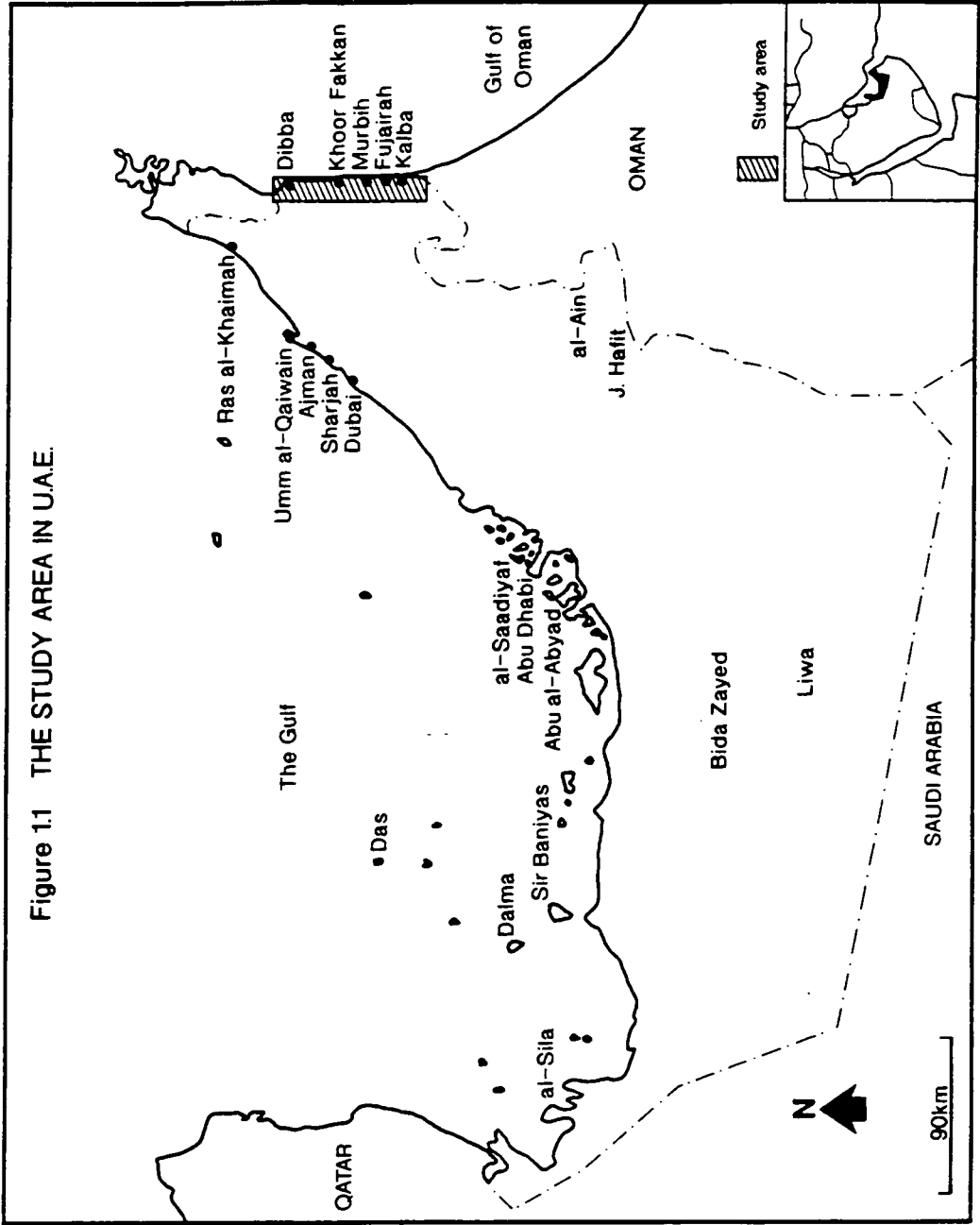
The coastal land of the United Arab Emirates (UAE) begins in the west where it borders the state of Qatar and Saudi Arabia and ends in the east at the Omani border. Within this area there is a great diversity of economic activities, many of which have been covered in the previous studies about the UAE in general and some which have not yet been examined.

The UAE has two coasts: the western and the eastern. The coastal area of the west is rich in oil deposits whilst no oil has been discovered in the eastern coast, so far, despite surveys. This has led the inhabitants of the eastern coast to develop other alternative sources of income. Fishing and farming are major economic activities of the people of this coast. Whilst the East Coast (E.C.) does not have oil deposits, many of its people have found work in the other oil rich Emirates, especially those of Abu Dhabi and Dubai. At the same time wealth derived from oil in the other Emirates has played a major role in developing the E.C. by providing the finance to construct new facilities such as seaports, an airport, trade centre and many more.

The search for oil began in October 1935¹, and commercial production started from the early 1960s. The real effect of oil wealth on people began at the beginning of 1970s.

A. Significance of the study

The E.C. of the UAE is located on an open sea in contrast to the Gulf and this gives it a unique role amongst the Emirates (Figure 1:1). Historically, this location has played a major role in the area's past. At the end of the 16th century, the E.C., was



part of the Batinah Coast, and was a target for Europeans wishing to colonise the area. The harbours, especially were targeted. It was considered important to develop the natural harbours of Khor Fakkan and Dibba to act as supply points for colonisation purposes. These ports were considered valuable in their own right as they were important trading centres for the area, and the focus of many merchants.

Whilst inhabitants of the other oil-rich Emirates had the opportunity to turn from the traditional activities of fishing and farming for livelihood, the E.C., with little prospect of oil deposits, continued to pursue these traditional activities to provide their daily necessities. Thus the E.C. remained the poorest and least important part of the Emirates.

It was during the Iraq-Iran war that the E.C. first became important to both the UAE and the other Gulf states, while the 'Operation Desert Storm' over Kuwait underlined its strategic importance. This importance is based upon its connections with the other Gulf countries: by sea, through its seaports, by land through its highways connecting the E.C. with the rest of the UAE in the Gulf, and by air via Fujairah airport. Its geographical importance can perhaps best be appreciated by looking at a map of the area which shows the E.C. is located outside Gulf waters but it faces the Indian Ocean with no natural or artificial obstacles (eg straits, borders) hindering open sea passage, and is connected with the Gulf hinterland and other Middle East countries such as Jordan, and Iraq by an extensive and up-to-date highway network. All the above factors combined, make the location of the E.C. an important one, not only for the UAE but for the Gulf states generally.

Its unique location gave the UAE the advantage of access to international

waters during the Iraq-Iran war and the Gulf crisis. The government of the UAE had by the beginning of the 1980s invested money to develop this coast. This development has been undertaken by three main government institutions: the Emirate of Sharjah, the Emirate of Fujairah and the Federal government through its many agencies, eg Ministry of Agriculture and Fisheries (MAF).

Since the coast comprises areas under the control of both Emirates (Sharjah and Fujairah) the governments of both have been involved in its development. Both Emirates pursue their own (quite different) policies of development in their territories. The difference is that almost all of the Emirate of Fujairah territories are located on the E.C. facing the open sea. Thus this Emirate focuses its attention on developing these coastal advantages whereas the main territories of the Emirate of Sharjah are on the west, an inland coast, so it gives most of its attention to the western coastal area of the Emirate, leaving the east coast territories less developed.

The recent economic activities of the E.C. can best be examined by dividing it into two periods: pre- and post-oil. During the pre-oil period the economic activities and government involvement of the E.C. were different from those which followed the development of oil in the other Emirates. The conditions, and the changes arising from oil exploitation need to be examined and analyzed to give an evaluation of the economic activities which were a feature of the area and which have changed or been replaced and this, hopefully, will point to some of the future possibilities of which the area is capable. Other future possibilities will also be examined, amongst them government and private sector efforts to develop the area and provide an alternative to the traditional subsistence economy of the E.C. so it can take its place with the

other Emirates and the Gulf states. One major reason for seeking alternative industrial activity in the E.C. is to increase government revenue. To date no single study on the E.C. giving as complete and comprehensive picture of its economic activities has been carried out.

B. Aims of the study

To understand the aim of the UAE government in developing the E.C. and the recent importance of the E.C. worldwide as well as the development of the economic activities in the E.C and the impact of the oil wealth from the other UAE regions, one must examine the pre-oil period and the current economic activities in the area.

The aims of the study are:

1. To examine the pre-oil economic activities in the area before the exploitation of the oil in the UAE;
2. To analyze the post-oil economic activities and the role of government support to the development of the major economic activities in the coast;
3. To compare the pre- and post-oil economic activities, and government influence on these economic activities;
4. To evaluate the future prospects of the E.C., its geostrategic importance and government alternatives in developing the E.C.;
5. To fill the gap in literature of the E.C. There is little written material specifically relating to the economic activities in the E.C. and most previous studies merely included the E.C. as an example, or as a small section within the larger context of the UAE.

The study is also intended to answer the following questions:

- a. What was it like to live in the E.C. before the oil industry?
- b. What were the main economic activities in the area before and after the exploration of the oil in the UAE ?
- c. How did the oil revenues from other Emirates affect the development of the E.C.?
- d. What are the possibilities of converting the E.C. from a coastal area whose main activities are farming and fishing to one concentrating on manufacturing industries?
- e. What are the main E.C. problems as a result of the government development of the area eg water shortage, and what are the future possibilities of other problems arising, such as pollution?
- f. How important is the E.C.? can it play an international role in the re-export industry? What, if any, will be the effect on the E.C. of the return of Hong Kong to China in 1997?, Is the E.C. likely to become the equivalent of Singapore or Hong Kong for the Gulf region in terms of international trade?
- g. What is the role of local government as regards the development of the existing facilities of the E.C. such as its airport and seaports ? Will government be able to promote the region sufficiently for it to be able to play an international role in the future?

The study focuses on the development of the economic activities from the pre-oil period to recent times and aims to offer some alternatives and give some predictions of future economic activities in the E.C. Also the study intends to collate the existing variety of information about the economic activities in the area, and try to classify this information to give a structured view of the recent situation and prepare some of this

data so it may contribute to any future plans for the area.

C. Review of literature

The E.C. lacks comprehensive studies covering the area as a whole. As mentioned in (5) most studies include the E.C. as part of a larger study of the UAE. This study, to the best of my knowledge, is the first comprehensive study concentrating wholly on the economic activities of the E.C.

Other main studies which include the E.C. are:

The study of White and Barawani A Survey of the Trucial States Fisheries Resources With Reference to the Sultanate of Oman (1969-1970) which gave valuable information on fishing industry in the UAE and some mention was made of fishing industry in the E.C. generally.

The MAF has published several reports on fishing (eg Technical Report Numbers 3, 4, and 5) between 1979 and 1980 which dealt with the landing of fish in Kalba and Khor Fakkan and some hydrographic features of some areas of the E.C. in general. These reports calculated the volume of fish landed in the two areas. But since then a lot of changes have occurred as a result of population growth and other socio-economic factors (eg increase in affluence) in these two areas, which have stimulated the demand for more fish, and the reports are now somewhat out-of-date. The MAF has also published a couple of books and studies of farming in the UAE eg Farming in the UAE (1981), Production of Covered Vegetables (1982) and The Development of Farming in the UAE (1985). These books give some important data on this field as well as demonstrating government support to the farmers in the UAE as a whole

with some reference to the E.C. region.

Previous studies dealing with farming have tended to concentrate on the UAE in general with some reference to the E.C. within this context. The reports of Sir William Halcrow Report on the Water Resources of the Trucial States (1969) and Trucial States: Hydrological & Groundwater Survey (1965) are considered to be the most comprehensive work on water resources in the UAE and the work included the E.C.. In the survey made by Durham University, Survey of Soil and Adricultural Potential in the Trucial States (1966-1967), which gave a valuable description of soil and irrigation methods of the UAE and, again, some reference is made to the E.C.

The brief study of Ghunaim, Industrial and Agriculture Development in Fujairah (1987) gives a valuable introduction to these topics in the Emirate.

The brief study of Abduh, UAE Seaports (1989) gives some highlights on UAE seaports, their locations and development as well as the movement of foreign trade at these seaports. The study referred to some E.C.'s seaports.

The Ministry of Planning has published several statistical and studies on the UAE. The book, The Socio-economic Development in the UAE (1987) demonstrated these developments, especially in the farming, fishing and manufacturing sectors.

Tomkinson in his book, The UAE; an Insight and Guide (1975), refers to Fujairah and the Batinah coast in general.

Fenelon, statistical adviser to the government of Abu-Dhabi, in his book, The UAE, An Economic and Social Survey (1973) provides a valuable description of the economic activities of the UAE and their development.

The study of the Arab League, The UAE, A Comprehensive Survey (1978) has

provided details on the UAE, especially on water resources and economic activities of the UAE with some reference to the E.C.

Hellyer, Fujairah: An Arabian Jewel (1990), one of the Arabian heritage series, is a guide to visitors to Fujairah which gives a simple introduction to its history, agriculture and industry.

Local newspapers: al-Bayan, al-Khalij, al-Ittihad and Khaleej Times have provided some reports and news covering some aspects of the economic activities in the UAE as well as the E.C. These newspapers have published some surveys and long essays on the area with some up-to-date data on some of the economic activities in the E.C. that some of the books and the articles written on the UAE did not cover.

Some magazines and reports published by the Sharjah (al-Tijarah) and Fujairah (al-Ghorfah) Chambers of Commerce give some valuable sources of information on the area's economic activities as well as statistics. The seaport authorities at Fujairah has published, Fujairah Port Handbook 1991, on the Fujairah seaports in the E.C. as well as on the Fujairah Free Trade Zone. This handbook gives some statistics on the activities of the seaports in the area. Also there are a wide number of references included in the study.

As mentioned above, previous books, reports and studies on E.C. economic activities have mostly dealt with them as part of the economic activities of the UAE and many have dealt with one particular field of economic activity of the UAE in general.

D. Study method

The method followed in order to answer the thesis questions was:

- (a) To collect and abstract the data obtained from published and unpublished statistics and up-to-date surveys and fieldwork.
- (b) To compare, contrast and analyze the above for various years and by so doing, put into their proper perspective and, wherever possible, answer the research questions asked.

A variety of material relating to the research topic has been covered. It must be noted that figures on the pre-oil period can only be approximate and information gleaned from interviews with older people, whilst valuable, is dependent upon the accuracy of their memories. Data collection was based on the following:

1. Written materials

Materials, such as books and articles, related to this study were collected from various sources in the Arabic and English language.

2. Official reports

a. Local government agencies:

- 1. Department of Water and Electricity in both Kalba and Khor Fakkan
- 2. Municipality of Fujairah
- 3. Municipality of Sharjah (Kalba and Khor Fakkan branches)
- 4. Municipality of Dibba

5. Fujairah Chamber of Commerce, Industry and Agriculture

(FCCIA)

6. Sharjah Chamber of Commerce and Industry (Kalba and Khor

Fakkan branches) (SCCI)

7. Department of Commerce and Industry in Fujairah

8. Fujairah International Airport (FIA)

9. Fujairah seaport

10. Dibba seaport

11. Khor Fakkan seaport

12. Emiri Courts; in Fujairah, Kalba and Khor Fakkan

b. Federal government agencies:

1. Ministry of Agriculture and Fisheries (MAF)

2. Ministry of Electricity and Water (MEW)

3. Ministry of Planning

3. Fieldwork

Historical records, official sources and previous research could not provide all the data required for this work and there was a notable lack of available data on pre-oil activities and on the current situation regarding eg pollution. The researcher carried out a number of fieldwork trips to find some answers to questions required by this study. Four field trips were carried out by the researcher between 1988 and 1991 (15 Dec. 88 to 20. Feb. 89), (10. Feb. 90 to 30. Mar. 90), (1. Sept. 90 to 2 Oct. 90) and

(29. Dec. 90 to 20. Feb. 91). During this fieldwork a lot of the thesis material was collected and some interviews were made. The researcher questioned farmers and fishermen of the area to elicit information from their experience about farming and fishing pre and post-oil in the E.C., as well as aspects of manufacturing in which they were, and are, engaged, to get answers to some research questions. Some of this information relied upon the memories of older people. The researcher also sought the opportunity of interviews with local inhabitants and officials from various government departments with which they were involved, eg airport, seaports, farming departments and water services. These interviewees gave the researcher the benefit of their professional expertise of their specialism regarding the various topics of this thesis. Wherever possible, these interviews will be referred to in the text with their source. In some cases the researcher cannot make a direct attribution.

E. Problems occurring during this study:

1. Language problems

Many workers in the main industries in the E.C. are immigrant workers from places like the Indian Sub-continent and do not speak Arabic or English and this caused problems in terms of communication during interviews. It was strongly suspected that sometimes misleading information was given by interviewees because they were trying to convince the researcher that their productivity was high. I felt this was the case especially in interviews regarding farming. Many interviewees did not want to give a 'straight' answer fearing their employers would hear of the substance of the interviews. The researcher thus had to steer a path through information from

these sources so that the study would be accurate.

2. Data

The data on the E.C. was collected and supervised by many local and Federal agencies. Since the E.C. belongs to more than one Emirate and the thesis required more than one type of information to cover the whole range of economic activities in the E.C. past and present, many agencies were involved and this in itself posed a problem. For example

a. Local agencies:

Since the E.C. is located in two Emirates, data required at a local level had to be obtained from the local agencies in both Emirates and the researcher experienced considerable difficulty regarding data required from the agencies under the jurisdiction of the Emirate of Sharjah. Another problem with local agencies is that often there is no centralisation or uniformity in the storage of records, some information on E.C. matters, eg data on Kalba, Khor Fakkan and Dibba, would be stored in the west coast as it came under the Emirate of Sharjah, but in other cases the researcher often had to go the locality itself to find the information required, information on Dibba is an example of this time-consuming and difficult element of research. Often to get comprehensive data on towns, eg Khor Fakkan, the researcher had to deal with not only the main local government agencies, but also their headquarters, and the Federal agencies, and some information was very difficult to trace at all, eg data of the seaport of Khor Fakkan.

b. The Federal agencies:

Some of the data required was not available at the time it was needed. Sometimes this was due to a time lapse between the information being collected by Federal agencies and being classified and sent to its appropriate place of storage, eg various ministries, Emirate government. This made the task of collecting a comprehensive picture of various topics, eg small villages, difficult. Another problem was the method of classification, for example information from the MAF could be classified by Emirate or some other heading, eg on a regional basis. The MAF annual Bulletins, starting with the year 1986/7, gave a useful picture of many important activities and changes occurring in the E.C. at the relevant time but this was not comprehensive. Subsequent MAF Bulletins have added to the picture but it is not complete as before the 1986/7 Bulletin. Only data of a minor nature exists on farming and fishing in the E.C.

Confusion about data occurred, for instance looking for one specific item of information relating to one sector: it might be written in one MAF Bulletin under one category, eg referred to by Emirate, and in another, under another category, eg agricultural region.

3. Unmarked boundaries

Most of the data had to be gathered from more than one source. Sometimes sources were located close to each other, sometimes less than one km apart, but this proximity did not necessarily make the task easier.

The methods and practices employed in data collection for the same sector and

topic differed from place to place, eg Kalba and Fujairah: Kalba town belongs to the Emirate of Sharjah and Fujairah city belongs to that of Fujairah and the same data on different areas was classified differently in different Emirates, while practices also varied, eg trade licences in the two Emirates were dealt with differently.

F. Structure of the thesis

The thesis has been divided into eight chapters:

Chapter One gives an introduction to the study, explores its significance for current and future plans. It also describes objectives and methodology used in the study.

Chapter Two gives a general description with especial reference to the physical, economic and human characteristics of the UAE in general but concentrating mainly on the E.C. as well as examines the geostrategic importance of the E.C.

Chapter Three deals with the pre-oil economic activities, primarily from the late 1940s to the late 1960s and concentrates on traditional farming, including irrigation, primary tools and equipment, and traditional fishing methods, marketing of fish, types of fishermen and fishing boats. It must be noted here that some of these activities are still practised today and therefore this information has a current relevance as well as an historical value. For example, in farming, some basic tools are still in use today, eg the traditional saw, traditional irrigation methods still survive, eg flooding. Fishing also retains many traditional elements, some albeit with modifications, eg anchovies have been caught by seine net for generations, but pre-oil seine fishing had to rely on manpower to pull the fishing net whilst now four-wheel

trucks are used. These changes have been possible due to some of the wealth of the oil in the UAE finding its way to the E.C. (which, of course, has no oil resources).

Chapter Four discusses and analyses the existing economic activities in the E.C.. This chapter explores the impact of oil wealth on economic activities and the new techniques applied in farming and fishing in the area. Modern irrigation systems eg sprinkle and drip, as well as farming in greenhouses are also discussed. New fishing methods which are in use in the E.C., types of fishermen, quantity and quality of fish landed, and markets are also discussed. The chapter tackles the existing manufacturing, types, motivation and obstacles facing manufacturing and trading in the area.

Chapter Five gives a comparison between pre-and post-oil economic activities in terms of farming, fishing and manufacturing production. Size, quantity, quality, tools, equipment and marketing are compared. The chapter also examines the government's role in developing the E.C.. Major government facilities eg airport, trade centre and seaports are discussed and evaluated.

Chapter Six deals with the major problems resulting from new development of the area. Water problems are examined, and some future predictions regarding this problem are made. The chapter focuses also on pollution, roads, the increase on dependency on foreign labour and the distribution of farmland in the E.C. are also discussed.

Chapter Seven explores the pressures of land use in the E.C., looking at farming, housing and manufacturing in the main. The chapter also explores the significance of the E.C. as an international re-export base with some focus on the

factors conducive to its development as a major re-export centre. This chapter also examines the possibility of the E.C. becoming the Hong Kong or Singapore of the Gulf area. The chapter closes with government alternatives for developing the E.C.

The study closes with Chapter Eight which consists of the findings and recommendations of the study.

Endnotes to Chapter One

1. Fenelon, K. The United Arab Emirates, An Economic and Social Survey. London: Longman, 1973. p. 32.

II. General Description Of The United Arab Emirates And The Study Area

A. Background of the UAE

1. Physical characteristics of the UAE
 - a. Climate
 - b. Topography
2. The economy of the UAE
3. Social geography of the UAE
 - a. Population growth
 - b. Major cities in the UAE
 - c. Distribution of people

B. The East Coast of the UAE

1. Description of the E.C.: boundaries and definition
2. Government structure
3. The importance of the strategic location of the E.C.
 - a. The importance of the E.C. to the UAE
 - b. The E.C. as gateway to the Gulf
 - c. Worldwide importance of the E.C.
4. Historical background of the E.C.
5. The Geographical distribution of population in the E.C.
 - a. From Khor Kalba to Sikamkam
 - b. From Qurayyah to Zibarah
 - c. From Bidyyah to Dibba al-Husin
6. The economic activities of the inhabitants of the E.C.
7. The expansion of the E.C. towns
 - a. Kalba
 - b. Fujairah
 - c. Murbih and Qidfi
 - d. Khor Fakkan
 - e. Dibba
 - f. Other towns and villages in the E.C.
8. The infrastructure of the E.C.

Summary

Endnotes to Chapter Two

II. General Description Of The United Arab Emirates And The Study Area

Before studying the economic activities of the E.C., it is appropriate to give some background on the UAE as a whole, as well as the study area. The first section will give a general background of the Emirates of the Federation, especially discussing the physical and human characteristics of the UAE. The second section will discuss briefly the E.C. in relation to the UAE as well as the historical background and the expansion of towns of the E.C. to give a broad background about the area in general.

A. Background of the United Arab Emirates

The UAE was previously under British control. During this time it was called the Trucial States. The Emirates united to form the UAE on 2 December 1971 following British withdrawal from the area. It is now a member of the United Nations and is also one of the founding members of the Gulf Co-operation Council (GCC). The UAE is also a member of the Arab League and OPEC.

The Federation of the UAE consists of seven Emirates; Abu Dhabi, which is the capital of the UAE and has rich oil deposits, Dubai, with its trade centre, and Sharjah, Ajman, Ras al-Khaimah, Umm al-Qaiwain and Fujairah. Each of the Emirates has its own government and jurisdiction over land ownership, oil and gas resources. However, federal agencies have responsibility for other areas of government such as education, agriculture, health services, immigration, and defence. The individual rulers of the Emirates are all members of the country's main governing body, the Federal Supreme Council. The President and Vice-President of the UAE are elected from the

members of the Supreme Council and serve for a term of 5 years. Their term of office can be renewed for a further term of 5 years.

The UAE covers an area of approximately 77,700 square km (Table 2:1) and is situated on the Gulf. Table 2:1 shows that the largest Emirate in the Federation is Abu Dhabi with 86.67 per cent of the total UAE area. The smallest Emirate in the Federation is the Emirate of Ajman with only 0.33 per cent of the total UAE area. The table also illustrates that the population of the UAE is concentrated in the three main Emirates, Abu Dhabi, Dubai and Sharjah. These three Emirates are also the important oil producers in the Federation. The UAE is located in a desert area where, obviously, water is scarce but there are natural oil deposits which have brought prosperity to the Emirates. Since its creation the UAE has gained a leading position amongst the major Middle East trading countries and a reputation in the world trading markets as a centre for Middle East trade.

Natural resources are not constant throughout the Emirates; Abu Dhabi, Dubai and Sharjah have oil deposits whilst the other four Emirates - Ajman, Umm al-Qaiwain, Ras al-Khaimah and Fujairah - have little or no oil. This fact, assumes significance given the autonomy of each of the Emirates, and consequently those Emirates with oil are more important than those without, having greater wealth and political power.

As each Emirate has autonomy and has charge of its own revenues, some Emirates, those with oil resources, are richer than others. Geographically Abu Dhabi is the largest Emirate and its development is more advanced than that of the other Emirates due to the wealth derived from its oil revenues. However, Dubai and Sharjah

Table 2.1 Area and population of the United Arab Emirates in 1985 (excluding the islands)

Emirate	Area			Population
	% of Total	in Sq. Mile	in Sq. Km.	
Abu Dhabi	86.67	26,000	67,340.5	670,125
Dubai	5.00	1,500	3,885.0	419,104
Sharjah	3.33	1,000	2,590.0	268,723
Ajman	0.33	100	259.0	46,318
Umm al-Qaiwain	1.00	300	777.0	29,299
Ras al-Khaimah	2.17	650	1,683.5	116,470
Fujairah	1.50	450	1,165.5	54,425
Total	100.00	30,000	77,700.0	1,604,464

Source: Saif, S. The Modernisation of Agriculture in the UAE. (Unpublished M.Sc. Thesis) 1987. p. 16.

have both benefitted from oil revenues of their own while other Emirates, especially the northern Emirates, have benefitted from the oil revenues of Abu Dhabi, some of which have been used to develop these Emirates:

"In the long run, it is the development of these smaller Emirates which will determine the overall identity of the UAE."¹

Because of its navigable creek, Dubai has been a thriving trading centre for centuries. Recently it has used the wealth derived from oil to build upon its geographical advantages and historical trading background to develop facilities enabling it to become a trade centre for the modern world. There has been heavy investment in an airport and seaports, notably the Jebel Ali scheme. Dubai now has a worldwide reputation as a major trading centre for the markets of the Gulf and Middle East.

Other Emirates, for instance Fujairah, are trying to emulate Sharjah and are also trying to gain a niche in world trade markets. Fujairah is the only Emirate wholly located on the Gulf of Oman, and thereby outside Gulf waters. Since the early 1980s this Emirate has tried to exploit its strategic location outside the Gulf in order to gain a place in world markets and has provided facilities such as seaports, a trade centre and an airport to this end. Most of these facilities were constructed using investment from other oil-rich Emirates such as Abu Dhabi and Dubai.

1. Physical characteristics of the UAE

a. Climate

The UAE is in an arid zone and consequently most of the land is desert. Its

location is latitude 22° 26' north of the equator and longitude 51° 56' east. It is affected by the Gulf water and the Indian Ocean. A meteorological station was established in Sharjah in 1934 and has recorded summer temperatures of 47°C². Winter temperatures (December to March) vary from 10°-20°C. Average precipitation figures are around 250 mm, most of which occurs during the winter months with greater precipitation in the north, especially in the mountain areas. Precipitation varies from year to year, records showing it as low as 25 mm (1966-67) and as high as 500 mm (1971-72)³. Humidity is higher in the coastal areas, especially during the summer.

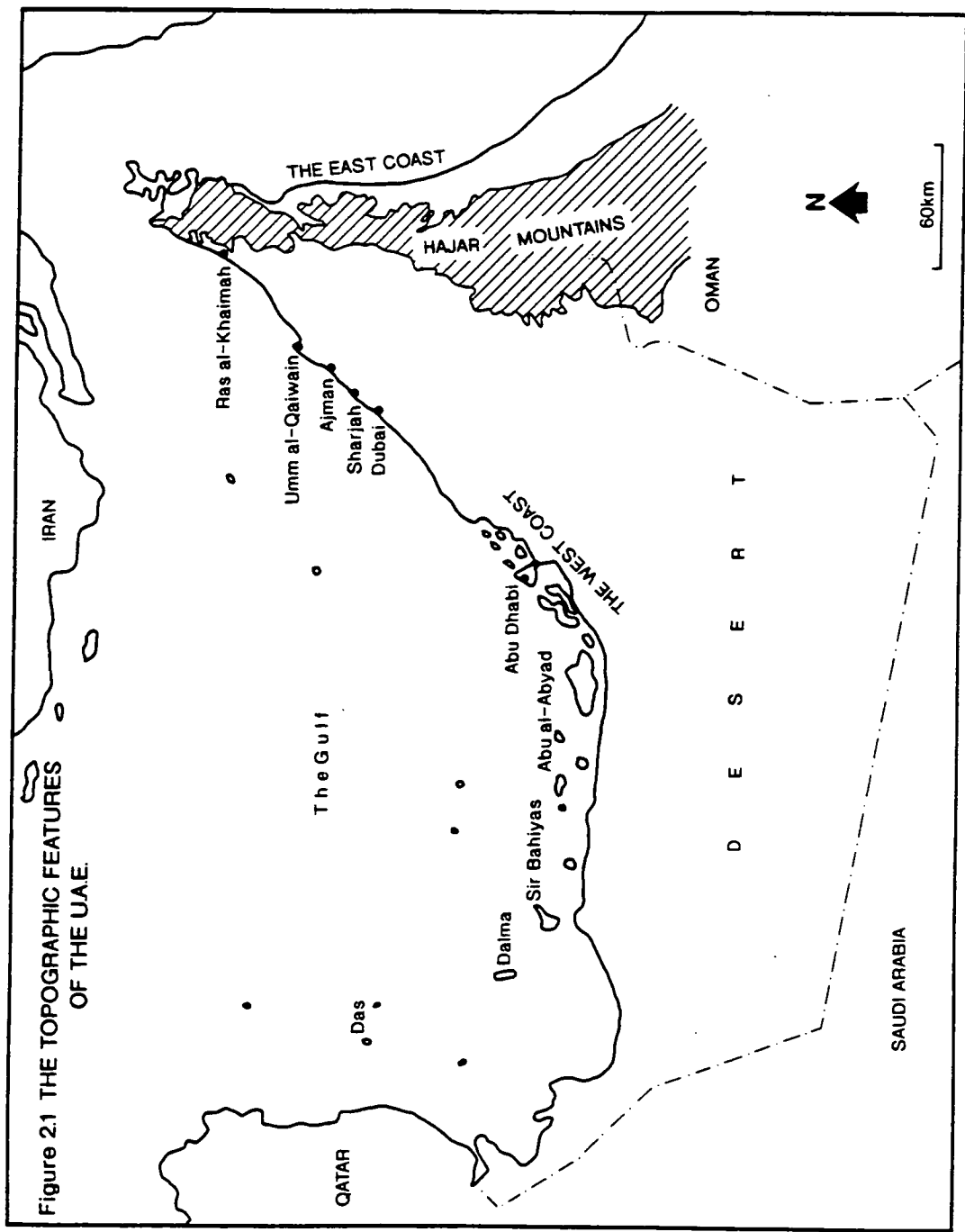
b. Topography

Essentially the topography of the UAE comprises four key elements:

(1). Mountain areas

The north and east part of the UAE are surrounded by mountains. They are considered to be a continuation of the Omani range. The range of mountains in the north, called Rus-Lijbal, are in the Emirate of Ras al-Khaimah and are the location of the Ras al-Khaimah mining industries, where the manufacture of cement predominates. The range extends beyond Ras al-Khaimah and into the Emirate of Fujairah, south east of Ras al-Khaimah, and here the mountains, called the middle mountains or al-Hajar, are located largely in the east of the UAE (Figure 2:1), and are the main area for mineral industries such as the manufacturing of mineral wool. Some mountains are as high as 2,000 metres in the UAE, with the highest being in the Rus-Lijbal range⁴.

The range runs from northern UAE to the north east with most of the direct slopes to be found to the west and east of this mountain range. Due to the steepness



of slopes, many wadis in the E.C. are prone to flooding and in the past this has caused problems, especially in winter. The flooding of wadis causes much damage to properties in the E.C., especially to farms buildings and houses. Similar damage also occurs in the western part of this mountain range.

(2). Coasts

The UAE has two coastlines (west and east) strategically located on two Gulfs, the west coast on the Gulf itself and the east coast on the Gulf of Oman. Thus the UAE benefits from both gulfs. The total coastal line of the UAE is 720 km⁵, stretching from the state of Qatar and Saudi Arabia territories in the north to Ras al-Khaimah, and from Dibba on the Oman Gulf to Khor Kalba in the south. Six of the Emirates are located on the west coast which is rich in oil. This coast was important long before the discovery of oil as it was famous for its pearl diving. Its importance has changed with the oil industry and needless to say, with the development of the artificial pearl industry in Japan. Oil exploration first took place in 1958⁶ and since then the area has witnessed large scale development. Most of the population of the UAE is concentrated in this area because it is where the oil industry is located.

The UAE's other coast is the east coast where so far no oil resources have been found despite government investment in exploration along the coast. Exploration for oil has been funded by both the Sharjah and Fujairah governments but so far to no avail. The Emirate of Fujairah is the only Emirate located on this coast, except for some territories belonging to the Emirate of Sharjah (Sharjah's main territories are on the west coast).

The population of the UAE is mainly concentrated in the coastal areas. The

fishermen of the area consider the natural creeks of these coasts a valuable asset in fishing, using them for safe shelter for their fishing boats. Some creeks are deep and have thus in the past lent themselves for use as natural harbours, eg Khor Fakkan.

(3). Desert

The desert covers a large part of the UAE inland from the Dhaid, passing al-Ain and on to Abu Dhabi. Huge sand dunes are a major feature of these areas and, particularly between Dhaid - al-Ain and al-Ain - Dubai, sand dunes cause various problems to residents and to the road network. During the summer and on windy days, large tracts of road are covered by moving sands causing frequent delays. In Abu Dhabi, the largest Emirate with an area of 67,340 square km, the desert represents 70 per cent of the total land area⁷. The problem of sand dunes is a recent one. In the past the desert did not pose so many problems to the inhabitants, it was a place of bedouin settlement and some desert land was prized as good pastoral land, especially for camels and goats. Al-Dhafra, Liwa and al-Ain were all areas of bedouin settlement. The oasis at al-Ain was an area with an abundance of water long before the expansion of the city of al-Ain. The oasis at Dhaid was also famous for its water supply and date trees. Water was plentiful enough for inhabitants of this area to be able to grow cereal for local use.

(4). Islands

There are more than 100 islands in the UAE, most of which are to the west of Abu Dhabi on the west coast of the UAE. Most of the islands are small, and some are tiny. In the past the islands were important for the pearl diving industry, since divers used them for shelter from strong storms. The biggest island is Abu al-Abyad.

In modern times, some of the islands are considered to be strategically valuable to the UAE, for instance Abu Musa, Zarku and Das islands are useful loading points near the offshore oilfields for exporting oil. Dalma island is a populated island, which was previously important in the pearl fishing industry and recently the Abu Dhabi government has provided it with hospitals, schools and sea transport facilities to connect it with other UAE regions. Saadiyat island has a pioneer project using sea water distillation for greenhouse farming. The purified water is used to irrigate the greenhouse plants as well as providing Abu Dhabi with fresh water.

2. The economy of the UAE

The five major sectors of the economy of the UAE are: oil, agriculture, fishing, trade, and recently, manufacturing. In 1989 there were 200,000 donum¹ of cultivated land in the UAE and the agriculture production was 560,000 tons. Fish production was 91,700 tons for the same year⁸ and the UAE is almost self-sufficient in fresh fish. The oil industry represents the major part of the gross domestic product (GDP), with crude oil representing 55.9 per cent of the GDP in 1982⁹. This percentage shrank to 38.4 in 1989, not because oil production slackened but because of the success of the government's new policy to develop alternative industries to oil in order to reduce the country's dependency on oil exports. Agriculture and fishing formed 1.1 per cent of the GDP in 1982 with a slight increase by 1989 to 1.7 per cent. The manufacturing sector represented 8.5 per cent of the GDP in 1989, again a direct result of the government focusing investment on this sector.

¹ One hectare equals ten donums

The rapid rise of the manufacturing sector in the GDP can partly be seen to be due to the role played by the Ruwais Industrial Zone and port of Jebal Ali, together with the duty-free Industrial Zone which comprised 2.5 b USD¹⁰. Development of new manufacturing activities in the northern Emirates, especially in Ras al-Khaimah and Fujairah also contributed to the increasing proportion of the GDP taken up by manufacturing activities in the UAE.

3. Social geography of the UAE

a. Population growth

Before the exploration of oil the population density of the area was small. In 1950 there were only 80,000 people living in the UAE (Table 2:2). With growing affluence and no war or natural disaster, population increased from 1950 to 1990. The table shows that in 1990 the population of the UAE was estimated to be nearly 1.85 million. Much of this increase occurred in the mid-1970s mainly due to a large influx of foreign workers. The immigrants were employed in the country's development programme which necessitated the construction of the many buildings and roads all over the UAE.

The population table illustrates the change in the population of the UAE. Distinct changes occurred in the population pattern in the period 1950 to 1990. The major cause of these has been oil and changes are as follows: before 1960, the pre-oil development period, the population showed a gradual increase. After 1960 when oil resources in the country were being exploited, the population began to increase at a faster rate but, in fact, whilst the oil industry began the change in population, it was

Table 2:2 The United Arab Emirates population from 1950-1990

* Estimated number

Year	Population
1950	80,000
1960	86,000
1965	120,000
1966	160,000
1967	170,000
1968	180,000
1969	190,000
1970	220,000
1971	273,000
1972	325,000
1973	378,000
1974	430,000
1975	557,000
1976	680,000
1977	862,000
1978	930,000
1979	975,000
1980	1,042,100
1981	1,122,000
1982	1,186,000
1983	1,194,500
1984	1,230,900
1985	1,604,464
1990	* 1,844,000

Source: al-Matrooshi, M. O. Oil Revenues and Economic Development
in the UAE, 1988, p. 7., and
Ministry of Planning, Central Statistic
Development. Statistical review, p. 2.

not until the 1970s that the impact of the oil wealth began to affect population figures dramatically. Starting from the early 1970s the population figures show a massive percentage increase; from just over 0.25 million in 1971 to nearly 1.85 million in 1990. The period 1950-1970 on the other hand shows only a gradual increase in population growth. At the same time the advent of the oil industry also affected the lifestyle of UAE inhabitants significantly.

At present the population is mainly concentrated in Abu Dhabi, where in 1990, over 42 per cent of the total population of the UAE resided¹¹.

b. Major cities in the UAE

UAE cities expanded to cope with the increase in population and to provide administrative services for the developing Emirates. The following are the major cities of the country:

1. Abu Dhabi

Abu Dhabi is the capital of the UAE and the location of the federal government. The land occupied by the city comprises 9.7 per cent of the total area of the UAE¹².

In the late 1940s Abu Dhabi was a small island with a population of only 2,000¹³. By 1990 the total population of Abu Dhabi was estimated at more than 550,000¹⁴. In the recent past the government of Abu Dhabi has invested heavily in development of facilities and, subsequently, it has become one of the most important cities in the Gulf region (Peck 1986 called it the Arabian 'Houston'). Most of the Federal agencies are represented in Abu Dhabi as well as a great deal of commercial

activity. Abu Dhabi can therefore offer superior job opportunities which is the main reason why there is a high concentration of the population of the UAE in this city.

2. Dubai

Dubai is the trade and commercial capital of the UAE. This reputation is based partly on its historical role as a trade centre for the Gulf as whole. It is an attractive location for firms of the UAE, and has also attracted many Gulf businesses to establish bases there. In 1908 Dubai's population was only 10,000¹⁵, by 1948 Dubai was the largest city in the UAE with a population of 25,000¹⁶. In 1990, the total population of the Dubai city is estimated to be 349,086¹⁷. Dubai is now considered to be one of the major trading centres for the Gulf markets, a position enhanced by the establishment of the Dubai International Trade Centre and the Jebel Ali Free Trade Zone.

3. Sharjah

The city of Sharjah is located directly to the north of Dubai and its suburbs extend almost to the city of Ajman. In 1908 Sharjah city was the centre of the Trucial States with a population of 15,000 (almost equal to the total population of Dubai and Abu Dhabi cities at the same year)¹⁸. The population later dropped to 5,000 in 1939, as a result of the importance of the Dubai and Abu Dhabi cities which became the new centres. This was a natural response to the economic changes in the nearby cities. In the 1968 population census, there were only 20,000 people living in this city but, by 1990, this number had increased dramatically to approximately 230,000 people.

Sharjah city occupies 1.4 per cent of the total area of the UAE, and its prosperity is based largely on activities linked with the shipping industry, for instance

it has a thriving container industry. It has also benefitted from oil revenues directly; from the mid-1970s it had a share in the small oilfield at Abu Musa island. It was not until 1980 when the Amoco Company made finds of oil and gas at al-Sajaa that substantial oil revenues enabled full scale development of Sharjah¹⁹.

4. Ras al-Khaimah

Ras al-Khaimah city is located in the far north of the UAE. Most of the city's inhabitants work in agriculture and the farms of this area supply most of the vegetable markets of the UAE. In the 1968 population census there were 8,800 people living in this city, by 1990 its population was estimated to be close to 100,000. Oil in small quantities was found in Ras al-Khaimah in 1983 and since then it has become the fourth most important Emirate in the oil industry.

5. Ajman

Ajman is the smallest Emirate of the Federation, and the city of Ajman covers an area of approximately 130 square km. It is located beside the Gulf, and gains some benefits from its location close to Sharjah and the Dubai, the commercial cities. The population increased from 3,700 in 1968 to more than 60,000 by 1990. Most of this increase can be accounted for by the fact that many people working at Sharjah and Dubai prefer to live in Ajman as rents are low compared to those of the surrounding area.

6. Umm al-Qaiwain

Umm al-Qaiwain city is one of the northern cities of the UAE, with an area of approximately 754 square km which represents only 1 per cent of the total UAE. The city of Umm al-Qaiwain is small and has limited resources. In 1968 the city's

population was 2,900. By 1990 it had increased to nearly 20,000. The main sources of income of the city are farming and fishing.

7. Fujairah

The city of Fujairah is located on the Gulf of Oman, north of Kalba, and in the 1968 census had a population of 2,000 which had risen to more than 35,000 by 1990. The city's importance is based on its role as the administrative centre of the municipal government of the Emirate of Fujairah and most UAE federal agencies of the E.C. have offices in the city.

8. Al-Ain

The city of al-Ain in the Emirate of Abu Dhabi (the richest Emirate of the UAE) became important in the mid 1970s when the government of the Abu Dhabi Emirate invested heavily in the development of the area. In 1977 the University of UAE was established in al-Ain, increasing the city's importance still further. Al-Ain is located close to the Omani border, in the southeast, and is important both to the Omani and UAE people. In 1990 the population of al-Ain was estimated to be almost 200,000, most of whom lived on farms and worked in the commercial and federal agencies of the UAE.

c. Distribution of people

The distribution of the people in the UAE is determined by the following:

1. Historical and political characteristics

The history of this area includes tribal warfare and Western colonisation (especially by the Portuguese). Both of these affected the population distribution by

driving people away from the attractive but vulnerable coastal areas to remoter mountain areas. These inaccessible areas were less likely to be threatened and were more easily adapted as defensive sites for protection from invasion²⁰. Thus there are historical reasons for the pattern of settlement in the UAE as well as the effect of the oil industry in recent times. Before oil was discovered in the UAE, it had already started to alter the nation's demography. Neighbouring countries where oil was discovered attracted many UAE people to move from the Emirates in the early 1940s to seek a better life in neighbouring oil-rich states such as Kuwait and Saudi Arabia.

2. Physical characteristics:

Generally, the main areas of settlement in the UAE are concentrated on the coastal area, the east and west coasts, with the majority of the population on the western coasts. Dubai creek has provided safe harbour for many centuries and its waters are rich fishing grounds. Consequently in the past it became a populous settlement. This longstanding concentration of the population around the creeks, at the west and the east coasts, of the area is demonstrated by the preponderance of old buildings near the creeks. The population decreases in numbers towards the desert and mountain areas. In the desert and mountainous areas of the UAE, water played a decisive role in settlement during the pre-oil era of the UAE (and farther back in history, in the Trucial States). Water determined that the main concentrations of the population were around springs and *aflaj*, especially those at al-Ain and Liwa.

3. Economic characteristics

As stated above, the distribution of the population in the UAE during the pre-oil period was closely linked with the availability of water. Fresh water was required

for domestic use and for agriculture, and seawater provided fishing grounds. Most of the older settlements were to be found in places with a natural water supply, such as al-Ain, Dubai and Dibba. With few resources to trade with the rest of the world, the region had to be largely self-sufficient for its food and other needs and as the amount of water limited the amount of food which could be produced, it also determined its modest population levels. Wealth from the oil industry, however, has enabled the UAE to free itself from the restrictions of self-sufficiency and as well as removing restrictions on population levels, has led to the development and expansion of urbanisation in the UAE regardless of existing natural water resources of the cities. City life has become attractive to the residents of the UAE not only because the cities offer the attractions of new economic activities such as employment in the oil and manufacturing industries and trade, but also because in the cities the quality of life is high with modern facilities not found in country areas.

B. The East Coast of the United Arab Emirates

The E.C. with a population of around 100,000 is on its way to playing a major role in trade in the UAE as well as in the Gulf generally. The recent attention of the UAE government to the area in terms of providing facilities and promoting the area, as this study shows, is a clear sign it regards it as of world wide importance in the future.

1. Description of the E.C.: boundaries and definition

The E.C. is an area of land situated in the north east of the UAE. It is located

between latitude $25^{\circ} 10'$, $25^{\circ} 60'$ north, and $56^{\circ} 30'$, $56^{\circ} 40'$ east. This coast is approximately 90 km from Dibba in the north to Khor Kalba in the south and approximately 10 km wide²¹. This study deals with the E.C. as a geographical rather than a political area.

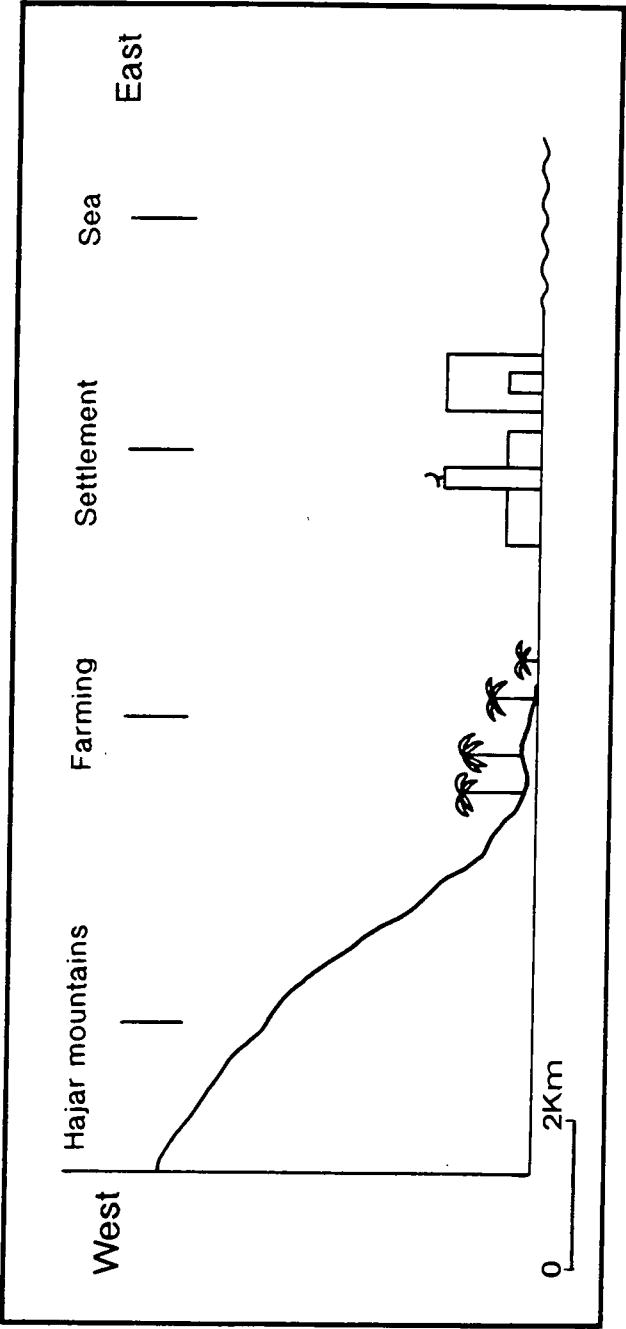
The E.C. is a narrow coastal strip, the border of which is the mountains in the west. In some areas the Hajar mountains almost close the gap between the plain and the sea, leaving a narrow path for the road network which connects E.C.'s towns. As a result of the mountains, the area is famous for its natural creeks, eg at Khor Fakkan and Khor Kalba. The Hajar mountains surround the E.C. along its western front, and, as a result, the coast is full of deep gullies formed by wadis and alluvial fans.

The Omani boundaries surround the E.C. from the south and the north. As mentioned above, from the west the coast is surrounded by a mountain range where some of the small mountain villages, eg Bithnah and Masafi are located.

On the way from Masafi to the east, the land starts to slope towards the sea and beyond the mountains, agricultural land becomes predominant. The nearer to the coast one travels, the more settlements there are and residential areas are larger (Figure 2:2).

Travelling from the north, once past the town of Dibba al-Husin, the landscape comprises farms and open spaces until the habitable land narrows by the Gulf of Oman. Midway to the south, the first major town is Khor Fakkan where the farmland and residential areas are enhanced by many picturesque and useful creeks which cut through the terrain. Leaving Khor Fakkan the traveller passes through rich farmland with a few small residential areas along the way towards Murbih which is only a few

Figure: 2.2 Cross section of the East Coast



kilometres from the city of Fujairah, and from here to the second important settlement, the city of Fujairah, the land is flat and features open spaces. From Fujairah it is only 5 km to the third most important settlement, the town of Kalba, a medium-sized town and the land is mainly farmland. Kalba is only 10 km from the E.C.'s southern border which it shares with Oman. Again, from Kalba to the border, the landscape features mainly small residential areas and part of it is *Sabakhah*.

The E.C., as its name suggests, is a coastal area. In the past the area has been called by many names. Some writers referred to it as the Batinah or Oman coast, (the coastline consists of both UAE and Omani territory). Other writers referred to the E.C. area as the Shimiliyyah Coast which is a traditional name used by many local people. The definition of the Ministry of Agriculture and Fisheries (MAF) of the UAE, which perceives the area in agricultural terms, is the East Region.

Located on the Gulf of Oman and the Indian Ocean outside the Gulf water facing the Far East and the Indian Sub-continent, the geographical location of the E.C. ensures it is an important strategic area, both in relation to other UAE regions, other Gulf states and in a global sense. The following chapters examine this importance. Recent world events have highlighted the strategic importance of the E.C.'s location. This has been demonstrated recently during the Iran-Iraq war and the Gulf Crisis of 1990/91.

2. Government structure

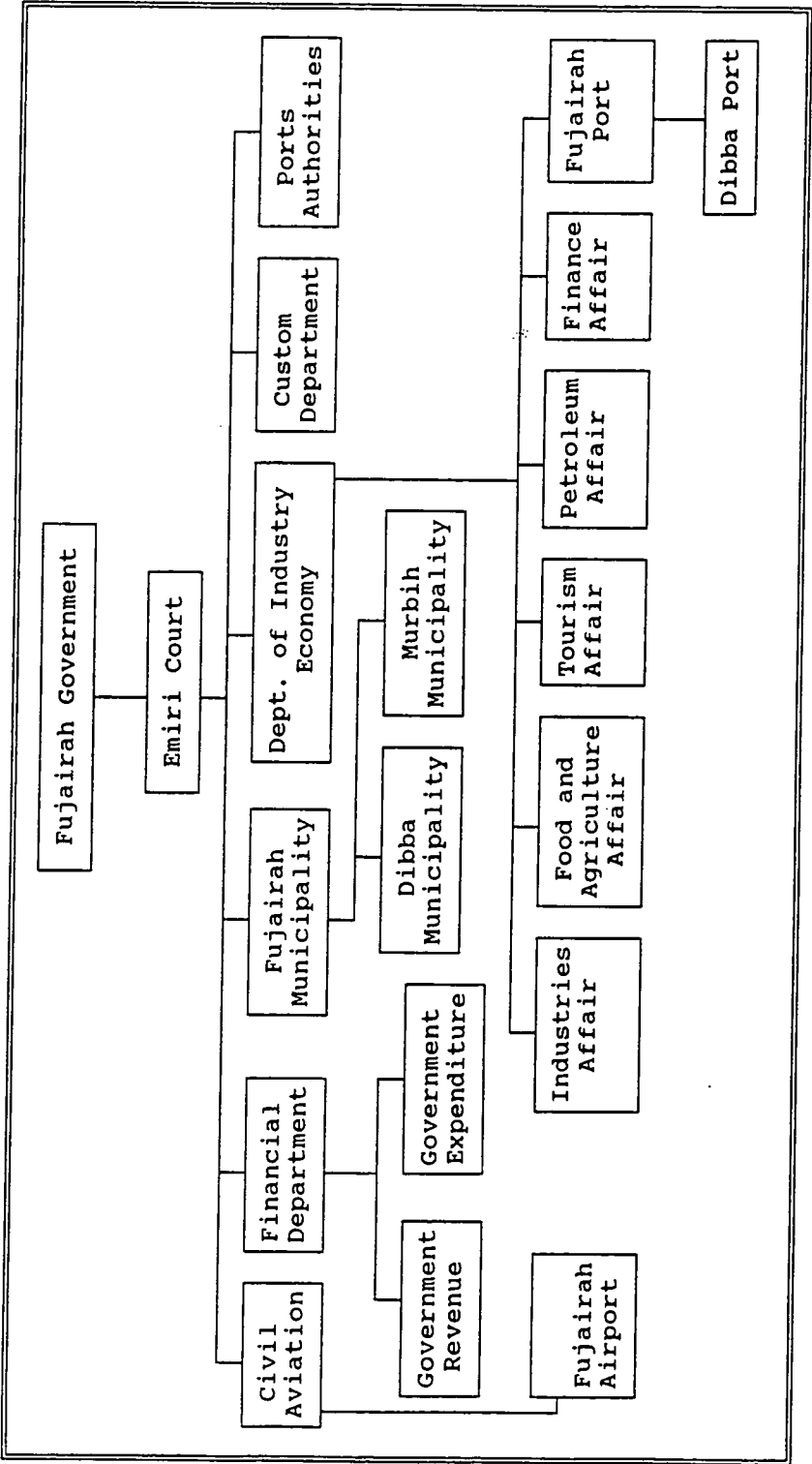
The Emiri Courts² provide the local government for the E.C. The area under

² Government House

the administration of the Emirate of Fujairah is directed by the Emiri Court of Fujairah. The remainder of the region is under the rule of the Emirate of Sharjah and is controlled by two Emiri Courts; that at Kalba, and that at Khor Fakkan. Besides these main Courts there are other local government institutions involved in various elements of local administration in each area, for instance, the Department of Industry and Commerce at Fujairah, branches of the Sharjah Chamber of Commerce and Industry at both Kalba and Khor Fakkan. These are major government agencies for E.C. industry. As well as local government, there are also some Federal agencies, such as the MAF which administers the agriculture and fishery industries in the E.C.. Co-operation between the local municipal government and federal agencies operating on a local basis is essential. One example is given here to demonstrate this; if someone wants to farm a piece of land, permission for use of land for agriculture is issued by the local municipality. The prospective farmer then has to register with the MAF to receive the farming card, which enables the holder to receive some services of the MAF at no charge, and others at half price, eg installation of irrigation systems. This instance demonstrates the need for close co-operation and agreement between the various local government agencies (Figure 2:3).

There are many agencies involved in government at a local level. To sum up, the main towns or municipal area of the E.C. have their own local government, but they are also subject to the Federal government, and to a variety of other government agencies with specific functions. Villages are also administered by a variety of local and Federal government agencies. They are usually under the jurisdiction of their nearest municipality, with federal government also being involved in various aspects

Figure 2.3 Government of Fujairah structure which deals with the economic activities in the area



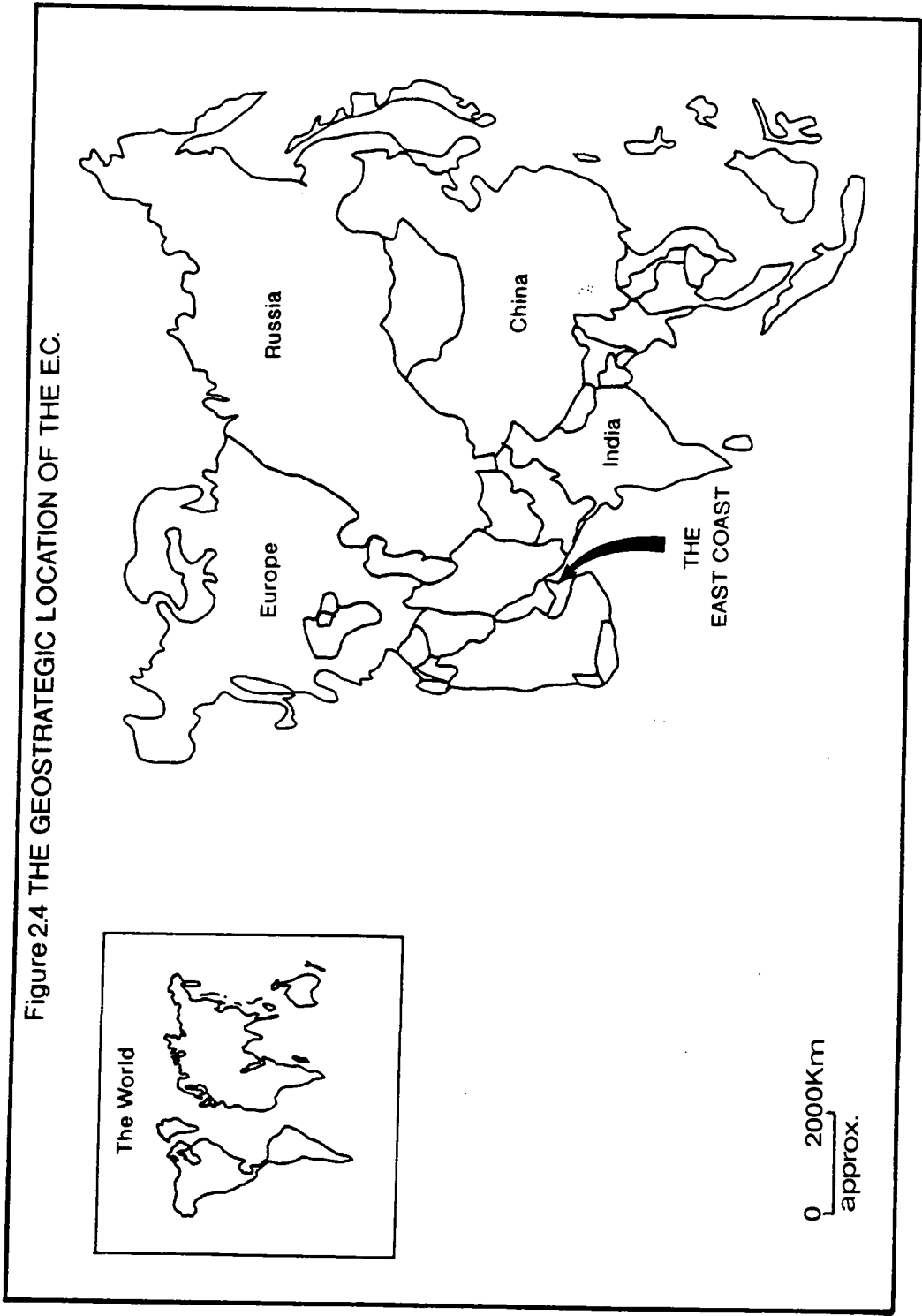
of administration. The villages in the area around Khor Fakkan can be used as an instance. These villages are administrated by the municipal government of Khor Fakkan, with small projects carried out by the municipal government or that of the Emirate, and larger schemes such as roads, public buildings and schools being carried out by Federal government.

3. The importance of the strategic location of the E.C.

Recent world events and changes in world markets have shown that the location of any industrial area can be crucial in enabling it to play a major role in the commercial world, eg the commercial importance of Singapore and Hong Kong is largely based on the historical importance of their location. In terms of location, the E.C. is strategically placed to play a major role in promoting local industries and to provide good access to other UAE regions, as well as acting as a midway station to the Gulf area as a whole (Figure 2:4).

a. The importance of the E.C. to the UAE

The E.C. gains a strategic importance by being outside the Gulf waters, giving the UAE an advantage over many of its neighbouring Gulf states. The Iran-Iraq war highlighted a potential weak link in the economy of many Gulf states: with the exception of Saudi Arabia, Gulf states had no access to the sea other than through Gulf waters. With this in mind, the idea was mooted during the war that Gulf oil could be exported overseas via Fujairah, using a pipeline through the E.C.. Discussion took place regarding the establishment of an oil refinery to facilitate the export trade



which would accrue from such a scheme²². To date, no definite decisions have been made on such a project.

As well as its obviously important role in times of strife in the Gulf region, the importance of the E.C. region to the UAE and to the area as a whole is increasing. One reason for this is the construction of roads from Masafi to Dibba and from Masafi to Fujairah. These roads were built to connect the E.C. with other regions of the UAE, and since they opened in 1961 they have enhanced the importance of the E.C.²³

However, it was not until the early 1980s that the real strategic importance of the E.C. was realised when the government of the UAE established new facilities such as seaports and later an airport in the area. These facilities increased the importance of the E.C. enormously and made a tremendous economic difference to what is an area without oil resources located amidst states of great oil wealth. Despite the lack of oil resources, in recent years, more and more merchants of the UAE have opened branches of their business in the E.C., and some have moved all their business to the area to take advantage of the new facilities available there. By doing so they avoid delay in transportation of goods and reduce the cost of shipping their merchandise through the Strait of Hormuz. During the emergencies, the E.C. was considered to be the safest access to the UAE without entering the Gulf waters.

b. The E.C. as gateway to the Gulf

The E.C. has the potential to be a very important area serving the interests of the whole of the Gulf. This is because it is an essential part of the excellent road network of the UAE connecting it to other regions of the Gulf and thereby enabling

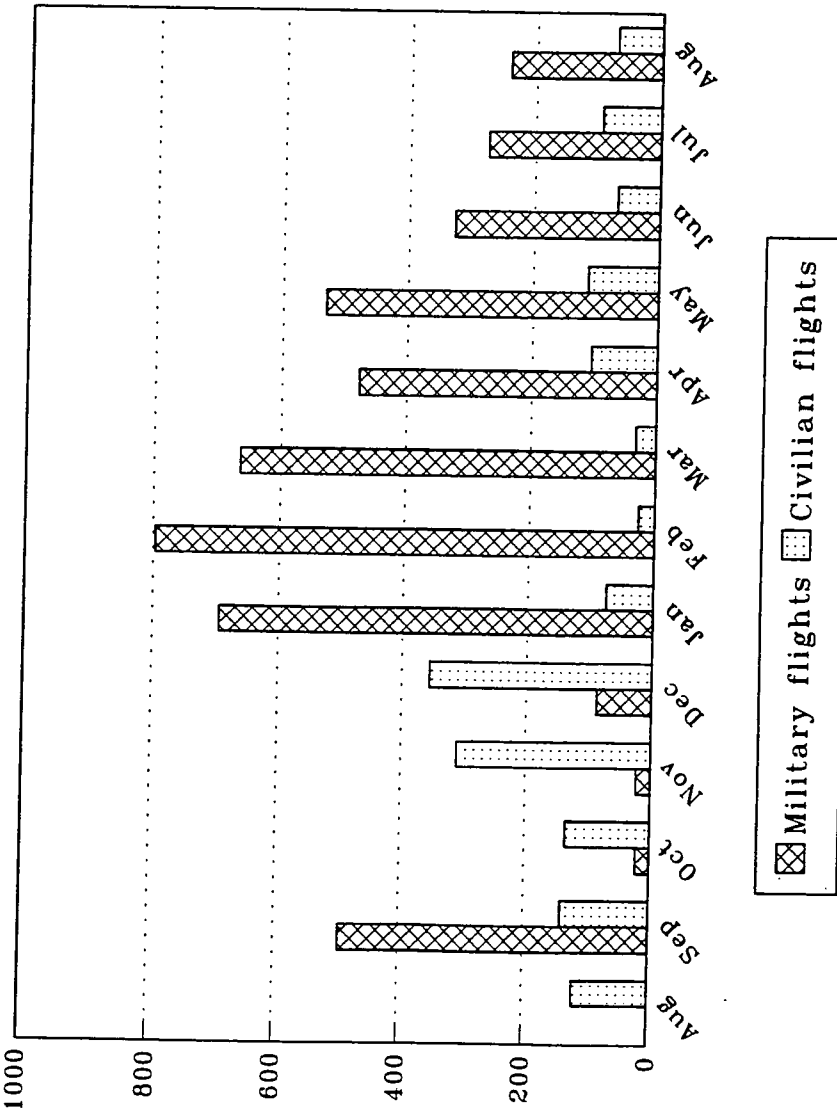
the E.C. to play a major role in the Gulf region's economy. During the Iraq-Iran war and the Gulf Crisis, the E.C. played a major role in supplying many Gulf countries with their needs through its airport and seaports. During the Gulf Crisis, Fujairah airport played a major role, with the allies from all over the world using the airport to serve the Gulf area with military equipment and providing the allied armies with their supplies (Figure 2:5). The table illustrates the number of military flights which used the Fujairah Airport between August 1990 to August 1991. During this period the number of civilian flights decreased and the number of military flights increased. This demonstrates the important of such a facility in emergency events. Because of the political situation and consequent high insurance (Chapter Seven) for shipping in the Gulf, container vessels from the Far East and Europe found it prohibitive to enter Gulf waters and, instead, unloaded their freight at the E.C. ports. From E.C. ports the containers continued their journey by land transport to their destinations, enabling shipping to leave the area as quickly as possible.

The following chapters are intended to highlight the importance of the E.C. to the Gulf area as a whole.

c. Worldwide importance of the E.C.

The recent role of the E.C. as a midway station and safe haven for shipping is not new. However, the role of the E.C. as a strategical location has changed somewhat from that it played in history, being a safe shelter to the passing ships. Whilst the E.C. was well known to the merchants of China, the Far East and the African east coast before oil exploration in the UAE, a special relationship between

Figure 2:5 Total flights from the E.C. between August 1990 – August 1991



Fujairah International Airport

*. Gulf War Started on 17 Jan. 1991

the E.C. and the rest of the world has developed in recent years as a result of the new facilities in the E.C.

In recent years many businessmen from the Gulf area as well as the Indian Sub-continent and Europe have chosen to load their freight in E.C. ports because such ports are located outside the Gulf area eg the American President Line (APL). Many international firms have also chosen the E.C. to be their base to the Gulf and other neighbouring regions. During the Iran-Iraq war and the Gulf Crisis, many of these firms were forced to manage more of their business through E.C. ports and, at the end of the hostilities, many continued to do so, especially after they experienced the new facilities that the E.C. offered to the businessmen eg trade centre, free trade zone.

4. Historical background of the E.C.

The importance of the location of the E.C. has been recognised for a long time. Historically its people were renowned sailors and its seaports were famous for their trade with the Indian Sub-continent and the Far East:

"As a result of the trade between the ports of Batinah Coast such as Khor Fakkan, Dibba and Sohar, and India and the Far East, the Indian orange was, according to Masudi, brought to Oman, where it was planted. It was later taken north to the Mediterranean"²⁴.

The historical relationships between the Indian Sub-continent, the East, African coast and the E.C. have always been strong. Many E.C. sailors also used to make the long voyage to China:

"... Its people, like those of Khor Fakkan and Dibba, were probably sailing up and down the Gulf, and also on the long voyages to China, India, East Africa and Madagascar"²⁵.

The importance of the E.C. as a trade route, between the Far East and the Indian Sub-continent and the Middle East and Africa, has been recognised worldwide for a long time, and it has played an important role on the world stage many times in history.

The Emirate of Fujairah was recognised by the British as an independent Sheikhdom in 1952²⁶ and remained independent until it was united with other Sheikhdoms of the Trucial States to establish the UAE in 1971.

Khor Fakkan is experiencing a revival and is growing in importance since the days when the following comment was made:

"... it has never recovered from its destruction by Albuquerque in 1507, when it was deserted by the Hindu traders who resided there"²⁷.

The naturally deep seaport of Khor Fakkan is mentioned several times in primary sources from ancient times. Many voyagers who passed through the area commented upon its seaport and Muslim scholars and European voyagers also commented on its springs and date trees²⁸

"It was a large town... The climate was temperate and healthy..."²⁹

In the past Khor Fakkan was a strategic site for anyone wishing to control the whole Omani coast and, located by the open sea with its natural harbour, it played a major role in many sea battles during the European colonisation of the area. It was especially important in the sixteenth century. In ancient times the sailors of Khor Fakkan played a major role in trade in the area, and records of their voyages to Africa and the Far East have provided useful studies for many scholars.

The town of Dibba was a famous place in history, with a famous bay. It was

important as trading centre for the whole area. In the past most of the traders at Dibba were from the Indian Sub-continent (as today) and China, and its markets featured many foreign commodities. Many traders used to travel to the market at Dibba to trade with Arab and non-Arab merchants and trading took the form of bargaining³⁰. Dibba market has featured several times in historical records, eg Miles:

"... The general trend of the coast here is south, and we now come to the famous town and bay of Dibba. This well-sheltered bay, six miles across, was formerly a great emporium of trade and may have been the mart alluded to by Nearchus ..." ³¹

In the pre-Islamic period, Dibba was an important town in the area, specialising especially with trade from the Indian Sub-continent, Africa and the Far East. Later on, Dibba played a major role in controlling the whole coast, and in the writings of some Europeans it is called the capital of Oman, demonstrating its historical importance at that time³².

Kalba was the first state in the E.C. to be recognised by the British as an independent Sheikhdom. It remained independent from 1936 until 1951 when it was incorporated within the Sharjah Sheikhdom³³.

5. The geographical distribution of population in the E.C.

Since the 1985 population census is, to date, the most recent census, the 1985 census has been used for much of the information on the geographical distribution of the population of the E.C. The census reveals that the population distribution divides the E.C. roughly into three equal areas: the south (from Khor Kalba to Sikamkam) where the majority (45 per cent) of the population of the country lives, the centre

(from Qurayyah to Zibarah) where about a third of the population of the E.C. resides; and the north (from Bidyyah to Dibba al-Husin) where population is the lowest (Figure 2:6).

Details of these three areas are as follows:

a. From Khor Kalba to Sikamkam

This area has one major city, that is Fujairah, and a major town which is Kalba. In 1968 the population of the town of Kalba and its suburbs was only 3,119 but by 1990 the population was estimated at 11,858³⁴. Fujairah had 2,009 citizens in 1968 and by the end of 1990 this number had increased to 25,416. Government policy has been to encourage an increase in population and the population of this area reached 45,360 in 1990 (Table 2:3).

Compared with other areas in the E.C. this area has a relatively large concentration of people. In 1990 around 45 per cent of the total population of the coastal areas was concentrated in the area from Khor Kalba to Sikamkam. Table 2:3 shows that 82 per cent of the total population of this area is concentrated in Kalba and Fujairah. The high percentage is due to the proximity of Kalba and Fujairah to each other, and it in this area that most of the economic activities and new commercial facilities of the E.C. are to be found.

It is estimated that in 1990 there were only 234 people living at Hafara, representing only 0.5 per cent of the total population of this area.

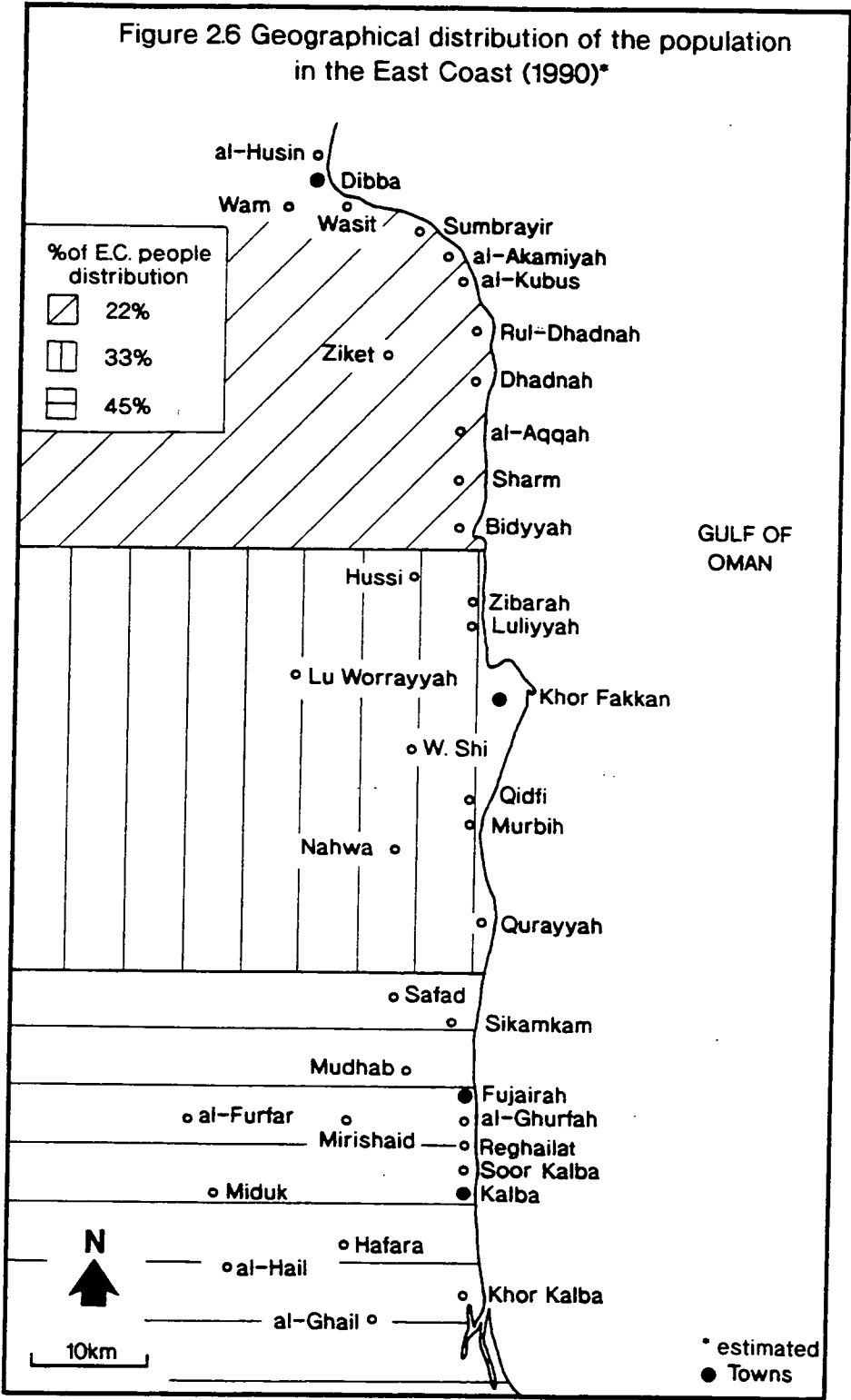


Table 2:3 Population in settlements from Khor Kalba to Sikamkam, 1990

Place	Population
al-Ghail	430
Khor Kalba	2810
Hafara	234
Treaf	1176
Kalba	11858
Soor Kalba	2732
Fujairah	25416
Sikamkam	704

Source: Ministry of Planning. Estimated number based on the UAE 1980 Population Census.

Table 2:4 Population in settlements from Qurayyah to Zibarah, 1990

Place	Population
Qurayyah	2134
Murbih	3984
Qidfi	3170
Nahwa	80
Sheas	62
W. Shi	10
Khor Fakkan	21504
Hussi	14
Luliyah	1876
Zibarah	708

Source: Ministry of Planning. Estimated number based on the UAE 1980 Population Census.

b. From Qurayyah to Zibarah

This area of the E.C. has one major town, Khor Fakkan, which, with its suburbs, had a population of 2,860 in 1968³⁵. By the end of 1990, the number of residents in the town alone was 21,504 (Table 2:4) and the suburbs were also expanding rapidly. In 1990 this number represented 64 per cent of the total population in this area and continues to do so. The high concentration of the population in Khor Fakkan is due to the fact that Khor Fakkan represents the local government for the surrounding areas. It is one of the oldest towns in this area. The area is considered to be the second largest concentration of population in the E.C. with 33 per cent of E.C. residents living here. Most of the population in this area live at Khor Fakkan with other areas being quite sparsely populated, eg at the end of 1990 there were only 10 people living at W. Shi.

c. From Bidyyah to Dibba al-Husin

This area of the E.C. is located in the far north and adjoins the Omani border. Dibba is its main town. Dibba is divided into two parts: Dibba al-Fujairah and Dibba al-Husin. There are 17 villages in the area where approximately 22 per cent of the total E.C. population live (Table 2:5). Only seven of these villages have over one thousand residents. The table shows that some of the villages are large, for example Dibba al-Husin had 6,056 and Bidyyah had an estimated population of 3,020 in 1990. The smallest population in 1990 was Adub with a population of only 140 people.

Table 2:5 Population in settlements from Bidyyah to Dibba al-Husin, 1990

Place	Population
Bidyyah	3020
Sharm	858
al-Iqqah	208
Dhadnah	1900
Ziket	202
Rul-Dhadnah	208
Rul-Dibba	438
al-Kubus	404
al-Akamiyah	2160
Sumbrayir	582
Adub	140
al-Riddah	432
al-Ghurfah (Dibba)	1218
al-Muhalab	2234
Wasit	2102
Wam	520
Dibba al-Husin	6056

Source: Ministry of Planning. Estimated number based on the UAE 1980 Population Census.

6. The economic activities of the inhabitants of the E.C.

The information on economic activities is mostly derived from the population census undertaken by the Ministry of Planning in 1985 (Table 2:6). This table shows that nine categories³⁶ of employment provide the major part of the economic activity in the area. From this table we can see that the majority of the E.C. inhabitants worked in the social services in 1985, around 48.4 per cent of the total work force (above 15 years of age). As a typical UAE region and because of the increased activity in the building industry, with much new housing and other construction work being undertaken at the end of 1970s³⁷ and the beginning of 1980s, this category represented 12 per cent of the total work force in the E.C. in the 1985 census. Almost 98 per cent of building workers were non-UAE citizens, most of them being from India or Pakistan.

The traditionally important activities of fishing and farming took the third place and represented 11.2 per cent of the total number of the E.C. workforce in the 1985 census, with the oil industry and mining employing comparatively few people, only 0.7 per cent. Since the census there has been a lot of changes in the economic activities in the E.C., much of it due to increased attention from government and also from the private sector, as the following chapters explain. This has resulted in the development of employment opportunities and industrial and commercial expansion in the E.C.

7. The expansion of E.C. towns

As a result of oil revenues from other regions of the UAE (the west coast),

Table 2:6 The distribution of the labour force (above 15 years) in the economic sectors in the E. C.
as shown in the UAE National Census 1985

	A.F	M.O	C.I	W.E	C.B	T.H	T.C	I.R	S.B	N.C	N.S	N.U	Total
E.C.Z.	1073	23	36	300	70	122	345	59	4876	1	15	89	7009
Non E.C	1905	171	2131	360	3130	2309	1202	270	7967	0	25	79	19549
G.Total	2978	194	2167	660	3200	2431	1547	329	12843	1	40	168	26558
Total %	11.2	0.7	8.1	2.5	12	9.2	5.8	1.3	48.4	.001	0.2	0.6	

Source: Ministry of Planning, UAE Population Census 1985, Part One and Two.

