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Human Settlements Division

HIGHLIGHTS OF THE HUMAN SETTLEMENTS SITUATION IN THE UNITED ARAB EMIRATES

Country Profile

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FOREWORD

Within the frame work of the work programme of its Human Settlements Division, the United Nations Economic and Social Commission for Western Asia (ESCWA) has embarked on the preparation of country profiles on human settlements and the building materials and construction industries in all its member countries.

The profiles are not meant to be an end in themselves. Rather, they represent a foundation on which other studies can be based in an endeavour to achieve the twin goals of integrating the physical dimension of planning with the overall national socio-economic and environmental development planning and the development of local building materials and construction industries.

The profile is structured to present general information on the country, with emphasis being placed on physical, socio-economic, demographic and other aspects that affect or are affected by human settlements development, and includes data on the building materials and construction industries. Where applicable, the profile outlines declared government policies, objectives and strategies for the development of human settlements and of the building materials and construction industries. It includes the present situation as regards the institutions that have been set up and the manpower trained for the implementation of the declared policies and where appropriate, it points out gaps, problems and constraints, as well as existing or potential opportunities that must be taken into account in formulating future policies and plans for the development of human settlements and the building materials and construction industries.

Follow-up action will include an in-depth analysis of the information contained in the country profile, the formulation of proposals and recommendations for the solution of existing problems with a view to achieving the twin goals mentioned above and, once all the countries of the ESCWA region have been covered, a set of indicators will be compiled and periodically updated which will provide the planners and policy makers with a useful tool for evaluating and monitoring the progress made in the development of the human settlements, building materials and construction industries.

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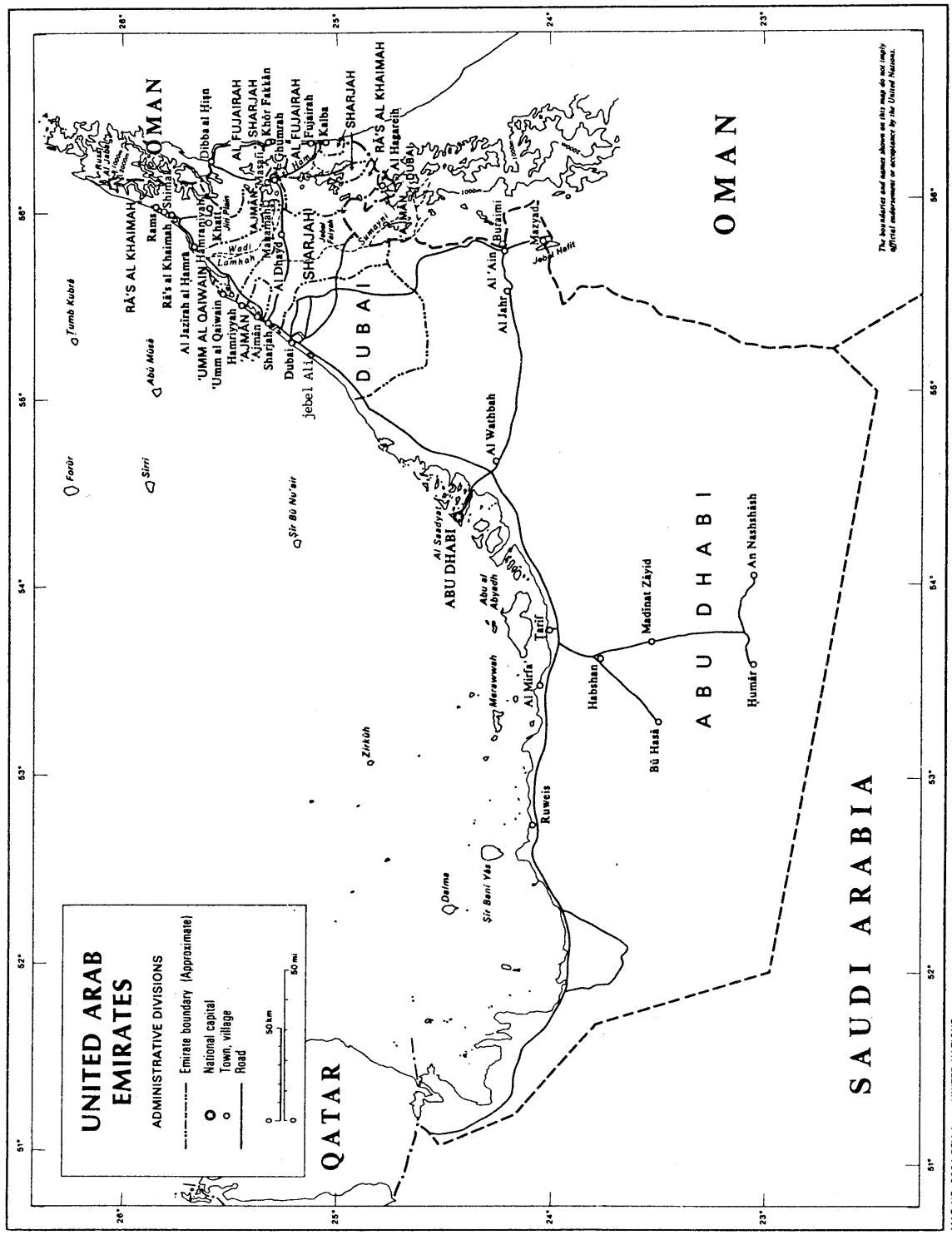
United Arab Emirates



