Chapter Two

GEOGRAPHICAL FRAMEWORK, NATURAL RESOURCES AND ECONOMIC BASE

OF THE UNITED ARAB EMIRATES

The United Arab Emirates being located between 22° 50'N to 26°N and from 50° 25' to 51° East (A.J. Cottrell, 1980) is a federation of seven small Sheikhdoms: Abu Dhabi, Dubai, Sharjah, Ajman, Umm-al-Quaiwan, Rasal-Khaimah and Fujairah bounded by the Arabian Gulf in the north (see figure 2.1).

United Arab Emirates has about 77,770 sq.km. of area, but very difficult to define precisely as this figures does not include a number of sand bars and islands of which the largest are Dalwa, Al Ghubbah, Abu Musa, Azzarh, Das and Mubarak. The greatest distance is 544 km. from north east to southeast and 361 km. from southeast to northwest. Six of the emirates (States) lie on the coast of the Persian Gulf, while the seventh one Fujairah is situated on the eastern coast of the Peninsula and has direct access to the Gulf of Oman (Middle East and North Africa, 1985). The internal divisions of the smaller states are very much complicated because of non-continuous nature of enclaves, e.g., Sharjah consists of three parts. However, it is necessary to note that the UAE and Saudi frontier has not been demarcated in exact terms.

1 Formerly this country was known by many names such as the Trucial Sheikhdoms, Trucial Oman, Trucial Coast and Trucial States.

2 The total length of international border is 1,173 km. Although there is no (serious) clear boundary disputes among the emirates. In addition these are unresolved and potentially divisive border disputes with Saudi Arabia and Qatar.
UNITED ARAB EMIRATES
PHYSICAL FEATURES

Fig. 2.1

1. THE COAST AND COASTAL PLAIN
2. THE INTERIOR DESERT
3. THE UPLAND PLAINS
4. THE RUGGED MOUNTAINS
Geography provides a degree of unity to the highly fragmented political identity, specially through its climate which is characterised by subtropical conditions. The imprint of the aridity is bold in affecting the modes of life, specially of the pastoral-nomads. The water is limited and sporadic but wherever it is available, has given rise to intensive agriculture and thus concentration of population. For instance, Buraimi Oasis, where the large number of people have settled in the town of Al-Ain. Another major element of diversity has been the localized impact of modern economy, in particular the oil industry. It has brought immense wealth to few pockets which have by now become areas of dense population mostly due to in-migration and partly due to natural increase. The natural increase in population is mainly due to the reduced rate of mortality as a result of better medical facilities (M. Abdel Kader Natem, 1972).

The relief factor played an important role on human occupancy. The western coast district, Abu Dhabi has the Khor at Udaid on its west and salty-coastal sands of Matti on the east. It consists mostly of dark sanddunes, stony hillocks and pebble tracts and to the east of this salt marsh, there is Dhafra region, where the coastal gravels and Sabkha exist. This region is bounded on the west by an immense soil that Sabkha extending southward for nearly 112 km., upto Rub' al-Khali. Sandy-desert with its scrub vegetation exist throughout the rest of Abu Dhabi. The coastal strip with most of the population bordering the Arabian Gulf, has sand and scrub, giving place to an extensive gravel plain. In Ras al-Khaiman area, the hill slopes dotted with date palm trees comes down upto the sea (A.J. Cottrell, 1980).
Towards the east, as the desert reaches the Musandam Peninsula, there is a major mountain range, extending about 80 kms., north to south, with an average width of 30 kms. The highest peak of the mountain rise to about 8,000 feet, though still higher part lies in the Sultanates of Oman, reaching up to 10,000 feet. Cultivation do exist on Oasis and wadis such as Siji and Hama. The hilly tract reaches upto the eastern coast of the Gulf of Oman. The topography is featureless except sand dunes along the Al-Ain road. On the eastern side of the road upto Dubai, there are some remarkable standing Mushroom rocks due to the action of wind. Isolated Wadis with very steep slopes are also some characteristic features here (K.C. Penecon, 1974). In general, physical landscape is desertic by every standard and unites these emirates into a single geographical identity.

As earlier noted, the climate is of crucial importance. Weather conditions are dominated by long hot and dry summer. From May to October, temperature ranging between 38° and 50° centigrade in the middle of the day, but the night temperature may be 20°C or even less. In winter the range of temperature is between 20°C and 35°C and whereas the minimum temperature sometimes is as low as 9°C. Humidity is high throughout the year with a higher summer temperature and a very mild winter. However, there are considerable variations in the temperature and humidity between the coastal fringe, the desert, and the mountains. Rain is frequent and irregular. It usually falls in January and February. The average annual rainfall varies between 25 mm and 125 mm, the higher limits being received
by the eastern mountains. Droughts are frequent as there is highly fluctuating and scanty-summer rains. The main local wind is known as Shargi, a humid south-eastern wind which blows along the trucial coast. The high humidity content and a long coastal belt with high temperature becomes unbearable. There is intensive evaporation from the water surface partly due to the high temperature and also because of the strong local wind (Encyclopedia of Third World, 1982).

Soil is one of the most vital natural resources of any region, without which no agricultural activity is possible. Lithosols and sands in semiarid to humid areas, Reddish-Brown and yellow-Brown soils, Terra Rossa and Rendzinas; chestnut and alluvial soils, infill and beach soils are the common types which occur in this region. There is a stunted vegetational cover in the whole region except on the high mountains where thick vegetational growth exists. The coast is barren sandy tracts with palm and date trees with the sandy desert character and harsh-dry climate with a stunted vegetational cover most of the areas are marked by high degree of nomadic activities (U.B. Fisher, 1976).

There are number of oases where water is more abundant locating to settled agriculture. Among the large oases Al-Ain in Abu Dhabi is the largest oasis and the most fertile land. Generally, water on the oasis is brought by a system of underground canals and by digging wells. In Abu

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3 As a result three new approaches are important when discussing the classification of soils: U.S. Seventh approximation and its supplement; the FAO/UNESCO classification, and the various land capabilities approaches. The seventh approximation is extremely valuable.
Dhabi, Liwa is another most important oases which is more than 200 km. from Al-Ain. Topographically, these two oases are quite significant.

Oases are also found in other emirates of the UAE of which the oases located in Sharjah, Ummal-Quaiwain and Dubai are of great importance. Sharjah has an oases of about thirty miles east of the town at Dhaid. There is another oases known as "Malaj al Mu'alla" which is located in Umma al-Quaiwain. In contrast to the extreme aridity conditions of the sandy deserts many oases on the Batinah coast and Ras al-Khaimah favours successful plantation of fruits and vegetables (K.G. Fenelon, 1974).

Natural Resources

Agriculture and soil resources are the chief resource base of the economy of the UAE (S.A. Mekide, 1971). The economy markedly lacks diversification. The agricultural development lack modernisation and in a state of poor condition plays a minor role in the economy and engaged only small fraction of the active population of the region (Economic Survey of the Middle East, 1957). Whereas, the potential oil resources is the only and the major resource-base of the economy not only of UAE but also of all the Gulf states.

Oil

The discovery of oil in the United Arab Emirates, is undoubtedly the single most dynamic force acting as a catalyst of change and modernisation.
With the rush for oil resources in the Persian Gulf right after the first World War, the British had signed an agreement with Shaikh on 3rd May 1922 in which he obligated himself to grant oil concession, and that too only to a person appointed by the British Government (J.G. Lorimer, 1964). Oil was first explored in the trucial states in October 1935 (K.G. Fenelon, 1973). In 1938 the Shaikhs of Dubai, Sharjah and Kalba signed an agreement to give concession for annual rentals. The ruler of Abu Dhabi gave concession to the Petroleum Development Trucial coast on 1st January 1939.