A.F.: Agriculture and fishing
M.O.: Oil industry and mining
C.I.: Manufacturing
W.I.: Water and electricity
C.B.: Constructing and building
T.H.: Trade, restaurants and hotels
T.C.: Transportation
I.R.: Insurance, finance and real state
S.S.: Social services
N.C.: Not classified activities
N.S.: Not shown
N.U.: New unemployment

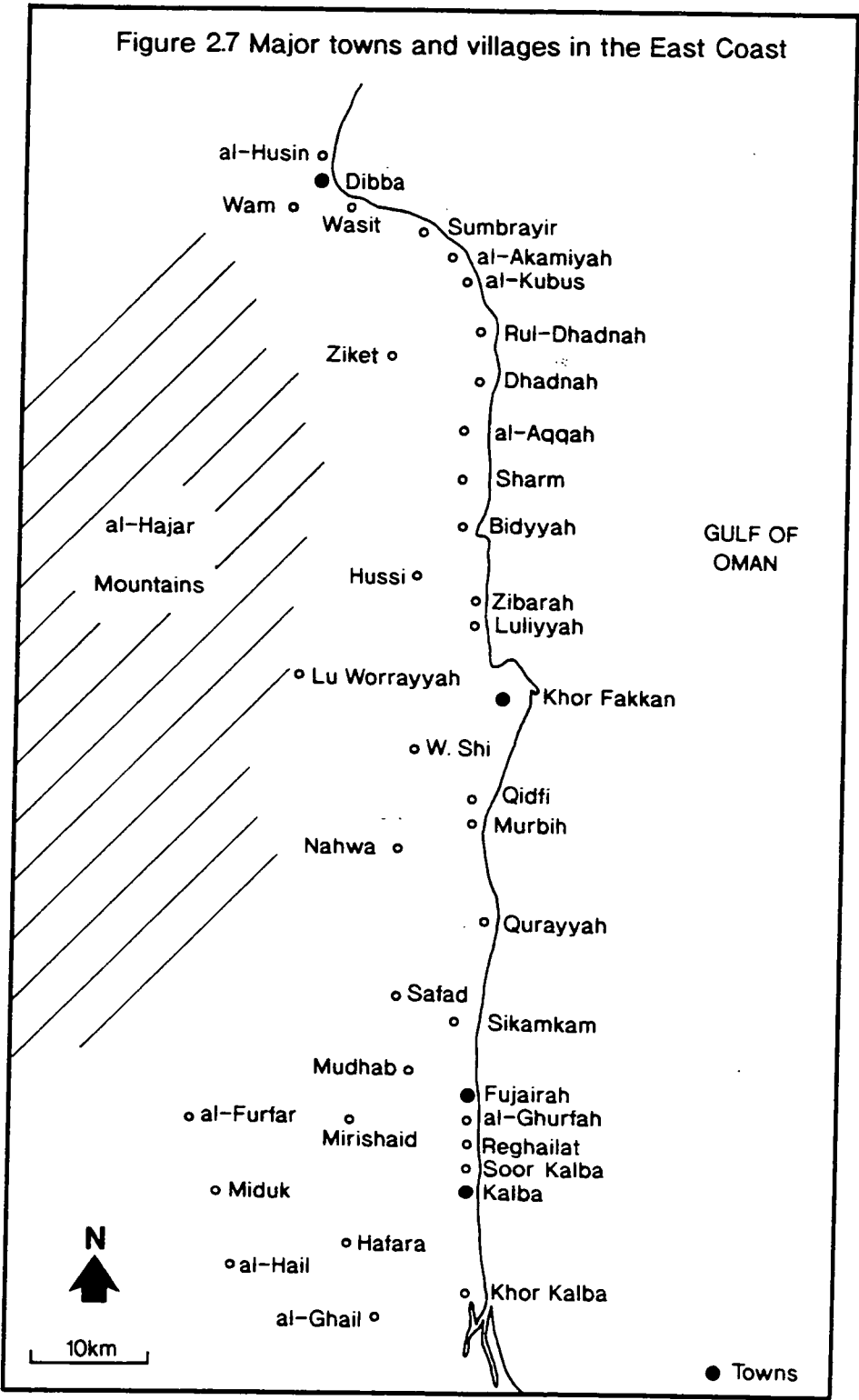
E.C. cities have expanded to cope with the increase in population.

a. Kalba

The area of Kalba covers almost 50 square km, with 15 square km being residential, and almost 12 square km still in agricultural use³⁸. Kalba is the administrative centre of the area. There are many small villages in the area, like Treaf, al-Ghail, Khor Kalba, and these are all under the jurisdiction of the Kalba administration (Figure 2:7). Kalba itself is governed by the Emirate of Sharjah.

Kalba is located in the south of the E.C. and Kalba town represents almost the last point of UAE territory before Oman. Located on the border with Oman, Kalba is important to both the inhabitants of the E.C. and Omani border villages. Most Omanis travelling to the north pass through Kalba, and Omanis who live close to Kalba also travel frequently to the town for shopping. The local Omanis also use the markets at Kalba as well as other E.C. markets to sell their agricultural produce.

Originally, the citizens of Kalba were concentrated in the old historic town, they lived in small houses constructed from palm tree fronds or a mixture of stone and mud. The urban population was relatively small and was almost self-sufficient. Roads were primitive and therefore animals were used for transport, and facilities in general were few. Following the establishment of the UAE in 1971, Kalba began to expand southward, and in the mid-1980s the old town was destroyed and new roads and houses were built to form a modern town. Most of the residents of old Kalba were given free housing and some received compensation from the government for the loss of their homes.



Recently Kalba's urban area has spread so much that Kalba and Soor Kalba have almost been joined together. Expansion of the town is also closing the gaps between Kalba and many of the villages in the surrounding areas. Urbanisation is also spreading towards the Omani borders and, if this continues, within a few years the area between Kalba town and the Omani border will be taken over by housing and commercial units.

b. Fujairah

Fujairah city is the administrative centre and capital of the Emirate of Fujairah, and the city was the traditional residence of the ruler of the Emirate of Fujairah in the past. The present ruler moved to a new palace in the Mudhab area, which, however, with the expansion of the area of Fujairah, is only two km from the old palace and still part of the municipality of Fujairah.

In 1968 there were 2,000³⁹ people living in Fujairah but by the end of 1990 the number had increased to an estimated 25,416.

As Fujairah city experienced a boom in business activities, it expanded and new residential areas have grown up to house the increased number of new inhabitants. The new residential quarter of the city is divided into blocks similar to those in America. The government of Fujairah has played a major role in developing the city and in the actual construction of much of the new building. It has constructed a new airport to serve the city and the E.C.

What remains of the old residential quarters in Fujairah is located close to the sea, but has been largely deserted by the original inhabitants. The area between Kalba

and al-Ghurfa is especially desolate whilst the city of Fujairah has expanded to the west and north west and new residential areas have been established in Mudhab (including the ruler's palace) to the north west of the city (Figure 2:8).

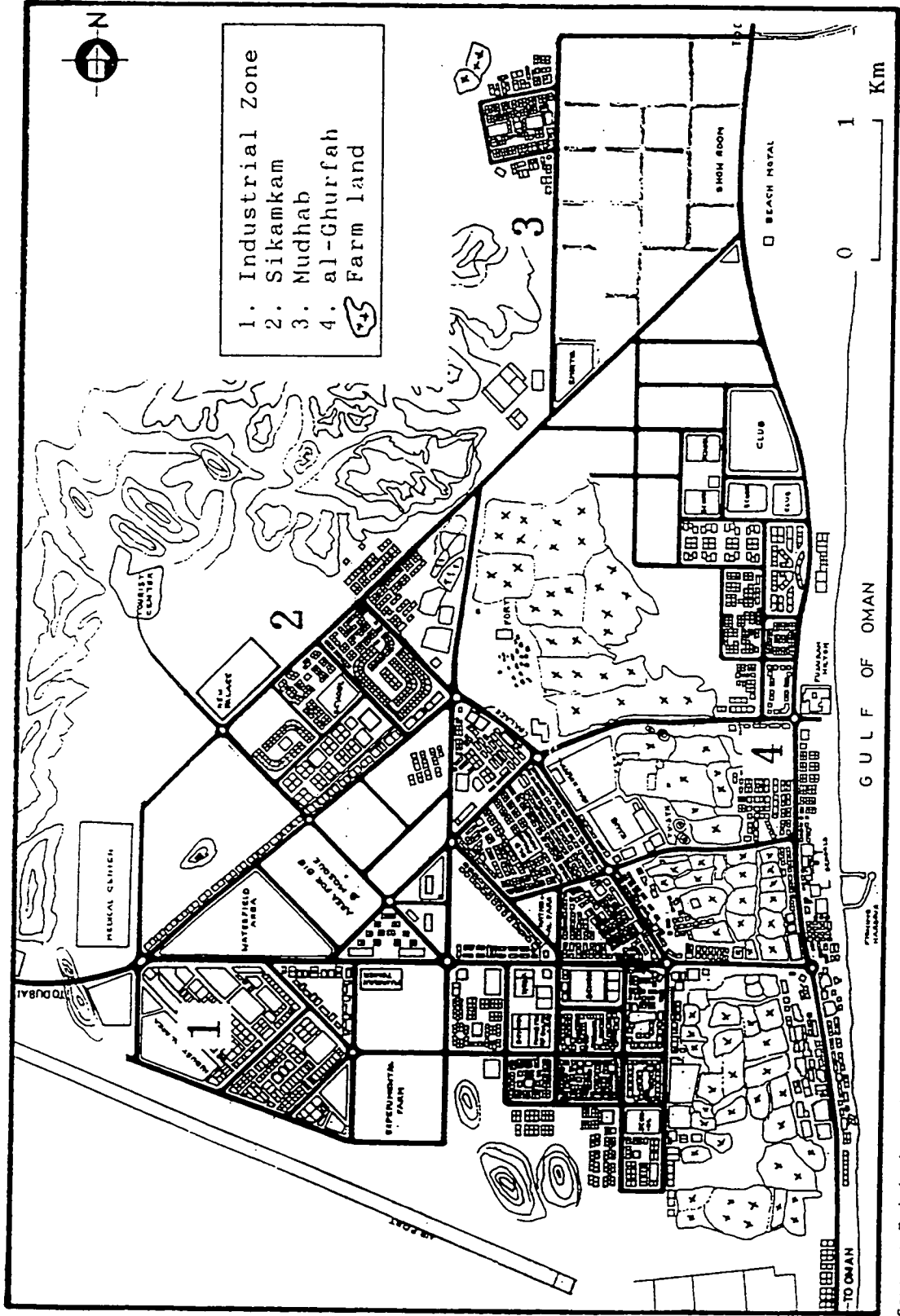
The other oil-rich Emirates have all participated in developing Fujairah, and have provided the financial resources needed to establish its industrial infrastructure. Notable amongst the donors are Dubai and Abu Dhabi, and, as well as generous outright gifts of money, financial institutions of the other Emirates, like the Abu Dhabi Fund have given loans (80.5 m UKP) to finance development in the area⁴⁰. The government's new policy of developing the region's natural resources and finding alternative sources of income began in the late 1970s and early 1980s and was largely funded by the generosity of the other Emirates in the UAE.

c. Murbih and Qidfi

On the way to Khor Fakkan from Fujairah, there are two small villages which are almost joined together. They are served by one small fishing harbour (Figure 2:9) and there are two sea water distillation stations here to supply the Fujairah area with its drinking water.

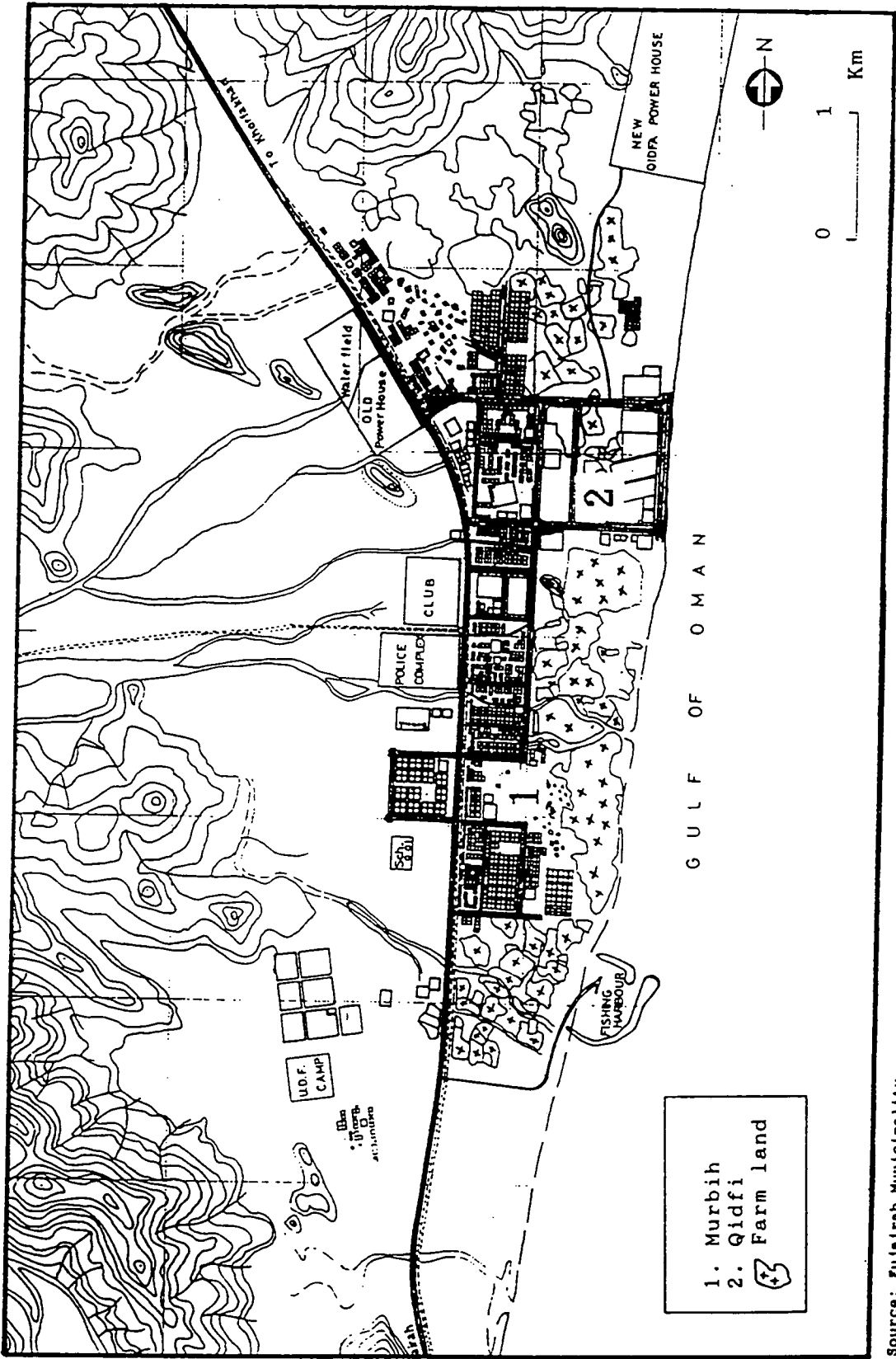
The combined area of Murbih and Qidfi is comparatively small. However, a new residential area has sprung up to the west of the main highway. This highway serves the whole of the E.C. and it is possible with the natural advantages of the site that the area will expand and develop more in the future. The government has recognised this and has recently built new public houses⁴¹ and a sports club to serve the two villages in this area. The government has also constructed an electricity power

Figure 2.8 FUJAIRAH CITY AND ITS SURROUNDINGS



Source: Fujairah Municipality
Fujairah Master Map (modified)

Figure 2.9 MURBIH AND QIDFI AREA



Source: Fujairah Municipality.
Murbih and Qidfi Master Map (modified)

station to supply the whole of the E.C. with its needs and to operate the two water distillation stations sited in the area.

d. Khor Fakkan

Khor Fakkan was an important town in the past. It is located centrally in the E.C. and covers an area of 9 square km. It is now considered to be an important tourist attraction for visitors to the E.C. who travel to the area from Fujairah or Dubai.

In recent years the municipal government of Khor Fakkan has divided the town into nine residential quarters, covering an area of approximately 9 square km⁴². The industrial zone is located in the Zibarah area north of the town. Agricultural land occupies only 11 per cent of the total area around the town, with the highest concentration of land use, 68 per cent, being residential and commercial (Table 2:7).

Khor Fakkan has many small villages, including Luliyyah, Zibarah, Sheas and Nahwa, and these all fall under the administration of the town. Luliyyah and Zibarah cover an area of approximately 12 square km⁴³ and their vegetable farms and fishing harbour are an important source of agricultural and fishing produce for the markets of Khor Fakkan and Fujairah. The agricultural area of these two villages is approximately 18.2 per cent of the total land. In contrast, at Sheas and Nahwa, agricultural land use represents 75 per cent of the total.

Khor Fakkan has received much attention from the government of Sharjah as it is the administrative centre for all the areas which belong to the Emirate of Sharjah in the E.C. The government has developed its seaport and it is now one of the most important seaports in the E.C. A new shopping centre has been constructed to serve

Table 2:7 Residential, commercial and agricultural areas in Khor Fakkan and the surrounding areas by the end of 1980s (in Sq. Km)

Area	Tot. Area	Residential & Commercial	%	Agricultural	%	Other %
K.Fakkan	9	6	68	1	11	21
Luliyah & Zibarah	12	2	18	0.9	18.2	63.8
Sheas	1	0.24	25	0.76	75	0
Nahwa	1	0.24	25	0.76	75	0

Source: Sharjah in Fifteen Years Time 1974-1988. P. 66.

people of the Khor Fakkan area and surroundings, as well as to provide a tourist attraction.

e. Dibba

Dibba, as a town is unique in the Middle East. It is considered to have an equivalent position in the Middle East to that held by Berlin for the two Germanies in the past. The land of Dibba divides the Emirates of Sharjah (Dibba al-Husin), Fujairah (Dibba al-Fujairah) and the parts of Dibba which belong to Oman.

In recent times the government has paid much attention to Dibba, constructing a seaport, modern housing and roads. Thus the ancient importance of the town and port of Dibba has been revived in modern times.

Dibba is located in the north of the E.C. and is the main access to Omani territories from the north which partly accounts for its importance. The residential areas of Dibba are expanding to the south west of the town and it is predicted that in the future Dibba will play a major role in the further development of the E.C. It is expected that the seaport at Dibba will serve the surrounding area and also relieve pressure on other E.C. seaports at busy times.

f. Other towns and villages in the E.C.

There are three major towns in the E.C.; Kalba, Khor Fakkan and Dibba, which are the centres of local government. Most of the small villages of the E.C. are administered by the local government of the nearest town, eg Luliyyah is administered by Khor Fakkan town.

The E.C. has many small villages eg al-Saf, Zibarah, Bidyyah. Sikamkam is a typical example, with a population of around 800 people. Dibba al-Husin is another. It is located in the north of the E.C. and is the last settlement before the border with Oman. It covers an area of almost 3.4 square km and 56 per cent of the total land use is agricultural, with the rest being used for residential and commercial purposes⁴⁴.

8. The infrastructure of the E.C.

The present infrastructure of the E.C. has been developed since the establishment of the oil industry. For instance health services have been developed largely during the 1980s to serve the inhabitants of the area and new hospitals have been built in the major E.C. centres of Kalba, Fujairah, Khor Fakkan and Dibba. In 1987 there were four hospitals⁴⁵ under the Ministry of Health administration, with 478 beds, operating in the E.C. In that year 589 medical staff worked at these hospitals (Table 2:8). These hospitals were geographically distributed in the E.C. to serve the inhabitants of the area as well as the Omani border villages. The E.C. also has a lot of private clinics providing health services to the inhabitants of the area. Hospitals at Khor Fakkan, Dibba and Kalba provide a health service to the inhabitants of the cities and the surrounding areas (including the Omani border villages).

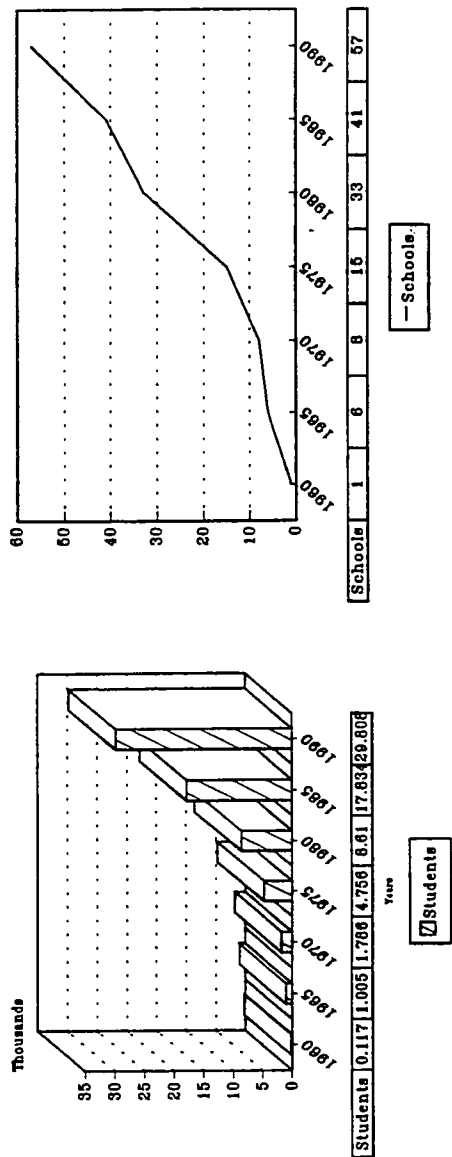
As well as health services, other facilities in the E.C. such as education have expanded since the beginning of the 1970s. Educational institutions have increased from one school in 1960 to 57 by the end of 1990. This has been necessary to cope with the increased number of students in the area (Figure 2:10). The number of students in the E.C. increased from 117 in 1960 to 29,808 students in 1990. This

Table 2:8 Number of hospitals in the E. C. in 1987

Hospitals	Beds	Doctors	Nurses	Technicians
Fujairah H.	158	45	112	42
Dibba H.	78	32	65	22
Kalba H.	84	43	40	22
K.Fakkan H.	158	22	111	33
TOTAL	478	142	328	119

Source: Ministry of Health. Fujairah Health Department, Fujairah.

Figure 2:10 Number of schools and students in the E.C.
from 1960-1990.



Ministry of Education
East Region Administration Office, Fujairah

increase is due to the government policy of educating the people of the area and developing the E.C. infrastructure.

The area of the E.C. is well served by a modern telecommunication network, and each town is provided with fire stations and banks. Modern seaports, airport, parks, highways and many other facilities would not have existed but for the wealth accrued from oil in the other Emirates. All these facilities have played an important part in the development of the economic activities in the E.C.

Summary

The UAE with its population of almost 2 million has gained its reputation as a trade centre among the Gulf countries. The excellent location of the UAE on both the Gulf waters and the Oman Gulf has given the country the flexibility to monitor business in the area. The wealth driven from the oil exploration has helped the country to build its infrastructure which in turn has enabled the country to adopt a modern lifestyle. Its cities have expanded to cope with the increased population.

The E.C. of the UAE has recently received government attention and funding, enabling the area to develop its facilities. This has given the E.C. the chance to play a major role in the UAE and Gulf trade. The next chapters will focus on this aspect of development.

The towns of the E.C. have grown with the increased population, and the government of the UAE has played a major role in developing the E.C. The importance of the E.C. as a trade route has been recognised for a long time and the recent importance of the E.C. is a revival of its ancient role in trade. The lifestyle of

the people has changed from a traditional to a modern one, all as a result of the oil wealth coming to the area.

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45. Indeed there has been more than one hospital operating in the area before and after the exploration of oil in the UAE. These hospitals are not under the Ministry of Health Administration, like the Iranian Hospital which provided health services to the E.C. inhabitants before the exploration of oil in the UAE.

III. Pre-Oil Economic Activities In The E.C.

A. Traditional agriculture:

1. Distribution of traditional agriculture
2. Irrigation methods:
3. The Major agriculture production:
4. Livestock
5. Marketing of agricultural produce
6. Primary tools used in traditional farming:
7. Types of farms in the E.C.
8. Inside organisation of the garden
9. Farm land system:
10. Farm land taxes
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B. Traditional fishing in the E.C.:

1. Fishing trips
2. Quantity and quality of fish caught in the E.C.
3. Method of catching anchovies
4. Common methods of fishing in the area:
5. Night fishing
6. The main types of fishing boats in the area:
7. Marketing of fish in the area
8. Ownership of fishing boats

C. Traditional manufacturing in the E.C.:

1. Traditional manufacturing related to farming:
2. Traditional manufacturing related to fishing
3. Traditional manufacturing activities within the home:
4. Other traditional manufacturing industries:
 - a. Tanning

D. Other economic activities in the E.C.:

1. Supplying of water
2. Building
3. Supplying firewood:
4. Digging wells
5. Other services

E. Trading and marketing in the E.C.:

1. Trading:
 - a. Trade in the E.C.
 - b. Trade with other UAE regions
 - c. Trade within the Gulf countries

F. Prospect of oil

Summary

Endnotes to Chapter Three

III. Pre-Oil Economic Activities In The East Coast.

The E.C. of the UAE has no oil reserves. The inhabitants on this coast used to be largely self-sufficient, living by farming or fishing. Some left the area to seek a better life in neighbouring countries such as Kuwait, Saudi Arabia and Bahrain. Those who worked in neighbouring countries spent months or years away from their families and during that time the women took care of the children and the family. Those who remained used local materials and their own skills to gain a living at home. The determination of the inhabitants, location, and the physical environment of the E.C. directed the way in which the inhabitants gained their livelihood, with three major activities predominating.

The first of these was farming. As a result of the limited technology available in the past and the fact that the main fishing catch, anchovies, was seasonal, agriculture was the main activity. It provided the people with two things: (a) food for their families, and (b) the means to purchase the necessary materials to build their houses. The second major activity was fishing. The E.C.'s location by the sea facilitated this activity and fish were abundant in the area. The third activity was the manufacturing of tools. This was a traditional industry, providing tools for the other two industries and enabling the inhabitants of the region to be independent of any outside help in the form of imports.

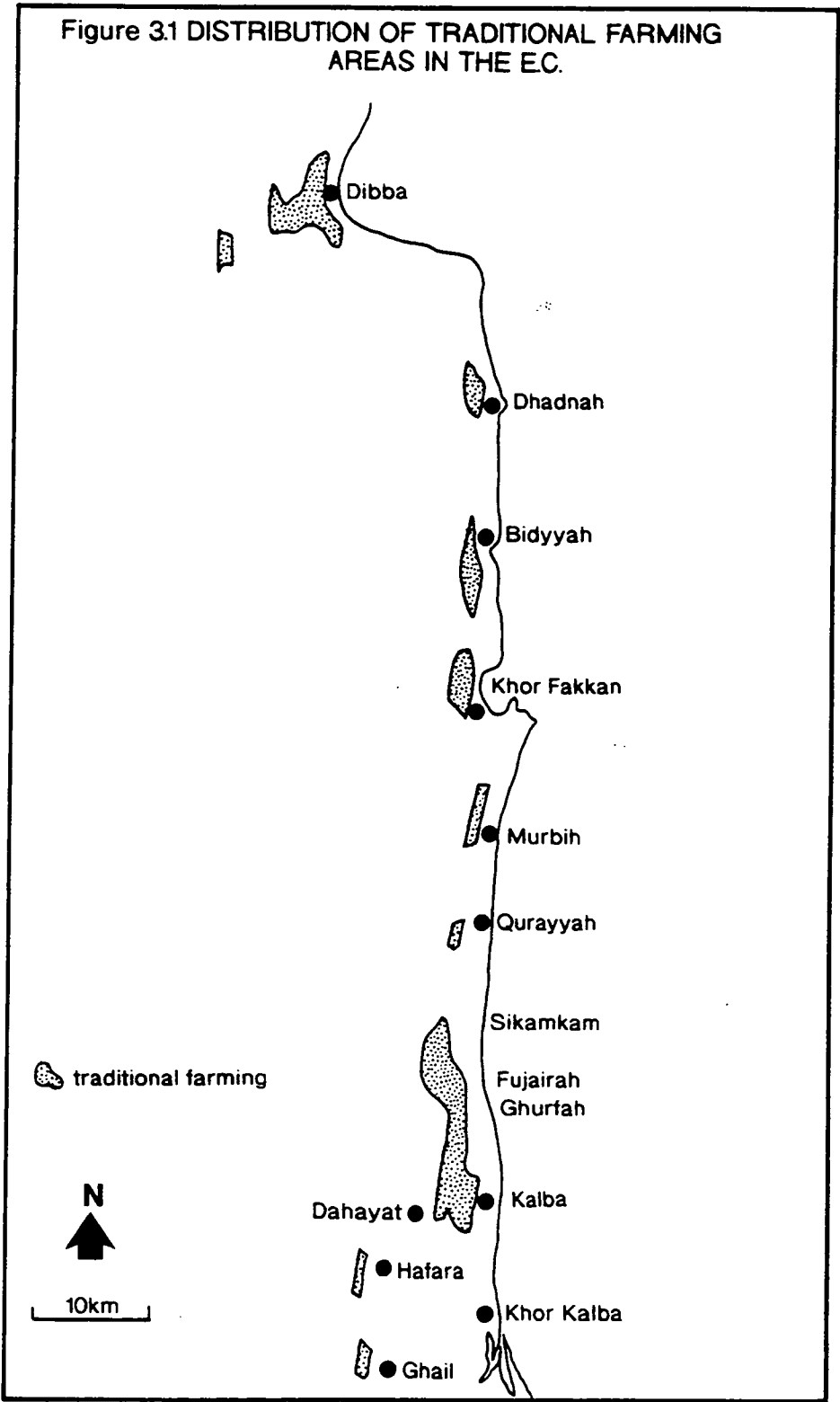
A. Traditional agriculture

Traditional agriculture was a simple way of farming which depended on basic skills, simple tools and equipment. Before the development of oil, the farmer's own

labour, supplemented by animal power, was all that was used to farm the land. Farming and fishing used to be the major sources of livelihood in the E.C. and it is obvious that people also enjoyed these activities as, even after oil was discovered, they still took great pride in these traditional activities and way of life, keeping their traditions alive. The combination of manual labour with animal power used to farm their land is still seen in the popular bull fighting contests (Chapter Seven). In the old days, any free time that the farmers had was spent in these contests and today the splendid condition of bulls and equipment and the pride of the farmers who still keep them for the contests demonstrates the survival and strength of the traditions of the area.

1. Distribution of traditional agriculture

Because of the nature of the environment, agriculture was practised in small settlements close to water. Small villages which have been excavated at Fujairah, Kalba, Khor Fakkan and Dibba, followed the traditional agricultural patterns still indigenous to this region. For example, in Kalba, the farm land was concentrated in an area called Dahayat (Figure 3:1). Agriculture in this area later suffered because of an increase in salinity, resulting in poor soil and water supplies. A settlement pursuing the traditional form of agriculture has also been found to the west of the old town of Kalba at the site where expansion is now taking place. In Fujairah, traditional agriculture was practised in the Mudhab area; In the area around the old castle, and in Sikamkam to the north of the new housing area. As Figure 3:1 shows, in Khor Fakkan traditional agriculture existed in the area to the north west of the old town.



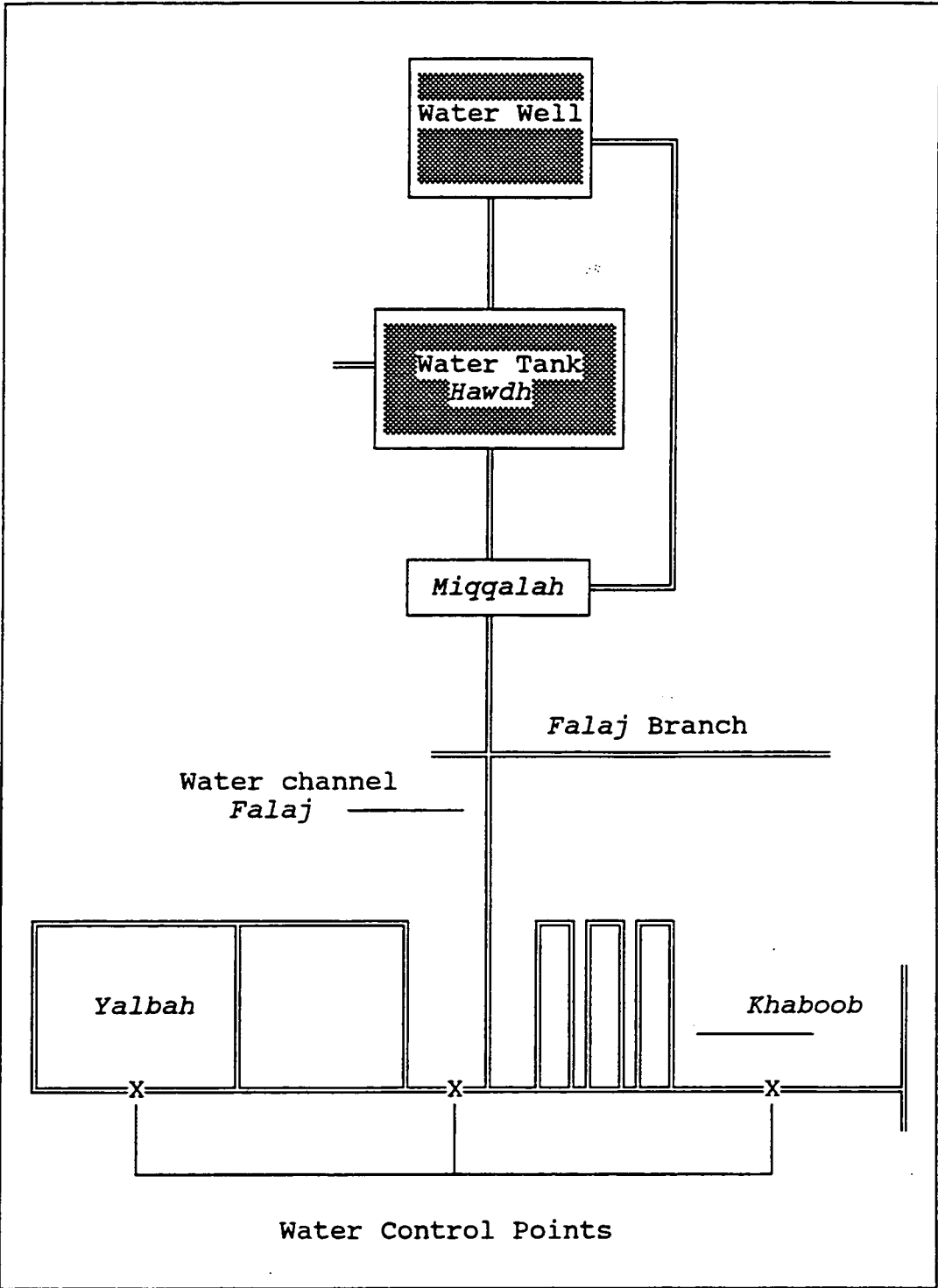
Meanwhile, in Dibba the inhabitants farmed in the interior, away from the sea water, in mountain villages.

2. Irrigation methods

Agriculture in the E.C., as in all countries of the Gulf, depended upon being able to irrigate the crops. Irrigation methods varied from place to place. In the E.C. the usual method of irrigation used the water that was raised to the surface by traditional techniques. The water was collected in a tank, called a *Hawdh* or *Miqqalah* from where it ran into a canal, called a *falaj* or *falai* (this is not to be confused with the accepted name of the traditional irrigation system of *falaj*, which used to bring water from high land, in paragraph a below). The *falaj* was a narrow channel, half a metre wide, with several branches from it (Figure 3:2). Each branch had its own connection to the *falaj* and each could be opened or closed as the farmer required. These canals irrigated the *Yalbah* and *Khaboob* directly. Usually the farmer irrigated his garden daily except for those crops and trees which did not require much water, such as palm trees and some citrus.

When people lived in areas with limited water resources, it was important to be able to bring water to the surface but this was a difficult process. The resourceful cultivators in the E.C. used primary techniques to bring water from wells to the surface, using manual labour and animal power plus natural resources. This ingenuity enabled them to farm their land and grow crops, giving the E.C. the reputation of the "fruity" coast, due to the abundance of fruit trees grown in the area. Amongst others, mango, citrus, papaya, guava and almond were common.

Figure 3:2 Diagram of traditional irrigation method found in the E.C.



Source: Fieldwork 1991

"Traditionally the Batina Coast is a fruit growing area and there are large numbers of fruit trees there"¹.

In the past, using only simple equipment and tools the farmers of the E.C. were able to satisfy all their nutritional needs from their own farm produce.

Four types of traditional irrigation systems were used in the area:

a. *Falaj* (plural *aflaj*):

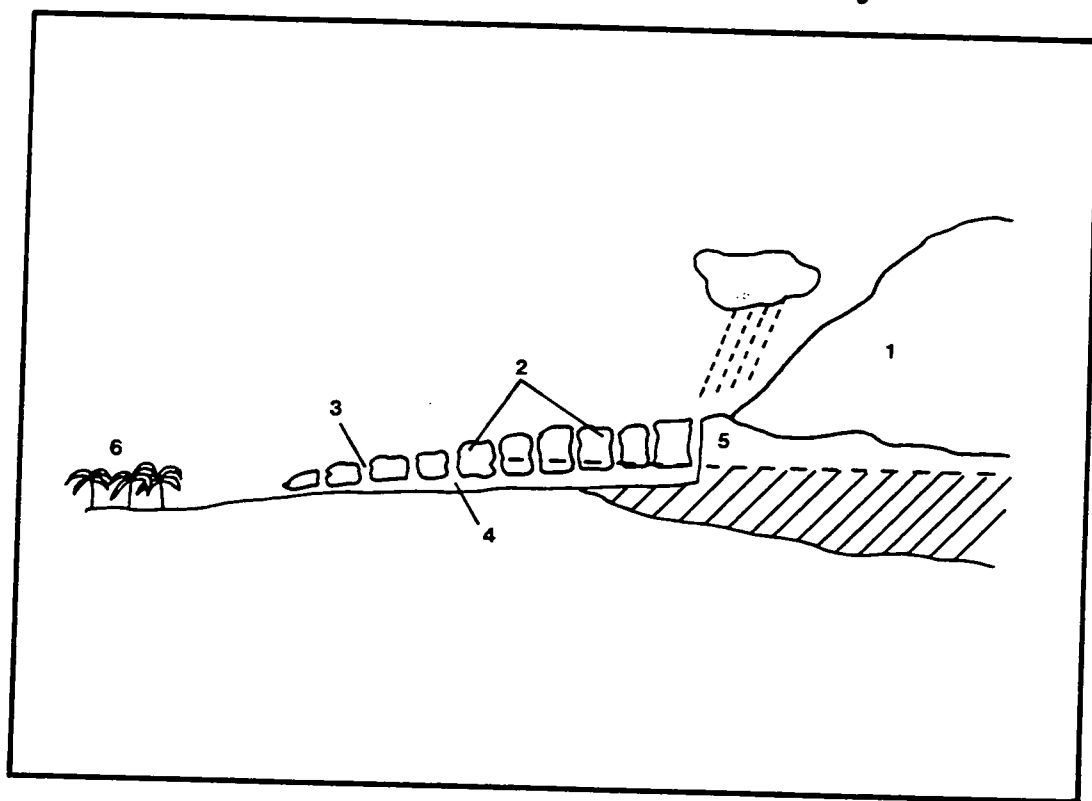
History does not tell us the date when the aflaj were introduced to the area, but it is thought that they first were appeared in Armenia and spread to Persia and, from there:

"they were introduced to Arabia in approximately 640-320 BC"².

The *falaj* was a man-made canal which allows water to flow gently from its source, usually a spring located in a high region, down to the low land where plantations of palm trees and houses were located which require a water supply.

A *falaj* was built as follows: the builders dig a long underground tunnel starting from the high elevation and gently sloping to the low, locating the end of the tunnel as near to the plantations and houses as possible (Figure 3:3). Depending on the topography and the geology of the land, sometimes part of the water channel was on the surface rather than in the form of tunnel. For the parts underground, ventilation openings were sometimes included in the tunnel design. These openings were also useful during the construction to enable the tunnel to be cleared of building materials, and once in use, to clear the tunnel of any extraneous matter which could stop the water flowing, so that the water supply remained clean.

Figure 3:3 Cross section of a *Falaj*



1. High land
2. Strata which contain the underground water
3. Ventilation openings
4. *Falaj* running water
5. Underground water
6. Farmland

Source: Institution of Arabic Research and Studies

Dawlat al-Imarat al-Arabiyyah al-Mutahidah,

Derasah Mashiyah Shamilah. "UAE, a General Survey

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1978, p. 205.

A slope was necessary for this system of water supply and in the past the location of villages was usually dictated by the topography, with small settlements growing up around *falaj*, eg Sikamkam located at the end of the *falaj* al-Owaina. Of necessity in the past tunnels were relatively small and the amount of water limited. This meant that farmers were only able to farm small areas of land around each *falaj*, with Sikamkam again being a good example of this. Traditionally most of the inhabitants of the settlement who clustered around the *falaj* shared the water, the supply being diverted to each farm's irrigation channel for a certain length of time.

Aflaj were usually found in mountain areas. In the E.C. there were three kinds of *aflaj*:

- (a) *al-Dawodiyah*³, or continuous supply. This kind of *aflaj* had a plentiful supply of water for most of the year. The volume of this kind of *falaj* was directly affected by the level of underground water and these *aflaj* had a deep and plentiful underground water supply to draw upon. An example of such *al-Dawodiyah* was the al-Owaina *falaj*.
- (b) *al-Qhailiyah* or shallow water supply. The volume of the water of this kind of *falaj* depended upon rainfall. During the rainy season the water level of these *aflaj* rose leading to an increase in the amount of water available. In times of drought the water supply decreased and often stopped altogether. *al-Qhailiyah* therefore functioned only in the monsoon period in the winter. An example of this type of water supply was the *falaj* Ziket.
- (c) *al-La-hudhoriyah* or warm spring water. Water from the *al-la-hudhoriyah* came from deep underground strata and its main feature was that it was warm, sometimes

reaching a temperature of 38°C. People used to travel long distance to these springs, as it was believed they had the power to cure ailments such as skin disorders. An example of an *al-la-hudhoriyah* was the *falaj* Mudhab, near Fujairah.

The water from *aflaj* was usually divided between the inhabitants of the surrounding area. Each *falaj* had a supervisor who directed the water to farmers or other consumers at certain allocated times, which usually meant plantations were irrigated on an average once every 4 or 5 days. The amount of water for each consumer was allocated on a time basis also and the water supply from the *falaj* was directed into their channel for a certain period of time.

b. *al-Manzifah*:

al-Manzifah was a system of irrigation using loads and levers and was found in many countries. In some places it is called the Shadoof. *al-Manzifah* was a simple way of irrigating, relying on manual labour and very simple equipment. A strong tree trunk between 3-5 metres in length, taken from of a certain kind of tree, was counter-weighted at one end and a bucket was fixed at the other. Sometimes the bucket was made from animal skin. The equipment was held by three branches placed over the well. When the rope was pulled down, the counterweight simultaneously lifted the other end up, and the bucket dropped into the well and was filled with water. By loosening the rope, the counterweight came down and the full bucket was pulled to the surface. Then the farmer poured its contents into the canal. This method was used to water small gardens with a few trees or crops. It has existed for many centuries in Kalba, Murbih, Sikamkam, Fujairah and other areas in the E.C. where traditional

agriculture has been found by excavation.

c. *al-Yazrah*:

al-Yazrah consists of an bull, a rope and a pail set up over a well. In the past this equipment was used on big farms and some had more than one *Yazrah*, depending on the amount of crop grown. Irrigation by this equipment used animal power. The farmer dug a wide hole in the ground, about 13 metres long by 4 metres wide, with gently sloping sides from the surface down to about 4 metres deep. The slope was to help the bull gain a foothold whilst it pulled the full pail. Two men were needed, one to direct the bull backwards, and the second to pour the water from the pail into the water tank or directly into a water channel⁴. Another team of two men and bull relieved them at intervals, so usually 5 or more bulls were needed on farms using *al-Yazrah* irrigation.

The *al-Yazrah* method of irrigation differs from that of *al-Manzifah* in that it was possible to cover large areas with *al-Yazrah* but it needed more than one person to manage it. Usually the pail was bigger and the water could be raised from deeper in the ground than in the *al-Manzifah* irrigation method. Irrigation by *al-Yazrah* combined human and animal power, whilst that of *al-Manzifah* only required manual labour.

al-Yazrah is now only found on two farms in the area. One is in Fujairah and the second in Murbih and they both exist to show children and students the techniques used to irrigate the land in the past. The old people of the area were proud of *al-Yazrah* and point to its dependability in comparison with the modern water pumps

they now use which sometimes break down.

d. *al-Dalo*:

Irrigation by *Dalo* was a simple method of irrigation where three tree branches were pegged together over a well and a bucket was suspended on a rope from them. The bucket was used to draw water from the well. This method was very common all over the world at one time. In the E.C. it was used to irrigate palm trees, and was locally called *Tahmeem* which means 'pouring water for trees'. This method was commonly used when the water level of the well was close to the surface, eg around 3 metres deep.

Some wells were not located on farms but were sited outside farmland. Anyone who needed water could use the water from these wells.

In general irrigation methods were simple and locally made, because of the limited farm land needed to grow a small quantity of agricultural products. The irrigation methods were out-of-date ones and produced a small quantity of water to irrigate the farm crops.

3. The major agriculture products

In the past, most of the agricultural yield of the area was for local use but a surplus was used to exchange for materials unavailable on the farm. Because of transport difficulties, produce was usually bartered to people who lived close by but also some merchants travelled from Iran and the Gulf areas like Bahrain to purchase the farmers' produce, especially their crops of tobacco and dried limes. This produce

was sent to Bahrain or to the Far East.

The following were the main agricultural products of the area:

a. Tree crops:

The main tree crops in the area were:

1. Palm trees:

The palm was and still is a seasonal tree which produces fruits seasonally. It is very tall, with a trunk which can reach up to 25 metres high. The female of the palm tree does not give good dates without being fertilised by a male tree, so farmers have to grow both male and female palm trees or pollinate their female palms with male trees from their neighbours' trees. Palm trees have been grown for a long time in the E.C. and elsewhere in the Gulf area and they were an integral part of the agriculture of the people. They require a desert climate and consume a small amount of water. The climate is well suited to palm trees, which do not need much water except at the beginning of their life. For the first 45 days the plants need watering well, but from then on they can absorb moisture via their long thin roots from deep underground. Palm trees are resistant to high salinity in the soil and heat. With a little care they can grow tall and give a high yield.

Palm trees were grown all over the E.C., with most being concentrated in the Fujairah, Kalba, Murbih and Dibba areas. The palm tree is regarded as God's gift to the people of these desert areas, where there is a shortage of food and water. The palm has many uses,⁵ food being merely one of its benefits. The following were its main uses:

(a) Food: *Ruttab* (fresh dates) and *Tamar* (dried dates) were the main ingredients in the diet of the population of the E.C.. Dates with milk were a feature of cultivators' meals in the area. In the past, as now, dates were eaten in a variety of ways; fresh, mixed with flour, made into syrup for pancakes. The fresh dates from the first crop, the *Tabshurah*, were sometimes sent to the markets on the west coast and were transported by sea⁶, because the shortage of good roads used to make overland transport difficult. There was competition amongst the farmers to get their produce to the markets first in the past as, then, being the only dates sold at the market, they fetched the best price because there was no competition.

The entire process of date production, from planting the young trees to packing the harvested crop into sacks comprises the main feature of the lifestyle of the cultivator. The type of packing used depended on the quality of the dates. The best dates were pressed and packed in sacks made of palm tree leaves. After collection, they were stored for several days in a clean room with sacks overlapping each other. A hole was made in the ground and the sacks were pressed, squeezing the dates and extracting their dates syrup which was collected in the hole.

Second grade dates were partially dried and packed in bags and kept for future use by the family. The remainder of the crop was used as animal feed.

(b) Other uses of palm trees: If one looks at the houses of the old farmers one can see how valuable the tree was in the past. Such houses would be surrounded by fences made from *Daan* (palm tree fronds tied together with rope made from palm tree leaves). Rooms of the farmhouse were constructed from material provided by the palm trees, with tree trunks acting as supporting beams. Most, if not all, the furnishing of

the house was made from palm trees, including floor coverings and clothes bags and even some food plates and covers were made from material from the palm tree.

2. Mangoes:

The E.C. was and still is famous for its mango production. Mangoes have been grown in this area for a long time. Fujairah and Kalba were the major areas for mango, but they were also grown in many other villages. The mango tree reaches 8 metres in height and has an estimated crop of 800-2,000 fruits every years, depending upon the size and span of the tree. Mango trees have a productive life of about 25 years, producing fruit annually during this time. The mango season was the most prosperous time for the farmers of the area. Many people visit the E.C. at this time expressly for the mangoes, spending their holidays here, attracted by the fresh mangoes, dates and other fruits they can buy in the area. Mango trees do not need much water, for example in winter watering once every 20 or 30 days was sufficient, depending upon the age of the trees and the nature of the soil.⁷

3. Mulberries, guava and Indian almonds:

The above fruits probably originated in western India. According to Hawley:

"All the fruits grown on the Batinah have been Indian Varieties"⁸.

The E.C. farmers preferred to grow these trees because they need little attention. For a mature guava tree, watering every 10 days was sufficient to provide the moisture needed by the tree's roots. The trees can reach 10 metres in height and average harvests per tree reach 80 kg. Almonds have a similar yield.

4. Bananas:

Banana trees grew in low-lying areas where water was plentiful. Usually they were planted close to running water, by canals or near houses. Bananas were grown on most farms in the E.C. and in the major settlements, especially Dibba and Murbih.

The bananas were consumed locally by the farmer's family or sold in the local markets of the region, especially Kalba.

5. Citruses, limes and oranges:

Citruses, limes oranges, together with dates, almonds and mangoes were the major features of any traditional garden in the E.C. The mountain villages led the way in growing oranges whilst limes were mainly found in the gardens close to the sea. Sikamkam was noted for growing oranges, as was Hafara to the west of Kalba.

b. Ground crops:

The common ground crops in the E.C. were:

1. Alfalfa:

Alfalfa was an animal fodder crop grown on most farms in the E.C. as well as the UAE, especially those with mud soil. Farmers used to grow alfalfa under palm trees or on its own. The virtue of alfalfa was that the tops of the plants can be cut off regularly (usually farmers do this every 10 days) for fodder leaving the rest of the crop in the ground to grow and provide further fodder when required. Alfalfa did not require much watering, every 3-4 days was sufficient. The plant was good for the land, in terms of nitrogen and helping to keep the soil from erosion, its roots system holding the soil together, with nutrients for the soil provided by decaying roots of old

plants. Alfalfa was easy to cut and gives a good yield. It was estimated that for every cut of *Yalbah* 3 by 5 metres, 12 faggots (bundles) of alfalfa were obtained. The crop was used locally on the farm to feed the animals or sold in the local market.

2. Cereal crops:

The people of the E.C. have grown cereal for many centuries and cereal crops played a major role in their self-sufficiency before the oil. Wheat, which was called *Saaif* in the area, was an important crop and the E.C. used to be a major wheat growing area, along with the Dhaid region. Wheat was grown in winter and in late summer and was a major source of food. In the past it was ground using a simple tool called *Raha*, a grindstone consisting of two pieces of hard stone, the bottom one being fixed, the top one moveable. By rolling the upper stone upon the lower one, wheat between the two stones was ground to become meal which was used to make bread. Barley and millet were also grown. In the past the villages of the E.C. were entirely self-sufficient in cereal but sometimes the surplus harvest was shared with neighbouring villages.

3. Tobaccos:

The E.C. was, and still, is a major tobacco growing region. Tobacco was grown in the mountain villages where the soil suits the crop. Farmers grew tobacco for use locally and also to send to the coastal towns from where it was exported overseas. The crop was also grown in other settlement areas. It was grown for two purposes, local use and export to the Gulf area, especially to Bahrain, and to India and the Far East. For the Gulf trade, merchants used to come from the Gulf area to the

E.C. at harvest time to collect the farmers tobacco and they would have the crop peeled and packed locally.

A typical example from Kalba was the merchant Bin Hashim from Bahrain whose activities accurately mirror the trade in the past. This merchant authorized a local man to collect the farmers' tobacco harvest and, after the tobacco was dried, Bin Hashim would rent a building in Kalba where local people would be employed to peel and pack the tobacco leaves⁹. Then it would be exported to Bahrain by sea. At other times Bin Hashim would transport the tobacco to Dubai on camels, donkeys or cars and from there ship it overseas.

4. Sweet potatoes:

Sweet potatoes were grown in winter in the E.C. They were called *Findal* and were grown in *Yalbah* or *Khaboob*. Sweet potatoes, with onions and wheat were an important food combination in the diet of the population in the past. One *Yalbah* produces 20-30 kg of sweet potatoes. The farmer consumes most of his own crop and the remainder was sold or bartered locally for other commodities.

5. Onions:

Onions were grown in *Yalbah* and one *Yalbah* yielded about 35 kg of onions. Most farmers grow onions not only because they were a useful part of their diet but also for barter. For example, people from the mountain villages bring oranges to exchange for wheat or fresh or dried fish which they used as fertiliser for their farms, or for other commodities, such as onions so that they were self-sufficient.

Traditional farming has always played a major role in supplying the inhabitants of the area with their subsistence. The cultivated crops of the traditional farm

comprised almost 70 per cent of the people's food. The main farm products such as cereals, onions, sweet potatoes and fruit and citrus trees also played a major role in trading, for instance, 70 per cent of the onion harvest was used for subsistence and the rest was bartered or sold at market. Cereal was traditionally a major part of people's diet and on average around 40 per cent of the cereal harvest was used for trading and found a ready market with those people who did not have farms of their own to grow cereal. Farmers sold cereal direct to customers and also at the market. The remaining 60 per cent was kept by the farmer to feed his own family. Dates were another example of agricultural produce which farmers grew for both their own use and for bartering with neighbours or for selling at market. Palm trees were grown everywhere in the E.C. and farmers used on average around 50 per cent of their date crop for bartering or selling, and they packaged and stored the rest for their own future domestic use. Other farm products like alfalfa were mainly consumed locally, around 90 per cent being grown to feed the farmer's own animals.

Other crops were grown more for sale or bartering than for the farmer's own use. Citrus trees were grown around mountain villages and most of the harvest was sold at market or bartered for other goods. In fact citrus and other fruit trees comprised almost 25 per cent of the total farm area (Figure 3:4). Tobacco was another crop grown mainly for commercial purposes, it was sold at local markets to merchants who came from far field and often later exported it. Around 80 per cent of the tobacco harvest was marketed, with just 20 per cent being consumed locally¹⁰. There are no accurate numbers for the agricultural produce from the area, but in the Fujairah area agricultural produce is estimated to have yielded about 10,500 UKP by the end of the

Figure 3:4 Layout of a typical traditional farm shows the percentage of crops grown at this farm

Onions (10%)	Cereals (Millet, Maize,..etc) (20%)	
Tobacco (15%)		
Fruit and Citrus Trees (25%)	Animals and Irrigation Space (10%)	
	Alfalfa (10%)	Sweet Potatoes (10%)

Source: Fieldwork 1990

1950s¹¹.

On the whole, the agricultural products were small in quantity and there was less variety in field crops. Most of the farm produce were fruits and some vegetables. The production used locally with some was used in bartering and trade. Palm trees and some cereals were the features of the traditional farm produce.

4. Livestock

Farmers who want to be self-sufficient must pay great attention to their livestock. In the E.C. agriculture tended to be self-sufficient and a farmer would grow vegetables and fruits as well as keeping livestock for meat, milk and eggs. The animal fold was an integral part of the farm.

Mixed farming was practised during the pre-oil period. Most of the farms as well as the houses in the area were raising poultry for their meat and eggs. Livestock was an important element of any house or farm in the E.C. and it was considered as an extra income for some families. Chickens and their eggs were sold at the local markets as well as direct from the farm and the house. Farmers used to demonstrate their hospitality when they had a guest by serving a whole lamb. The lamb would be cooked with spiced rice and would be served whole to the guest.

Other animals kept on the farm, camels and donkeys, were used mainly for transporting produce to market and carrying house materials from the winter to summer quarters. Because there was no electricity, farmers had to move their homes from summer to winter for fresh air and to be close to the area being farmed. Most families would have one or two donkeys (Table 3:1). The table illustrates a

comparatively large number of goats and cows raised in the area by the end of 1950s. This shows that the inhabitants of the E.C. depended on these animals for their milk and meat.

Table 3:1 Estimated number of the main domesticated animals kept in the E.C. before the exploration of the oil at the end of 1950s¹²

Cattle	Goats	Camels	Donkeys	Cows
1450	4500	230	420	1400

Before oil brought technology to the area farmers in the E.C. used animals, especially bulls, to plough the farmland before crops were planted, and for irrigation purposes, as detailed earlier. Dibba, Fujairah and some mountain villages were considered as major areas for raising animals in the E.C. Some of the inhabitants of mountain villages eg Sikamkam were raising these animals because most of them did not go fishing. Men used to spend their time in their farms growing their crops and women helped them at the farms or stayed at home to take care of their animals.

5. Marketing of agricultural produce

Before the oil industry in the area changed the conditions, the farmers of the E.C. only grew those products which they needed for home consumption and their surplus was sold or bartered in the local markets. It was not until the end of 1960s that the concept of growing produce to satisfy the tastes of other consumers farther afield developed. This developed along with the road networks and demand for fresh

produce which came with the oil industry. With improved transport facilities the farmers of the E.C. began sending their produce to Dubai market.

Once the sale of farm produce from the E.C. was extended to neighbouring regions, the marketing of farm commodities became more complex. Transport had to be hired to transport produce to markets such as Dubai, and the journey would take from 4 to 6 hours. Products such as almonds and guava were sent to Dubai as these crops were not indigenous to that area and so there was little local competition.

The crops would be packed in wooden boxes, and the farmer on one of his family would accompany the boxes to the market. Normally a group of farmers would hire a vehicle, such as a Bedford van, to carry all their produce to Dubai. A typical example would be: five farmers would hire a van in advance of the harvest, giving themselves enough time to prepare and package their fruit. The return trip would cost about R200¹³. The farmers would all help to load the vehicle, which would take about 1,000 boxes. A typical load would be consist of mangoes, almonds and guavas. Assuming a selling price of R3 per box, and farmers with an equal number of boxes, each farmer would net R560 after paying the hire charge. This would be a very profitable venture and encouraged farmers of the E.C. to take special care of guava and almond crops because they fetched a good price in other markets.

6. Primary tools used in traditional farming

In the E.C. traditional farming using simple tools was practised in most villages (Figure 3:5). The farmer had several traditional tools at his disposal:



Figure 3:5 Some primary farming tools

1. *al-Das*

2. *al-Itilah*

3. *al-Khaseen*

4. *al-Mahash*

5. *al-Misharah*

6. *al-Misshah*

- a. *al-Mahash* or trowel, was locally made and was used mainly to uproot the weeds growing close to the main plants which harmed crops during their growing period.
- b. *al-Misshah*, a kind of spade or harrowing tool, was also made locally and consisted of a piece of wood, usually a branch of a tree, measuring approximately one metre long, and ending in a carved metal end. It was used in the past to remove soil from irrigation canals, and make *Yalbah* and *Khaboob*. It was also used to dig wells and plough the soil inside the *Yalbah*.
- c. *al-Das*, similar in shape to a saw or big knife was used in a similar way to a sickle. It was used to cut palm tree rinds and dead leaves. Two types were used in the area. The first one was the smaller called the *Miyyaz*. Besides its normal use, the *Miyyaz* was also used for felling small trees. The *Das* was locally made and cheap but had to be sharpened regularly with a *Mashal* (file). Traditional craftsmen were employed to sharpen the tools.
- d. *al-Misharah*. There were two types of *Miyasheer* (singular *Misharah*) used in the E.C.. The first and smaller of the two was handy for lopping small branches, clearing palm trees of dead leaves, cutting small trees and branches of trees to make fences for the garden. The second type was a little bigger and was usually used to cut branches from large trees for use as beams in house construction.
- e. *al-Khuseen*, was an axe used widely in the E.C. by farmers and woodcutters. It was

used on the farm for the *Tashreekh*, the woodcutting process, which was used in the preparation of food.

f. *al-Midhrab*, was a simple tool made from the branch of a tree which had one end sharpened. The *Midhrab* was used at plantation time to prepare the ground for the crop, when the farmer was irrigating the *Yalbah* to facilitate water penetration of the soil and to make holes (about 6 inches deep) for the seedlings. This process was called *Tadhreeb*. The seedlings were planted and covered with the same soil, to avoid the water washing away the young plants. This process was used with wheat and small plants like tomatoes and onions.

g. *al-Itilah* was a valuable farming tool used for many different purposes. It was made from a piece of iron ranging from 1-2 metres in length, with a flat edge at one end and pointed at the other. It was used (a) to dig wells and to break up large stones encountered by diggers before the water strata was reached, and (b) to cut palm shoots from the parent plant to make new plants for planting in other parts of the farm.

As outlined above, all tools used in the area were simple, made from local materials and for local use. Tools were made by the local craftsmen, as a result of the lack of technology in the area at that time.

7. Types of farms in the E.C.

Because of the small population of the area, and the limited number of tools and equipment, most of the older farms in the E.C. were small, ranging from 2-5

donum in size. The reasons for the size were: (a) the cost of managing a farm. Most farms needed 2-3 *Biyadeer* (singular *Baidar*) to manage the land and livestock. *Biyadeer* monthly wages ranged from R30-50¹⁴ and (b) there was also the cost of tools and equipment to stock the farms.

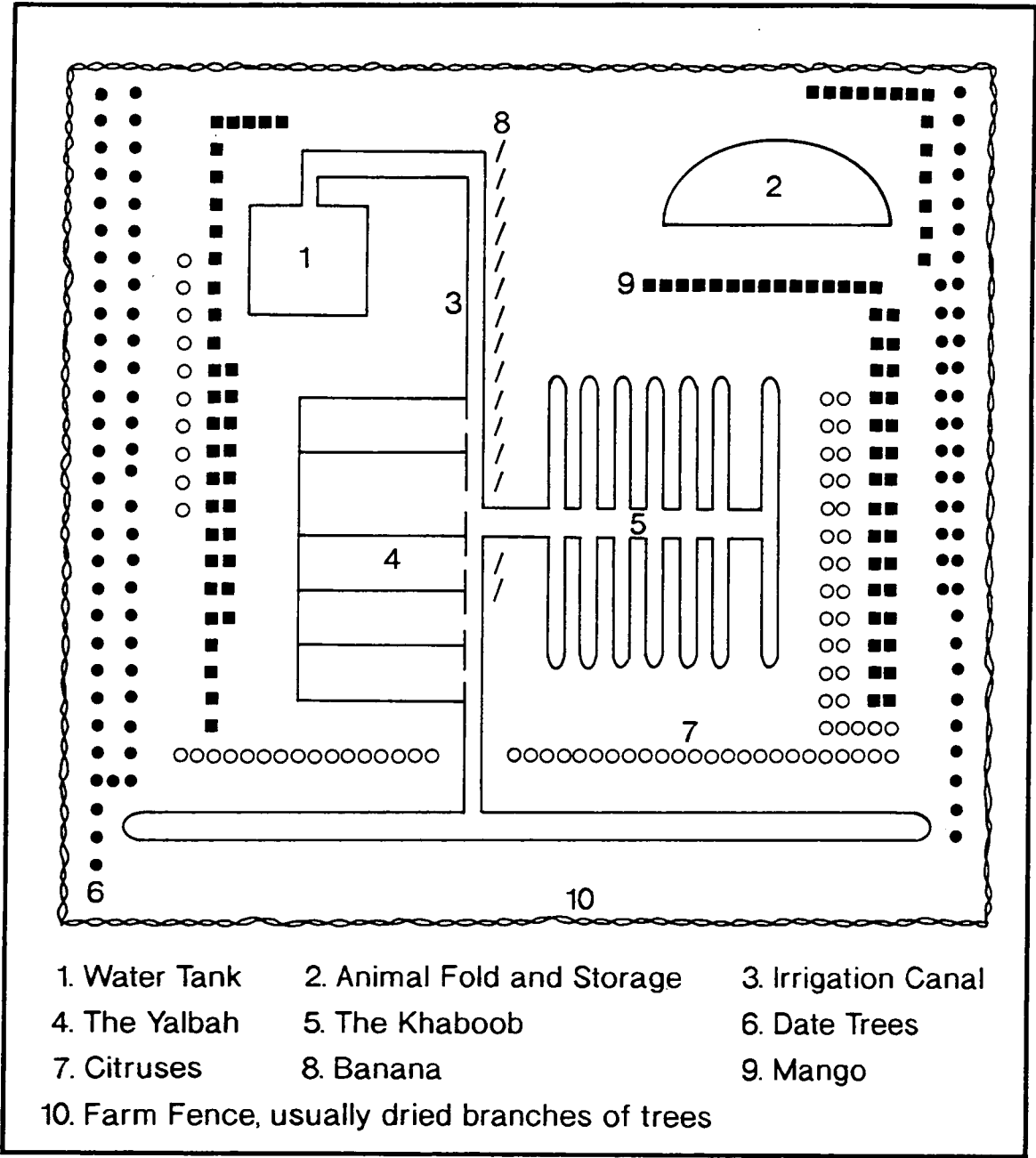
Farms located close to each other where farmers benefited from co-operation with their neighbours, eg sharing water supplies. The farmer first irrigated his farm and, once his land was watered, he let the water supply flow down to the land of his neighbour. This happened when a farmer could not get water for his farm because the water level in his well was too low, or when he did not have the equipment to draw the water from the well. In such circumstances he contacted his neighbour, farmer B and, if farmer B agreed, he could get the water from his farm. Certain times were agreed on for farmer A to use his neighbour's water supply.

Such neighbourly co-operation extended to sharing farm tools and help both at harvest time and when farmers built their summer houses on the land. In the evenings where moonlight makes working possible, some farmers irrigate their land at night.

8. Internal organisation of the garden

The garden was usually divided into three sections. The irrigation equipment used for watering the garden was kept on the first section. This equipment usually consisted of a bull, a rope and a pail, the *al-Yazrah*, or *al-Manzifah*, "loads" and "lever". Storage was also built on this part of the garden and usually it also contained the animal folds (Figure 3:6). Here farmers raised the animals needed to provide meat

Figure 3:6 The inside organisation of the traditional farm in the East Coast



Source: Fieldwork 1990

and milk for the needs of their own families.

The second section of the garden was planted with date, citrus and fruit trees such as banana and mango, whilst the third section was usually put down to wheat and alfalfa crops, and some vegetables.

Thus, the use of the first and second sections remains constant while that of the third section changes depending on seasonal requirements. For example, at the beginning of winter, farmers grew some wheat and onions on this land and at the end of winter they grew vegetables such as eggplants, sweet potatoes, tomatoes and melon on it. This section was divided into *Yalbah* and *Khaboob*. The *Yalbah* was a levelled blocked space, about 4 by 6 metres where onions were grown. The *Yalbah* was designed to contain the water and fertiliser inside the required area for the use of the plants and, at the same time, conserve water. This was necessary because of the shortage of water in the past but it was also difficult to irrigate large areas of land with traditional irrigation methods. The *Khaboob* was similar to a *Yalbah* but was much smaller, 1 by 6 metres, and was used to grow sweet potatoes.

9. Farm land system

The way people lived varied from place to place depending on the characteristics of their area. For example, people who lived close to the sea spent more time fishing than farming. They were quite poor and, therefore, did not have the financial resources, nor the free time, to devote to farming their land. They also had to spend weeks away from their farms on fishing trips and thus did not have the means to buy and manage a farm of their own.



a. Ownership of farm land:

The common word for an area of land farmed in the E.C. was a 'garden'. The following were the main types of garden which existed in the E.C. in the past:

1. The ruler's gardens. Usually the rulers of an area selected the best plots, those with a concentration of mud, clay and water, for the site of their gardens.
2. Some gardens belonged to those people whose ancestors had owned much land long ago when land ownership first became important. Usually such people were affluent. They included the Persians who came to the E.C. long ago to settle and trade with local people.
3. Gardens owned freehold by a few members of the local population.
4. Some of the farm lands used to be *Waqf* (endowment) rather than commercially run. When someone donated part of or whole of his farm as *Waqf*, then the harvest of this land, or the money raised from its produce, was distributed to the poor.
5. Farm land that was occupied by tenant farmers. Landowners with more than one farm often leased gardens to others to look after and farm and the return was usually in the form of some of the crops or labour to improve the prosperity of the garden by the planting of palm or citrus trees.
6. Private gardens managed by *Baidar* (plural *Biyadeer*), farm labour who shared the harvest equally with the owner of the land.
7. The inherited garden. For these traditionally the eldest son or his wife managed the garden or employed someone else to do so for him.

Farm land was given to farmers by the rulers of the area. People who could afford to establish and run a farm asked the ruler for permission to plant the land after

surrounding it with tree branches and to start farming. It was in the ruler's interest to ensure the people of the area had enough land to feed their families and to supply the local markets (limited) with some farm produce. Also this meant that the owner of the new farm could offer work on the farm to the local people or could farm the land by himself. Because people were so poor they did not aspire to own their own farms. Local people, when asked why they did not have a garden in a good location despite having lived in the area for so long, answered that at the time they had not realised that there would be such a high demand for farmland. Rather, they were looking for food to eat, not setting up in business!

10. Farm land taxes

There is evidence that farm taxes had been existed in some areas in the E.C. for a long time, eg Kalba and Fujairah¹⁵. According to the Durham University survey (1966/67), land taxes were apparently levied at inconsistent rates¹⁶. In Kalba, for example, the ruling family used to levy tax on most of the crops and services. Wood gatherers and wood cutters had to provide wood for the ruler's family regularly and farmers were also expected to provide produce on a regular basis.

At harvest time the ruler sent his servants to collect the tax. Most of the time the tax was in the form of part of the farmer's harvest. For example, if a farmer harvested 100 sacks of semi-dried dates of 50 kg weight each, 20 bags would be reserved for the ruler's family. The tax here was therefore 20 per cent. Tax figures are only approximate, based on interviews with the older people in the area, and rely upon their memories, but it can be said with reasonable certainty that the tax varied from

place to place depending on the type of people who lived in the area, eg people who lived in a mountain villages could pay less, and the nature of ownership of the gardens. For most of the region, the ruler took some of the farmer's yield as tax. Tax collection began at harvest time, whether the harvest was wheat or dates. The ruler instructed his guards, the *Askar* (singular *Askari*) to collect the tax¹⁷.

11. Pastoralism

In every village in the E.C. there used to be at least one or two herdsmen to watch the goats and sheep of the village. The herdsman would take the animals to pasture in the morning and return with them at evening. Usually the pasture was in the mountain regions where there was an abundance of grass. During the day the herdsman would guard the animals whilst they browsed. He was paid by the owners according to the number of animals in his charge and his wages might be in the form of money, food or services that the owners could provide. Some of the herdsmen took pastoralism as a career and they spent their time with their animals. In the past most of the families in the E.C. owned more than ten sheep and goats. The reason they kept this number was because they used their milk and meat.

In conclusion, during the pre-oil period, farms were small and farming was based on the available primary tools and equipment. The quantity of farm produce was small and was consumed locally. Tax was collected by the rulers in some areas of the E.C.

B. Traditional fishing in the E.C.

Fishing was one of the major economic activities in the E.C. The inhabitants of this coast were either fishermen or farmers or both. It was rare to find a person who was not involved personally in fishing activity or who had no relatives involved. Fishing for local needs had been practised here for centuries and there had never been any need to limit the catch from an abundant supply of fish. Certain places were known to be good for catching fish, for example, in Kalba there were three main fishing sites, the *Mahari* (Khor Kalba), *Jabal Reshead* (Kalba) and *Cani* (between Kalba and Fujairah). Most of these sites were in a direct line from these areas to the sea, where the water was over 30 metres deep. Fishing governed the routine of life in the area. The men were up early in the morning and walked along the beaches looking for signs of fish in the sea. The actual fishing operation occupied the whole day and, in the evening, nets were gathered in to be mended and prepared for the next day's fishing.

1. Fishing trips

During the fishing season, fishermen often took their boats to neighbouring waters to catch fish when there were no fish in their own area. These trips were called *Izbah*. They used to go to the Oman or Dibba area. Before setting off the fishermen had to get permission from the *Wali* (mayor), the local authority of the area in which they intended to fish. The local authorities were keen to give permission to boats from other areas to fish in their waters because their inhabitants could buy the fish and also had the opportunity to sell the dates they had grown to the fishermen, who may not

have brought their own with them.

The practice of fishing in the waters of another area could be reciprocal. When fish were scarce in their area, they were able to make trips to their neighbour's water to fish. The fishing trips took 1-2 weeks and their aim was to catch certain kinds of fish, such as sardines or anchovies¹⁸.

Also involved in fishing trips were people, called *Halayah*, either from the same area, or who followed the main fishing company. *Halayah* caught their own fish and dried it to sell but did not get involved in the main fishing operation. These people used to share the food with the camp and sometimes contributed a little money in exchange.

The fish were dried at the camp and sometimes sold there or brought back home. Donkeys and the *Amlah* were used to transport the catch back home. The largest share of the money from the sale of the fish went to the owner of the boat, while each of the rest of the fishermen got a share which varied in proportion to their participation in the trip. For instance, those who rowed the *Amlah* received a different sum from those who poled the fish net.

This method of catching fish, where the fishermen leave their home and travel to places where the fish were abundant, involved meeting other people and co-operating in their work, thus building a strong relationship.

2. Quantity and quality of fish caught

Most of the fish landed in the E.C. were anchovies which was the commonest fish in the area. Rashid al-Zaabi, an old fisherman from Khor Kalba explains why they

used to fish for anchovies:

"We were poor and our main career was fishing. The anchovies were an important fish and we wait hoping to see it in the area. We catch it to eat it fresh or dried. What was left was used as natural fertilisers on our farms"¹⁹.

The fishermen wait for the shoals of anchovies, especially the *Learibi* variety of anchovies to come to the area in winter. The *Learibi* travelled from western India and by the time it arrived in this area it was tired and gathered in large shoals²⁰. The fishermen waited for the arrival of the fish with their equipment and boats ready. News of the arrival of the anchovies were communicated to neighbours and fishing trips then set off from Dibba for the territories of the Oman. At the end of 1950s, the annual catch of fish is estimated to have been 9,500 tons, most of it being caught by using seine nets. In the same period, the number of fishermen is estimated to have been 1,300, distributed among the E.C. fishing areas. Anchovies catches ranged from 500 to 3,000 kg in each fishing operation. Fishermen also caught Indian mackerel, locally called *Garfa*, from the shore, and sardines in small quantities using the seine nets.

3. Methods of catching anchovies in the E.C.

Fishing for anchovy was one of the main activities in the E.C. The anchovies, or *Barriyah* are a small fish found over a wide range of the sea. The fishermen co-operate in the operation to catch anchovies, and again, this shows the close relationship of the people of the area. Skill and power was required to catch anchovies. Anchovies were caught by a seine net called *Qeteen* (Figure 3:7). These



Figure 3:7 Fishing net stretched before being loaded into the boat (above) and fishermen handling the *Qeteen* (below).



anchovies caught in the *Qeteen* were taken to an area of land called the *Muawaf* in small quantities by groups of 4-5 people who used a small piece of net called a *Yall*²¹. The *Barriyah* then was taken from the shore to an area of dry land called the *Yirddab* where it was spread out to dry in the heat of the sun. The anchovies were packed into bags for the buyers who bought direct from the owner of the boat on the site where it was dried (Figure 3:8). The buyers usually travelled from the mountain villages or from other areas outside the E.C.. Some of the anchovies were exported to Europe and Indian Sub-continent to be used as animal fodder and fertiliser²². During the post-oil period, while some of these processes are still used to catch the anchovies, some changes have occurred, eg using the truck to pull the fishing net.

4. Common methods of fishing

The area had many different types of fishing. The following were the most common methods of fishing in the E.C.:

a. *al-Leekh*:

The *Leekh* was a netting made of strong nylon thread. Netting was bought from the market and the fisherman would decide what length and width he required it to be. He then cut it to size and attached floats made up to the ends of palm tree stems to the edges. These floats were called *Karb* (plural *Karbah*). The bottom of the *Leekh* was weighted with small stones to keep it vertical in the water. The net was anchored at both ends to ensure it would remain in the same place. On the next day the fisherman returned and collected the fish that had gathered in the *Leekh*. The fish were



Figure 3:8 The *Shashah* (above) and drying the anchovies (below)



sold directly by the fisherman to the buyers with no middleman.

b. *al-Shabakah*:

The *Shabakah* was used to catch small and medium sized fish and one type of *Shabakah* was used to catch prawns and shrimps. The *Shabakah* was usually made by the fishermen themselves and was made of cotton or nylon thread, which makes it light to carry.

Usually the fisherman used the *Shabakah* in the evenings to catch fish in the creek, for example in Khor Kalba and Dibba. Only relatively small quantities of fish were caught by this method.

c. *al-Dobayah* or *al-Gargur*:

The *Dobayah* was and is still in use. It is a trap made of tiny palm tree fronds which were left in shallow sea water for a few days or buried near the sea until they were flexible. The whole trap was designed so as to allow fish to be able to enter but not to leave the *Dobayah*. The traps were left in deep water for 1-3 days after which the boat returns to collect the catch. The fishermen set off early in the morning so as to be back in time to catch the morning fish market. When the *Dobayah* became dirty or weak, it was brought to shore for cleaning and repair.

d. *al-Midar*:

In the past the simplest method of fishing was by using a fish hook, the *Midar*, and nylon line. This is still in use today. This method was practised inshore as well

as at sea. Worms and small fish were usually used for bait.

5. Night fishing

In the past one problem was that fishermen could not see the fish move and thus chance played a part in this method of fishing. They fished at night because then there was usually a chance of catching the big fish, especially the King fish, which was called the *Canaad* by the local people, at night. The fish were caught by the same method as that used to catch anchovies but the operation was much more haphazard as regards quantity and quality of the catch, as the fishermen had to rely on chance to find the fish. Actually they fished in the same area where they caught anchovies during the daytime, because the big fish came to the area to diet on small fish. Fishermen used strong nets in night fishing. Night fishing usually began after the Isha praying or after 9 pm. It was called *al-Bayit* and was practised all over the E.C., as well as in the rest of the Gulf area.

6. The main types of fishing boats in the area

In the past different tools and equipment were used for each different type of fishing in the E.C. and the following were the most common types of fishing boat found in the area:

- a. The *Amlah*. This was a surf boat approximately 10-13 metres in length, which was used close to the shore to catch the sort of fish which swam close to the beach, such as *Barriyah*. The *Amlah* was locally made and the building operation was called the

Washer. In the E.C. the fishing industry imports labour from Sur (Oman) and imports some materials such as the wood used in making the boats from overseas, especially from India, though using the expertise of local professional boat builders. Khor Fakkan and Kalba were noted for their expert boat builders.

b. The *Shashah*, was a simple boat very common in the area. It was made of palm stems which have been left in the water for about a week or buried close to the shore to make them flexible. Inside it was lined with *Karb*, small pieces of the fronds of palm trees (Figure 3:8). A *Shashah* was usually operated by one man, but for long distance fishing trips or to catch anchovies, two men were needed to operate it. *Shashah* was used to carry the fish traps out to sea and also to catch fish using nets. It had to be pulled out of the water after each trip, otherwise the materials with which it was made absorbed too much water and it became so heavy that it sank²³.

c. The *Boom*. The *Boom* was a big boat used in Khor Fakkan for a long time. As Khor Fakkan has been a sea port for a long time, the inhabitants have a long tradition of trade with the Gulf countries, the Iranian coast, and India. This type of boat used to be built in Kuwait and was used for transporting fish and exchanging goods with the E.C.. At one time the number of these boats being used reached about 45²⁴, most of them belonging to local people.

7. Marketing of fish in the area

In the past there used to be small market places in the E.C. where customers

used to buy their fish. For example in Fujairah, fishermen used to pull their boats ashore close to the recent (new) fishing market to sell their fish. The customers gathered in the morning under an old tree waiting for the fishermen to arrive from their fishing trips. Some people bought direct from the beach and thus some of the fish was sold before arriving at the market place.

Some of the dried fish of the E.C. was transported to Dubai via Khor Fakkan seaport and from there to Bahrain or India. The price of fish was low and most inhabitants in the fishing areas were getting their fish fresh and sometimes free through their neighbours. Some of the mountain villages did not get their fish daily, and those who wanted to buy fish, had to plan their trip to the coastal areas to buy their fish. Sometimes, if the inhabitants of the coastal areas wanted to visit their relatives in the mountain villages they took some fish with them as a gift to their relatives.

8. Ownership of fishing boats

Because boats were expensive and running costs were high, not many people owned their own fishing boat. This does not mean that there were not many boats in the region, but the number of large boats was small. Consequently, most of these big fishing boats belonged to rich people. Sometimes one person owned more than one boat and he may have hired other fishermen to manage or help with his boats. An owner of many boats often became the head of the fishing process in an area, having great influence locally, with the power to hire and fire workers. Usually however, owners managed their own boat or authorised someone to manage their boats for

them, giving such deputies authority to buy fishing tools and equipment. In some areas a boat like the *Amlah* was a surf boat belonging to the whole family, with the head of the family in charge of operations.

As well as the big, expensive fishing boats described above, there was a smaller type of boat in common use called the *Shashah*. This was made of palm stems available locally, and because it was made locally, it was cheap to build and run and was much more common. The majority of the fishermen of the region operate *Shashah*.

In conclusion, during the pre-oil period, fishing was practiced with simple tools. The principal catch was the anchovies, and the catch was small and used for local consumption. Fishing boats were primary and were made locally from local materials and by local people.

C. Traditional manufacturing in the E.C.

The manufacture of goods was an activity every society pursued and, as elsewhere, traditional manufacturing activities had taken place in the E.C. for a long time. Manufacturing technology did not remain static over that time but improved continuously as a result of the development of technology and skill both developed by the indigenous population and also introduced to the area by immigrants from other lands. For example the people who immigrated to the coast from the land to the south of the Iranian territories brought their customs to the area and introduced new food dishes.

In the E.C. before the discovery of oil, most of the population earned their

living by farming and fishing. Manufacturing was not practised on a grand scale but was limited to craftsmen practising in, and for, the area where they lived. The goods they produced were (a) the simple tools used in the farming and fishing practised locally whose manufacturing enabled the people of the area to be independent of imported goods; (b) items were made for the local markets, either to sell or barter for other commodities, such as salt, spices, fish or farm produce.

In the past, the manufacture and distribution of goods was limited by the availability of the material resources found in each area. For example the people who lived in the mountain villages specialised in the manufacture of food, like cheese, animal fat and butter. The people who lived in the coastal areas specialised in fishing products.

The manufacture of goods did not take place in specific places, such as craft shops or small factories, but was conducted in the houses where the craftsman also lived. The people who wanted to buy the goods would visit the home of the craftsman and choose and bargain there for their requirements. The most common goods for sale were those needed for fishing, farming and in the home.