After the World War II, the exploration drive by PDTC on the trucial region declined. In 1951 as a result of the arbitration, Abu Dhabi sought to grant to the International Marine Oil Company (IMOC) to tap oil in the newly required offshore territory (Ragaei El Mallakh, 1981). In 1953 IMOC relinquished their concession and another concession of 12,000 square miles was also granted to the Abu Dhabi Marine Areas Ltd., (ADMA). The two-thirds of ADMA was owned by British petroleum and rest by a French company. During the period of 1960 oil was found in huge quantities in Abu Dhabi at the Murban Field onshores south of the Tarif and

4 When the Iraq Petroleum Company (IPC) formed a subsidiary which was named Petroleum Concession Ltd., but in 1936 the name of this company was changed into Petroleum Development Trucial State Ltd., (PDTC), which immediately contacted the individual Sheikdoms and offering agreements for concession right to explore for oil and to develop production on commercial scale. The Iraq Petroleum Company established Petroleum concessions limited as a subsidiary initially capitalised at £100,000.

5 The ownership of Abu Dhabi Petroleum Company and Qatar Petroleum Company at that time was identical involving 23.75 per cent each for Shell, CFP British Petroleum Mobile and CYNON and 5 per cent for participation owned by Gulbenkin.
exploited commercially (Shell International, 1972). In 1963 PDTC relinquished its concession in Dubai to concentrate its efforts in Abu Dhabi and PDTC became the Abu Dhabi Petroleum Company. This company failed due to concession granted to Japanese consortium in 1968. The Middle East Oil Company undertook oil exploration and drilling began soon after.

The Abu Dhabi Petroleum Company is the biggest company and it was jointly owned by BP, Shell and CFD. Under the participation agreement of 2nd September 1974 the Abu Dhabi Government acquired a 60 per cent individual interest in asset and concession formerly held by ADFC. Adding to its large concession in UAE and the Japanese firm Abu Dhabi Oil Company (ADOCO) have obtained additional acreage in Abu Dhabi and contracted to spend at least $16 billion an exploration to cover the new areas, Satan, Dalma and Jamian. Of these Satan is the most potential field with reserves estimated to be 100 million barrel (Ragaei El Mauakh, 1981). A new onshore concession was signed with ADOC in October 1980 and ADOC invested $55.5 million on exploration during the first eight years with a number of bonuses.

Another concession agreement was concluded in November 1980 for oil exploration covering an area of one million acres near the Bu Hasa, Asab, and Bab fields, Southwest of Abu Dhabi. In late 1972 Abu Dhabi joined the organisation of Petroleum export countries (OPEC) and other Gulf states to formulate an agreement for the benefit of the producing nations. In February 1973, Abu Dhabi Government signed an agreement with Japanese oil tanker company (Ragaei-EL-Mauakh, 1981).

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6 Upon signature that was ($5 million), for the discovery of oil in commercial quantities (~2 million), and when the output reaches up to 50,000 barrels per day ($2 million), and the export reach from 100,000 barrel per day to 200,000 barrel per day that ($6 million). All these taxes and royal ties have paid as laid down by the Abu Dhabi Government.
In late 1980 it was agreed upon to form an operating company ADCO to carry out operations for the joint concession holders (Middle East Oil Survey, 1978). Dubai became the main oil producing Sheikhdom, when ADPC relinquished its Dubai concession in 1963 and the territory was granted to a continental oil company which was the principal owner of Dubai Petroleum company. In 1954 the offshore concession were granted to superior oil company and later it was taken over by the Dubai Marine Areas Ltd., and was jointly owned by CFP and Hispan Oil (World Oil, 1969).

Sharjah and Ras al-Khaimah were not as fortunate in their quest for oil as Abu Dhabi and Dubai. The Butter Gas and Oil Company was the operator for the Abu Musa project under the participation agreement on the basis of which 55 per cent of all oil lifted to Sharjah. West of Mubarak in Sharjah granted oil concessions to two firms of the United States namely Pinnacal Gas and Oil and Nickolos-drilling. The ruler Sheikh Sultan signed an agreement for exploration in the eastern sector. The results of the Seismic-testing in 1979 led to exploratory drilling in 1980 (UAE Annual Report, 1980).

Ras-al-Khaimah granted an offshore concession in 1964 to Union Oil Company and Southern National Gas Company on 80 and 20 per cent respectively. On March 15, 1969 Shell Oil Company was granted an on-shore

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7 To summarize the companies and fields under their operation are:
ADCO, BUHASA, Asab Bab, Sad Sahil, AdNA-OPOD- Umm Saif, Lower Zakum, and Upper Zakum (ADNOC); CFP-Abu-Bukhoos; Amerada-Amerada-Mess-Arzanah.

8 In short the exploration and production concession offshore Dubai are shared equally by Dubai Marine Areas Ltd., and Dubai Petroleum Company. The partners in Dubai Petroleum Company are: (1) Continental Oil Company - 60 per cent; (2) Texaco - 20 per cent; Sun Oil - 10 per cent and Wintershall - 10 per cent.
concession covering about 375 sq. miles (Hawley Donald, 1971). The area held by Shell Oil Company and John Mecon Corporation was later handed over to Peninsula Petroleum Company. Vital exploration of the Netherlands was also awarded concession in Ras al-Khaimah (Ragaci El-Mallach, 1981). In addition, Gulf Oil also took an active interest in the exploration for petroleum in Ras al-Khaimah.

Similarly, oil concessions in Sharjah, Umm Al-Quainwain and Ajman were granted to John W. Mecon and Pure Oil Company; Bonin Bochumer Mineralgesell-schaft won the concession right in Fujairah (Hawley Donald, 1971). Fujairah granted exploration rights to reserve oil and gas and United refining is sharing its concession in Umm Al-Quainwain with three Canadian companies. URC also possessed the production concession from Ajman for hydrocarbon exploration. In 1976 Umm Al-Quainwain signed an agreement for exploration and drilling with the Miston oil and Minerals Co. Ajman granted its own petroleum exploration rights in 1978 over 55,000 acre area. (For agreements and concessions see Appendix-1).

A thirty five years oil exploration agreement has been initiated with a group of five United States firms covering 1 million acres in Dubai’s Jebel Ali area and the operation began in April 1975 (Ragaei el Mallakh, 1981). The most sweeping development in the UAE’s recent oil history is the establishment of ADNOC. This move is very much in line with other middle eastern, North African and OPEC producers. The technical details and data of Crude Oil production by field and discovery is shown in Table No.2.1, Fig.2.2.
UNITED ARAB EMIRATES
CRUDE OIL PRODUCTION
(BY FIELD AND DISCOVERY DATE, 1980)

Fig. 2.2
Oil Production

Oil was discovered in 1951 when deposits were located beneath the coastal waters of Abu Dhabi and the commercial exploration of petroleum began in 1962, and greatly increased revenues of the state (Middle East and North Africa, 1984). Oil in huge quantities was struck in offshore Dubai in 1966, and Sharjah in 1974. The oil production of United Arab Emirates is shown in Table-2.2.

In 1980, the total production of crude oil of UAE including Abu Dhabi Dubai and Sharjah was 7169 million barrels. Among these states Abu Dhabi started its production of crude oil at an early date. In 1962, the total production of crude oil was 6 million barrels and in 1977 the production level increased to 603 million barrels, and there after the level of production showed a decreasing trend during 1978, 1979 and 1980. It was lowered down to the level of 592 million barrels in 1980. In the case of Dubai the production was only 4 million barrels in 1969, and it increased to 132 million barrels in 1978. Then afterwards during 1979 and 1980 the level of production lowered down to stand at 129 million barrels and 128 million barrels respectively. In Sharjah the first production started in 1974 and it was only 9 million barrels, and it increased to 14 million barrels in 1976. The level of production showed a decreasing trend in the next two years and it decreased to only 4 million barrels in 1980. Among these states Abu Dhabi got a highest share in crude oil production than Dubai and Sharjah (See figure 2.3).

Oil reserves for Dubai were estimated to be 1,300 million barrels by
UNITED ARAB EMIRATES
PRODUCTION OF GAS
(1976-80)

Fig 23(b)
1 January, 1978, which was much lowered than the estimated reserves of Abu-Dhabi, (30,000 m. barrels) and Sharjah (16 million barrels). However, Dubai's rank was tenth among the Middle East producers and Abu Dhabi took the fifth position. The combined total oil reserves of Dubai and Abu Dhabi were about 31,000 m. barrels, accounting for 8.5 per cent of the Middle East potential reserves of 369,996 million barrels (Oil and gas Journal, 1978).

On 1 January 1980, oil reserve for Abu Dhabi were estimated to 29,000 million barrels, which was comparatively higher than that of Dubai and Sharjah. The total reserves for Dubai, Abu Dhabi and Sharjah were about 43,100 - million barrels (Oil and Gas Journal, 1980).

The price of oil was relatively low before 1973, and therefore, no capital investments were made to exploit the associated natural gas through liquification and export. After 1973 capital investment became economically feasible and so UAE moved to utilize their flared gases (Atif A. Kubursi, 1984). The UAE was one of the largest countries to have potential gas reserves in the world, ranking third just next to the Soviet Union and Iran. The state of Abu Dhabi contains large reserves of natural gas both of on shore and offshore type. It produces more than 90 per cent of all the gas-based products in the UAE (Mana Saeed Al-Otaiba).

According to the OPEC estimations, the total gas production in the UAE were 1043 million cubic metre in 1970 which increased to 12,333 million cubic metres in 1975, and further expanded to 14,859 million cubic metres during 1980 (Atif A. Kubursi, 1984). The gas production of Abu Dhabi and Dubai states is shown in Table-2.2. In 1980, Abu Dhabi and Dubai
together produced about 9.63 million cubic metres of gas. The level of production of Abu Dhabi and Dubai, during the period was 8.90 million cubic metres and 0.73 million cubic metres respectively. Abu Dhabi's level of production was much higher than Dubai during 1980.

**Trends of Demand and Supply of Oil**

Upto the end of 1960s the oil had its own way in the Gulf both in terms of production and income to the host countries in the form of royalties. The birth of the organisation of Petroleum Exporting Countries (OPEC) in 1960 made some important changes. However, it did not alter their status significantly much transformation were seen after 1970s (Sreedhar, 1983). The first demand was for higher royalties and the companies were readily agreed. The 1973 oil embargo quadrupled the price of crude oil and generated huge income in these oil producing countries. Price hike went upto 1978 and all the oil producing countries started producing more oil from the existing wells and continued drilling more oil wells.

The particular interest in the oil-production of these states could be explained by their desire to maintain the equilibrium of the international market (Newsweek 1981). Abu Dhabi maintained increase in production to make up for the requirements and commitment by the government.

During 1970-1980 there was a significant fall in the demand for the Gulf oil, by North America and Europe. This was in response to the conservation policies adopted by their respective governments. Also there
UNITED ARAB EMIRATES
OIL PRICES BY FIELDS
(1978–80)

Fig. 24
was a decrease in demand of gulf oil by USA as USA changed its direction of exporting oil from Latin America and Africa especially from Venezuela and Nigeria (D.O. Croll, 1981). The crude oil supplies to India from the UAE was raised from an annual level of 1.5 million tons to nearly 2.5 million tones. The demand of crude oil and oil products by India increased many folds over the years. India has signed an agreement to import about 40 per cent of the nitrogenous fertilizers from Abu Dhabi (For oil prices in detail see figure No.2.4). ADNOC markets a portion of its share of crude oil directly to both public (Government owned) and private-companies (Ragaei El Mallakh, 1981).

Oil Export

Crude oil is the major export item of the United Arab Emirates. Table-2.3 illustrates the oil export of the UAE, during 1962-1980. The total oil export of these three states (Dubai, Abu Dhabi and Sharjah) of UAE was 1762 million barrels in 1980. The total oil export of Abu Dhabi was 6143 million barrels in 1980. Similarly the export of oil from Dubai and Sharjah was 1042 million barrels and 61 million barrels respectively. The total oil export in UAE increased from 137 million barrels in 1967 to 439 million barrels in 1972, and it further increased to 721 million barrels in 1977. During 1978 the volume of oil export decreased to 662 million barrels and again it increased in 1980. (See figure 2.5). In late 1980 a new dimension was added to the uncertainties.

Ragaei El Mallakh has made a note that the Government selling prices (as of July 1977) for the various crudes were $13.17 barrel for 40° API Zakum and $13.04/barrel for 37° API UMM-Sheif (Offshore) UAE Oil prices by fields and gravity for 1978-1980 indicating the price escalation in 1979, is shown in figure No.2.3.
UNITED ARAB EMIRATES
EXPORT OF CRUDE OIL
(1962-80)

Fig. 2.5
in oil supply firstly due to the Iranian revolution and secondly because of the Iran-Iraq war.

Among the major importers of UAE oil, Japan is the leading importer followed by USA and the France. Together these countries imported about 59.7 million barrels of Abu Dhabi's oil exports in 1978. Netherlands, the United Kingdom, West Germany, Switzerland, Norway and Italy are among the other major buyers of UAE's crude oil. The relative shares of the UAE oil importers remained unchanged throughout the year 1979 and in the first half of 1980, but in late 1980 the level of crude oil supply got disrupted due to neighbourhood conflicts and overall disruption in the international oil market. In 1976 the countries having percentage share of oil export were Japan (28.3 per cent), USA (13.5 per cent), France (13.2 per cent), United Kingdom (8 per cent), Holland (6.2 per cent), Spain (4.3 per cent), West Germany (4.6 per cent), and Italy (3.3 per cent), (See UAE oil statistical Review, 1977).

Income generated from oil has been greatly affected not only by the rapid increase in volume of oil exports but also the increase in price of this commodity. The economic structure of UAE is heavily dependent upon the oil and the income generated from oil was about 90 per cent of the total export revenue. The oil revenue of UAE was only 2 million US dollars in 1962. With the gradual increase in oil price the revenue generated from the oil export also showed a rapidly increasing trend. It reached about 109.6 million US dollars in 1967 and showed further rapid increase to reach about 900 million US dollars in 1973. 1973 was considered as the
year of great divide in the history of oil economy, not only of UAE but also of all OPEC countries just after 1973 due to rapid increase in oil price the oil revenues of UAE started increasing manifold and suddenly increased from 900 million dollars to 5536.0 million US dollars in 1974. Then after it showed increasing trend to reach about 19,344.0 million US dollars in 1980 constituting about 27.36 per cent of the total revenue in UAE (see figure 2.6).

There was a great change in the economic structure of UAE and economic activities suddenly started to be diversified, the construction and infrastructural development went on unprecedented scales. Thus creating magnetic effects to have more working hands. Thus it created a great demand for technical workers which the country could not supply. Therefore, international migration took place from the various countries to the UAE, where the lion's share was provided by South and South-East Asian countries and African countries like Egypt and Sudan.

Agriculture

In most of the developing countries of the world, agriculture is the mainstay of their economies, but in the Gulf, agriculture provides a very minor contribution to the nation's economy due to scarcity of water (K.G. Fenelon, 1974). Agriculture has been practised in the United Arab Emirates since ancient times, particularly in the Al-Ain, Al-Dhaith, Ras al-Khaimah and Fujairah regions as well as in the Liwa Oasis where the soil was fertile and water was available for irrigation. In spite of
United Arab Emirates Oil Revenues

Fig. 2.6
the fact that only 5 per cent of the country's usable area is under
cultivation, agriculture plays an important role in the country's
economy, and the government is making great efforts to develop it
(Mana Saeed Al-Otaiba, 1977).

Agriculture however, has always been constrained by many factors
like the location of the Emirates in the sub-tropical arid zones, and
the Shaikhdoms are characterised by great heat and humidity. Precipi-
tation is highly variable. The average annual rainfall varies between
50 mm in the West to 150-200 mm in the hilly areas. However, there
are periodic rain off from the above mountain sloped to give short
surface water flows in the mountain wadis.