1. Traditional manufacture related to farming

Whilst farming activities of the E.C. were not sophisticated, nevertheless tools were needed on the farm. The blacksmith was the most common and important craftsman in farming areas and metalwork products were an integral part of the farming equipment.

a. Metalwork:

In the E.C. there were around thirteen blacksmiths distributed throughout the settlement areas (Table 3:2). As Table 3:2 shows, the majority of the blacksmiths were to be found in the area of Fujairah. The reason is because Fujairah was famous in its metalwork during the pre-oil period.

Table 3:2 Estimated number of blacksmiths and their distribution in the E.C. at the end of 1950s

Kalba	Fujairah	Sikamkam	Murbih	K.Fakkan	Dibba
2	4	1	1	3	2

Blacksmiths were not formally taught their craft but learned it by observation and practice. The craft was passed on from father to son, some families even taking name the *Hadad*, meaning 'smith'. In the smithy, attached to his home, the smith would make goods to be sold to his customers who came to his house to buy. However, he would also make goods for sale in the local market, the *Sooq*. The advantage of making the goods on their home premises was that the blacksmith could work at the same time as waiting for customers and thus did not waste time.

Most of the blacksmith's work was in copper, iron or silver. These materials were imported from Oman or Iran. Most of the simple tools used in the traditional agriculture of the area were made at the local smithy, eg harrows, trowels and sickles. Prices were reasonable enough for farmers to be able to afford them and sometimes blacksmiths even made items free of charge for their tribal kin or for exchange for other commodities needed by their own families.

Blacksmiths also made items such as daggers, coffee pots and swords for sale

in the local market or to be used at festival time when daggers were worn with ceremonial clothes and traditional sword dances were a feature of festivals.

b. Farming equipment made from palm trees:

1. Rope

The area was famous for its rope manufacture. This was not a large scale industry because most of the rope made in the E.C. was made by the farmers themselves. Sometimes, however, a craftsman would specialise in rope making.

Ropes were made from palm rinds grown locally and it was a skilled process. The method was as follows. After cleaning the tree of rinds, the farmer would collect the rinds and wash them in water and leave them for a while. He would then cut small pieces from the rind and braid these into long ribbons. By tying the braids together, the farmer could make ropes of different thicknesses.

Many sizes of rope were manufactured for many different purposes. Thick rope was made and used for climbing trees or for fishing. Other sizes of rope were used by the farmer to attach utensils and tools to other things and rope was also used in irrigation. For example, the farmer tied a length of rope to an empty bucket which would be lowered down a well or water pit to retrieve water. Rope was also used in house-building, for example, to tie the beams of the houses together.

2. Manufacture of farming items made from palm trees

Farmers used to use a small basket to keep chickens in at night. The basket protected the chickens from foxes. These baskets were made of palm fronds teased into thin threads and braided together. The braids were then sewn together and made

into a round-shaped basket.

Farmers used baskets called *Jifeer* which were made in different sizes with big ones used to move top soil from one place to another at plantation time. A *Thuy* was a large basket designed to fit on an animal's back and would be used to carry fertiliser for long distances, eg from Dibba to Khor Fakkan. *Thuy* have been used in the E.C. for a long time, since long before cars were used.

Another useful product made from the palm was the *Khasaf* or 'sack'. This was made on the farm by the farmer or his family from palm fibres and was used for packing dates. The women of the family would braid the palm fibres together, and the men would sew them into the appropriate shape. In such domestic manufacturing activities, such as at harvest time, the farmer's house became a small factory unit, manufacturing the items needed to pack the harvest. Palm trees often provided both the crop and the means of carrying it to its final destination.

c. The Manufacture of the *Daan* (plural *Deun*).

Daan was made up of bundles of palm fronds tied together with ropes. *Daan* was used for:

1. House construction

It was used in constructing the walls of the houses and also to form the interior house ceilings. Fences around the house were also made from palm fronds.

2. Drying dates

Daan was also used at harvest time in the process by which dates were dried. The place where the dates were dried and packing took place was called the *Misstah*.

3. Summer accommodation

Daan was used by farmers to construct their summer houses. In these houses they constructed a platform called a *Siyam*, about one metre above the ground, safe from snakes and scorpions.

d. Processing of dates:

The people in the E.C. have always been well known for their skill in the processing of dates. Processing took place locally, either on the farms or in houses. Four types of date processing were used in the area:

1. Normal processing

After grading, cleaning and weighing the dates, the farmer would process them to extract date syrup.

2. *Madluk* processing

This begins by the farmer choosing the best dates and removing their stones. Then the dates were mixed with spice and squeezed together, producing a good taste. This type of date was the most expensive.

3. *Imdabas* processing

This dates was given a high sugar content. Having cleaned them, the farmer added syrup and left the dates until they had absorbed enough syrup. They were then packed in cans for domestic use or taken to be sold at the market.

4. *Bisal*, dried dates, processing

The date was put in a large cooking pot which was filled with water and boiled for a while. The mixture was then dried and was called *Bisal*. The coast has always

been famous for producing *Bisal*, but most of the time it was made for local consumption only.

On whole the above ways of manufacturing occurred locally. The traditional manufacturing techniques satisfied the needs of the local people. No specific factory or workshop was set up for production as farmers processed dates with the help of their families, using local materials and labour. All of the farm tools and items were made locally using locally material and for local use only.

2. Traditional manufacturing related to fishing

It was common practice for fishermen to make their own tools and equipment.

a. Manufacture of fishing equipment:

1. Fishing nets:

Usually fishermen made their own nets using local labour. The labour force mostly comprised those who participated in the fishing, but sometimes nets were made by craftsmen specialising in making nets. The type of fishing nets used to catch small fish like anchovies are still in use today. It can be up to 40 metres in length and 10 metres wide. The *Qeteen* net had small holes, about 0.2 x 0.2 inches in diameter and was designed to catch small fish, especially the anchovies.

Nets were made from either palm rind or nylon threads, the *Qeteen*. Other types of net designed, made and used locally were the *Leekh* and the *Shabakah*. In the past the use of local labour and manufacture made the area self-sufficient in its fishing activities.

2. Tools and equipment like anchors (used in rowing boats), the *Shashah* (paddle and

oar) and hooks were all made by local labour. The plummet was an important item of equipment, used to measure the depth of water and to locate fishing traps and this was made using different lengths of rope.

A variety of fishing traps were also made from palm fronds. The palm fronds used were buried close to sea water to become flexible and then shaped as required. Material from palm trees and other locally found materials were also used to make the floats and weights needed for the fishing net. The floats were attached to the net so it did not sink and the weights fixed to the lower part of the net to keep it vertical.

b. Manufacture of boats:

There used to be two main types of fishing boat common to the area, the *Amlah* and the *Shashah*. These were both made locally using local materials. Boat building factories or boat-yards did not exist but it was the practice for the fisherman who needed a new boat to engage specialist boat builders (Figure 3:9). Terms would be agreed for the new boat and then a one room building would be built close to the sea to protect the boat-builders from the heat whilst they worked. It was common for the owner of the new boat to pay the workers with a small wage and also supply them with their food and water. Tools like the hammer, brace, bit, hand drill, and other equipment needed in boat-building were made locally from local materials. It was the custom for fishermen also to call upon these boat-building specialists to repair and maintain their boats during the times when there was no fishing.



Figure 3:9 Process of curing fish (above) and a retired fisherman from the E.C. building an antique boat



c. Processing of fish:

The E.C. was and still is an important region for fishing. Most of the fish caught were dried and sent to cities like Dubai and Sharjah or were sold in the local markets of the coast. The following are some of the fish processing procedures that were followed:

1. Anchovies

Part of the anchovies catch was dried and large areas in the E.C., close to the residential areas, were used to dry anchovies. Most of the population took part in this activity. After the anchovies had been dried, some of the dried fish would be pounded to make a nutritious food called *Sihnah* which was usually eaten with rice. The rest of the dried fish was packed, to be used on farms as fertiliser. Fresh anchovies, mixed with spices and salt and stored in cane or pot vessels, made a sauce commonly eaten with bread. This way called *Mihyawah* or *Mishyawah*, was also imported to the E.C. by the Iranian people.

2. Other dried fish

The large fish caught in the area were the valuable King Fish (locally called the *Canaad*), the Skipjack (locally called *Sadah*), and the Yellow-fin tuna (locally called *Gubab*). Some of the fish caught were washed with sea water and cut into strips for curing. Salt was added to the shreds and the end product, a cured fish, was stored in cane or pottery vessels for future use.

Another way of curing fish, the *Kiseef*, was also used in the past. Large fish were cut into strips, salt was added and they were hung up in the fresh air for a few days (Figure 3:9). Once cured they were taken to market to sell or kept as food for

the fishermen and his family.

Such processes for drying fish were very important to the people of the area, providing them with a source of food during the bad weather when it was not possible to go fishing. The surplus cured fish which was sold also provided a good income for the fishermen.

3. Fish oil

Oil was extracted from large fish such as shark and sail fish (locally called *Khail al-Bahr*) by the fishermen of the area. This oil was used to paint the fishing boats to protect the wood from salt water and from the weather when the boats were beached²⁵. It was also used to paint house doors, especially those made of wood. Today it is still used to preserve the wood of boats and houses. This type of oil was not used in cooking.

In conclusion traditional manufacturing procedures related to fishing were simple and primary. The techniques applied in traditional manufacturing of fish tools and items, eg anchors, were simple. Fish processing eg curing, was conducted for local consumption.

3. Traditional manufacturing activities within the home

Traditionally a lot of manufacturing took place within the home. This was because most of it undertaken by the women of the family and home was considered the most secure place for women to work in. It was also convenient for them to work at home as they could start as soon as they had finished their domestic duties (cleaning and cooking) and using the home as the work-place, and no extra rent or

extra expense was incurred. Consequently a lot of traditional manufacturing, the making of food and other items, was conducted in the home.

a. Other food manufacture:

1. Milk production:

In the past fresh milk was readily available for sale in the E.C. Three types of milk were produced in the area: (a) Goats' and sheep milk, to be drunk fresh. This was usually sold in aluminum containers in the market. (b) Camel milk, this was a valuable food for the bedouin in the E.C., especially in the al-Ghail area, 10 km south of Kalba town. (c) Cow's milk. This was also considered an important food by the people because most of their butter and fat came from cow's milk.

2. Manufacture of curds, yogurt, cheese and fat:

The manufacture of all these products was in the home. The women would milk the animals and add plant seeds to the milk, and then leave it to curdle. Some of the curdled milk would be used by the family and the rest put in a *Sigah*, a container made of goatskin in which the curdled milk would be churned to make butter or boil to make fat. These food processes were practised in the mountain villages in Sikamkam, Treaf, Murbih and, in part of Dibba.

3. The manufacture of cured meat:

The process used was similar to that used in the manufacture of cured fish but the meat was left in a shady place and hung for a long time before being ready for consumption or sale. It provided useful emergency rations, to take on trips which might last some time when food might not be readily available.

b. The manufacture of domestic furniture

1. Beds and bedding:

These, and other similar items of domestic furniture, were made by local craftsmen specialising in the manufacture of furniture, and were sold directly by the craftsman who made them to the customer.

In the manufacture of such items, fibres from the dyed palm were normally used but also from almond. Leaves of other plants which were found locally were added to give different colours to the materials. From such dyed fabrics the women used to make fans, cleaning cloths and food covers to protect food from flies. This traditional manufacture demonstrates that in the past the inhabitants of this region were well aware of the dangers of leaving food unprotected.

2. The manufacture of mats

Mats were used in the E.C. in the past, as they are today, as items of domestic furniture, for sitting and eating, and also for praying. They were made from natural and dyed palm fibres which gave the mats the appropriate shape and texture.

3. Kitchenware, water containers

Cooking pots, pans, coffee pots and food plates were made of brass. The *Minhaz* and *Irshad*, mortar and pestle, were made either from wood or copper. The *Mihbash* or fire tongs and the *Mihmas*, a thin spoon used in the baking of bread, were made from iron. Many of these items were made by the local blacksmith.

The pottery water containers were good for keeping water cool in summer. Some of these containers were made from animal skin and were suitable for taking on journeys for drinking water.

c. Pottery:

Because of an abundance of clay in some areas, the mountain region and some parts of Ras al-Khaimah, the people of these areas made very good pottery products for domestic use locally and sometimes also for export to Dubai by sea. It must not be forgotten that as well as the water containers made locally, water pots were also imported from Iran. However, the locally made containers predominated, being manufactured in Fujairah, Khor Fakkan and Dibba. Clay was used from the villages and different shapes and forms of container were used for different purposes: for the storage of water, for the curing processes, for cooking pots.

d. Wool Weaving:

Areas where the bedouin lived, such as Qurayyah, Sikamkam and Treaf have long been famous for the weaving of wool. The wool was taken from sheep and goats in spring, cleaned of dirt and then dyed different colours using local herbs. The bedouin women used hand spindles and, once the wool was woven into material, were very skilful at making a variety of items from it. Amongst these items were woollen blankets, both big and small, which were used to make the traditional bedouin tent. Also some domestic furniture was made from woven materials, for example, woollen sheets and pillows to be used in the guest room. The women also made woollen bags with fine decoration and designs to be used in the home, or to carry their possessions during their travels.

e. Manufacturing of products used in house-construction:

The materials used to build the summer residences of the people of the E.C. were all found on the farm in the past. The traditional house was a simple construction, a one-roomed shed-like building covered by a roof made from palm fronds. The house was surrounded by matting also made from palm fronds. Doors, windows, beams, and ropes used in construction were all made locally in the past and put together to the householder's own specification.

The houses used in winter were constructed using clay as well as materials derived from the palm tree. Usually the bottom part of the structure was made of clay and palm fronds from which the leaves had not been removed as this helped to prevent dust from coming through the walls on windy days. Such houses had groin-vaulted roofs to facilitate water drainage during the rainy season. All materials used in such houses were available locally and there were local people who specialised in the manufacture of materials used in construction, eg cutting the palm trees, making doors and windows.

On the whole, most of the traditional manufacturing activities within the home were made by women, eg fat and cheese, in small quantities to be used within the family or for bartering for other items.

4. Other traditional manufacturing industries

Whilst fishing and farming were the predominant means of livelihood, the area supported other activities which provided a living for some of its inhabitants.

a. Tanning:

Tanning was found in a few areas in the E.C.. They used to convert animal skins and hides into leather, using different techniques like adding salt, or burying the skins in special soil.

The leather made from the tanned skins had many uses, for example it was used to make the water containers used on journeys. Some domestic furniture was made of cured skin and drums, shoes and sandals were also made of the leather made from the local animals.

In conclusion, traditional manufacturing was necessary in the area, as a result of local demand for farming and fishing tools. Traditional manufacturing was a natural response to the needs of the farmers and fishermen in the area. All of the manufactured items were primary and simple ones. Traditional manufacturing used local materials and was made by local people.

D. Other economic activities in the E.C.

Beside the primary economic activities of fishing and farming traditional in the E.C. there were secondary activities also providing employment and catering for the needs of the inhabitants. These include:

1. Supplying of water

Before the existence of local authorities to organise the water supply for the residents of an area, some inhabitants gained a living from supplying water requirements. These inhabitants would deliver water either from its source or from a

well or *falaj* to houses. The water was brought by two methods:

a. Carrying water in containers loaded on their backs. At first the water containers were buckets made of animal skin but later empty fuel cans made of tin were used. These cans were imported from Iran. This method was suitable for delivering water to houses close to a water supply.

b. Transporting water by animals:

This was used when the water supply was some distance away. A large basket, called a *Kheri* was used, loaded on the backs of animals. The *Kheri* was made of palm rinds and would take 4 tin cans (paragraph a. above) full of water. The customers would order their water the day before they required it and usually the water supplier had regular customers. The water supplier would make 4 to 5 journeys to get water for his customers daily, and also supply his own family with water. The average cost for 20 litres of water was R.50¹.

2. Building

There was a tradition of house-building and some craftsmen of the E.C. had pursued house-building as a career for a long time. They used simple tools and were hired especially to build the houses with their *Barjeel*, a large room used to ventilate the house. Building the *Barjeel* was a specialized job. It was difficult for ordinary people to build such houses but often they could build their own more modest

¹ In the 1950s 1 Sterling Pound equalled around 10 Indian Rupees.

dwelling using doors and windows supplied by builders. Sometimes builders also provided the clay for people who were building their own houses. The clay was brought from its source by animal transport.

3. Supplying firewood

There were two types of people involved in the supply of firewood:

a. Woodcutters:

These were often hired by the owner of trees. The trees were often on farm land but not always. The owner would pay the woodcutters to fell the trees and cut them into manageable sizes. Then the wood would be left to dry until it was possible to cut it into smaller pieces to use for firewood. All this took place on the site where the wood was grown.

b. Gatherers and sellers of firewood:

Gathering firewood was quite a complex job in the E.C.. The wood gatherers had to be up early and walk to the mountains with their animals, to gather the branches of small trees, locally called *Esbiq*. The wood was loaded on to the backs of the animals and the gatherer had to make the journey back to deliver the wood to customers before the midday meal at noon. Usually wood gathers travelled in twos or threes so as to help each other and prevent loneliness.

Gatherers differed from woodcutters in that they had to pay tax to the local ruler. The tax could be in the form of firewood. Usually the gatherers delivered the

firewood to the ruler and got a free meal as well as paying his taxes. This tradition along with this method of tax payment was established in Kalba a long time ago.

4. Digging wells

The E.C. used to be totally dependent on water raised from below ground for farming and domestic needs. Because underground water was the only source available, well-digging was considered an important and specialised job. The farmer, or anyone else who wanted a well, hired such specialists. Diggers travelled from job to job with their simple tools and it took 10-15 days to dig a well, depending upon the terrain and depth of each well. Usually the hirer fed the diggers during their stay.

5. Other services

In the past, teachers called *Muttawah* (singular *Mutawa*) eared their living teaching students the Qur'an and other Islamic Law. They were paid by the student's parents as the students finished each section of the Qur'an. Naturally they were religious people as well as teachers and some also took care of mosques, being paid by money donated by devout people.

Some people also eared a living specialising in medication, using local herbs for their cures.

In conclusion, some economic activities, eg those of water suppliers and builders, were important in the area. The well diggers for example were needed in the E.C. for farming and domestic use, and were part of the complete process of self-sufficiency of the inhabitants in the E.C.

E. Trading and marketing in the E.C.

Trade in the E.C. was facilitated by the fact that the land is a coastal area enabling trade with neighbouring countries accessible by sea, and with the East.

1. Trading

a. Trade in the E.C.:

There were two major trading places in the E.C. (a) the area around Dibba and (b) around Kalba, which is located between Fujairah and Oman.

The market in Kalba consisted of a group of small shops, each shop approximately 3 x 7 metres, built from palm fronds (Figure 3:10). The shopkeeper would be open for business more than 10 hours each day, even taking his lunch and midday siesta at his store. This type of store sold important commodities like sugar and rice. Kerosene, the traditional lighting fuel, was also stocked²⁶.

Most permanent shops were owned by Iranian immigrants, but near the permanent shopping area there was a large open space used by the local farmers and people from the mountains to sell their produce. At this market place commodities such as fat, cheese and eggs were sold by the farmers and mountain villagers who brought goods to sell or exchange for other commodities.

b. Trade with other UAE regions:

Because of the lack of a road network at that time, and the difficulties of reaching the west coast of the UAE, traders used to send their goods to the west coast



Figure 3:10 A typical traditional store

by animal or used the sea transport around the Strait of Hormuz.

Most of the E.C. traders used to send their goods to Dubai markets, especially the agricultural products and dried fish to be traded or sold to buyers. They often returned with other goods to trade back home. Sometimes, some traders and merchants from Dubai or Sharjah used to come to the E.C. at harvest time to buy agricultural products or dried fish. They brought other commodities to trade or sell in the E.C.. These merchants used to buy tobacco and dried lime to take back to Dubai and Sharjah. These commodities were transported in large vessels and sent to India and other areas.

c. Trade with the Gulf countries:

The E.C. is located between Omani territories to north and south and this encouraged trade with the Omani peoples. Omani farmers and merchants used to bring their agriculture surplus and tobacco crop to Kalba market from where it would be sold for export to Gulf countries. Similarly, the Omanis who lived in mountain villages traded at the markets in the north, such as Dibba. Produce was also traded with the other Gulf countries, especially tobacco, dried limes and dried fish which was sold to Bahrainian merchants.

Khor Fakkan is a natural harbour and was famous in the past as the gateway between the E.C. and the rest of the world. The merchants of Khor Fakkan were famous in the Gulf. They used to rent or buy trading vessels from Kuwait to take their goods to Iran, the Indian Sub-continent, and to the Far East²⁷. Agricultural products and dried fish were the major items of export from the E.C.. Wood, salt and fuel and

other commodities not readily available in the E.C. were important imports.

Some trade relations existed between the Iranian coast and the E.C.. Most of the Iranian traders arrived in the area in their small ships in the winter time bringing goods like salt and fuel to be sold in the E.C.. At the same time, traders from the E.C. got ready for them by preparing dried limes and tobacco to sell or trade for other commodities.

F. Prospect of oil

The exploration of oil in the UAE has brought a lot of changes to the country and it has changed the lifestyle of people of the UAE in general, and the E.C. in particular. The wealth derived from oil has enabled the government to build a modern infrastructure, eg fish and vegetable markets, new roads, seaports and airport. This infrastructure is not only valuable for the E.C. today but should stand the country in good stead in the future. The facilities provided have enabled the farmers, the fishermen and others to market their products, as well as to participate in the development of the area as a whole.

The real effect of oil wealth started at the beginning of the 1970s, when oil revenues enabled the government to support the fishing and farming sectors as well as others. Oil is also the major source of income for the UAE government, which encouraged the government to support and develop the other sectors, moreover controlling these activities. This control has enabled the government to play a major role in developing the E.C.

Since oil wealth and the government role are the major keys in the

development of the area's economic activities. So, it is essential to mention this issue before we discuss the post-oil economic activities.

However it is difficult to keep these changes in chronological order in the text. Therefore government role in developing the area and the new facilities, which have played a role in development the E.C., will be discussed in more detail in Chapter Five (B).

Summary

We can say that before oil was discovered on the E.C. of the UAE, economic activities in the area were of a basic nature and the inhabitants were engaged in activities which satisfied their basic needs. For agriculture, simple tools and farming techniques were used to manage the farms.

One feature of the agriculture of that time in the E.C. was that it was self-sufficient, based mainly on cereals and other farm produce (detailed in this chapter). The farmers were very dependent upon the products of the palm tree in terms of food and other household needs. Most of the agricultural produce was for local consumption and it was rare to export produce to markets other than the local one. In some areas taxes were also levied by the local rulers upon the farmers.

Fishing was the second major occupation with most of those involved being local people fishing locally. With their simple tools these fishermen supplied the local market with a variety of fish. The fish was used for food and other purposes such as fertiliser for the farms.

Thus from the above we can see the importance of the combination of fishing

and farming activities to the inhabitants of the E.C. Because of the location of the farms near the sea, the people were able to combine fishing and farming activities and, thereby, fishing supplemented agriculture to enable farmers to subsist on small plots of land which otherwise would have provide an adequate level of subsistence.

Some of the farming tools, equipment and methods eg traditional irrigation systems (such as flooding) are still in use today.

The traditional manufacture of various products using basic tools and for local consumption thrived due to a good local demand for them. Low incomes and a shortage of imported commodities forced the people to depend on their own skills and land and those of their neighbours for their needs and hence most of the simple tools used were manufactured locally to supply local domestic needs rather than the export market.

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 19. Interview with Rashid al-Zaabi, one of Khor Kalba fishermen. 16 March 1990.
 20. Interview with Obaid ibin Ali, retired fisherman from the Dibba region. 18 March 1990.
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Hay, R. The Persian Gulf States. Washington, D.C.: The Middle East Institute. 1959, p. 53.
 26. A can would be filled with kerosene and a piece of cloth or palm rind would be fixed into the top with a glue made from dates. The cloth/rind would soak up the fuel and, once ignited, would provide a light.

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IV. Current Economic Activities In The East Coast

A. Agriculture

1. Current distribution of the farm land in the area:
2. Irrigation systems in the E.C.:
 - a. Distribution of the various irrigation methods in the E.C. farms
 - b. Advantages and disadvantages of the new irrigation systems
 - c. Comparison of different types of irrigation systems
3. Sea water irrigation plants in the E.C.
 - a. Khor Kalba seawater project
4. Agricultural production and distribution in the area:
5. Livestock in the area:
 - a. The animals raised in the area:
 - b. Dairy farms:
 - c. Poultry
6. Marketing the agricultural produce in the E.C.:
7. New farming techniques introduced into the area:
8. Growing crops in covered houses
9. Government experimental and model farms in the E.C.:
 - a. The aim of these farms
10. Government support:

B. Fishing in the E.C.

1. The distribution of fishing and fishermen in the E.C.:
2. Fish catch in the area
3. New fishing techniques:
4. New fishing method introduced to the E.C.:
5. The marketing of fish in the E.C.:

Case study

6. Fish markets in the area:
7. Types of fishermen in the E.C.:
8. Fishermen and their boats:
9. The government's role in the fishing industry
10. New fishing schemes planned for the area

C. Manufacturing in the E.C.

1. Existing manufacturing in the area:
2. Other valuable manufacturing activities:
3. Types of industry needed in the area:
4. Motivation toward manufacturing in the area:
5. Obstacles facing industrial development in the area:

D. Trading in the E.C.

1. The current retail situation

Summary

Endnotes to Chapter Four

IV. Current Economic Activities In The East Coast.

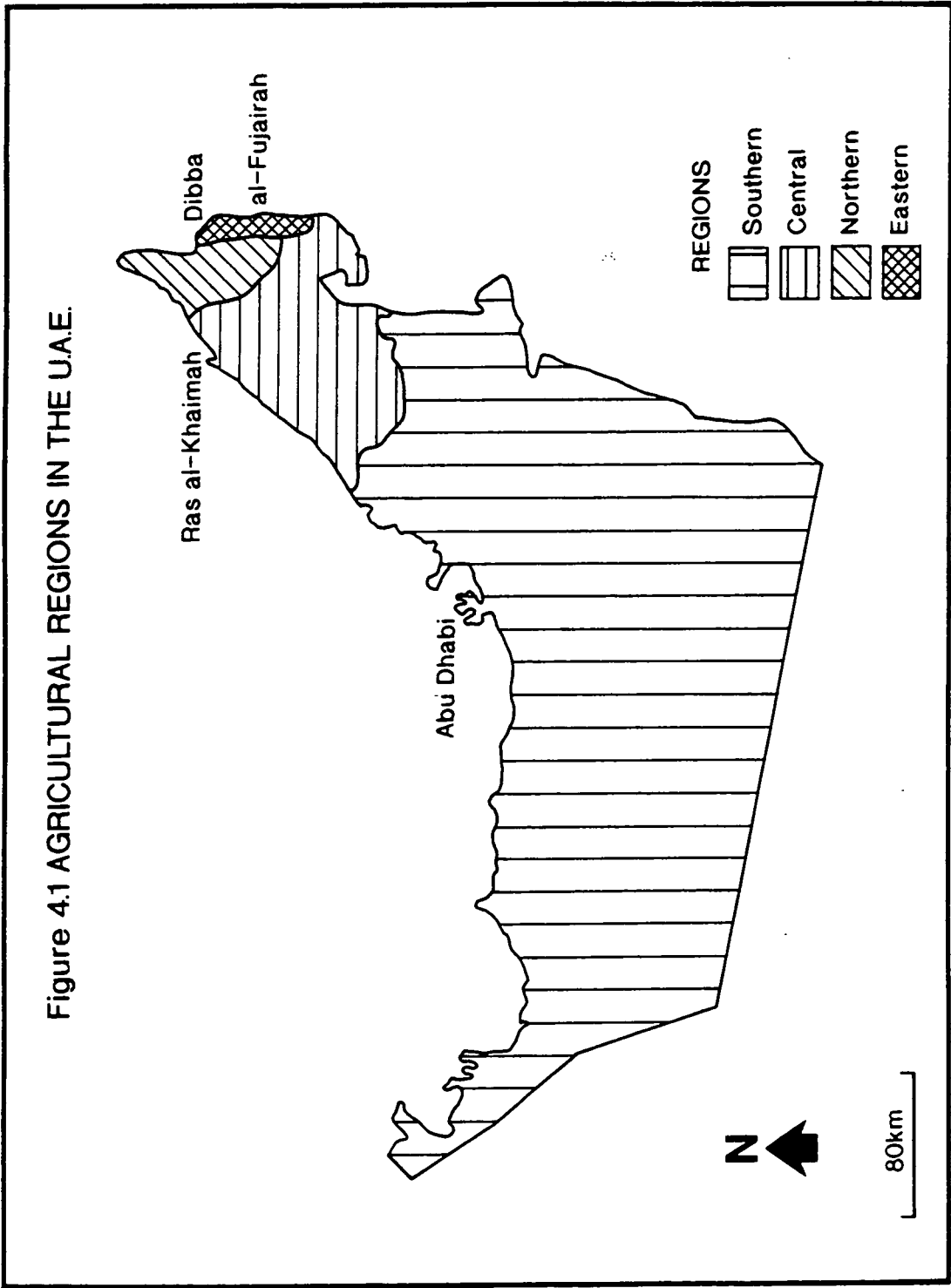
The existing economic activities in the area have been affected by the government support which has come as a result of the oil wealth from the other Emirates. Farming and fishing are still major economic activities for the area's inhabitants, though with changes brought by the introduction of oil wealth. The following sections examine the current economic activities in the E.C. and the government support for these sectors with more detail and analysis, along with the new government policy towards other sectors, eg manufacturing and trade.

A. Agriculture

As in the past, farm land is still distributed by local government in the E.C. Any local person has the right to an agricultural holding free of charge in his area, but once allocated his land he is obliged to begin farming his holding within a specific period. These periods are specified by local government and are usually 6 months. If the new landholder fails to farm the land within the time laid down, the land may be repossessed and given to someone else.

1. Current distribution of the farm land in the area

The MAF was setup in 1972 following the establishment of the UAE. For administrative purposes, it divided the UAE into 4 agricultural regions. Each region contains several districts. The aim is to provide good facilities for farmers. The 4 agricultural regions are: (a) the south region; (b) the north region; (c) the central region; and (d) the east region (Figure 4:1).



The East Agricultural Region is divided into 7 areas which, in the UAE, are called unities (Figure 4:2), These are: Kalba, Fujairah, Murbih, Khor Fakkan, Dhadnah, Dibba, and Masafi. These belong to two Emirates, Fujairah and Sharjah. This study will focus on the first 6 unities and exclude Masafi¹ (Figure 4:3). In 1989, as a result of government policy on the distribution of farm land, the number of agricultural holdings in the E.C. increased to 5,132 (including those of Masafi)² compared with 2,525 in 1977 (Figure 4:4). Between 1977 and 1983 a lot of new farm lands were distributed to the inhabitants of the E.C. As Figure 4:4 shows, after 1983 the number of agricultural holdings increased slowly to reach 5,132.

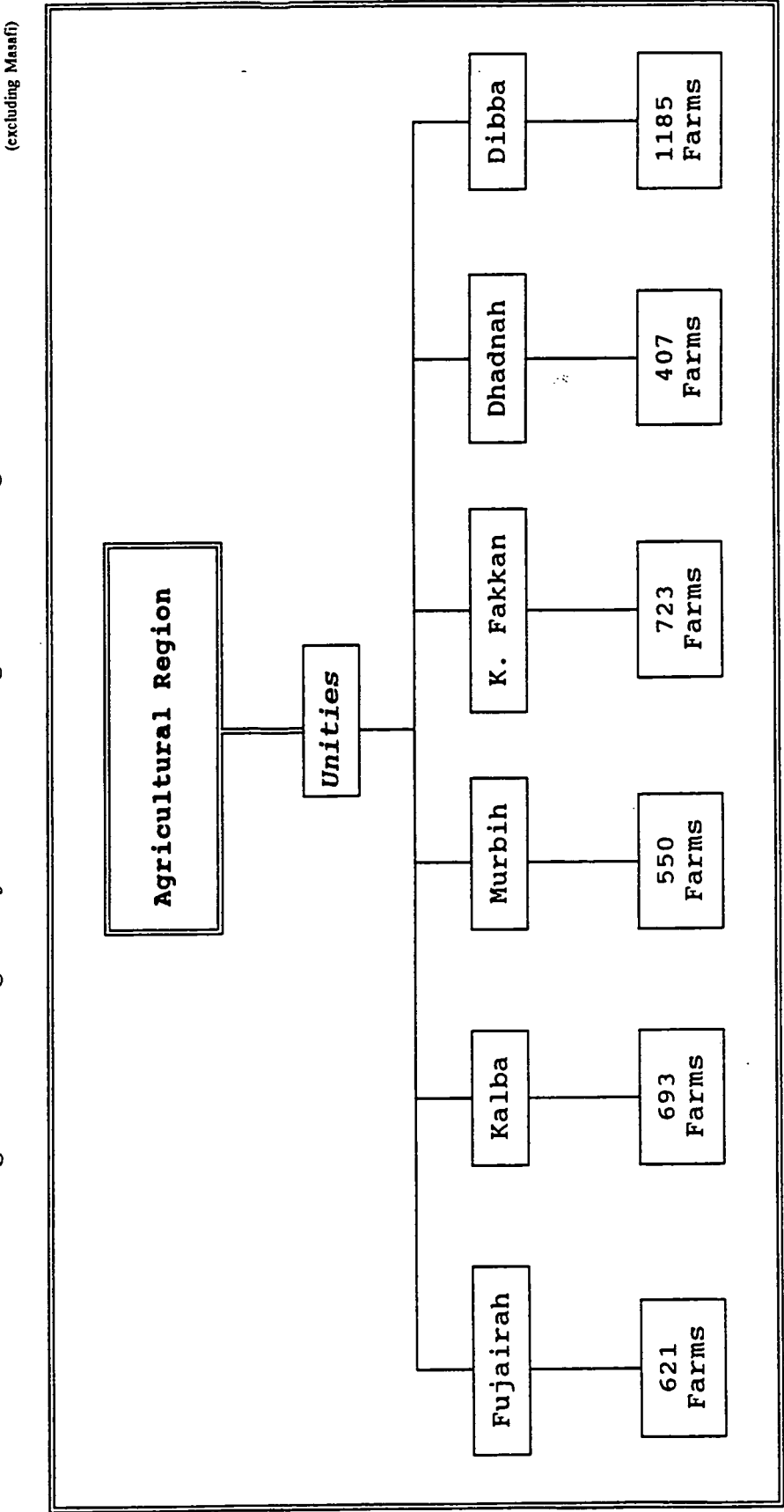
a. The unity of Kalba:

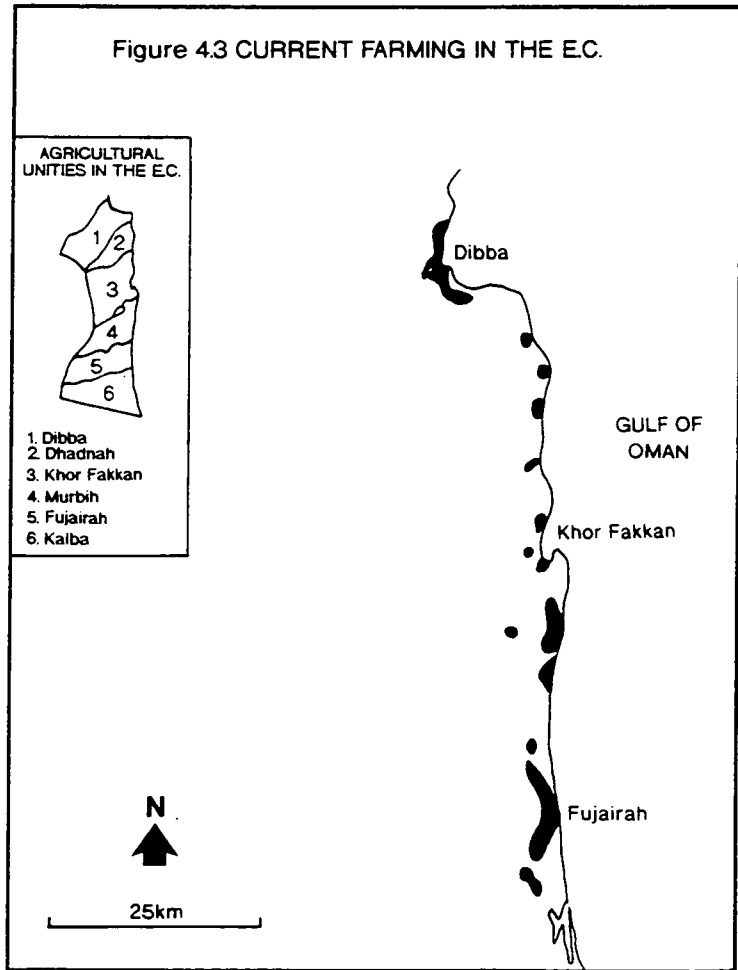
The government attached a great deal of importance to the agriculture in this unity not because of its location in relation to the hinterland, but because it had the best agricultural land in the E.C. and consequently much attention was paid to its agricultural development. It was in this unity that the first experimental farm in the E.C. was established in the 1960s, incorporating the earlier Diqdaqqa experimental station in Ras al-Khaimah which had been founded in the mid-1950s³.

In 1988 there were 693 farms⁴ in Kalba, distributed in ten districts and representing 16.5 per cent of the total number of farms in the E.C.. In 1978 the number had been 547 farms. The highest concentration of farms is in Soor Kalba where there are 201 farms, with 195 in Treaf, 180 in wadi Wisam, 55 in al-Saf, and only one farm in Ain al-Ghumur.

These farms employ about 850 workers, representing 25 per cent of the total

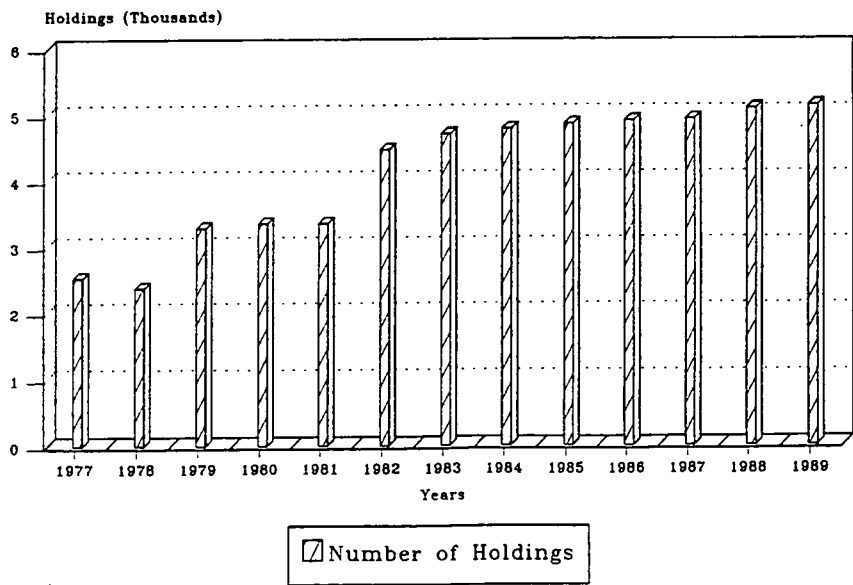
Figure 4:2 Diagram of the Eastern Agricultural Region 1990





SOURCE: Gabriel, E. (editor) *The Dubai Handbook* Germany/Institute of Applied Economic Geography, 1987 p.20

Figure 4:4 Number of agricultural holdings in the East Coast for the Years 1977-1989.



MAF, Statistics 1977p.2, 1982/83p.4, 1986/87p.47, 1988, 1989.

agricultural work force of the E.C. (this is the official number of workers, ie those registered with the MAF. In fact it is estimated that more than double this number are employed in the area, many of them unregistered, being casual labour working as and when farmers require them.) The majority are farm labourers from the Indian Sub-continent. Wages average 600 UAE Dirham (Dh)¹. The main farming area is to the south west of Kalba town, and good soil is also found in Wadi Wisam and Wadi Soor (near Kalba). The average size of farms is about 9.3 donum. Of the 13,109 donum (Table 4:1) of agricultural land in Kalba, almost 60 per cent is farmed every year which, in 1988, amounted to 31 per cent of the total farming land in the E.C.

b. The unity of Fujairah:

The administrative headquarters of all the unities of the E.C. is in Fujairah. There are 19 districts in the unity of Fujairah, containing 621 farms, representing 15 per cent of the total number of farms in the E.C. Most of the farms are concentrated in 4 districts: al-Sharyah, with 84 farms; Ghurfah with 70 farms; Sikamkam with 68 farms; al-Reg hailat with 60; al-Sewaida, Qaino and al-Fadqah all have one each. The number of workers in this unity was approximately 760 in 1988, which was 22.5 per cent of the whole agricultural work force in the E.C. This number is low taking into account the number of farms in this unity. The estimated number for 1990 is around 1,200 workers. Most farms have more than one worker, but in the past most owners would employ only one worker. In 1984 the average wage was 900 which has now fallen to approximately 600 Dh. This drop is due to the fall in oil revenue in the UAE

¹ In 1990 one British pound equalled approximately 6 UAE Dirham.

Table 4:1 Number of farms and workers in the E.C. agricultural unities, in 1988.

Unities	Farms and Percentage		Workers and Percentage		Area and Percentage	
	Farms	%	Workers	%	Area, donum	%
Kalba	693	16.5	850	25	13109	31
Fujairah	621	15	760	22.5	6891	16.5
Murbih	550	13	560	16.6	4003	9.6
Khor Fakkan	723	17	440	13	5635	13.5
Dhadnah	407	9.7	350	10	6040	14.5
Dibba	1185	28	409	12	5976	14

Source: MAF, Eastern Region Administration. (Unpublished Data)

in the last few years, and the import of workers from Bangladesh, making labour more plentiful and therefore cheaper. This fall in wages is prevalent throughout the E.C..

The total land being farmed in the unity of Fujairah is 6,891 donum, representing 16.5 per cent of the total agriculture land in the E.C.. In 1988 the total agricultural area was 4,923 donum, distributed in 19 districts the average farm being 11 donum in size.

c. The unity of Murbih:

Between Fujairah and Khor Fakkan there is a small district called Murbih. In this unity there are 550 farms, with an area of 4,003 donum, comprising 9.6 per cent of the total farm land in the E.C.. In 1988 almost 70 per cent of this land was used for agricultural purposes.

Murbih has 6 main farm districts, starting with the area around Murbih itself with 216 farms (most of which are located close to the sea). The second district is Qidfi with 182 farms, most of which are small compared with the farms in Fujairah and Kalba. The third district is Qurayyah with 116 farms. Qirat has the fewest farms in the unity of Murbih, having only 4. The number of agricultural workers in the whole unity is about 560, most of whom are Pakistanis.

d. The unity of Khor Fakkan:

There are 12 districts in this unity, with 723 farms. Most farms are concentrated around the district of Luliyyah with 177 farms, and al-Bidyyah with 175 farms. In Sheas there are only 7 farms and in Hussi, only one. The total farm land of

this unity is 5,635 donum, of which 65 per cent was used for agricultural purposes in 1988. There are about 440 farm workers on these farms, working either full- or part-time (the part-time workers earn a living in two ways, usually working on the farms in the afternoons, while fishing in the mornings). The average area of each farm is 7 donum.

e. The unity of Dhadnah:

Dhadnah is found between Khor Fakkan and Dibba. There are 407 farms in this unity, 227 in Dhadnah itself, 115 in Rul Dhadnah, 49 in Ziket and 16 in al-Iqqah. These 4 districts have 6,040 donum of agricultural land, representing 14.5 per cent of the total farm land in the E.C.. In 1988 3,308 donum in this unity were used for farming, whereas in Khor Fakkan, 3,649 donum were farmed in the same year. There are around 350 farm workers in the unity, earning an average wage of 700 Dh.

f. The unity of Dibba:

This unity has 21 districts with the highest concentration of farms in the E.C. The largest number of farms in the unity is found at Dibba al-Husin which has 287. al-Akamiyah has 155 farms and Sumbrayir 119 farms, whilst al-Muhalab has only 3 farms. The total agricultural land in this unity is 5,976 donum, comprising 14 per cent of agricultural land in the E.C.. In 1988 there were 4,998 donum used for agricultural purposes, and whereas the unity comprises 14 per cent of the agricultural land in the E.C., with 1,185 farms (1988 figures) it has 28 per cent of the total number of farms in the E.C.. In 1988 the MAF recorded 409 workers registered for farm work in this

unity, a significantly small number taking into consideration the large number of farms in the unity. The reasons for this disparity are: (a) not many farmers are registered with the MAF because it is difficult for them to get the facilities provided by the MAF; (b) most owners prefer to work their farms themselves and not hire workers because the farms are small (averaging around 2 donum); (c) some farm owners use part-time workers who only work once a week irrigating the farm land and have another job for the rest of the week. These workers may not register with the MAF.

On whole the E.C. with its six agricultural unities and more than 4,150 farms has enabled the MAF to distribute its services to these unities. The majority of these farms are located in the Dibba unity.

2. Irrigation systems in the E.C.

All farmland in the E.C. has to be irrigated and the main water supply continues to be from underground sources. Both traditional and modern irrigation methods are in use on farms in the E.C. The traditional irrigation methods tend to survive on the small farms and those in the mountain regions. During the post-oil period new techniques have been applied to old irrigation methods, adapting them to the mechanisation now being implemented in farming in the E.C.. The same source of water is used to supply urban as well as agricultural demands and consequently the water supply is overstretched. This, together with the location of the E.C. close to the sea, which means the rain water from the mountains quickly runs to the sea without getting the chance to penetrate to the underground strata, is the main problem facing the government.

With the aim of solving the problem of water supply to agricultural land, the MAF allocated 16.5 million Dh⁵ for new irrigation systems to be installed comprehensively over the country's farm land. The amount proved insufficient for this as the demand for irrigation systems exceeded the budget allocated.

Modern irrigation methods can be divided into 3 types: drip irrigation, bubbler, and sprinkler. Each system suits a particular crop best and it is therefore important to select the correct system to get the best from the crops and the irrigation system.

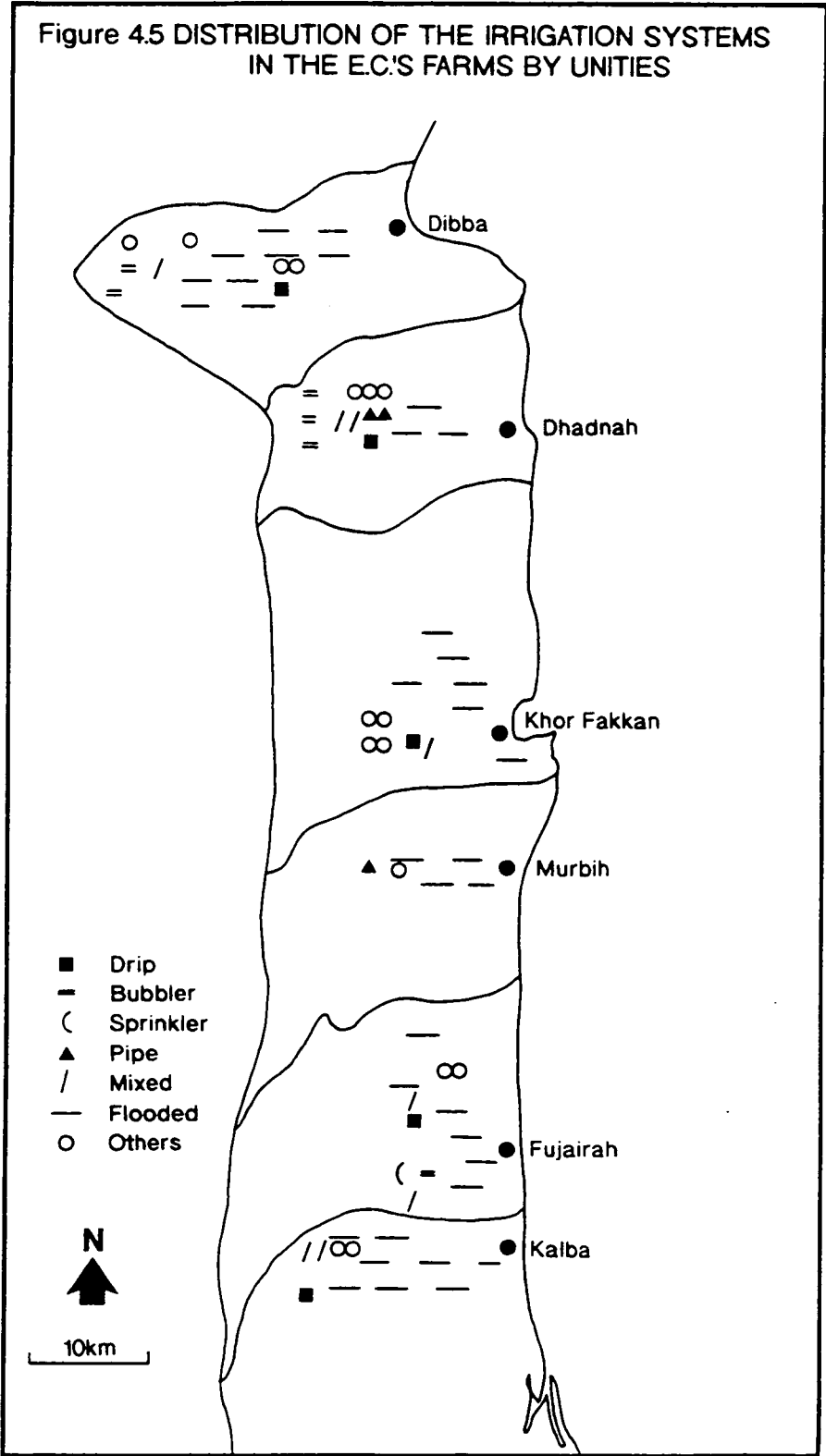
a. Distribution of the various irrigation methods on E.C. farms:

The following describes these seven types of irrigation used in the E.C. (Figure 4:5). The last method referred to derives from the pre-oil period:

1. The drip system:

This is suitable for watering vegetables. In the E.C. it is used for tomatoes, cucumbers, eggplants and other vegetable crops. It is also used in greenhouses and has the advantage of water conservation.

The usual system is an installation of pipes between the lines of vegetables. In some cases, one pipe serves two rows of vegetables to save water and to enable more vegetables to be grown. The pipes have small holes at 12 inch intervals and allow water to drip at the rate of 3-15 litres per hour (depending on the requirement of the plants). The pipelines are connected to the main water pipe which is connected to the water tank and the fertiliser unit. This type of irrigation system is mainly found in Kalba and Fujairah at the moment, but more and more farms in all areas are taking



advantage of this system.

2. The bubbler irrigation system:

This is one of the new irrigation systems introduced to the E.C. and has given good results in irrigating trees. It is especially good in the cultivation of mangoes and citrus trees. The bubbler system is mainly found in farms in Dhadnah and Dibba. In 1988 19 farms were using this system. The main advantage of this system is that farmers can water a large number of trees in a short time and it is labour-saving.

The bubbler system waters trees by means of a cascade (umbrella), like a fountain, emanating from a pipe which provides the trees with water and also flushes the salinity from the tree trunks into the surrounding banks. With this system, the consumption of water is approximately 1,400 cubic metres per donum a year compared with 4,300 cubic metres for the same area using the normal flooding irrigation system.

3. The sprinkler irrigation system:

Irrigation by sprinklers is widely used in other areas of the UAE, for example in al-Ain and Abu Dhabi, where there are big irrigation schemes and very large farms.

The sprinkler system is suitable for growing wheat and animal foodstuffs. In 1988, a farm in Fujairah also used this system for the cultivation of melon and water melon crops. The crops were grown over a large area, and it was found that the system provided ample water for good growth. The sprinkler system has the added advantage that it washes the leaves of the crops as it waters them.

The above irrigation systems are all modern ones and need some skill and thus farmers need to learn how to operate them. Once learned, however, the systems are

easy to operate. However, the above does provide a drawback to their implementation, especially as most of the farmers in the area are not educated, and the MAF engineers experience language problems when trying to teach the hired Pakistanis who work on the farms. Consequently, the number of farmers using the new system is still relatively small (Table 4:2). The majority of E.C. farms use the bubbler system. In 1990 a total of 2,968 donums of E.C. farm land were irrigated by this system.

The three irrigation systems are all composed of two important parts: (a) the water pump with the control unit, including the fertiliser mixer and filter. It is with this equipment that the first process of the irrigation system is effected. It begins with water being pumped from the well, passing through the control unit where it is mixed with fertiliser (if required) and then filtered. Finally it is metered. (b) the second part of the process uses a network and is distributed to the plants by the drip, sprinkler or bubbler system. In all three systems liquid fertiliser is used and this is readily available in the local markets.

As Table 4:2 shows, in 1990 only 80 farms were using the three above mentioned new irrigation systems, but, as one government representative commented,

"We are at the beginning of agricultural development, and farmers will soon recognise the benefits of using these systems. According to our records, more farmers are applying for the new system."⁶

4. Irrigation by long pipes:

In this system, the farm is divided into blocks. Each block has its own pipe connected to the main pipe coming from the water tank. This method of irrigation has developed from the traditional irrigation of the area. A feature of this system is that the water reaches the plants directly from the water tank and thereby avoid being

Table 4:2 Number of farms using modern irrigation systems in the East Region
from 1983-1990

Year	No. of Farms	Area of Farms in (Donum)			Total
		Drip	Bubbler	Sprinkler	
1983	29	155	897	67	1119
1984	30	117	593	67	777
1985	38	89	957	272	1318
1986	46	205	2151	297	2656
1987	61	296	2511	1210	4017
1990	80	356	2968	1484	4808

Source: MAF. Statistics 1982-83,/1984-85,/1986-87 &/1990.

evaporated in the high summer temperatures.

In farms in Wadi Wisam (in Kalba), and in Dhadnah, some farmers have constructed concrete-lined canals to reduce the loss of water which hitherto soaked into the ground in the unlined water channels.

In fact both the above methods of irrigation still consume great quantities of water compared with the more modern system, but farmers still use these methods. There are two farms in Dhadnah using the pipeline irrigation system and it is also still found in farms in Murbih and Kalba.

5. Mixed irrigation systems:

Most farms in the E.C. use more than one system of irrigation as they grow different crops which need different irrigation systems. In Kalba there are 12 farms using mixed irrigation systems and 9 in Dhadnah (Table 4:3). At these farms farmers irrigate their vegetable crops using the drip, and water their trees by the bubbler system, but keep the traditional methods in reserve in case something goes wrong with the modern equipment. Some of these farms also use the modern irrigation system in their greenhouses.

6. Other irrigation methods in use in the E.C.:

In some areas farmers still use old irrigation systems like the *Falaj*. Owners of small farms often cannot afford to install the new systems so they irrigate their land via the systems on neighbouring farms. Sometimes, due to high salinity or because a farm is too small to make the installation of an irrigation system or the digging of well viable, a water tanker can be hired to bring water to the land to irrigate trees. This is common with palm trees. There are 69 farms of this type found in Dibba, 52

Table 4:3 Distribution of irrigation systems in East Coast farms in 1988

Unity	Drip	Bubbler	Sprinkler	Pipe	Mixed	Flooded	Others	Total
Fujairah	2	2	1	0	5	595	13	621
Kalba	3	0	0	0	12	669	9	693
Murbih	0	0	0	1	0	543	6	550
K.Fakkan	1	0	0	0	2	668	52	723
Dhadnah	1	12	0	2	9	357	26	407
Dibba	1	5	0	0	6	1104	69	1185
G. Total	8	19	1	3	34	3939	175	4179

Source: MAF, Eastern Region administration office, Fujairah.

in Khor Fakkan and 26 in Dhadnah.

7. Irrigation by flooding:

The majority of farms in the E.C. use the traditional flood irrigation system. This is a pre-oil system but is still in use today, beside the new ones. As Table 4:3 illustrates, approximately 94 per cent of farms still use this system. It operates as follows: the water is collected in a water tank by a pump powered by electricity or fuel and the water is conveyed down pipes, or mud or concrete canals to the *Yalbah* and *Khaboob* area to water the plants.

Nowadays some farmers appreciate that the system wastes water and to help avoid water loss and to avoid water evaporating in the heat of the day, they start irrigating in the evening or early morning.

The existing irrigation methods, eg flooding, will have to remain for a few years depending on government policy, until the government can control water consumption in farming. So far many farms who have adopted the modern irrigation systems are farms owned by people who are not full-time farmers but use the farms for holidays and have installed the irrigation systems to water fruit trees for their own use.

b. Advantages and disadvantages of the new irrigation systems:

The new irrigation systems which are applied in the E.C. have some advantages as well as disadvantages. The bubbler or drip irrigation system which has been used in the E.C. for some time now, reduced the water consumption in the farms that used the modern ones. The new irrigation systems are using a small quantity of

water to cover large area. The system require less labour to monitor, because most of the irrigation process is done by modern machines.

Using the water to irrigate one plant at the same place for a long time can encourage some soil problems, eg the area around plants can develop salty deposits. A further problem being encountered is that the pipes laid to irrigate fruit trees often necessitate the moving of existing farm structures and machinery, and some existing pipes have been destroyed when they have been used for the drip irrigation system.

The new irrigation systems require a degree of skill to monitor them in use, especially to ensure the correct amount of liquid fertiliser is mixed with the water. Some training of farm workers is necessary for their correct use. One problem arising is that as many farm workers now are non-UAE labour which have a higher turnover than the local workers of the past, farmers now have to spend quite a lot of time training workers who may only stay a relatively short time before returning home to their own country.

c. Comparison of the different types of irrigation systems:

1. Water consumption:

Old irrigation systems, which are the most commonly used on E.C. farms, consume large quantities of water. The modern systems require approximately half the quantity of water to irrigate the same area of crops as the out-of-date systems. For example, replacement by drip irrigation could save 60-78 per cent of water consumption used by traditional irrigation methods⁷. The reason for this dramatic difference is that with the old systems large quantities of water soak wastefully into

ground which is not supporting plants as the channels are open. Overflow also accounts for a proportion of waste, and evaporation accounts for another proportion whereas, with the new irrigation systems, the water is poured around the base of the plant itself and only waters the soil around roots.

2. Labour:

Unskilled labour and simple, primary tools are all that is required to operate the traditional irrigation systems in general use in the region whereas the new systems, although they require less labour to operate, eg drip irrigation system could save up to 85 per cent of labour⁸, do require farm workers with a degree of both knowledge and skill to operate them effectively. Some form of technology is also required to monitor the modern systems and this too requires training of farm workers.

3. Cost:

The traditional irrigation systems are cheap to install and run, farmers can construct their own water channels whenever their workers can be spared from other tasks on the farm, and construction does not require engineers or special training. On the other hand, modern irrigation systems require a degree of knowledge to lay pipelines correctly and trained engineers are needed to select the optimum site and to train farm workers to operate them. All of these services (if not supplied by the MAF) are considered to be costly for the ordinary farmers.

In conclusion, the types of irrigation systems used on E.C. farms vary and often the choice of system depends upon the financial circumstances of the individual farmer. Some farmers can afford the latest and best, others have to manage with cheaper systems, or may even have to put up with the out-of-date systems installed

in the past.

3. Sea water irrigation plants in the E.C.

The E.C. suffers from a shortage of water resources, and the government is at present involved in a project to convert sea water for domestic and agricultural use. Using sea water is a new method of irrigating plants and not all plants can tolerate it. The plants have to have a high tolerance for salt, namely they must be halophytes, which are plants tolerant of the high salt content of sea water and can be grown in either summer or winter with good results. Scientists⁹ believe they need a minimum of 5 ppm of salt.

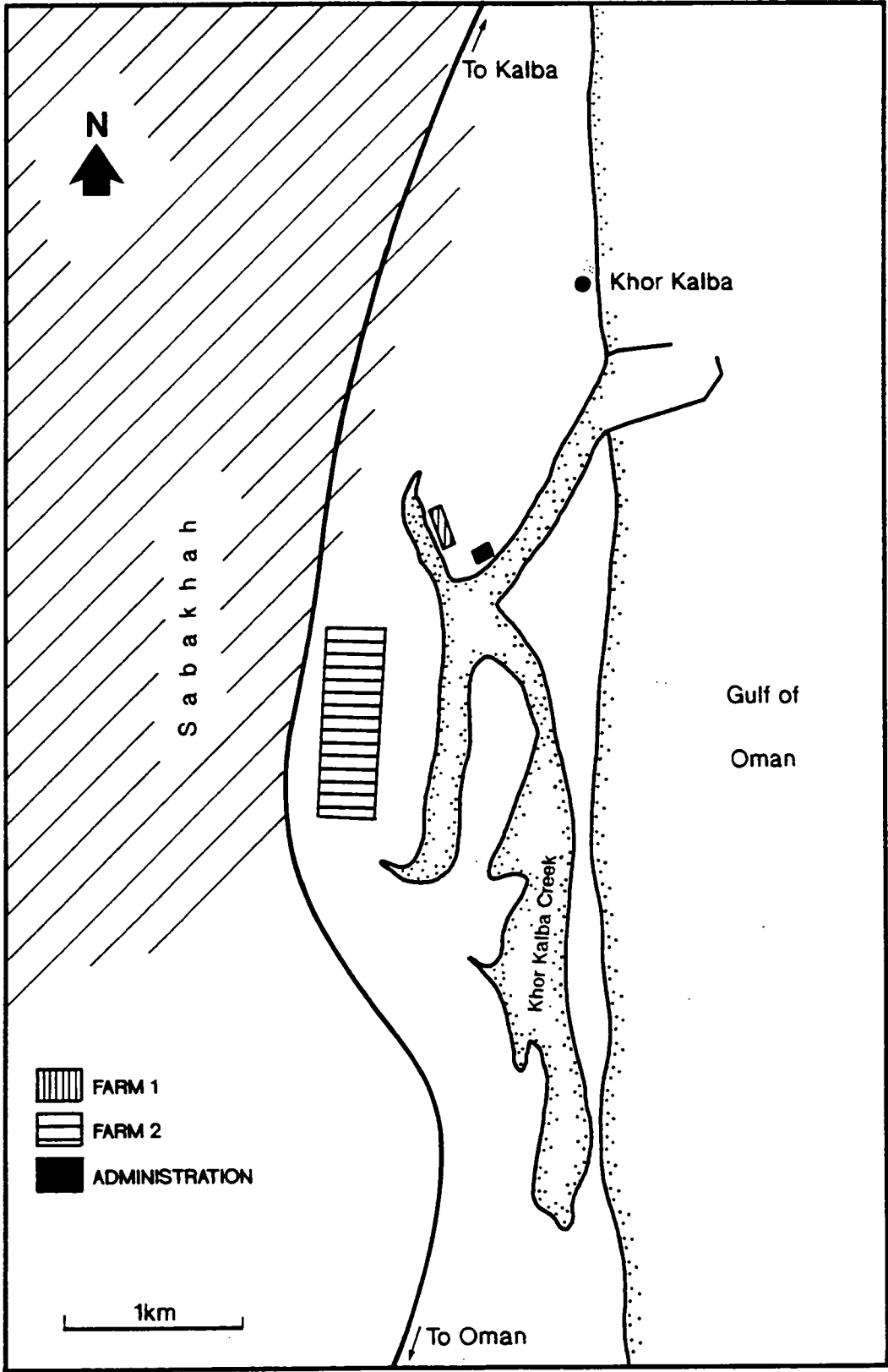
"Yet there is no fundamental biological incompatibility
between plant life and highly saline conditions"¹⁰.

Sea water irrigation plants are used in many countries such as Mexico, the US, the UAE, Kuwait, and Egypt¹¹. Experiments using sea water in irrigation plants began in the 1960's. In 1976 barley grown in a test field at the Bodega Marine Laboratory, 130 km north of San Francisco, gave good results.

a. Khor Kalba seawater project:

In the southern part of the E.C. almost at the border, there is a small town called Khor Kalba (Figure 4:6). This has a lagoon surrounded by mangrove trees (*Avicennia marina*) where the sea water irrigation plant is located. The project is run by the Kalba Agriculture Company, a partnership between H.H. Sheikh Sultan al-Qasimi, ruler of Sharjah, and Mr Wood Prince, and is under the direction of the University of Arizona whose engineers and officials (mainly Americans and Mexicans)

Figure 4.6 SEAWATER IRRIGATION PROJECT AT KHOR KALBA



supply the expertise. The project officially started in the 1986 on an area of 100 donum¹². The location of the project was chosen for its suitability in terms of soil type and abundance of sea water. The farm is divided into 3 blocks for testing, with two locating, one site to the west of the Kalba Marine Motel, and the other near the Kalba Oman highway.

Halophytes are grown at the Khor Kalba project with seeds imported direct from the USA. Some of the harvested seeds are sent back to America for farther experiments. On 24 May 1989 the greatest height of this plant was recorded as 58.6 cm¹³ in block I of the Khor Kalba experimental farm. Tests on halophyte seeds have shown that there may be a possibility of producing oil from these, of which about 27 per cent could be processed to make cooking oil. Also hay from the plants, after washing, can be used for animal feed. Both of these products are being developed and tested in the project.

The farm uses water direct from the sea to water the plant and modern irrigation systems have been installed with sprinkler systems covering part of the farm. The other farm (close to the Omani border) uses a flood irrigation system where the water is directed to the farm along (salty soil) canals and then distributed to the various sections of the farm. Drainage is installed in the areas under cultivation to remove the remaining water from the land, especially in areas with poor natural drainage. Fertilisation is applied to the soil before planting takes place, using Urea and Super-Triple Phosphates.

The purpose of the sea water irrigation project is to bring the marshy areas of the E.C. under cultivation and to be a model and experimental station for tests, the

results of which it is hoped can be applied to agriculture generally in the UAE. The project is also intended to provide foodstuffs for the animals in the area.

One comment to be made on this project is that, so far, there is no local involvement in it. It is intended as a project to help the farmers of the area but there is no local interest in it. This has come about because of the way the project was undertaken. From the beginning it has been something undertaken by experts from abroad, but it is hoped that it is only a matter of time before local people get involved. This can happen if the government distributes land to farmers suitable for growing plants which can tolerate sea water irrigation, but otherwise the project may well fail.

4. Agriculture production and distribution in the area

The total potential agricultural area in the East Region has increased from 29,110 donum in 1973 to 46,789 donum in 1989. The increase has occurred since 1978 as a result of the government's new policy to develop this sector (Table 4:4). Agricultural production is a major source of income for people who do not work in the public sector in the area and there are also some who do work in the public sector who are part-time farmers, although they are, of course, not entirely dependent upon farming for their livelihood.

Farm land increased from 9,212 donum in 1977 to 32,840 by 1987¹⁴ and this was accompanied by an increase in agricultural production from 16,767 tons in 1977 to 53,186 tons in 1987, representing 10 per cent of the total agricultural production in the UAE.

There are three main sources of income coming from farming in the E.C. and

Table 4:4 Total area devoted to agriculture in the East Coast from 1973-1989.

Years	Total Area (in Donum)
1973	29110
1976	23709
1977	16321
1978	30138
1980	32444
1981	33444 *
1982	33417
1983	36132
1984	36131
1985	46342
1986	46307
1987	46012
1988	46400
1989	46789

*. According to the MAF. Statistical Bulletin 1982-83.

Source: MAF. Statistics. /1982-83/1986-87/1989.

these are as follows:

a. Fruit tree production:

As shown in previous chapters, the growing of fruit trees is not new in this area. In the 1986/87 farming season, 53 per cent of the total farm land in the East Region was in fruit tree production¹⁵. From 1981 to 1988 the area under production with fruit trees has remained almost unchanged, but the quantity produced has increased from 14,205 tons in 1981 to 29,814 tons in 1988 (Table 4:5). This is firstly due to government support and encouragement, with a concentration on the fruit trees resulting from the historical reputation of the E.C. for the growing of fruit trees this government support has taken the form of providing experimental fruit farms in the area. Secondly, the increase in production has been due to the fact that farmers now prefer to grow fruit trees rather than vegetables because of market demand and water and soil salinity. In general, fruit production reached a peak in the 1986/87 farming season with a total crop of 32,140 tons.

Most farmers in the E.C. grow fruit trees. From the MAF data, we can see that the total area planted with fruit trees in the E.C. is 21,423 donum with a production of 28,124 tons of fruit in 1988, worth around 89 million Dh. The largest fruit growing area is in the unity of Kalba with 6,294 donum used for fruit trees and the highest production of fruit in the E.C., reaching 11,170 tons in 1988. The Murbih unity has less land for fruit trees, only 2,025 donum, and the Dhadnah unity produces only 190 tons of fruit. The most important trees grown are mangoes and citrus trees, and the East Region grows more mangoes than any other area in the UAE. In 1982 3,267

Table 4:5 Area and production of fruit trees in the East Coast 1977, 1981-1988.

Years	Area in Donum	Quantity in ton.
1977	7218	11499
1981	22368	14205
1982	18426	14417
1983	21696	15296
1984	22523	26910
1985	22905	27106
1986/87	24056	32140
1988	23379	29814

MAF. Statistics, 1977/1982-83/1984-85/1986-87/1988.

donum were planted with mangoes, giving 3,306 tons of fruit. This quantity increased to 8,138 tons in 1987 and the planted area increased to 4,192 donum in the same year (Table 4:6). From Table 4:6 we see that, from 1982 to 1987, whilst the area under production did not increase, the quantity of production did and this is due to:

- (1) improvement in existing techniques used in growing mangoes eg an increase in the distance between two trees to leave enough space for the tree to grow;
- (2) the introduction of new techniques to grow mangoes eg grafting;
- (3) the influence of the information and seedlings from the experimental and model farms (Kalba, Fujairah and Dibba) in the area, resulting in farmers growing new kinds of mangoes; and
- (4) government support for the growing of mangoes.

b. Vegetable production:

As well as fruit tree production, farmers in this area are also supplying the local market with their vegetables. In 1977 the area planted with vegetable crops was 1,751 donum and this has increased, reaching a peak in 1983 when 9,386 donum was under vegetable crop. This was the growth peak of vegetables in this region and farmers were happy with the prices they got for their vegetable crops but, since then, the situation has changed. As a result of government support and farmers' enthusiasm, vegetables have flooded the market and revenues from the growing of vegetables have fallen.

In 1983 vegetable production reached a high point and since then it has started to decline. Government has given support in the form of irrigation equipment,

*Table 4:6 Area and production of mango in the UAE
from 1982-1987*

Region	Year	Area (in Donum)	Quantity (in ton)
Southern	1982	N.A.	N.A.
Central	//	1000	131
Northern	//	50	27
Eastern	//	3267	3306
Southern	1983	N.A.	N.A.
Central	//	1450	198
Northern	//	70	41
Eastern	//	3560	3570
Southern	1984	N.A.	N.A.
Central	//	1618	305
Northern	//	82	51
Eastern	//	3694	8446
Southern	1986	N.A.	N.A.
Central	//	1815	459
Northern	//	67	43
Eastern	//	3645	8153
Southern	1987	N.A.	N.A.
Central	//	1904	607
Northern	//	99	34
Eastern	//	4192	8138

Source: MAF. Statistics. 1982-83/ 1984-85/ 1986-87.

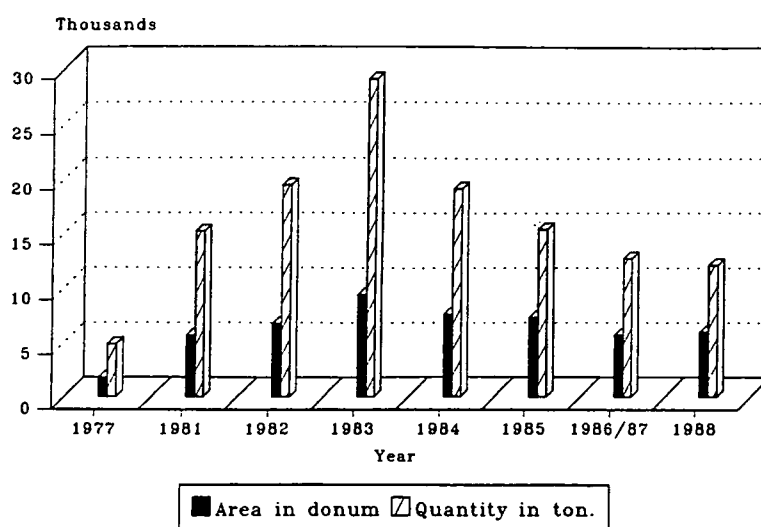
improved seeds, fertilisers and chemicals. But even without this support, farmers have been able to invest in vegetable production because they got their money back after harvesting the crops. However, the profitability of vegetable growing and the market demands for vegetables has meant that often the land has had to bear crop after crop without rest which has exhausted the land and robbed the soil of its goodness.

The decline in vegetables grown in the E.C. started after 1983. The land used for vegetables decreased to 5,927 donum in 1988 , yielding only 12,043 tons (Figure 4:7). After this the effect of soil exhaustion and water problems (scarcity and salinity) made themselves felt in the E.C.. From the MAF data we can see that the Khor Fakkan unity is the largest vegetable growing area in the E.C. (Table 4:7). This unity took the lead in growing vegetables and almost 28 per cent of the vegetables grown in the E.C. are grown here. In 1988 1,157 donum were planted with vegetables in this unity producing 2,395 ton for vegetables for the E.C. markets. The Murbih unity grows the least vegetables, where only 500 tons of vegetables were produced in this unity in the same year.

c. Production of field crops:

In the period 1977 to 1988, the land used for the production of field crops has increased from 243 donum to 3,142 donum and productivity has increased from 429 tons in 1977 to 9,391 tons in 1988. However the total volume of production is small in comparison with other crops grown in the E.C.. Unlike the vegetable crops, there has not been a decline in productivity as field crops like alfalfa and tobacco are very well suited to the area, requiring little water, attention, fertiliser or irrigation.

Figure 4:7 Area and production of vegetables in the East Region 1977, 1981-1988.



MAF Annual Statistics 1977, 1982/83
1984/85, 1986/87, 1988.

Table 4:7 Vegetable production in East Coast farms in 1988

Unity	Area in Donum	Quantity (in ton)	Value (1000 Dh)
Fujairah	552	984	1421
Kalba	844	2167	2941
Murbih	347	500	797
Khor Fakkan	1157	2395	4566
Dhadnah	412	882	1777
Dibba	765	1438	2046
Total	4077	8366	13548

Source: MAF, East Region Administration, Fujairah.

Additionally, the demand for these crops is high. The majority of farms growing field crops are found in Kalba and Fujairah unities, because of the suitable soil and their proximity to the field crop markets. In 1988, 6 unities of the E.C. produced 7,364 tons, valued at more than 8 million Dh.

In conclusion, the E.C. was and still is a major fruit producer in the UAE. Fruit trees occupy a large area of the farm land in the E.C.. As a result, 32,140 tons of fruit were produced in the E.C. farms in 1987. The increase and subsequent decrease in vegetable production can be traced to an increase in demand followed by a market glut coupled with the initial government encouragement of water schemes, followed by an overuse of the water and consequent problems caused by the salinity of water affecting the soil. This demonstrates the importance of the use of water for the future of agriculture in the E.C.. The production of field crops has increased in recent years to cope with the local and UAE demand for crops for animal feed.

5. Livestock in the area

Farmers in the E.C. have practised mixed farming for centuries, raising livestock for meat and milk (as described in Chapter Three) and as draught animals in the irrigation process. It is still rare to find a farm that does not raise some animals, and most farms also raise some poultry.

Nowadays, the government pays more attention to the livestock in the area, as part of a new policy to develop this sector. The MAF sends its specialists to treat the animals at the farmers' farms. In some areas, eg al-Ghail, the government supports financially the animal breeders to produce more milk and meat and to increase the

number of animals in the area. This support has increased the quantity of meat and milk products in the E.C.

a. The animals raised in the area:

1. Goats:

Large numbers of goats are kept in the E.C. for their meat and milk. In 1987 there were 84,751 goats in the area, 84 per cent of which were female, demonstrating that the goats are mainly kept for milk and breeding purposes. In 1987, 1,862 tons of goat's milk was produced, compared with 1,316 tons in 1982 (Table 4:8) which shows that the number of goats in the area has increased to meet the increasing demand for milk. Most of the produce from goats is used locally but some is sent to the markets at Dubai and Sharjah.

2. Sheep:

There were about 6,000 sheep in the E.C. in 1989, of which more than half were in Kalba district. Sheep are raised at farms and at some houses but most of the sheep of the district are raised in the bedouin areas like Treaf and al-Ghail. In 1987 164 tons of milk and 45 tons of meat was produced from sheep, most of it to be consumed locally¹⁶.

3. Cows:

Cows are important to the people in this area, especially to the bedouin who use their milk to make cheese and yogurt. As Table 4:8 illustrates the number of cows has increased from 2,031 in 1982 to 2,815 in 1987. In 1982, 255 tons of milk was produced, but by 1987, 97 tons of meat was being produced and 348 tons of milk,

Table 4:8 Number and production of animals in the E. C. from 1982-1987 (in ton).

Year and total	Cows		Goats		Sheep		Camels	
	Milk	Meat	Milk	Meat	Milk	Meat	Milk	Meat
1982	255	88	1316	275	31	120	22	8
Total number	2031		60517		6231		150	
1983	265	74	1421	294	34	125	23	9
Total number	2148		64655		6654		160	
1984	284	79	1520	315	36	134	25	10
Total number	2298		69181		7120		171	
1985	304	85	1626	337	39	143	24	11
Total number	2459		74024		7618		183	
1986	325	91	1740	361	42	153	26	12
Total number	2631		79206		8151		197	
1987	348	97	1862	386	45	164	28	13
Total number	2815		84751		8722		211	

Source: MAF. Statistics 1982/83, 1984/85, 1986/87.

representing 14 per cent of the total milk production of the area.

4. Camels:

The number of camels decreased after the discovery of oil in the UAE. In recent years the government has encouraged the keeping of camels in the country and this has led to an increase in the number of camels being kept every year. For example, in 1982, the total number of camels in the area was 150, and by 1987 this figure had increased to 211 camels. Many camels are reared for camel racing which is very popular in the UAE. In 1987 the production of camel milk reached 28 tons, most of it from the bedouin areas. Meat production increased from 8 tons in 1982 to 13 tons in 1987, illustrating the increased demand for camel meat, especially at wedding celebrations.

b. Dairy farms:

To cope with the high demand for dairy production during the post-oil period, the government and private sector have established dairy farms in the area. So far there are 3 dairy farms in the area:

1. al-Reghailat dairy farm:

This is a new farm located between Kalba and Fujairah which is raising cows for milk. The farm has more than 500 cows and productivity is high. It is equipped with the latest technology for feeding and milk production, enabling customers to buy fresh, high quality milk. The farm grows its own feed for the animals and this is of a high quality. It has a small plant producing fresh milk and yogurt for the local market at reasonable prices.

2. Dibba dairy farm:

To supply the local population of the area with milk, the government established another dairy farm at Dibba. This has an area of 800 donum with dairy plant, offices and grass for animal feed. The project cost around 16 million Dh and produces about 2.5 million litres of fresh milk. In 1989 the farm had 800 cows¹⁷ and it is planned that this number will increase in the future to satisfy the increasing local demand for its products.

3. Dhadnah goat and sheep dairy farm:

This farm is the only one in the UAE to that raises goats and sheep primarily for milk production. It covers an area of 350 donum and has about 3,000 local, Omani, and Somalian goats and sheep and produces both milk and meat. The farm uses new techniques in raising animals and also new feeder systems for high meat and milk production.

c. Poultry:

Most people raise some kind of poultry at their houses and farms in the E.C.. Some farms specialise in raising certain poultry, for instance chickens. This is not a recent development in the area as poultry have been raised for a long time, but the introduction of frozen poultry has affected farming in the area. Before the introduction of frozen chickens, people used to buy fresh poultry and eggs direct from the local farms. In 1989 the MAF estimated the number of poultry in the area to be around 60,000.

The Arab Company for poultry production in Fujairah is a new project in the

E.C. which came about as a result of government policy and post-oil schemes to develop the area:

The Arab Company is a giant project which was set up in Fujairah in 1981 for poultry production. The project is the joint venture of the government of Fujairah and the Arab Company for Livestock Development. The project has total capital assets of 80 million Dh¹⁸ and is the major (though not the only) poultry project in the UAE. It has the capacity to rear 4 million broilers and produces 11.5 million eggs per year. Most of its production is sold at local markets and at markets elsewhere in the UAE. Future plans include an expansion of productivity so as to be able to export to other Gulf countries.

Production at the Fujairah poultry plant started at the beginning of 1985 with 1.5 million broilers and a production level of about 6 million eggs. By 1987, 3.6 million broilers and 12 million eggs were being produced¹⁹. This illustrates a high demand from the local market, and the government has future plans to establish other poultry schemes.

In conclusion, the government has succeeded in preserving the traditional domestic livestock and poultry of the area and developing it to meet modern market demands. In terms of government support, free services have been offered to those who raise animals to enable them to increase the number of animals farmed, and veterinary clinics have been established to ensure the well-being of livestock in every area. This has led to an increase in prosperity in animal farming in the E.C.

In 1987, the MAF administered 6 veterinary clinics, at Fujairah, Khor Fakkan, Kalba, Murbih and Dhadnah. In 1986, the number of animals and poultry treated at

these clinics was 16,248 and this number increased as the number of animals and poultry increased, so that by 1987 there were 66,525 cases being treated²⁰.

It is envisaged that the increased number of farm animals kept in the area, both in the government and private sector, will bring long term prosperity to farmers in the region. It will also produce a growing need for animal foodstuffs and produce organic fertiliser. It is, therefore, hoped that many farmers will increase the area under cultivation for animal feed, hoping to meet the demand for these crops from animal farmers, and that the price of organic fertiliser will drop.