Geographical Foundation of Agriculture

With the increasing demand for food grains pasture and fodder
crops, water and fertile soil considered to be important factors in the
country. Water is the basic need for agro-economic growth and sustain-
ing large population concentration in the urban centres. Water resources
have played a crucial role in determining the settlement patterns and
the growth and location of economic activities in this region.

In the past, water resources were developed with the aim of supply-
ing to agricultural fields for domestic needs either from surface or
ground water (F.A.O. 1976). Water supply and drainage are critical
factors everywhere in the Gulf region (P. Beaumont et al., 1979).
Water supply and drainage are critical factors everywhere in the Gulf region (P. Beumont, et al., 1970). However, no comparable data are available on water resources of the United Arab Emirates. In the United Arab Emirates, the available ground water plays a vital role due to the scarcity of surface run off in the arid condition. Since ancient times the people of the UAE have been irrigating their agricultural land by the available ground water by a system which is known as Falaj, as well as water wells. A system of underground canals is also found in many parts of the UAE, i.e., in the Al-Ain oasis, in Fujairah, Dubai, Sharjah and Ajman (Ragaei El Mallakh, 1981).

Irrigation is done by Falaj system by transporting water from its high elevated sources to the lower land which has been prevalent over the years. The construction of these underground aqueducts required a high degree of accuracy. In this system several closely located and interconnected water wells are dug in the elevated ground in mountaineous regions. The water is collected from such wells which is directed into the entrance of the Falaj and then it is allowed to flow through the gently descending aqueduct. The sharing of water supplies from a Falaj among the cultivators mostly depends on the number of hours and the system of rotation. The data regarding Falaj irrigation network is shown below (Mana Saeed Al-Otaiba, 1977).
Abu Dhabi (Al Ain Region)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Region</th>
<th>No. of Falaj</th>
<th>Sl. No.</th>
<th>Region</th>
<th>No. of Falaj</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Al Ain city</td>
<td>2</td>
<td>5.</td>
<td>Al Qattarah</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Al-Mitaradh village</td>
<td>1</td>
<td>6.</td>
<td>Ben Farid village</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>Al-Muejei village</td>
<td>1</td>
<td>7.</td>
<td>Al-Hail village</td>
<td>1</td>
</tr>
<tr>
<td>4.</td>
<td>Al-jeemi village</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total = 8

Besides, irrigation by rain water is still crucial for many crops, and wheat gardens in this region. Rainwater is also used for the maintenance of grazing lands in the desert, where the Bedouins have their camels and cattles. The rainfall usually occurs in the winter though it falls sometimes in summer in the Al Ain region as well as in the eastern emirates. Due to high temperature the summer rainfall evaporates back quickly and thus it is of less importance.

In the past, irrigation with well system was quite limited because the lifting of the water out of the well had to be done mostly by primitive methods with animal as drought power. At present, due to the availability of mechanical pumps, thousands of wells have been dug and these are used for tapping the underground water even up to 3,000 feet. Consequently, percentage of irrigated land has now greatly increased. In 1970, there were more than 160 wells in the UAE, and many of them were well equipped with mechanical and power driven pumps. In Abu Dhabi also, wells have been cleaned out and provided with pumps. In the northern states, many villages have suffered during the period of drought causing not only
personal hardship but virtual choking effects on livelihood, (Fene lon, 1974). Between 1976 and 1980, 1545 new wells were dug by the government in the UAE. Consequently, fall in the water table has been normal. For example, the water table in Ras al-Khaimah fell by 3.37 m (1980) and led to increased salinity in the soil, (Middle East and North Africa Year book, 1984).

On the Batina coast at Fujairah and Dibba, there is salty sandy loam soils close to the sea and hence it can have water from shallow wells but the water quality is a pertinent problem. But in the mountain wadis there are small scale diversions of surface flow are useful for cultivation as in Ajman. On the gravel plains, Falaj and wells have allowed to develop the large and small areas of oasis farming. For example, Al Ain complex of Abu Dhabi is very near to Omani Buraimi, there the great settlement between Rams and Digdagga in Ras al-Khaimah were locally accessible ground water, coincide with alluvial soil in the desert zone (K.C. Fenelon, 1974). Until recently only the ground water was the source of water supply to the trucial-coast settlement and for very small pockets of cultivation in Southern Abu Dhabi. In all other areas the soils are infertile having high salinity near to the coast and sandy loam in the interior areas (J.H. Stevens, 1968).

In most of the irrigated areas the use of the land is intensive and the size of agriculture holdings is generally very small, thus posing many problems for introducing various method of mechanisation (Makdise, 1971). The land suitable for cultivation is confined to favoured localities and oasis.
The following data shows the land use in the United Arab Emirates from 1965-1980.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1. Total Land area</td>
<td>8,360</td>
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<td>8,360</td>
</tr>
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<td>2. Arable and Permanent Land</td>
<td>8</td>
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<td>12</td>
<td>13</td>
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<tr>
<td>3. Arable land</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>4. Permanent Crops</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>5. Permanent Pasture</td>
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<td>200</td>
<td>200</td>
<td>200</td>
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<td>6. Arable irrigated</td>
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<td>5</td>
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</tr>
<tr>
<td>7. Forest and Woodland</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>8. Other land</td>
<td>8,152</td>
<td>8,152</td>
<td>8,152</td>
<td>8,152</td>
</tr>
</tbody>
</table>


According to available data and information the net sown area under permanent crops in UAE is about 7,000 hectares only, thus barring large junks of uncultivated land (1980). The net amount of arable land and permanent cultivable land in 1980 was much greater compared to this category of land in 1965-75. The area under permanent crops was three thousand hectares in 1965 and increased to 5 thousand hectares in 1980 (see figure 2.7).

The irrigated land in the United Arab Emirates is shown below.
Irrigated Land in UAE, 1960-1980 (in thousand hectares)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Area Under irrigated land</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>


In 1960 the total irrigated land in UAE was 3 thousand hectares and it increased to 5 thousand hectares in 1980 due to the new source of irrigation water.

In 1970, the average per capita cultivated land was estimated to be 15 hectares in Abu Dhabi and 0.2 hectares in the remaining six states. The average per capita cultivated land for the all seven states was 0.3, and most of it was under the palm-trees. The rest of the cultivated land is planted with vegetables and summer crops, which are not highly productive (Sadik and Shavely, 1972).

In Ras al-Khaimah fertile arable land is to be found along the coast and in the foot hills of the mountains, where permanent supplies of water from surface or underground resources are available. In the northern section of Ras al-Khaimah, cultivable agricultural land extends from Sha' am to Digdajga, where the farms on experimental basis are located. The southern part of emirates belonging to Fujairah, predominantly agricultural, is surrounded by many villages notably, Al Darah, Darg, Qor and Mania, where farming is the main occupation (K.G. Fenelon, 1974).

Ras al-Khaimah has more suitable land and greater rainfall (6 to 8 inches per annum) than the other Sheikhdoms. The total amount of cultivated land
is estimated to be 15 per cent of the 600 sq. mile sheikhdoms (Middle East Media, 1971). It is estimated that the total area under agricultural holdings increased from 125,691 dunums in 1973 to 233,560 dunums in 1979.

After the establishment of an agricultural experimental station at Digdaga (Ras al-Khaimah) by the FAO in 1965, the agricultural pattern in the UAE has undergone a major transformation. Traditionally, agriculture along with nomadic pastoralism was the rule in the UAE and it was confined to Oasis cultivation, e.g., Al Liwa, Dhaid, Al-Ain, Falaj al Mualla and on the east coast. The date palm remains to be the major crop (Middle East & North Africa Year Book, 1985). However, others include mainly vegetables and fruits like bananas, apricots, mangoes, pomegranate, guavas, Indian almonds, limes, bitterlimes, sweet lemon, and other citrus fruits. The combined output of all fertile lands has been partially sufficient to the needs of its people. (Ministry of Information, 1974).