6. Marketing the agricultural production in the E.C.

Marketing their produce can be expensive for farmers, and this is a major problem for which so far a solution has not been found in the E.C.. For instance, in the al-Ain region where tomatoes are grown, the mere cost of the cases for the tomatoes is more than the cases of tomatoes are fetching at market, especially in the time of glut. Most farmers complain about this, but solutions are not always forthcoming. However, at al-Ain the problem has been solved by the establishment of an agricultural centre to which farmers send their produce and from which farmers then receive their money. The farmers are thus freed from having to deal with the wholesalers. Ordinarily in the E.C., the farmer has to farm the land and market his own produce, which takes up more time and labour. For example, a farmer from the E.C., after spending over 3 months growing his crop, must then harvest the crop and package it and drive to Dubai or Abu Dhabi (a 2-4 hours journey in many cases), because often the local market cannot absorb the whole E.C. production.

The policy that the farmers in the E.C. have followed is a very simple one leading sometimes to market gluts. For example, in 1982 the demand for tomatoes was high, encouraging farmers to concentrate on tomato-growing in the future years. This caused a market glut and falling prices. The situation was exacerbated by the fact that to change to tomato-growing farmers had borrowed heavily, banking on good returns, but after the harvest many were unable to pay back their debts as interest mounted. Response to market conditions in the E.C. therefore appears to be immediate and short-sighted. The solution may lie in educating the farmers themselves to take government advice and a long term view in decision making, or perhaps in the establishment of co-operatives or an institution such as the British Milk Marketing Board, where farmers who concentrate on certain market products can join forces, eg to fund market research and advice on planning.

a. The recent situation in the marketing of agricultural produce:

As a result of marketing problems like the above, which have been experienced recently by E.C. farmers, many farmers have been begun to sell their harvest direct from the farm whilst it is still being grown. This seems to be working with some crops, but not all. Usually wholesalers tour farms in the vegetable and fruit growing seasons and offer to buy a farmer's production direct from the farms. The wholesalers undertake to collect and package the crops and farmers then are saved the trouble of marketing. Then appear to prefer this, even when it means they lose some money by selling this way compared with the income they would get from marketing their own produce. It is a good idea as wholesalers know their markets. Most wholesalers are

Indian and also have good contacts with the sellers (also mainly at the Dubai and Abu Dhabi markets, who are also Indian).

However, there is a problem with selling to wholesalers in that sometimes the wholesaler agrees to buy a crop before it is sown and he merely pays a small deposit to secure this agreement. The farmer, encouraged by the prospect of firm sales, goes ahead and plants, but, by the time the crop is harvested, the wholesaler has been attracted by cheap prices of imports and reneges on the agreement, leaving the farmer in difficulties. For example in Kalba in 1983 more than two farmers lost their money and their crops when buyers ran away with the crop. Part of the problem is that many farmers cannot read or write and buyers cannot write in Arabic anyway. This means there is usually no written contract between buyer and seller to protect the interests of the farmers. Moreover, as most of the wholesalers and retailers are of the same nationality (Indian), they get together to control prices and the farmer is offered the same low price by all those wishing to buy. Thus the buyers control the market and profit greatly at the expense of the farmers. This situation has always existed due to the absence of government price control.

In the 1983/84 farming season (from January to September), E.C. farmers produced more vegetables than the market could take, causing a sharp drop in vegetable prices. For example, one box of tomatoes weighing 10 Kg was less than one Dh that year and the farmers had no alternative but to get rid of their surplus crops by destroying them, burning them on their farms or stopping watering the crop. This happened to many vegetables including eggplant and okra.

There is no evidence in the area's history that market situations like the above

occurred in the past and it is obvious that the oil has brought new problems to be tackled by both farmers and government, especially the marketing of farm products.

The MAF have tried to alleviate the problem by encouraging farmers to grow other vegetables to supply the market and also to reduce the quantity of imported vegetables. However, the problem is that, at the beginning of the vegetable harvest, the price is high, but then it drops as the harvest comes on. Another reason why prices are low is that there is a shortage of storage facilities for the surplus crop and so the market is glutted, rather than crops being kept back for later use or sale when prices have improved. Also the quantity and quality of local produce eg for tomatoes (in terms of shape and thickness) is not always suitable for exporting. Such problems, of course, can be solved, and the MAF is the most suitable vehicle for encouraging farmers to grow those vegetables which are likely to have a good market value, and improving facilities for farmers so they are able to grow crops which can compete favourably with the imported ones.

On the whole, most of the wholesalers in the E.C. as well as in the UAE are from the Indian Sub-continent, and they control the marketing of agricultural products. Farmers in the E.C. are facing difficulties in marketing their product, and this situation requires government intervention to organise the marketing.

7. New farming techniques introduced into the area

As a result of government support, new technology in farming and the consequent introduction of new crops and farming equipment, farmers are now producing higher yields. Mechanisation has taken over from the old manual farming

methods and the result is that more food is now produced and prices are very competitive, thus benefitting the local market.

a. In some areas farmers used irrigation machinery powered by petrol to irrigate their crops. They needed special equipment to dig deep wells to get the large volume of water required to farm successfully. Now many farms use electric-powered water pumps. In 1987 the total number of electric generators used in the farms of the area was 349. In 1990 more than 90 per cent of the total number of farms in the area had some form of irrigation machinery, either electric-or fuel-powered.

Farmers have also largely adopted the spraying of insecticides on their crops, and the equipment used varies from a small machine capable of being carried on a man's back while he sprays the crops in a small area to large machines using long pipes used for spraying large areas on a sprinkler system. Some sprays are powered by fuel, whilst others are located close to the farms' main water tanks and spray the crops directly from a sprinkler or from pipes laid amongst the plants, for example those used in greenhouses. Some of these sprays are powered by electricity.

b. New techniques in growing crops:

As a result of high water consumption in growing crops and government funding which has provided expertise from all over the world, new techniques have been developed suited to farming in the E.C. as follows:

1. Tree crops:

New types of fruit trees have been introduced in the E.C.. These new fruit

trees, eg Indian and Pakistani mangos, were given a trial in the MAF experimental farms before their introduction. The new varieties have been distributed to farms and have given good results. Knowledge about thinning, pruning, bunch-bending, and cleft grafting of fruit trees has been disseminated by the MAF and has been introduced on the farms, being used for many types of trees, such as the palm, mango and lime. Cleft grafting of mango and citrus has shown excellent results and, after training, farmers have found this method easy to follow.

Cleft grafting has the advantage that one tree is capable of producing two types of fruit from the same species. In cleft grafting a small branch is taken from a different variety of tree (but from the same species) and is secured into a cleft on the main tree where, eventually, it will unite with the parent tree. Henceforward the tree will bear two different varieties of fruit, for example grapefruit and lemon.

New techniques in pollination have been adopted in palm tree cultivation. Besides the normal hand pollination methods used previously, equipment to facilitate pollination, eg pollination sprays, has been introduced and also farmers can now buy products to enhance fertilisation of their trees from MAF stores. The new techniques save the farmers (a) labour, the cost and scarcity of which (workers having to be recruited from places such as Pakistan) can be a problem; (b) fertilisers, the amount used is reduced; (c) time, the new techniques are both labour and time-saving.

2. Ground crops:

Various new ground crops have been introduced to the area, after being tested in the experimental farms. For example, several kinds of strawberries and figs brought from Italy and Turkey respectively have been introduced and give a good return.

Some vegetables are now grown in greenhouses and new technology has provided efficient methods of watering and fertilising.

Research has suggested totally new sorts of farming, for instance, fish farming. Farmers used to keep their water tanks full at all times so that they could cope with emergencies such as engines breaking down. A new study recommended that they use these water tanks for fish-farming.

On the whole, new farming techniques applied in the area have given excellent results in developing E.C. farm products. The new techniques eg cleft grafting and using the pollination sprays, have improved the quality of the fruit trees in the area, and have increased production.

8. Growing crops in covered houses

One of the innovations introduced in agriculture in the E.C. is that of covered houses, also called greenhouse cultivation. Greenhouses were introduced in the 1970s having been tested in the Diqdaqqa experimental station and at Kalba (where the station was called *al-Khabeer* locally, meaning 'the expert'). Much of the new technology now used in the area was first tested in these experimental farms.

The greenhouse method of growing is recommended as,

"you should experience no difficulty in raising hardy and half-hardy plants as early in the season as is desirable"²¹.

Greenhouses are new to the E.C. and provide a method of growing crops either in season or out of season. Farmers can now grow winter crops in summer by using cooled greenhouses. In summer time, temperatures reach 45°C in the E.C. and

vegetables like tomatoes cannot flower at such a high temperature. But the greenhouses can provide a temperature controlled environment where such crops can flourish.

a. Types of greenhouses used in the E.C.:

There are four main types of greenhouses used in the E.C.:

1. The Ordinary Greenhouse:

Most greenhouses in the E.C. are of this type, it is 36 metres long by 6 metres wide and is made of steel bars covered by oilskin. Farmers mainly use this type because (a) it is inexpensive, and easy to construct and manage; (b) materials used in its construction are available locally so there are no transport costs involved; (c) it is easy to move such greenhouses from one site to another without damage.

Farmers are able to control irrigation and fertilisation in these greenhouses. A typical crop grown in these ordinary greenhouses is chili.

After the land has been prepared and levelled for a new greenhouse, irrigation pipes are distributed throughout. Usually the drip irrigation system is used but also the traditional method of pipelines can be used.

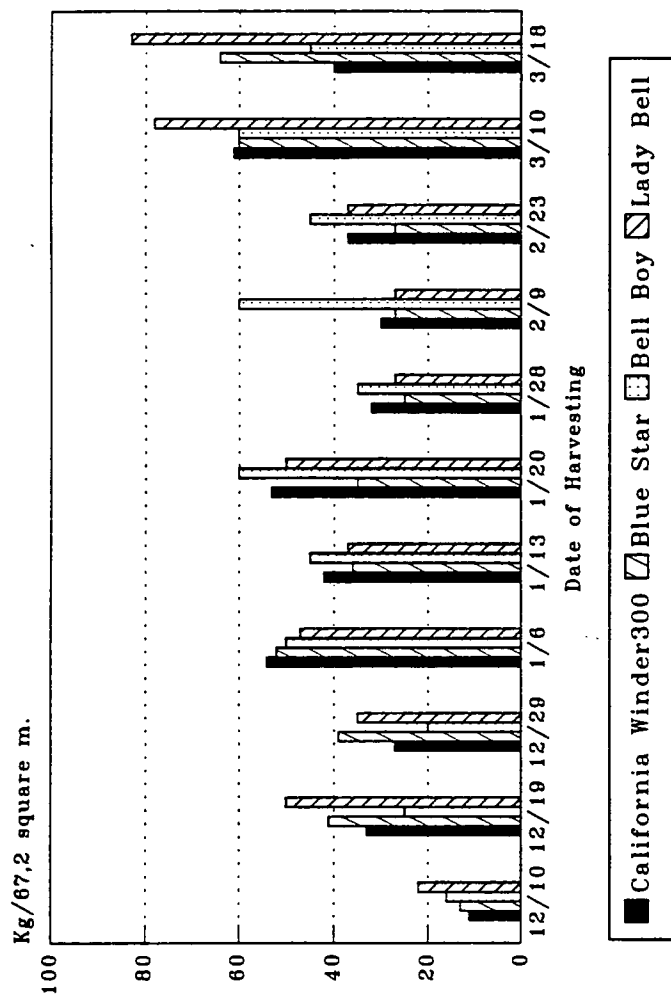
Seedlings such as chili can be transplanted and cultivated in the greenhouses or grown from seed in them.

About 70 days after plantation, the chili crops can be harvested (Figure 4:8). The average yield is about 12.2 tons per donum²².

2. Temperature-controlled greenhouses:

Temperature control enables the greenhouses to be kept cool. One type of

Figure 4:8 Graph of chili yield according to type and reaping period, grown in greenhouses.



MAF, Intaj al-Khadhrwat al-Mahmiyah, 1982
"Production of Covered Vegetables" p.29.

cooling exists in the Dibba unity and other types have been tested in other areas of the UAE. The technique adopted in these greenhouses is relatively costly, especially for a normal farmer. The ordinary cooled greenhouse needs 3 or 4 large fans fixed to one side of the greenhouse. At the other side of the greenhouse, water soaked materials are fixed. When the farmer activates the fans, the air inside the greenhouse is stirred and the moisture is drawn from the material to help reduce the temperature inside the greenhouse.

Another type of temperature controlled greenhouse, the air-conditioned, is imported from Holland or France. These greenhouses are very expensive and usually used by large agricultural companies for growing expensive crops. Their air-conditioning units need expert engineers to maintain them. One such air-conditioned greenhouse is found in Dibba. It covers an area of one donum. In 1988 it was planted with cucumbers, tomatoes and chili.

The advantage of the cooled greenhouse is that, in the very hot summer when crops like tomatoes and cucumber need relatively low temperatures to flourish, they provide the right temperature. Without them, the yield would be much smaller. The temperature in the greenhouses averages 15°C, and humidity is maintained at 60-80%. Farming in this type of greenhouse usually starts in April and lasts through to November. The usual crops are cucumbers, tomatoes, chili, eggplants, and other vegetables.

3. Shade nets:

These are usually used at the end of September to provide a nursery under cover for seedlings. A row of frames is set up over the plot where the farmer wants

to plant his crop. The usual covering for the frames is black plastic. Once the seedlings have become established under cover, the farmer can transplant them to other areas of the farm. This method of growing is used with tomatoes, chili and eggplant seedlings. Once established, the plants are either sold to other farmers or transplanted elsewhere on the farm.

A major advantage of this method of growing is that the farmer can remove all or part of the cover to provide sunlight for the plant as required and also large areas can be covered relatively cheaply as compared with the cost of a cooled greenhouse. Black plastic is usually used as it reduces sunlight by about 50 per cent and can withstand ultraviolet light²³.

4. Low covered tunnels:

These are made as follows. Galvanized hoops of the same height as regular plants are set in the ground and covered with plastic sheeting. The seeds are planted underneath in the shade provided. These covered (sunken tunnels) tunnels are used in the E.C. to provide plants, especially tomatoes, with shade in summer time and to protect them from strong winds. These tunnels can be sited anywhere on the farm and are easy and practicable to use. One man can fix them over the lines of tomatoes or eggplants. The materials used in these tunnels are same as those used in the shade nets.

b. Siting and type of greenhouses:

The site upon which the greenhouses are built is very important. They should be sited in an area where windbreaks are available, or failing that, sites should be

planted to provide wind-breaks. It is also important to ascertain the prevailing wind direction so that the greenhouse door can be positioned towards the wind to give the greenhouse good ventilation.

All the above criteria can be achieved by the farmers with advice from the engineers in the unity. Materials for constructing ordinary (those without temperature control) greenhouses are available in the local market.

When a farmer decides to install a greenhouse, he applies to the MAF whose engineers visit his farm and choose the right location for the greenhouse. The MAF team also provides maintenance and modification of materials to be used in construction. After the site has been chosen, MAF engineers will teach the farmer how to manage the greenhouse and demonstrate the best methods of irrigation and fertilising of crops.

c. Advantage of greenhouse horticulture:

Excellent results have followed the introduction of greenhouses to the area by the government as a result of the oil wealth. The donum productivity has increased by over 100 per cent. For example 5 tons per donum of watermelons could be produced if grown in a greenhouse, compared with 2.2 tons grown in an open field. In fact, greenhouse horticulture is one of the major solutions to the water problems of agriculture in the area. Farming in the E.C. requires a large consumption of water and the MAF has tried to find ways of dealing with this heavy demand. Growing crops in greenhouses saves a considerable amount of water, as well as labour. A saving of up to 50 per cent of the amount of water used for irrigating the same crops grown by

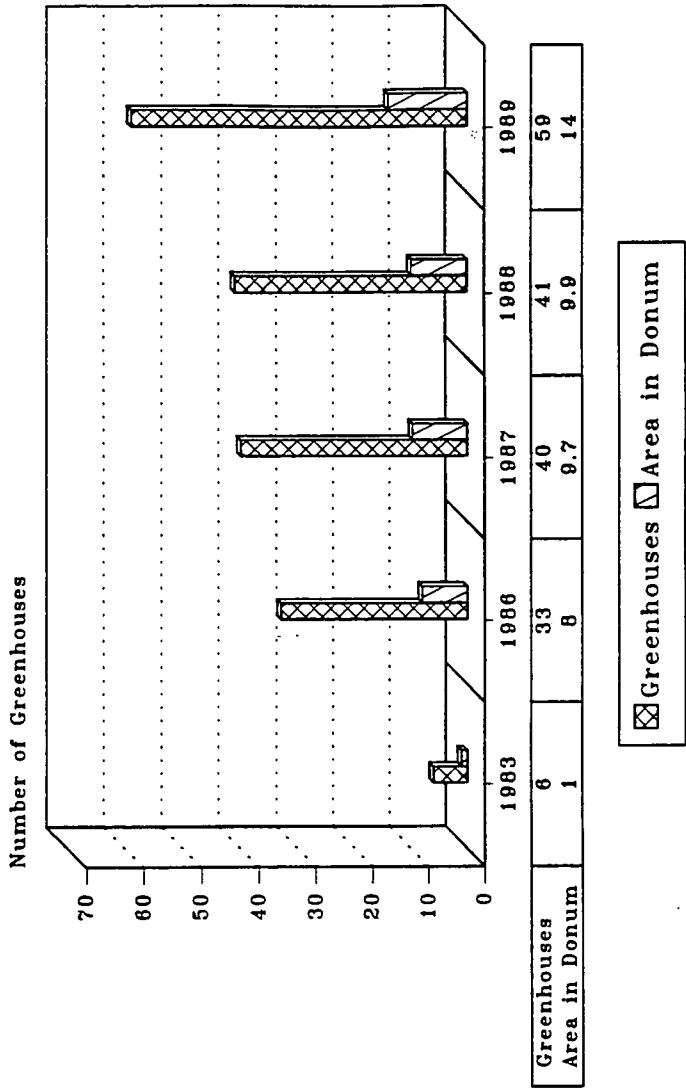
normal farming methods is made when the crops are grown under covered houses. The greenhouse can also supply local markets with out-of-season crops. This saves having to import such crops, with a consequent saving of both government and consumers' expenditure.

All these advantages following upon the introduction of greenhouse horticulture have spurred the government to more testing in growing crops under covered houses. The government encourages farmers to install greenhouses by helping and advising them on greenhouse horticulture, by supplying the materials for greenhouses at modest prices, and by helping install them. The MAF promotes greenhouse horticulture through the media, to the extent of supplying direction and instructions to be followed for managing greenhouses on farms²⁴.

d. Distribution of greenhouse horticulture in the area:

The greenhouse was introduced in Kalba in an MAF project at the beginning of the 1980s. The project started with 2 greenhouses, approximately 230 square m each, planted with chili and tomatoes. Following the success of this trial, the MAF encouraged farmers to introduce greenhouses to their farms. In 1983 there were 6 farms with greenhouses in the area and by 1986 this number had risen to 33, with an area of 8 donum. In May 1989 the number of farms with greenhouses in the area reached 59, covering an area of 14 donum (Figure 4:9). This represents 3.2 per cent of the total number of greenhouses in the UAE, and whilst this is a small percentage, it is likely it will increase in the near future, as Figure 4:9 shows that the number of greenhouses in the E.C. is increasing every year.

Figure 4:9 Number and area of greenhouses in the East Coast 1983, 1986-1989



MAP.Statistics,1983,1986/87,1988,1989.

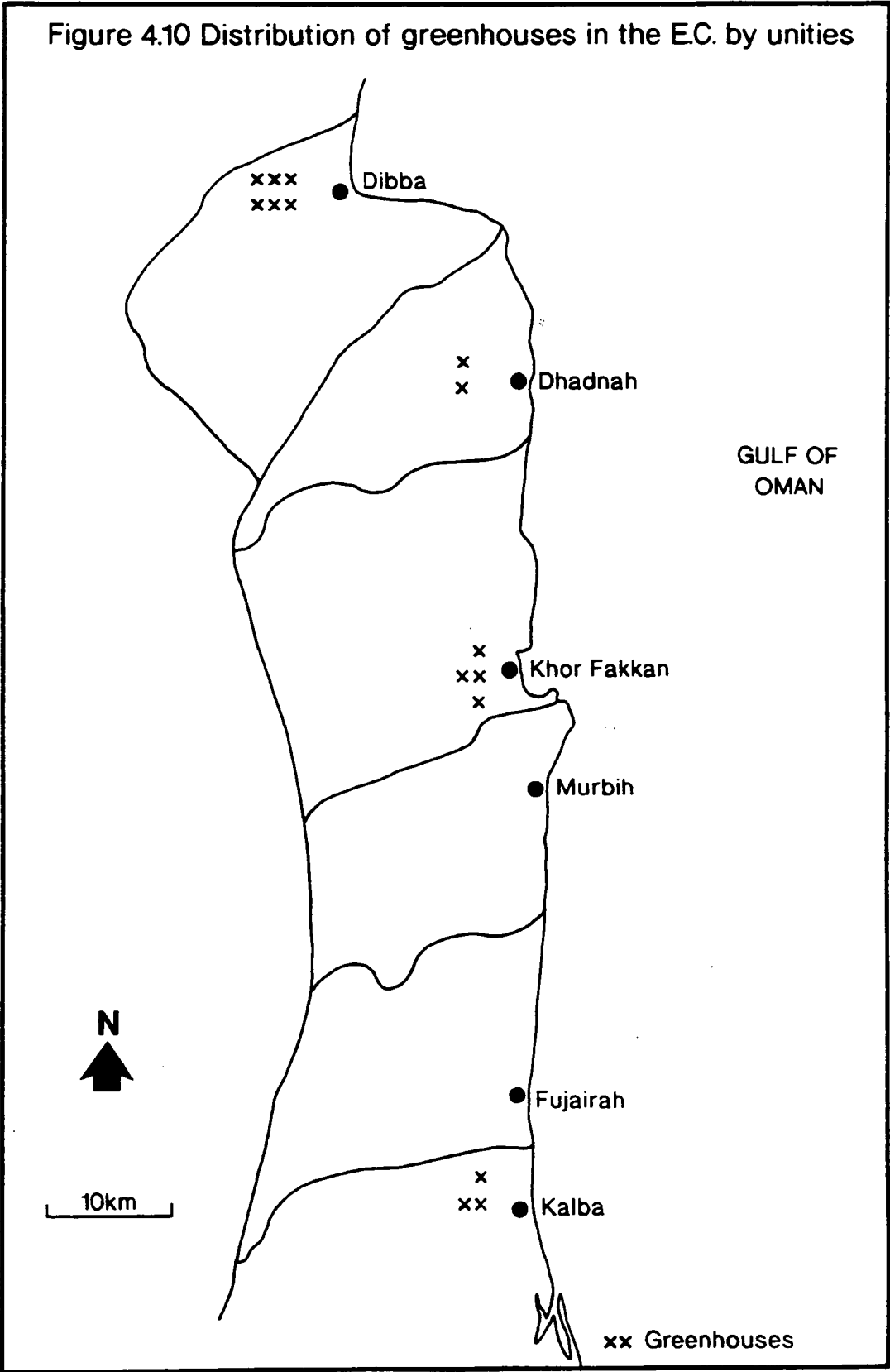
The increase in growing crops in greenhouses demonstrates government support for greenhouse horticulture and also the benefits that accrue to the farmers adopting methods of growing crops under covered houses. From the 1988 MAF data, it can be seen that 48 per cent of the total number of greenhouses in the E.C. are concentrated in Dibba (Figure 4:10). Fifteen of these greenhouses are in private ownership and 5 are owned by partnership. There are 10 greenhouses in Kalba, 8 of which are private, while the remainder belong to a local government project. In Khor Fakkan there are 10 privately owned greenhouses. Only one greenhouse is found in Dhadnah.

e. Government and farmers' attitudes to greenhouse horticulture:

The government is very aware of the economic value of greenhouse horticulture in the area. The cost of installing greenhouses, however, is high and for small farmers this may be prohibitive but, once the farmer has built his greenhouses, they have a long and productive life, so the capital expenditure on installation is recouped in high yields and cost reductions, with a saving of water, labour and fertiliser. Thus, whilst installation of greenhouses is costly, it is a very worthwhile long term investment for the small farmer.

The above factors mean that the government encourages farmers to install greenhouses and, appreciating the prohibitive cost to small farmers of installation, contributes as much as it can (a) by sending engineers to advise and help construct greenhouses on farms, and (b) by training farmers how to manage their greenhouses. The above services are provided at half price or free of charge.

From the point of view of the farmer, the major advantage of greenhouse



horticulture is that he can achieve higher profits, as the greenhouses enable him to grow vegetables out of season which provide a very good return and thus provides him with a good income. From the point of view of the government, the amount of water required for greenhouse horticulture is much less than that required by the traditional agricultural methods. This is a major factor in the government's promotion of greenhouse horticulture.

However, not all farmers appreciate the benefits of innovations such as greenhouse horticulture. There are also many farmers in the E.C. who distrust new technology and conservatism prevails amongst many farmers and inhibits innovation. A comment from one old farmer in Kalba illustrates this:

"Farming in greenhouses is a complex matter ... we have to spend a lot of money in farming a small part of our farms... and waiting for the MAF to complete the building of the greenhouse... we used to farm this land without the benefit of greenhouses and we had no problems."²⁵

In fact many farmers will not accept the arguments for introducing this new method of farming, and do not appreciate the benefits of the greenhouses. When it is pointed out to them that greenhouse horticulture saves water, their response is, why save water, who is it being saved for? As there are no meters monitoring their water consumption, it does not matter to such farmers how much water their crops consume, and unless metering is introduced, the government's argument for greenhouses as the solution to excessive consumption of water will continue to fall on stony ground.

Thus, it would appear that whilst greenhouse horticulture is a good method of farming, well suited to the area, the idea is going to take time to become widespread unless more farmers take it seriously and the government finds more persuasive ways

to promote this new farming technique.

9. Government experimental and model farms in the E.C.

In an attempt to avoid having to import foodstuffs, which affects the balance of payments, the government of the UAE encourages its farmers to produce more fruit and vegetables in order to be able to feed its people from its own land. Their aim is more food for less expense. In pursuit of this aim, the MAF have established numerous experimental stations all over the UAE. In some areas there are several of these as well as model farms.

a. The aim of these farms:

The MAF established these experimental and model farms for the following reasons:

1. To enable soil studies to be carried out on each type of farm land present in the country and to give an evaluation of each type of soil to enable farmers and agricultural engineers to choose the most suitable crops for the particular soil in their region
2. To assess which irrigation system best suits which crop and which saves water and labour; to assess the side effects on the soil and plants of using the various irrigation systems.
3. To produce a farming calendar showing the farmer in each area when best to sow and harvest each crop. The MAF have also imported fruit trees from abroad to find out which the fruit trees grow best in the E.C., for example at the model farm at

Dibba, fig, citrus, mango and other fruit trees are grown.

4. To test new insecticides for their effectiveness; and the optimum and quality and quantity required to produce the best crops and to prevent damage to plants and soil by overuse of chemicals.

5. To experiment with greenhouse agriculture. Greenhouses are used at the experimental and model farms to try out different techniques in planting, watering and fertilising at each farm found in the E.C. to assess optimum techniques to be adopted on ordinary farms practising greenhouse horticulture.

6. To try out new techniques such as agri-paper farming and tissue culture. From these trials the model farms can assess the best methods of germination and cultivation of seedlings. Some farms are also experimenting with cleft grafting, concentrating especially on grafting local and imported trees to each other to find the best fruit trees for particular areas.

7. To provide the farms of the E.C. with various kinds of fruit trees, especially those not indigenous to the area but which suit its climate and soil eg grapefruit. Nurseries grow many varieties for distribution to farmers for their own farms and also for the ordinary inhabitant with a garden in which he can grow trees. This is part of a new policy to increase the overall number of trees in the E.C..

8. To provide a suitable environment for agricultural research. A lot of research is being undertaken at the farms on crop diseases and insecticides.

b. Existing experimental and model farms in the E.C.:

The MAF have two experimental farms, one at Kalba and one at Fujairah, and

a model farm at Dibba, as well as several demonstration farms.

The difference between these three types of government-sponsored farms is as follows:

At model farms, the government grows special fruit trees trying certain techniques which they hope, later, will prove suitable for use on ordinary farms in the E.C.. The experimental farms pioneer new techniques and develop new seeds, whilst at the demonstration farms, farmers could visit these farms to see at first hand modern methods which may be suitable for their farms and get advice and guidance.

1. Kalba experimental farm:

The experimental farm, called *al-Khabeer* by the local people, is located 2 km outside the town of Kalba. It covers an area of 36 donum and was built to be used for experiments directed by the Diqdaqqa agricultural experimental station. Because the area is an important agriculture region, the farm serves both as a demonstration farm for the farmers of the area to learn good methods of farming and also as the administration centre for the MAF in the area.

In 1980 greenhouses were introduced at the farm and planted with cucumbers and tomatoes and gave a very good yield. This was the start of greenhouse agriculture in the E.C.

The experimental farm is divided into five sections;

- (a) offices
- (b) greenhouses
- (c) irrigation equipment
- (d) fruit trees of varies kinds. About 40 per cent of the land is planted with oranges,

31 per cent with mangoes and the rest with a mixture of fruit trees (Figure 4:11). The figure illustrates the concentration of orange trees, because the MAF tries to grow various kinds of orange trees to find the ones suitable for this area.

(e) experimental area for vegetables.

Nowadays the experimental farm is under direct MAF administration, with 12 workers managing the farm under the supervision of MAF engineers. There are two specialised nurseries at the farm, one a covered plot of land, and the second an open-air nursery, covering an area of one donum each. These nurseries are used to grow limes and mango seedlings for distribution to farmers. As well as the above, the farm is also used for experimenting to improve the strain of vegetables.

2. Fujairah experimental farm:

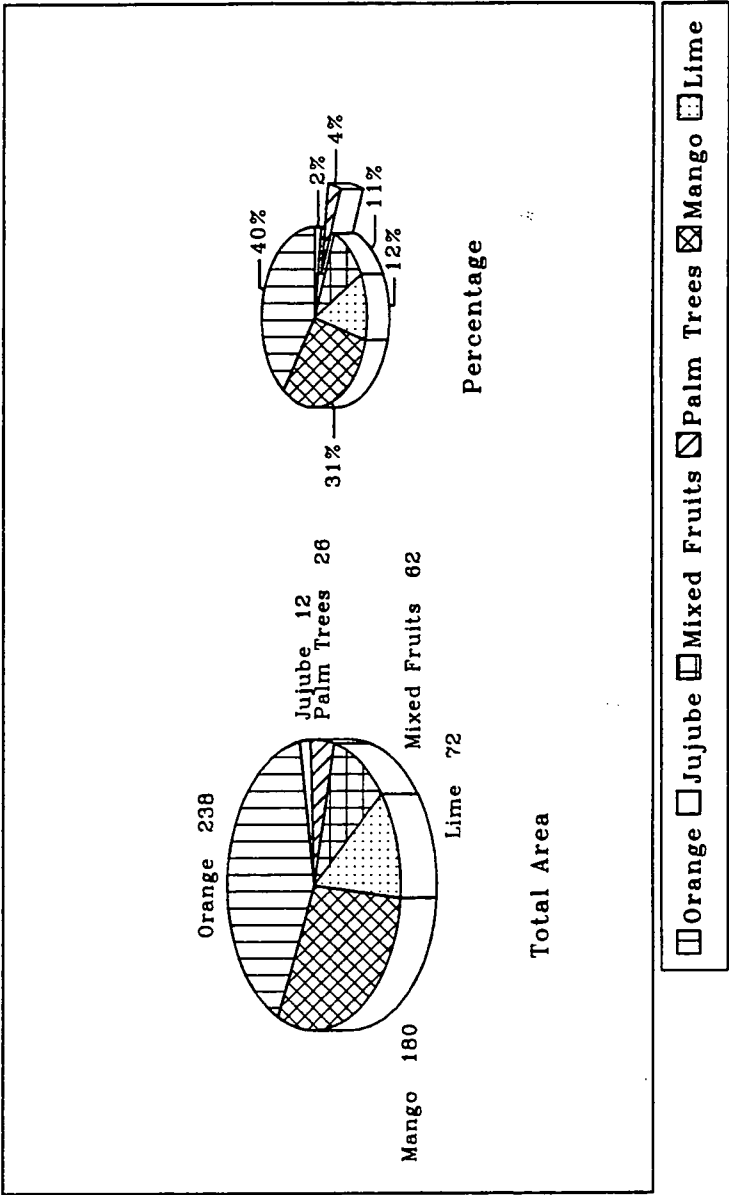
After the success of the Kalba farm, the MAF decided to establish another experimental farm in the Fujairah area to serve farmers and to disseminate information about the best kinds of fruit and vegetables to be grown on local farms.

Like the Kalba farm, the Fujairah experimental farm is divided into sections, as follows:

- (a) general farm facilities
- (b) fruit trees
- (c) greenhouses
- (d) vegetable plots

The vegetable section was used to test several kinds of vegetables and compare them with those grown at the Dibba model farm. This section covered an area of 4 donum and in 1989 it was planted with tomatoes, cucumbers, lettuces and

Figure 4:11 Area planted by fruit trees at Kalba Trial Farm in 1989.



MAF, East Region Administration, Fujairah

cauliflowers. Each crop was planted in a section of the donum under controlled conditions and planting was undertaken at different times, using different techniques with every crop, to ascertain the effect upon the plants of the fertilisers and chemicals used as well as soil types and seasonal variations. The aim of the test growing was to gain information about crops so as to be able to advise farmers in the area of the best methods and seasons for growing their crops.

Fruit trees are also grown at the Fujairah experimental farm and over the past 15 years 549 citrus trees have been planted and the area covered is approximately 19.7 donum (19,764 square metres)²⁶. There are 65 2-year old citrus trees in an area of 2.3 donum, 90 mango trees of approximately 1-2 years age cover an area of 4.4 donum, and 77 imported mango trees of 4-6 years age, covering 3.8 donum and 22 trees which are over 15 years old.

The farm also has 4 greenhouses used in experiments on vegetables, and there are two nurseries for tree seedlings, comprising a covered area of 12 donum and an open area of 2 donum, again a similar situation to that at Kalba.

The work force comprises 32 workers running the farm, with MAF engineers visiting the farm daily to observe the growing crops, follow the development of tree diseases and the effect of spraying chemicals upon vegetables and fruit trees. The experimental farm provides good fruit seedlings for the farms of Fujairah district.

3. Dibba Experimental Farm:

The Dibba fruit project is based at two farms, an experimental farm and a model fruit farm, both located 1 km from Dibba town centre.

The experimental fruit farm:

This was built in 1978 by the Food and Agriculture Organization (FAO) and was later taken over by the MAF. The experimental fruit farm at Dibba was planted with 1,250 fruit trees including citrus, guava, limes, grapes, coconut and various tropical fruit trees. Details of these are as follows:

- (a) There are 43 different kinds of citrus trees imported from all over the world being tested at the farm, comprising around 503 trees in all, covering an area of 21 donum. Most of the orange trees at the farm are imported from Jordan, the grapefruit from California, and other citrus trees are imported from India, Pakistan and Australia.
- (b) There are 224 mango trees imported from India and Pakistan covering an area of 10 donum at the farm. They give a very good yield and because farmers who have grown mango trees from the seedlings at this farm have been so impressed with the result that they have recommended them to neighbouring farmers. As a result, most farmers of the E.C. use mango seedlings from this farm.
- (c) Grapes from different countries are also undergoing trial at the experimental fruit farm. Engineers have tested 26 different kinds of grapes on the farm and an area of 2 donum is used for growing and testing grapes. Lately the MAF have removed half the vines. This is because some imported vines have given poor yield in the E.C., as compared with those of their native lands, and the different growing conditions in the E.C. are the reason for the a poor crop. Subsequently, grapes have been imported from Cyprus, Yemen and the al-Homraniyah experimental station in Ras al-Khaimah.
- (d) Figs are also grown on the farm and give good results. The farm has 80 fig trees in a 3 donum area. Some of these trees are giving good yields, others not so good. At

present the MAF are studying what kind of fig trees are best for the E.C. so as to be able to advise and distribute such trees to the E.C. farmers in the future.

(e) Pomegranates and guava have also been grown with good yield achieved. There are 32 guava trees, mostly imported from India, and 48 pomegranate trees brought from the al-Homraniyah experimental station. The trees are growing under various condition to assess the benefits of different farming techniques, watering and fertiliser.

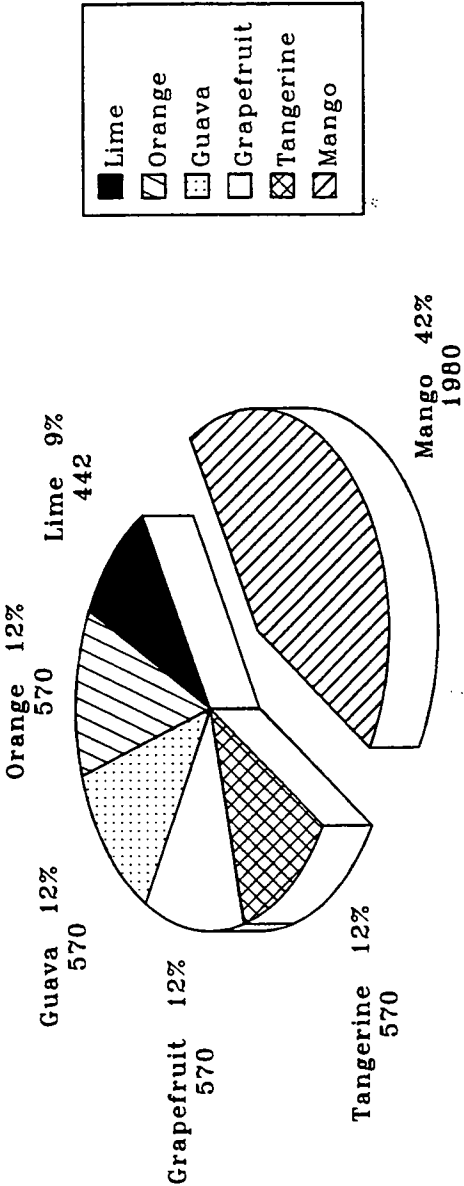
(f) Other fruit trees such as papaya are tested at the farm. An area of 8 donum is devoted to this, giving good yields.

The Dibba Model Fruit Farm:

To the west of the original experimental farm a new model farm has been located. The MAF have utilised some of the land of the old experimental farm to establish a typical farm to be used as a model farm specialising in growing fruit. This covers an area of 600 donum and planting was started in 1985. The farm was set out in a particular way, divided into 4 sectors, each covering an area of 150 donum and each sector divided again into sections of 25 donum. Each section is planted, serviced and managed separately to assess given conditions. There are 11 wells in use, each with its own electric pump and all connected to the main irrigation network which uses a bubbler irrigation system.

In 1987 the farm had 4,702 fruit trees covering an area of 275 donum, which represented 46 per cent of the total area of the farm (Figure 4:12). As shown in Figure 4:12, mango trees have a big share in the farm with 42 per cent of the total number of trees grown.

Figure 4:12 Total area planted with fruit trees at Dibba Model Farm, 1987.



Number and percentage of fruit trees

MAF-East Region Administration, Dibba Model Farm, Annual Report,1987, Fujairah.

The model farm and experimental farm are under one administration and together contain 10 nurseries, 7 of which are covered. In these nurseries new seedlings are grown for transplanting in the model farm and it is envisaged that soon the farm will be able to supply all E.C. farms with improved and tested fruit trees. There is also a temperature controlled greenhouse equipped with the latest in greenhouse technology. The greenhouse must be monitored 24 hours a day, but at the moment there is a problem in the running of this greenhouse due to a lack of trained engineers and workers.

The MAF have hired 24 workers to run the two farms but the farm administration complain that more are required to manage the model farm efficiently.

In conclusion the experimental farms in the E.C. play a vital role in the development of agriculture in the area as an advantage of the oil exploration. Most E.C. farmers have benefitted from the experimental farms. In general these farms have concentrated on growing the two fruit trees which are most important in the area, the mango and citrus, but they are also introducing new types of fruit trees to the area which also give a high yield, and many farmers have planted these trees with good results.

The farms have also been instrumental in introducing new types of vegetable seeds and new methods of growing vegetables to the area. It looks as if these farms have a bright future as long as the MAF is able to increase its support for them.

10. Government support

Since the establishment of the MAF in 1972, agriculture has come to depend

more and more upon the MAF. The Ministry's own data shows that the majority of farmers depend a lot upon the MAF, mainly for loans to purchase irrigation machinery, fences, and the facilities provided by the MAF. The MAF provides a lot of money for agriculture in UAE., and especially in the E.C.. The MAF's budget is allocated annually by federal government and is around 50 million USD²⁷ (around 184 million Dh) at the moment, and with this, it has achieved a great deal in promoting modern agricultural methods in the area.

a. Aspects of government support to farmers:

The government, represented by the MAF, is providing farmers all over the E.C. with facilities and services. The following are some of the services available to farmers at either half price or free of charge:

1. The MAF hires engineers from all over the world to bring their experience to bear upon ways of achieving better production in the area.
2. The MAF sends engineers to farms to investigate and monitor the crops, examine them for vegetable diseases, identify the cause and advise on the cure. Engineers also demonstrate the best method of spraying trees and give farmers advice, eg on insecticides. They also train farmers in the various techniques now available to them which will give them a better yield from their land. For example, farmers used to plant tomato seedlings on both sides of the *Khaboob* (embanked strip of land approx 2m x 10m). Now most farmers follow MAF advice to grow on only one side for better results. MAF engineers also assess the best use for farm land in different seasons, for example they advise farmers to grow onions instead of tomatoes in the

hot season.

In 1987 the total number of visits by MAF engineers to farms in the E.C. reached 3,526, with 2,996 farms benefitting from these visits.

3. Ploughing services:

The MAF provides a free ploughing service to farmers in the E.C.. In 1977 there were 9 MAF tractors serving 2,525 farms. In 1987 there were 25 MAF tractors but the number of farms had increased to 5,051. These tractors serve the farms on a rota system. Each farmer registers his farm for ploughing and waits his turn for the tractors. Some farmers complain about the way the system is operated as there are times when they need the service urgently and cannot get it at the times they require. This can cause farmers considerable inconvenience. In one year²⁸ MAF tractors worked 7,631 hours serving an area of 19,838 donum. This can be divided into 16,803 donum for ploughing, 2,354 for planning, 616 for levelling and 66 donum for other purposes.

4. Irrigation machinery and farm fencing:

Government support for fencing varies from year to year depending on the availability of fencing in store with the MAF (Table 4:9). The table shows that the highest number of fencing folds distributed in the area by the MAF was 5,555 in 1983, compared with 137 in 1982. The difference is due to the amount of money allocated for fencing by the MAF in different years. Recently the allocation for fencing has been reduced by the MAF as many of the newly established farms are for people who are not engaged as full-time farmers but use their farms for holiday purposes, and thus are considered to be ineligible for MAF fencing as they can well

Table 4:9 Number of machines and fencing folds distributed in the East Region 1977, 1982-1987.

Years	Engines	value in Dirham	Fencing/ fold	Value in Dirham
1977	240	1,652,798	2620	108,730
1982	77	356,773	137	14,248
1983	92	1,533,452	5555	794,365
1984	12	193,510	2927	418,561
1985	23	220,542	1069	152,867
1986	140	609,950	00	00
1987	1	22,200	00	00

Source: MAF. Statistics 1977./1982-83./1986-87/.

afford to buy their own.

The MAF provides farmers with new irrigation equipment at half the market value to encourage them to produce more crops at less cost. Thus the government supports the farmers indirectly as well as by giving them cash support. The MAF also provides a free maintenance service for irrigation machinery. In 1986 the MAF distributed irrigation machinery to 140 farmers and this alone cost the Ministry 609,950 Dh (Table 4:9). In same year they installed 50 engines, free of charge, and maintained a further 1,525 in the area²⁹. Maintenance of machinery used to be difficult for farmers in the E.C., especially in the vegetable farming season. An average cost for maintaining one engine is 700-900 Dh, quite a large sum for farmers to pay, especially for those farmers who needed the service because their farms still have old irrigation machinery. In farming in the E.C. most crops need irrigating every one or two days, especially in the hot, desert areas. Sometimes the MAF engineer is on holiday when he is needed to deal with breakdowns, causing problems to the farmers when their irrigation machinery breaks down, and forcing them to pay for repairs from their own pocket.

5. Improvement of seeds:

The MAF spends part of its budget on seeds and on improvements to the quality of seeds grown in the area. It also tests a variety of young fruit trees imported from overseas with a view to growing them in the area and has a model fruit farm in Dibba. In 1987 the MAF distributed 251 kg of seeds among farmers, the highest distribution being in November (180 Kg). However, this is small in comparison to earlier years, for example in 1982 the MAF distributed 1,285 kg of seeds (Table 4:10).

Table 4:10 Quantity of agriculture requirements from improved seeds and nurseries
in the East Region 1977,1982-1988.

Years	Nurseries			Seeds/ Kg
	Fruit	Forest Orna.	Vegetables	
1977	3617	6905	00	11390
1982	10845	12091	00	1285
1983	12164	7023	4348	1072
1984	9856	5433	31537	305
1985	9914	4514	7914	627
1986	12546	7939	00	195
1987	4732	5874	115	251
1988	3344	5243	00	24716

Source: MAF. Statistics. 1977./1982-83/,1984-85/,1986-87/,1988.

This change is due to farmers preferring to buy seeds on the open market, even though they pay more for them and to farmers who have chosen to grow crop whose seeds are not available from the MAF. In 1977 the MAF distributed 11,390 kg of improved seeds, of which 415 kg were tomato seeds. In 1988 the MAF distributed 24,716 improved seeds, at a price around half that of the market price. This encouraged the farmers to buy from the MAF. Of this distribution, 66 per cent were tomato and melon seeds³⁰.

The MAF supplies farmers with a variety of saplings, tried and tested at the experimental station in the E.C. In 1986 the MAF distributed 20,485 seedlings to E.C. farmers, 12,546 of which were fruit trees and 7,939 ornamental forest trees. The largest number went to the South Region, with the eastern region coming second.

6. Fertilisers and insecticides:

The MAF sells fertiliser to farmers at half price, so they pay on average 22 Dh for a pack of organic fertiliser weighting 25 kg, while the same quantity is sold on the open market for about 40 Dh. In 1986 the MAF distributed 10,379 bags of chemical fertiliser weighing 50 kg each in the E.C. (Table 4:11), accounting for 6.4 per cent of the total amount of fertilisers distributed by the MAF in all the agricultural areas of the UAE in that year. The E.C., with a 23 per cent distribution of MAF fertiliser in 1977³¹, was the single largest consumer of MAF subsidised fertiliser amongst the regions of the UAE. As Table 4:11 shows, the biggest quantity of insecticides which have been distributed in the area from 1977 to 1988 occurred in 1982. Also a large quantity of chemical fertilisers was distributed between 1982 and 1986.

The MAF imports insecticides, ensuring that only those with the least adverse

*Table 4:11 Quantity of fertilisers and insecticides distributed in
in the East Region from 1976-1988.*

Years	Fertilisers / Bag		Insecticides		Per
	Chemical	Organic	Litre	Kilogramme	
1976	6910	N.A.	8239	1525	
1977	17500	N.A.	8250	3450	
1978	25045	N.A.	9525	5201	
1979	00	N.A.	8171	6432	
1980	00	N.A.	00	00	
1981	00	N.A.	5601	2412	
1982	27463	8929	11840	7404	
1983	75329	320	6586	3849	
1984	16161	00	994	245	
1985	28794	10801	9435	6422	
1986	10379	00	3501	4674	
1987	8362	00	5964	2814	
1988	9938	2707	10328	5125	

Source: MAF. Statistics. 1977./1982-83/1984-85/1986-97/1988.

effect on the environment are chosen. They distribute these insecticides on the same basis as the other subsidised products they make available to farmers. In some cases the MAF use small aircraft to spray insecticides over a whole area, for example, in the mango and date season they protect the crop of all the farms from disease by spraying from the air. Thus because the MAF takes overall responsibility for farming in the E.C., the problem of disease here is not treated as a problem of individual farms but on a general basis which this ensures a good yield for the entire country. In 1986 the area treated with chemicals by MAF teams was 4,641 donum, representing 15 per cent of the total area under crop production in the region. In the same year, 5 MAF teams provided 694 farms with facilities for dealing with pest control.

b. Other government support:

Agriculture receives financial support from both local and central government. Local government allocates land for farming purposes (the distribution of this farm land, has been previously discussed). This distribution of farm land encourages the growing of crops for the local market.

Central Government financial support to farmers is mainly channelled through the MAF. It is provided in the following ways:

1. The government have already increased the amount of water available in the area, for example the MAF built dams (eg Wadi Ham dam in Fujairah) to collect and store rainwater, and have plans to continue improving water supplies.
2. The MAF promotes the use of new methods of irrigation by farmers by providing equipment to improve the water supply and eliminate scarcity.

3. Experimental stations have been established by the government in the area to grow and demonstrate the best quality fruit trees and vegetables.
4. Growing crops in greenhouses has been promoted as it reduces the amount of water and fertiliser needed and farmers are given support to establish greenhouses.
5. The MAF runs agricultural training courses where farmers can learn the best and cheapest methods of crop growing.
6. The Federal government compensates farmers for losses due to natural disasters such as flooding of wadis and storm damage. Compensation is estimated by the government and this enables the farmer to be able to buy his seed's crop, replacement machinery, etc so that, whatever disaster he has suffered, he has enough resources to enable him to continue farming in the next season.
7. The government recruits international experts in agriculture to lecture to farmers and to examine farming problems in the area. It also arranges international conferences on farming, eg in February 1989³² an international conference was held in Khor Fakkan on the development of agriculture.

All of the above is in addition to the loans advanced to farmers from the MAF to enable them to develop their farms.

In conclusion, the above demonstrates that government subsidies to the farmers in the area have played a major role in developing this sector and led to an increase in the quantity and quality of farm produce in the E.C..

B. Fishing in the E.C.

Fishing has been practised in the E.C. for a long time and, before oil was discovered, it used to be one of the major activities of the inhabitants in the area. After the oil industry developed in the UAE, fishing methods changed. The traditional fishing boats, were replaced by motorised boats; the government supported the fishing industry to protect the livelihood of the local fisherman. This support encouraged those who had left the industry and joined the government sector to retire, either as full or part-time fishermen.

The government has also undertaken research projects on the fishing industry. In the 1987 the catch was estimated at approximately 85,800 tons³³ and it appears that the government is quite satisfied with the industry being at this size and there are no plans for expansion.

Various studies and surveys have been carried out by the government of the UAE and others bodies, for example by the FAO to evaluate the quality and quantity of fishing in the UAE as well as the E.C. and the area within the Gulf in general. The study of White and Parawani (1970) gives useful estimates and predictions about fishing in the area. The MAF survey started in 1976 also gives detailed information on fishing for the whole of the UAE.

In 1978 the UAE government signed an agreement with the Japanese government whereby Japan would send experts to survey the fishing area. This agreement resulted in the establishment of the Marine Resources Research and Culture Centre at Umm-al-Qaiwain.

1. The distribution of fishing and fishermen in the E.C.

There are 17 locations where men are engaged in fishing for a living in the E.C..³⁴ Fishermen tend to live in small villages with harbour facilities, and these villages are concentrated in an area of coastal land covering approximately 90 square km. Most of these villages are in the Fujairah region in the south, which has 12 such villages; Khor Fakkan has two and the remaining 3 are located in the Kalba region.

At Khor Kalba there is a lagoon where fish can be bred and consequently the area supports a lot of full-time fishermen. However, the Dibba region has more fishermen than any other region. Most of the fish caught in Dibba are sent to Dubai, Abu Dhabi and the Gulf country markets. At Dibba a large number of fishing boats operate from the sea port using Dibba as a base for their operations in and around the Gulf.

The majority of those engaged in fishing in the Dibba region are non-UAE citizens earning wages ranging from 700 to 1,000 Dh. Some workers are not wage-earning but share fishermen. In share fishing, after subtracting the expenses involved in fishing, eg fuel and equipment, the workers share the profits from the sale of fish with the owner on a 50/50 basis.

2. Fish catch in the E.C.

The amount of fish caught varies from place to place and at different times in the E.C. and there are no accurate figures for the numbers of fish caught in the area. The following are reasons why the amount of fish caught varies and cannot be estimated:

- a. Most fishermen in the area, both full and part-time, do not have specific times to catch fish. The catch depends on the abundance of fish in the area which can vary from day to day.
- b. Because the fishing waters are in an open sea there are a lot of harbours where fish are landed and it is difficult to hire someone to control and estimate landings as these go on all day and into the night.
- c. Not all the fish caught locally are sold at local markets, and also some fish from other areas are sold at local markets (these are usually types of fish not available locally).
- d. Most of the information available on the quantities landed is not precise but estimated as the local markets do not have weighing facilities. The fish sold are estimated approximately from the price the wholesalers are paying and is recorded by the brokers.

In 1976 the MAF estimated the amount of fish caught in the area annually was 8,237 tons. These fish were caught by 301 fishing boats, valued at 31.4 million Dh, and represent 13 per cent of the total fish caught in the UAE that year. In 1982 the E.C. took the lead in the fish industry with 45 per cent of the total fish caught in the UAE (Table 4:12). In this year 31,597 tons of fresh fish were caught, 55 per cent in seine nets³⁵. Five years later the quantity caught had dropped to 24,277 tons, 9,407 being caught in seine nets, showing a reduction in this method of fishing³⁶. Again

Table 4:12 Volume of fish caught in the East Coast in selected years

Years	E.C. Volume of Fish in (ton)	UAE Total	Percentage
1976	8237	64431	12.8
1982	31597	70109	45.1
1986	22553	79500	28.4
1987	24277	85410	28.4
1988	22890	89696	25.5

Source: MAF. Statistics 1977,1982,/1986-87/,1988.

the last MAF statistics show a drop in production to 22,890 tons, representing 25.5 per cent of the total UAE fish production. Of this, 7,086 tons were caught by boats powered by petrol, 5,927 tons by diesel powered boats, and 9,877 tons by seine nets.

3. New fishing techniques

The traditional methods of fishing are still in use in the E.C. but new techniques have been introduced as the area has developed after the coming of the oil industry. The following are some of the new techniques:

a. Anchovies fishing still uses methods employed in the past but with the following modifications:

1. Fishermen used to haul up the full fishing nets using manual labour, whereas nowadays most fishermen have 4-wheel drive cars which they use to pull their nets in from the sea. Two 4-wheel drive cars are connected, each to one side end of the seine net, and the net is pulled ashore.

2. Boats with fuel engines instead of rowing boats are used. In the past a fishing boat needed 6 to 8 men to row the boat, whereas now only 2 or 3 are needed to manage the boats. Modern boats made of fibre glass are used in the area and these are locally made. At Khor Kalba there is a factory making fibre-glass boats and most of the fishermen of the area buy their boats here.

b. New materials are used to make the fishing traps. The traps are now made of aluminum threads (Figure 4:13). In 1988 the number of fishing traps in use in the area



Figure 4:13 Part of fishing trap (above) and new fishing traps at Kalba (below).



was 6,614, compared with 13,841 in 1986³⁷. In 1986 the total number of fishing nets was 1,487.

4. New fishing method introduced to the E.C.

a. *Hayyali* or "trawling". This method was recently introduced to the area by workers from the Indian Sub-continent, and it enables large quantities of fish to be caught at one time. It is simple to use. The fishing net consists of small holes averaging 3 inches square and the whole net averages 80 metres in length. The fishing net is secured to the boat and the bottom of the net is stretched out by using heavy weights whilst the top of the net is kept taut. The fishing boats pull the net along in the water slowly trawling the fishing lanes.

One problem with this method of fishing is that trawlers cut a lot of fixed fishing nets while they cruise the sea for fish. In 1990 there were many complaints from fishermen about the cutting of nets by trawling fishermen³⁸. The owners of the nets report the loss of their fishing nets to the police station and there have been skirmishes between the two types of fishermen but, nevertheless, many prefer to trawl.

5. The marketing of fish in the E.C.

The fish are sold in three ways in the area, the first of which has existed for centuries (described in Chapter Three) and the other two have emerged during the post-oil period.

a. Direct from the boat:

Some fish is sold at the harbour where buyers gather waiting for the return of the fishermen from their fishing trips. This way existed during the pre-oil period, there have been changes in the post-oil period to the tools and equipment, eg engines and modern boats. If the catch is small fishermen prefer to sell their catch at the harbour as it cuts out the middleman.

If the catch is large, the fisherman tends to take it to the fish market where he sells it to the broker. Selling through the broker is labour-saving, as selling fish in small quantities at the harbour takes up much time. The direct selling method and selling via brokers are found at small harbours like those at Khor Kalba, Ghurfah, Murbih and Dibba al-Husin.

b. To retailers:

Other fishermen send their catch to be sold to retailers at the fish market. Customers can buy fresh fish from the retailers in the morning and evening. Usually the full-time fishermen bring their catch to the market to sell in the morning as they have a large catch to sell, whilst the part-time fishermen bring their catch in the evening as they work during the morning and go on fishing trips in the afternoon to supply the evening market.

c. To wholesalers:

The major fish markets like Fujairah and Dibba are crowded in the early morning with wholesalers and fishermen trading with each other. These markets attract

wholesalers supplying other fish markets, from as far afield as Oman.

At Fujairah fish market, the municipal government hires a local man to work as a broker and for every quantity of fish sold the broker charges 10. Dh.

Fish are usually brought in jeeps and there are often over 50 fishermen's vehicles gathered for the early morning selling. The vehicles queue up to sell and trading starts at 7 am. Usually within one or two hours the whole quantity has been sold and the fishermen have been given their money and can go back to their boats to fish again.

In December 1988, 7,210 kg of fish were landed for morning fish sales in Fujairah fish markets brought by 53 cars (Table 4:13). A fisherman's jeep car holds an average of 150 kg and this amount fetches about 350 Dh. The majority of the fish landed on that day were Spanish Mackerel, almost 4,500 kg. At the same time only 40 kg of Sail fish were landed on that day.

Case study

Mohyi El-Deen Yuqoob is a wholesaler who has been operating in this area for the past 17 years³⁹. He employs 3 agents at the Fujairah fish market to sell the fish, paying 12,000 Dh in wages to his workers every month. He hires 8 workers of Indian nationality with an average wage of 1,000 Dh each. Mohyi also pays 18,000 Dh for renting fish refrigerators in which to store his fish.

"Today I paid 3,000 Dh for 6 jeep-loads of fish. Of course this is a great deal of money for a normal trader to have to lay out, but I make more money by buying in such bulk. First I call on the other fish markets to ask how much fish is fetching, then I assess the price of fish here, and then I buy. Sometimes I lose money but this

Table 4:13 Estimated volume of fish landed at Fujairah fish market
in 18 Dec. 1988 between 7-10 am.

Number of Cars	Kind of Fish	Quantity (in Kg.)
30	Spanish Mackerel (SM)	4500
9	S.M. & Indian Mackerel	800
3	Skip Jack	1000
4	S.M. & Skip Jack	500
2	S.M. & Mackerel Irevally	200
1	Mullet	50
2	Sail Fish	40
2	Mixed Fish	120
53		7210

Source: Fieldwork 1988

is the nature of the business."⁴⁰

Most of the wholesalers of the area buy their fish in bulk and then sell at local markets. The unsold fish is taken back to be stored for the next day's trading at the fish market or sent to other markets. Some businessmen store the unsold fish until the following day and then mix it with the fresh fish caught that day, before sending all the fish to another market. By doing this they avoid having to send their fish lorries long distances with half loads and this helps keep transportation costs down.

Nowadays most of the fish markets in the area are controlled by people from the Indian Sub-continent but the government of the E.C. organises and supervises the fish markets.

Dried fish are also sold in the E.C. and most fishermen dry and sell their fish themselves. It is sold either direct to the farmers who use it as fertiliser, or to merchants from other countries. In 1990 some fishermen from Kalba sold their dried fish to merchants from Sri-lanka who returned with it to their own country and packaged it in small quantities for the local markets there (Figure 4:14). In March of the same year transporters took some of the Kalba dried fish to the Indian Sub-continent.

6. Fish markets in the area

There are 4 major fish markets in the area:

a. Kalba fish market:

This is located near the town centre and is constructed of plywood. It is divided into two parts, one side is used to sell vegetables and fruit, the other side is



Figure 4:14 Loading fish for exporting overseas (above) and one fisherman is loading his truck with dried fish (below).



for fish. Most of the fish sellers are of Indian nationality but have lived in Kalba for many years.

The MAF conducted a survey to find the total amount of fish landed at the market at Kalba annually (Table 4:14). The survey showed that the highest monthly volume of fish delivered to this market for sale was in October 1978, approximately 9,585 kg of fish as compared with February 1979 when there was only 3,582 kg brought to the Kalba market. Table 4:14 shows that in September 1978, 8,457 kg of fish was landed during that month, fetching a total of 87,819 Dh. In 1989 the total volume of fish delivered to the same market has been estimated to be 50,000 Kg. This number is smaller than that in 1979, because most fishermen preferred to deliver their catch to Fujairah fish market, where a large number of buyers gather everyday to buy a large quantity of fish from this market.

b. Fujairah fish market:

The fish market was established by the government and also houses meat and vegetables (Figure 4:15). There are 20 shops selling fish and the market can handle most of the fish caught in the region. Each shop unit costs 6,000 Dh to rent and renting is supposed to be restricted to locals. The market is sited in a good location, is equipped with modern facilities and is designed with health and sanitation in mind.

The fish market operates for 10 hours each day and the sellers receive the fish direct from the fishermen. In fact there are only one or two local fishermen who manage their own shops in the market, the rest are rented to traders from the Indian Sub-Continent. At first, the local fishermen tried to operate the shops but they did not

Table 4:14 Estimated quantity and price of fish landed in Kalba fish market from June 1978- May 1979.

Months	Quantity in Kg.	Price in Dh.
June 1978	4479	43,565
July	4945	55,410
August	5493	65,975
September	8457	87,819
October	9585	83,224
November	5841	52,596
December	5614	55,745
January 1979	4310	39,465
February	3582	36,342
March	5238	52,854
April	6810	64,718
May	3892	36,068
Total	68,246	673,781

Source: MAF. Fish Survey at Kalba # 5, p. 176, 1980



Figure 4:15 Fujairah new fish market

do very well so they subleased them to Indians to operate them on their behalf.

The old fish market which was across the road from the new building traded at the same time as the new fish market at one time and a lot of fishermen preferred to sell their fish at the old market because they did not have to pay rent or license fees there. However, the fishermen operating from the new market complained about the strong competition from the non-UAE traders. All business has now been transferred to the new market.

Fujairah is a major fish market in the E.C. and most of the fish landed here are not actually sold at the Fujairah market but sent to Dubai, Sharjah and Abu Dhabi fish markets. Most of the fish arriving at this market comes from the Fujairah region and Kalba. The average wage for those working in the market is around 800 Dh. Many fishermen of the area prefer to sell their fish to the wholesalers at the Fujairah fish market who use large cooled transporters to take the surplus fish to other markets. There is a high demand for fish and the fishermen are able to satisfy this demand at the moment so the livelihood of fishermen is secure.

c. Khor Fakkan fish market:

This is located near the sea port of Khor Fakkan and resembles the one at Kalba. As at Kalba, vegetables and fish are sold from the same market. Because it is near the sea port, the fishermen can send their catch via sea transport to other markets in the Gulf area at little cost. The market serves the Khor Fakkan region and supplies both the government and private sectors with fresh fish.

d. Dibba fish market:

This is a new fish market constructed to serve the inhabitants of the region. Many fishermen of the area bring their fish to this market and there are wholesalers as well as retailers to buy their fish. Fish prices are good and there is also the alternative that the fish can be sold at two other minor fish markets in the same area.

The new Dibba fish market was built near the town centre and so has good transport facilities and buyers can easily reach the market from all over Dibba (Figure 4:16). The market sells many varieties of fish and this variety attracts many buyers. It is equipped with good facilities, such as car parks and cleaning units (to serve both buyers and sellers).

On the whole, fish markets in the E.C. have played a major role in marketing the E.C. fish. These markets have helped the fishermen to sell his caught in short time and return to his career. The new fish markets, eg Dibba and Fujairah, are provided with modern facilities to serve the fish buyers in the area.

7. Types of fishermen in the E.C.

Fishing as a livelihood is possible in the E.C. as a result of government support for the fishing industry, and the good income which can be made from fishing, where most fishermen get an average of 5,000 Dh per month. There are three types of fishermen found in the area:

a. Full-time:

Most of the full-time fishermen in the area are men who have practised fishing



Figure 4:16 Inside view of Dibba new fish market (above) and some kinds of fish sold at E.C. markets (below).



for a long time. It is their livelihood and they depend entirely on what they can catch. These men tend to work by themselves except when they have to hire labour to help prepare the fishing nets and bring the catch to the beach. They work from early morning until sunset on the beach fishing (Chapter Three). Whilst they wait for the fish they repair their fishing nets and prepare their boats.

In the first week of March 1990, 95 per cent of the cars arriving at Fujairah fish market belong to local full-time fishermen bringing their catch to sell in the market (most arrive in the morning as it is the main time to sell). This shows that the full-time fishermen are playing a major role in supplying the fish markets with their requirements.

b. Part-time fishermen:

Most of the men who fish part-time live in Fujairah, Kalba or Dibba. These men work in the government sector and their afternoons are free so they spend this time fishing. The advantages of working part-time are that these fishermen have the security of a monthly salary from the government, and also the fact that they have a salary means the banks are more willing to lend them money to finance and maintain their boats. Usually these part-time fishermen employ 2 or 3 workers to help in their fishing, and such workers are usually Indian. The number of such workers reached 1,286 in 1989/90 in the E.C..

Some fishermen hire local labour to manage their fishing boats and they share their profits with them rather than pay them a wage. In 1987 the number of local people being paid for helping with the fishing was 718, compared with 968 non-UAE

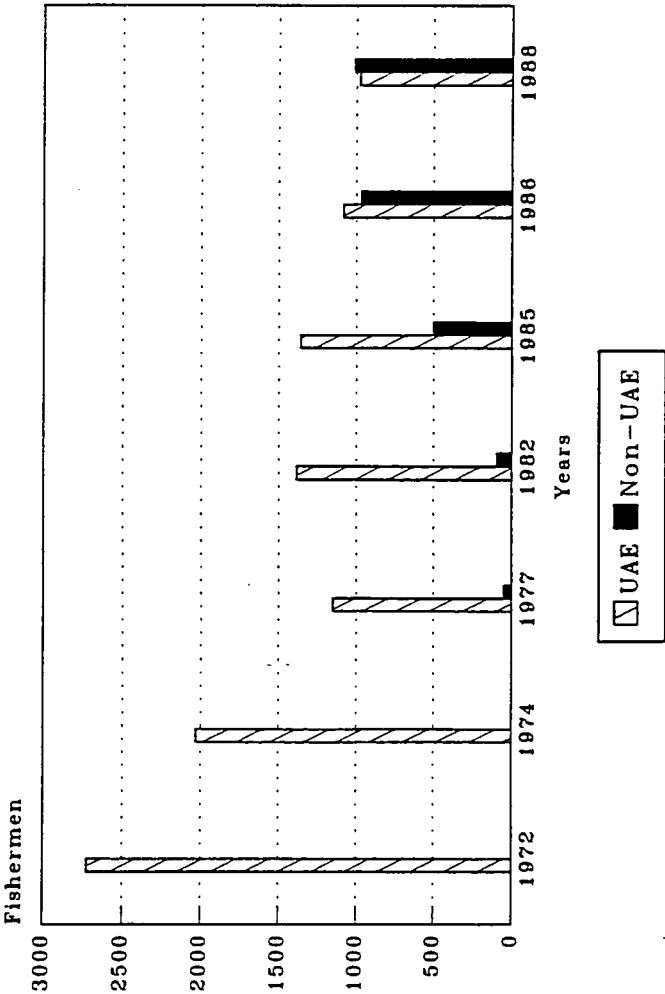
workers in the same year⁴¹. Part-time fishermen have also usually fished in the area for a long time, but whilst they like the job of fishing, they find that fishing part-time is preferable as they have a monthly income to support their families. The security and salary of a job is also useful as the catches of fish are not always large enough to support families.

c. The third type of fishermen found in the E.C. are those who fish for pleasure. Fishing as a hobby is increasing, as well as providing their families and relatives with fish, these fishermen can also sell their catch. However, most of the time such fishermen are not fishing for money. Usually they fish from noon until evening time and they tend to fish in groups.

8. Fishermen and their boats

a. The number of fishermen in the area varies, for example in 1972 there was a total of 2,725 which by 1977 had fallen to 1,204 (Figure 4:17). If we look at the above statistics and match them to contemporary events, we can see why the changes occurred. In 1972 when independence had only just been granted, resources for modern economic activities (which are largely capital intensive) were scarce and thus we had a subsistence economy. The development of an independent government with an injection of finance from the development of the hydrocarbon industry meant that with the introduction of technology, labour could often be replaced by machines, eg engines for boats. At the same time with the development of government there was a demand for workers in this sector and many fishermen left fishing as opportunities

Figure 4:17 Number of fishermen in the East Coast in selected years 1972-1988.



(UAE 1976)p.376,378, MAF. Statistics
1977 Table 62,1985p.143,1987p.152.

were available for easier work, such as guarding schools and hospitals. By 1986 the total number of fishermen had increased to just over 2,000 but this increase was not due to an increase in the number of local people returning to fishing but an increasing number of non-UAE workers being employed in the fishing industry. This is another major effect of oil, which has provided well paid jobs for E.C. nationals, and the capital for nations involved in the fishing industry to employ lower paid immigrants and thereby maximise their profits. In 1977 it was estimated there were only about 50 non-UAE workers engaged in fishing in the E.C. whilst by 1988 this number had risen to 1,012 (this is the official number registered with the MAF). These non-UAE workers filled the vacuum left by local fishermen who chose to work part-time in the fishing industry. In 1972 there were 2,725 local men engaged in the fishing industry, but 16 years later the number had declined to 978 (whilst this number only represents those registered with the MAF it is thought to be quite accurate).

In the late 1970s, owners of fishing boats had to hire many workers to help with the anchovies catch as the fish were caught from rowing boats at that time and these, of course, needed men to row them and others to haul in the catch. Nowadays two 4-wheel cars can do the same job with much less labour. The table shows that by the 1988 the total number of fishermen had increased to just over 2,300 but this increase was not due to an increase in the number of local people returning to fishing but to an increasing number of non-UAE workers being employed in the fishing industry, which is another major effect of oil.

The number of non-UAE fishermen has increased to meet the demand for fish due to the increase in the population of the E.C..

b. Fishing boats:

Most, if not all, of the fishing boats in the area are now motorized and are powered by either diesel or petrol. There are two types of fishing boats operating in the area at the present:

1. Small boats:

These boats, made of either wood or fibre-glass, and ranging in length from 5 to 10 meters, are usually used by those who practice fishing as a part-time job. They are usually equipped with 5-30 horsepower engines. The majority of boats found in the area are of this type.

2. Medium-sized boats:

Most of these boats are used by professional fishermen for whom fishing is their livelihood. These boats can travel great distances and carry large quantities of fish, and make deep-water fishing possible (Figure 4:18). Some of these boats have their own cooling units to keep the catch fresh until it arrives at its destination.

The medium-sized boats range from 10 to 20 metres and usually have diesel engines. Some boat owners put in to the port at Dibba to sell their catch direct to the wholesalers.

Nowadays there are some boat owners from Kalba whose boats operate entirely at Dibba. The owners employ someone to manage their boats and so can stay at Kalba. It is usually non-UAE workers who manage such boats and even sell the catch for the owners. The owners travel from Kalba at the weekends to collect their share of the profits. Some owners hire workers to fish and sell their catch whilst they finance the boats by their work in the government sector. The cost of a medium-sized



Figure 4:18 One of the medium size fishing boats operating in the E.C.

boat can reach up to 150,000 Dh (around 25,000 UKP.). Income from such boats averages between 15,000 to 20,000 Dh monthly, which is a good return for part or full-time fishermen.

The number of fishing boats has increased from 367 in 1974 to 639 in 1988 (Table 4:15). Table 4:15 also shows that the number of rowing boats has declined and that by the time of the 1985 boat census, there were no rowing boats in operation any more. This shows how the fishermen of the area appreciate the benefit of fuel engines.

The number of boats fuelled by diesel increased from 50 in 1974 to 138 in 1986 and those using petrol increased from 149 to 531 by 1988. The use of motorised boats should have produced a reduction in the number of workers engaged in the fishing industry but as a result of the increase in demand for fish in the E.C., an increasing amount of non-UAE labour is employed in fishing and the amount of fish caught has increased, thus demonstrating the efficiency of the E.C. fishing industry.

The 1989 MAF data shows the increase in the number of fishermen and fishing boats with the number of local boat owners reaching 592 and local workers employed by them in fishing reaching 635 (Table 4:16). As the number of non-UAE workers engaged in fishing was 1,286 in 1989 this shows that the number of the E.C. fishermen and local workers is increasing to almost the total of non-UAE fishing workers.

In conclusion, the full-time fishermen have played an important role in supplying the E.C. fish markets with daily fresh fish. The participation of the part-time fishermen in the area has increased the quantity of fish and in someway has helped in reducing the fish price.

Table 4:15 Number of fishing boats in the East Coast for selected years from 1974-1988.

Years	Types of Fishing Boats Using			Total
	Diesel Fuel	Petrol Fuel	Oars	
1974	50	149	168	367
1977	N.A.	234	67	301
1982	105	372	60	537
1985	77	542	00	619
1986	138	413	00	551
1988	108	531	00	639

Source: (UAE 1978) p. 380, and MAF. Statistics 1977, 1985, 1987, 1988.

Table 4:16 Distribution of boats and people involved in the fishing industry in the East Coast in 1989.

Regions	Number of Boats		Fishermen	Number of Workers	
	Diesel Fuel	Petrol Fuel		Local	Others
Fujairah	67	262	223	263	578
Kalba & K. Kalba	12	142	118	127	292
Khor Fakkan	29	127	126	121	142
Dibba al-Husin	67	62	125	124	274
Total	175	593	592	635	1286

Source: MAF. East Region Administration, Fujairah. (unpublished data).

9. The government's role in the fishing industry

The present buoyant fishing industry in the E.C. is partly a result of government encouragement and subsidies. The government, represented by the MAF, gives great support to fishermen in the E.C.

The government also tries to protect the fishing industry in the E.C. It issues decrees concerning the organization and protection of the fishing industry in the area. Three important decrees have been issued by the UAE Cabinet to protect and preserve fishermen and the sources of fish in the area. In 1978 the Cabinet issued a decree to ban fish exports from the country. In 1982 a decree was passed banning the catching of shrimps from April to the end of June every year⁴². The decree also banned the selling of fresh shrimps in the same period to protect the shrimps during the breeding season.

The third decree was concerned with safety measures. In 1989 the Cabinet decree banned fishermen going to sea to trade, fish or tour without taking telecommunication equipment connected to the emergency services of the area⁴³.

The above illustrates the government's care, and desire to protect and support the fishermen of the E.C.. Fishermen of the area receive various forms of support from the MAF. In 1986 the MAF distributed 104 marine engines to fishermen in the area, having a total value of 820,008 Dh. This represent 26 per cent of the total number of marine engines distributed in the UAE. In the same year fishermen in the E.C. received money to the value of 410,004 Dh in loans⁴⁴, and in most cases the MAF does not expect these loans to be paid back in full. Some loans are free while only half of others is required to be repaid.

The MAF has established 4 workshops in the area to help with maintenance of marine engines and services are often free to fishermen. The workshops are at Dibba, Khor Fakkan, Ghurfah and Khor Kalba. In 1987 111 marine engines were maintained at these workshops, 103 of which were petrol engines⁴⁵.

10. New fishing schemes planned for the area

Many businessmen are interested in doing business in the fishing industry in the area. Fishing is favourable for investment due to the demand for fish, the location of the E.C., and the provision of new government facilities such as transportation and banking. Recently a company has been set up at Khor Kalba to package the fish before exporting it to Arab and European countries. A new breeding plant was established in 1990 at the lagoon at Khor Kalba for shrimp breeding and the government of Fujairah is trying to encourage other international companies to establish fish plants in the area.

In conclusion, the government has played a major role in developing the fishing industry in the E.C.. During the post-oil period, the fishing industry in the area has witnessed new fishing techniques as well as new fishing methods eg *Hayyali*. This has led to an increase in the quantity and the quality of fish caught in the area.

C. Manufacturing in the E.C.

The inhabitants of the E.C. are employed either in the public sector or in the traditional economic activities of fishing or farming. As a result of the shortage of oil in this area, the region has had to exploit its other natural resources. In the Hajar

mountains (which cover a large part of the E.C.), factories producing cement, mineral wool, marble and tiles have been established, and there is also a fish processing industry. Production supplies local and UAE markets as well as exports to other Gulf countries, Hong Kong, and many other countries.

1. Existing manufacturing in the area

Most of the factories in the area were built to use the natural resources of the region. All of these factories have been built recently. In 1988, 69⁴⁶ factories were operating in the E.C. dealing with the processing of fish or mineral resources from the Hajar mountains, (these factories varied in size but all employed more than 10 workers, and some had as many as 200-300 employees).

a. The fishing industry:

The region has had a fishing industry for a long time. Manufacturing in this sector developed as a result of a high demand for fishing nets and boats resulting from an increasing demand for fish. New factories making fishing equipment have been established in the area. Most of these factories are small with a limited capacity, but are very numerous. They make products such as fishing traps and small boats. Unfortunately much of the material used in production has to be imported from abroad.

The Sun Rise Company, belonging to the ruling family of Kalba is one example of a factory involved in the fishing industry. The plant is located at Khor Kalba and processes frozen and packaged fish. The fish processed is imported and

consists of fish and shrimp which are cleaned and either frozen or cool-packed to be sent to the Arab and European markets where the demand for fish is high. In the future, the company plans to expand business to include produce for the local markets.

Another factory which makes small fibre glass fishing boats is the Khor Kalba Fibre Boats Factory (Figure 4:19). This small factory has 6 full time Bangladeshi workers. Fibre glass is brought from Dubai markets and boats are designed and made here.

b. Manufacture of local mineral resources:

Manufacture involving local mineral resources was started at the end of the 1970s with good results and commercial advantages. All the raw materials used in the factories are found locally. There is major government involvement in this industry, with factories being either wholly or partly owned by the government. The following are examples of factories operating in the area using the natural rocks of the area:

1. Mineral wool manufacture (rockwool):

As a result of changes worldwide in the construction industry and the new laws concerning the use of thermoacoustic in building construction imposed in most developed countries, rockwool has become a necessary commodity in the building industry. The manufacture of rockwool is new to the area, and the E.C. is one of only two areas making rockwool in the Arab world⁴⁷. The industry is based at Fujairah and the Fujairah Rockwool Factory is owned by the government of Fujairah. Production started in 1983 with capital of 15 million Dh. The factory uses a special type of rock (diabase) available locally to produce mineral wool (or rockwool) which



Figure 4:19 Khor Kalba Fibre Boats Factory (above) and fibre boats manufactured at Khor Kalba factory (below).



is used for many purposes in the construction industry (Figure 4:20), eg where fire resistant or weatherproof materials are required, and in farming (agrodase) as a substitute for soil, especially in greenhouse agriculture.

In 1988 the total production of mineral wool was 5,000 tons⁴⁸. The UAE which takes 65 per cent whilst the GCC countries, Pakistan, Yemen and Hong Kong, take the rest.

2. The cement industry:

The cement industry in the E.C. was established in 1979 with a cement plant at Dibba (almost 70 km from the town of Fujairah) owned by the Fujairah Cement Industries. Both the Fujairah and Abu Dhabi government have big share holdings in this company. Capital is approximately 350 million Dh, production capacity is 520,000 tons per year and there are 240 workers. A British company supervises and manages the company.

Three raw materials, limestone, marl and alluvium are used in the cement making process and these are all found in the E.C. The plant site was chosen in a central location for ready access to the areas where these raw materials occur. They are combined with chemical imported from India to produce high quality cement. Most of the finished product is marketed in the UAE. and other Gulf countries.

3. The ceramic industry:

The Emirates Ceramic Factory is one of the most modern factories manufacturing in the area, and is provided with the latest technology in terms of manufacturing and packaging systems. The ceramic factory is located in Fujairah and was started in 1982 to supply the UAE markets with its needs. Any surplus is

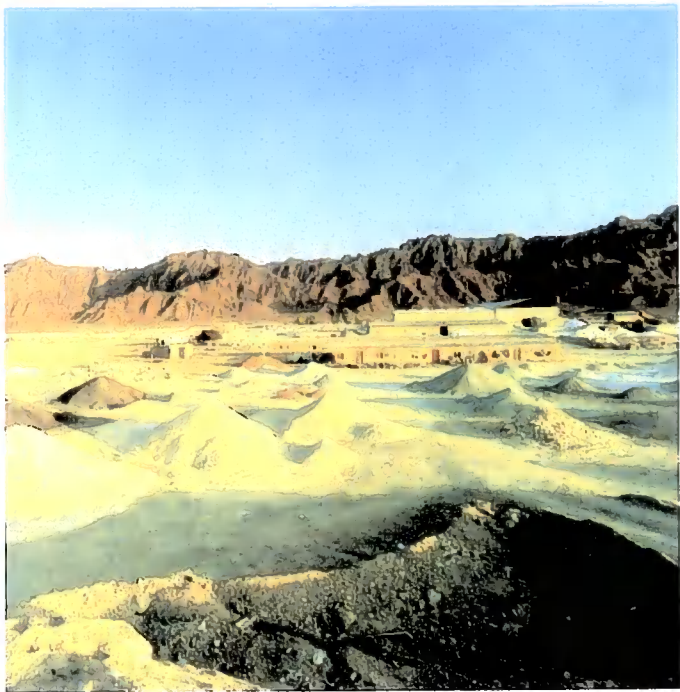


Figure 4:20 Rock manufacturing in the E.C. (above, source: Fujairah Marble & Tiles Factory Leaflet) and mineral wool (rockwool) produced from raw materials from the Hajar mountains (below, source: Fujairah Rockwool Factory Leaflet).



exported to GCC countries.

Initial exploration took place for the raw materials needed for the ceramic industry and shale was found in large quantities in the local mountains in the area. The factory now produces more than 100 types of ceramic, with a range of more than 50 colours, and production is of a comparable quality with that of ceramic plants in Europe and America⁴⁹. The factory produces over 600,000 square meters of ceramic tiles for walls and floors per year. The UAE takes 30 per cent of production, the GCC 20 per cent, with the rest being sold to other countries.

The al-Jasim Automatic Tiles and Marble Factory in Fujairah is another company using local raw materials to manufacture tiles and marble products in the E.C.. This company started in 1978 using materials from the local mountains. It has 58 employees, most of whom are Arab, Indians or Pakistanis and produces 45,000 square metres of marble and ceramic tiles per year, 60 per cent of which is for the local market, with the remainder being exported to Kuwait and other GCC countries.

There is another ceramic factory located at Dibba which the Fujairah government established, investing 11 million Dh in it. This produces approximately 1,200 square metres of mosaic tiles daily⁵⁰ and, again, like the other tile factories, the raw materials are obtained locally and part of the production is exported to Oman and India in this case.

There are other factories in the area using the local rocks, the Fujairah Rock and Aggregate Company, for example, produce various types, shapes and sizes of gabbro rock to be used in civil engineering marine construction, where the products required need to be very hard and of a high quality. Most of the products of this

company are exported to GCC countries.

4. The clothing industry:

There are two clothes factories in the E.C., one operating at Fujairah, and another at Khor Fakkan. The Fujairah clothes factory produces 12 million articles for export to Europe and America, and the Khor Fakkan factory sells to local market as well as to America. (other UAE factories also export to America.)

c. Other industries:

The area has many small manufacturing plants producing a variety of materials. For example, there is a fertiliser factory in Qirat producing 50-60 tons of fine fertiliser daily⁵¹ and a mineral water factory at Bidyyah producing about 30,000 litres daily. This factory has 38 workers and production supplies the E.C. and other UAE markets (the former factory cost 6 million Dh, the latter 10 million.).

On the whole, the availability of local raw materials from the Hajar mountains helped in developing the manufacturing in the area. The new industries, eg rockwool, have featured the E.C. industries among the other UAE regions.

2. Other valuable manufacturing activities

Traditional manufacturing industries could be a valuable industry in the E.C. drawing upon the benefit of past experience in manufacturing to satisfy current demand for their products. The following are some of the manufacturing industries that could be developed in the area:

a. Dairy production:

There is a good demand for sheep and goats milk, to be processed into dried milk and traditional cheese and yoghurt and this is a thriving industry in the area.

b. Palm tree products:

The region has a large number of palm trees from which, amongst other items, ropes, mats, fresh dates and syrup are manufactured for export to other countries. The demand for these items is increasing.

c. The manufacture of agricultural production:

As a large surplus of seasonal vegetables are produced every year, a freezing and canning industry are needed to ensure year-round supplies of locally grown produce.

d. The fish industry:

So far there is only one company producing frozen fish in the E.C.. However since there has been an increase in world demand and the development of fish farming, it is possible that, given these circumstances, there is scope for the industry to expand in the E.C. in the future.

3. Types of industry needed in the area

Specific conditions exist in the E.C. which determine the nature of the industries which it needs to attract. These conditions are as follows:

- (a) The E.C. has only a comparatively small area to offer for industrial use in comparison with large industrial areas available to multinational corporations elsewhere in the world;
- (b) There is a shortage of local labour.
- (c) The government needs the sort of industries which will provide an income for the future in the area.

The following are the sort of industries the government needs to attract in order to fulfil the above conditions existing in the E.C. and to achieve its goal of bringing manufacturing industries to the area:

a. High technology industry:

Because of the shortage of labour in the E.C., government action needs to be directed towards attracting these types of manufacturing industries which use the advanced equipment of high technology and thus rely on machines rather than manpower in production. Also it is likely such high technology industries employ highly trained personnel, skilled in all areas of business, including how to be competitive vis-a-vis external markets. Hopefully, if such industries can become integrated into the existing industrial fabric, they will help to sustain the local market against adverse competition⁵². High technology industry is labour saving and, whilst the work is highly specialised, it is envisaged that, after training, local people could be employed in such industries. Some high technology industry has already been established, for example, in 1988 in Fujairah a company^{that} assembles typing equipment for use in medical and computer manufacture was set up.

b. The oil industry:

The oil industry is a valuable resource for the government of the UAE providing approximately 90 per cent of its government's income⁵³. It follows that development of oil refineries in the E.C. using the oil found in the west coast, would be a valuable source of revenue. It is possible Gulf or UAE investors could fund such development, relieving the government of this expense.

The site of the E.C., on the open sea, is especially suitable for the establishment of an oil refinery as such a location would not constitute as great a danger of pollution to the Gulf area as one inside the Gulf.

Economically, the threat posed by the Iraq-Iran War and the Gulf Crisis could have a considerable effect on the oil industry of the Gulf and the UAE. Gulf countries have invested heavily in oil refineries and petrochemical plants and their economies rely on their oil revenues so they will need to continue their oil industry. In the mid 1980s, Iran warned that they were going to close the Strait of Hormuz and whilst this has not ever occurred, it brought the gravity of the situation home to the Gulf states. This prompted the idea that, as the E.C. is readily accessible to the Gulf, the laying of oil pipelines across it could provide an access point for oil exports from the southern Emirates.

c. The location of the E.C. lends itself to supporting a major shipping station with dry docks to serve the large cargo ships and oil tankers which frequent the area's shipping lines but which cannot enter the Gulf. This would be a good industry for the E.C. to develop as it could offer maintenance to international shipping en route from the Far

East and Europe.

4. Motivation toward manufacturing in the area

The E.C. is suitable for many kinds of industry, but so far most of the manufacturing industries which have settled in the area have done so because of the raw materials available here. More than 80 per cent of raw materials used in industry in the E.C. are derived from local sources.

Some factories have been based here primarily to benefit from the location and facilities available in the E.C. The following are some of the advantages which have made the E.C. attractive to manufacturing industries wishing to open new factories:

a. The government role in developing the area for industry:

The government has encouraged industry and been very sympathetic and sensitive to its needs in the area. For example, financial facilities are readily made available to encourage the establishment of factories. The Government have established industrial areas in each town in the E.C., areas which are designated for industrial use only. These areas are provided with facilities such as telephone lines, electricity and water at a very much reduced cost, to enable business to develop. New roads have been constructed by the government to serve these areas' commercial needs.

b. Government support:

The government welcomes any investors wanting to establish new factories in

the area and encourages them, offering many government facilities to support new ventures, for example, offering land for a factory for a token rent, as well as the utilization of sea ports, airport, good highways (paragraph f below)

c. The location of the E.C.:

The E.C. is located on the open sea and this enables companies establishing here to export their products directly through the E.C. sea ports to the rest of the world. An international airport has been built at Fujairah designed to attract companies who need to export the goods they make. Also the area has deposits of asbestos and other minerals (Chapter Seven).

d. Availability of raw materials:

The local mountains are a source of many raw materials not found in other areas in the UAE, for example rockwool.

e. Information facilities:

The government has prepared data relating to manufacturing and this is available to new businesses to help them eg establish and assess the potential of market conditions. Fujairah especially has good data facilities for business needs.

f. Government organisations to help business:

The government has established and funded organizations designed to encourage and support business in the E.C.. Examples are the local Chambers of

Commerce and Industry (CCI), found in Kalba, Fujairah and Khor Fakkan, and the Department of Industry found in Fujairah. These organisations help investors to set up and also to manage their business in the E.C..

g. Cheap imported labour:

The government encourages investors to bring their factories to the area by providing low cost air-flights for workers from the Far East and the Indian Sub-continent. Wages for imported labour are low which also helps to keep manufacturing costs down.

h. Government subsidised facilities:

Government policy is designed not only to ensure that the area develops an industrial base with local involvement but that those who are encouraged to invest in the area will provide long term commercial enterprises rather than short term ones. To this end, the government offer very advantageous medium and long-term agreements for the facilities required in industry and commerce which, as well as encouraging companies to establish in the area, also encourages existing businesses to expand here as their overheads are low in the area. Local government administers advantageous agreements for facilities, and thus plays an important part in the development of business life in the area. There is, however, overall supervision and encouragement by central government.

i. Marketing:

Exhibitions relating to manufacture are welcome in the E.C. to encourage large companies to do business. The government has also funded new facilities to help the development of manufacturing industries in the area, for example, in the Emirate of Fujairah, the government has built a trade centre and equipped it to hold exhibitions involving local and international companies which operate in the area.

j. Low industrial rents:

The cost of renting office and factory premises is low in the E.C. compared with other areas in the UAE and this encourages business to establish here. The cost of both plant and accommodation for workers is low.

In conclusion, the government in the E.C. encourages and promotes new industry in the area. Location, low industrial rent and the new facilities could encourage multinational firms to establish in the area.

5. Obstacles facing industrial development in the area

a. Both local and foreign companies wanting to build plants in the area face the following problems:

1. Limited market:

Any manufacturing industry which wants to set up in the area will first have to take into account the fact that, because of the small population of the E.C. and its limited capacity for goods, it will need to look elsewhere to sell the majority of its goods.

2. Foreign competition:

The government has a policy of an open economy which means that local companies have to compete with foreign companies who can often produce good quality goods at less cost. This is especially so for those companies with a base in the Far East where cheap labour is abundant. This problem could be avoided, however, if the government encouraged the establishment of industries able to withstand foreign competition, or if the quality of goods produced in the E.C. could compete with imports. Alternatively, commodities that can be produced locally at a low cost need to be encouraged.

3. Capital investment:

Most of the banks operating in the E.C. cannot offer large capital sums for local businessmen to invest in large scale manufacturing industry without requiring guarantors. The result has been that the businesses that are being established in the E.C. at the present time tend to be small, with little capital to expand and buy raw materials and machinery. The lack of facilities for raising working capital can, of course, also cause financial problems for existing companies and this may lead to otherwise viable businesses being closed down.

4. Duplication and overproduction:

There are no government restrictions on companies manufacturing the same or similar products nor on amounts produced in the area. This does lead to too many goods of one kind being produced for the available market. For example, there are 7 factories making cement in the UAE and, as some Emirates depend partly for their revenue on their factories, this competition affects their income. In the absence of

government imposed restrictions, some factories face difficulties in selling their products and this leads to financial problems. A good idea for the future health of the economy would be if the government could provide the necessary finance and advice to enable some of the factories already suffering from competition to change to other products, which in turn would lead to a wider range of goods being available in the area.

5. High maintenance costs:

To establish a manufacturing plant in the E.C., most if not all of the parts have to be imported. This means high maintenance and operating costs. Moreover as parts are not readily available in the E.C. business owners often face problems of delays or stoppages in production whilst parts are repaired or new ones obtained from abroad. Often when machinery breaks down, the factory must wait for an engineer from the company that supplied the machinery to come from abroad to repair it and this too, as well as the delay which causes financial loss, incurs expensive charges in fees, accommodation and other expenses involved in bringing experts from abroad.

The problem of maintenance cost and delays incurred due to the need to import plant is a major stumbling block to the establishment of factories in the area.

b. Other problems faced by international companies wishing to establish in the E.C.:

1. International companies look for security in business and need to ensure their investment results in a sufficient return to make it profitable. They are also concerned to ensure that the political situation of the country will not endanger future business and the present and previous experience of companies in the Middle East has

discouraged investment. One way of counteracting the adverse political impression vis-a-vis investment is for government to take a hand and assure prospective investors of their political support. The government should also stress to prospective investors that there have been no hostile incidents involving foreign companies operating in the area, and that, unlike other areas in the Middle East, the E.C. is not involved in any political problems which could affect trade.

2. Most multinational companies take into consideration social facilities available in the area in which they are considering starting to trade before they make any decision. For example 'big city' life with the sort of entertainment found in their own countries may be a deciding factor in attracting their own personnel to transfer to the new location. Cities like Dubai can provide this kind of night life, but in the E.C. it will take some time before the entertainment facilities of such big cities can be matched.

In conclusion, the wealth driven from oil industry in the other UAE regions has played a major role in developing the manufacturing in the E.C.. As a result of this wealth, the government was able to build new facilities, eg seaports and trade centre, which encouraged new firms to establish in the area.

D. Trading in the E.C.

Trading, as one of the economic activities in the E.C., depends on the three Emirate markets: Dubai, Sharjah and Abu Dhabi. Together with local small shops, it is estimated the E.C. had 4,500 shops in 1990 (usually run by a non-UAE citizen). These markets are the main trading outlets in the region.

1. The current retail situation

Trade in the E.C. is mainly conducted in smaller shops usually constructed alongside each other, on both sides of a road, forming small shopping streets or precincts. The average rent for such small shops is about 6,000 Dh per annum and usually the owners are from the Indian Sub-Continent, who employ workers, paying them an average wage of about 900 Dh per month. As much as 500 Dh can be made daily by shops in good locations.

These small shops are controlled by the government through the local Chambers of Commerce administered by local government. Every shop requires a license from the government and the licensing records show that, whilst in Khor Fakkan there are some local people managing shops, in general shops are usually owned or run by a non-UAE citizen with local people acting as sponsors for immigrants for licensing purposes.

In some areas, new shopping centres have been constructed, for example in Fujairah, Khor Fakkan and Dibba (Figure 4:21). These shopping centres consist of small shopping units selling clothes, electronic equipment and other commodities. The following are the main items sold in shopping centres:

a. Clothes:

Many shops in the centres sell clothes, most of which have been imported from the Far East and Europe. However, with local factories being established in the E.C. and other areas of the UAE, local goods at competitive prices are appearing in the local clothes shops.



Figure 4:21 Khor Fakkan's new shopping centre

b. Foodstuffs:

There are more food stores than the population can support in the E.C. and consequently some small shops are closing down as they are now facing strong competition from large supermarkets which have recently started operating in the E.C. These supermarkets sell retail, buying their supplies wholesale from the market at Dubai.

c. Cars:

Large companies such as Nissan and Toyota sell their products in the E.C. and as a result of the high price of new cars, a thriving second hand car business has developed in the area, with garages and shops opening to satisfy the demand for spare parts for imported cars. The area also has a large number of car hire companies, for example in 1990 in Kalba alone there were more than 17 car hire companies, and as most families in the area own at least one car, it is possible there are more hire companies than the area needs.

d. Building materials:

Most of the shops selling building materials are concentrated in Fujairah and belong to some Persian businessmen who have been settled in the area for a long time. At Kalba shops selling building materials have especially prospered due to the Omani demand for building materials.

Summary

The current economic activities in the E.C. require a good trading policy imposed by the government if the retail trade is to have a good future.

As regards agricultural products, the E.C. is considered to be an important area for fruit tree and vegetable production for the whole of the UAE but the government needs to work hard to help the farmers produce the right kind, and quantity, of produce. For example farmers need to be better informed as to what facilities are available for them from the MAF and it would be a good idea if the MAF could organize small groups of farmers from each area and teach them the best methods of farming their particular area.

Modern farming with government support has achieved some of the goals set by government to increase productivity as well as the quality and quantity of produce. Government support enables farmers to get the benefit of modern farming techniques eg grafting. The farmers benefitted from using new irrigation systems which save more than half the water used by traditional irrigation systems. All this has changed the lifestyle of the farmers in the area.

As regards fishing, the existing situation may cause future problems, for example competition for fishing between full-time and part-time fishermen and competition between locals and non UAE fishermen. The MAF needs to look at the job, at the equipment such as fishing nets, and at the locations, with a view to preserving and enhancing the fishing industry.

In all, manufacturing and selling in the area could have a prosperous future, given greater attention from local government to certain disadvantages (outlined

above) existing at the present time.

Endnotes to Chapter Four

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V. Comparison Between Pre-oil And Current Economic Activities And The Government's Developmental Role

A. Comparison between the pre-Oil and the current economic activities in the E.C.:

1. Agriculture:
 - a. Location of farmland and size of farm
 - b. Irrigation systems
 - c. Production
 - d. Farm tools and equipment
 - e. Farming techniques
 - f. Government role in agriculture
2. Fishing:
 - a. Types of fishermen and fishing boats
 - b. Volume of fish caught
 - c. Marketing of fish
 - d. Equipment and tools
 - e. Fishing techniques
 - f. Government role's in fishing
3. Manufacturing:
 - a. Type of manufacturing
 - b. Raw materials
 - c. Labour
 - d. The Effect of government's role
4. Trade

B. Major government facilities in the E.C.:

1. Seaports and harbours in the area
 - a. The importance of the E.C. seaports
 - b. Major seaports in the area
 - c. Major harbours in the E.C.
2. Air services in the E.C.:
 - a. Fujairah airport:
3. The Fujairah Trade Centre
4. The Fujairah Department of Industry & Economy
5. The Chambers of Commerce and Industry
 - a. The FCCIA
 - b. The SCCI

Summary

Endnotes to Chapter Five

V. Comparison Between Pre-Oil And Current Economic Activities And The Government's Developmental Role

The location of the E.C. is one major factor influencing the type of economic activities in the area. The UAE is located mainly in the Gulf with the Ras al-Khaimah at the strategic strait of Hormuz and the E.C. facing the virtually open seas of the Gulf of Oman. From here it is close to the Indian Sub-continent and the Far East. Thus whilst the UAE has the advantage of being partly of a Gulf state, part of it, the E.C., faces virtually open water, giving it a vital role as a gateway to the rest of the world. Whilst the significance of geography has been explored in detail (Chapter One) it is worth a reminder here to show the significance of these locational factors for the development of sea trade and to show how the E.C.'s location facilitates travel. It is through travel that the inhabitants of the coast have come into contact with other peoples and attitudes and this has contributed to their receptiveness for change and the development of the area.

Another very important factor, of course, has been the wealth derived from oil. Oil exploration on the west coast of the UAE required imported labour on a large scale and, later, this labour played a major role in developing the economic activities of the coast (Chapter Six). The wealth to be made in the oil industry meant that many E.C. inhabitants preferred to work in the oil-rich western Emirates rather than their own area. While this meant the E.C. suffered from a labour shortage as its nationals left to work in the oil-rich Emirates, a part at least of the money they earned returned to their families in the E.C., enhancing its economy and changing the lifestyle of many in the E.C.

A good example of the changes brought about in the E.C. by the influx of money from the oil industry in the western Emirates is the replacement of the donkey by the car. In the pre-oil period, donkeys were used for many purposes, for example, in farming, for transporting goods and people and in trade with the mountain villages. The animals were numerous and it was rare to find a family who did not own at least one donkey. Besides their usefulness for transport, donkeys enhanced the family's status in much the same way as the number of camels owned by a desert clan, or the Rolls Royce in the drive of a Western family house. There were approximately 420 donkeys and 15 cars¹ in the E.C. at the end of 1950s, but by the end of 1980s there were more than 13,854 cars and no working donkeys in the E.C.² In the past the number of donkeys a family owned showed its (wealth) and donkeys were bought not merely as beasts of burden. Since the development of the oil industry in the area, the donkey has been replaced by the car, not only for transport but as a status symbol. Now it is rare to find a family without at least one car parked in front of its house. This example illustrates the changes occurring in the E.C. and, to help us to appreciate the development of the economic activity of the E.C. which lies behind these changes.

A. Comparison between pre-oil and current economic activities in the E.C.

Economic activities have changed a great deal since the establishment of the oil industry, which began to make its effect felt in the E.C. in the late 1960s and early 1970s (Table 5:1). Oil revenues enabled the government to plan a future for all Emirates, including many regions and aspects of life not directly involved with the oil industry. A major element of government policy for the country's future has been

Table 5:1 Development chronology I

Date	Economic Activities
1950s & 1960s	Traditional farming // fishing // manufacturing Primary tools and equipment Bartering Less trading Rowing boats Depend on man and animal power Intensive local labour No water or soil problems No pollution
1970s	Beginning of the transaction Experimental farms Beginning of water problems Modern fishing boats Water pumps Modernisation of fishing and farming
1980s	New farming techniques // fishing techniques Greenhouses Modern irrigation systems The Dibba Model Fruit Farm Improved seeds New farming techniques, eg. grafting New fishing methods, eg. Hayyali Pollution Serious water and soil problems

development and modernisation generally of the economic activities of the E.C.. Government support has shown itself in many different ways, and worked through both central and local government agencies. Investment and financial support for craftsmen and other workers and businesses developing their activities were two ways in which the government helped in the economic growth of the people of the area.

1. Agriculture

The government policy of developing the economic activities of the E.C. is shown by the activities of the MAF. Starting from the mid-1970s ,a large part of the MAF budget was allocated to improving agricultural conditions generally³. In the past in most areas in the E.C. the amount of land farmed was limited owing to the lack of tools and equipment. The improved economic situation in the UAE has resulted in many changes in farming in the E.C., and the following are the major ones:

a. Location of farmland and size of farm:

Traditionally the land farmed in the E.C. was always located in the immediate vicinity of the farmhouse. Usually the house was built first and the family began to grow vegetables for their own consumption on the land around it. In areas like Kalba and Fujairah, it was usual for those owning farms to spend the summer in the country on their farms. Farmhouses were built from local materials, especially the products of the palm trees found through the region. The reasons for the summer-only occupation were twofold: first to be close to their summer crops, and second to avoid the intensity of the summer heat of the town by living in the country. The country also had an

abundance of water as compared with the town and this was an added incentive. Most farms were small and tended to be clustered together for several reasons, such as the sharing of tools and equipment (Chapter Three). Some farms were managed by farm workers rather than farmed by the owners themselves. On these farms usually three or four workers were employed but some of them did not receive salaries, rather they shared the harvest with their landlord. Most of these farm workers were recruited locally and were, in effect, cheap labour for the landlord. Agricultural activity was labour intensive, not because farms were large but because in agriculture in the E.C. at the time only primitive tools were available, making farming a labour intensive activity. Also farm labour was very cheap, and other jobs were hard to find locally. Because only primary tools were available each task on the farm took quite a long time and much labour.

As well as being limited by distance and lack of equipment, agriculture was also limited in extent in the E.C. due to the nature of the available land. Much agricultural land in the E.C. is midland coastal reclaimed land whose soil needs a lot of attention to be productive. In addition, in the past, because only primitive tools were available, reclamation itself was laborious and slow, and consequently only small areas were able to be reclaimed for farming purposes. In the early 1960s the total area being farmed in the E.C. was estimated to be 20,000 donum, most of which was located close to the residential area of those who worked it. Some of this farmland was in the mountain villages of the country. The average farm size was 2 donum, but some farmers owned more than one farm. Because of the lack of modern agricultural equipment, however, it was usually not practical to amalgamate two farms. Thus

farmers owning more than one farm kept the farms separate, often farming one for himself and his family, with the other leased to someone who would manage it but share the harvest with the owner at the end of the farming season.

In recent years and as an effect of the oil, the amount of land being farmed has increased all over the E.C. because large areas of poor agricultural land have been converted to good productive farmland. By improving seed quality, suitable fertiliser and more farm labour have been employed to reclaim and farm this land. All this has come about with the help of the government, which has invested heavily in agriculture and its development in the E.C.. In addition, a lot of new land has been distributed among the farmers free of charge. One result of these changes has been that often the farmer's house is not close to the farmland he works, as, with modern transport facilities and technology, this proximity is no longer necessary.

Another result of agricultural development has been a great increase the amount of land farmed. In 1989 there were 46,789 donum⁴ of farmland, as compared with ca 20,000 donum in the early 1960s.

As a result of government agricultural policy, many new farms are located in areas specifically designated as farmland and these areas are away from the major residential areas. Most farm labour these days is derived from the Indian Sub-continent rather than locally, (this situation may have effected the nature of farming in the area eg most of these farm labours came from countries (eg southern Bangladesh) where water is in abundance to farm in a desert environment, so they do not pay attention to the quantity of water consumed in farming) and these foreign workers do most jobs on the farm. The same amount of farmland now takes much less labour to work than

in the pre-oil days and productivity is higher, thanks to new equipment and modern irrigation systems which have been installed at most farms. This has enabled many farms to farm larger donum and produce more crops with less labour.

The size of farms is still small in comparison to those in the Western World and elsewhere. In some agricultural areas of the E.C. the farm size is much larger now than in pre-oil days, being 5-10 donum or more. Such farms are owned by farmers who work full time on their land and supply the local markets with various vegetable and fruit products.

b. Irrigation systems:

Before the oil industry farmland was irrigated by traditional methods based on the use of manpower and animals. In some areas farmers also made use of natural resources, eg the *falaj*, small canal used to irrigate farms located near its source (Chapter six). However, for the most part man and animals working together provided the means of getting water to the crops. bull were used to draw water from wells in buckets and the farmer then poured the water directly on the crops from the buckets. Traditional irrigation methods meant that it was only feasible to grow crops close to a water supply and, even then, much time and labour were required to water the crops. Another factor which had to be taken into account in transporting water any distance was the problem of the E.C.'s hot climate which meant much water was lost through evaporation during transport. In all, it was impractical to transport water far in order to increase the amount of crops grown. Another problem which limited the amount of land that could be irrigated for growing crops was that the irrigation canals were built

from the only available material, mud, which is readily affected by water. Whilst the banks keep water in the irrigation channels, because of its nature it has a tendency to break down and precious water is often lost before reaching the crops.

The financial support of the MAF has meant that many farmers have been able to instal modern irrigation systems on their farms at half price. These modern irrigation systems use less water to irrigate the crops, for example irrigating by drip system can save almost half the quantity of water that the farmer uses in his farm crops using the traditional irrigation system. The government has also installed a comprehensive electricity network throughout the E.C. and this has provided farmlands with electricity, enabling them to use the modern systems which are powered by either electricity or fuel. This has meant that quite modest agricultural holdings have been able to be modernised. Modern wells are usually dug by the farmers themselves with the help of MAF teams, and are powered by either electricity or fuel.

Wells are the most common source of water supply on the farms but there are other, more complex, modern irrigation systems. Many farms in the E.C. now have bubbler and drip irrigation systems and these have revolutionised irrigation. Most of these systems were installed for the farmers by MAF engineers.

c. Production:

In the past agricultural production was poor, in quantity and quality, and restricted by the limited knowledge available to farmers. Because of the lack of government support, farmers worked their land with the only tools and seeds available to them, the traditional ones used for centuries. This meant that productivity had

remained at the same level for centuries. However, farmers were usually able to feed themselves and their families by their labours, and any surplus, albeit small, was used to barter for other products from their neighbours or to sell at the local market.

Despite the primitive tools and lack of technology in the E.C. before the advent of oil revenues, if we were to examine agriculture at that time we would find that, despite the limited resources available to them, farmers did a good job in producing enough vegetables, cereals and fruit for local needs.

It has been estimated that at the beginning of the 1960s production on traditional farms was around 11,000 tons, most of which was from fruit trees. At this time the main criterion in choosing which crops to grow was not customer taste but self-sufficiency.

Since the 1950s, and as a result of government spending in agriculture, agricultural productivity by 1986 had increased almost fivefold to over 53,000 tons (Table 5:2). For example, the productivity of field crops has increased from 770 tons in 1981 to 9,391 ton by the end of 1988. The table also shows that a booming season for vegetables production occurred in 1983 before it declined the following years as a result of water and soil problems. The variety of vegetables and fruits being grown has also multiplied since the 1960s, and fruit production especially has developed a great deal since then. None of this could have been achieved without government help.

Vegetable production reached a peak before the mid-1980s as a result of the increase in land being farmed for vegetables. However, this increase caused marketing problems which meant, once again, that the government was required to intervene to help the farmers solve problems caused, paradoxically, by the very success of the

Table 5:2 Agricultural production in the East Region from 1981-1988 (in tons)

Year	Vegetables	Fruits	Field Crops	Total
1981	15098	14205	770	30073
1982	19317	14417	2412	36146
1983	28849	15296	3855	48000
1984	19058	26910	5224	51192
1985	15314	27106	7414	49834
1986	12642	32140	8404	53186
1988	12043	29814	9391	51248

Source: MAF. Statistics, 1982-83/,1984-85/,1986-87/,1988.

government policy and the resulting efficiency of the E.C. farmers.

d. Farm tools and equipment:

Both before and after the advent of oil in the E.C. the farmers' tasks ranged from reclaiming land to harvesting crops. Before the oil industry, farmers in the E.C. only had the traditional primitive tools and equipment to help them in these tasks. Even though times have changed and the demand for food is much greater now, the use of some traditional tools survive alongside the modern equipment. One reason is that small farms still survive and on these sometimes modern equipment is not always suitable for the tasks required, or the terrain, eg the ploughing of inaccessible land where tractors cannot easily reach. Of course, however useful such traditional tools are in certain circumstances, their general use before the oil industry meant that productivity on farms was poor. The division of the land available into different sectors each growing different crops, some of which are more suitable to one terrain than another was not possible before the advent of oil brought wealth to provide farmers with the latest technology and machinery. Thus the distribution of crops for the maximum yield was often impractical and more time had to be spent in preparing relatively small areas for agriculture. Without modern equipment such as combine harvesters, gathering in the crops took a long time, as did transporting the harvest to market. The result was that farms were labour intensive.

Today, the MAF provides a very useful service in introducing farmers to the latest agricultural technology. Modern equipment and tools are imported from all over the world, and in many cases the farmers can buy these at half price. The MAF even

supplies some tools free of charge.

The MAF employs appropriately qualified personnel available to serve every need of the farmers in the E.C. and their trained engineers are ready to answer queries from farmers on the new equipment. These engineers, and other experts employed by the MAF, go out to demonstrate new equipment and methods on the farms, for instance the best way to plough and how to spray crops with insecticides.

Farms in the E.C. are now more organised eg the location, than in the past, and less labour is needed. Thus the farmer is saved both time and labour. Modern agricultural equipment uses fuel or electricity rather than manpower and this is important as, since the oil industry was developed, labour is much scarcer in the E.C. than previously.

e. Farming techniques:

In the past farmers, with limited land under cultivation and relatively primitive farming methods, produced relatively poor yields, but they could readily dispose of their crops and did not have to worry about competition. Consequently whilst farmers had little or no capital to invest in new technology and equipment, there was also little impetus for them to try new techniques to improve farming methods and productivity as well as little capital to be able to do so. Moreover, the fact that the government paid little attention to the agricultural sector meant that there was no external encouragement for farmers to develop new techniques in growing their crops, or to try new crops. The result was that the traditional methods and crops remained in use in the E.C.. Farmers did not want to gamble with their crops by trying different ways to

fertilise plants or trying out new types of fruit trees.

Nowadays, however, the situation has changed. The UAE, and especially the E.C., has opened its doors to the import and export of many different kinds of crops, new types of fruit trees, new varieties of vegetables and other agricultural products. This, and the competition of imported food products, has meant that E.C. farmers, supported by the MAF, have had to find the best methods of growing more crops at less cost. The MAF tries out new techniques in different areas and has also introduced new vegetables which it has shown farmers how to grow. It has also pioneered greenhouse agriculture in the E.C. very successfully. Farming in these greenhouses enabled the farmers to double the donum productivity at their farms.

f. Government's role in agriculture:

During the pre-oil period of the E.C. government facilities for helping the farmers was, of financial necessity, poor. However, farmers were taxed and, therefore had to work hard not only to support themselves and their families but also to satisfy the demands of local government. In some cases, taxes on agricultural crops were levied and the monies collected were spent on other things. Very little money was allocated to developing the agricultural sector.

Since the exploration of oil in the UAE, the situation has changed. Even though no oil has been found in the E.C. the government, represented by the MAF, have ploughed oil revenues into the area to support and further develop the agricultural sector. Experimental and model farms have been established all over the E.C. to test and demonstrate new farming methods for the farmer. In terms of facilities

now available to farmers, the MAF provides many services free of charge, eg supply of MAF tractors for ploughing and engineering expertise. Improved seeds are available at half price for farmers from the MAF and so are many other farming requirements such as fertilisers and insecticides.

In conclusion, the oil exploration on the other UAE Emirates has effected the farming industry in the E.C. The impact of oil on farming can be seen in the quantity and the quality of farm products in the area which came as a result of the government support played by the MAF in the early 1970s. It changed the farming industry from a traditional one using primary tools and equipment to a modern one using the latest farming techniques available in the area.

2. Fishing

The two main activities of the E.C., fishing and farming, are major predeterminants of the lifestyle of the inhabitants. Located by the open sea, and on the Gulf of Oman, E.C. fishermen, have been able to become major fish suppliers to the whole of the UAE and their reputation as fishermen is high.

a. Types of fishermen and fishing boats:

The traditional fishermen in the E.C. were local men for whom fishing provided a livelihood and whilst some of them had no other means of earning a living, in many ways they enjoyed a lot of independence. Other fishermen were also farmers but fishing was their major pastime, they often farmed land as a 'failsafe' so as to be able to feed the family during the times of fish shortages in E.C. waters.

Most of the fishing boats were small and built of local materials, such as palm trees. In the early 1960s the number of fishing boats in the E.C. was estimated to be 300, and the only power available to get them to the fishing areas was oars and manpower. Since government has lent considerable support to this sector, three types of fishermen are now to be found in the E.C.:

1. The full-time fishermen
2. The part-time fishermen who go fishing after finishing work. Part-time fishermen are often full time government workers during the day.
3. Those who enjoy fishing as a hobby.

By 1990 the number of fishing boats in the E.C. had increased to 636 and, by this time, most were powered by diesel or petrol⁵. Boats are still usually made locally but the local building materials have been replaced by fibreglass.

b. Volume of fish caught:

It is estimated that by the end of the 1950s, the annual catch was approximately 9,500 tons, most of which was caught by seine net. The catch was mainly small fish used to fertilise crops or dried for consumption for times when fish were likely to be scarce. The volume of fish caught has increased, reaching a peak in 1980 when the total volume caught was 31,957 tons⁶. Since the 1950s there have been other changes: now the fish caught are usually large, mature fish which are caught by fishing traps rather than seine nets. The 1980 figure has since fallen and, by 1989, the amount of fish caught in the E.C. had dropped to 22,890 tons. The reason is that the UAE's requirement for fish had been satisfied during that period by

other UAE regions who have flooded the market and forced the E.C. to reduce its catch. Most of the fish was caught during the winter months.

c. Marketing of fish:

In the pre-oil period, the fishermen sold their catch on an open area of land called the *Sooq*. Here fishermen sold their catch to local buyers or retailers. The *Sooq* usually only operated in the mornings and fishermen used to collect fish from their traps very early in the morning and take it straight to the *Sooq* so it was very fresh. In the evenings most fishermen spent their time repairing fishing nets or maintaining their boats and preparing for the next day's fishing trip.

Before the oil exploration each group of fishermen used to sell their fish locally for the needs of their own community, and the remaining fish would have to be destroyed, or dried for fertiliser, as there were no freezers or ice available to enable them to keep the fish fresh to be sold the next day. After the oil exploration this changed and new fish markets were established in the E.C. at which a variety of fish from all over the E.C. were sold. Fujairah and Dibba Fish Markets are two example of the developments in the fishing sector and markets such as these were opened to all fishermen. From this time brokers have played a large part in the selling process and buyers came from all over the UAE to buy fish to be transported and sold in other UAE cities.

Once it had revenue to invest, the government took a hand in organising the fish markets to ensure quality of fish was maintained for the customer. Now government officials inspect these markets to ensure hygiene and sanitary standards

are maintained. Obviously the situation for the customer is much improved with more variety, cleanliness and freshness. However, compared to the pre-oil period, fish are now a little more expensive due to the increased costs of fishing eg labour and equipment, and marketing.

d. Equipment and tools:

Before the oil industry, fishing in the E.C., like agriculture, was practised with the only tools and equipment available to the fishermen, the traditional tools which they either made themselves or which were made locally from local materials. The products of the palm trees were used to repair fishing nets and even to build fishing boats. Simple tools were made from local raw materials but some tools were imported from neighbouring countries. There was a demand for fishing boats and equipment in the area and this enabled some people to specialise in boat building or repairing fishing equipment as a job. As with agriculture, the restriction of primary tools meant that yields were not high.

Today fishing tools and equipment are modern and in many cases have been imported. The exceptions are the fishing boats and some fishing nets. However, whilst some of these are still made locally, they are usually made from materials imported from overseas. Nowadays most of the fishing nets, especially the *Qeteen* are imported but the fishermen still design and sew them in the traditional way to satisfy their individual needs. New marine engines have replaced the traditional oars but modifications and repairs on them are undertaken locally. Palm tree fronds are substituted by steel threads in the manufacture of the fishing traps but they are still

locally made although the steel is imported.

e. Fishing techniques:

Before the oil industry enabled the government to inject capital into the fishing industry, traditional techniques in fishing were widespread in the E.C. These methods required fishermen to work in co-operation with each other and this gave a unity to fishing communities. Families all worked together in harvesting the fishing catch in the same way as they did in agriculture. Again, as in farming, although many hands were needed to bring in the catch fishermen had no labour problems because there were enough people locally to recruit. The majority of the people of the E.C. before the advent of oil were either fishermen or farmers, or both.

The traditional technique for bringing in a catch demonstrates how labour intensive fishing was. Those involved shared the catch which was used for two main purposes; most of the catch would go to feed their families, with the remainder being dried and used as fertiliser on their farms.

Nowadays the situation has changed and the manpower for the fishing industry is imported from abroad, mainly from the Indian Sub-continent. Local fishermen hire more workers to work on their fishing boats and in most cases they leave those workers to do all of the fishing jobs, eg catching and selling the fish. With the new workers have come new methods of fishing, such as *Hayyali*, trawling (Chapter Four). Since the adoption of new methods and technology in fishing, catches are larger. In the past the catch was limited not only because of the restrictions of primary tools but because the fishermen only needed to catch enough fish to feed their families and

fertilise their soil. Any surplus would rot as there were no freezer facilities available and transport facilities were also poor and so fish could arrive fresh enough for sale in other areas where there was a market for it. Nowadays, these facilities are available and there is also a heavier demand from urban areas for fresh and dried fish. The freezer facilities for example increased the volume of fish in the markets, especially in bad weather. Also it enabled the consumers to buy their fish anytime they needed it from any close supermarket.

These days the old labour intensive method of drawing the catch to shore has also changed, manpower has been replaced by the use of engine power (Figure 5:1), a few fishermen spread out their nets and use their four-wheel drive trucks to pull the fishing net to shore.

f. Government's role in fishing:

As with farming, in the past local government did not concern itself very much with the fishing sector. However rulers were often themselves involved in fishing, having their own boats and managing them themselves or sharing ownership with local fishermen, eg in Kalba. Whilst government did not spend any money in developing the fishing industry, local fishermen practised their craft under the protection of the ruler of each area and there was a recognised area of the coast for each group of fishermen to fish.

After the oil exploration and UAE independence, the fishing sector received a lot of attention from central government and government support and the provision of facilities by the MAF encouraged an increase in the volume of fish caught and



Figure 5:1 Four-wheel drive trucks play a major part in the fishing industry in the E.C.



modernisation of fishing equipment and tools. Fishing techniques changed to suit the new equipment and demand.

Government took an increasing interest in the fishing sector and started to organise and regulate fishing activities in the E.C.. Legislation was introduced and some government departments became very involved in the fishing industry, especially involving labour, telecommunications and the import-export business generated by the changes in the industry.

In conclusion, the wealth derived from oil has affected the fishing industry dramatically in the E.C. It has been instrumental in changing it from a local-based industry, part of a subsistence economy, with limited markets, using primitive equipment, to a major part of E.C. economic activity with sophisticated equipment, both in catching and keeping the fish fresh, and with a better and more widely-based market.

3. Manufacturing

As the above demonstrates, the majority of the population of the E.C. were involved in activities such as fishing and farming before oil, which were limited in scale of production and market due to a lack of resources to modernise and develop these industries. Not only has the oil provided the capital to develop these industries but as the states around the Gulf have become rich, it has also provided a huge hinterland with money to spend and tastes to be satisfied which has enabled the industries to develop in scale, confident of market demand. The local building industry is a further example of the changes brought about by oil. Before oil, exploitation of

the E.C.'s resources was hindered by lack of equipment and a limited and local demand. Since the oil exploration, many people can afford large villas, and many new government and commercial buildings are also required. As a result manufacturing in the E.C. has increased, and a large part of the products, like house construction materials, are exported to other countries. Other UAE regions take a small proportion of these goods but most are exported to other GCC countries, Europe and the Far East.

a. Type of manufacturing:

The majority of goods manufactured in the E.C. in the past were for use in farming, fishing and the keeping of livestock. As they were for local consumption only, and there was no competition from imported goods, on the whole the quality of goods produced was not high. The goods themselves were of the type to help local people be self-sufficient and production included animal products, dried fish, pottery and house materials. On the whole goods were produced in the domestic setting, one exception being the blacksmiths who worked in workshops. Factories, as we know them, did not exist.

With the advent of oil in the UAE, many new types of manufacturing came to the E.C. requiring factory production methods and demanding new standards of quality as they had to compete with foreign goods. The manufacture of rockwool and building materials are the types of manufacturing industry which have been established in the E.C. in recent times. Modern factories have been established equipped with the latest technology to enable the products made to be of a very high standard. Most of these factories use foreign labour. Compared with factories in the West and elsewhere, most

E.C. factories tend to be comparatively small and average approximately 40 workers each.

b. Raw materials:

In the past the materials used in traditional manufacturing processes were brought from local resources. Palm trees were the major source of materials used in house-building and in furniture, for instance, and these were readily available near their place of manufacture. Most craftsmen collected or bought the materials needed to make their products in the E.C. itself, for instance, water storage containers, cooking pots, and pottery were made of mud found in the mountain areas of the E.C. which fires well.

The new factories in the E.C. also use the raw materials available locally but also import others, such as chemicals from India and the Far East. The local mountains are considered a rich geological area for the raw materials for cement and ceramic manufacture. Locally caught fish are also a rich resource for the new factories, but now these can be supplemented by imports, eg the Sunrise Factory at Kalba processes fish caught locally but also, in times of shortage, it imports fish from Oman to enable it to continue in production.

c. Labour:

In the past the E.C. had little foreign labour, the workforce being made up of local people and a few foreign traders who had come to sell their goods and had settled. Many of these foreign traders moved on after a few years. In the 1950s there

were few small shops operated by people from abroad. For example, in the same period there were around 10-20 foreigners in the whole of Kalba.

Since the advent of oil, there has been a huge influx of foreign labour into the E.C. (and other parts of the UAE and the other Gulf states) and this has occurred solely because of the development which has taken place resulting from oil revenues from the western Emirates. The phenomenon of imported labour has arisen to fill the labour shortage which is due partly to the developments of government sectors which has come in the train of the oil wealth and into which many E.C. nationals have been drawn. These developments have also meant that many E.C. nationals are now being employed in new private sectors of economic activity and this also is a reason for a shortage of workers in the traditional sectors. Moreover, with the advent of oil there has been a boom in economic activity to provide for the developing country and existing businesses have been able to expand and new ones such as those manufacturing luxury goods have been established, all needing more workers. The booming economy and foreign workers have also created a demand for more agricultural products, and the higher quality of life has meant retail outlets have increased in size and number, and also require more workers.

Non-UAE people have come to the area as a labour force rather than as permanent immigrants, and the pattern is for workers to live in the UAE but for their families to remain at home. The money earned in the UAE by these workers is sent back to their families in their home countries. The system thus benefits both the E.C. and foreign workers.

d. The effect of the government's role:

During the pre-oil period the government played little part in the manufacturing sector of the E.C.. As the goods produced were for local consumption and were limited in number and revenue, there was little profit to be made and the manufacturing sector of the community was unlikely to be a major source of government revenue. It was not worth the government investing in the craftsmen of the area in the circumstances that existed in that sector before the oil exploration. Thus the craftsmen of the E.C. were completely dependent upon the sale of their goods for their livelihood and there was no external financial support or advice available to them.

Nowadays government policy is geared to more involvement in the manufacturing sector of the area, and its aims are to develop local facilities and support the sector wherever possible in order to increase government income from it. It encourages this sector by providing data and resources to enable development of business. The government provides its help to local industry through local authorities and local agencies.

Government support for development of the area's seaports, airport and the establishment of trade centre have also helped to expand the manufacturing sector in the E.C. and the increased revenues which have accrued to the government through its investment and business fees have led the government to take an increased interest in it. The Emirate of Fujairah is one example of this, the Emirate owns or shares more than 50⁷ per cent of the total manufacturing companies in Fujairah.

4. Trade

Besides fishing, farming and the manufacture of locally needed commodities, there were few other traditional economic activities in the E.C. before the advent of oil. This scarcity was due to the fact that trade was hampered by the lack of transport facilities and demand. Bartering was a common method of acquiring goods and farmers used to trade their agricultural produce for fish and pottery. However, there were a few merchants in the E.C., especially at Khor Fakkan, who used to import goods from the other Gulf states and from India and their goods found a market at harvest time and when fish were plentiful, ie when the local inhabitants had a surplus.

Today trade in the E.C. has changed in many ways from that described above. Government support, both direct and indirect, has been a major factor in the changes. For instance, it has been government sponsored building of roads and seaports that has made trade possible for the first time in many cases. The result is that the trade sector has improved dramatically in recent years and more and more people from the E.C. are now involved in new economic activities, such as import and export. The investment capital of the area has also increased, for example, in Fujairah alone investments increased from 8 million Dh in 1977 to 660 million Dh in 1988⁸. Most of the increased trade and investment is in food, clothing and domestic products.

Since government support is a major key in the development of the E.C., the next section will expand on details of the government's role in developing the E.C. (Table 5:3). Also it will focus on the government facilities and aspects of government activities in the area.

Table 5:3 Development chronology II

Date	Government's Role
1950s & 1960s	Less income Less government role Tax applied Less government facilities and services No government control on businesses
1970s	Setup of the MAF Starting of the oil wealth The beginning of government support to farmers and fishermen No more tax New houses and roads
1980s	More money to farmers and fishermen New government facilities Seaports Airport Trade centre Government involved in controlling and organizing the Businesses

B. Major government facilities in the E.C.:

It may be helpful to focus on the facilities now available in the area which are conducive to a buoyant economy. The E.C. is provided with social facilities by both federal government and the local government of each Emirate. The Ministry of Health operates four major hospitals in the E.C., the hospital at Fujairah for example is equipped with the latest equipment and receives patients from all over the E.C. The distribution of post offices in the area is excellent and provides an efficient swift service all over the world. The area is well served educationally by government-funded and private schools teaching Arabic, English and Urdu. The E.C. also has hotels (Chapter Seven) providing facilities for foreign visitors. All these are the type of changes brought about by economic development in the E.C.; other changes are the development of the social services and other facilities eg roads.

All of the above obviously contributes to the quality of life of the E.C.. The following are other facilities which are provided by the government to encourage the economic activities of the area:

1. Seaports and harbours in the area:

As outlined in the introduction to this chapter, the E.C. has access to the open water of the Arabian Sea and the Indian Ocean as well as to the Gulf and this location has meant its people have always engaged in fishing industry and in sea trading. The importance of providing good fishing harbours and seaports to connect the E.C. with the rest of the world was recognised early and, of course, the wealth of the oil industry has enabled these to be established. Now there are three major seaports

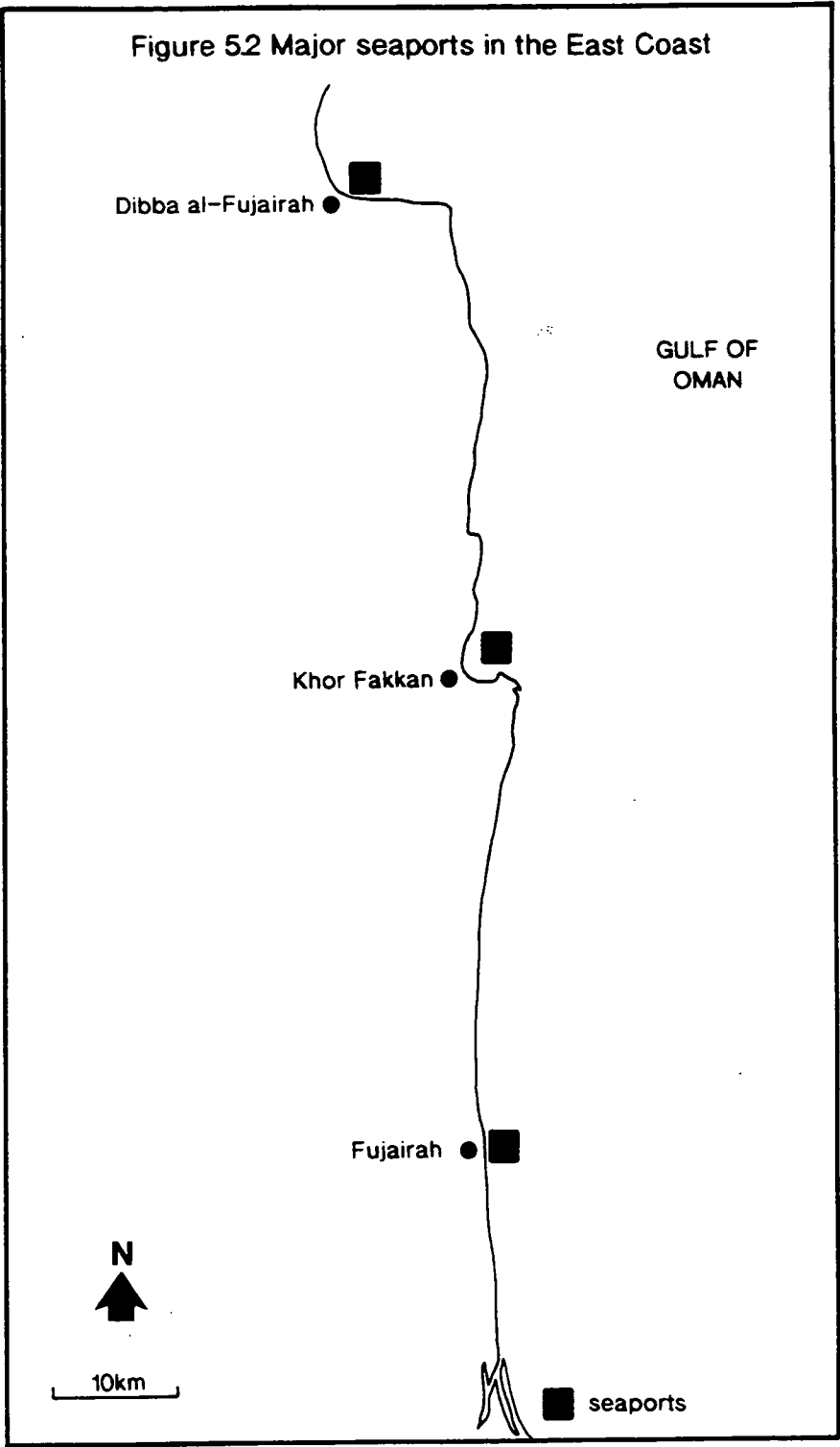
operating in the E.C., one at Dibba, one at Khor Fakkan and one at Fujairah (Figure 5:2). As Figure 5:2 shows, the close location of these three seaports could benefit the specialisation of each port in certain functions, eg roll-on/ roll-off (Ro-Ro) in Khor Fakkan and small containers in Dibba al-Fujairah. There are also five fishing harbours distributed along the coast north to south, at Dibba al-Husin, Murbih, Ghurfah, Kalba and Khor Kalba.

a. The importance of the E.C. seaports:

The E.C. has an old trade relationship with the Indian Sub-continent and the Gulf countries. Khor Fakkan (paragraph. b) which has a natural harbour has had a busy trade with the Gulf and the Indian Sub-continent since the early nineteenth century when merchants from the Gulf and India called there to pick up the goods produced in the E.C. and sell their merchandise to the inhabitants of the coast. Khor Kalba has a natural creek which from early days has provided a good harbour for fishing boats and many boats still set off from here for fishing trips.

The seaports of the E.C., especially Fujairah and Khor Fakkan seaports, provide excellent access for the UAE commodities to be exported to the rest of the world. The government have always recognised the importance of having good seaports located outside the Gulf, and the location of the ports is strategically important for exporting oil and importing commodities for the UAE.

The government recognised the importance of having good seaports in the E.C. both in times of peace and in war. At the time of the Iran-Iraq war, Iran considered closing the strait of Hormuz as an alternative to cutting exports by sea to Iraq. Most



of the Gulf oil, except the Saudi oil, passes through this strait and so an open access to the Arab hinterland which does not involve having to go through the Gulf is crucial for the continuing prosperity of the area as a whole. The government of the UAE also recognised early that having good seaports outside the Gulf would also reduce the pressure on the major seaports of the Western Emirates, and this was particularly important during the 1970s when the oil industry was at its peak.

Additionally the ports have played an important role in the development of the area as they were ideal for taking the construction materials imported in increasing amounts as urban development grew in the UAE and the Gulf in general. At the end of the 1970s most of the Gulf seaports were very busy and overcrowded which led to ships being delayed as they waited their turn to unload⁹. These delays were costly as well as undesirable and put excessive pressure on the labour force and administration of the ports. This meant more seaports were needed and the development of ports on the E.C. was especially attractive as they would be based on the open sea.

In recent years E.C. seaports have played an increasingly important role in UAE foreign trade. In 1980 only 1.7 per cent of the total UAE foreign trade went through the seaport of the E.C. (at that time Khor Fakkan was the only seaport in operation). Six years later 13.5 per cent of the total UAE foreign trade passes through the seaports of the E.C.¹⁰

The UAE government also recognised the importance of road transport between the UAE seaports and the Omani territories early and established new roads of modern design to connect the E.C. seaports with Sharjah International Airport and Fujairah International Airport (FIA) and the other cities of the UAE. The distance between the

seaport and the airport of Fujairah takes only 10 minutes by road which makes the area very attractive for the re-export trade.

The location of the ports of the E.C., near the ports of the Indian Sub-continent, the Far East, those of Africa and the Gulf, give the area a unique importance as regards the shipping lines between the Far East and Europe. Many oil and cargo vessels use E.C. ports as transit stations, for example cargo vessels from Kuwait to Colombo stop at one of the E.C. ports as a halfway point (Kuwait is 586 nautical miles from the ports of the E.C., Colombo is over twice that distance). This location factor attracts many of the shipping lines from the Far East and Europe dealing with Gulf trade into the ports of the E.C. (Table 5:4). The table shows that Bandar Abbas seaport on the Iranian coast is the nearest seaport to the E.C. seaports only 110 nautical miles away. This could play a major role in developing the export and the import industry between the UAE and the Iranian coast.

b. Major seaports in the area:

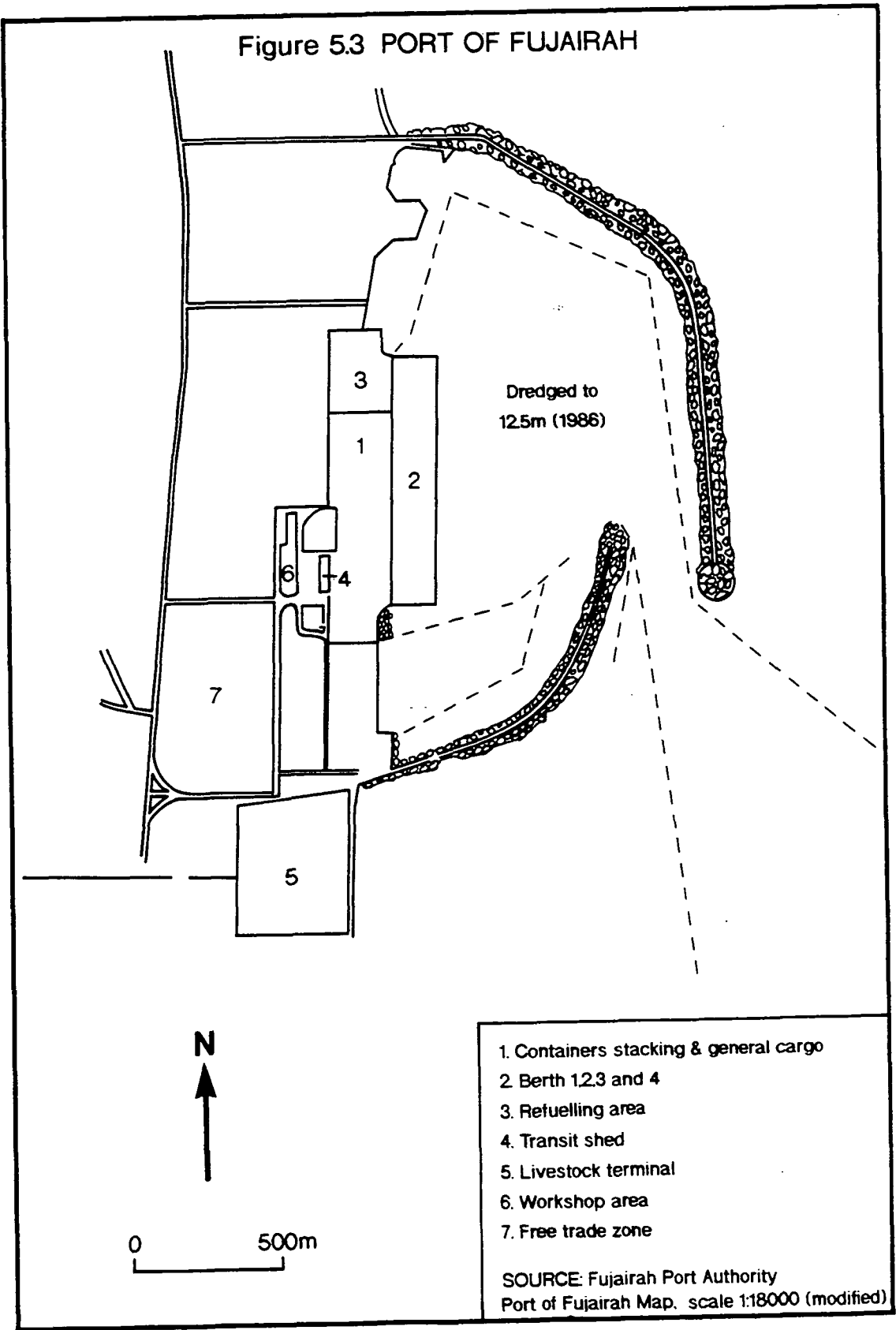
1. Fujairah seaport:

In 1978 the government of Fujairah began the Fujairah seaport project. The first stage of the construction of the port cost around 48 million USD and 28.2 million USD was allocated by the government for the second stage of construction¹¹. The port was completed in 1980 and the installation of equipment to run the port was completed by 1983 when it started to operate. Since then the government of Fujairah has spent a considerable amount of money installing new equipment at the port to enable it to take its part fully in the shipping industry of the area (Figure 5:3). The

*Table 5:4 Distances and steaming times from the East Coast ports
to the world ports (in natural miles).*

Gulf Port	Hours at			Distance
	12 Kts.	15 Kts.	18 Kts.	
Bahrain	33.4	26.7	22.3	401
Bandar Abbas	9.2	7.3	6.1	110
Dammam	37.5	30.0	25.0	450
Doha	29.1	23.3	19.4	349
Dubai	14.2	11.3	9.4	170
Kuwait	48.8	39.1	32.6	586
Muscat	13.3	10.7	8.9	160
Other Ports				
Aden	113.0	90.0	75.0	1357
Bombay	83.0	67.0	56.0	1000
Cape Town	384.0	307.0	256.0	4609
Colombo	145.0	116.0	97.0	1739
Durban	318.0	255.0	212.0	3819
Karachi	48.0	38.0	32.0	570
Mombasa	189.0	151.0	126.0	2268
Port Sudan	168.0	134.0	112.0	2010
Singapore	274.0	219.0	183.0	3285
Suez	222.0	177.0	148.0	2659

Source: K. Fakkan and Fujairah sea ports.



port was built by the South Korean company Hyundai Engineering and Construction. Until the end of 1986 a British company, the Felixtowe Dock and Railway Company, managed the port for the government under a five year agreement¹². When this agreement came to an end the government of Fujairah took control from the British company and now runs the port itself.

Sea/air cargo has become an important feature of the economy of the area. In 1988 the port handled 16.5 million kilos of sea/air cargo¹³, making it the second biggest cargo handler in the UAE (Dubai's port Rashid is the first) and Fujairah seaport has earned itself a reputation as the 'Mother Port' of the Gulf¹⁴. According to the statistical report of the World Container Ports League, the port of Fujairah has risen in the last few years from 60th to one of the top 40¹⁵. This increase in importance of the port comes from its excellent location vis a vis the Gulf and the quality of the port facilities which smoothly handles third and fourth generation cellular vessels.

The main features of the Fujairah seaport are:

- (a) Its location on the open sea, with no natural obstacles to its entrance.
 - (b) The importance that the Fujairah government attaches to the port because, with the airport of Fujairah, it represents one of the most important schemes for their new development. The government has invested an enormous amount of money on these two, hoping to recoup this in an increase in government incomes within a short time.
- The continuing government interest in the port means that it is attractive to world shipping companies to use it as a base for their operations from the east and west as they can feel safe that the port facilities will be able to keep up with new

developments because of the backing of government funds.

(c) The large amount of quay space. There are three major quays at the Fujairah seaport, the first is 600 metres with a 12.5 metres draft, the second is 180 metres, with 11 metres draft, and the third is 290 metres with 7 metres draft¹⁶.

(d) The port is provided with two IHI gantry cranes which have a minimum outreach of 34.5 metres and capacity of 40 tons. The port is also equipped with one IHI Post Panamax gantry crane with an outreach of 39.6 metres and a capacity of 40.6 tons, two mobile tons cranes with a capacity of 24 tons and three 40 ton top loaders. It also has a variety of tractors, forklifts and trailers to handle all the types of goods which the port handles.

(e) General cargo is a big proportion of the work of the port. It has 7,800 square metres of container storage, 2,500 square metres of transit warehouse storage and 84,000 square metres of paved land which is used for open storage for containers and general cargo¹⁷.

The following cargo statistics show an incredible growth rate in the cargo industry at this port, for example, during the six years of the port's operation the number of vessels docking at the port increased from 339 in 1984 to 1,297 in 1989. At the same time the total tonnage of general cargo increased from 16,570 to 106,697 (Table 5:5). These increases demonstrate the importance of the port in the shipping world. The table also shows the increase in oil cargo through the Fujairah seaport from 113,058 in 1984 to almost double this figure in 1989. In 1988 the port started the sea/air cargo industry with full arrangement between the port and the airport of Fujairah.

Table 5:5 Fujairah sea port cargo statistics from 1984-1989

	1984	1985	1986	1987	1988	1989
Vessel Calls	339	477	728	713	918	1297
TEU Throughout	87099	133385	138558	188129	202893	270661
General Cargo	16570	28442	78056	162607	143669	106697
Bulk Cargo	883185	461690	771635	443301	588105	249677
Livestock	206800	716732	591178	753201	215093	152512
Oil Cargo	113058	77482	95318	186334	105714	209913
Sea/Air Cargo	00	00	00	00	16153	19580
Container V/L	00	00	137	202	254	N.A.
Total Tonnage	N.A.	N.A.	2155016	2443537	2534329	3060836

Source: Port of Fujairah. Information Handbook, 1990, p. 16.

(f) Free Trade Zone:

The government of Fujairah established a free trade zone in 1988 to attract multi-national companies to set up business in the area. The trade zone offers the following facilities to companies:

- (1) 100% foreign ownership and repatriation of capital and profits;
- (2) Duty free imports and exports;
- (3) No sponsorship restrictions;
- (4) Cheap land and energy;
- (5) No currency restrictions, corporate taxes or personal income taxes.

The following is the answer given by Dr. Salim Abduh, technical adviser to Fujairah government, when asked what the government's intention was in providing these facilities:

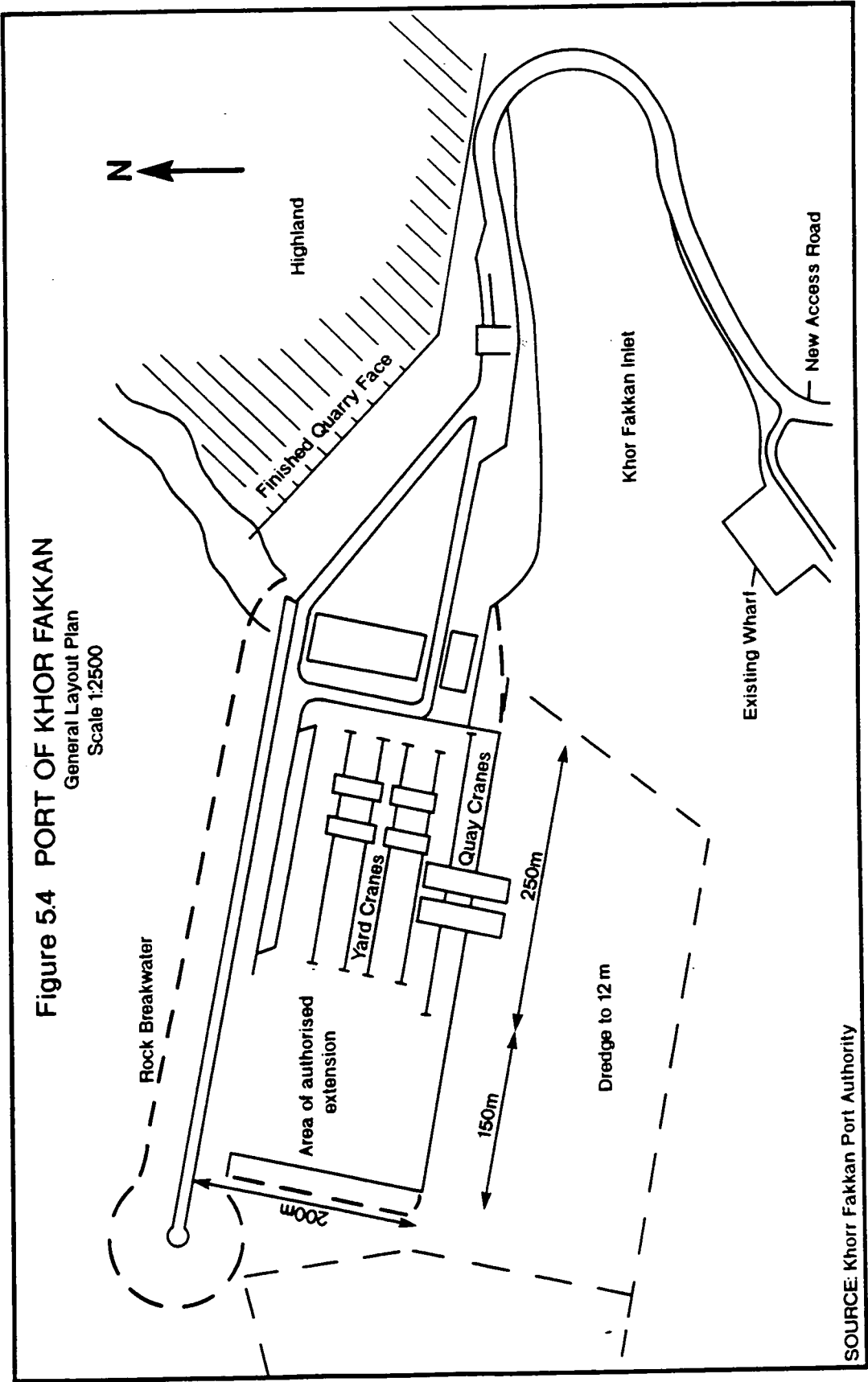
"We are not the only seaport authority in the area who give all these facilities, some other seaports offer the same facilities. We hope that these facilities will attract more and more companies to move into the area and thus benefit the whole of the E.C. Maybe in the future the government will apply rules to increase its revenue from these facilities"¹⁸.

All the above facilities are offered to companies interested in operating in the area. As a result in 1988 the port authorities received 50 applications to operate within the free trade zone¹⁹. Most of these gained government approval and established business. With the many facilities provided and the completion of the FIA, the E.C. looks set for a boom in the area in the near future and has the facilities to handle the sea/air cargo which this will bring in its train.

It is envisaged that the port of Fujairah could reach its objectives and full potential within a few years of its establishment if government support is increased in terms of administration and funding for facilities required to bring the port up to international standards.

2. Khor Fakkan seaport:

The port of Khor Fakkan is one of the oldest in the region, with the oldest natural harbour in the UAE. It was the first seaport in the E.C. and most of the ships passing into and out of the Gulf use this harbour. Its location between the mountains of the Hajar ensures good shelter for ships from the strong winds and high tides to which the area is subject (Figure 5:4). As Figure 5:4 shows the east part of the port is surrounded by the highland which makes the port a safe place for small ships. Because the water of the harbour is very deep, it was economical to exploit it and a saving was made on the project to deepen the port which was undertaken in 1977 by the Sharjah government. The port was commercially established in 1979 when it was equipped with a container terminal and began playing a role in the shipping industry. From that time on the facilities of this port induced multinational container companies to use it on their regular lines for their operations from America and Europe to the Gulf countries and the Far East. However, as the Khor Fakkan seaport is considered to be the second major seaport after Khalid Seaport (on the west coast) in the Emirates of Sharjah, it has fewer facilities than the first seaport (Fujairah). The port of Khor Fakkan is older than that of Fujairah but, because of its location and the policy of the government of Sharjah, it remains a small seaport. In the mid-1980s, however, with the Iraq-Iran war ending, the government is began to pay attention to



this port as one ideally suited to serve the shipping needs of Europe, America and the Indian Sub-continent. Since November 1986 the container terminal at the port has been managed by the Gulftainer Company, who also manage the container terminal at Port Khalid inside the Gulf. In 1990 there were eight regular marine lines calling into the seaport of Khor Fakkan. In the same year the port received an average of 35 ships a month²⁰, in comparison with an average of 250 vessels calling at the port of Fujairah over the same period.

Khor Fakkan port has two berths totalling 430 metres in length, 12.4 metres in depth plus a Ro-Ro pontoon measuring 60 metres by 40 metres, with a capacity of 1890 tons which is able to operate two vessels at the same time²¹. To handle cargo the port is equipped with six cranes, two of which are 41 ton cranes. There are third generation Mitsubishi gentry cranes and four 41 ton Mitsubishi yard cranes. There are also two tugs of 2,100 HP fitted with fire fighting equipment²² and the port contains an open storage area of 100,000 square metres.

From the port statistics we can see that during the eleven years from 1979 to 1989 the port received only 2,911 vessels with an average of 265 ships in any one year. This number is small for a seaport located on the open sea, like Khor Fakkan. The port began to receive more ships after the Iraq-Iran war ended and there was a danger of the strait of Hormuz closing.

Port Khor Fakkan handled 238,882 tons of general cargo in 1983 but by 1989 this had declined to 400 tons per annum, (Table 5:6) perhaps the major side-effect of the success of the Fujairah seaport which began operations in 1983. The container business has also declined, from 190,981 TEU's in 1986 to only 117,486 in 1989 but

Table 5:6 Khor Fakkan port statistical report between 1979-1989

Years	No. Vessel	TEU's	Total Tonnage of G. Cargo	Ro-Ro Units	Fresh Water M/tons
1979	29	2379	57082	N.A.	N.A.
1980	119	21239	71328	6856	//
1981	184	21596	112933	321	//
1982	63	342	102047	2	//
1983	73	19	238882	293	62679
1984	214	N.A.	195449	240	60703
1985	252	40103	85110	148	94164
1986	427	190981	3881	N.A.	97637
1987	512	62380	18965	600	33543
1988	556	124218	4000	13	55911
1989	482	117486	400	00	45742

Source: Khor Fakkan port memo, Feb. 1990.

this is still considered a healthy trade for the seaport and, as the Khor Fakkan port statistics table shows, annual amounts of cargo vary considerably, making averages useless for information purposes. The table illustrates that the number of vessels calling at the port increased after the mid 1980s to reach a peak in 1988 (556), which shows the importance of the area's ports.

One important feature of the seaport at Khor Fakkan is that, like the container terminal at Port Khalid, the container terminal is administered by Gulftrainer. This means there is a flexibility in managing the two ports, one located outside the Gulf, the other inside, and the arrangement also means that equipment and personnel can be moved from one port to the other to cover times of peak demand. This arrangement obviously is advantageous to both ports.

Freights from the Khor Fakkan seaport are transported via the domestic highways to the airports at Fujairah and Sharjah, and as, it is located in the north of the E.C., it serves the Omani villages in the north as well as the E.C. hinterland.

The prime locations and good facilities of the above two seaports obviously has encouraged an increase in the handling of cargo in the E.C. and by 1989 E.C. seaports handled a total of 107,097 tons of general cargo and 388,147 twenty equivalent units (TEU) in container cargo. This business is continuing to grow as a result of the increasing numbers of container companies becoming interested in using E.C. ports.

3. The seaport at Dibba:

The seaport at Dibba cost around 100 million Dh²³ and is located to the east of the town of Dibba. It was designed by Sir William Halcrom and Partners to serve

government's role in developing the area. The administration of Port Dibba and Fujairah comes under the Fujairah government which is continuing to invest heavily to develop these ports to give better services to international shipping. It is clear from the annual statistics that more and more companies are applying to operate from these ports (especially from that at Fujairah) and that the number of vessels calling at the ports (again, especially of that at Fujairah) is increasing. The port authorities at Fujairah recorded 1,297 vessels calling in 1989 and confidently expect to double this number in the next few years.

However, the port at Khor Fakkan is not faring as well. In 1989 the total number of vessels calling at the port was only 482 as compared with 556 in 1988. It is envisaged though that, with a little promotion of the port internationally, it too could play a role in the economic development of the E.C.

The above demonstrates the government's role and objectives in port management. They have invested heavily in installing the latest equipment at the seaport of Fujairah to enable it to comply with international shipping standards for large vessels. Additionally the government is endeavoring to train the local labour force so that the port can eventually be run by E.C. nationals and already E.C. employees are taking a major part in port administration, especially at the ports of Fujairah and Dibba.

As regards the free trade zoning of the ports, Fujairah already had the facilities required to enable a free trade zone to operate there and, so far, they are doing a good job with sea/air connections which will eventually make the E.C. a prime location for international re-export business.

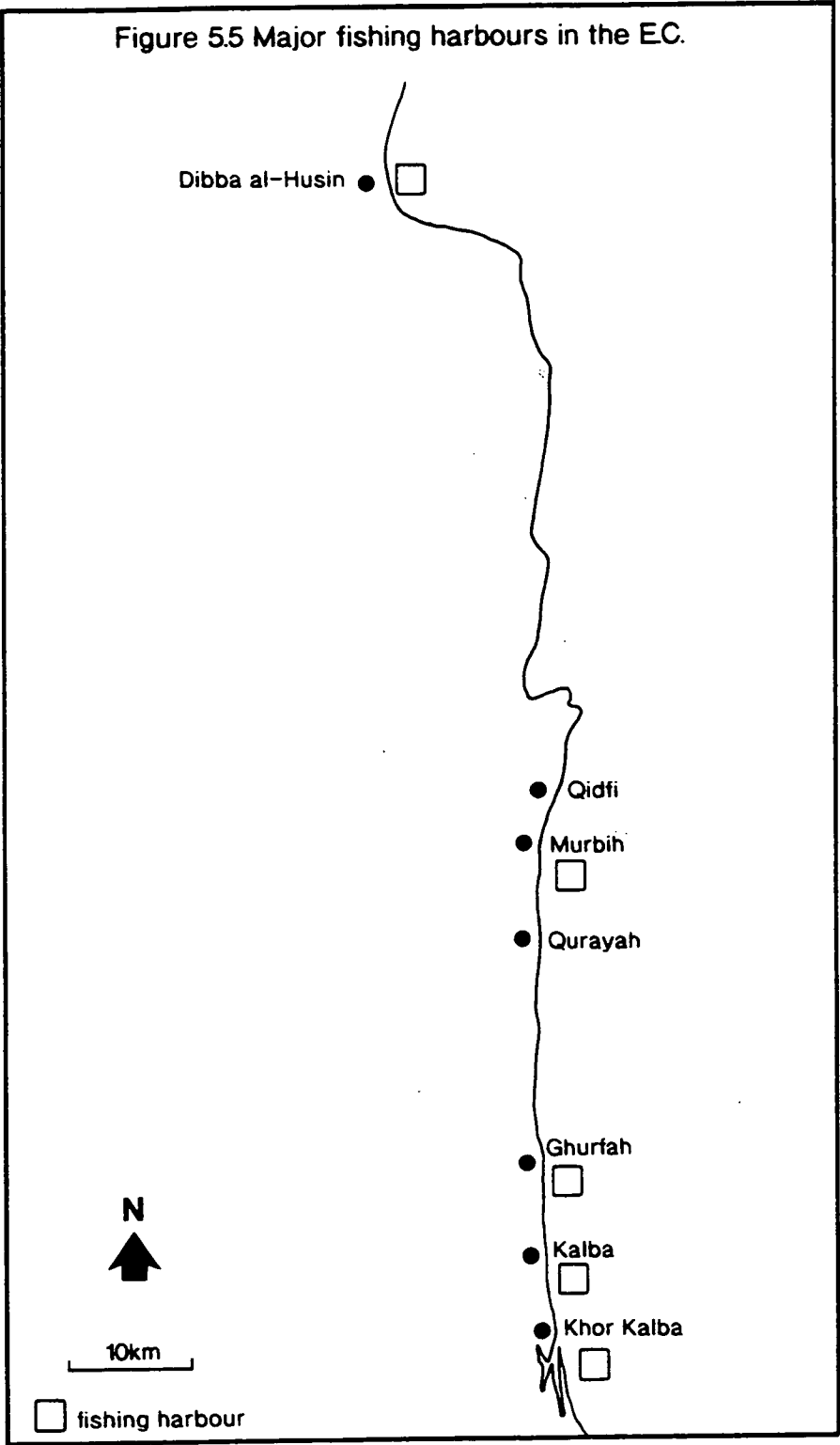
On the other hand, the seaport of Khor Fakkan, located as it is with mountains on both sides, is unlikely to develop as an important free trade zone. It has limited land available for future expansion and this factor will also inhibit its future development as a major port. Unless there is some agreement between the two ports as regards specialisation, eg containers or Ro-Ro at one port only, there is little benefit to be gained by two seaports operating so close to each other. This means there will be a limited role for one of these ports in the future development of the E.C..

In general, the three seaports on the E.C. have played different roles in serving the E.C., eg Dibba seaport has been used by some of the E.C.'s inhabitants either for fishing or pleasure, while Fujairah port is used by international shipping lines. These ports give the E.C. a good position among the other world developed regions.

c. Major harbours in the E.C.:

Many fishing harbours have built in the E.C. in recent years. Most of these are located in the area where fishing has been a major occupation for many years. These harbours were constructed by the Sharjah and Dubai governments to provide safe shelter for the fishing boats of the area and some have recently been enlarged as a result of government financial support (Figure 5:5). This also, of course, reflects the continuing importance of fishing to the inhabitants of the E.C.

These harbours have many advantages for the fishermen. They do not have to pay any fees or taxes to the government to use the harbour facilities and the harbours are provided with breakwaters ensuring safe shelter for their boats. Consequently most of the region's fishermen anchor their boats in these harbours. The harbours are also



used widely by the part-time fishermen and owners of pleasure boats.

Fishermen usually construct small storage sheds for their equipment and tools for their boats and the port authorities do not charge for the space used (Figure 5:6). These storage sheds are usually made from palm tree leaves, fronds or mats.

The harbours are also used as a selling place for fishing, eg Kalba harbour, and some fishermen also build and maintain their boats at these harbours.

At the present the E.C. has five small fishing harbours serving the whole coast from north to south.

1. Dibba al-Husin fishing harbour:

This harbour represents the farthest point of the UAE territory in the north and is located close to the Omani border. The harbour covers an area of 53,000 square metres²⁴. The owners of small and medium size fishing boats gather at this harbour early in the morning to sell their fish to dealers who travel from elsewhere. It is close to the town centre and the vegetable market and thus also serves the area around Dibba al-Husin (Figure 5:6). It is a gathering place for fishermen from all over the E.C.

2. Murbih fishing harbour:

The fishing harbour at Murbih was constructed to satisfy the need for a small fishing harbour to serve three local fishing villages. It cost the government 18 million Dh to build and is located at the entrance to the city of Murbih, between al-Qurayyah and Qidfi and serves all three places. The harbour is not very deep, only four metres at its entrance, but this is sufficient for local fishermen who tend to own small fishing boats. It is also used as a base by the coastguard which patrols most of the E.C.



Figure 5:6 View of fishing boats anchored at Dibba al-Husin fishing harbour (above) and fishermen's stores, made of palm tree fronds at Kalba harbour (below).



coastal waters.