The date palm is the principal fruit variety, extensively grown in the UAE as it withstands harsh environment. Modernization has not led to diversification to a large extent, as planting of date palms still occupy the prime position. There are near about 3 million date palm trees in the country (see figure 2.7). More than 3,50,000 of them are located in the Al-Ain region (Mana Saeed Al-Otaibe, 1977). The following table shows the distribution of date palm in the seven emirates. 

.../-
Distribution of Date Palms, 1970

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Emirates</th>
<th>No. of date palms (in thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Abu Dhabi</td>
<td>1,400</td>
</tr>
<tr>
<td>2.</td>
<td>Sharjah</td>
<td>500</td>
</tr>
<tr>
<td>3.</td>
<td>Ras al Khaimah</td>
<td>500</td>
</tr>
<tr>
<td>4.</td>
<td>Fujairah</td>
<td>300</td>
</tr>
<tr>
<td>5.</td>
<td>Dubai</td>
<td>200</td>
</tr>
<tr>
<td>6.</td>
<td>Ajman</td>
<td>50</td>
</tr>
<tr>
<td>7.</td>
<td>Umm Al Quwain</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>3,000</strong></td>
</tr>
</tbody>
</table>

The cereal field crops such as wheat, barley, rice, cotton and sugarcane are unknown, because these crops require large quantities of water. At one time such crops were extensively grown. The crops grown in the UAE are used mainly for commercial purposes and as fodder crops. The cultivation in the Al liwa oasis is almost exclusively confined to the growing of date palms in well-arranged palm gardens. In 1971-72, 71 per cent of the area was under the palm trees in the six states (Dubai, Sharjah, Ajman, Ummal Qaiwain, Rasal-Khaimah, Fujairah) and 29 per cent of the area was under other crops (Sadik and Snavely, 1972). At present palm trees are being grown in every state of the UAE, and around 40-50 per cent portion of the cultivated land is covered by palm trees. Due to the lack of data on the cropping pattern of this country, it is rather difficult and futile to undertake analysis of cropping pattern,
although one wishes to do so, as it gives good guidelines to add qualitatively to the nature of the economy, welfare of the people and other related aspects.

It is very difficult to measure the recent changes in agricultural production of this country in quantative terms. Information on levels of production crop wise are not readily available. The Table shows that there has been a considerable increase in the production of fruit and vegetables, particularly dates and lemons and others.

**Principal Agriculture Tree Crops Production, 1971-80**
(in thousands of metric tons)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dates</td>
<td>8</td>
<td>30</td>
<td>11</td>
<td>30</td>
<td>39</td>
<td>40</td>
<td>51</td>
</tr>
<tr>
<td>Lemons &amp; others</td>
<td>19</td>
<td>--</td>
<td>--</td>
<td>4</td>
<td>4</td>
<td>9</td>
<td>4</td>
</tr>
</tbody>
</table>


According to available information the production of dates was only eight thousand metric tons in 1970. It increased to thirty thousand metric tons in 1980. There has been about more than six fold increase in the production of dates during 1970-80. In the case of lemons and other crops' production the level was four thousand metric tons which increased to nine thousand metric tons in 1979 and further decreased to four thousand metric tons during 1980. Among fruits and vegetables, tomatoes, sweet melons, water melons are important items. The following table shows the fruit and vegetable production in 1970-80.
Selected fruit and vegetable production (Million tons per hectare - Production in thousand m. tons)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomatoes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>17.3</td>
<td>34.0</td>
<td>34.0</td>
<td>46.0</td>
</tr>
<tr>
<td>Yield</td>
<td>9.0</td>
<td>22.0</td>
<td>22.0</td>
<td>36.0</td>
</tr>
<tr>
<td>Sweet Melons</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>27.0</td>
<td>24.4</td>
<td>24.4</td>
<td>22.0</td>
</tr>
<tr>
<td>Yield</td>
<td>1.4</td>
<td>1.0</td>
<td>1.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Water Melons</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production</td>
<td>8.0</td>
<td>35.7</td>
<td>35.7</td>
<td>31.0</td>
</tr>
<tr>
<td>Yield</td>
<td>1.0</td>
<td>9.0</td>
<td>9.0</td>
<td>25.5</td>
</tr>
</tbody>
</table>


The production of tomatoes was 17.3 thousand metric tons during 1970 and doubled in 1978 and 1979, it increased to forty-six thousand metric tons during 1980. Similarly the productivity of tomatoes increased fourfold during the period 1970-1980. The production level of sweet lemons and water melons was low during 1980 compared to the level of production of tomatoes. However, the yield of these two items was much lower during 1970-79. In the case of the sweet melons the productivity level increased by fifteen times from 1979 to 1980 (see figure 2.8).

In the United Arab Emirates - Ras al-Khaimah is the only state utilising intensive agrarian research. This emirate has more suitable land and greater rainfall (6-8 inches per annum) than the other Sheikhdoms. Therefore Ras al-Khaimah produced sufficient quantities of fruits and vegetables and export the surplus produce to the neighbouring states, (Middle East Media, 1979) The productivity of both land and labour is very low in the states of UAE due to the unproductive soil and the
UNITED ARAB EMIRATES
SELECTED FRUIT AND VEGETABLE PRODUCTION

INDEX
- TOMATOES
- SWEET MELONS
- WATER MELONS

IN THOUSAND METRIC TONS


PRODUCTION OF FISH
IN 000 METRIC TONS


Fig. 2-8
scarcity of water for irrigation.

The yield of selective fruits and vegetables given in the above table has shown an increasing trend over the given years. As the minister of Agriculture reported in 1981 that UAE has attained self-sufficiency in the production of such fruits and vegetables (Middle East and North Africa, 1984).

**Problem Facing Agriculture in the UAE**

In spite of the great efforts made by the government of UAE to raise the productivity level of agriculture the country faces many problems which are given below.

**Lack of Sufficient Irrigation Water:** Underground water resources exist in the eastern emirates in the Al-Dhaidh, Al Uwair, and Al-Ain regions, but the available supply is not sufficient for the growing needs of agriculture (Mana Saeed Al-Otaiba, 1977). Due to the physical setting of the country which is arid, the scarce and fluctuating rainfall leaves little water to be stored underground. Few pockets of water bearing aquifers are also not exploited properly for irrigational purposes. The government is not fully successful in drilling new artisan wells.

**Shortage of Labour:** Agriculture in the UAE suffers from a shortage of labour due to the fact that most of the young people leave the villages and migrate to the towns seeking employment in the government services.
and thus leaving the agricultural activities in the hands of old men and the women folk. Due to the shortage of active workforce to be engaged in agriculture, the per hectare productivity remains low in the country (Atif A. Kubursi, 1983).

Marketing Problem: In UAE there is no good market to sell off the surplus agricultural produce. It is therefore essential that a central marketing centre should be set up to administer the efficient distribution and sale of agriculture products.

Agriculture plays a marginal role in gross national products in this country. In 1970 the share of agricultural sector to national income was under 1 per cent (J.L. Long, 1981), and the proportion of the workforce in agricultural sector is small. According to the World Bank Report the gross domestic product was 15.0 per cent in 1960, 3 per cent of the labour force produce 4 per cent of the GDP (in 1979) (World Bank Development Report 1981). Agriculture is poor in UAE. However, it may become an important segment of the economy if proper planning and development is undertaken by the government. It is a welcome step on the part of some of the Gulf-countries that they are having deep concern for agricultural development. Several changes have been brought in the agriculture of this region due to various measures being taken to develop agriculture. Production level is expected to be raised in the dry farming areas by ploughing more land with the use of modern technology. The introduction of crop rotation in the recent years is another way of increasing production (E. Beserup, 1985).
A Federal Ministry of Agriculture and Fisheries was established in Abu Dhabi and decided that the individual states could also follow their own policies in this sector. Secondly, the Federation welcomed the states to join £90 million Pan Arab Afro industrial investment company bringing impetus to the primary-sector of the economy. The UAE aims to develop its agricultural sector to achieve self-sufficiency in many fields in order to reduce dependence on imports. Therefore, it has encouraged agricultural research in a big way in Universities and Institutes.

There is a wide scope to increase the efficiency of water use by up to 60 per cent, and to top some highland flows of good quality water before it becomes charged with salt while running through beds. It may also be feasible to blend desalinated water with some of the poor quality of water from cheap aquifers (Z. E. M. Chuneimy, 1979).

More crops and vegetables like wheat, tobacco, beans, cauliflower, onions, cucumber, melons etc., could be grown successfully and profitably (Ragaei E.L. Mallakh, 1981). Various horticultural experiments are taking place at Sadiyat to provide good-economic lease to agriculture in the desert area. Crops are grown with irrigated water derived from the desalination plant. The arid land research centre at Sadiyat is testing over 170 types of vegetables for commercial use. This has been operated and designed by the environmental research laboratory experts from the Arizona University, and at present it is financed by the Abu Dhabi government. Due to this, crop yield is high compared to conventional farming. For example, at Sadiyat, one acre
can produce near about 71 tons of crop yield annually and the conventional farm which could produce only 31 tons. Half of the acre of land is covered by eighteen air supported semi-circle cylinders which are made from plastic and are devoted to low growing crops such as cabbage, spinach and beans. In the other remaining area there are steel framed polythene covered houses for growing cucumber and tomatoes. The power is supplied by three diesel engines (with) and these engines have fitted on waste-heat recovery mufflers. The government is considering to set up other soilless culture scheme elsewhere in the Sheikhdoms after the success of the arid land and research centre (The Times, London, 1971).

On 16 April 1977, Abu Dhabi inaugurated its new Desert Development Station in the Sulaymat area in Al-Ain. This station is built by the Japanese Institute for Desert Development. The purpose of this station is mainly to produce vegetables. In 1972 an experimental farm was opened at Rowaya, Dubai. This farm covered an area of 0.3 square miles designed most probably to attract the Bedouin to settled farming. The Government also was ready to provide 478 square yard plots which are adequate for the average family and help to provide other things to the settled farmers (Ragaei EL Mallakh, 1981).

The UAE represented in newly formed Arab Institute for Investment in Agricultural Development (AIIAD). The decision was taken to establish the Institute at the annual meeting of the Governors of the Arab Fund for Economic and Social Development (AFESD) which was held in Rabat in April.

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10 The project, initially funded by the Abu Dhabi government and the Rockefeller Foundation, has been under the direction of a team from the University of Arizona.
1976. The institute hopes to assist member states in achieving self-sufficiency in food production, with the immediate goal to create an "Arab breadbasket" which would reduce the shortage of food imports to this country. Only at enormous costs and extreme dependency on external supplies of equipment as well as technology, the Sadayat Island experiment is a long standing and familiar instance of an advanced technology project in the Abu Dhabi (Middle East Eco. Digest, 1976).

Abu Dhabi was the first state to experiment in artificial farming at Sadayat Island. The high cost big technology high energy programme shows that such projects are not automatically-economically viable. More recent project at Mazaid and near this Al Ain shows that modified and controlled environmental system of less esoteric kind utilising lessons learnt at Sadayat and elsewhere, may provide market demands efficiently and adopting agriculture to use the limited ecological opportunities and relevant manpower which are available in the Gulf states (UAE Ministry of Information, 1978). The Government of the United Arab Emirates has in recent years been devoting special attention to the development and improvement of agriculture. It has supplied the farmers with agricultural equipments and provided financial and other forms of assistance. The effect of this policy is clearly reflected in the development and changes that have taken place. The agriculture in UAE, although having precarious and delicate environmental constraints could perform a better role in the economy, if proper strategy is developed at the planning and implementation level. Inputs by the migrants with rural and agricultural background are necessary.
Other Sectors of the Economy

Prior to independence, the UAE was Trucial Oman also known as the Trucial states, and the whole territory were under the British protection. The British first came to the Gulf at the beginning of the seventeenth century as traders, representing the East India Company, and for two centuries they were entirely involved in peaceful commercial activities, centred mainly on Bandar Abbas and Bushire on the Persian Coast and Basrah and in the valley at Baghdad (Abdullah Mahmood Morsy, 1978).

1. Pearling Industry: Prior to the discovery of petroleum, the economy of the seven Sheikhdoms was based on pearling, fishing, and trade formed an important source of income for the coastal tribes. Petroleum was first discovered off the coast of Abu Dhabi in 1958 whereas commercial production began in 1962. Since then the economy of the area has undergone dramatic changes (Middle East and North Africa, 1984). The major resource for them to exploit oysters. Thus the pearling industry became their principal economic activity upon which the whole social and economic life of the emirates were dependent upon. The pearling industry also provided a significant share to the national income, providing employment and revenues of the Sheikhdoms.

Most of the pearl merchants were foreign resident communities largely Persian and Indians. The British played an important role in guaranteeing the structure on which the pearl trading was based. The dependence of the industry was very strong on the international market. The pearl merchants in Bombay were the principal agents who transmitted
the exquisite Gulf pearls to the jewellers of Paris, London and New York (Al-Otaiba, 1977). Only the inhabitants of those states directly bordering the Gulf areas were allowed to indulge in pearling. With this agreement enforced by the British Maritime peace efforts (Mohamed G. Ruhaimi, 1980). The pearling industry declined during the early twentieth century. The main factors for such decline of the pearling industry are below (Fenelon, 1973).

1. Japanese had introduced a new cultured pearl. The Japanese pearls farming was very cheap and it was possible to sell it in the world market at a low price.

2. During the 1930s there was world-wide depression, resulted in the loss of luxury market, such as in France and Italy.

3. The demand of trucial coast pearls reduced because of the World War II, as their large American and European markets were lost. The trucial states contact with the rest of the world began to shrink at a faster rate.

Abu Dhabi was extremely hit by the pearling depression and only Dubai was able to sustain an economy which was built on the traffic in gold. In India, the price of gold was almost doubled compared to the world markets level, giving rise to unrecorded movements of gold which was given an opportunity to buy at lower prices. Thus Dubai's economy survived the pearling depression. In 1966, 10 per cent of the total production from gold mines of the free world was channelled through the Dubai, valued equivalent to 4 million ounces (Hawley Donald, 1971).

2. **Fishing**

Prior to the discovery of oil and to the pearling industry, fishing
was the most important source of income and still it remains a major contributing source of income to the countries especially the countries which have no oil fields (Sadik and Snively, 1972). The sea has been a traditional source of wealth and employment for the Sheikhdoms. At the beginning of the 19th century the Sheikhs of Sharjah and Ras-al-Khaimah had a navy of 163 large vessels, in more than 800 smaller crafts and some 19,000 sailors. It has been estimated that nearly 17 per cent of the total population of the UAE relies on the sea for their livelihood (K.G. Fenelon, 1973). Moreover, UAE has a 700 km. long coast line and numerous islands provide suitable fish-breeding grounds. Fish is the important item in the daily diet of all sections of the population of United Arab Emirates. The following table shows the production of fish of this country during 1970-80.