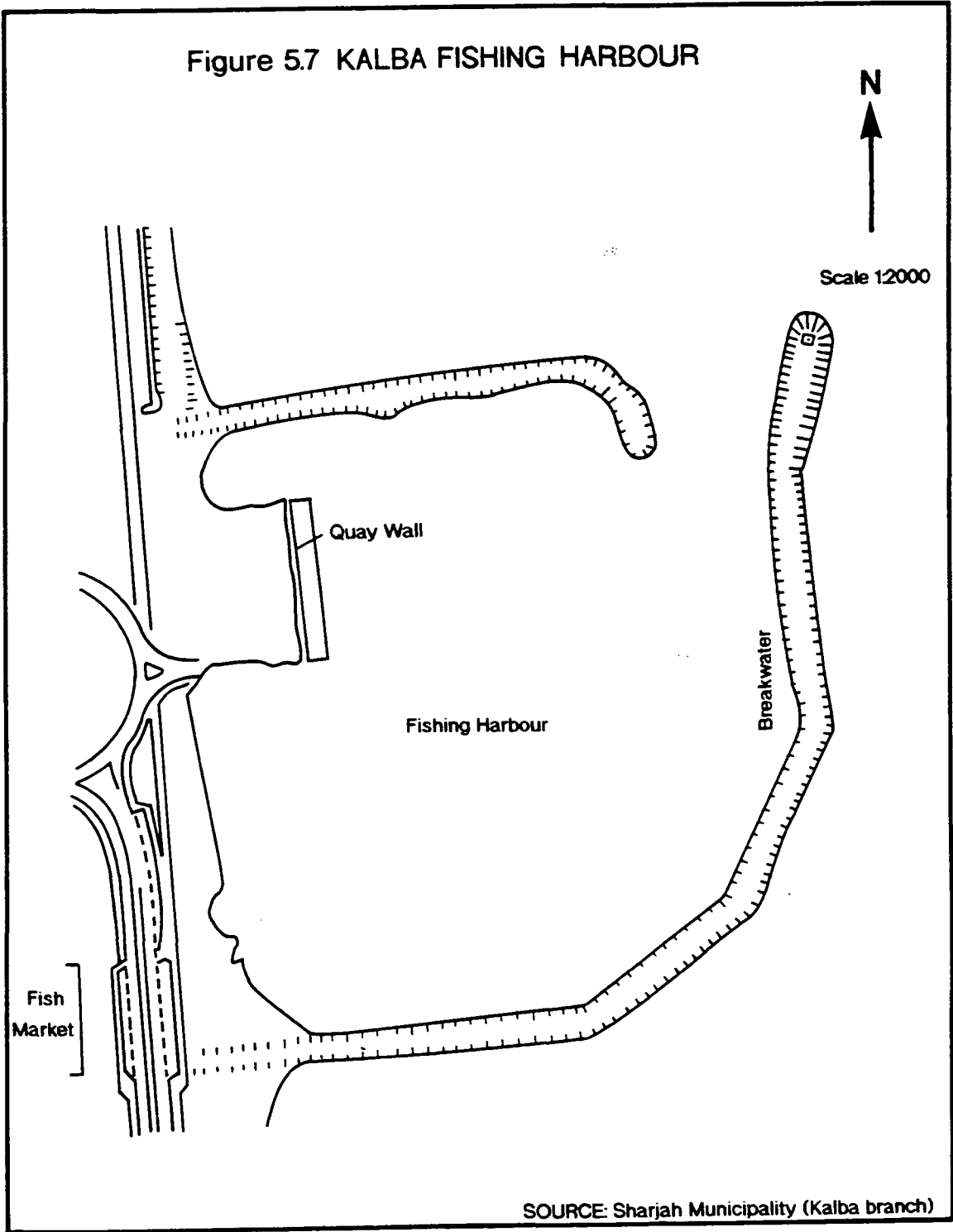
3. al-Ghurfa fishing harbour:

The location of this harbour enables it to serve the fishermen of Fujairah, Ghurfah, Reghailat and Mirishaid, and it is close to the fish and vegetable markets of Fujairah. In design it is almost a copy of the harbour at Murbih and, like there, the fishermen anchoring there regularly have built themselves small storage sheds for their equipment and tools. More than forty boats start out for fishing trips from this harbour every day and the catch is usually sold at Fujairah fish market which is only half km from the harbour.

4. Kalba fishing harbour:

This harbour is located in the old city of Kalba, and the harbour is also next to the fish market (Figure 5:7). Kalba harbour is considered to be the ideal design for the other E.C. fishing harbours which usually are provided with a breakwater and a small quay wall. The harbour replaced the old fishing harbour where many merchants, especially Iranians, used to land goods such as salt and fuel to sell or barter with the local inhabitants.

Kalba harbour is now used by companies to supply ships in the area with water and other commodities. Small fishing vessels also use the harbour and it serves more than 200 fishermen. Most of the boats anchored here are small one or two engine fishing boats. There are more than 15 stores built at this harbour for use by the local fishermen and at least 50 fishermen start their fishing trips from this harbour every day.



5. Khor Kalba fishing harbour:

This is a small harbour located very near the UAE border with Oman. Khor Kalba has a natural creek which has provided safe shelter for fishing boats for a long time. The harbour is used as the starting point for fishing trips into Omani waters.

Khor Kalba is designed to be a major seaport serving the area and as a result the Sharjah government have plans to develop this harbour on three planes: firstly to provide a breakwater to give better protection for local fishing boats; secondly to provide a landing and sale point for the catch of medium-sized fishing boats, and the government constructed small buildings to be used as a part of the harbour facilities, and a small fish factory (never used); thirdly to provide the harbour with the necessary equipment. This development has taken more than ten years and has suffered from cancellations and other problems, financial and otherwise, nevertheless some of the above facilities are now provided.

In conclusion, the fishing harbours in the area played a major role in the fishing industry in the E.C.. They gave the local fishermen a safe shelter for their fishing boats.

2. Air services in the E.C.

The geographical location of the E.C. has meant it has always had a certain strategic importance, (located midway between the Indian Sub-continent and the Far East in one side and the Middle East and Africa in the other), and this has meant that, even before the oil industry developed, it had some air traffic. In December 1932 the British built a small runway at Kalba²⁵ which served small military and civilian

aircrafts en route to India.

The desirability of another airport in the E.C. was recognised by the government of the UAE and the inhabitants welcomed the decision to build one. However, the government, looking to the future development of the area, decided to build an international airport rather than one for domestic purposes only. The decision arose as a result of increased attention focused on the E.C. by the government of the UAE and the role which it expected the area to play in increasing UAE trade with other nations and, of course, to take full advantage of the oil revenues of the area. Also, since all of the UAE international airports (Abu Dhabi, Dubai, Sharjah and Ras al-Khaimah) located on the west coast of the UAE, the need for another one on the E.C. was necessary to cope with the future development of the area and increased attention focused on the E.C.

a. Fujairah airport:

The original need for an airport in the E.C. was for domestic purposes, for local flights to and from other Emirates but, because of government policy for the E.C. (above) it was decided that the airport built at Fujairah would be an international one, to serve the E.C. generally and also to be useful in the general economic development of the UAE. The Emirate of Fujairah does not have rich oil reserves and is the only Emirate outside the Gulf, being located on the Gulf of Oman. Fujairah is a useful place for the UAE to have an airport and, hopefully, it will play a part in the encouragement of economic development of the E.C. and the UAE as whole. Geography, once again, can be seen to play its part, Fujairah airport, in the event of

problems (eg the Iran-Iraq war, invasion of Kuwait) would be a vital airport for the whole of the Gulf region. This alone would justify the existence of an airport of international rather than domestic nature and size. Its position on the Gulf of Oman directly facing Karachi is another useful asset. These factors, of course, are also ones which can be exploited to justify development generally in the E.C., and with this, and the present economic conditions of the E.C. in mind, the government directed its attention to developing the other resources of the E.C., and the manufacturing industries and tourism have been encouraged. The government has directed its attention and resources to developing the area as a base for industry and trade in order to increase its income from commercial revenue. To do this it has had to provide facilities to enable industry to be established and give support to companies already in the area so that they can operate and develop successfully.

Government policy has always been to develop the E.C. with the financial support of other Emirates in the federation, especially the oil rich ones like Abu Dhabi and Dubai this success of this policy has enabled the government to establish the seaport, airport and trade centre at Fujairah.

The construction of FIA began in 1983 and it was in operation by October 1987. It cost approximately 27 million USD²⁶. Even though traffic was expected to be modest for quite a long time, the government was far-sighted enough to provide the latest technology and thus the airport offers a very good service to airlines and has proved successful in attracting international airlines to use the airport. At the time of its opening the airport had only one runway 3,750 metres long, 45 metres wide, constructed in asphalt.

The airport buildings are made of local materials and the passengers' main terminal is distinctive with local marble and ceramic decoration. There is a duty free shopping centre offering a wide variety of merchandise which compares favourably with other duty free shops at other airports in the UAE.

So far six airlines use the airport for passenger and cargo services and others have shown interest in flights to the Far East and Europe.

1. The advantages of Fujairah airport:

The airport at Fujairah has an advantage over the other five international airports in the UAE in that it has excellent visibility the whole year. The other UAE airports suffer from fog for some days of the year, and this can force flights to change their destination.

Fujairah airport also has the advantage of being the only airport in the E.C. and being in a suitable location to serve a large part of the coast including the Omani borders from the north to the south. This feature means that the airport has an important role to play in the development of the E.C. and the Omani coast generally. Before Fujairah airport was opened air travellers from this area used to have to travel long distances to get to an airport. The establishment of the airport at Fujairah made air travel from the E.C. much easier and, by the time the airport is at full capacity with airlines from both east and west operating from it, it will be able to offer an excellent service, comparable with the other airports in the UAE.

2. Services provided by Fujairah airport:

Fujairah airport was established in the E.C. to provide the following services:

(a) Passenger services: At the moment the airport can handle 200 passengers per

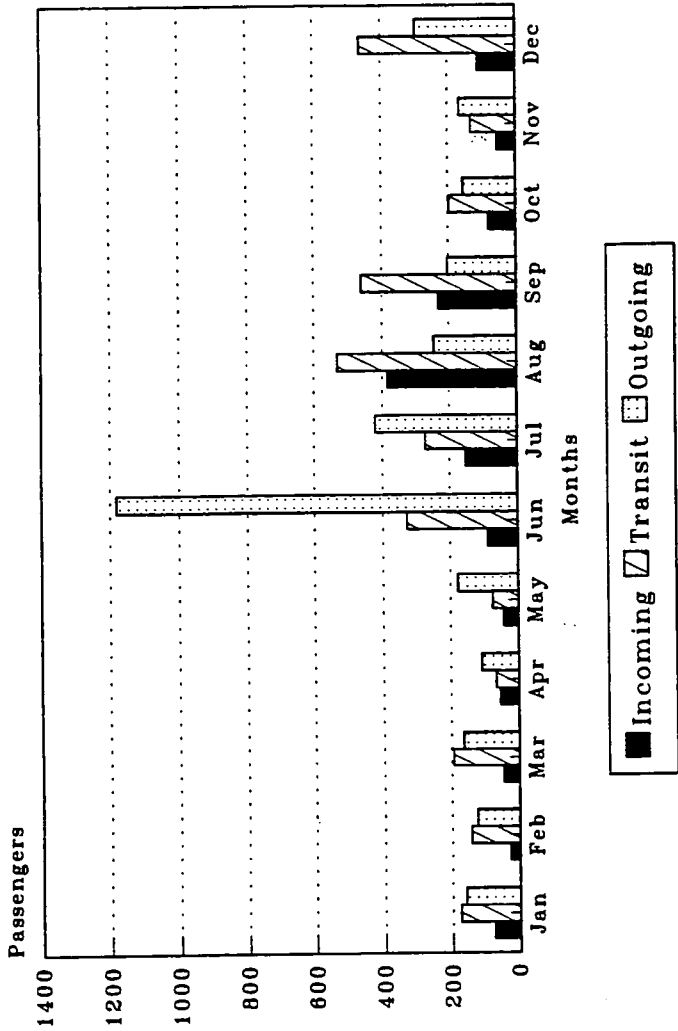
hour²⁷. This number may seem small in comparison with other international airports such as Gatwick or Dubai airport but it is capable of being increased when demand increases.

The airport serves the cities of the E.C. and also Oman whose northern and southern borders are nearby.

In 1989 the airport handled 7,826 passengers which was a 22 per cent increase from 1988. One reason for the increase is the development of holiday traffic. For instance many of the teachers in the E.C. are of Egyptian origin and use the airport in the school holidays to return to Egypt. Consequently most of the airlines who use the airport have increased their flights to and from the E.C. in the summer to handle the increased number of people wanting to travel during their holidays (Figure 5:8). As Figure 5:8 shows, passenger movement from and to Fujairah airport is increasing during the four summer months between June and September. The Fujairah airport passenger figure also gives more detailed information on the increase and content of passenger freight.

(b) Cargo: There have been major developments worldwide in the air cargo industry in recent years and the trend has been towards delivery of goods the same day or, at the latest, the day after sendoff. FIA has achieved this for its customers by close co-operation with the seaport at Fujairah. Both ports are equipped with the latest technology in handling cargo which has enabled them, in co-operation, to provide a very quick service. Recently the FIA set up a record with a timing of 45 minutes for loading a 747 Saudi cargo craft²⁸ demonstrating the efficiency of its modern equipment and cargo handlers. In 1989 FIA handled more than 200,000 kg of general

Figure 5:8 Fujairah International Airport passenger
statistics, 1989.



Fujairah International Airport, 1989.

cargo, most of which came via the seaport at Fujairah (Table 5:7). As Table 5:7 shows most of these cargo movement has occurred during the month of April. In the same period, 97,945 kg of air cargo left the airport, most of it coming from Fujairah seaport and other UAE seaports eg Dubai.

(c) Military purposes: The airport has been used by small military aircraft for training and for purposes of national security. During the Iraq-Iran war and the Gulf Crisis it had an important military role to play in guarding the E.C. In 1989 the airport had a total of 400 military arrivals²⁹ which represented 20 per cent of total arrivals to the airport that year.

(d) Training: The airport incorporates the Fujairah Civil Aviation Centre. The centre cost 3 million Dh and was established to train E.C. pilots. An average of 40 training hours are required to qualify as a pilot and at the centre this costs approximately 19,000 Dh which is considered a reasonable price.

(e) Domestic/short flight facilities: The airport hires small aircraft for business and pleasure. A small aircraft and its pilot costs 300 Dh an hour to hire and this service is very useful for businessmen and officials in their work. It is also useful for researchers studying in the E.C. and nearby areas.

(f) Tourism: The airport is a fundamental part of the development of tourism in the E.C.. The encouragement of tourism is one way the government expects to get the maximum benefit from the airport.

In addition to FIA, there is a small runway at Khor Fakkan. This is mainly used by the MAF for aircraft used for crop spraying. It is also used for emergency landing of small aircraft, and for some pleasure trips.

Table 5:7 Fujairah International Airport cargo statistics, 1989 (in kilogram)

Month	Revenue		Non Revenue	Mail	
	In	Out	In	Out	
January	241	82	201	00	29
February	120	00	87	27	23
March	837	892	509	00	27
April	149	97945	216	00	15
May	19	87	321	00	58
June	12	2420	187	17	29
July	531	90	4	20	11
August	00	156	158	00	22
September	30	296	54	126	20
October	00	140	41	00	19
November	219	89	904	00	14
December	694	00	73	00	15
Chartered	106449	2200	00	00	00
Total	109301	104397	2755	190	282
					21

Source: Fujairah International Airport, 1990.

Generally, Fujairah airport could be an important facility in the E.C. and this will help in bringing more businesses to the area by the end of the 1990s as well as developing the cargo industry of the E.C.

3. The Fujairah Trade Centre (FTC)

The FTC is located in the heart of the town. It is modern in design and has up-to-date facilities. It is possible for those establishing in the area to conduct their business from the centre, to do their shopping there, and also to live with their families close by. Like Dubai International Trade Centre, the FTC was established to give impetus to the economic development of the area which it serves. It is plain from the decision of the Fujairah government to establish the trade centre here that it considers Fujairah to be a major focal point in the E.C.. The FTC is located next to the Fujairah apartment complex (Figure 5:9) and is only three minutes from the FIA. Many new businesses which have been already established elsewhere in the area move to the trade centre when they expand their business activity.

The FTC, with its tower block rising 10 floors above the shopping mall, dominates the skyline. Each floor of the FTC is equipped with all the necessary facilities for business, such as telecommunication, air-conditioning and the offices are large and well designed. Each floor consists of three wings, each with an area of 900 square metres, and the wings are capable of being divided to provide smaller areas for individual business needs.

The shopping mall is 6,500 square metres in area and is divided into small units, selling goods such as clothes and electronics. It also has 40 two and three-

bedroomed apartments available for rent at reasonable rates.

So far insurance companies and other commercial agencies have located their business in or near the FTC. The centre has organised many exhibitions promoting the area's commercial enterprises, including furniture and computers. It has proved to be a very useful facility for the UAE businesses seeking to expand their business in the area.

An important advantage of the trade centre is that any business can be established there without the complications of local sponsorship, as the FTC acts as sponsor for those enterprises wanting a commercial base in it.

4. The Fujairah Department of Industry & Economy

One of the government's main ways of encouraging economic development of the Fujairah area has been the establishment of a Department of Industry and Economy at Fujairah. This was set up in 1980 and plays an important part in the area's economy by liaising between government and investors.

"The Department plays a major role in the formation of modern, sound and steady infrastructure in the Emirate's field of economic, industrial and agricultural activities"³⁰.

The Department is very much involved with developing the natural resources of the Emirate. A very useful part of its work has been compiling and making available information on the area which is useful for commercial enterprises wishing to establish in the E.C. Once the department was established by government, it was, more or less, given a free hand to formulate its own policy and determine the type of work and direction of work necessary to promote the area. Besides putting in hand

such work as the compilation of a database for business (as described above), it has also taken up some ideas and suggestions which have come from private investors and experts doing work or research in the area. The department has welcomed these and in many cases taken such suggestions further by undertaking feasibility studies. If its finds on suggested ideas show projects are viable, then the department approves them and they are submitted to government for further action.

The pioneering of projects by the department has been an important factor in the economic growth in the area. Some of these projects have been undertaken for the government and some of these projects have resulted in very good financial returns, eg rockwool, ceramic and cement.

For the businessman and investor interested in establishing in the area, the department has been able to give guidance and advice as to the best ways to achieve required goals. Whenever possible the department tries to sit in on company meetings of policy and decision to ensure standards and quality of projects are high.

It is important to mention here that the Fujairah Department of Industry and Economy is a local authority-based institution and for some projects investors also have to apply to the Ministry of Economy and Industry for permission to undertake certain processes and business activities.

5. The Chambers of Commerce and Industry (CCI)

The CCI is considered to be the meeting point between the private and the government sectors. It also represents the private sector, and aims to protect their interests and incorporate their ideas and suggestions into future government plans

wherever possible. The Chamber also plays a major role in the development of industry and trade in the area. It puts traders and manufacturers in touch with the latest information and technology in their field.

In the E.C., the CCI is administered by local government and carries out government policy on the development of business in the area. Each CCI is comprised of members who pay fees to practice their business in the area. In return for these fees, the CCI provides its membership with a variety of business facilities and also connects members with national and international agencies which could enable them to increase their profits. The Chamber also tries to protect its members from fraud and deception and advises on these and other problems encountered in trading with local and foreign companies.

To establish a business in the area, three things are required:

Firstly, local government requires each company wishing to conduct business in the area to furnish certain legal documents, such as rent agreements, local government planning permission for the business to trade (approvals depend on type of business), before trading can begin. Fees are charged by local government and in return a licence is issued permitting the business to practise.

Secondly, the CCI must approve the business name and activities, this avoids adverse competition for existing companies and, of course, thereby protects existing members of the CCI. The Chamber issues a certificate of trading with the approved business name and activity on it. This certificate varies according to the nature of the business but it is essential for companies seeking contracts in the UAE to have such certificates. In return for its certificate each business pays fees to the Chamber.

Thirdly, companies have to satisfy fire regulations and inspection of business premises may be required by fire station officers. Additionally other approvals are also required depending on the particular activity of the business in question.

In all, the Chamber provides many facilities for its members. The following are some of the facilities it provides³¹:

- (a) It provides a meeting place for people from industry, trade and other business sectors to get together. It provides the organisation within which businesses can work to protect and promote their production, while also providing a voice for those interests.
- (b) It issues a trading certificate to its members, which is recognised as an important document in the UAE and overseas. This certificate is an important validation document, especially for those companies with import and export businesses.
- (c) It represent its membership in all economic activities inside and outside the country.
- (d) The Chamber is represented on most economic boards and organisations relating to industry and trade in the country and thereby can exert influence when policy is being formulated and decisions made which affect its members.
- (e) The Chamber conducts field studies and research relevant to particular business enterprises available to its members. The Chamber's library also provides members with the latest data on business generally.

The business activity of the E.C. is administered by two Chambers of Commerce and Industry, the FCCIA and the SCCI.

a. The FCCIA:

This body controls and organises business in the areas and is itself under the control of Fujairah government. The Chamber was established in 1981 as part of the government's general economic development. A branch was established in Dibba to provide more facilities to that area.

In 1990 there were 105 different types of business enterprise registered with the FCCIA, (for registered activities, see Appendix 1)³². There are many registered members practising each of these different economic activities, distributed over the area under FCCIA administration.

For administration purposes the FCCIA divides the various types of business enterprise into six categories or classes and aims to provide specific services to suit the needs of each category. Different fees are charged to the different categories according to the size of the company and the facilities provided by the Chamber.

The following are the six categories of economic activity:

1. Special category:

This category includes very large capital intensive companies practising in the area, and includes banks and insurance companies. The FCCIA charges such companies 5,000 Dh in annual fees, and provides them with essential information and ensures they conform with UAE legislation.

2. Distinguished category:

This is also called class A and includes most factories and import-export businesses operating in Fujairah. The FCCIA charges these companies 2,250 Dh in annual fees. For this they get their trading certificate and the Chamber promotes their

products and protects them from adverse competition whenever possible.

3. First class B:

Most car rental companies and second hand car dealers are enrolled under this category and the FCCIA charges them 1,500 Dh in fees. This fee allows them to trade in the area under FCCIA legislation.

4. First class C:

Many small to medium companies, eg automobile services, are enrolled in this class. The FCCIA charges them 750 Dh and in return they receive a trading certificate to enable them to practice in the area.

5. Second class:

The majority of small business in the area are enrolled in the second and third classes. For instance, in the second class are supermarkets and restaurants. The annual charge is 370 Dh. In 1990 nearly 18 per cent of the total registered business enterprises were enrolled in this category.

6. Third class:

Almost 25 per cent of the total registered members are in this class. They include most of the small stores in the Emirate, like cafeterias, tailors and small food stores.

Part of the importance of the FCCIA is due to its organisation of, and participation in, the important conferences and exhibitions held in the area. In 1989 the Chamber participated in 12 major conferences held in the UAE and internationally³³. In the same year the Chamber organised and took part in more than six exhibitions, some in the UAE and others abroad. In addition, 14 economic

delegations visited the Chamber that year to take a close look at the resources available and prospects for investment in the area.

b. The SCCI:

In 1970 the municipal government of Sharjah established the SCCI to organise the economic activities of that Emirate. The need for the SCCI arose as a result of a boom in business which occurred in the 1970s, and this boom enabled the Chamber to play a major role in developing the economic activities of the Emirate. In the early 1980s, the government began to focus more on the development of the Emirate territories and this resulted in branches of the Chamber being set up at Kalba and Khor Fakkan.

For administration purposes the SCCI divided the area's economic activities into three sectors:

- (a) The industrial sector: Most of the industrial activity of the area (under SCCI administration) is enrolled in this sector, including manufacturing workshops, boat builders, furniture manufacturers, sweet factories.
- (b) The commercial sector: More than 75 different economic activities are enrolled in this sector, including banks, contract companies, marine service companies, car rental companies and supermarkets.
- (c) The vocational sector: Most of the people who practise within this category are non-UAE citizens and include tailors, laundries and car garage services. There are about 36 different activities registered with the Chamber in this sector.

The Chamber also classes the members of the above sectors into six categories

according to the type of business enterprise and amount of capital investment.

There are two branches of the SCCI in the E.C.:

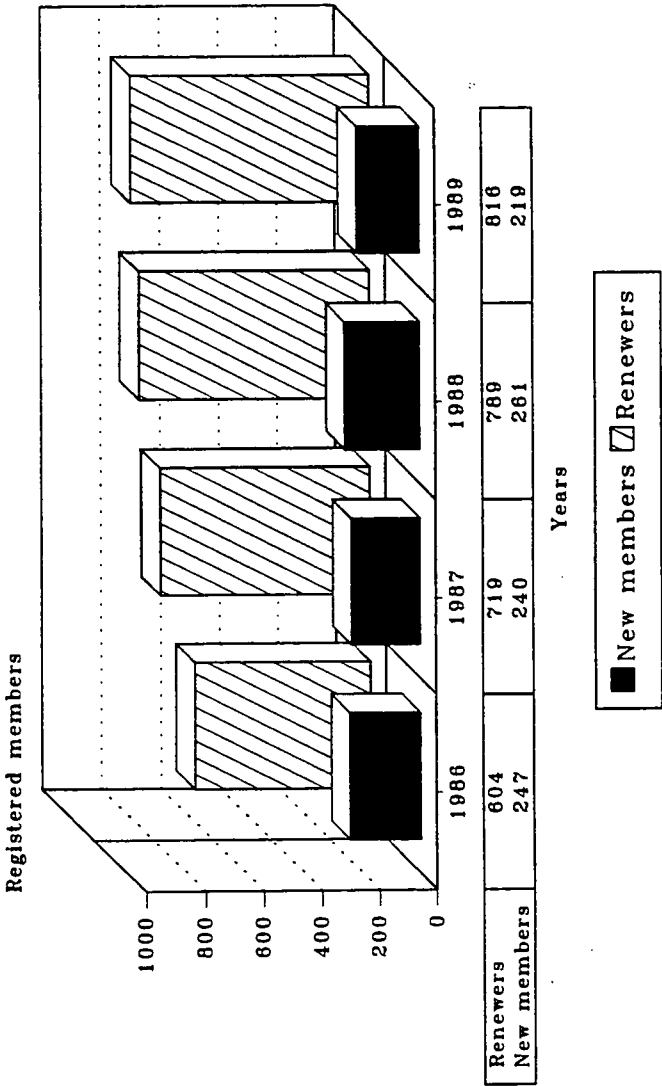
1. The Kalba branch of the SCCI:

With the commercial development of the area, a need arose for an organisation to serve the needs of the industrial, commercial and vocational sectors of business in Kalba and its environs. This organisation, the Kalba branch of SCCI, gave the government control over the economic activities of the area and, at the same time, gave official recognition to companies trading in the area. Before the establishment of the Chamber in Kalba, people set up in business as long as they could get a visa to work in the area, and new and existing traders did not bother to apply for trade licences. As trade licences are the main way in which the government ensures business enterprises conform to government legislation, before the Chamber was established the government had little or no control on the activities of business in the area. The Chamber altered this state of affairs and enabled the government to regulate commercial activities in the area to the benefit of the local inhabitants.

However whilst the establishment of a branch of the SCCI has enabled the government to regulate business to a certain extent within the area and has led to more traders renewing licences, from the membership figures (Figure 5:10), we see that more people are not renewing their licences in order to avoid paying fees to the Chamber. The cost of fees and degree of the government control exerted by the Chamber have also meant that some people hesitate to establish a new business in the area.

As Figure 5:10 shows, in 1986 604 members renewed their licences and 247

Figure 5:10 Number of registered members at Sharjah Chamber
of Commerce and Industry, Kalba branch between 1986-1989.



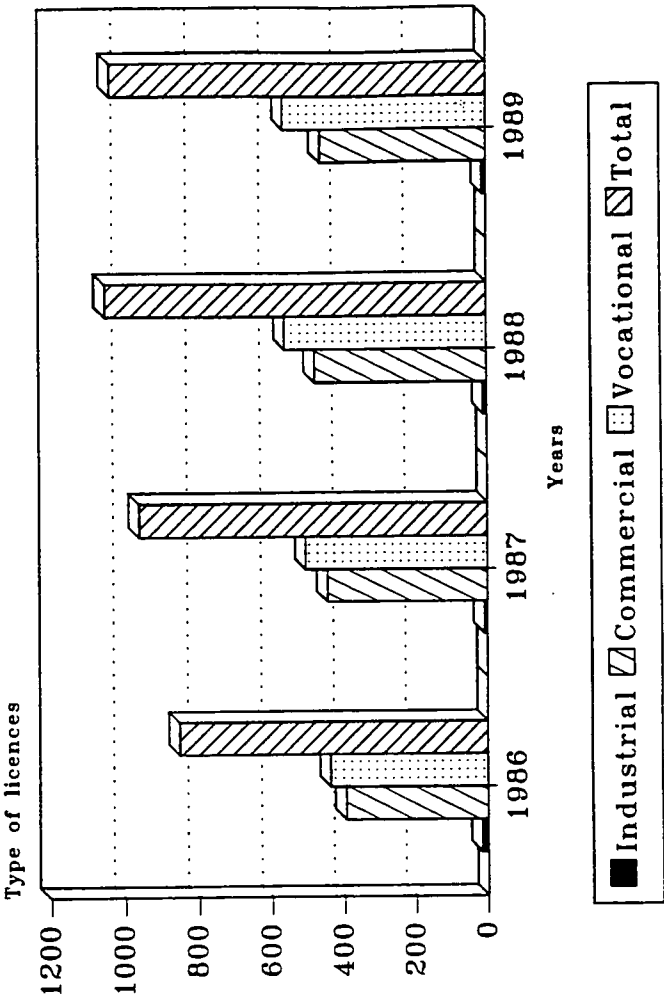
Sharjah Chamber of Commerce and Industry
Kalba branch, 1990

new members were enrolled. If we consider the number of new members enrolling every year, after four years the number renewing their licences should have been about 1,350 but, in actual fact, by 1989 only 816 licences were renewed and there were only 219 new members applying for membership. The estimated shortfall, over 500 members who should have renewed their licences, can be divided between those who have cancelled their licences because they are not trading anymore, and those who are having financial or sponsorship problems. It is the government's intention to put pressure on the traders who are out of the Chamber and who do not have trading licences. Legislation has been introduced to bring such traders into line and thereby force all traders in the area to comply with trade licensing laws. To this end to those traders who do not renew their licences regularly, an additional late fee is now charged. Recently the Chamber has also raised the level of fees charged.

The Chamber has three sectors of economic activity; industrial, commercial and vocational (Figure 5:11) and each has its own certificate of trade, or licence. Figure 5:11 shows that the registered members in the vocational sector are increasing from year to year. The increase of registered members in this sector is due to the fact that the area is close to Fujairah where most of the people in this area are using the products of those vocational members, especially carpenters and tailors.

The industrial sector is very small in Kalba and in 1989 comprised only one per cent of the total membership, whereas the commercial sector in the same year represented almost 44 per cent of the total membership, with 460 members practising in this sector. The commercial sector includes such business as tailors, cleaners and hairdressers.

Figure 5:11 Registered members according to type of licence at
SCCI, Kalba branch from 1986-1989.



Sharjah Chamber of Commerce and Industry
Kalba Branch, 1990

2. The Khor Fakkan branch of the SCCI:

This was established at the same time as the Kalba branch in 1980. Both branches are controlled by the E.C. administration department which operates from the SCCI head office in the Emirate of Sharjah.

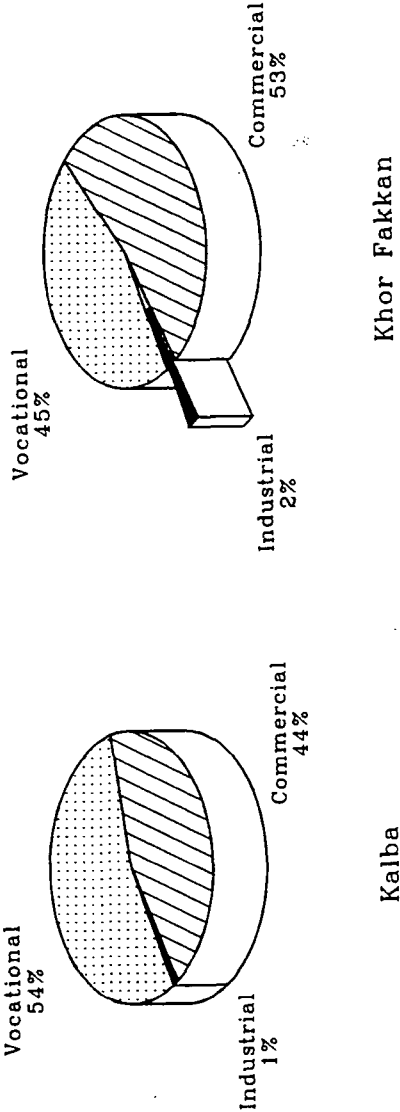
As with the other branches, the Chamber at Khor Fakkan divides its membership into three sectors of registered economic activity and issues licences to members according to their sectors of trade. In 1989 there were 1,231 registered members at the Khor Fakkan branch of the SCCI, with 53 per cent enrolled in the commercial sector, 45 per cent in the vocational and only 2 per cent in the industrial sector. These statistics represent new members and those renewing their licences during that year.

In 1989 the entire membership of the branch was 2,729³⁴ (this figure represents the number of trade licences issued until that year). According to the 1989 SCCI Khor Fakkan Chamber statistics, 379 licences were cancelled or in the process of being cancelled, there were 1,231 new and renewed licences, and 1,119 licences were not renewed in that year.

In comparing the two branches of the SCCI, the statistics show that in 1989 the number of registered members at Khor Fakkan was greater than at Kalba and at Kalba 54 per cent of the total membership were enrolled in the vocational sector whilst at Khor Fakkan only 45 per cent were in this sector (Figure 5:12). The commercial sector represented 54 per cent of the total membership at Khor Fakkan whilst at Kalba only 45 per cent were in the commercial sector.

The concentration of the vocational sector at Kalba may be the reason why the

Figure 5:12 Total number of members according to economic sector
at SCCI in Kalba and Khor Fakkan branches for 1989



Sharjah Chamber of Commerce and Industry
Annual Report 1989.

SCCI branch there is focusing on this sector. It is possible for it to do this as Fujairah is only two km from Kalba, and the Chamber there can provide more facilities for the commercial sector. As Fujairah has a seaport, and an airport and much government interest and investment has taken place to develop the commercial sector at Fujairah, the Chamber's facilities are correspondingly extensive, and it makes sense for the Khor Fakkan commercial sector to look to Fujairah for this provision.

In Kalba the vocational sector represents more than half of the total membership owing to the nature of the Kalba area where there are many small villages. The traders of these villages provide the membership of this sector of the Chamber.

At Khor Fakkan there is a large commercial sector because of the seaport and port facilities and because, historically, it was a commercial area even before oil exploration in the UAE.

On the whole, the Chambers of Commerce in the E.C. helped in organising the business in the area by registering the numbers of each sector. As well as providing the members with a lot of facilities, mentioned above, which enabled the members to monitor their business in the E.C.

Summary

As the above illustrates, the comparisons between the pre-oil and existing economic activities are very noticeable in everyday life in the E.C.. For the older people the changes are especially great, moving from a self-sufficient peasant economy with few material possessions to one resembling those in the Western World.

The government has a major role in bringing about these changes and the facilities already provided, and those planned for the future, by the government will help in developing the economic activities of the area still further. It is likely that government agencies, such as the Chambers of Commerce will play an increasingly important part in future economic activities, in regulating business and organising the economic sector to the benefit of the inhabitants of the area.

With co-operation between the various government agencies and those administering the facilities which help trade, the E.C. is capable of being one of the most important industrial and business regions in the UAE in the future.

Endnotes to Chapter Five

1. There is no reference to the number of cars in the area in the 1950s, but since the number of cars in Dubai was 24 in 1948 (which was a more developed area than the E.C. at that time and is still), it was probably doubled by the end of 1950s. Also because Kalba was an independent Sheikhdom in the early 1950s, the number is assumed to be close to reality.
2. Ministry of Interior. Annual Statistical Bulletin, number 12, 1989. pp. 520 & 528.
3. Indeed there is no specific amount of money available because the E.C. is part of the East Region section and the MAF does not allocate specific amounts of money to develop one agricultural region. The money is spent improving the agricultural conditions for the UAE agricultural regions as a whole.
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8. Ibid.
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10. Ibid., p. 50.
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17. Port of Fujairah. Port of Fujairah Profile, 1989, p. 1.
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32. Fujairah Chamber of Commerce, Industry and Agriculture. Personal contact, 17 January 1991.
33. Fujairah Chamber of Commerce, Industry and Agriculture. Annual report for 1989, p. 5.
34. Sharjah Chamber of Commerce and Industry, Khor Fakkan branch. Annual report for 1989.

VI. East Coast Major Problems As A Result Of The New Development

A. Water

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Summary

Endnotes to Chapter Six

VI. East Coast Major Problems As A Result Of The New Development

Whilst development of any area may have a beneficial effect, inevitably problems also arise. In the E.C. the development of the country which followed the injection of wealth from the oil industry also brought in its wake major problems. So far the government has recognised and tackled some of these problems, such as the problem of water, whereas others, for instance the danger of pollution, has not received enough attention from the government. Some of the problems now require urgent government attention. For others problems, eg widening of some roads, it may be wise for the government to wait to see the effect of future development in the area before tackling them. The increase in the demand for land for housing and business purposes will be discussed in Chapter Seven.

A. Water

The E.C.'s problem of providing an adequate clean water supply is one common to the whole of the UAE. The problem has been greatly exacerbated since the oil industry began as population and industry have increased dramatically since then. However, the topography of the E.C. has meant it has always had a water problem. The E.C. is a coastal plain, consisting of a narrow strip of land 1-10 km wide. Rainfall is seasonal, falling mainly in the winter. In the past, before the country could afford to buy the equipment and expertise for water conservation, most of its rainfall was lost. Wadis, water channels which dry up quickly after rainfall, were a feature of the whole area and rainfall flowed into these wadis from where it quickly

flowed into the sea or soaked into the soil of the wadi. This meant that for most of the year the area was arid and most residential areas were (and still are) clustered on the one or two km along the coastline or around wadis.

Development of the E.C. led to a growth in the size of cities, and a demand for urban facilities, many of which require water. An increase in population and many new government-sponsored projects requiring water has also exacerbated the water shortage. The three changes above have all increased the demand for water due to in the climate and topography of the E.C. was always a scarce commodity.

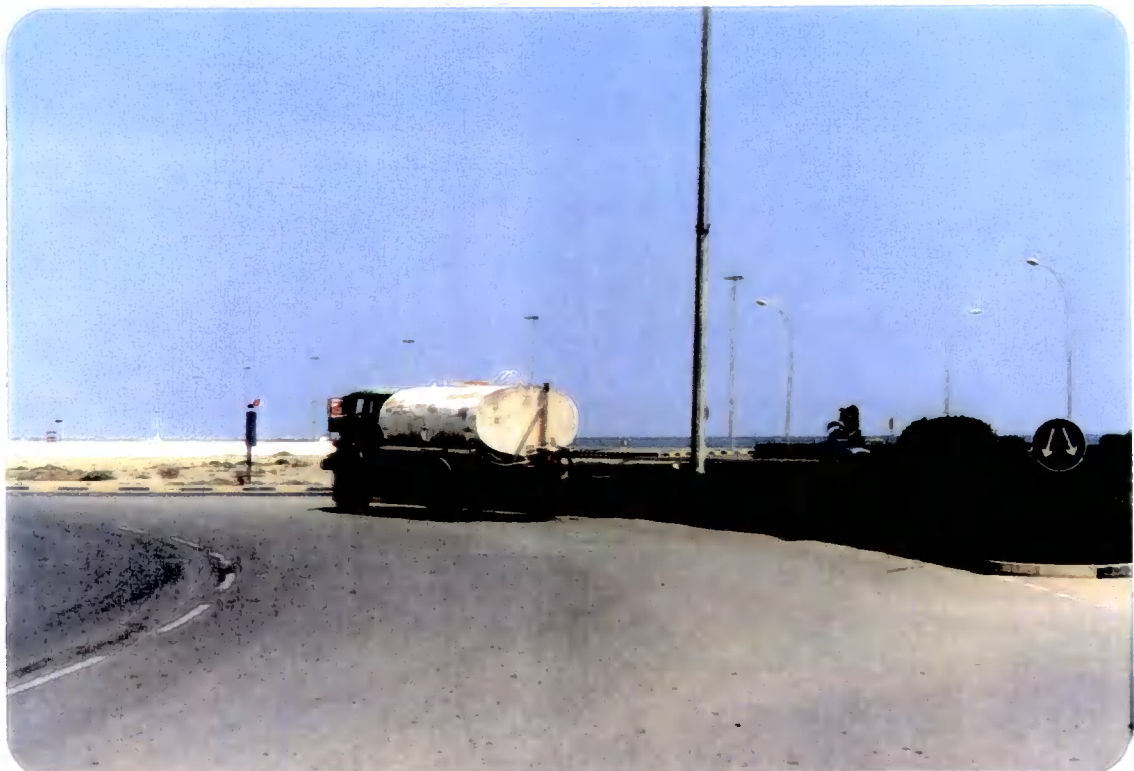
The water problem first became serious in the 1960s and early 1970s when cities were growing in size in the E.C. and water consumption increased dramatically. The population increase which came with urban development also produced a market for more agricultural production which, in turn, required more water. The advent of industry, and the many other changes that development of the area brought with it, all increased the demand for water and, in fact, due to a lack of efficient organisation of water supplies, much water was wasted in the new industries, as well as in the building of new housing and in agriculture, leading to a serious water shortage.

A major problem of the E.C. today is the provision of adequate drinking water. As a result new private companies entered to business to supply drinking water in some areas. In other areas drinking water is provided by water tanks which are filled by tankers delivering by road transport, a costly way of providing for a large volume of water (Figure 6:1).

We have analyzed the water situation in more detail below, examining the old methods of supplying water for domestic and irrigation purposes and those now



Figure 6:1 Private company selling water in Kalba (above) and watering the city's plants by water tanker (below).



existing in the E.C. in relation to the present problems of water shortage.

1. Water resources in the E.C.

To find the root of the water problem in the E.C., some details of on the water resources in the area are necessary. The E.C. has three sources of water: underground water, rainwater and distilled water from the sea (Figure 6:2). None of these sources provides a constant supply, the level of underground water varies from year to year depending upon precipitation; rainfall varies both seasonally and from year to year; and the supply of distilled water depends upon the amount of capital invested and is, thereby, of a limited quantity and expensive.

a. Rain:

The rain system shows an almost regular pattern, a 3 or 4 years period when rainfall averages about 127 mm per year followed by another 3 or 4 years period when it drops to 25 mm, and even to nil (Figure 6:3). The rain mainly falls during the winter months but there are exceptions to this and this unpredictability also, of course, makes rainfall an unreliable source of water supplies.

As the E.C. is coastal, if left to itself, the rainfall flows down to sea and is lost as a water supply for the area. Lately the government has constructed dams in the main wadis to store water and prevent it flowing away into the sea. In some areas where the open channels of the wadis meant a loss of water through evaporation and seepage into the soil of the wadi, dams have been built and now rainwater is collected in these and sometimes piped to some nearby farms. With the help of such

Figure 6:2 Diagram of water resources in the East Coast

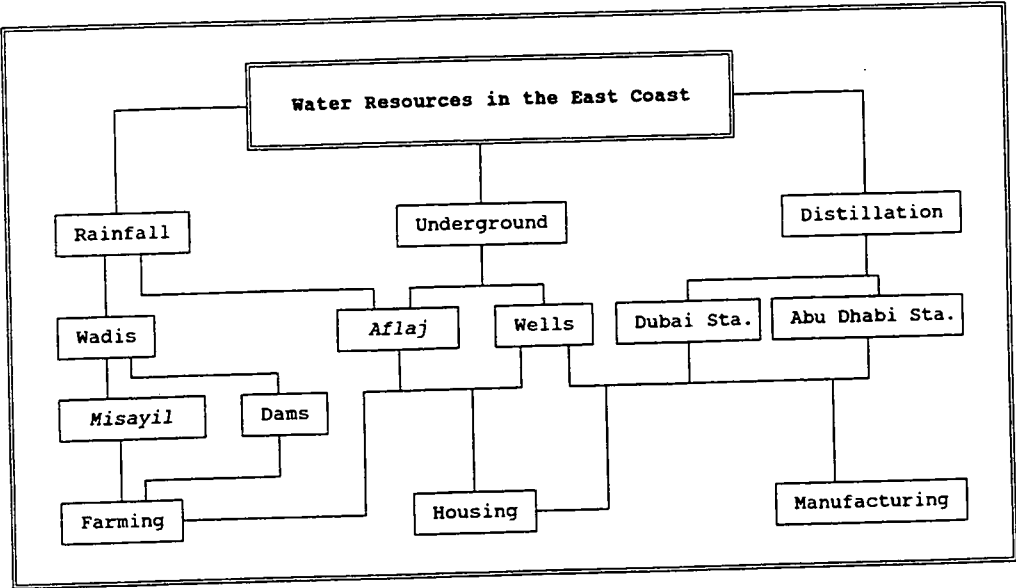
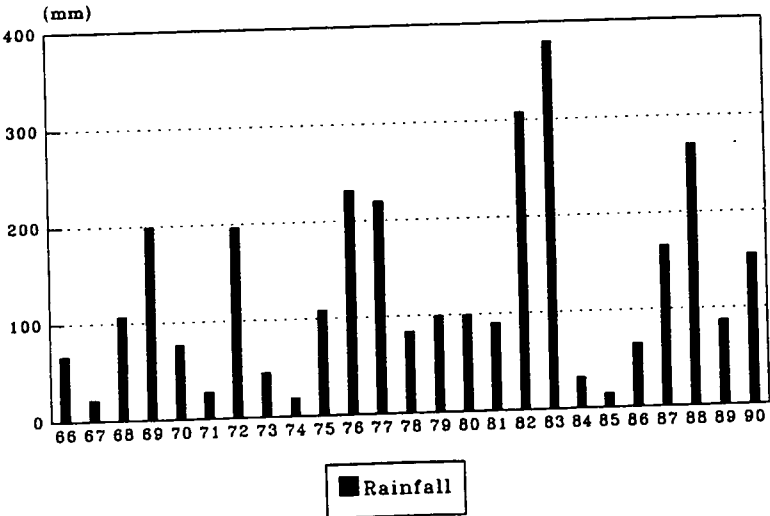


Figure 6:3 Yearly average of rainfall in the East Coast
from 1966-1990 (mm).



Ministry of Agriculture and Fisheries
Dubai.

government-sponsored schemes, the inhabitants of the E.C. are able to enjoy a better supply of water than previously had been derived from the rain of the area.

There follows a description of the main sources of water in the E.C. and the traditional and modern ways in which the inhabitants of the area have tried to conserve the precious supply of rainwater to satisfy their domestic and agricultural needs:

1. **Wadi:** a wadi is the channel of a watercourse which is dry, except after rainfall. Rainfall flows down from the mountain regions of the area and gathers strength, carrying mud and tree trunks with it. Due to the area's topography, wadis exist throughout the E.C. and during the rainy season large quantities of water flow down from the mountains to end in the sea. Wadis vary in size in the E.C. from less than 1 km to 6 km in length, depending on the water source. The major wadis of the E.C. are wadi Shimal, Ham, Soor Kalba, and Shi. Wadis can carry a large volume of water and if they are located on steeply sloping land they flow very fast and once they reach the cities they can do a lot of damage to farms and houses (Figure 6:4).
2. **Miselah:** (plural *Misayil*). The *Miselah* is a system of irrigation whereby water is diverted from the main wadi and channelled into small canals. The *Miselah* is used for irrigation purposes on the farms. The *Miselah* is only of use on rainy days. When rain is expected some farmers gather at their farms waiting for the water to reach them along the channels. Sometimes a group of farmers share the water of each *Miselah*, the farm nearest the *Miselah* receiving its supply of water first and then the next farm gets its share, and so on. This system is an old one, but in some areas is still in use, and farmers still claim their right to their share of water under this system.



Figure 6:4 Flooded wadi in the E.C. residential areas



In the past the system was very important and some of these *Misayil* were well known among farmers. Their importance is demonstrated by the fact that often the *Misayil* were named after the men who took care of them, eg the *Miselat* Qasim al-Biraq, in Kalba.

3. Dams: dams can be built on wadis to prevent the water from the wadis draining uselessly into the sea. Usually such dams are fed by more than one wadi and in the E.C. the water from them is used to supply the local farms and also in some cases to replenish underground water levels. With money gained from a booming economy it has been possible to fund the building of dams.

There are two large dams in the E.C.:

(a) Wadi Ham Dam, located at Fujairah. This dam is nearly 5 km from the sea and collects water from the wadi Ham, al-Furfar and Miduk. It was constructed by the MAF and was finished in 1983. Its main aim was to collect water from the wadis to replenish the table level of the underground store of water which is a feature of the E.C.. As it is an open water supply and subject to evaporation, the water must be channelled into its underground storage within 20 days of collection¹. The dam has a storage capacity of 6.5 million cubic metres². In the first 5 years after construction 10,220 cubic metres of water were conserved by the dam³.

(b) Wadi Shi Dam: is located at Khor Fakkan and is 1.25 km in length and can store water up to a depth of 25 metres, with an estimated storage capacity of 8 million cubic metres⁴. Due to its location between mountains, and its design, water is available from this dam for most of the year.

b. Underground water supplies:

Almost 90 per cent of the total water supply of the E.C. is drawn from underground sources. It is used for agricultural, domestic and industrial purposes. Some methods of drawing the water to the surface employed in the E.C. are traditional ones existing for centuries, using man and animal power, but some modern methods have also been introduced. The following are the three most common methods of bringing the water to the surface:

1. *Bahayiss* (singular *Behisah*). *Bahayiss* are holes 2-3 metres deep dug in close proximity to the sea, for example some *Bahayiss* at Kalba are located less than quarter km from the sea. The *Bahayiss* fill with water which is collected manually in small water buckets or other containers and in the past this water was used mainly for domestic purposes. *Bahayiss* were dug during the winter and immediately after the rainy season when the underground water level rose due to precipitation. It is an old method using primitive equipment but in the past provided water for domestic use only. The water was easily accessible for collection being near the surface and this method was found in many places in this area, especially in Fujairah and Kalba in the past. Its limitations were that *Bahayiss* used to be located near the sea and so settlement and farms tended to be concentrated in a very narrow coastal strip. *Bahayiss* were in use until the middle of the 1960s but have since been superseded by more modern methods.

2. *Aflaj*: The *falaj* is an underground canal taking water from its source and allowing it to flow gently to the farms. The farmers share the water. *falaj* is an Old water resource (Chapter Three) used in the E.C. to irrigate the farms in the area, and houses

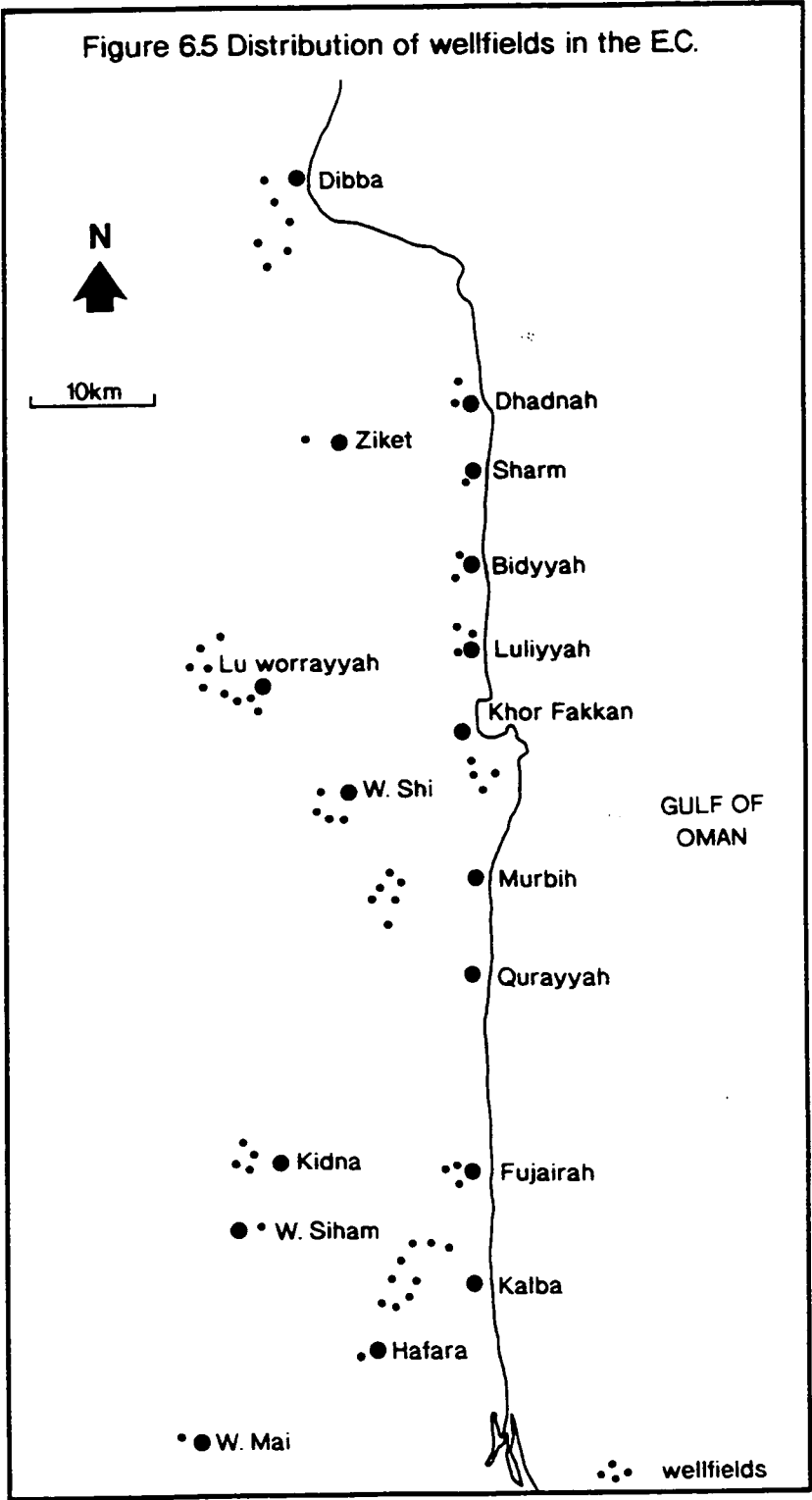
were constructed around the *falaj* to get the benefit of its water.

3. Wells

In the past wells provided a major supply of water in the E.C. and they are still to be found in most old houses. In the meantime the water supply in new houses is provided by government-owned pipelines. It is not known how many wells there are in the E.C. because most of them are dug without government approval. There are two main types of well to be found in the E.C..

(a) Ordinary wells dug by farmers and householders for private use only. Such wells are also built by the MAF for agricultural purposes. In 1982 the MAF dug 83 wells free of charge for farmers in the E.C..⁵ In 1986 they built only 3 wells and in 1987 they built none⁶. The reason for this decrease in government sponsored building of private wells is that the MAF is trying to reduce the number of private wells in the area because the water from these small wells used for agricultural purposes greatly increases the consumption of water from the natural underground water store and thereby can increase the salinity in the soil. However it is quite easy and cheap for local farmers to hire companies to build their wells for them. As a result in 1990 the total number of operating farm wells in the E.C. was 4,840, with 400 wells on reserve⁷.

(b) Wellfield. These are government-sponsored projects constructed either by local government or by the MEW. So far 17 wellfields have been built in the E.C..⁸ (Figure 6:5). These wellfields are distributed all over the E.C., with each one connected to a main pipeline to supply the needs of nearby urban areas. Figure 6:5 shows that sometimes there is more than one wellfield in one area, the Fujairah area for example



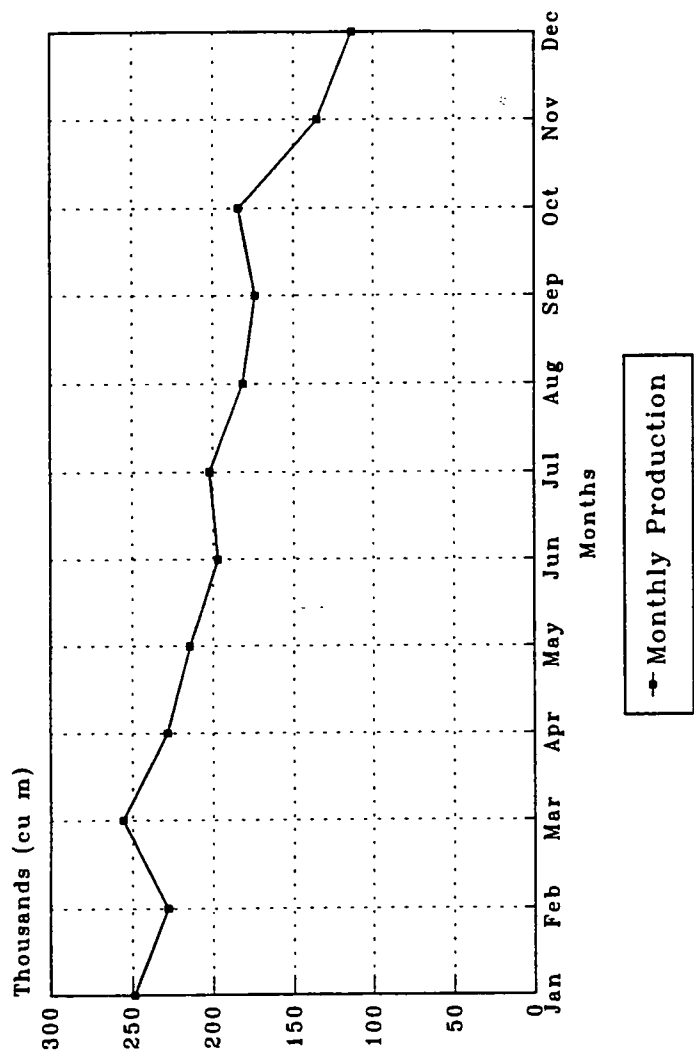
has three wellfields, and often more than one well is connected to each water pipeline which feeds a water tank. From the tank the water is piped along the main water pipeline to urban areas where a smaller pipeline distributes the water to individual offices, factories, shops and houses. For instance in Kalba there are 18 wells, all located in two small areas (Wadi Wisam and Soor Kalba) and all connected by pipelines to a large water tank which feeds the main pipeline of Kalba town. When the pipeline reaches Kalba the water is distributed to the various areas by a network of smaller pipes.

In the one wellfield at Fujairah there are 9 wells operating almost 22 hours daily. In January 1989 these produced 248,519 cubic metres of water⁹ (Figure 6:6). In December of the same year only 5 wells were in operation, the rest had to be stopped because of various problems, like the high salinity of their water supply. These 5 wells produced nearly half the total water supply, approx. 113,604 cubic metres.

c. Sea water distillation:

Two major problems have occurred as a result of the high demand for water in the E.C. The first is the problem of salinity experienced in supplies from wells. The second is a drop in the underground water level which, again, affects most wells in the area, necessitating the digging of deeper and deeper wells. Consequently the government has had to look for new sources of water. This problem is not confined to the E.C. but is one prevalent throughout the UAE. With the development of the arid regions after the changes brought about by the oil industry, the demand for water increased dramatically and the governments of the area generally have had to look for

Figure 6:6 Monthly water production in Fujairah wellfield
in 1989 (cubic metres).



Ministry of Electricity and Water.
Fujairah Water Production Data 1989.

ways of increasing their water supply. One consequence has been interest in research findings of seawater distillation processes and the establishment of seawater distillation plants.

There are two seawater distillation stations in the E.C.:

1. Abu Dhabi Station:

This station uses a long-established method of distilling seawater. The station is located in the middle of the E.C. at Qidfi, close to the power station, and was funded by the government of Abu Dhabi, hence its name. It cost 22 million Dh and produces 3,785 cubic metres of purified water daily¹⁰. It requires 11,356 cubic metres of seawater to produce 3,785 cubic metres of drinking water. The station began operating in February 1989 and the water produced feeds the main water tank of Fujairah.

Seawater at the Abu Dhabi station has to go through several processes to purify it.

(a) A long pipe draws water from the sea to the distillation plant. The technique used to draw the water from the sea to the desalination plant is a syphonic system. The pipe is emptied of air by vacuum suction and this draws the seawater into the plant.

(b) The water is channelled into two storage tanks which contain several compartments.

(c) The first stage of filtration, using dualmedia, now follows. At this stage chemicals are mixed with the water to disinfect and clean it. Two filtration units are employed in this stage.

(d) The second filtration stage uses cartridge filters and the equipment consists of

three lines of small filters (Figure 6:7).

(e) The water is then pumped under high pressure to a storage tank (2,500 sq m in diameter) and from here is pumped by three distribution pumps into the main pipeline to the municipal water tank.

2. Dubai Station:

This second seawater station is located in the same area as the first and, whilst it distils on basically the same principles as the plant at Abu Dhabi, more modern methods have been incorporated into its design, with the main difference being that the water used does not come directly from the sea but from wells dug close to the shore.

There are 12 wells operating close to the shore to supply the station with water for distilling. The plant uses ca 116 cubic metres per hour¹¹.

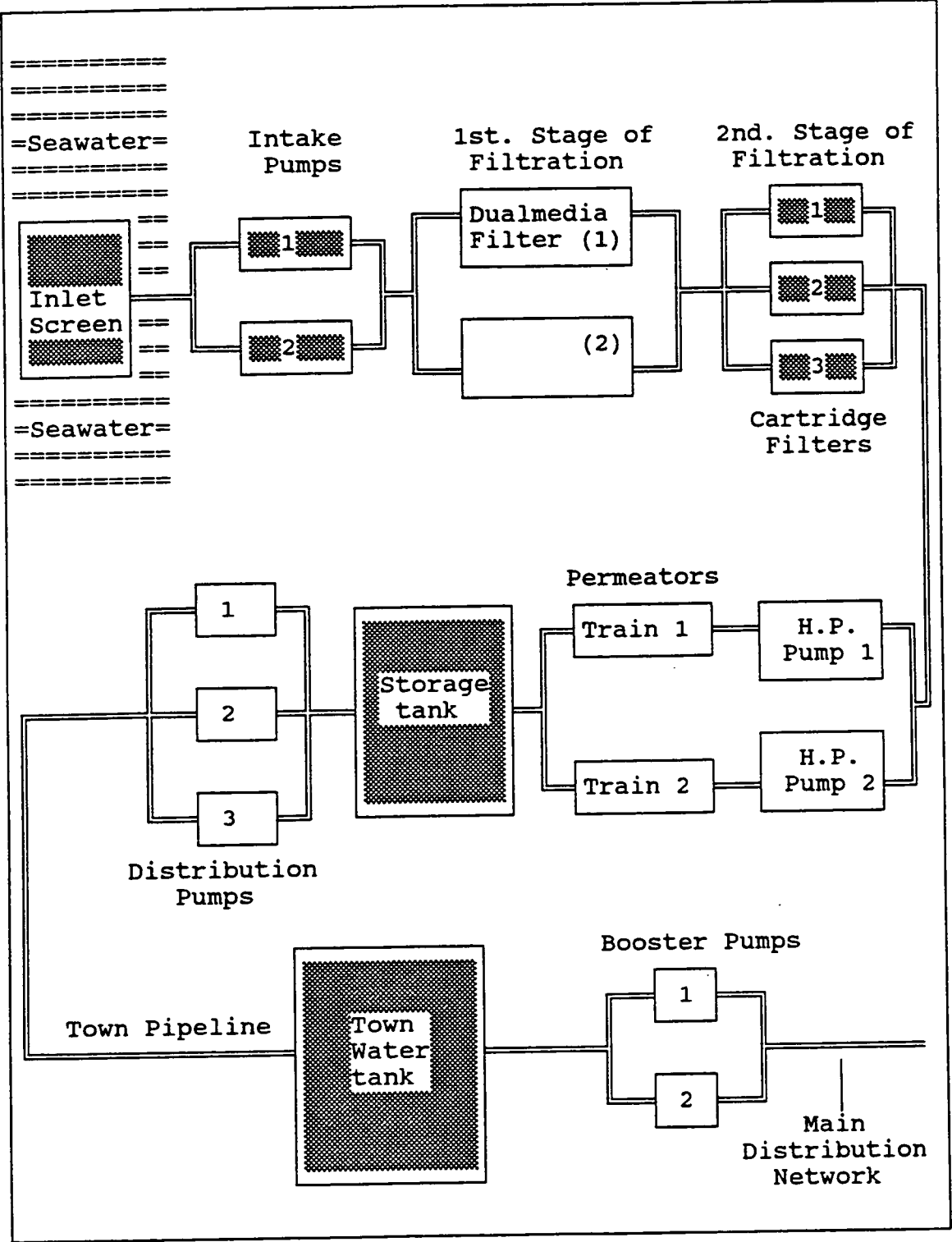
These two distillation plants provide almost 25 per cent of the total drinking water supply of the E.C. and the government plans to build more stations in other areas in the future to satisfy the ever increasing demand for drinking water. Because of the salinity and the cost of the pipeline and transport it is envisaged that future plants will, like the ones already built, be used mainly to supply the coastal region.

2. The role of government and the private sector vis-a-vis the water supply of the E.C.

a. Government:

The government of the E.C. has to look at the water situation in the country both at the present and for the future. This responsibility means that it must conserve existing sources of water for the future. To this end, the government is trying to

Figure 6:7 Diagram of seawater distillation process used in the E.C.



Source: Fikri al-Showairbiji, Qidfi Station, (modified by the researcher)

reduce the amount of water taken from underground sources. The increased demand for water which followed development of the area has meant more water has been taken from underground. The result has been that a water shortage is now being experienced, especially in the summer, due to the lower water table.

A major government aim is to conserve as much water underground as possible in the winter to enable the underground table to rise. The government built the dams and distillation plants described above, partly to supply the immediate needs of the population but also to replenish the underground water level. Despite such government efforts, however, there is still a severe water shortage in the summer in some parts in the E.C., even though at this time the population drops as some of the foreign workers return to their own country for the summer months. The reason why the demand is so high is the very high temperatures of the summer months, because of which people need to consume more water to replace that lost. Also a lot of water is lost through evaporation, eg open irrigation channels in the summer heat. As well as the additional consumption of water in the summer months due to the heat, there is also a considerable volume of water wasted throughout the year in the E.C., through the persistence of old irrigation systems, seepage and leaking pipes.

The water shortage in the E.C. is exacerbated by the fact that some of the population are exempt from water charges and therefore have no incentive to limit their consumption. For example, some personnel of the Ministry of Defence are exempt from paying water charges. These may not make up a significant proportion of the population but, because of the Arab tradition of extended families, households in the E.C. are large and one employee of the Ministry in the household means

exemption for all the members of that household. The result is that some sectors of the community, eg Ministry employees' families, consume a disproportionate share of the valuable water supply. At the moment the government is not tackling this situation with a view to conserving water supplies.

Nevertheless, on the whole, the government is making great efforts to encourage people to be careful with water and the media is one vehicle used. There are regular features on television and in the press about water conservation. Moreover, part of the duties of government officials such as those of the MAF are to educate and encourage water conservation, eg the MAF encourages and subsidises the implementation of modern irrigation systems (which are less wasteful of water) on farms.

b. The role of private companies:

In Kalba where inhabitants face a shortage of drinking water, part of their need has been filled by private companies which have set up in business to sell water. Water is brought from as far as Khor Fakkan and Fujairah by the inhabitants. Private water companies also take the government water supply and treat it further to provide drinking water. Many people find the government water supply unsuitable for drinking and therefore resort to that supplied by private water companies, or to bottled water. Indeed, 80 per cent of the UAE inhabitants are using bottled water for drinking¹². Thus, many consumers use both private and public water supplies, the former for cooking and irrigation, the latter for drinking purposes.

There are two main private water companies in Kalba, the al-Furat Pure

Drinking Water Company and the al-Kawthar Sweet Water Company. These two use water from the government's main water supply and treat it further as follows:

- (a) Firstly water from the municipal water supply is directed into a large fibreglass tank (2 cubic metres capacity).
- (b) The water is then further purified, chemicals are added and mixed mechanically with the water (Figure 6:8). The treated water is then pumped to the company's main purification tank and waste is drained to an underground tank constructed by the government, to drain the rain water.
- (c) An electric pump then forces the treated water from the main purification tank into three smaller tanks located above it (Figure 6:9). The height of the tanks means that no pump is required to bring the water to the tap at ground level for siphoning the supply to the consumer as required. Water pressure at a height performs the same function as a pump.

The private water companies in Kalba charge 45 Dh for 0.4 cubic metres of treated water but this includes delivery to the consumer's house.

3. The current water situation in the E.C.

At present there are two agencies involved in the control of the government-controlled water supply in the E.C.:

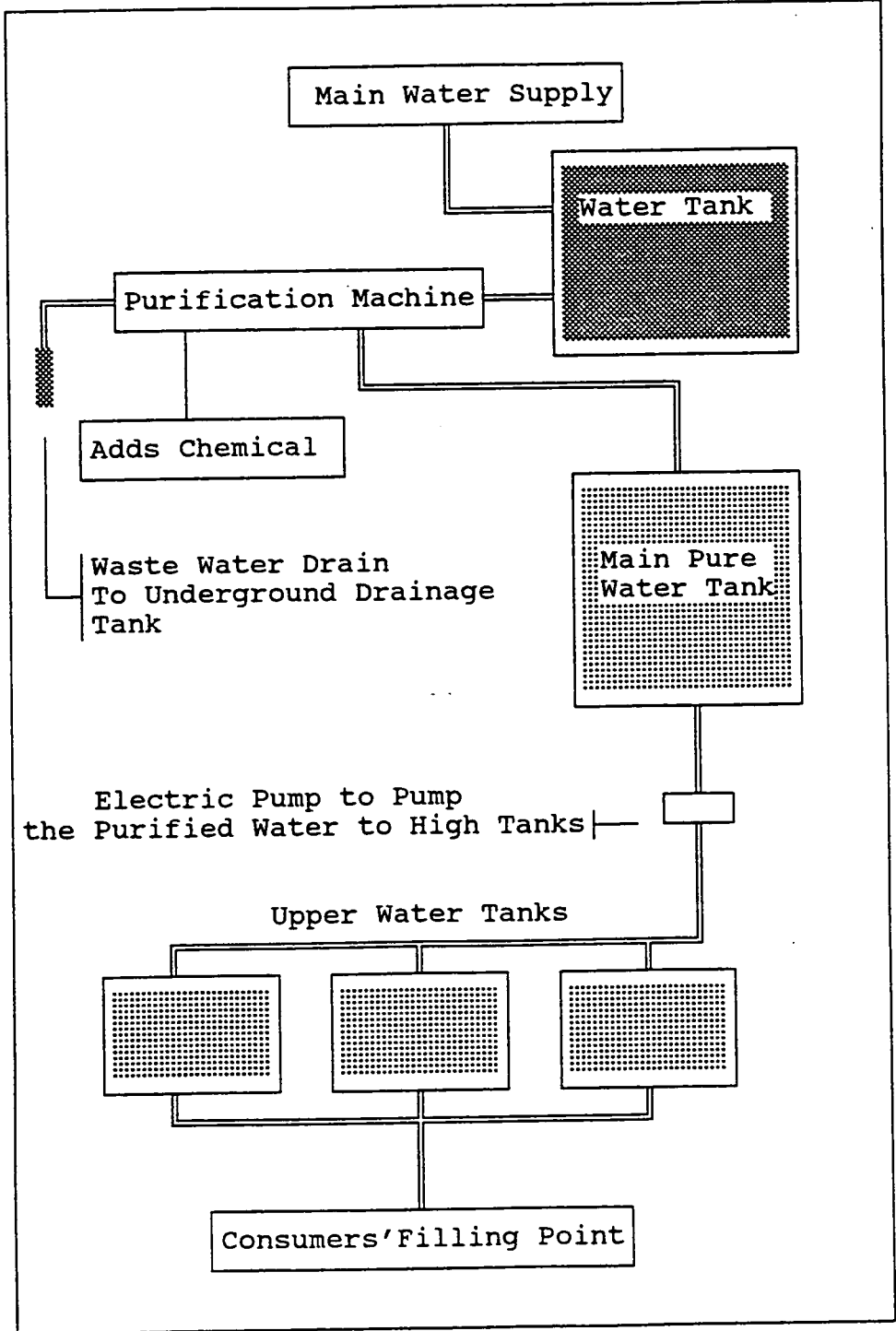
- (a) Local water Departments: These are funded and controlled by local government, for instance in Khor Fakkan and Kalba the Emirate of Sharjah owns and administers the department.
- (b) MEW: this Ministry controls water consumption in the areas of the E.C. where the



Figure 6:8 Purification machine (above) and private water company premises at Kalba (below).



Figure 6:9 Diagram of water purification process used in Kalba



Source: Fieldwork 1991

water supply is not directly owned by an Emirate.

a. Distribution of water consumers:

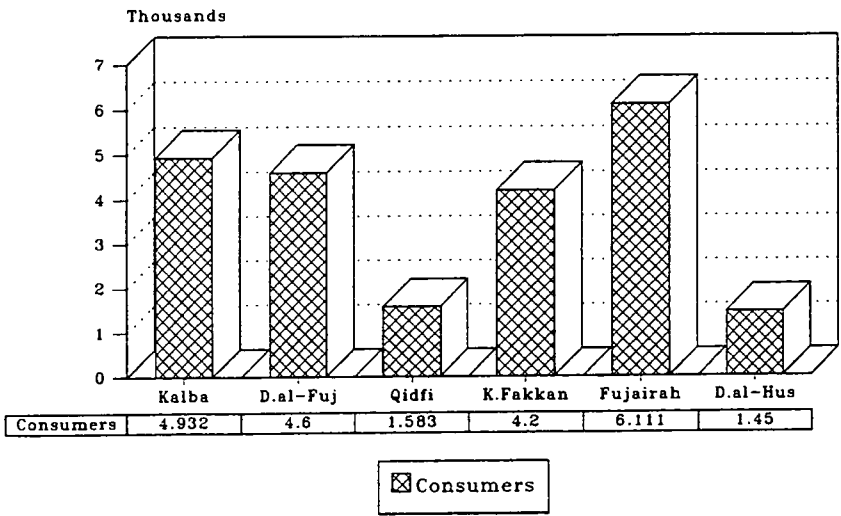
Domestic water supply in the E.C. is controlled by the government through local water departments in each area, and by the MEW whose main office is in Fujairah. Most houses in the E.C. have a water meter (gauge) to calculate the water consumption. According to government statistics, in 1989 there were 22,866¹³ registered consumers of water in the E.C. (Figure 6:10). These figure show that the majority of registered consumers are located in the Fujairah and Kalba areas; Fujairah has 6,111 consumers out of a total almost 23,000 whereas Dibba al-Husin has only 1,450 consumers.

The number of water consumers is increasing in the E.C. all the time. In the Kalba area for instance the number of consumers registered with the local water and electricity department has risen from 800 in 1972 to 4,922 in 1989¹⁴ (Figure 6:11). As Figure 6:11 shows the high number of water consumers occurred between 1972 and 1984. This was a result of the increase in population in the area during the same period.

b. Independent water supply:

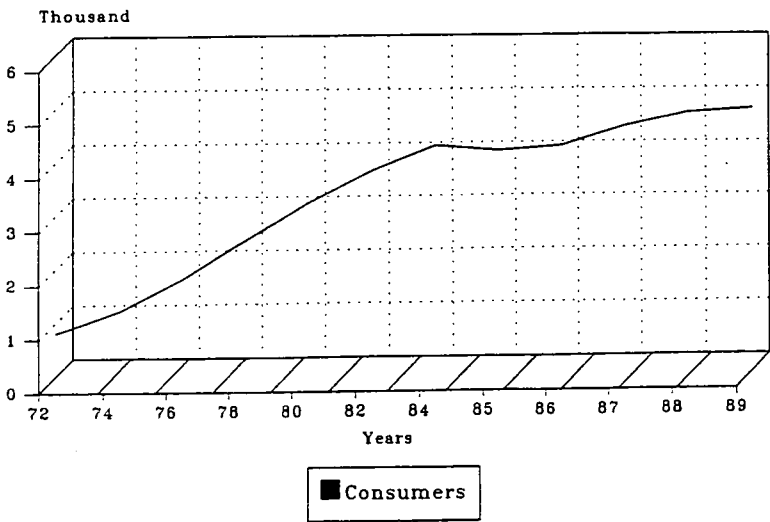
The above deals with the organised water supply, metered and registered by government-controlled agencies such as MEW. The government charges for water supplies and this has led to some people seeking for alternatives that are cheaper or free. The main alternatives to the government's piped water supply is to tap the

Figure 6:10 Number of water consumers in the
East Coast 1989



Ministry of Electricity and Water.
Fujairah Office. Also, Kalba Department
of Electricity and Water 1990.

Figure 6:11 Number of water consumers in Kalba area
from 1972-1989.



Kalba Water and Electricity Department.

underground sources of water by building private wells. Little capital expenditure is needed to build and operate wells and farmers and house owners have taken advantage of this. Once in operation the wells provide these consumers with an unlimited supply of free water and the cheapness of this alternative has led to many privately owned wells being dug. This has posed a serious problem for the government, these wells have been dug without government approval or control and subsequently the underground water level which feeds these wells has fallen considerably.

In 1990 daily water consumption in the E.C. was 37,854 cubic metres per day (Cu M/D)¹⁵ (not include farming consumption), most of which came from underground sources. In the same year almost 90 per cent of the annual water consumption of the E.C. was used by the areas around the three cities: Fujairah (15,142 Cu M/D), Khor Fakkan (11,356 Cu M/D) and Kalba (7,571 Cu M/D). The government has to make projections on future water demand. Taking into account the predicted urban development and the expected level of increase in the population in the E.C., it is likely the demand for water will double in the near future, causing a severe water shortage. In this situation water supplies outside direct government control (such as privately owned wells) exacerbate the problem considerably. The following are the main sectors where wastage occurs:

1. Farming:

So far there is no legislation to organise the consumption of water on farms. Farms in the E.C. are not provided with water meters and the government cannot calculate the amount of water used. Because they are not charged by volume, farmers can afford to be generous, even wasteful, of water and large amounts are used in

agriculture. This is seen as one of the main reasons for the water shortage in the E.C. and conservation of water on farms is required if a serious water shortage is to be avoided in the near future. One way to make farmers more careful would be the installation of water metres on farms and charges made according to volume used. This would discourage waste and may be the only way the E.C. can avoid having to face a very serious water shortage in the future.

2. Domestic use:

The volume of water used for domestic purposes is another problem. On the whole inhabitants of the E.C. as yet have little concern for the implications of a water shortage and are not generally aware of the benefits of conservation and this leads to large quantities of water being lost. For instance, water leaks and seepage in houses and other buildings are supposed to be reported to the MEW and rectified, but the cost of rectification has to be borne by the owner and if a leak is not affecting the property there is often little impetus for owners to pay for such repairs, eg water dripping needlessly into a garden or a building site. This means water is often wasted through a lack of basic repairs in the E.C.

3. Other users of unorganised water supplies:

Unorganised water consumption occurs in manufacturing, trading and many other sectors of the community. Many companies operating in the E.C. use a disproportionately large amount of the underground water resources, for example there are companies involved in the shipping industry in the E.C. seaports which actually sell E.C. water, in bottles or tanks, to passing shipping. These companies consume large quantities of water and some are not paying anything for their supply, eg a

company at Kalba selling drinking water to passing ships from wells they have dug. Such companies make no contribution to the government for the water they use and, therefore, whilst their raw material is free of charge, it does draw on the main water resource for the whole country, the underground water table.

c. Salinity:

The high level of salinity in water affects some economic activities in the E.C. which are dependent on the underground water for their supplies. Farming for example is affected by the increase of water salinity. Many farmers have suffered due to the high saline content in their soil. In the al-Saf area the majority of farmers have already left their farms because of the salinity of the water supply and the subsequent poor quality of their soil and crops. Some fruit trees, eg palm trees, have been less affected but if the salinity increases further, it is likely they too could suffer.

At one time the water supply in most parts of the E.C. was relatively salt free or had low salinity but the problem of salinity is increasing and most areas are suffering from it. For instance, in Sikamkam water was of good quality in the past; in 1965 salinity ranged between 1,000-2,000 ppm¹⁶ whereas it has now reached almost 15,000 ppm in some wells.

The agricultural sector of necessity uses a lot of water. For instance Kalba now has 693 farms using underground water to irrigate the land. Farms are now larger in the E.C. (Chapter Four) and more crops are produced which means more water is used on the land. As a result of this increasing demand for water for agriculture, the underground water level has dropped considerably and many farmers have had to dig

deeper wells (often more than 50 metres deep) to reach water. Because of the high demand for water for agricultural and domestic purposes, and the need to increase agricultural production to feed the growing urban population, the government itself added to the problem by sponsoring the building of private wells on farms. When the water level falls it is replaced by the sea water which, of course, is more saline. Thus the more numerous and deeper the wells the more saline the water and this poses a serious problem for the near future.

In the past, as farmers had only basic tools and animal and manpower to work their land and the demand for their produce was less, less land was farmed and, therefore, less water was required, water was drawn from wells as and when it was needed. Now water pumps work almost 24 hours a day and the increased consumption has serious implications for the future. Farmers in Sikamkam and parts of Dibba have already had to abandon their farms because of poor soil, weak crops, and low yields due to salinity.

In view of the alternative employment opportunities generated by the oil industry and a healthy economy, the above mentioned problem of the water raises an obvious question; if farming takes so much precious water, why not stop large-scale farming and save the water for other uses? With its good airport and seaports facilities and an excellent road network to all parts of the region, agricultural produce to feed the population of the E.C. could be imported from other countries. One reason, beside the government policy to produce more vegetables, to reduce the quantities imported, for the continuance of farming, is that the area is a traditional agricultural area and the people are used to farming their land. To change from such an agricultural lifestyle

would be revolutionary and any government attempt to impose regulations to ban farming would be very unpopular. Therefore, farmers continue to use large amounts of water and are often unwilling to co-operate with the MAF in water conservation efforts. The MAF does not have powers to control farmland and farming activities in the area and its mandate is to supply farmers with their needs, and give advice. The MAF achieves a lot in helping farmers but it does not buy their surplus products in a glut and with modern agricultural technology and new market forces (Chapter Four) created by the changes brought about by the advent of the oil industry, overproduction and exhaustion of the soil are problems which farmers are increasingly having to face. In the light of these changes that have come about, the MAF does, however, have a good chance of encouraging farmers to reduce their water consumption by persuading them of the benefits of turning their land entirely over to the growing of fruit trees. Trees like mangoes need less water and by guaranteeing that it will buy the fruit at a good price, the MAF could indirectly convert E.C. farms from growing vegetables to fruit. This, coupled with the active encouragement of modern irrigation systems designed to avoid wastage could make a difference to the water scarcity, whilst enabling inhabitants of the E.C. to pursue their traditional farming lifestyle.

4. The future outlook for water supplies in the E.C.

An adequate supply of good water is posing a serious problem in the UAE in general as well as in the E.C. The government is aware of the gravity of the situation and is trying to plan to alleviate the situation. Awareness is growing and the following is one example of the warnings of unorganised water consumption now being heard:

"Unless immediate efforts are made to cut back on the pumping of fossil water for agricultural use, the country will face an environmental crisis of major proportions"¹⁷.

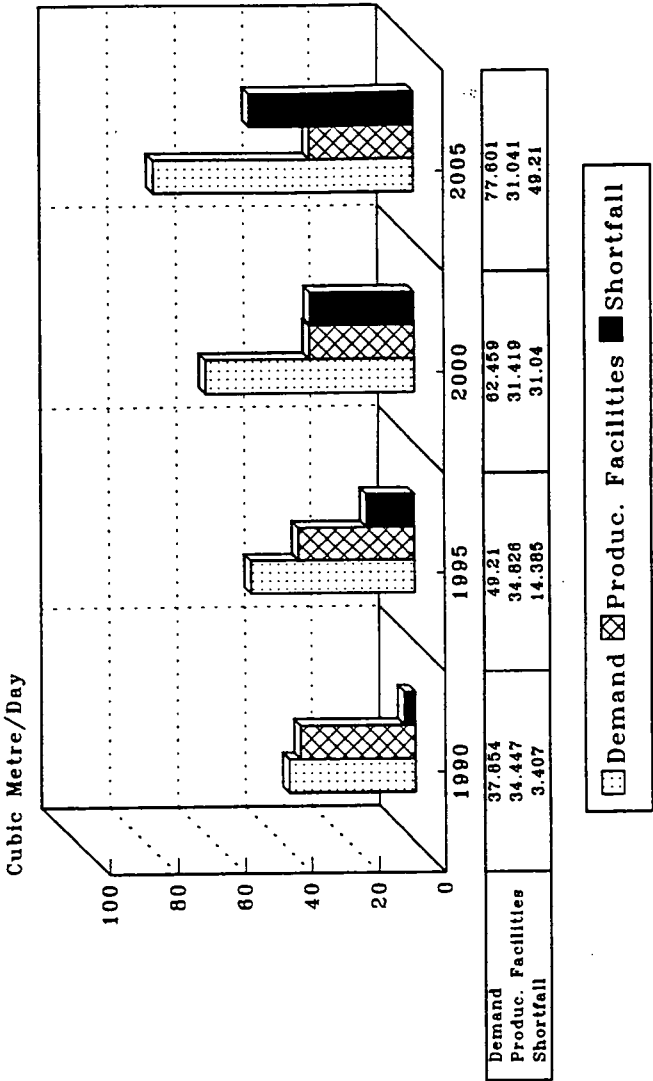
With the recent water consumption in farming, salinity and the drop in the water table are likely to increase in the near future. Fujairah and Kalba are likely to be facing the effects of this problem in the very near future. However, the government has already put in hand projects to preserve the water and replenish the underground levels with encouraging results. For example the Department of Water and Electricity at Kalba is studying a new project to supply Kalba and its surroundings with fresh water. The new study shows that there is possibly a large volume of water to be found in an underground source in the Wadi al-Hilo area, located west of Kalba city, which could supply Kalba with its needs from the fresh water¹⁸.

In 1988 the water level in wells close to Wadi Ham dam was raised to almost 2 metres¹⁹. As well as providing water for consumption, dams also feed the underground water supply and with more dams being built in the wadis in the E.C. it is hoped the underground water level will benefit. This is in addition to a more efficient use of rainfall which the dams provide.

For domestic uses, it is hoped that government policies encouraging conservation, and new projects to conserve and organise the water consumption will be able to prevent a serious future shortage occurring. The study which is done by the MEW predicts that water demand for the E.C. will rise from 37,854 cu M/D in 1990 to 77,600 cu M/D in the year 2005 (Figure 6:12). As the Figure shows, the shortfall will be 49,210 cu M/D in the year 2005.

Nevertheless the government hoped to be able to provide adequate water

Figure 6:12 Water demand & production facilities up to year
2005 in the East Coast (cu M/D).



Ministry of Electricity and Water
Water Department, Dubai.

supplies for the next ten years at least if their policies and projects are successful.

In conclusion, the above demonstrates that the water problem in the E.C. is a recent one resulting from the extra demand on water supplies caused by development arising out of oil exploitation in the area. The underground water reserves have been used as the main water supply which has depleted the water table.

B. Possibilities of pollution in the E.C.

Pollution is a worldwide problem. The definition of pollution can never be precise, it varies according to the degree, location, type of impurities involved and long term effects. For example, many different writers have defined air pollution in many different ways, as Henderson-Sellers wrote in 1984, "as many ways as there are authors". However although writers may argue about precise definitions of pollution, they agree upon one thing, pollution usually occurs as a result of human activity.

The problem of pollution in the E.C. is many-faceted. At the moment the government denies that there is a problem but it is evident that unless the government takes action now, pollution will become a serious problem in the future.

There are many examples of countries already suffering the effects of pollution for the government of the E.C. to learn from, and these examples show that it is vital for the government to control the level of pollution in the E.C. before the problem begins to cause serious damage to the country's environment. One form of pollution already affecting the country is that caused by manufacturing industries. At present the government puts the onus for pollution control upon the companies involved and expects them to meet international standards of pollution control in their

manufacturing plants²⁰ rather than taking direct responsibility for pollution control for the country as a whole.

The following are the major areas of activity where the threat of pollution is greatest in the E.C.:

1. Sea pollution

Pollution of the sea along the E.C. has many sources. Oily waste is a major problem, but it is not the only waste discharged from shipping which frequents the area. The implications of pollution of the sea along the coast is grave. Pollution of waters in other areas of the world has shown that any effects on the marine environment are likely to be long term. This is especially serious for an area like the E.C. where so many people are employed in the fishing industry. So far the world has no adequate solution for sea water pollution, and that caused by oil is especially difficult to deal with.

a. Oil pollution:

The consequences of a disaster such as the Exxon Valdez in the E.C. waters are unknown. The Exxon Valdez ran aground near the shore in the seas along the coast of the state of Alaska, USA, spilling about 100,000 tons of crude oil²¹. This disaster provides an example of the short and long term effects of oil spillage on a fishing community and on the environment. The consequences of the Exxon Valdez disaster are especially relevant to the E.C. which also has a fishing industry, and as more ships are frequenting E.C. waters, the likelihood of an oil spillage increases.

One of the main activities of the E.C. seaports is to refuel large ships, and consequently many ships in the E.C. waters tend to have large stocks of fuel on board, which of course, makes any disaster at sea more likely to cause major pollution damage. Even without a major oil spillage such as that in Alaska, relatively small oil leaks from tankers are already affecting the environment of the E.C.. Throughout the year deposits of tar, a petroleum residue, are washed up on the country's beaches and it is obvious that this pollution comes from oil spillage at sea. One future solution to this problem is that the government should band any oil tanker from sailing in UAE waters, especially those of the E.C., if it is not provided with a double body to avoid oil leaks, like the recent American law which banded oil tankers from sailing in USA waters without having double bodies to reduce the danger of oil leaks from these oil tankers²².

b. Discharge wastes:

As we have seen early in this chapter, the increasing demand for water since the urban development which followed the oil industry in the UAE has meant the government has built two desalination plants, and to meet future demands for water more plants are likely to be built. During desalination some treated water is discharged back into the sea and this water contains chemicals used in the distillation process. There is a high concentration of chemicals in this water, discharged into a relatively small area of the sea, and the danger is that the marine life of the sea near the desalination plants will eventually be affected. Currents can also carry this polluted water to the main fishing grounds and this poses a potential threat, not only to the

livelihood of the fishermen whose catch is likely to suffer but also, ultimately, to the health of the inhabitants of the E.C. who eat the fish caught in these areas.

The problem is exacerbated by the fact that some ships operating in E.C. waters, specially the large tankers on their way to the Gulf's oil refineries, discharge their waste into the sea along this coast in preparation for loading oil in the Gulf. In August 1991 fishermen from Kalba complained that large quantities of tar deposits were polluting the area from Kalba to Khor Kalba covering an area of more than 3 square km. The fishermen refused to fish during that time to protect their boats and fishing nets²³.

"... for whatever reason, ships discharge oily waste, sludge oil and tankwash off the coastline during the night. By daybreak the offenders are many kilometres away, leaving behind seaborne filth that is deposited on the shores of the country by wind and tide"²⁴.

The E.C. waters are also polluted by the owners of local fishing boats who discharge their fuel waste, and dump trash and other materials into the sea.

2. Air pollution

The location and topography of the E.C. makes it especially prone to air pollution. The E.C. is a narrow plain facing an open sea and backed by mountains. Humidity ranges between 60 and 100 degree most of the year in the E.C. and is especially high in summer and this high level of humidity affects the ambient air and increases the possibilities of pollution²⁵. It is not confined to the E.C. but is prevalent around the world. Indeed the impact of air pollution on the environment is one of the topics currently exercising everyone's attention in the Western World. Again there is

no hard and fast definition of what constitutes polluted air. Opinions vary as to what measurement or standard of pollution in the ambient air constitutes a danger. For example the accepted standard of fresh air around a manufacturing area in many Third World countries would not be considered acceptable in a similar manufacturing area in the Western World. Yet in the Third World many manufacturing areas with a high level of chemical pollutants in the air are also residential areas eg in India and Mexico.

The following are the main areas of activity in the E.C. which pose a potential air pollution problem:

a. Manufacturing:

Government officials claim that, so far, the development of manufacturing industries in the E.C. has not caused any severe pollution of the air. However, as the number of new companies establishing in the E.C. rises, the possibilities for air pollution also rise. There is no official study of air pollution by manufacturing industries in the E.C. and it does not seem as if the government is unduly worried about the effects of air pollution caused by manufacturing in the area as yet. The adverse effects of air pollution are not confined to the people living in close proximity to the manufacturing areas. Wind direction and air circulation can carry smoke and dust from the industrial zones to residential and agricultural areas far away from the main areas of manufacturing in the E.C.

b. Exhaust fumes:

Another potential source of pollution in the E.C. is that of exhaust fumes. Cars and other vehicles emit sulphur dioxide and nitrogen oxide into the atmosphere and with the ever increasing number of cars in the E.C., unless action is taken, this problem is bound to increase. The increasing traffic between the seaports and FIA and from the airport to the rest of the UAE may also be a contributory factor in future air pollution.

c. Other sources of air pollution:

With manufacturing industry comes the release of waste products into the atmosphere but modern agriculture also affects the ambient air. The stubble of crops which are subject to chemical fertilisers is burnt releasing atmospheric gases into the air.

The three sources of pollution described above already exist in the E.C. and as development of agriculture and industry continues, are likely to increase. They pose a potential environmental problem to the country the significance of which does not, as yet, seem to have been realised by those who are causing the pollution.

3. Soil pollution

Soil pollution occurs as mankind directly or indirectly adds elements to soil that are not readily broken down. This occurs directly in the E.C. when manufacturing waste is discharged onto the land polluting the soil, and indirectly through irrigation and fertilisation, containing chemical additives. The history of pollution in other parts

of the world has shown that the effects of chemical additives to soil often do not appear for a long while, but the E.C. is already suffering from the effects of soil pollution, especially in the areas of intensive farming and in manufacturing areas.

The following are the main causes of soil pollution in the E.C.:

a. Agriculture:

The traditional methods of farming formerly practised in the E.C. did not, on the whole, adversely affect the soil. Following the increasing affluence brought about by the oil industry in the region, it has been possible to buy equipment and materials from the West and introduce different forms of farming and different farming techniques have been applied to existing forms of agriculture.

The MAF and farmers have introduced new methods from the West and other parts of the world, often without being aware of the drawbacks as regards pollution of the soil and the effects of agricultural technology imported from the West, for example, being used in the very different climatic and other conditions of the Middle East. It is not only the climatic and topographic differences that cause the problem, but the lack of knowledge of E.C. farmers who are now using western techniques on their land. An example of this is the misuse of fertilisers. These have been used in the West for a long time where the importance of using the right amount per donum is fully understood. Manufacturers such as ICI stress that only a small amount of fertiliser is required to mix with the soil to produce increased yield and quantity but, in the E.C., many farmers add large quantities to their soil expecting that the more they add, the higher the yield. This practice has already resulted in damage to top soil

in some parts of the E.C. and crop productivity has been affected.

Again, in the West, the use of suitably treated fish and animal waste as fertiliser has been successful. The recycling of organic waste to enrich the soil is particularly useful to an area like the E.C. where fishing and farming are the two major industries. However, the concept has been imperfectly translated to the E.C. from the West and some of the unwanted organic waste from abattoirs and fish processing and markets has been used as fertiliser without being correctly treated first and this, too, has affected the soil. It also poses a potential threat as a health hazard. The old method of burning the bushes at some of the E.C. farms may have had some positive impact on the soil, clearing the land at lower cost, as well as some negative impact, such as a major problem in the topsoil and disturbance of the physical condition of the soil²⁶.

Yet another problem has been caused by the increased volume of underground water used for irrigation. Most wells are dug without government approval or knowledge and the number of wells has dramatically increased since the oil boom. The water in many of these wells contains a high concentration of chemicals to be found naturally in underground strata. Farmers have been able to use their increasing affluence and modern equipment to build wells to water their land but have not been aware of the dangers of irrigating their land with water with a high ppm of chemicals. The result is that yields have suffered.

b. Industrial and domestic waste:

Soil can very easily be polluted by waste. The industrial and commercial

sectors of economic activity in the E.C. have created both direct and indirect soil pollution. Direct pollution is caused by companies discharging their waste into the earth, eg waste products from garages, such as burned or used fuel. These materials are not readily degradable and pollute the soil immediately around such garages. Other companies convert their waste material into a liquid form which is then discharged on to the land or into the water system where it often ends up on the land.

There is also indirect pollution of the soil from air pollution caused by industry in the E.C.. Factories emit their waste from chimneys in the form of a very fine dust, and this airborne dust settles on the land causing soil pollution.

4. Dust and smoke pollution

Many houses and other buildings in the E.C. suffer from another form of pollution, that of dust and smoke. Dust in the E.C. is mainly directed from the following sources:

a. Windborne dust:

During the summer months the E.C. is subject to winds which carry minute particles of dust which pollute the atmosphere. These affect farm crops and also buildings, giving a dark colour to the buildings in the E.C. This dust also accumulates on streets and it is often a major problem to keep buildings and streets clean in the E.C. because of the dust.

b. Local manufacturing:

Air pollution has been the price paid by the E.C. for its industrial boom. It is too early at the moment to predict the full implications of this for the area but both government and inhabitants are now aware of the pollution problem caused by the factories and are becoming increasingly worried about this situation. As industrial development continues to increase, the effects of pollution it brings with it, will affect the area more and more unless something is done. The effects are now making themselves felt in the E.C.. Dust from factories is already affecting the quality of human life, and animal and plant life are also suffering²⁷, the quantity and quality of agricultural crops have been visibly affected by pollution, Khor Khwair provides an example of the problems likely to be experienced increasingly unless something is done to control the emission of poisonous matter. In Khor Khwair (in the Emirate of Ras al-Khaimah) the industrial zone was built near residential and agricultural areas. Local people complain that the smoke and the dust coming from the local factories has damaged palm tree production²⁸. This experience could very likely occur in many other areas in the E.C. as industrial development increases. Khor Khwair thus provides a warning for the future.

The example of Khor Khwair above shows that dust and smoke from factories is already affecting the environment in that area and that industrial emissions affect agriculture as well as the health of the local people. Pollution in other areas in the world has shown that soil pollution first affects small plants, grain crops, and vegetables, then larger plants such as shrubs, and finally trees. The fact that palm trees have been affected at Khor Khwair is therefore especially worrying in view the fact

that palm trees provide a major part of the agricultural produce of the E.C. and in the region generally, and that they are an important part of the staple diet of the people, as well as a major export.

The fruit of palm trees takes a long time to ripen on the trees and thus dates from trees in industrial areas are subjected to a prolonged period of pollution. The fruit can be washed before selling but washing removes the sticky residue which is the main sign for the customers that the dates are fresh. Consequently it is usual for farmers to pick the fruit from the palm trees and sell them unwashed. Now smoke from industrial chimneys means dates from palm trees near the industrial zones have to be washed and cannot therefore be sold as fresh dates.

In addition to the effects on agriculture, the E.C. is now finding that smoke from factories and dust from manufacturing processes is affecting the health of the inhabitants and the cleanliness of the cities.

One source of dust and smoke in the E.C. is the manufacture of cement and other mineral-based industries which use local raw materials, eg rockwool (Figure 6:13). The first stage of many rock-based industries is quarrying; rocks are split off from the main rock formation, broken up and often ground, and all these processes generate a lot of dust, most of which is airborne and it eventually settles in the areas near quarries unless wind currents carry it farther afield. This adds to the pollution caused by the actual processes involved in manufacturing products like cement which also emit smoke and dust into the ambient air.



Figure 6:13 Smoke from local factory, operating close to residential area in the E.C. (above) and dust from rock manufacturing (below).



5. Noise pollution

Noise can be a serious health hazard as well as an inconvenience and many people who live close to industrial areas in the E.C. are experiencing discomfort due to the excessive noise. Recently the government has zoned industrial development into special locations but, in the past, industrial areas often grew up in and around cities such as Fujairah, Kalba, Khor Fakkan and Dibba which provided their workforce, financial services and transport network. The government now discourages this urban mixture of residential and industrial areas but those industrial areas already existing in and around towns continue to create a nuisance. E.C. towns also tend to have many small service shops which set up in residential areas rather than industrial zones to be near their customers and these too tend to be noisy causing a nuisance to their residential neighbours. The government is trying to persuade existing small factories to move to industrial zones with some success but the relocation of small service businesses has been less successful.

Noise pollution comes from the following sources:

a. Small factories:

Many small scale manufacturing concerns are located in residential areas and produce noise which is a nuisance to the area. For example in Kalba there are small brick factories in residential areas (Figure 6:14). One operates late and starts early disrupting local residents with noise, and the vehicles of the other two cause a lot of noise when materials are loaded and unloaded at their premises.

Whilst other manufacturing processes like cement, may not be located in



Figure 6:14 Brick factories located in residential areas in Kalba



residential areas they nevertheless generate so much noise when in operation (use of explosives, drills) that the sound travels to the nearest conurbation and causes a nuisance. An example of this is that of the noise caused by explosives used in quarrying raw materials from the mountains around Dibba to make cement. This makes a great deal of noise which is heard in some areas in Dibba and which is inconvenient to the residents of city.

Also the smell coming from these factories is causing discomfort to the inhabitants near these factories. For example inhabitants of Qirat village complain about the smell coming from the Fujairah Fertiliser Factory²⁹.

b. Badly located industrial zones:

In recent years the government has persuaded many small factories, shops, and car services to move to industrial zones which are special areas provided with the necessary facilities for trading such as roads and electricity. However some of these industrial zones are not located in ideal places. For example, in Fujairah the industrial zone is located near Fujairah airport and the area is becoming crowded with industrial plants and machinery, open storage areas and warehouses. The result has been a great deal of noise and pollution. It looks as if this intensification of pollution in this part of Fujairah may force the government to relocate this industrial zone in the future.

Kalba has a similar problem, its local government has chosen an area to be used as an industrial zone, but this is located next to the residential area. In addition some small businesses dealing in such things as car services are located in the residential zone itself (Figure 6:15). Owners of multi-story properties have let the



Figure 6:15 Small car service shops located in residential areas, the source of noise pollution.



ground floor to shops and small business while upper storeys are apartments rented to private individuals. These residents have complained to the municipal government about the noise from businesses below their living quarters and on more one occasion the government has issued letters to owners of such businesses trying to persuade them to move to the industrial area.

6. Pollution from fishing processing

Fishing is one of the main economic activities in the E.C.. The government is very keen to support fishing because unlike many forms of employment in the area it is not seasonal and, unlike farming, it does not depend on rainfall and so it is an all year round activity.

For many years fishermen have brought home part of their catch to dry and the strong smell has pervaded the residential area. The aroma is especially strong on the second drying day. Drying is done mainly in winter and if the rain falls or the wind blows during the time when the fish are being dried, the problem is much worse. Not only is the smell unpleasant but it attracts flies and insects and thus the ambient air is greatly affected.

Local government has recently banned the drying of fish in or close to residential areas and has designated specific zones for drying fish. This has helped considerably.

However, fishing also causes other sorts of pollution. Fishermen leave old fishing boats, unwanted tools, and detritus on the beaches (Figure 6:16). They also dump rotting trees trunks which they have used in deep sea fishing. All this refuse



Figure 6:16 Tree trunks and unwanted fishing boats left on beaches (above) and process of drying fish (below).



damages the local environment as well as being very unsightly.

Some fishermen also pollute the sea by throwing waste into it from their boats, as well as getting rid of the used fuel from their engines overboard. This threatens the marine environment and the MAF issue warnings to fishermen not to pollute the sea. In an attempt to stop the dumping, the MAF has provided places at each fishing harbour where fishermen can take their waste to get rid of it³⁰.

7. Municipal waste disposal methods

Local authorities in the E.C. play a major role in waste disposal and in keeping the E.C. generally clean and tidy. The municipality of Fujairah is a good example of how this is achieved.

The municipality allocates an annual budget to be spent on protecting and cleaning the local environment³¹. The following are some of the methods of waste disposal used in this area:

- (a) The municipality has established a small sewerage system, as a precedent to be followed in the future to serve an area of approximately 2,000 inhabitants³². The collected water is treated with chemical and re-used to irrigate the street plants.
- (b) The municipality has also set up a specialist department for highways and parks. Municipal refuse collection tankers collect trash bags and take them to the fertiliser factory where the refuse is recycled for use as fertiliser.
- (c) Scrapyards have been established and scrap and other unwanted items with metal parts (eg abandoned cars) are collected, compressed and processed providing valuable scrap metal which is sold by auction.

(d) The municipality has constructed a small fertiliser factory where most of the waste collected in the area is taken to be recycled. Nevertheless some of the E.C. towns and villages, eg in Kalba and Khor Kalba, are still using old methods to get rid of their waste, like burning them away from the residential areas (Figure 6:17). The fertiliser produced is used to fertilise the plants which enhance the town streets and parks.

In 1989 the municipality of Fujairah employed 125 workers to take care of general cleaning in the area³³. Similar methods of waste disposal and manpower levels are to be found in other municipalities.

8. Government action on pollution

Recently the local government of Fujairah has established a small department to deal specifically with pollution in the area, with especial priority for oil pollution. A small aircraft patrols the coastline regularly observing shipping to detect any illegal discharge of oil or other waste into E.C. waters. If any ship is caught discharging waste into the sea, photographs and video film are taken to be used in criminal proceedings against the ship's captain and the shipping line.

In addition the Marine Department at the seaport of Fujairah inspects offshore anchorages twice weekly by boat³⁴. Early warning of pollution being carried to the shore, especially around Fujairah, is provided by the Gulf Environmental Protection vessel, the Abu Ahmed³⁵.

The administrators of some municipalities in the E.C. are very anxious to keep their region free from pollution and they do all they can to encourage companies involved in manufacturing in their areas to protect the environment and the health of



Figure 6:17 Burning waste at Khor Kalba



the inhabitants. Local government also tries to encourage people to help protect their own environment by education, and by providing domestic residences with waste disposal facilities. Municipalities also try to encourage landlords of apartment blocks, offices and other building to undertake responsibility for cleaning and maintenance of their buildings³⁶.

The local government of some municipalities, for instance that of Fujairah, has already made strenuous and far-sighted efforts towards creating a cleaner environment and has provided facilities to help this. The activities of the administration department of Fujairah seaport is a good instance. The seaport administration is very concerned with the risks of pollution from shipping at night. Such shipping poses a serious problem of control; ships can discharge oily waste, tankwash and rubbish into the sea with impunity because by daybreak they are far away out of the jurisdiction of the E.C.. Captain R Turnbull, the Fujairah seaport harbour master, is one of the people particularly concerned in dealing with this problem and he would like to see more government action to protect the marine environment.

Some local authorities have already taken the initiative and imposed fines on those who pollute the environment. For instance, in 1990 the Fujairah seaport authority decided to penalise owners of vessels failing to report the sighting of pollution with a fine of 2,000 Dh³⁷.

The government has also organised conferences to discuss the problem of pollution and to plan strategies to avoid it. As well as government officials such as those of the MAF, the Coast Guard, Police, seaport personnel, the potential culprits of pollution, and fishermen, are invited to these meetings³⁸. These conferences make

people aware not only of the dangers to the environment they are causing but of the possible financial loss of being caught.

On the whole, pollution in the E.C. is still in the primary stages and it is better to tackle the problem now before the environment is seriously damaged. Certain factors contributing to pollution, such as high temperatures and wind velocity and direction are beyond the government's control. They are, however, constant and predictable factors not likely to increase with development. Other contributory factors which can be tackled are, on the whole, directly linked to development and as this increases, so does the level of pollution. It is essential the government impose legislation to organise waste disposal and to protect the environment as soon as possible. Besides being of benefit to the local people such legislation also, ultimately, will benefit those investors in the E.C. whose new business or expansion is a potential threat to the environment. As we have seen in the date producing area of Khor Khwair and in the residential areas suffering from the noise of quarries, pollution has already caused bad feeling between local people and industry and it is possible that further damage to the environment affecting more people's livelihood and quality of life could lead to more bad feeling, and even to large claims for compensation. Animosity and expense can be avoided if manufacturing companies take steps to protect the environment in which their factories and processes are situated.

C. Local government involvement in the area

The E.C. consists of two Emirate territories, Sharjah and Fujairah (Chapter Two). Whilst each Emirate has its own municipal government, the Federal government

is also closely involved in policy and decision-making. The Federal government has to ensure that its policies and individual decisions that it puts into effect are for the good of the whole country, rather than to benefit of the specific interests of either Emirate. At the same time it must ensure that decisions take account of local conditions in the individual Emirate. Government policy is to transform the country into a thriving and modern nation. The present government plays an excellent and important role in developing the E.C.

Industrialisation often occurs with little or no government intervention but when a government consciously tries to effect industrial development its planning must be comprehensive and carefully thought out to ensure development is suitable for the country, and successful. To this end, in the E.C. two plans run concurrently as follows:

- a) Short-term planning: the government formulates certain goals and objectives to be achieved within the next few years. In the E.C. such short-term plans often involve most of the economic sectors of the country and are designed to encourage existing, and establish new, business ventures of large, medium and small scale, whose activities fit in successfully within the overall plan.
- b) Long-term plans: these are designed to achieve long-term goals and objectives and plan government policy for many years to come. These plans should be more general and comprehensive than (a) and, amongst other objectives, include encouragement of large-scale industrial concerns, and other businesses to plan their own future development within the framework of the country's long-term plans.

As in some other countries, dealing with immediate pressing needs often must

take precedence over long-term planning. In the E.C., unfortunately, many plans put into operation tend to be short term ones and, on occasions, unfortunately, government planning in the E.C. has been poor. The result has sometimes been confusion and delay.

The following are some of the government policies put in hand in the E.C. so far:

a. Re-organisation of local government in the E.C.'s municipalities:

At the beginning of the 1980s there were two separate municipalities under the aegis of the government of Sharjah, Kalba and Khor Fakkan. To some extent the local government based in these municipalities served the needs of the E.C. generally and the towns themselves were expanding rapidly and thus requiring more administrative services. At this time, the development of the E.C. was very much in its infancy, and the government found it necessary to establish the two municipalities. After a while, the existing municipalities seemed overmanned and were expensive to run. From the government of Sharjah's point of view, it was essential to reduce costs and to put into action as soon as possible a cost-effective governing body replacing the local government personnel based in the two centres at Kalba and Khor Fakkan, which would perform the same tasks, eg advising on, and processing applications for government subsidies, organising and administering urban facilities, and controlling the allocation of land.

With this in mind, in 1990 the government of Sharjah decided to merge the two municipalities under the control of the Sharjah municipality. This proved to be an

unfortunate decision at that particular time. The cities of both areas were expanding rapidly, people were looking to the government to provide more facilities to help in the development of each area and government distribution of land, especially for housing, had become an increasingly important function of municipal government. People were looking for more government facilities to be offered, cities were expanding rapidly, and co-operation rather than amalgamation of the two municipalities was seen as a better option by the people when, as a result of the merger, hundreds of municipal employees, the majority of whom were local labour, were sacked, with many more being given early retirement. Many of these retired workers were young, in their 30s and consequently retirement payments were very small. This forced many young people previously employed in local government to travel out of the country to find work to support their families.

The merger resulted in much confusion and loss of trust in the government as an employer, and, many young people, and the majority of educated people, subsequently preferred not to work in local government. The merger created the feeling that there was a lack of job security in municipal employment, and the merge was seen as an indication of the government's lack of concern for its workers which might recur in the future, ie many felt that if they went to work in municipal administration the job they had today might, at the whim of the government, be lost tomorrow. Consequently, recruitment of able personnel became difficult and the local government sectors of the Kalba and Khor Fakkan areas were seriously weakened. The local inhabitants, as well as municipal employees, blame their dissatisfactions with local government on the government merger.

At the same time as Kalba and Khor Fakkan are having to deal with the post-merger problems, the government of Fujairah is trying to develop facilities to encourage future development of its cities and the future needs of the people generally. In an effort to facilitate the development of a strong, effective local government, it has introduced a training and development program to improve the standard of its workforce. In order to achieve this, the government now sends existing officials to receive education and training in the West, eg UK. The government has had some success in encouraging local labour back into its workforce and, nowadays most of the new schemes undertaken in Fujairah are managed by locals and opinions are changing. Many inhabitants now approve of their municipal government and feel that it is doing a good job.

b. Problems caused by government projects in the area:

Whilst it is true that the government in the E.C. is, on the whole, successful in developing the area and its facilities (eg seaports), some of the changes they have brought about have unfortunately brought with them undesirable changes affecting existing economic activities. For example, fishing, a traditional form of employment in the area, is being increasingly affected by the expansion in shipping in E.C. waters which is a result of government encouragement of industrial development and overseas trade. As one fisherman commented:

"Before, the water was clean and quiet, and it was easy for us to fish but now, as a result of the development in the area, ships' motors cause so much noise that fish leave the area. Fishing is the only livelihood we fishermen have, now some kinds of fish are not coming to the area any more, and we have to go farther out to

sea on our fishing trips"³⁹.

c. Job opportunities:

In the E.C. it is very noticeable that many young people travel to other Emirates, especially Abu Dhabi, for work rather than working at home. The following are some reasons forcing those young people to leave home to work:

1. Many of the new jobs available in the E.C. require specialised knowledge and training, eg engineering, and because the E.C. has no higher educational establishment of its own, unless young people travel hundreds km or abroad to attend universities and other educational establishments, they are ineligible to take up the better posts offered in their own country.
2. As has already been indicated, local government has earned a reputation for job insecurity and, in addition, government salaries are not high. The oil industry in neighbouring areas has affected the E.C. and has raised expectations of an improved lifestyle and high standard of living among many young E.C. nationals who feel they cannot live comfortably on the salaries they can earn in the E.C.. As a result many of them prefer to work in Abu Dhabi and Dubai where salaries are high, even though this means they have to drive more than 300 km to work.

In conclusion, the local government may have helped in developing the E.C. in general, but at the same time, some of the unorganised government's schemes may have had a bad influence on the area, as mentioned above.

D. Pressure on some existing roads

The E.C. has an excellent highway connecting it with the Western Emirates. This is a four lane carriageway constructed to high modern standards. It also has many other roads which are good and considered to be up to modern standards. However, some roads of these roads are narrow and were not designed to take the amount of traffic now using them. They are crowded at peak traffic times because of the increase in traffic caused by the successful development of the area. A consequence of the government's investment in the area and the facilities it has provided (and continues to provide) is that it is apparent the E.C. will have to expand its present highways network in the near future to keep up with demand. To attract business, especially in the cargo and industrial sectors, good roads are essential. Experts predict an increase in road traffic and whilst the existing roads in the area are suitable for the present movement of vehicles, and provide good access to other Emirates, the government will need to develop the following road networks to satisfy predicted future demands and to connect the whole area together in a modern highway system:

a. The Oman-Kalba road:

The existing road from Oman to Kalba is small and narrow. It is the main road connecting Oman with the UAE from the north, and is considered a good access route from the Omani territories in the south to the cities of the UAE in the north. It is also a major access route to Omani territories in the north (Musandam).

The Oman-Kalba road is very important to the Omani people as well as to the E.C.. Most of the Omani agricultural production reaches the markets of the UAE via

this road. It is also important to the E.C. as it provides access to villages located close to the E.C. but over the border in Omani territory where many E.C. inhabitants have relatives. In addition, the road represents the major access to E.C. villages located close to the Omani borders, eg al-Ghail.

It is obvious that this road will have to be modernised in the near future to keep up with the demands of traffic. Reconstruction to widen the road to create an adequate two lane highway is required. Such an improvement would serve both the inhabitants of the E.C. and the Omani people and would probably result in an increase in Omani trade with the E.C. and the whole UAE.

b. The Kalba-Fujairah road:

This road is already experiencing major traffic problems most of the time because of the heavy demands on it as the link between the two major cities of the E.C. and also because it is the main access to the Western Emirates from Kalba and the region around Kalba. The road is only 2 km long and its route is bounded by the residential area of Fujairah on one side and the coastline on the other and, therefore, widening the road would be difficult without knocking down existing houses. At present the road is small and narrow and unsuitable for the demands of the developing area, as well as for the possible increase in traffic from Kalba to Dubai and Abu Dhabi. It is difficult to know how to improve this road without major disruption of existing services and buildings (reflecting poor planning) but some action is necessary to satisfy the demands of the expanding area of Kalba, Fujairah and the E.C. generally.

c. The Khor Fakkan-Dibba road:

The road from Khor Fakkan to Dibba (37 Km) is crowded during the holiday season and at weekends when many tourists pour into the area to enjoy the open seas and fine beaches. It is estimated that during these periods more than 1,200 vehicles use this road from and to Khor Fakkan⁴⁰.

The government of Fujairah has recently opened a new seaport at Dibba al-Fujairah to serve Dibba and its hinterland, as mentioned in Chapter Five. This development will obviously increasingly affect road traffic in the future and it is important for the future development of the seaport and the area generally to improve this road or replace it with a modern highway. Such an improvement would also benefit the residents of the area as, especially during the holiday season, a lot of accidents occur on this road. An improved road would also provide good access for cargo shipment between the seaport of Dibba and Fujairah airport, an important factor for the rapidly expanding business of re-exporting goods brought about by the establishment of modern seaports and Fujairah airport.

The above mentioned roads are those which connect the major cities of the E.C. and most of them need government action if they are to satisfy the future requirements for a modern highway network. The road from Kalba to Fujairah, in particular, is in need of widening to provide the dual carriageway urgently to alleviate current peak hour traffic problems. The increase in vehicle movement to and from the E.C. will necessitate road improvement schemes in the very near future. At the moment the road network is adequate but as the number of vehicles in the E.C. increases, these roads will require urgent attention.

It is also apparent that the government needs to pay more attention to the road network connecting government facilities, such as seaport and industrial zones and, as well as improving these roads by widening etc, basic maintenance needs to be improved to enable them to cope with the predicted increase in traffic generated by development in the area.

In general, recent roads in the E.C. may become crowded by the increased number of vehicles using these roads in the near future. So it will be necessary to widen and modernize these roads to cope with the vehicle movement in the future.

E. Increasing dependency on foreign labour

This phenomenon exists all over the UAE, and indeed in many oil-producing Gulf countries, but it is new to the E.C. Before the exploration of oil in the Western Emirates and the wealth from oil revenues, most of the small businesses in the E.C. were owned and managed by E.C. nationals, and employed local labour. The oil industry has changed this and, now, throughout the E.C. the labour force and personnel controlling and managing small and medium scale business activity in the area is largely from abroad. This is the result of the following factors:

a. Most small businesses in the area are controlled by Indian, Pakistani, Iranian and some Arab (eg Lebanese and Egyptian) nationals. This is a normal phenomenon in this part of the Middle East; most of the wholesalers and retailers in Dubai, Abu Dhabi and Sharjah are of the above nationality and they prefer to employ and trade with people of their own nationalities. For instance, wholesalers in Dubai offer good credit

facilities to dealers of their own nationality (with some exceptions) exporting to the nearby Emirates, whereas they ask for payment in cash from dealers from other nations. Many wholesalers in Dubai prefer to sell their commodities to their own nationals and even to appoint managers, sub-dealers and distributors of their own nationality to trade in their commodities in the E.C.. As the above demonstrates, they have a tradition of helping each other in business and unfortunately this excludes the E.C. nationals. In addition, E.C. traders and businessmen do not co-operate amongst themselves in the same way and for both reasons above, small E.C. businesses which import commodities for consumption in the E.C. sometimes go out of business in a relatively short time.

b. Over the years people in the E.C. have come to depend increasingly on foreign labour in many different walks of life eg for farmwork and housework. Consequently in recent years, with increasing affluence generating more employment, it was natural for such people to employ more foreign labour.

c. Employers tend to trust foreign labour more than local labour. Because most foreign workers come to the area from poorer countries to support their families overseas, they are prepared to work hard for less money, compared to local labour. This is highly satisfactory to the owners of firms, especially as E.C. nationals demand high salaries to cope with the high standard of living in the UAE in general, and in the E.C. in particular.

The preference for foreign labour in the E.C., approximately 90 per cent of the

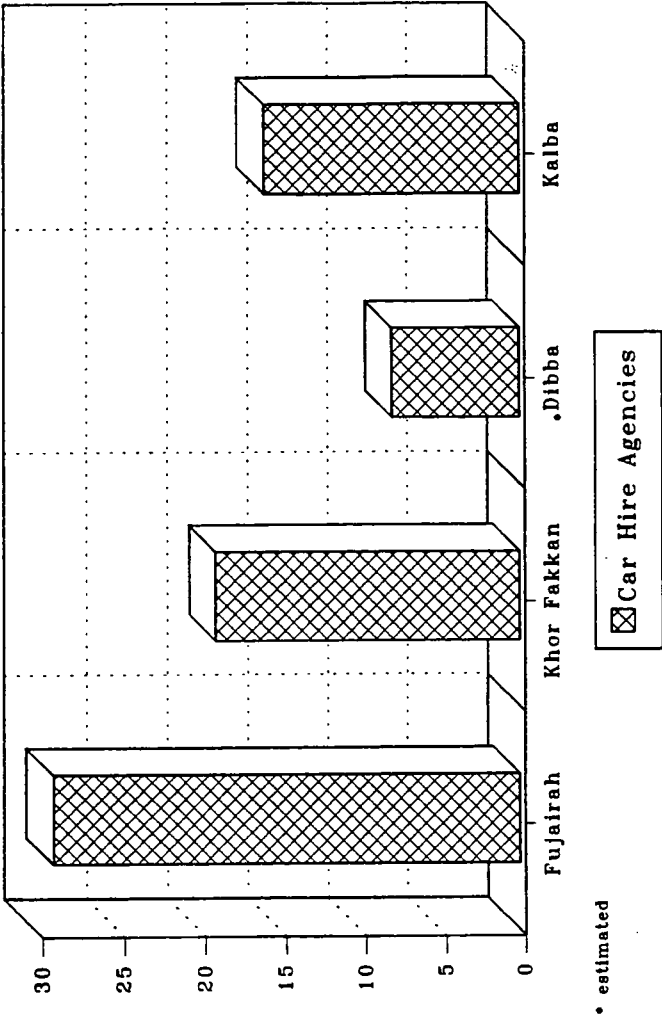
total businesses in the E.C. are managed by foreign labour especially banks and small shops, has led on occasions to bankruptcies. In the 1970s when some young inexperienced businessmen in the construction industry employed foreign nationals as managers, the managers defrauded them and the money lost through this dishonesty meant the businesses could not continue to operate⁴¹. The preference for foreign labour had, and continues to have some effects on the E.C. and on many other Gulf states. One problem in particular has occurred in the E.C. and in other UAE regions involving foreign labour. Owners and managers often prefer to appoint foreign workers rather than E.C. workers because foreign labour tends to have more experience and accepts lower salaries than E.C. nationals.

As the above shows the E.C. benefits from the experience and low salaries of foreign nationals working in the country but it is a moot point whether the dependence on foreign labour will help its economic activities in the long run. To offset against the benefits of experience and low wages is the problem that many E.C. inhabitants and many businesses depend on foreign labour to run their businesses and maintain their lifestyle.

F. The problem of the multiplicity of small firms operating in the same business

The E.C. is crowded with small businesses, many offering the same service or goods, for example, in Fujairah there are more than 29 car hire firms, with an average of five cars per business (Figure 6:18). If we examine the city needs, in 1990 the total population of Fujairah town was estimated to be 26,000,⁴² and most inhabitants had more than one car. It is clear therefore, that there is not enough business to support

Figure 6:18 Number of car hire agencies in the E.C. in 1989.



Fujalrah Chambers of Commerce, Industry
and Agriculture & Sharjah Chamber of
Commerce and Industries, (E.C.branches).

29 car hire firms in the city. Figure 6:18 shows that the number of car hire firms in the E.C. are concentrated in the three next most important towns after the city of Fujairah. This concentration may be refer to the population concentration in these four areas.

However, having studied the reasons for the increase in the number of car hire companies in the area, the reasons why so many businesses are competing for the same businesses were found to be as follows:

a. There is less government control over the number of businesses of the same type operating in one area. As long as someone can afford to pay the licensing fees to the local government agency they can operate.

b. Owners of car hire businesses are offered very favourable terms by car dealers in the area which attracts people as they need little or no capital to start in business. Most car dealers are willing to sell cars to such businesses if they receive some guarantee in return. Usually car dealers register the cars in their own names which ensures they can get their money back. If the owner of the car hire firm fails to pay the monthly payment to the dealer, the dealer can repossess the car.

c. Imitation of success: This is a major factor in the multiplicity of small businesses trading in the same activities. When people in an area observe a successful businessman, they copy his business activity which leads to an increase in the number of businesses of that type or style. This has often led to bankruptcy in the E.C.. Many

local people complain about this but, so far, the government has not stepped in to control the multiplicity of businesses operating in the same commercial field. As one government official stated, "it is a free country with free trading and open competition". The multiplicity of car hire businesses (Figure 6:18) is only one example that can be cited from many. The area has many more tailors than it needs, with some streets being full of tailors. For example there is a street (al-Qalah Street) of tailors in Khor Kalba, most of whom are Bangladeshi. The same thing is happening in Fujairah as well as the whole E.C.. As the amount of business which Fujairah can provide for tailors is limited, such multiplicity, as with the car hire firms, begs the question why these small businesses continue to trade in such adverse commercial conditions. As the street of tailors in Khor Kalba shows, most of these small business ventures are run by Bangladeshis and whilst their profits are relatively small by E.C. standards because there is a limited amount of work to be shared amongst many, nevertheless their earnings in the E.C. are more than they could hope for in their own country and so they continue to operate in the E.C.. As most of Khor Kalba's tailoring businesses employ more than one worker per shop, the area has a high proportion of foreign labour as well as of tailors.

In general, the multiplicity of small business in the area does not serve the interests of the development of the E.C., it only increases the amount of foreign labour in the area.

G. Trade problems

a. There is no clear trade policy limiting the number of businesses of the same type in a given area. Consequently anyone can open a shop in any area without having to

consider existing businesses and this causes problems for both existing and new traders.

b. There is an over-abundance of shopping malls with many shops selling the same kinds of products, all at different prices. This has tended to make customers distrustful of buying from small shops and diverted them to the markets of Dubai and Sharjah.

c. As most of the shops in the E.C. are small, individual shops cannot stock the variety required by the customers, who now prefer to go larger shops where they can buy a variety of items at the same place.

H. Distribution of farmland

Government policy requires that every citizen of the E.C. (in most E.C. areas, depending upon the availability of land in each area) has the right to a free piece of land for housing, farming, industrial or commercial land upon which to build a small building. Not all E.C. citizens take advantage of this opportunity but many do. Whilst this distribution of farmland does not affect the ordinary people in the area, it does affect existing farmers. The problem with this policy is that farmland is being distributed amongst non-farming people who use it for holiday purposes for their families. Most of these people reclaim the land, grow some trees and other produce to satisfy their own needs, and construct swimming pools and holiday retreats on what could be land producing crops to supply E.C. demand. Consequently much land is used only during the holiday season. Because of the popularity of such holiday

retreats, take-up on land is high and, generally, in the allocation of land genuine farmers have tended to lose out, being given comparatively small amounts of land, sometimes insufficient to grow enough crops to feed their families. As a result, farming as a livelihood is suffering; farmers do not want to spend their working lives farming small plots of land. In addition to the lack of profit from cash crops, the smallness of the areas farmed mean investment in machinery and equipment is not cost effective. The situation is exacerbated by the fact that in many farming regions in the UAE, eg the Ras al-Khaimah region, there are farmers enjoying a high standard of living because they have sufficient farmland to farm successfully. Dissatisfaction amongst small-scale farmers is especially noticeable in Kalba and its surrounding areas and in some parts of the Khor Fakkan region.

Summary

The government-sponsored development of the E.C. has been possible because of the wealth of the UAE derived from the oil industry. The above mentioned problems have developed as a result of the successful development of the E.C. paid for by the oil industry and therefore we can see that the problems are an indirect result of the changes taking place due to the industry.

Whilst water has always been a problem in the E.C., increasing demand due to increasing industry and commercial activity as well as an expansion in the population and its increased standard of living (both direct results of post oil economic conditions) have exacerbated the water problem greatly. The water problem is felt especially by farmers and others who require water for their business activities as well

as those inhabitants of below average income for whom water is a heavy expense. The government is trying to deal with this problem by constructing dams over wadis to preserve water to feed the underground storage reserves and new seawater distillation plants have been commissioned in the area to distil seawater for drinking purposes.

Other problems, such as pollution, have now been recognised as of primary importance, and the government of the E.C. has recently begun to pay more attention to such problems.

The above shows that industrial development can cause problems as well as bringing benefits to a country and that these problems can be many and of a wide variety. They can arise from many different circumstances, eg location and economic conditions.

Some of the problems discussed, for example labour, pollution and water scarcity, are prevalent throughout the UAE and the region generally. Nevertheless the people of the area are looking to their government to find solutions for them in the E.C. or, at least, to reduce the scale of such problems. It is apparent, however, that many problems of the area cannot be solved by the government action alone but are due to the lifestyles adopted by the people since the oil industry: if everyone in the area imported only his real needs in foreign labour, claimed only the land they actually needed for industrial or domestic use, and so on, the problems now facing the country would be very much less.

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VII. Future Prospects For The East Coast

A. Land use

1. Main factors affecting land use in the E.C.
2. Demand for land:
 - a. Demand for land for housing purposes
 - b. Demand for land for agricultural purposes
 - c. Demand for land for business purposes

B. The significance of the location of the E.C. as an international re-export station

1. Future prospects for the East Coast:
 - a. The re-export industry:
2. Factors conducive to the E.C.'s development as a major re-export centre in the future:
 - a. Government policy
 - b. Facilities:
3. Can the E.C. become the Hong Kong or Singapore of the Gulf in the future ?

C. The increased demand from international firms to establish in the E.C.

1. Arrival of new companies in the E.C.

D. The development of tourism in the E.C.

1. Places of interest to tourists
 - a. Water springs:
 - b. Historic sites:
 - c. Scenic attractions:
 - d. Night life:
2. Bull fighting
3. Tourist facilities
 - a. Hotels
 - b. Tourist agencies
 - c. Transportation:

E. Other government alternatives for development in the E.C.

1. Fish farming
2. Shrimp mariculture
 - a. Suggested locations of shrimp mariculture
3. Salt mining in the E.C.
4. Rock mining
5. Strategic cereal storage
6. The possibilities of oil exploration in the E.C.

F. Future outlook of the E.C. without oil wealth

Summary

Endnotes to Chapter Seven

VII. Future Prospects For The East Coast

Most of the experts and businessmen who have visited the E.C. in recent times have predicted that the area will change dramatically in the near future due to government policy to develop the area by investing more capital, and providing facilities which make the area attractive to multinational companies. In addition, it is envisaged that the changes occurring in the world of finance, such as the return of Hong Kong to the Chinese, and the economic development of the Gulf countries like Bahrain and Dubai, especially in the business of re-exporting, will have a positive economic effect on the E.C..

A. Land use

A large part of the land in the south of the E.C. is *Sabakha*, salty soil, which is unsuitable for agriculture. The area of Khor Kalba and the land from Sikamkam to Murbih is *Sabakha*. Due to the limited amount of land suitable for farming or housing in the E.C., most of the farms are small and clustered together in the fertile areas. Land in the E.C. is primarily used for farming and housing, but business is also coming to occupy a significant proportion of the land use of the country. The land available for housing is comparatively small and, in some places like Fujairah city and Khor Fakkan town, difficulty is already being experienced in finding enough suitable land for building purposes¹.

1. Main factors affecting land use in the E.C.

In the E.C. land for farming and housing is distributed to local people by the

municipal government of each region, rather than being in the control of central government. In the past, permission from the mayor of each town was required for land use, and generally, the further from the urban concentration, the bigger the amount of land would be granted to prospective farmers. Thus, outside the main urban areas, farms tend to be much larger.

However, this policy is changing somewhat. In general, the land is owned and administered by the Emirate of each locality. Each Emirate has power over its own territories and the federal government only intervenes in special cases. Consequently, it is the administration of the Emirates which makes the legislation regarding land in each area. For example, the Emirate determines which areas are for farming and which for housing. If the Emirate wants to build new houses it has the power to remove old houses to do so (as happened in Kalba in the mid of 1980s). However, most public houses in the E.C. are built by the federal government or the government of Dubai and Abu Dhabi².

In most areas of the E.C. land is free to E.C. nationals living in the area upon application to local government and as long as the conditions laid down by local government for its use are observed. However, acquiring farm land is not always easy because much of the available fertile land has already been taken into cultivation.

Municipal government has designated certain areas for housing and for agriculture and other areas for other uses, for example as industrial zones. Thus we can see from the above that the municipal government is the main legislative body and policy-maker for land use in the E.C. It is the municipal government who has the right to decide whether a farm should be set up or not in a specific area. It also has the

right to allocate land for other uses and, on the whole, municipal government is conscious of the danger of other demands for land encroaching upon good agricultural land and accordingly designates certain areas as farm land. Steps required to acquire land for agricultural purposes:

- (a) The prospective farmer must apply for land from the municipal government (local municipality) in the area in which he lives.
- (b) The application is examined with regard to land use and the municipal government must satisfy itself that the land is actually going to be used for farming. If the land is granted, it must be turned over to agriculture within a specified period of time, or it will be repossessed³. The length of this time limit differs from area to area but the condition regarding use or re-possession is general throughout the E.C.. This requirement applies to most land in the E.C..

Thus the government gives land to its nationals on application and there are no taxes upon the land. The only expense incurred in acquiring land is the cost of fees for the initial transaction. Landowners have the right to sell land acquired from the government, but the obligation for the new owner to use it for the purpose specified, eg agriculture, remains.

Despite the above municipal regulations regarding land use, in general in the E.C. there is no clear written legislation for the land use and distribution of the various areas in the E.C. as a whole. This has not been necessary in the past as the population was small and limited agricultural technology meant people could not farm large areas of land. Farmers used the land to feed their own families and supply the limited needs of small local markets. This pattern of agriculture also provided security

for people (especially older people), as farmsteads were not scattered, the people lived in close-knit communities where neighbours were aware of any danger to each other and could help each other generally (Chapter Three). All this was possible because farmland was not centrally organised and legislation regarding land was sparse or non-existent. By and large this situation still exists today with the exception of the land used as experimental farms, like the Dibba Model Farm.

However, recently, legislation regarding agricultural land use has been introduced to some areas of the E.C. For example, the right of every citizen of the area to receive a farm, house, industrial or commercial land for his own use as long as the land is put to that purpose within the specified time limit, and depending on the availability of the land in each place. In terms of agricultural land, the MAF gives guidance and direction on the best way of farming the land to the owners of land (eg what kind of fertiliser is most suitable for the land, individual crops), but otherwise has no powers over landowners.

2. Demand for land

It is envisaged that future demand for land will increase, especially as cities expand as a result of the population growth and the requirements of commercial and industrial development.

a. Demand for land for housing purposes:

The population of the E.C. is growing rapidly and, as a result, a few years from now, it is envisaged the region will face the problem of finding enough suitable

land for housing. Possible future housing demands pose not only a problem of competition for the available land from agriculture and industry, but also the problem of suitability of land. Large areas of the E.C. are not suitable for housing purposes due to the drainage requirements, and problems with the construction of septic tanks have already been experienced in some areas newly allocated to housing, a good example is being some parts of the Kalba area.

Housing land use in the E.C. can be divided into two main types:

1. Rural housing:

As a result of the traditional pattern of farming and housing, of most of the existing agricultural settlements in the E.C. (excluding those near cities) are close to farm land and consist of small communities or villages rather than scattered agricultural homesteads. The expansion of these communities due to factors such as increasing population will be at the expense of agricultural land and this poses a problem. Whilst some of the increased population of these villages will inevitably migrate to the cities for work, family and community ties are strong in the E.C. and it is envisaged that the majority will prefer to stay in the communities in which they grew up and where their families and friends live.

However, this poses a major problem for the future. As well as the danger of encroachment on agricultural land by expanding villages, most houses in rural areas were constructed close together and without modern organisation or facilities which will make expansion of such villages to modern standards difficult.

Existing houses in the country are mainly owner-occupied and they follow the traditional pattern, for example, the animal fold is an important element in such

houses. Recently, however, the government has itself started to build houses for the people of the rural areas in an effort to prevent migration to the urban areas of the country. For example, 33 houses have been built by the government in Soor (west) Kalba, and 10 in Safad⁴.

2. Urban housing:

As previously mentioned, most land in the E.C. is owned by local government which distributes it amongst the people according to the availability of land. New government housing in the area is constructed by using modern designs and to suit modern life, with some consideration also being given to the traditional elements still remaining in the lifestyle of the people of the area.

The wealth from oil revenues reaching the E.C. cities has meant new houses have been constructed by the Federal Government and the governments of Abu Dhabi, Sharjah and Dubai. But, as well as new houses, residential areas also need facilities such as parks, sport centres, shopping precincts, schools, but many areas of the E.C. used for housing have not yet been provided with all these facilities. Also essential are roads and other facilities normally provided by federal government, such as hospitals, fire and police stations and, again, residential areas have developed lacking these facilities in certain cases.

The main existing residential areas of the E.C. are in the four major cities of Fujairah, Kalba, Khor Fakkan and Dibba. There are also smaller residential areas in small cities like Murbih and Khor Kalba. Most of these residential areas are located close to the sea, and thus, in one direction at least, expansion is impossible. Because of the unsuitability of much of the land in the E.C. for housing, it is probable that in

future the existing residential areas of the E.C. will grow until they join each other, cities will be closer together and it will, eventually be difficult to distinguish where one town boundary finishes and another begins. This is especially so far for the areas between the towns of Kalba, Khor Kalba and Fujairah city.

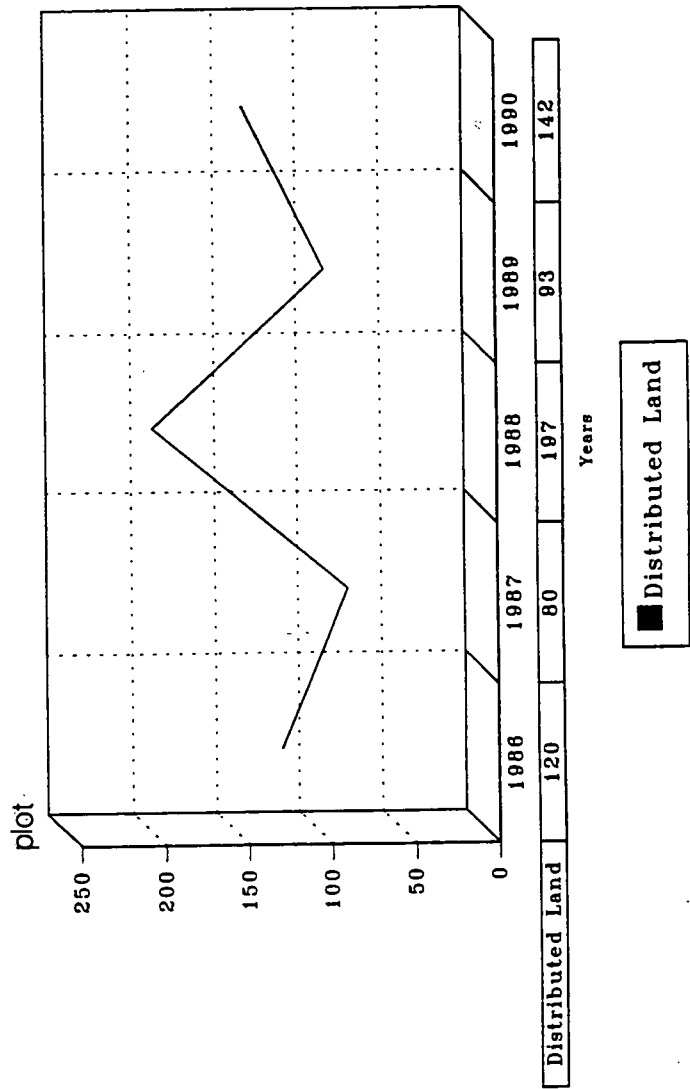
The amount of land available for housing varies from place to place and the area of each housing plot also varies in size depending upon the land policy of the local authority of the area. For example, in Fujairah, 1,200 square metres is the average site allocated for a house⁵. The municipality of Fujairah distributes about 126 sites per year to citizens wishing to build their own houses (Figure 7:1). The figure shows that the distribution of lands for housing fluctuated between 1986 and 1990. In 1988 Fujairah Municipality distributed 197 sites compared to only 80 sites in 1987. This fluctuation may be due to the policy followed by the local government in distributing the Emirate land.

It is envisaged that demand on future land use will be strong in many areas of the E.C. and it has been predicted that the three areas which will have the most problems to face regarding for land use are:

(a) Kalba town: the government has a policy at the moment of granting more than one plot of land to individuals and the plots of land granted are large in area. If this system of over-generous allocation is continued, the amount of land available for residential purposes will soon be very scarce.

(b) Fujairah city: because of its unique location outside the Gulf (Fujairah is the only Emirate in the UAE Federation located outside of the Gulf) and the importance of its facilities such as airport, trade centre, and seaport, it is likely that as time goes on

Figure 7:1 Distribution of land for housing in Fujairah from 1986-1990.



Fujairah will attract more and more people desirous of living there. Many will be business people establishing their companies in the city, and this is likely to produce a demand for high quality residential housing land.

(c) Khor Fakkan town: the geography of Khor Fakkan (mountains surround the town on three sides and the sea water from the fourth) means that it has a limited area for expansion and in the near future this could pose a problem for the government in its plans for commercial and industrial development of urban areas like Khor Fakkan.

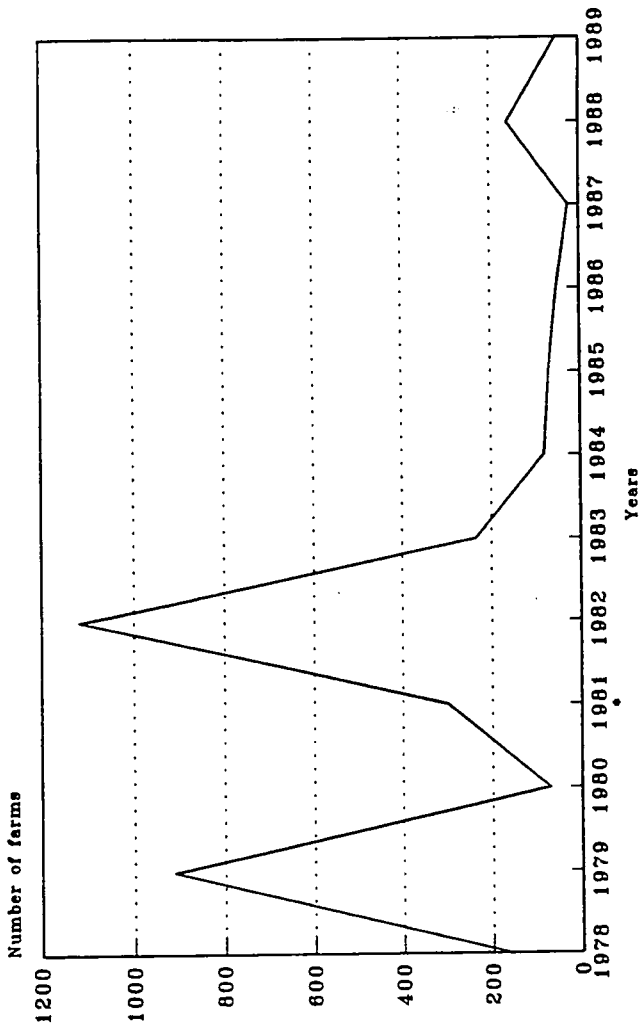
b. Demand for land for agricultural purposes:

In the E.C. land suitable for agriculture is mainly found at the end of wadis. The main agricultural regions are the stretch of land from Khor Kalba to the area south of Khor Fakkan and the Dibba area. The average farm distributed by the Fujairah municipality is 14,400 square metres⁶.

Farmland is distributed among the nationals of the E.C. by the local municipal government. All farmland is given free to anyone wanting to farm and in the 1970s large amounts of farmland were distributed. Between 1978 and 1989 the government distributed 3,223 farms in the whole area⁷ (Figure 7:2). From the farmland figures, we can see that after 1983 the distribution of farmland lessened. This may be because most of the best agricultural land had been taken up and also because of water problems in the area which led the government to reduce the number of farms distributed.

In recent times the government have encroached on to existing agricultural land to provide much-needed residential areas, eg in Kalba. To some extent the future of

Figure 7:2 Number of distributed farmlands in the E.C. from 1978-1989.



Ministry of Agriculture and Fisheries
Statistics 1980-1989.
• 1981 Estimated number

some farmland will depend upon its water supply. The municipal governments are faced with the need to build more houses for the new generation in the E.C. and one justification given for converting farmland to residential use may be that the farmland has a poor return because it has no adequate water supply. However, the problem of water is one that affects both agricultural and residential land use. Unless the Federal government does something about the problem of getting a water supply to some existing agricultural land, it is likely that large areas of farmland will become residential areas in the near future.

c. Demand for land for business purposes:

In the beginning of the 1970s, encouraged by government and as a result of the oil wealth in other Emirates, the E.C. witnessed new development in most of its economic sectors. The development of manufacturing in the region required more land to be allocated for the establishment of new industrial and commercial premises and to move existing workshops to new locations with better facilities to enable them to thrive and expand in more favourable surroundings. This situation forced the government to allocate industrial zones to serve the industrial needs of the E.C.

In the E.C. the municipal government has already located special areas or zones for industrial use. Unfortunately, these have often been located near residential areas and this has already begun to cause problems in some areas, eg Kalba. The siting of these zones was decided upon originally with the best of intentions. The government located industrial areas near the residential areas so that customers did not have to drive far to get the services they required. In fact, many existing businesses

carried on in the industrial zones are small, workshop-type businesses but this may not always be the case in the future as the government is also trying to attract large-scale industry and commercial enterprises from abroad. However, the government of Fujairah is trying to locate some of the new companies wishing to establish in the area in the new industrial zone at al-Hail which is not located near residential land.

As with agricultural land, in most areas of the E.C., land for industrial purposes is distributed free of charge, eg in Khor Fakkan and Kalba. In other areas, especially in Fujairah, the government has divided the industrial zone into small plots of land and collects rent from those businesses who occupy these units.

The commercial areas in the E.C. are usually located in the main streets of cities. Land on both sides of the streets is divided into blocks for commercial property. These blocks usually measure approximately 50 by 60 metres and are given to any citizen of the E.C. on application with fees charged. A block is usually comprised of a modest building of two or more storeys. The ground floor is usually given over to small shops and the second floor for small flats. Construction is usually by local construction companies, which are using foreign builders to do the job.

The regulations regarding commercial land are the same as those for farming and housing in that the person granted the land must put it to its designated use within a certain period of time or the land is taken back, to be given to someone who will use it for its specified purpose. As with housing and farming, usually the applications for commercial land are submitted to the municipal government in each area. Moreover, the ruler of each Emirate (Sharjah and Fujairah) has the right to grant lands to anyone, or to give direct instructions to the municipality to distribute land to

specifically-named people.

It follows from the above that if the E.C. continues to encourage commercial and industrial development, and land continues to be given free to whoever asks for it, within the very near future the government will receive applications for land which it cannot satisfy. In addition, the government has a policy of giving special encouragement to international firms to establish in the E.C. and this too will mean the country will face a large demand for land in the near future. The result of all this is that it is likely that the price of land in the E.C. will rise, especially that in the residential areas.

On the whole, unless the government encourages new investors in building, especially local people, to construct high-rise buildings rather than the present two-storey blocks, it will not be possible in future to meet the demand for building land. It is suggested that the government should adopt a policy of distributing commercial land to those who can afford to construct buildings of five or six floors or more, and help those who cannot by offering them loans or share the profit within certain years until they finish their loan. This is one, albeit perhaps partial, solution to the scarcity of land suitable for commercial use in the E.C., especially in areas like Khor Fakkan and Fujairah.

B. The significance of the location of the E.C. as an international re-export station

One of the most valuable features of the E.C. is its location outside the hazardous waters of the Gulf and away from the crowded Gulf cities like Dubai and Manama (Bahrain). The E.C. also benefits from its close connection with the other

UAE coastal area, the west coast, which is located inside the Gulf. these two coasts are connected by a good highway system.

The unique location of the E.C. was highlighted during the Iraq-Iran war and in the invasion of Kuwait by Iraq in August 1990. The importance of the E.C. seaports was proved during these two events as more and more ships from around the world used its seaports as a safe place to load and unload their freights and also to get supplies. The UAE government had already realised the strategic importance of the location of the E.C. in the late 1970s and early 1980s when it began to widen and enlarge existing seaports in the area, and to construct new ones.

The advantageous location of the E.C. has also emerged in terms of insurance of ships using Gulf waters. Insuring for shipping using E.C. seaports was 60 per cent less than other UAE seaports in the Gulf crisis⁸. Also the number of ships waiting to enter E.C. seaports increased by more than 50 per cent⁹, with the seaport of Khor Fakkan being especially busy in the recent crisis.

1. Future prospects of the East Coast

Future industry in the E.C. will be concentrated in manufacturing and other industries such as the export and re-export business. New industries are being introduced to the E.C. all the time, and it is envisaged this trend will continued.

a. The re-export industry:

The location of the E.C. as a connection station between the Far East, Hong Kong, the Philippines, Malaysia and many other countries of the West, Europe,

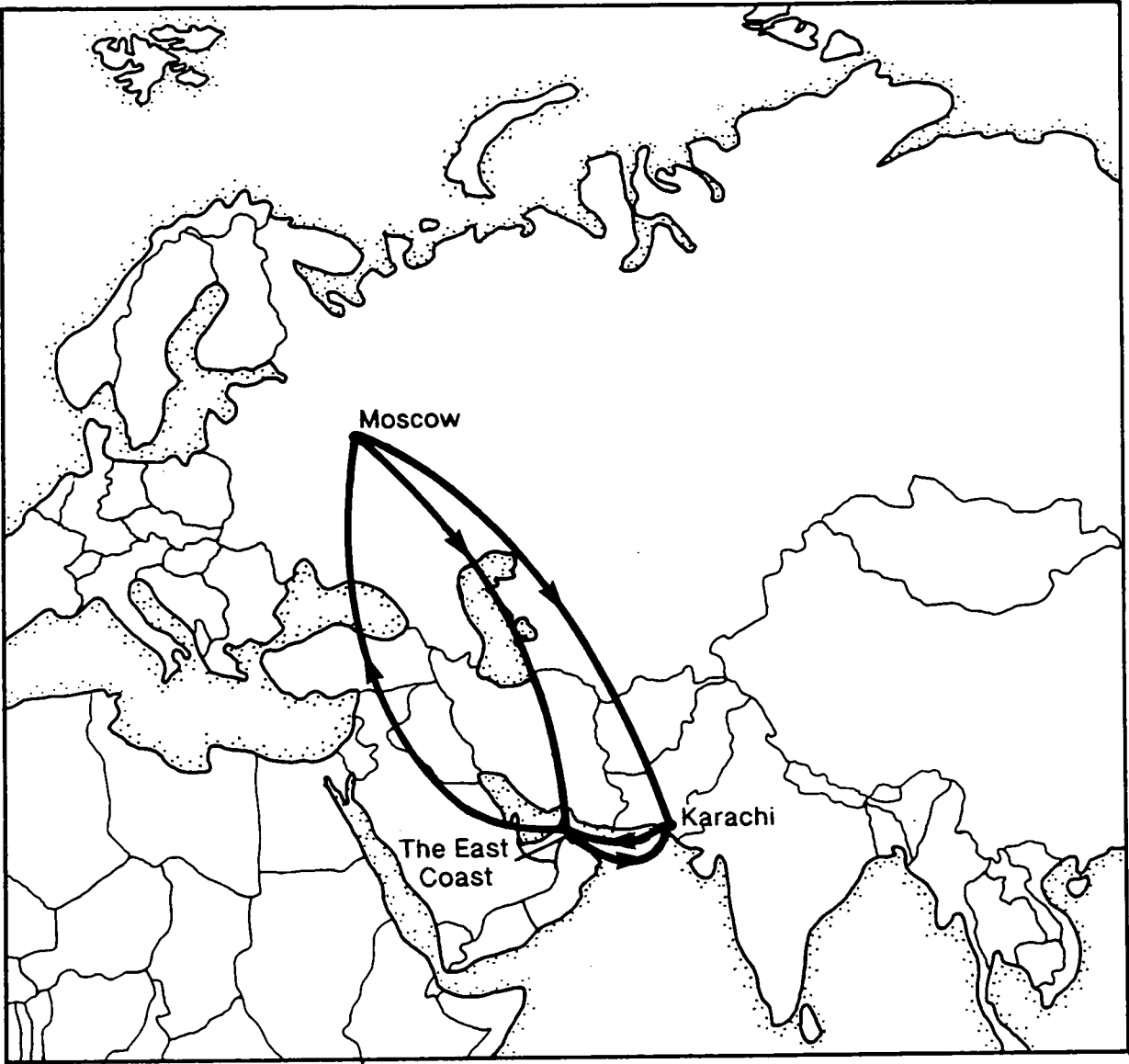
America and the other Middle East countries has stimulated the development of the re-export industry to the area. The re-export industry is served in the E.C. by the following facilities:

1. Air freights, A new feature of many businesses in the world markets is next-day freight delivery. Airlines play a major role in carrying valuable commodities from the West to the East through Fujairah airport.

One of the airlines which operates in the E.C. and which is increasingly getting a big share in the re-export industry in the area is Aeroflot, the Russia airline. Aeroflot operates between the Indian Sub-continent and Russia, and recently much of the cargo leaving Fujairah has been carried by Aeroflot, which is used by one cargo company operating from Fujairah airport. This cargo leaving for Russia includes such items as electronics, computers and VCRs. Most of these commodities come from Dubai market and are transported by road to the E.C. in trucks. In October 1990 Aeroflot carried 550 tons¹⁰ of cargo to the Soviet Union via Fujairah airport.

How do companies benefit from using Fujairah airport? If we take as an example a company trading in textiles and operating between Karachi and Moscow, we can see the benefit derived from Fujairah airport when we examine its activities. The company buys textiles cheaply on the Pakistan market for exporting abroad, getting the benefit of the advantageous export prices which are especially low in Pakistan. The cargo arrives in Fujairah and the company distributes some of the textiles to UAE merchants (Figure 7:3). The unsold textiles are re-exported to Moscow where the textile company pursues a similar path, selling part of the imported cargo and re-exporting the rest back to Pakistan again via Fujairah or direct from Moscow.

Figure 7.3 TEXTILE ROUTE FROM KARACHI, THE E.C.,
MOSCOW AND KARACHI



In Pakistan the company can now charge a higher price for the textiles as they are imports.

2. Sea freight. The E.C. seaports have a good reputation for handling large container vessels for the re-export industry. Moreover, the strategic location of E.C. seaports gives the sea-to-sea cargo industry a unique advantage; the authorities of the E.C. seaports started a project recently which allowed large vessels coming from the Far East to Europe to unload the part of their cargo destined for the countries of the Gulf in E.C. seaports and continue their journey to their next destination without having to enter Gulf waters. The cargo is then taken on to its Gulf destination by smaller vessels operating from E.C. seaports. During the Gulf crisis, the Saudi government agreed to bring its crude oil to the E.C. seaports where ship-to-ship transfer would be carried out¹¹. By this method large vessels reduce the cost of their operations considerably, the operation of large container vessels can reach more than 10,000 UKP per day¹², and an additional advantage to large ships is that they save time; sailing to Gulf seaports in the south takes at least one full day and another for the return, and this is doubled for journeys to seaports in the north of the Gulf¹³.

The above practice has great potential for development, small vessels can operate with less cost and time taking containers from E.C. seaports to the other UAE regions in the west coast and on to other ports within the Gulf. In August 1990 in the seaport of Fujairah the above practice led to a 98 per cent increase in the container industry¹⁴.

In 1990 the total re-export trade in Fujairah alone reached 104 million Kg, worth 1,019 million Dh¹⁵. More than 45 per cent of the re-export commodities were

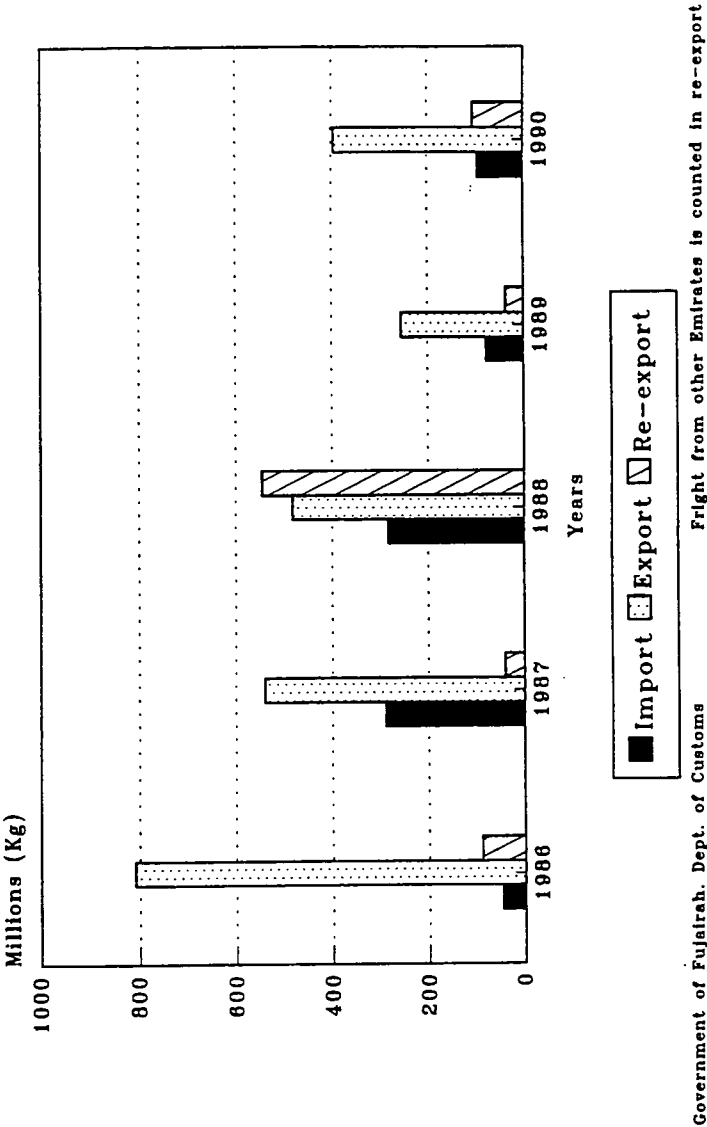
sent to three countries in the Indian Sub-continent India, Bangladesh and Pakistan. 1988 saw the peak of the re-export trade when more than 544 Kg (some of the freight came from other Emirates) of goods were re-exported to Europe, the Indian Sub-continent, GCC countries and other countries around the world. The year also witnessed a development in sea/air cargo.

From the available data in the E.C. we can see that exports from Fujairah were higher in 1986, at 808 million Kg than in 1990 (Figure 7:4). The reason for this was the export of heavy materials such as tiles, cement and rocks, most of which were (and still are) sent to GCC countries for use in the construction schemes of these countries. In 1990 exports dropped to 395 million Kg, worth more than 52 million Dh¹⁶, still almost 12 million Dh more than the 1986 figure. This increase in revenue is despite the fact that the weight of cargo exported in 1990 was less than in 1986. Most of the 1990 exports were semi and fully manufactured rock-based materials, fish, dates and other commodities.

In 1990 the E.C. imported 94 million Kg of goods through Fujairah, valued at approximately 281 million Dh. Most of the imports were frozen food, sheep and electronic sets¹⁷.

E.C. seaports have become major stations for the transshipment industry in the Middle East. Most large vessels prefer to unload the cargo destined for the Gulf and other nearby countries into other vessels waiting at E.C. seaports and continue their journeys in the smaller vessels. For example, if a vessels with cargo from Pakistan sailing on the Indian Sub-continent route has containers destined for Europe, it unloads these into a waiting vessel at an E.C. seaport and returns back with another freight

Figure 7:4 Emirate of Fujairah trade statistics
from 1986-1990.



load picked up in the E.C. to Pakistan. Another vessel then takes the freight from Pakistan along the UAE-Europe route to its final destination. This saves time and money for the owners of large vessels.

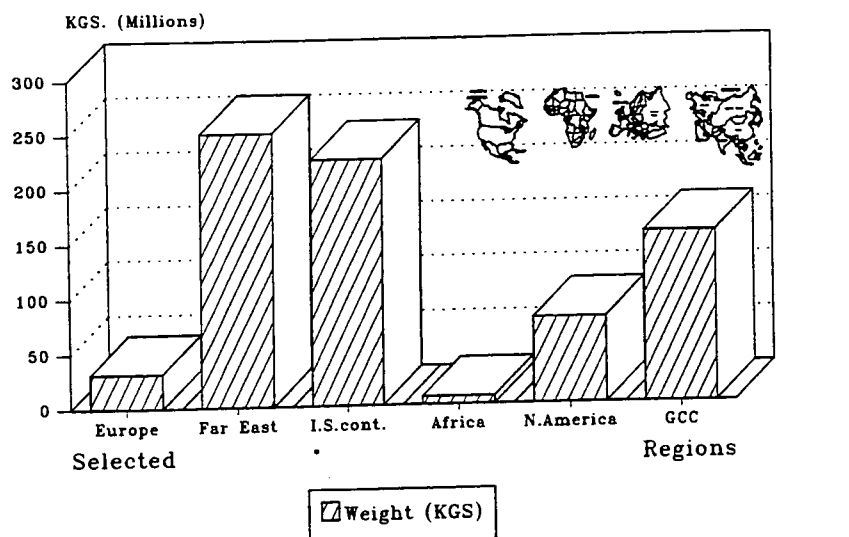
In 1990, 44,778 containers were transshipped to destinations in the Far East and the Indian Sub-continent via E.C. seaports. In the same year more than 798 million Kg were transshipped to other destinations using E.C. seaports¹⁸(Figure 7:5). The transshipment industry to GCC countries reached 150 million Kg in the same year. As Figure 7:5 shows, the highest transshipment of containers in 1990 was between the E.C. and the Far East, with the Indian Sub-continent in second place. This shows the importance of this new industry between the Gulf area and the Far East and the Indian Sub-continent.

Some of the containers unloading at E.C. seaports are destined for local ports inside the UAE, especially Dubai and Sharjah seaports and airports, which are only 120 km and 80 km away respectively from the E.C. This close proximity to other major ports makes container movement from the E.C. ports easier. Over the last few years the container industry between the E.C., Sharjah and Dubai has increased considerably.

In 1987 the total number of containers of 40 and 20 foot- equivalent units was 9,203 (Table 7:1). This number had almost doubled to 17,604 by the end of 1990. The majority of these containers, 97 per cent, were sent to Dubai. The table illustrates the annual increase in the number of containers from Fujairah to Dubai as well as to Sharjah.

3. Sea/air cargo. The re-export industry is booming in the E.C., in both airport and

Figure 7:5 Transshipment from Fujairah seaport to selected regions in 1990.



Government of Fujairah, Dept. of Customs.

* Indian Sub-continent

Table 7:1 Number of containers transshipped from Fujairah seaport to Dubai and Sharjah between 1986-1990

Year	To Dubai		To Sharjah		Total
	40"	20"	40"	20"	
1986	4	6	0	3	13
1987	4686	4220	100	197	9203
1988	6757	4538	150	247	11692
1989	6879	4691	349	98	12017
1990	7017	9995	339	253	17604
Grand Total	25343	25450	938	798	50529

Source: Department of Customs, Fujairah.

seaport transport. In 1988 half of the TEUs handled at Fujairah seaport were moved out of the country by air¹⁹.

So far the airports of the UAE, especially Dubai, Abu Dhabi and Sharjah are all benefitting from the success of E.C. seaports in the re-export trade to destinations outside the UAE. The cheap cost of container delivery from the E.C. seaports to these airports makes container transport easier to these airports and also to some other destinations outside the UAE. In 1991 the cost of transporting two containers of 20 TEU from the E.C. seaports to Dubai or Sharjah ports cost around 700 Dh¹ for one delivery²⁰. Dubai airport receives a large part of the freight from E.C. seaports for re-export to Europe and other countries.

"Much of Dubai's outgoing air cargo, for example, comes through the port of Fujairah"²¹.

2. Factors conducive to the E.C.'s development as a major re-export centre in the future

In general the E.C. is qualified to play a major role in the re-export industry. As well as its advantageous location, the area has promising facilities which will enable it to take a major part in the sea/air cargo trade between the Far East, America and Europe. At present, international airline and shipping companies are only just discovering these attractions and it is likely some time will elapse before more of them can be persuaded to use the E.C. airport and seaports as a transit station on their journeys between the East and the West.