Production of Fish (1970-80) (Total Catch live weight - 100 metric tons)

<table>
<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Year</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>40.0</td>
<td>1976</td>
<td>64.4</td>
</tr>
<tr>
<td>1971</td>
<td>43.0</td>
<td>1977</td>
<td>64.4</td>
</tr>
<tr>
<td>1972</td>
<td>43.0</td>
<td>1978</td>
<td>64.4</td>
</tr>
<tr>
<td>1973</td>
<td>43.0</td>
<td>1979</td>
<td>64.4</td>
</tr>
<tr>
<td>1974</td>
<td>68.0</td>
<td>1980</td>
<td>64.4</td>
</tr>
<tr>
<td>1975</td>
<td>68.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


11 A variety of fish inhabit the gulf, the most abundant being kingfish, rock-cod, snapper, tuna, crayfish and red sea bream. The coastal water of the Gulf of Oman have an unusual abundance of tuna, Spanish mackerel, bonito, jacks, snailfish, amrin, sardines and anchovy.
In 1970 the total fish production of UAE was only 40.0 thousand metric tons and it further increased to 68.0 thousand metric tons in 1975. During 1976-80 the production has gone down to stand at 64.4 thousand metric tons (see figure 2.8). The Ministry of Agriculture and Fisheries has put ambitious plans to develop a modern industry in this area. Fujairah and the enclaves belonging to Sharjah, that could possibly establish a major fishing industry at least they can be on the Gulf of Oman, where the much better facilities are available than the Gulf proper. At present, the fishing fleets throughout the federation include many types of crafts, ranging from diesel ships of varying power up to 150 HP to very simple boats.

The United States consulting firm Arthur D. Little, submitted a report to the Abu Dhabi Government in 1969 and recommended the following: (1) the quality of shrimp in the territorial waters of Abu Dhabi (also applicable to other Sheikhdoms) does not warrant commercial exploitation. It was possible to use the Gulf of Oman for Shrimp fishing, that might be commercially feasible (Ragei El Mallakh, 1981).\(^1\) (2) the abundance of other fish types in the Arab and Gulf warrants the establishment of a fishing industry; (3) The construction of fish factories to process fish should be encouraged, and (4) financial help should be provided either by direct investment or by foreign loans (Al-Otaiba, 1971).

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12 Two Sheikhdoms, Fujairah and the enclave of the Sharjah face the Gulf of Oman and therefore these are the most probable shrimp industry sites, if and when such ventures is promoted.
Before the discovery of petroleum the animal rearing was important activity in the country. After the discovery of oil the importance of animal rearing declined at a faster rate.

The most important grazing grounds are in the vicinity of the Al-Ain oasis and around the Liwa-villages in the Western parts of Abu Dhabi. Grazing grounds are also available in Ras Al-Khaimah, Fujairah, Sharjah and Dubai. Most cattle and camel herdersmen are Bedouins or migrants without settle homes, although some are permanently settled in villages near the grazing grounds. The inhabitants of agricultural oasis in Al-Dhaidh and Fujairah raise sheep, goats and cows. Other animals raised by those living nearer to the cities included horse, mule and donkey. It is estimated that the contribution of animal husbandry to the national economy does not at present exceed 1 per cent. It must have been higher in the period before the sixties (Mana Saeed Al-Otaiba, 1971).

Recently, Dr. Paul Turner, a livestock expert of the F.A.O. visited the country and offered valuable suggestions to improve the livestock situation in the UAE. He recommended (1) the establishment of a well staffed veterinary department to look after the health of the countries farm animals; (2) new and more nutritious types of grass and cattle fodder should be grown on an extensive scale, and the exploitation of the countries livestock potential should be improved.
The livestock population of the country includes cattle, camel, sheep, chicken etc. The table showing animal resources indicates that the cattle population has increased from seventeen thousand to twenty-six thousand during 1969-1980. While the population of cattle, sheep, goat etc., have increased over the years camel population shows a declining trend.

Animal husbandry is a primary source to the nomadic Bedouin. Dairy farming has been introduced in Ras al-Xheimah with a new breed of cattle, but it has been started only in irrigated farming areas (David-long, 1978). The Commission sent by the British Ministry of Development recommended that the country should develop its livestock resources so as to make itself sufficient in dairy production, meat and eggs.

In addition to the efforts being made to expand livestock production in the country, the UAE Government is financing, setting up of similar scheme in some friendly countries. The biggest scheme is being undertaken in Pakistan and the cost of the project is $20 million which involves

<table>
<thead>
<tr>
<th>Year</th>
<th>Cattle</th>
<th>Camel</th>
<th>Sheep</th>
<th>Goat</th>
<th>Chicken</th>
<th>Turkey</th>
<th>Cows</th>
</tr>
</thead>
<tbody>
<tr>
<td>1969-71</td>
<td>17</td>
<td>100</td>
<td>94</td>
<td>257</td>
<td>85</td>
<td>1,987</td>
<td>15</td>
</tr>
<tr>
<td>1975</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>19</td>
</tr>
<tr>
<td>1978</td>
<td>23</td>
<td>53</td>
<td>120</td>
<td>311</td>
<td>304</td>
<td>2,537</td>
<td>23</td>
</tr>
<tr>
<td>1979</td>
<td>25</td>
<td>50</td>
<td>125</td>
<td>290</td>
<td>310</td>
<td>2,590</td>
<td>25</td>
</tr>
<tr>
<td>1980</td>
<td>26</td>
<td>59</td>
<td>132</td>
<td>342</td>
<td>1,785</td>
<td>2,705</td>
<td>261</td>
</tr>
</tbody>
</table>

1982, FAO Year Book, vol.36
the planning of pasture land on which cattle can be fed, raised and then exported to the UAE (Al-Otaiba, 1971).

**Trade**

Economic prosperity in the United Arab Emirates mostly depends on crude oil production and trade, whereas oil is a new comer, trade and maritime enterprise have a long history, may be, dated back to 5,000 years or more. In the 19th century, the trade was an important means of livelihood for the inhabitants of the coastal towns. Prior to the discovery of oil, trade was confined to the simple needs of the small communities of the country. This trade covered the collection of firewood, making of charcoal, pottery, jewellery and the manufacture of swords and daggers (Fenelon, 1974). It is obvious that at present there are some changes within the trade structure due to the discovery of new oil fields and large scale commercial exploration of oil. Under the impact of this inflow of oil money the country's domestic and external trade structure underwent fundamental changes. The trading activities of Abu Dhabi and Dubai emirates have covered more than 90 per cent of the United Arab Emirates trade (Al-Otaiba, 1971). Dubai is now the major import centre and entrepot of the eastern end of the Gulf and the main port of entry for imports into the northern state of federation as well as into the interior of Oman. Economically, Abu Dhabi and Dubai plays a major role in UAE's economy.

Imports in Dubai increased sevenfold between 1964 and 1971. Dubai
was only the port of entry for the goods coming into the area before the new port development at Abu Dhabi. Moreover the low custom duties and the absence of restrictions have always attracted trade to Dubai. Custom duties are levied at the rate of 3 per cent and lower rates are applied to certain commodities such as foodstuffs and goods in transit.

The discovery of oil in Abu Dhabi in 1959 and the subsequent large imports of machinery and equipment, all of which had initially to come through Dubai, gave it a tremendous boost to trade. Therefore, each state became anxious to provide good communication facilities, hospitals, schools, etc. and these generated demand for the capital equipments and all sorts of consumer goods. On the domestic front, people now have money to spend on all kinds of household appliances and consumer goods (Arab Economic Report, 1973).

According to available informations Table 2.4 and 2.5 shows the trade pattern of UAE regionwise. UAE has imported all kinds of goods of total value of 8,597 million of US dollars and the total export value of 21,618 million US dollars during 1980 respectively.
During 1980 the total import to UAE was about 71.7 per cent from the industrial countries followed by non-oil developing countries 22.5 per cent. The total value of import from industrial countries was 6,112 million US dollars during the period 1980. The import from the oil exporting developing countries was 52 million US dollars during 1973 which is gradually increased to 241 million US dollars during 1977 and then after the import value showed a fluctuating trend during 1978-80. The countries of Asia contributed highest percentage share of about 12.5 US dollars during 1980 than Africa, Europe, USSR etc. The import from the Middle East countries itself was about 7.6 per cent during the period. The import from Europe showed a gradual decrease between 1976-80 (see figure 2.9).

The export from UAE to the industrial countries showed a gradual decrease between 1974 and 1978 whereas the export value trend increase gradually to the oil-exporting developing countries and non-oil developing countries during the period 1974-1978. After 1973 the export from UAE to the non-oil developing countries showed a rapid increase from 2.1 per cent in 1974 to 17.2 per cent in 1978. During 1979 the export to the developing countries declined and then increased during 1980 the largest of export was to Asia followed by Europe and Africa. The value of export from UAE to Asia was 1.8 million US dollars in 1974 which increased rapidly over the years to stand at 6.2 per cent during 1980 (see figure 2.10).