¹ In 1991 one pound equalled around 6 Dh.

a. Government policy:

A major factor in ensuring that the E.C. plays a major role in the re-export industry is the government's commitment to investment to develop existing facilities and to find the best way to encourage international companies and other transport lines to trust the E.C. as a safe and profitable place to site their business. The government of Fujairah is taking the lead in promoting E.C. seaports (Figure 7:6). It participates in international conferences about sea/air cargo and the development of airports worldwide from which it gains valuable knowledge and experience to enable it to develop, manage, and promote E.C. facilities.

Because of the future needs and the increase of container movement in the Fujairah seaport, the government has a future plan to provide the seaport with a computers network to help in monitoring the containers arrive in the seaport, to reduce the amount of labour where the computer now decides where to stack the containers by order, and to help load and unload the containers²².

b. Facilities:

The re-export industry depends on many elements to be successful. Suitable location and up-to-date facilities and equipment to load and unload freight, as well as good management, are essential prerequisites for the industry. The Fujairah seaport is now considered the third busiest container terminal in the Gulf region²³. This is partly due to the fact that the seaport has the latest technology available with which to serve international shipping. The importance of Fujairah as a 'mother' port for the Gulf area because of its strategic location (ie outside Gulf waters) has grown in the



Figure 7:6 Some leaflets promoting E.C. facilities (above) and expanding the Khor Fakkan seaport container terminal (below).



recent past. The facilities offered by this seaport, together with government support, have combined to give Fujairah a worldwide reputation which has led to an increase in the number of international shipping lines using the port as their main port of call in the Gulf area. Examples are the Asian Express Line and the Pakistan National Shipping Co.. The free trade zone in Fujairah seaport is a good example of the government instituting measures to encourage multi-national firms to establish in the area.

Following the development of cargo movement in the world, the port authorities at Khor Fakkan have extended their facilities. A new project has been started to widen its container terminal by filling up part of the old seaport with earth to enable the existing terminal to take more containers (Figure 7:6). This project to expand the capacity of Khor Fakkan seaport comes at a time when more and more shipping lines are applying to use the seaport as their base outside but near the Gulf. The seaport promises to be increasingly important because of the natural depth of its container terminal and the new facilities it can offer to shipping lines which are already finding it satisfies their requirements.

The E.C. also has the following facilities to serve the new industry:

1. Trade centre. As previously mentioned (Chapter Five), the FTC was established by the municipal government of Fujairah to serve the needs of E.C. traders and to give the kind of facilities required by large-scale businesses wishing to establish in the area. This trade centre has the capacity to handle most of the business already in the E.C. and is trying to gain a worldwide reputation so it can attract many more companies to the E.C. Most new firms in the E.C. have offices in the FTC.

2. Finance. There are a variety of financial institutions serving the E.C. which can help solve financial problems for companies. These financial institutions have helped many businesses to set up in the area and to get loans, and they also advise and deal with many other financial matters, eg insurance.

One of the main financial institutions advising and helping businesses to establish and operate is, of course, the banks. In 1991 there were 13 banks operating in the E.C. (Table 7:2), 8 of which were branches of national banks of the UAE, eg Fujairah National Bank, Sharjah National Bank, and the remainder were international banks. The table shows, the concentration of these banks at Fujairah, and the number of foreign banks which only operate from Fujairah (as a UAE law)²⁴.

3. Transport facilities. The fact that the E.C. has a very good road network, considering the population in the area, is a major factor in the development of industry and commerce. The E.C. has good access to the other regions of the UAE and its highway network connects the E.C. not only with the UAE but with Omani territories and beyond, especially after the recent construction of the new highway between the UAE and the Saudi territories which connects the UAE with the other GCC countries²⁵. This is a great asset for delivery of goods to UAE regions and to the cities of Oman which are located close to the E.C. (Figure 7:7). Because of its excellent road network, land transportation is a good method of delivering containers which arrive at the air and seaports of the E.C. from other UAE air and seaports and vice versa. UAE regulations allow goods vehicles to pull more than one container (20 TEU), thus facilitating the movement of transit containers very economically from the E.C. to any UAE destination (Figure 7:8).

Table 7:2 National and international banks and their branches which are operating in the East Coast in 1990

National Banks	Fujairah.	Kalba	Khor Fakkan	Dibba al-Husin	Dibba al-Fuj.
Oman Bank	1	1	1	1	1
Abu Dhabi N. Bank	1		1	1	
Fujairah N. Bank	2				1
Abu Dhabi Com. B.	1				
BCCE	1				
Sharjah N. Bank			1	1	
Ras al-Khaimah N.B		1			
Dubai Islamic B.	1				
Foreign Banks					
Arab Bank	1				
British Bank	1				
Saderat Iran	1				
Melli Iran Bank	1				
Bank of Baroda	1				

Source: UAE Central Bank, Fujairah.

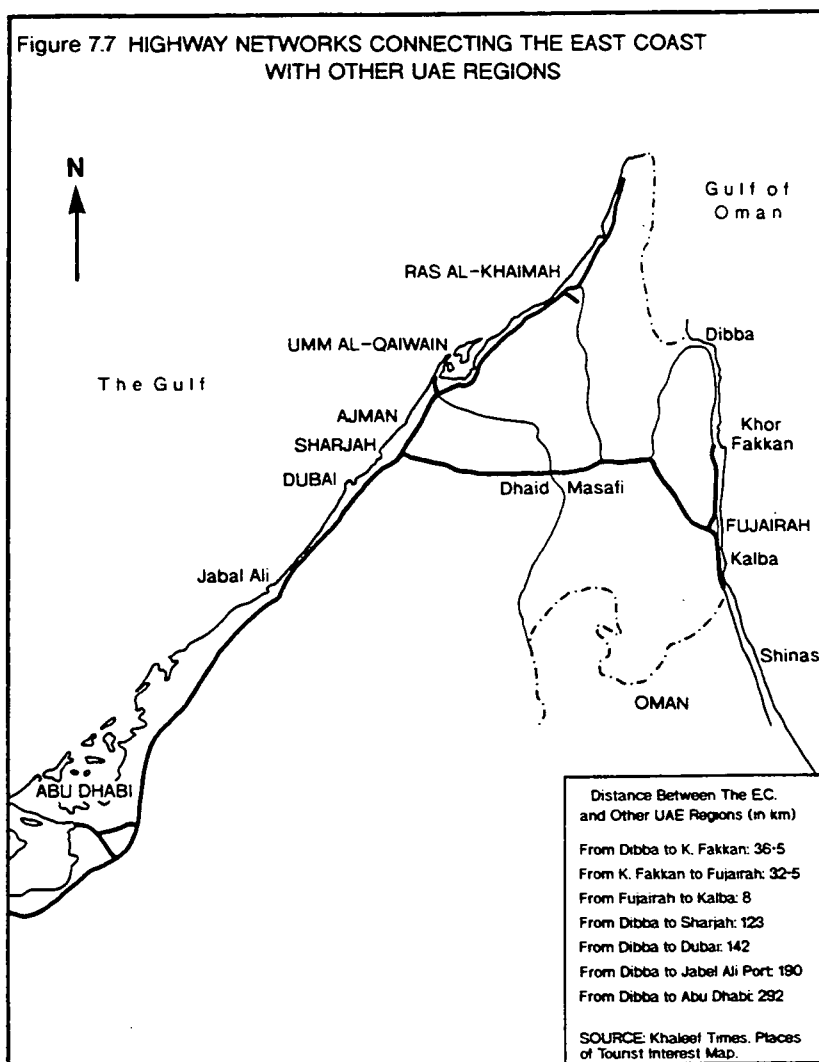




Figure 7:8 Highway network connecting the E.C. with other UAE regions (above) and transporting containers from the E.C. seaports to other UAE destinations (below).



3. Can the E.C. become the Hong Kong or Singapore of the Gulf in the future?

The importance of the geographical location of the UAE, and the E.C. in particular, may increase considerably by the end of the 1990s when Hong Kong is to be returned to China. As a result many Hong Kong companies are already moving out of the colony and many more are searching for new locations to use as a base or domicile for their business activities²⁶. Some of these firms have already established their business in the seaport of Jebel Ali (Dubai), others in Bahrain and in Mediterranean countries. In the exodus from Hong Kong, some firms have already established branches in the E.C. to get the benefit of its facilities, eg free trade zone, airport and seaports. The increase of the transport costs and handling time worldwide will encourage international firms and shipping lines to find alternative places to satisfy their needs. For example the need of efficient handling points for the transfer of freight from plane to ship and vice-versa could be achieved through the Fujairah airport and E.C. seaports. The proximity of the Fujairah seaport and the airport, less than ten minutes apart by road, and the good road network between E.C. seaports makes them efficient and able to handle a lot of freight in little time.

The location between the Far East and Europe and the availability of the existing facilities in the E.C. could give the area an advantage as a mid-way station. Freight needing to be received in Europe or the Gulf could quickly be brought from the Far East by sea transport to the E.C. and from here it could be transferred to air transport for a final destination in Europe. This could avoid the delay in passing through some man-made canals eg the Suez Canal. Such a system gives the E.C. an advantage of timing.

The land connections (highways) between the E.C. and the UAE and the other Gulf countries make the E.C. an ideal place for ocean cargo. Ocean cargo vessels may arrive in the E.C. with standard size containers which have to be offloaded and, in some cases, eg. air cargo, also must be palletized. All these process take time and halt the flow of cargo²⁷. In the case of land transport, this is solved, by loading the containers on flat trailers and sending them to their final destinations. This keeps the transfer of cargo to a steady flow.

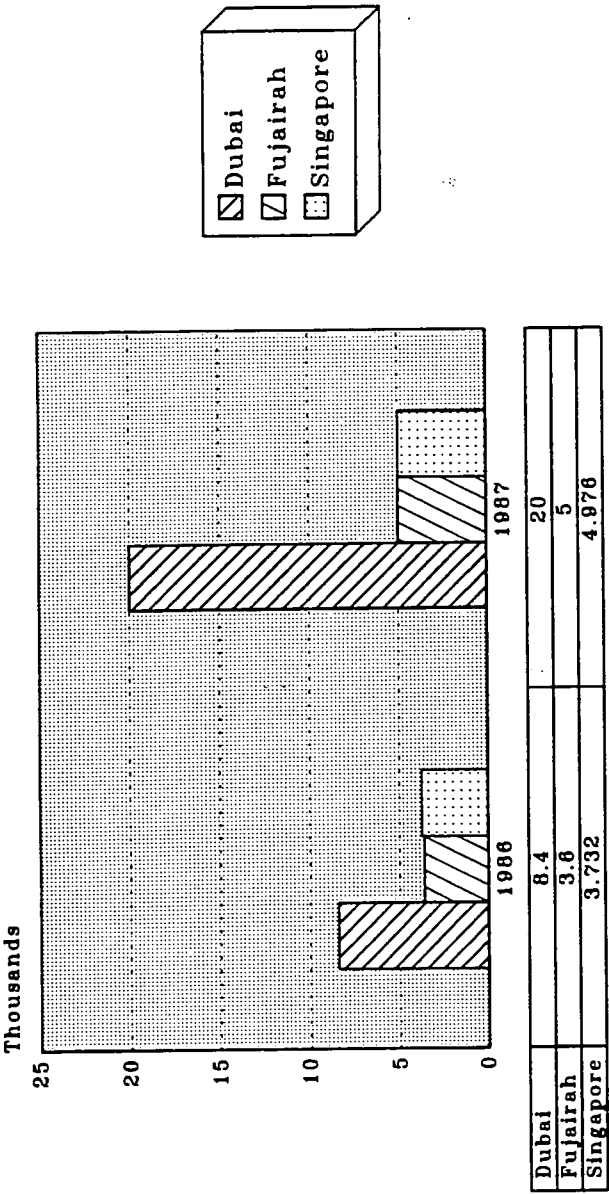
In a comparative study between the three transfer points Fujairah, Dubai and Singapore, Fujairah comes second after Dubai and before Singapore (Figure 7:9).

As Figure 7:9 shows, a sea/air cargo trade from the Far East (the western route) is developing through Fujairah. In 1986 there were 3,600 tons of sea/air cargo handled through Fujairah alone. This figure increased in the following year to reach 5,000 tons, a little more than the Singapore share. This is encouraging, bearing in mind the importance of Singapore as a port in the world.

As mentioned before, (Chapter Seven) the Khor Fakkan seaport authority started a new project to extend the seaport container terminal so it could take a greater part in the world cargo industry. With the financial facilities, the trade centre, the ideal location in relation to the Gulf countries and the close proximity of Dibba, Khor Fakkan and Fujairah seaports and Fujairah airport, the E.C. is ideally placed to become the Hong Kong or Singapore of the Gulf area. The cargo industry is one of the main industries which encourages multinational firms to take the E.C. as their base when establishing their firms and making other business with the Gulf area.

A recent survey carried out by one industrial foundation in Abu Dhabi

Figure 7:9 Sea/air cargo volume from the Far East between 1986-1987, Western Route,(tonnes).



Sharjah Airport Authority.
Sea/air Cargo Workshop. 20 March 1989, p. 6.

concluded that the UAE has the economic and technical qualifications to replace Hong Kong as the world's leading international free trade zone²⁸. This study highlights the fact that there are four major free trade zones in the UAE, one of which is the free trade zone at Fujairah seaport.

In conclusion, the E.C. could become an important place for the re-export industry if the government invested more money, and full collaboration between the other UAE seaports and airports is achieved. Government personnel in the E.C. are enthusiastically committed in their efforts to develop the area to its full potential, especially the airport and seaports and they hope that it will become the Singapore of the Gulf area²⁹.

C. The increased demand from international firms to establish in the E.C.

As previously mentioned, by the end of the 1970s, the demand for land use for business purposes had increased a great deal. The many advantages which make the E.C. an ideal location for business have encouraged many firms to establish their business here. Some of the business ventures are partly government funded, the capital needed to set them up is being provided partly by local government and partly by the companies involved. Many multinational companies have also established in the area, many to serve the shipping industry, eg supplying passing ships with their needs. One example of this the Kalipso Star Bunkering Co. Ltd., which is located at Kalba and supplies ships with water and their other requirements. To give an indication of the scale of development, a list of new firms divided into two main categories is given in Appendix 2.

1. Arrival of new companies in the E.C.

The shipping industry in the E.C. has attracted a lot of shipping agencies to site offices in the region. For Example in 1991 at Fujairah alone there were more than 27 shipping agencies serving all international routes³⁰. Most of these companies have moved their business from other regions of the UAE or have expanded their business by opening new branches in the E.C.. In 1990 there were eight international lines operating from Fujairah seaport serving the Far East, the Indian Sub-continent, the Gulf area, Africa, Europe and America. Other companies serving the shipping industry are also operating in the E.C. from the seaports of Khor Fakkan and Dibba.

In January 1991 a British company, Archem Ltd., which deals in mineral dressing, signed an agreement with the administration of the Fujairah Free Trade Zone to establish a new paint processing plant in the area³¹. The plant was located in the area so it could serve the UAE market, and the Gulf area generally. The Archem plant in the E.C. also aims to export its products to other markets. The company uses local materials in the manufacture of its products. It is associated with the Derwent Mining Co which has been operating in the E.C. for a while and part of the products of the Derwent are used in the manufacturing at the Archem plant.

In conclusion, the future prosperity of industry in the E.C. depends on government policy and the available facilities to serve the new arriving firms. The government should look for the quality of these new firms not the quantity.

D. The development of tourism in the E.C.

Tourism is considered to be one of the most important elements in the economic activity of many nations and, besides it plays a major role in promoting and sustaining friendly relations between the peoples of different nations³². Tourism is one of the most promising of the new industries to come to the E.C.. The winter months from October to April provide an ideal tourist season in the E.C., with temperatures average 22°C when most of Europe is experiencing cold weather. The E.C. is also an attractive place for a touring holiday. For those tourists who are seeking warm seas and fine beaches, the E.C. is an excellent place to spend a holiday. Businessmen from the Far East travelling to Europe and vice-versa may stop for sun and relaxation before they continue their trip. The E.C. with many quiet areas eg Dibba and Khor Fakkan, is deferent from the west coast of the UAE which is crowded with cities and traffic.

There are a lot of undiscovered beauty spots in the E.C. still waiting to be developed by the government and tourist agencies. Some ideal tourist locations have already received some attention from the government, especially those in the Fujairah area, parts of which have natural beauty and are suitable for tourism. The government of Fujairah has established a tourist centre at Mudhab to serve the industry. Most of the hotels in the E.C. have tour programmes to encourage more tourists to see the beauty spots of the region.

If it is promoted successfully, tourism could be a viable alternative source of revenue which means local government income for services in the area need not be unduly increased in the future. The government of Fujairah is trying to use its new

airport to promote its tourist industry. At the moment many of the tourists arriving in the E.C. are people who live in the UAE. During the holiday season, tourists from other Gulf countries, like Kuwait, and Qatar also spend family holidays in the E.C. and often tour the area, some solely for a touring holiday. During the winter months tourist agencies in Dubai, Abu Dhabi and Sharjah organise trips to the E.C. for tourists as part of package tours. So far there are no statistics for the number of tourists who visit the area because most of the tourists come as part of package tours which also include other areas. However, out of more than 30,000 tourists who visit the UAE annually, more than half spend some time, usually a few days, in the E.C.³³.

1. Places of interest to tourists

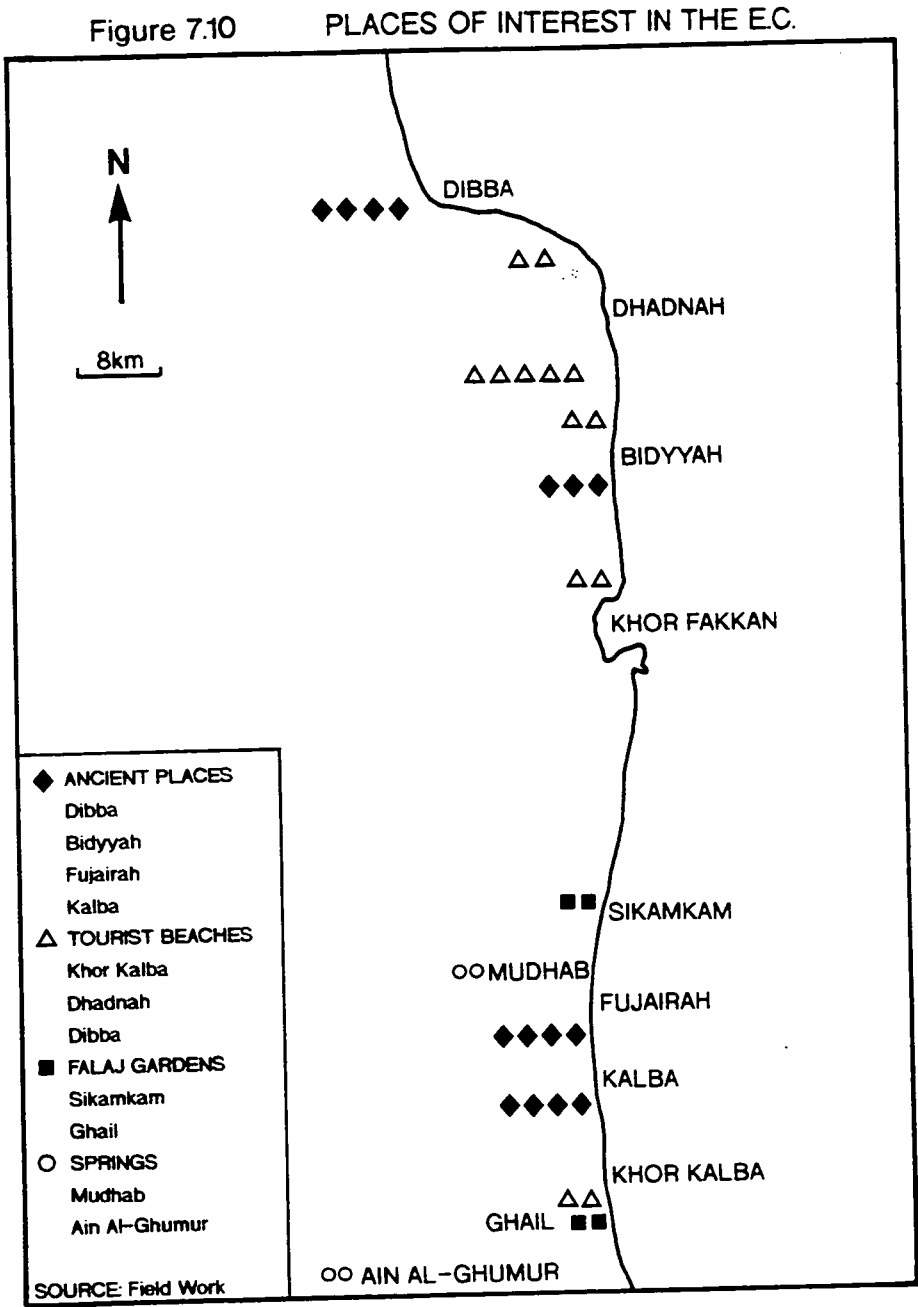
a. Water springs:

The E.C. is an ideal place to see warm springs, and waterfalls. Most springs are interesting places for tourists to visit. Some of the springs in the E.C. are known for their healing properties, especially for skin disease and are also gaining a reputation as natural parks where tourists and other holidaymakers can enjoy, eg camping and picnics.

The following are the famous springs in the E.C.:

1. Mudhab spring This is the only spring in the E.C. which has so far received government attention to develop it as a tourist area. It is located at Fujairah and covers an area of about 58,900 square meters³⁴. The site is planted with fruit trees and has two restaurants, swimming pools and a sauna (Figure 7:10).

2. Al-Ghumur spring. This spring is located in the mountain region and is a warm



spring ideal for tourist development as it is located only few km from Khor Kalba and is on the UAE/Omani border. Two swimming pools have been constructed to collect the warm waters of this spring and to allow visitors to bathe in them. The temperature of the water reaches more than 50°C and it is only possible to stand for a few seconds at the head of the spring because the water at that point is extremely hot. The spring is famous among the UAE and Omani people. There are no regulations governing visits to the spring and no fees are charged for its use, everyone visiting it can bathe in the spring and freely camp in the pleasant parkland which surrounds it.

3. Worrayyah waterfall. The Worrayyah waterfall is between Dibba and Khor Fakkan. It is down a difficult track and needs a four-wheel drive vehicle to get to it. Many tourist agencies in Dubai arrange groups of visitors to enjoy the waterfall and, for the more adventurous, camping in the mountainous area around.

b. Historic sites:

1. The old ruler's palace at Kalba and the castle at al-Ghail. In the old town of Kalba, the ancient country house of the ruling family is, potentially, an important tourist site. It is located close to the sea and constructed from specially made mud-bricks and stones. The house has been partly damaged and is deteriorating and restoration work is required urgently to preserve the house if it is to be a major tourist attraction in Kalba (Figure 7:11). There is also an old fort, probably built by the Portuguese³⁵, across the road from the place and, together, they are the major historical attractions of old Kalba.

The old castle of al-Ghail is located south of Kalba town. In the past it was the



**Figure 7:11 Old house of Kalba ruling family (above)
and old mosque at Bidyyah**



main defence to protect the area from marauding enemies.

2. The castle at Fujairah. This is one of the oldest castle in the E.C. and in the past it was very important as it commanded a strategic location controlling the sea and the surrounding mountains. The Unesco Mission of 1978 which visited the UAE to assess conservation needs, recommended that the area surrounding the castle be defined as a conservation area and preserved from any housing development. The Fujairah government recognises its value as a tourist attraction and maintains the castle for visitors which is open to public.

3. The ancient Mosque at Bidyyah. The Othmanayah Mosque at Bidyyah is one of the oldest mosques in the E.C., and perhaps even in the whole of the UAE (Figure 7:11). The structure dates back more than 4,000 years³⁶ and is one of the major tourist attractions of the area. The site is close to the main Dibba to Khor Fakkan road, and is a very attractive place for visitors. It is hoped that the area surrounding the mosque will eventually be excavated as it is believed it is a key archaeological site which could, ultimately, yield much valuable information about settlement in the area in the past.

Besides the above historical places of interest, there are many more sites of historical value in the E.C. which date from ancient times. Many sites require excavation and research to find out about earlier settlement in the area. The E.C. is full of ancient castles and houses which are worth a visit for the tourist to the E.C..

c. Scenic attractions:

1. Khor Kalba creek. The creek at Khor Kalba is considered an ideal location for those

looking for a holiday resort away from the stresses and noise of modern life. It has a motel which provides excellent hospitality and is an ideal location for an 'away from it all' holiday. A lot of visitors, both from other UAE regions and from foreign countries, find this a quiet relaxing holiday resort. The main leisure pursuits here are crabcatching, fishing, picnicing and swimming in the Oman Gulf.

2. The date gardens of *falaj* Town. In France tourism has been provided partly by arranging holidays where vineyards area visited and the local products sampled. A similar sort of holiday is possible in the E.C., visiting the traditional date gardens many of which still water their land with the tradition *falaj* irrigation system. There are a lot of these gardens in the picturesque mountain are and all that is needed to visit them is permission from their landlords who are usually very happy to welcome visitors and show them round.

3. Dibba beaches. Whilst it is true that unlike in the west, coastal areas with fine beaches are not traditional holiday resorts in the Muslim World³⁷ due to the Islamic culture and behaviour patterns, nevertheless leisure activities centred around beaches are becoming increasingly popular in the Arab World and the beaches of the E.C. are very attractive. Fishing is also popular on this coast. At Dibba the government has already provided some facilities to encourage tourists such as telephones and car parking. Waterskiing and sailing are also popular at Dibba and the clear waters make swimming irresistible. The beaches are clean and white and tourists from the Gulf area visit these beaches in such great numbers during the holidays and in the holiday times that it is wise to come early in the day if one wants a place on the beach.

4. The sea walk at Khor Fakkan and the old creek. Surrounded by the Hajar

mountains, Khor Fakkan is a delightful place to spend a holiday. It has a hotel which provides entertainment for visitors and the hotelier is working hard to promote the area by setting up an entertainment programme to give tourists in the area an enjoyable time. A tour of the old creek is a 'must' for visitors as many of the old, traditional ships of the E.C. which used to be used to carry passengers and freight to other areas of the E.C. and beyond are still moored there. The creek is a very interesting place and well worth tourists paying a visit.

d. Night life:

Whilst the night life is short (unlike in the West, most entertainment ends at midnight), there are many things to see and enjoy including the following:

1. The trade centre at Fujairah and its Sooq. In the FTC there are many places where tourists can enjoy nightlife. The trade centre has its own shops where visitors can enjoy shopping Western style until late in the evening. There is also a Sooq, the traditional Arab market, where tourists can browse amongst, and buy, both the modern and traditional goods of the E.C. The Sooq is open until late. The many shops in the area offer a great variety of merchandise to buy ranging from food and clothes to electronic goods (Figure 7:12).
2. The Islamic-designed Sooq at Khor Fakkan. Khor Fakkan has a new Sooq constructed in accordance with traditional Islamic design. The Sooq attracts many tourists in the E.C. and there are many small shops which sell a great variety of goods including souvenirs to remind visitors of their tour of the E.C.

Khor Fakkan is also an ideal place to spend a weekend and a lot of families

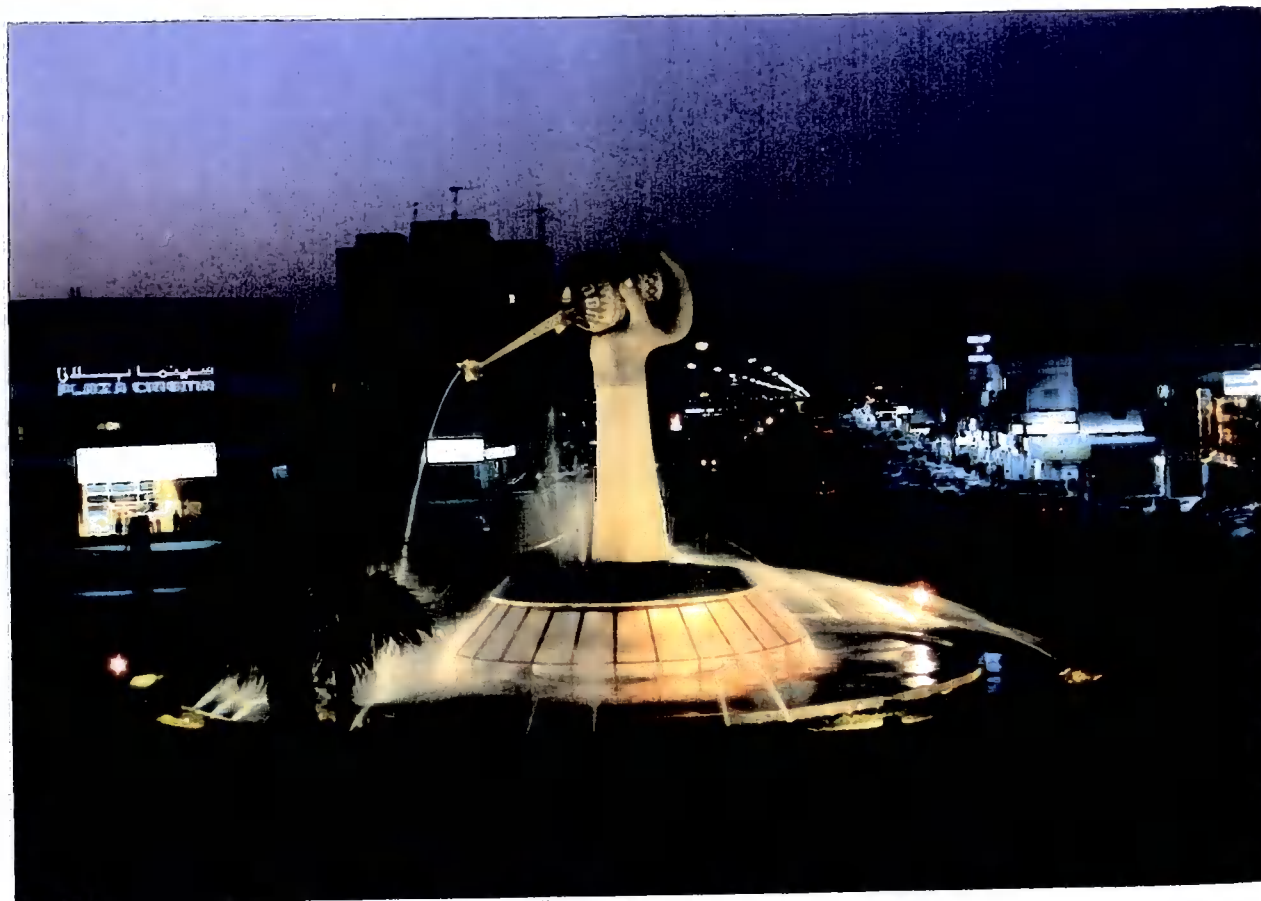


Figure 7:12 Views from the E.C., Fujairah at night (above) and view from Kalba (below).



from all over the UAE and the E.C. visit here and enjoy evening walks in its attractive recently-constructed park. The park has a beautiful cornice and pavements for strolling and has become a tourist attraction.

3. Restaurants. There are quite a number of restaurants in the E.C., usually located in crowded areas. Most of the restaurants are operate by Indian and Lebanese and serve various kinds of food. Public cafeterias are famous in the E.C. located in quiet roads or close to the sea and decorated with palm tree fronds in the traditional E.C. style. Most serve tea and snacks and hookah (narghile) and are part of the night life of the area.

In general, at the moment, the government is not doing a lot to preserve the more historic sites which are potential tourist resources nor encouraging the development of the other attractions such as parks. It would be advantageous for the tourist industry if local government developed the attractions of its respective areas and provided them with the necessary tourist facilities for use by local people and tourists from farther afield. One of the main ways government could help develop beauty spots and historic sites for tourists is in the matter of access. Many of the beauty spots lack good access for tourist cars and coaches and some of the natural springs, especially, are inaccessible. The government of Fujairah has made some efforts to help tourist but, in general, the area has not been developed for tourism and many places will stay unknown, not only to tourists from abroad but even to the people of the area unless the government realises the value of these sites as tourist attractions and natural recreation centres for the E.C. and the tourist industry.

2. Bull fighting:

The only place in the whole UAE where you can enjoy bull fighting is the E.C.. Bull fighting takes place in few places in the E.C., but it is possible to schedule your timetable during the week to watch more than one bull fight, which is a definite advantage for visitors attracted to the area specifically to see the bull fighting.

The inhabitants of the E.C., especially farmers, are trying to revive the traditional E.C. leisure pastime of bull fighting. As previously mentioned (Chapter Three) besides expecting their animals to provide food, farmers in the past were also proud of their animals, especially their bulls, for their fighting prowess and in the past to demonstrate this, each area organised a bull fighting season.

In recent years some farmers, especially retired ones, began bull fighting again and were keen to revive this traditional E.C. sport. At the moment there is little money involved in the sport, especially in buying fine bulls and the feeders. Most of the bull fighting in the E.C. is pursued as a hobby.

On bull fighting day (which differs from place to place) usually around 40 to 60 bulls are brought to the chosen spot to fight. The bulls are usually tethered to dry trunks (Figure 7:13) to await their turn in the arena.

Whilst bull fighting is not an official sport in the E.C., the government tries not to interfere with the sport. However, it takes no part in the organisation of the sport in the E.C.. Bull fighting is organised by the owners of bulls themselves and so far there are no official locations for bull fighting, nor is the government intending to become involved. It could, for instance, promote the sport by constructing arenas to enable owners to practise their sport more often. If the government seriously intends

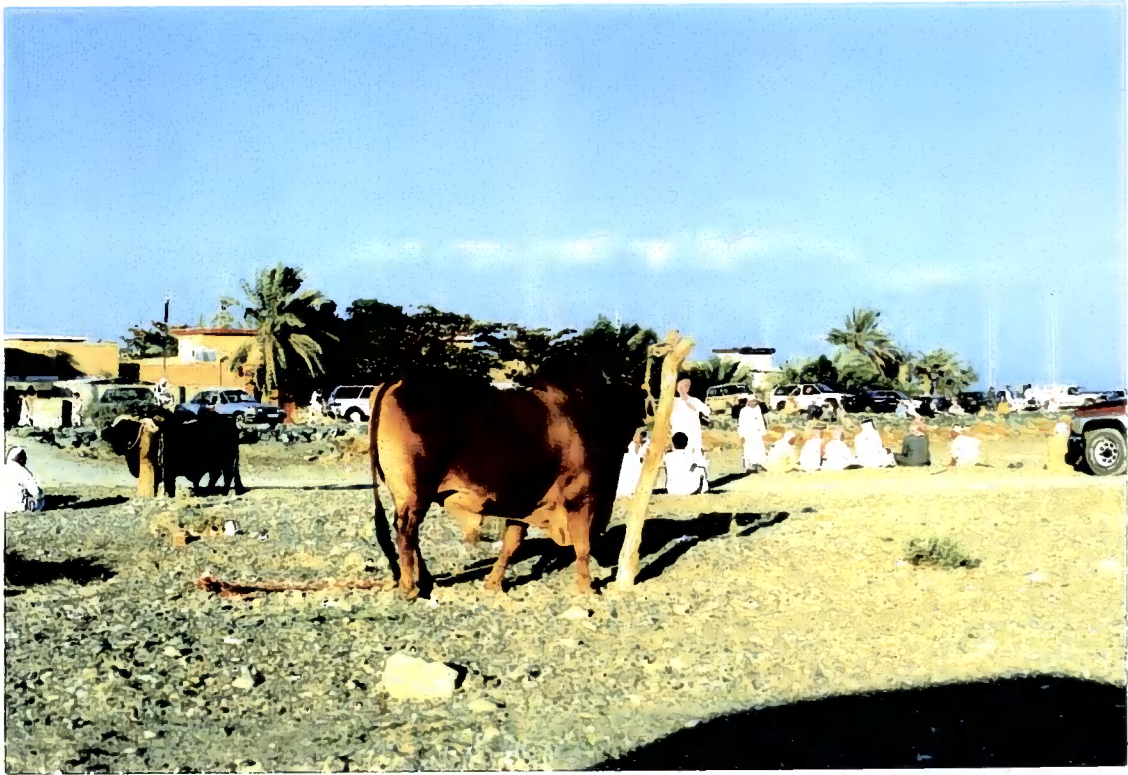


Figure 7:13 Views of bullfighting in the E.C.



to develop the tourist industry in the E.C. as a future alternative source of the government income, bull fighting is something it should look at as a possible tourist attraction, and participation in the organisation of the sport and construction of the arenas would help attract more tourists to the area.

One good thing from the tourists' point of view about bull fighting in the E.C. is that it takes place on different days so most of the farmers and fans have an opportunity to watch the sport more than once during the week and this is a distinct advantage for those planning tourist itineraries. The sport is sufficiently attractive to be part of the tourist industry and tourist agencies from other UAE regions plan trips to the E.C. for visitors to combine the bull fighting with other activities offered by the area.

3. Tourist facilities

The E.C. possesses many natural attractions potentially valuable to it if wishes to develop a tourist industry. The E.C. has blue sky almost all the year, and clean water with good beaches, some of which have been already been provided with picnic facilities. The E.C. has easy access by sea through its seaports, and by air through Fujairah airport, as well as an excellent road network linking it with all other regions of the UAE and through the territory of Oman.

a. Hotels:

The E.C. has some hotels of international standard, for instance, The Fujairah Hilton which has 100 rooms. Other hotels also have a large number of rooms to cater

for the tourist and business people who visit the area, for instance the Oceanic at Khor Fakkan has 530 rooms and 45 suites³⁸ and serves the tourist industry and the business needs of the area. The E.C. also has many motels, many in attractive places away from the cities where rooms can be rented. These are suitable for family holidays and charges for motels are cheap compared with hotel rates.

b. Tourist agencies:

Most of the tourists visiting the E.C. come through the Sharjah, Dubai or Abu Dhabi tourist agencies and there are also some local travel agencies who organise trips in the E.C. in conjunction with the above agencies. Some Dubai travel agencies have opened offices in the E.C., eg DANATA located in the FTC and operating throughout the E.C.. The volume of tourists is on the increase and it is hoped that travel agencies will increase numbers still further in the future by organising more tours.

c. Transportation:

The E.C. has good access by air and land, and the following are the main ways tourists come to the country:

1. By air through Fujairah airport. Regular flights from the Indian Sub-continent, the Middle East and Europe carry passengers to the E.C. and some other UAE regions. The travel agencies in the UAE and the E.C. use these regular routes and tourists have good access by air to the country.
2. By Land. The E.C. is well served by roads and tourists mainly come via the two main highways:

- a) The Oman road which connects Dubai and al-Ain region with the E.C. through Omani territory.
- b) The main highway from the southern Emirates to the E.C.. The E.C. is also well served by many car hire agencies and tourists can hire a car for less than 70 Dh¹ per day.

In general the government in the E.C. has been slow to encourage tourists to come to the area but the natural resources are attracting tourists to the area anyway. However some help from the government is required if the industry is to develop. Unless the government make a financial investment to preserve the historical sites which are potential tourist attractions, these ancient monuments may be damaged and the areas around them modernised which would virtually destroy them as tourist attractions.

Despite a financial shortage, some local governments in the E.C., especially those in Kalba and Khor Fakkan, are investing in tourism in an effort to develop the industry and to exploit the places which are capable of becoming tourist attractions.

In Kalba, for example, the municipality has placed grass and flowering plants on both sides of the main roads for a total of four km, enhancing the area greatly. Approximately 214,300 sq metres have been planted with grass and shrubs, mainly on the town's roundabouts and in its small parks³⁹. Thus, the Kalba municipality can take credit for making the area more attractive. With the available tourist facilities and with future ones in the pipeline, the government of the E.C. hopes to develop the tourist industry. The aim is not tourism on a large scale, which could have a serious

¹ Approximately 11 UK pounds in 1991

impact on the local lifestyle and environment, but to attract a few more people to the area who will spend money which will bring in much needed local government revenue⁴⁰.

One area in which the success of the tourist industry in the E.C. can be judged is the hotels which operate in the region. The Hilton Fujairah is a good example. At the end of the 1988 tourist season, this hotel signed an agreement with tourist agencies from Germany, Holland and Switzerland who undertook to book ahead 50 per cent of its total rooms. Because of this arrangement, other agencies from the UK and France often found difficulty in booking accommodation at the Hilton because all the rooms were taken⁴¹.

On the whole, the above demonstrates the increasing number of tourists visiting the E.C. and shows the development of the tourist industry in the E.C. is progressing satisfactorily.

E. Other government alternatives for development in the E.C.

As well as tourism, there are other alternative sources of revenue waiting to be exploited by government and commercial enterprise in the E.C. The government in the area receives many applications for new businesses and also from companies wishing to invest in, and expand industries existing in the E.C.

1. Fish farming

Because the E.C. is located adjacent to an open sea, fish farming is a viable industry, as yet largely unexploited. Whilst studies have been carried out for this

industry, none have been put into practice so far because there are enough fish found naturally in E.C. waters to support the needs of its inhabitants as well as to provide a surplus to export to other fish markets in the UAE and other GCC countries. Thus, at present, there is no need to establish fish farming in the area and fishing is left to E.C. fishermen. Whilst the government sees no immediate need to expand the region's capacity to produce fish, this option is available for the future and may be one way of increasing government revenue.

Another reason why the government has not so far promoted fish farming is that it is anxious to protect the environment and aware that schemes such as fish farming may take up areas which could be developed as tourist resorts for visitors and E.C. inhabitants.

2. Shrimp mariculture

The shrimp breeding farm is a valuable project in the E.C. as the demand for shrimp is going high and prices are good. There have already been a couple of projects to study the possibility of shrimp mariculture in the E.C., eg at Khor Kalba.

Shrimps are caught in small quantities in the fishing seasons in the waters around the fishing harbours of the E.C. and are sold by the fishermen in local markets at a price comparable with imported and frozen shrimp. So far the Sun Rise company located at Khor Kalba is the only shrimp processing plant in the E.C.

a. Suggested locations of shrimp mariculture

The area has many places suitable for shrimp farming, for example the lagoon

at Khor Kalba is considered a good site for such farms. The waters of the lagoon are quiet, and the indigenous mangrove trees provide suitable shade for the shrimps. The MAF report on shrimp has shown that a sizable quantity of shrimp larvae is available for mariculture⁴². The proximity of the lagoon to the fishing harbour at Khor Kalba and to the seaport and airport at Fujairah means the lagoon has excellent access, and transporting the shrimps to all parts of the UAE and abroad would therefore be very easy. So far Japanese and Iranian businessmen have already tried to breed shrimp for commercial purposes in this area.

Another suggested shrimp farming project is being studied in Fujairah. It is estimated that this project could produce up to 100 tons/year and it is envisaged this could provide a valuable commodity for export to Europe. The project is being studied by experts at the FAO and it is estimated it will cost around 5 Million Dh to establish⁴³.

3. Salt mining in the E.C.

Some areas in the E.C., the *Sabakha*, are not suitable for farming or housing but, as they consist of large areas of salty soil, could be used for mining salt by government or commercial enterprises. In fact the E.C. is capable of becoming the major salt supplier for the whole of the UAE. Salt mining is a promising industry in other parts of the UAE, eg Abu Dhabi.

There are many areas of *Sabakha* in the E.C. The following are the main locations which could be used for salt mining:

- a) The area between Khor Kalba and the Omani borders:

This area is suitable for collecting salt in its natural state and studies are required to develop this potential (Figure 7:14).

b) The coastal areas from the Fujairah seaport to Qidfi:

This area is close to the sea water and the incoming tides bring sea water to flood the land. The water takes a long time to evaporate but leaves salt as residue. It is possible this could be treated chemically for use as salt, or for other purposes.

4. Rock mining

The E.C., with its mountains is naturally rich in mineral resources and the government encourages multi-national firms to establish their plants in the area. Most of these plants are combined government/private investments and the government of Fujairah and Sharjah have both participated in these shared enterprises. Many projects are under way in the rock mining industry and others are awaiting government approval to begin processing of the rocks of the area.

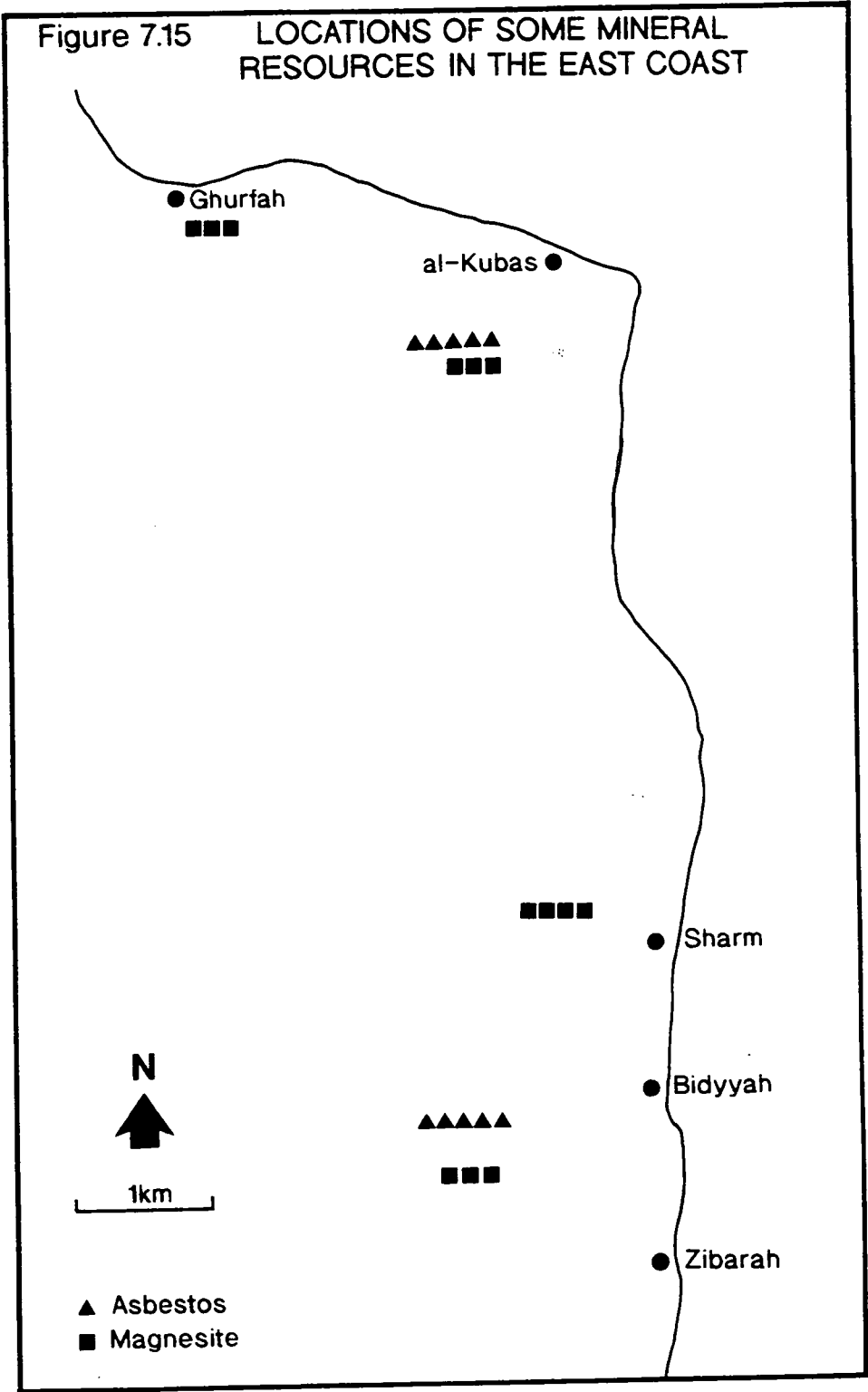
Further studies are also being carried out to explore the mineral resources of the mountains. Studies already undertaken have discovered asbestos and magnesite bearing rocks around Dibba and in other areas and there are some studies to exploit it in the future. Asbestos and magnesite are found close to al-Kubus and Ghurfah in the Dibba area and also west of Zibarah and Bidyyah⁴⁴. Magnesite is also found to the north of the Sharm area (Figure 7:15). Production of some minerals, like mineral wool and cement, is already under way whilst others are still in the research stage.

The latest mineral survey for the UAE carried out for the Ministry of Petroleum and Mineral Resources published in 1986 revealed the existence of copper



Figure 7:14 *Sabakha* near Fujairah seaport (above) and *Sabakha*, at Khor Kalba (below).





in commercial quantities in the E.C., especially in Fujairah⁴⁵. Also other valuable mineral resources like uranium and iron ore have been located in the E.C. mountains⁴⁶.

5. Strategic cereal storage

The E.C. has the resources, both geographical and otherwise, to become the strategic storage centre for wheat and other cereals to serve the UAE and other GCC countries⁴⁷. This project could be an important one in the future, especially bearing in mind the location of the E.C. and the existing facilities for transporting eg. the seaports and good road network.

It is hoped this project will save countries in the Gulf area money and time in future. For example, the centre's administrators could purchase large quantities of wheat on the international markets and store it at the E.C. wheat station. Because of the volume the station could deal with international brokers and buy large quantities at a much cheaper rate than normal and this means countries buying their cereal requirements from the E.C. station would be able to buy cheaper than they could on the international market and thereby save money. It is envisaged such a station would be able to send cereal to any country in the Gulf area because of the excellent transport facilities of the E.C. and the benefit of the sea and land transportation will be especially valuable for delivering to other Gulf countries. For example the grain would be imported from overseas and carried in large vessels to the E.C.. From the station itself, the grain would be carried in smaller vessels to save time and reduce the cost.

6. The possibilities of oil exploration in the E.C.

There have already been some trial explorations for oil in the E.C., none of which have confirmed the existence of oil, at least this is what officials claim. One oil company, Bomin Bochumer Mineralgesellschaft which had a concession to explore the oil in the Emirate in 1966, confirmed a commercially exploitable quantity of oil in the Emirate of Fujairah⁴⁸. Lately, one Australian company has acquired a concession to explore for oil in the Fujairah region and the concession extends to an area of 1,518 square km⁴⁹.

F. Future outlook of the E.C. without oil wealth

Most of the recent studies of the area predict the depletion of oil will occur by the year 2064⁵⁰. It is difficult to predict what life in the UAE and in particular the E.C. will be like after that period. Another factor to be taken into account in this scenario is how long the world will continue to depend on oil, if and when other alternatives to oil energy are discovered and if the world can ever reduce its oil consumption.

As previously mentioned, oil contribution to GDP fell from 55.9 in 1982 to 38.4 in 1989 (these figures may be affected by the drop in oil prices), followed by an increase in other sectors of the economy, eg farming from 1.1 to 1.7 during the same period. Lately the UAE has changed its policy to one where it is reducing its dependence on oil wealth in preparation for the decline in oil revenues and the depletion of oil resources within the next 72 years. This policy represents a new direction from government to discover other alternatives to oil revenues. Part of this

policy looks to manufacturing to provide more revenue (Chapter One). The latest changes in this policy have led to the establishment of the Ruwais Industrial Zone and the Jebal Ali scheme, which the government of Dubai has spent 2.5 b. USD in establishing. The government has also constructed five international airports and five free trade zones to enrich the commercial sector of the country. As well, it has developed new areas, eg the E.C., to increase local and Federal government income and to assist trade in the country generally.

All this has been funded by oil revenues and, as mentioned in Chapter One, whilst the west coast of the UAE has oil and the east coast has none, the wealth from the west has funded the development of the east to a large extent. The lifestyle of the west coast is tied to the oil industry whilst that of the E.C. is less dependent upon it. In the east coast many people still gain their income from traditional industries such as fishing and farming and so the end of the oil era may not affect the people of the east coast as much as those of the west coast.

The recent development of economic facilities in the area and future plans to develop the E.C. further could play a major role in giving partial independence from oil revenue to the UAE in the future. As the E.C. survived without oil up to the beginning of 1970s it could find it less difficult to recover from the depletion of oil resources in the future. The inhabitants of the E.C. are in a much better position to survive after oil than those in the west coast and in other oil-dependent Gulf states, eg Kuwait. Some people of the E.C. still gain their living by fishing which the government sees as capable of future development as and when the need arises but, with oil revenues still buoyant and providing revenue for government, the government

sees no urgency to develop these industries at the moment.

Summary

The existing and potential economic activities which have been described above guarantee that in future more business will come to the E.C. If these new activities come to pass and existing ones such as tourism are developed, the area is likely to witness a high demand for land as a consequence and urban growth will also be stimulated.

The E.C. has the potential to play a major role in the international re-export industry, greatly helped by the airport and seaports in the area and it is envisaged this will be a major growth area in the near future. The strategic location of the E.C. is also a major factor in the economic expansion, as are the facilities provided the E.C. to help develop business in the economic sector in this region.

In all, it looks as if the future of the E.C. will be prosperous and a boom in business is likely. As this chapter demonstrates, as well as existing business activities in the E.C. there are many new activities which the region is capable of sustaining and some of these may well also contribute to future prosperity.

Endnotes to Chapter Seven

1. The suitable land here means the land which does not consume large amounts of money to prepare it for building.
2. al-Khalij. No. 4185. 21 October 1990, p. 4.
3. The period is usually six months but can usually be extended by a few months, with some exceptions.
4. Kalba Municipality, special report on public houses in Kalba and its surroundings.
Also, Fujairah Municipality.
5. Ibid.
6. Ibid.
7. This is the number of farms distributed during the 11 years 1978 to 1989. This number is for the whole East Region, and represents the total number of farms registered with the MAF. There are other distributed farms but these are not registered in MAF files.
8. al-Khalij. No. 4277, 21 January 1991, p. 1.
9. Ibid.
10. Air Cargo News. Middle East Supplement. December 1990. viii.
11. Khaleej Times. Vol. XIII, No. 283. 23 January 1991, p. 17.
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VIII. Findings And Recommendations

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Endnotes to Chapter Eight

VIII. Findings And Recommendations

Oil Exploration and UAE independence have improved the quality of life for all the people of this area greatly. The wealth derived from the oil revenues has changed the lifestyle of the people dramatically and the modernisation period has come in the wake of the oil industry.

The economic activities of the E.C. are subject to the policies and programmes of local government and Federal agencies, and also affected by many other factors, internal and external in the E.C.. There are obstacles and problems facing the economic activities in the area in the future, for instance shortages of water and labour (Chapter Six). The E.C. is governed by three authorities: the Federal government, and the Emirates of Sharjah and Fujairah, and sometimes there is little co-ordination between these parties. In future greater co-ordination and even unification of a particular service or services under one body is recommended for maximum efficiency. For instance, water control: Sharjah has its own Department of Water whilst Fujairah's water is managed by the MEW. This situation increases the water problems and exacerbates other, related, problems, eg pollution. A greater degree of co-ordination could mean one overall policy plus economies of scale plus avoidance of duplication.

In order for local government sectors to be developed to fulfil future needs and offer improved services, the government needs to persuade the younger generation to work in local government. This would mean more participation by the younger generation in development but the government must be prepared to open its agencies to local labour, to provide training and to increase salaries to attract the younger

generation. Fujairah is already taking the lead in persuading local labour to take over many major facilities hitherto run by government. At the same time, the Emirate is giving its people the chance to take high positions in Emirate government, especially the administration of the seaports and airport.

The figures and tables presented in this study show that more than 45 per cent of the E.C. population are concentrated in the area between Kalba and Fujairah. Most government agencies, both Federal and local are also concentrated in this area. This could be a valuable source to government agencies to employ more local labour in their agencies to allow those people to participate in the development of their area.

A. The impact of oil wealth on the E.C.

Oil has played a major role in the development of the E.C.. Oil revenues have meant that the inhabitants of the county have changed from the traditional (and often primitive) lifestyle of a farmer or fisherman to the (often sophisticated) life of the twentieth century within the space of two decades.

1. Changes in lifestyle in the E.C. since the advent of oil

In the pre-oil period, the inhabitants of the E.C. had a very hard existence with an absence of many of the basic necessities of life. Health facilities were poor and there were only one or two schools in the region (Figure 2:10). The basics of education, reading and writing, were taught by teachers of the Qur'an. Food was relatively scarce and the daily diet of many was often inadequate. These conditions forced large numbers of E.C. nationals to find work in neighbouring countries in order to feed their families adequately. Those who remained in the area worked for a very

low wage
(and lived at subsistence level.

The wealth from the oil industry transformed the life of the inhabitants of the E.C. The standard of living rose dramatically and the quality of life was much improved. Moreover, the government of the UAE was able to devote time and money to the E.C.. The result has been a dramatic change in the daily life of the population of the E.C. Instead of spending most of their working life on farms or sea, many people now have their own businesses and offices, while many have jobs in the oil industry or in related activities. Some still travel to work in other Emirates such as Abu Dhabi and Dubai, but this brings revenue back to the E.C. Much of this work is in these Emirates and Federal sectors. Others who have remained in the E.C. have found work in local and Federal government agencies, an employment sector which has increased greatly since oil exploration. Thus the employment situation in the E.C. has changed dramatically in the wake of oil affluence. New cars and houses have become readily available to the people of the E.C. and the average annual income has risen from around 600 R¹ in the 1950s to around 15,500 UKP in 1990.

The researcher believes this thesis has highlighted the current situation of the E.C. enabling recommendations to be proposed which would help the government of this coast to get the maximum benefit from the E.C.'s resources.

B. Farming in the area

The findings of this study as regarding farming show that it is likely it will be able to continue at its current level for at least the next 15 years if conditions do not change dramatically. After that, if little or nothing is done to check the problems, such

as overuse of chemicals and water salinity, which are already affecting agriculture, the prognosis will be depressing for farmers. It is likely that farming in the E.C. would not cease altogether but this home industry would shrink considerably. Ironically, it is the very development of the facilities of the E.C. such as cargo ports and good roads which could bring in cheap agricultural products from abroad, eg the Indian Sub-continent². Prices in the market may fall in the future but so may the number of people able to earn a living on the land.

As described in Chapter Three, before the advent of the oil industry, farming was practised with simple tools and equipment. The oil industry and independence of the UAE in 1971 changed the nature of agriculture in the country, the amount of land under production increased, farming techniques were improved, new ones were introduced and the number of people involved in farming increased. The result was more production of a higher quality. Ironically the recent problems and technology (eg chemical fertilisers) could cause the loss of all this development in agriculture.

As a result of current agricultural policy in the E.C. most of the good farmland has already been distributed and much of this has not gone to full-time farmers but to those wanting land for pleasure, eg country villas. The consumption of water on these estates is high but this water has little return in the form of crops to feed the population. At the same time, the 1985-90 period saw many farms in the area having to close down due to water and soil problems arising from the overuse of water. Many of these farms are in the Kalba and Fujairah units where urbanisation is increasing and needs increased amounts of produce for its markets.

Whilst problems such as overuse of water and chemicals are obvious and

curable, it is difficult to persuade the farmers and fishermen to change their ways, especially as they are now geared towards increased production to satisfy increasing markets. The demands upon the food resources of the E.C. are thus increasing twofold, due to increasing population and misuse of resources.

Farming as a career is a way of life in the E.C. and it would be difficult to find something to replace it. Many farmers have no other skills and, besides, prefer work on the farm to that in the city. When the land is exhausted many prefer to move to fresh land and begin again rather than seek alternative employment and this may have two results: even more land becomes exhausted through overuse and E.C. farmers may be forced to farm land outside the E.C., for example farmers who lived in the area close to the Omani borders in the south now farm over the border on Omani land, either in partnership with Omanis or renting farms from them. These farmers are now in competition with E.C. farmers for a share of the market. The produce they grow is brought to E.C. and other UAE markets, much of it going to Dubai and Abu Dhabi.

During the pre-oil period, farm labour was intensive compared with the size of the land farmed. The reason for this was farm labour was cheap and abundant whilst the machinery needed to farm large area was out of the reach of most farmers' pockets (Chapter Five). Now more land can be farmed with less labour.

Full-time farms have played a major role in supplying the E.C. and other Emirates with farm produce from the beginning of the oil-era to the last years of the 1980s, and supply has kept up with demand due to the increasing use of technology, eg modern irrigation systems, improved seeds and fruit strains. But these changes have

only been possible for farmers with capital, and many full-time but impoverished farmers have not been able to compete and have ceased farming. The result has been some shortages. An indication that times are changing follows: the E.C. farms used to supply the Abu Dhabi and al-Ain markets with vegetables during the 1970s but now al-Ain's farms are supplying the E.C. markets with fresh vegetables (especially tomatoes).

Farmers of the E.C. depend a lot on the MAF which provides government support, expertise and encouragement to farmers to produce more. This, coupled with expanding demand and the possibility of good profits has meant increased production but marketing has remained poor and gluts have often resulted. Farmers have suffered from subsequent price drops. The MAF needs to help farmers more with long term planning and marketing.

There are many other recommendations that can be made concerning the MAF. Palm trees are an important crop and these require skilled care. Talks and other advice services are required to instruct farmers in the available technology, eg pollination methods, (and dangers of overuse). To avoid the dangers of market gluts a packaging factory to take the surplus date harvest and an export service are required and a factory to make surplus dates into syrup which could be marketed in other UAE regions and abroad could also benefit farmers.

The MAF has an important function in research, in some areas of the E.C. the land is suitable for growing fruit trees, and model farms, such as Dibba Model Farm, can pioneer and test the best strains and methods of farming so the farmer does not make costly mistakes with crops.

As regards distribution of farmland, the existing policy of allowing good agricultural land to be used for holiday homes needs attention and enforceable restrictions are required to ensure agricultural land is used to help feed the people.

The government could do much more to benefit the farmer by controlling the market more and it is recommended that it should establish collecting points to receive farm produce. Minimum or fixed prices need to be introduced to avoid wholesalers exploiting small farmers, a freezing plant and food storage needs to be provided so farm produce can be kept and used in times of shortage or sent elsewhere to be sold. A packaging plant like al-Ain vegetable factory would also help farmers market their produce better.

Since the demands of farming are considered to be the major cause of water shortage in the E.C., it is logical to discuss water at this point.

C. Water

Water conservation is important to the E.C., as it is to all countries in the region, and it is amazing that so far the UAE government has taken no major steps to conserve water. Most countries in the world limit water consumption at certain times, eg dry seasons, at other times of scarcity, and even renowned 'humid' countries such as Britain have hosepipe bans, whereas the E.C. with much less annual rainfall, has no restrictions on water consumption.

Water conservation is especially important in the E.C. due to its dependence on its agriculture. The E.C. is famous for its fruit trees, dates, citrus fruits and mangoes and specialisation in such crops coupled with a programme to replace the traditional, wasteful, methods of irrigation with more modern and less wasteful

systems are recommended. Too much water is wasted in the E.C. and agriculture, whilst an essential and important user of water resources, is also a culprit.

Nevertheless, agriculture should have a priority on water resources and a comprehensive plan to preserve water resources for farming is recommended as follows:

1. Encourage farming methods which conserve water, eg greenhouse farming, modern irrigation systems, the cultivation of species which can tolerate saline conditions and E.C. soil.
2. Water purification from sea water plants to be used for domestic purposes. It is also recommended that the government expedite the construction of more seawater distillation plants. A target of 52,995.6 cu M/D of water is recommended as compared with 11,356.2 cu M/D being produced now. This would leave the underground water supplies for irrigation purposes.
3. Meters need to be installed on farms to discourage waste. In the public sectors (eg clubs, parks) the government needs to enforce the use of taps which shut or close automatically after use to limit waste.
4. The government should expedite the construction of sewage systems to enable the plants which enhance the urban landscape to be fed by treated rather than fresh water.
5. The introduction of regulation to enforce water conservation, eg farmers are only to water their land when the sun has gone down or in the evening to avoid wastage through evaporation, while street plants should only be watered at night (E.C. towns are well-lit at night so this would present no problem).
6. The E.C. should specialise in crops it grows best and conserve water resources for

these crops.

7. At the moment many inhabitants of the E.C. are exempt from paying water bills, eg Ministry of Defence personnel. This encourages them to use more water. Exemptions need to be eradicated wherever possible and such personnel could be compensated by an increase in salaries.

In conclusion, the causes of the water problems of the E.C. are twofold: firstly, a lack of supply, while the construction of new plants could alleviate; secondly, a lack of awareness of the need for water conservation. Here education is required to make everyone aware of the problem.

D. Fishermen and fishing in the area

The fisherman of the E.C. have a close relationship with their boats and traps. No matter what happens in the development of the area, they will continue to want to practice fishing. Thus fishing has always been and probably always will be important in the E.C., but regulations are needed to protect it and it is possible to develop fishing in the area still more. This would require a strong fishing organisation to which all fishermen could belong. It would also require strong legislation to stop the oil and other waste being dumped in the sea. The fishing organisation could oversee such legislation and also regulate the industry by issuing fishing licences to limit the number of people (especially non-UAE nationals) allowed to fish in E.C. waters. The quantities and kind of fish could be regulated, as could the fish catching season, to ensure future supplies are not harmed by overfishing.

The fish markets of the E.C. are monopolised by non-nationals. 95 per cent of

traders are non-UAE citizens and they control the markets and the selling price of fish to the detriment of E.C. nationals, Kalba fish market being an example.

As a result of the destruction of farm land in the area due to water problems and government policy encouraging the use of chemical fertilisers, there is a possibility that the number of fishermen may be increased by those turning from farming to fishing (especially the part-time farmers). Fishing may thus become the main economic activity of the E.C.. This will largely depend on future government policy regarding fishing which could be encouraged by the following:

If the government limits fishing to E.C. labour only and either bans or reduces fishing by non-UAE fishermen, the number of local people able to fish as a full-time job could be increased and those who have been discouraged and left the industry due to cheap imported labour may return. Favouring the national fishermen would benefit the E.C. as follows:

- (a) The number of part-time E.C. fishermen could increase, providing an extra income for many families.
- (b) The E.C. nationals naturally try to market their catch in E.C. markets and this could increase the supply of fish and might also mean a drop in prices at local markets.

If the government does not tackle the problem of non-UAE fishing labour in the area, it could lead to non-UAE fishermen continuing to increase in numbers (this increase began in 1977, Figure 4:17), and squeezing out the native fishermen.

On the whole, government legislation to regulate the quantity, size, seasons of catches and marketing would protect the fishing seas and also affect the price of fish

in the market.

E. Industry and trade

There will be a major development in industry in the E.C. if the other UAE Emirates, especially Dubai, accept competition from the E.C. Alternatively, some kind of arrangement or compromise regarding competition could be valuable in enabling industry to develop in the E.C.. In this case business could boom in the near future. Major manufacturing industries could be developed in the area, especially those connected with the oil industry and shipping, eg container trade, re-exporting, as well as unrelated industry such as rock quarrying, cement-making, and the manufacturing of ceramics and tiles.

As a result of Fujairah's new policy to open its markets and develop its facilities, more and more new business has been established in the area. Recently the Emirate promoted the city's FTC, and organised exhibitions in other areas of the Emirate. For instance, an exhibition promoting the products of 60 E.C. and other UAE companies was held in Dibba Central Shopping Centre in March 1992³.

Recently a new generation of local people have launched a re-export business, and trading with the east, especially the Indian Sub-continent and the UAE and the Gulf regions, has increased.

If the above continues it looks as if the E.C. will play a major role in UAE trading in the near future but in order to enable the E.C. to play its role to the full, it is strongly recommended that the government should:

1. Encourage young people to participate in the development of their own area by

recruiting them into local government and the private sector, and salaries need to be increased to attract the young people. If the situation does not change in the near future, the E.C. could lose out in business. The oil-rich Emirates may attract local labour away from the E.C. and this will affect the purchasing power of the E.C.. At present many E.C. nationals work in other Emirates and it is noticeable that the busiest days in the area are non-working days when these workers return to their family homes. If more E.C. people are attracted back to work in the E.C., small businesses such as shops will benefit.

2. Encourage the private sector by giving more facilities to stimulate business. This would give young people the opportunity to start their own companies and extend the number of jobs available to them as the number of companies expands. At the moment the government sector cannot take all E.C. students who graduate from UAE colleges and overseas and there is a need for jobs for well-trained young people.

3. Provide business training to help new business people manage their own firms successfully, as well as providing facilities to encourage the young to start their own businesses. This could be achieved through a government education programme. It is also important that the government reduce the fees on small and new businesses.

4. Encourage the foreign firms who establish in the E.C., and who often have a great deal of expertise and experience in business in the Western World as well as the Far East, to train local people. Often employment with such companies is on a project basis, and is thus temporary, which discourages E.C. nationals from taking it up, but if the government could offer some job security (eg helping such workers to find other jobs with other firms) in exchange for training, it would encourage people to work for

such firms and they would thereby gain knowledge and experience.

5. Find a way to restrict the number of small businesses which deal in the same commodities in the area. The result of lack of control is that each firm's market share is too small. Legislation could specify the number of, say tailors, allowed to trade in each area.

6. Establish more small shopping centres for lease by local people and rents could be used to develop the locality or to build more shopping centres.

7. Establish a Department of Statistics to provide the information needed to help local people plan and manage their business and to help the government formulate plans for the future. Statistics would be helpful in developing policy at both the local and regional levels and decisions which have to be made would be more likely to be successful if there is accurate information available. Such a Department could also help the businessman by indicating market needs and market segments.

8. Establish a link between those looking for work and those who need workers. At the moment there is no agency or government department linking those looking for work with work available in the E.C. at a local level. The Ministry of Labour in the E.C. should have small offices in each locality where the unemployed (either foreign or E.C.) could register and where businessmen could advertise vacancies. This would help ease the employment situation in the E.C., help eliminate illegal workers and, by providing records of job and workers, help highlight skill shortages. It would provide useful information to the government generally.

9. Encourage multinational firms to establish in the area especially while some Middle Eastern countries have a partnership arrangement with companies (especially foreign

companies) who operate in their country. It is in the interest of the E.C. that the government does not participate in such partnerships with new businesses founded in the area. This should encourage businessmen to manage their own affairs, allow more flexibility, and also, hopefully, encourage multinational firms to establish in the area.

F. Shipping services

Shipping services in the E.C., eg supplying passing ships with their need, look to become a promising new industry in the future but they need facilities such as a dry dock to encourage their growth. A co-operative policy between E.C. seaports is also important if this industry is to develop, eg organisation of cargo and container transport overland or from port to port could be more efficient. Seaports could agree not to undercut each other and perhaps specialisation would reduce adverse competition between ports, eg Khor Fakkan to take Ro-Ro ships and Fujairah to specialise in large cargo ships. Recommendations have already been made (by a group of experts visiting the area) that E.C. seaports should be connected by rail to the UAE and other Gulf seaports to facilitate the movement of cargo. Rotterdam is a successful example of such an operation in Europe⁴.

G. Pollution

As a result of increased shipping in the area pollution is one of the dangers facing the E.C. in the near future. Further studies need to be carried out on pollution problems which threaten the area, and the government needs to pay more attention to these problems to avoid a future crisis in the area.

If the government support to the E.C. is increased in the near future and the government policy of developing E.C. facilities continues, the future of the area looks promising. However, such a policy and the consequent increase in the number of firms in the industrial sector will add to pollution unless the government tackles this problem in the very near future. Pollution is already affecting the E.C., especially the farming and fishing industries.

To avoid future damage to the environment the government needs to take action to protect the environment and such action needs to be applied to the whole E.C. and be organised and monitored nationally, rather than on a local basis. To be more effective, it is recommended the government focus on:

1. Regulations to be introduced to prevent pollution which apply to everyone, whether it is individuals, private firms or government institutions who pollute the environment. Fines should be heavy and rigorously enforced.
2. Some government and private sector industrial sites need to be relocated away from residential areas so their discharges do not affect people, eg the fertiliser plant at Qirat. As urbanisation increases, eg Kalba, existing industrial zones will be too near residential areas and crowding, traffic problems and pollution will affect the quality of life and health of the people of the E.C. Relocation of existing industrial areas will need to be considered in the future.
3. The government needs to control the distribution of fertilisers, either through the MAF or by limiting the activities of private companies dealing in fertilisers. It is recommended that studies on soil and water on E.C. farms be undertaken to ascertain which are the best fertilisers for crops in the area.

4. Strong legislation is needed to prevent oil tankers and other shipping from throwing waste and tank wash in E.C. waters.

H. General conclusion

In summary, before oil was discovered, economic activities were of a very basic nature, and tools and techniques were primitive in all industries in the E.C.. There were few crops grown, some cereals and vegetables and dates, whereas now there is a greater variety of vegetables and more fruit trees grown. Most goods made and food grown was for local consumption. Produce such as palm trees and fish provided more than food, eg palm trees provided material to build houses, fish was converted to fertilisers. Because of lack of capital and knowledge farms were small, as were boat and the result was that production was limited, leaving little excess for trading. The population thus was limited in size and many people had both to farm and fish to provide enough food for their families.

Since the discovery of oil, the government of the UAE has played a major role in developing the E.C. into a modern state and in reviving its historical importance as a trade route and centre of trade. The towns of the E.C. have coped with increased population and industrialisation and the lifestyle of the people has changed from the traditional subsistence existence to that of an affluent Western style. The above is largely due to the oil wealth coming to the area.

To summarise the future requirements, to develop the E.C. the government needs to improve its trading policy to control the retail trades of the country, agricultural specialisation diversification needs to be explored and farmers need to be

better informed as to crops, soil and facilities valuable to them, market forces and farming methods, and this also requires help from the government. The government needs to preserve and enhance the fishing industry and be aware of the dangers to it of competition and pollution.

In all, farming, fishing, manufacturing and selling in the E.C. can have a prosperous future, given greater attention from local government to certain disadvantages existing at the present time.

I. General recommendations

1. The UAE University must cater for future needs of the E.C. and the development of the coast by founding departments or colleges in high technology and in business.
2. The E.C. needs a comprehensive plan for the whole area rather than piecemeal policies for separate issues and localities. Such a plan should be long term rather than offer solutions which work in the short term, and should be aware of possible future problems and development.
3. The local governments of the Emirates of Fujairah and Sharjah need to establish a good working relationship and co-operate more fully if the whole of the E.C. is to get the maximum benefit from its local government. Co-operation is essential so that one plan, one policy, one decision is taken, rather than two or more, which has occurred in the past sometimes due to having more than one form of government planning and making decisions in one area.
4. Some facilities, eg water provision, must be controlled by one administration rather than many, with more government control overall, eg on water consumption legislation

to prevent waste, eg the MEW could have overall control of water supplies in the E.C.

5. A unified sewage system has to be established or, alternatively, each residential area needs to be forced to assume responsibility for this service and to organise collection points (even using the waste trucks to bring the waste) to be re-treated and then used for other irrigation or other purposes.

6. Some roads in the E.C., eg those from Kalba to Oman and from Khor Fakkan to Dibba, need to be modernised and expanded to cope with ever increasing traffic, especially cargo transport which should increase if the development of this industry is successful.

7. There should a special co-operative or body to control the fishing and farming industries in the area, and it needs an adequate budget and powers. The organisation has to:

(a) Make useful information concerning the industries available to its members, eg the daily price of vegetables in the markets, fish caught in various areas and the other required information.

(b) Open workshops, equipped with modern technology and staffed by experts to deal with emergency repairs, eg boat engines, irrigation system pumps.

(c) Make warehouses and freezer storage available so that excess harvests of fish and farm produce do not glut the markets to the detriment of sellers. Such produce could be stored until the market price is favourable and thus farmers and fishermen would increase their profits overall.

(d) Protect its members from overseas competition. This could be done in co-operation with other UAE organisations and official agencies.

- (e) Protect its members from wholesalers and other traders who seek to keep the price offered for goods low (this is practised in many countries around the world with good results, eg Pakistan, Republic Korea⁵).
- (f) Issue licences to its members and limit admission to the organisation to prevent over farming and overfishing, especially by non-E.C nationals.
- (g) Make it difficult for non-members to sell their products in the market by increasing the fees required to sell at the market. This would help to protect the full-time fishermen's and farmers' livelihoods.
- (h) Employ vehicles and personnel to guard members' property, eg fishing nets left at sea are often damaged by other boats; a coastguard service could often prevent this.
- (i) Stipulate where when and what kinds of fish can be caught to prevent overfishing and fishing during the breeding season.
- (j) To cooperate with the MAF in advising on the best crops to be grown and at what times to avoid market gluts.

The E.C. is faced with a land-use dilemma. On the one hand farmland is already overused and exhausted, water is scarce and increasingly saline and, on the other hand, the government is trying to exploit its natural resources, including agriculture, to the full, and at the same time to develop an industrial base by promoting its facilities to international firms, either in manufacturing or in the shipping industry. All these measures increase demand for water and can increase pollution of the land, both of which adversely affect the existing industries of farming and fishing. It is important that these industries are protected, indeed fishing is capable of future development if the government can encourage fish farming.



Whether the E.C. resources are developed successfully or destructively, to a large extent, depends on the government. For example the water problems are solvable if people are educated to conserve water, if more seawater distillation plants are built to increase the supply, and if a sewage system is built for the E.C. towns (most of the E.C.'s towns are small and new which would help in reducing the cost) and connected to treatment plants to enable re-use of water. Whilst such exercises are costly in the short term, a long term view is required when they will begin to show a profit and avoid the problems of insufficient resources for an increased population, urbanisation and industrialisation. If all the above is to take place, an effective working relationship, much co-operation, liaison and sharing of facilities and knowledge is required of the various government agencies of the E.C. and the UAE.

Endnotes to Chapter Eight

1. During the 1950s ten Indian Rupees equalled approximately one UKP.
2. This policy (import farm produce) is contrary to the UAE policy to develop local agricultural production.
3. al-Bayan. 29 March 1992, p. 2.
4. al-Ghorfa. Issue No. 15 (second year) 1992 p. 28.
5. Krueger, A. and others (editors). The Political Economy of Agricultural Pricing Policy. Vol. 2, Asia. Baltimore: The Johns Hopkin University Press, 1991. pp. 29-30 & 125.

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Appendices

Appendix 1

Registered Economic Activities at Fujairah Chamber of Commerce, Industry and Agriculture

1. Factories
2. General trade, export and import
3. Contractors and general trade
4. Contractors
5. Banks, exchange agencies and finance companies
6. Legal consultants
7. Engineering consultants
8. General transports
9. Computers
10. Jewelry
11. Printers and stationers
12. Bookshops, advertising and publication agencies
13. Steel manufacturing
14. Covered agriculture
15. Dairy products
16. Poultry and egg products
17. Bakeries
18. Carpenters and woodworkers
19. Perfume and cosmetics

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20. Textile merchants
 21. Ready-made clothes retailers
 22. Bags and shoes
 23. Sports goods shops
 24. Household appliances
 25. Electric and electronic appliances
 26. Sanitary and electric equipment
 27. Electric and sanitary goods
 28. Tyres and tyre-balancing equipment
 29. Furniture
 30. Curtains, carpets and decorations
 31. Food supplies
 32. Fresh and frozen meats
 33. Fish
 34. Live birds
 35. Sheep and goats
 36. Fruits and vegetables
 37. Provender
 38. Safety equipment and life-saving appliances
 39. Paints
 40. Welding
 41. Groceries
 42. Shares and real estate agencies

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43. Tobacco and cigarette sellers
 44. Martial art tuition and training
 45. Photography and photographic goods retail
 46. Maintenance of household and electric appliances
 47. Car tyre repair and retreading
 48. Selling and maintaining motorbikes and bicycles
 49. Selling and maintaining of marine engines
 50. Auditing and accounting services
 51. Distribution of beverages and sparkling water
 52. Watch repairs and parts
 53. Carpet and upholstery cleaners
 54. Car hire and leasing contractors
 55. Car trimmers and upholstery
 56. Tailors
 57. Selling textiles and tailoring
 58. Artists and calligraphers
 59. Insecticides and agricultural services
 60. Cinemas
 61. Supermarkets
 62. Second hand car dealers
 63. Insurance companies
 64. Oil and Gas field companies
 65. Cassette tapes and records

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66. Pharmacies
 67. Manufacture and selling of spectacles
 68. Light industries
 69. Building maintenance
 70. Men's hairdressers
 71. Women's hairdressers and beauty salons
 72. Clinics
 73. Clothes laundry and dry cleaning
 74. Hotels
 75. Car spare part retailers
 76. Cafeterias
 77. Car electricians
 78. Garage services
 79. Gifts and children's toys
 80. Dealers and distributors
 81. Marine sailing contractors
 82. Petrol filling stations
 83. Nursery schools
 84. Driving schools
 85. Typing services
 86. Glass stores and farming services
 87. Gas suppliers
 88. Video cassette stores

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89. Bamboo and wood workers
 90. Construction raw materials
 91. Painting contractors
 92. Plumbing and painting contractors
 93. Spice merchants
 94. Sweet shops
 95. Restaurants
 96. Coffee shops
 97. Scrap workshops
 98. Travel agencies
 99. Flying schools: training and coaching
 100. Marine shipping agencies
 101. Vessels supply agencies
 102. Shipping and forwarding agencies
 103. Volunteer offices
 104. Veterinarians and veterinary equipment sellers
 105. Private schools and languages institutes

Appendix 2

Shipping Lines in Fujairah

1. American President Lines. (APL)
2. Ceylon Shipping Corporation.
3. C.M.B. Transhipment, Compagnie Maritime Belge. (CMB)
4. National Shipping of Saudi Arabia. (NSCSA)
5. Normudu
6. Orient Express Line. (OEL)
7. Pakistan National Shipping Co.
8. West Asia Kontena Line

Shipping Agencies in Fujairah

1. Ahmed Marine Services
2. al-Batross Shipping Est.
3. Al-Bwardy
4. al-Ghaith al-Ghanim al-Qutub Shipping Agencies
5. al-Oufouk Company
6. Barwil Ship Services (UAE) Ltd.
7. Bhati Traders.
8. Emirates Maritime Services Co.
9. Fujairah Bunkering Company
10. Fujairah Marine & Mercantile

11. Fujairah Marine Services & Trading Company
12. Fujairah National Shipping
13. Modern Freight
14. Gulf Agency Company
15. Gulf Shipchandlers
16. Kanoo Fujairah
17. Lamnalco
18. Marks International
19. Nico International
20. Olympic Shipping Company
21. Rais Hassan Saadi & Co.
22. Seven Seas Shipping Co.
23. Sharaf Shipping
24. Stalco
25. Worldwide Traders
26. Unitac Shipchandlers Co.
27. Fairdeal Shipping