The economic policy in UAE has been contradictory since 1977 with reduction in money supply growth and a cutback in public expenditure. The
UNITED ARAB EMIRATES
IMPORT
(1973-80)

Fig. 2.9
rate of inflation has been brought down from 15 per cent to 35 per cent in 1976. The production and volume of export of crude oil declined by 8.5 per cent in 1978, and the export price increased by 3 per cent. The net impact of these changes on export revenue declined by 5 per cent, compared with an average annual growth rate of 13 per cent since 1974. The US share in total export increased from 16 per cent in 1977 to 26 per cent in 1978, but Japan remained the leading market, accounting for 25 per cent of the total. The growth rate of imports have dropped significantly in 1978, but Dubai's imports increased in value by 1 per cent, compared with 33 per cent of growth the year before due to the down turn in construction activity (GATT, International Trade Year Book, 1979).

At present the UAE is importing food items like livestock, canned meat, fresh fruit, frozen meat, sugar, canned foodstuffs, wheat flour, and frozen vegetable, crude material except fuels, mineral fuels, lubricant and related materials, animal and vegetables oils, chemicals, manufactured goods, machinery and transport equipment, and oil field materials. Imports of fertilizer and crude materials to Abu Dhabi registered a brisk expansion. Abu Dhabi requires a large number of imports of manufactured products and equipments, building materials, road construction equipments. The same is true of other Emirates (UAE Currency Board Bulletin, 1979).

Indo-UAE Trade

India has had age old ties with the UAE, in fact the Gulf region for centuries has acted as a bridge connecting India with the rest of the Arab world. There is much evidence to support the fact that there existed close commercial and navigational contacts between India and cities like Muscat

After independence, India could not have close relationship with these emirates because of a series of bilateral treaties signed by the British with the Gulf states. The emergence of the UAE as a sovereign independent state was welcomed by India which not only supported its entry into the United Nations but it has also established diplomatic relations at embassy levels (Foreign Affairs Record, Delhi, 1972). The United Arab Emirates is fast emerging as one of the most lucrative markets in the Gulf offering promising opportunities for economic co-operation with India. The increasing tempo of economic development has made the commercial conditions favourable to the growth of India-UAE trade (FICCI Report, 1982).

India enjoys many advantages in the UAE market. The geographical proximity and traditionally healthy and friendly ties with the UAE puts in a relatively better position to occupy a good place in the UAE market. Secondly there has been a growing acceptability of Indian industrial goods in the UAE market. Indeed, in certain commodities like galvanized iron products and cast iron pipes India had enjoyed a monopoly and in construction materials in general has been accepted as a regular and unexceptional supplier to the Gulf. The UAE now accepts sizeable quantity of infrastructure designs by Indian concerns which could be regarded as the product of most effective Indian technology.

Yet another advantage to India's favour is its broad industrial base. The broad range of industrial processes and capacity has resulted in a
widespread Indian consultancy services throughout the Gulf. The combination of manufacturing experience and consultancy capacity over a wide range of areas, has put India into the lead among the developing countries, and in her bid for project based export, turn key projects, involving a package of capital goods, plants as well as technology (FICCI, Report, 1982).

The present development plan of the UAE requires a substantial growth of infrastructure and industries and offer an extensive scope for increasing export of project and products from India. The rapid development efforts undertaken in the UAE necessitate the large scale imports of machinery and the consultancy services apart from the normal import of essential commodities, capital goods, and consumer articles as well as building construction raw material. India has demonstrated a substantial capacity in changing the import requirements of the Gulf states.

So far as the UAE is concerned, many items of export on a comparative basis from India could be identified. In the area of consumer goods, India could very well increase the present levels of supply of traditional items like tea, coffee, manufactured tobacco, spices, sugar, rice, potato, onion, meat, fruits and vegetables, gems and jewellery of gold and silver as well as imitation jewellery etc., which all together accounted for 19 per cent of India's total export to the Emirates (Economic Times, Calcutta, 1982).

Among engineering and allied items, India could export industrial machinery, electric power machines, and switch gears, domestic electric equipments, M.S. pipes and tubes, auto and auto parts, bicycles and parts,
diesel engine and parts, jute, textiles, sugar and cement, machinery, electric cables and wires, hand tools, wire rope and products, railway wagons, coaches and components, iron and steel castings. Steel structural, ship-building machinery, air compressors, transformers and electric transformation equipments for water processing plants, air conditioners and refrigerators, commercial vehicles, transport equipments, pumps and spare parts, plastic and other products and many other related items. India's exports of engineering goods to the UAE have increased from Rs.154.4 million in 1974-75 to Rs.227.4 million in 1980-81 and it had reached almost up to Rs.250 millions by the end of 1984-85 (The Economic Times, 1984).

In addition, India is also in a position to export construction material and equipments, clothing and textiles, leather manufacturers, semi-processed raw materials, chemicals, drugs and pharmaceuticals, hospital equipment. Further, a number of Indian farms could provide the whole range of services, such as plan formulizations, project reports, basic engineering, plant design and detail engineering (Financial Express, 1984).

Indian imports from the UAE have been relatively small in items comprising petroleum and petro-chemical products and in addition to very small volumes of metal manufactures, pearls and precious stones, non-ferrous base metal waste and scrap. However, India has started importing recently quite a substantial amount of fertilizers and urea from the UAE. Cement is yet another item which India has imported during the last three years but in relatively small quantity. Moreover, India is purchasing about 250,000 tonnes of urea from the UAE every year, out of which 175,000
tonnes were purchased under a seven-year contract between the UAE's FERIL and the Mineral and Metals Trading Corporation of India (MMTC) (Financial Express, 1982). Besides, during 1979-81, UAE, supplied an additional 1.5 million barrels of crude oil to India in the light of disruption caused in supply because of the Iran-Iraq war on the one hand and the fall in domestic production due to Assam problem and a huge fire in the Bombay High Rig on the other side (The Statesman, 1982).

Despite many advantages to its favour as discussed above, India's overall trade performance in the UAE market has been far from satisfactory. While Indian imports from the UAE increased from Rs.975.1 million in 1976-77 to Rs.2,377.5 million in 1982-83, its exports declined from Rs.2,673.0 million to Rs.1,401.9 million in the same period (see figure 2.11). India's share has been only 2.5 per cent, placing it at the 10th position as a trading partner in the overall trade pattern of the UAE. India's share in the UAE market was 4.4 per cent in 1977, but in 1981-82 it came down to 2.5 per cent (see Table-2.6) in the field of export of food items and live animals. In the case of machinery and transport equipment too, again India's share declined from 1.1 per cent to 0.3 per cent. In other items like chemicals, pharmaceuticals, vegetable oil and fats over trade figures have remained almost static.

One of the reasons for India's dismal performance has been due to the construction work being slowed down. Construction materials and intermediaries formed an important part of India's exports to the UAE. The massive cutback in the UAE's federal budget has serious effects on India
INDIA'S TRADE WITH UNITED ARAB EMIRATES

VALUE IN RUPEES MILLION

-1200
-900
-600
-300
0
300
600
900
1200
1500
1800
2100
2400

YEARS
1970-71
1971-72
1972-73
1973-74
1974-75
1975-76
1976-77
1977-78
1978-79
1979-80
1980-81
1981-82
1982-83

IMPORT
EXPORT
BALANCE OF TRADE

Fig. 2.11
to maintain a steady growth in the export of engineering goods. The Gulf market is completely different from that of Indian market, but this is not being fully understood. Thirdly, according to some Indian contractors, there has been periodic shortage of steel, and power which sometimes compel them to buy the same construction materials as well as other related material from outside at a higher rate than they could have got in India.