I. BACKGROUND INFORMATION

The United Arab Emirates is a federal union of seven emirates, namely, Abu Dhabi, Dubai, Sharjah, Ajman, Umm Al-Qaywayn, Ra's Al-Khaymah and Al Fujayrah. Formed in 1971, it is located on the eastern coast of the Arabian Peninsula and bordered by Qatar, Saudi Arabia, Oman, the Arabian Gulf and the Gulf of Oman.

The United Arab Emirates lies in the sub-tropical arid climate zone, but is also subject to the climatic influence of the Gulf and the Indian Ocean. This creates conditions of very high temperatures combined with very high humidity. The mean July and January temperatures are 33°C and 18°C, respectively. The seasonal variation in temperature is between 35 and 40°C. The difference between day and night temperature is also considerable and is more pronounced in the summer. The annual average rainfall is 8-10 centimetres of which 94 per cent occurs between November and April and 50 per cent between December and January. Apart from the oases, vegetation is limited to low shrubs. Ground water, the main water resource of the United Arab Emirates, is exploited by means of open wells and the falaja (traditional tunnels and viaducts).

The country is not particularly rich in construction minerals. Limestone reserves are estimated at around 200 million tons, 170 of which occur in Ra's Al-Khaymah and the rest in the Sharjah and Abu Dhabi Emirates. Sand is available mainly in Dubai, Abu Dhabi and Ra's Al-Khaymah Emirates but is good only for the production of low-quality bricks and aggregate sands. Marble, although found in large quantities and in great variety, especially in Ajman, can be worked only in small pieces due to numerous fractures. A variety of dimension stone, e.g. limestones, gabbros and granites, is also available in the northern emirates, although not in large quantities. Gypsum and clay are abundant but of very low quality. Thus, the mineral resources of the United Arab Emirates can support only a limited production of building materials.

The administrative units of the country consist of seven emirates (see map), 68 districts (makhfar), of which 19 are urban and 49 rural, 374 villages and 236 dependencies.

The population of the country showed a dramatic upturn beginning in the early 1970s. From a base of 180,000 in 1971, it more than tripled to reach 560,000 in 1975. It then doubled during the next five years and passed one million in 1980, the year of the most recent published census.[1/] Ministry of

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1/ The results of the 1985 population census had not been published at the time of writing (see table 5 for early results on households).

Planning and United Nations estimates project a total population of 1.31 million in 1990, 1.94 million in 2000 and 2.7 million in the year 2025. Table (1) presents the growth of the total population by major age groups.

Table 1. Population by major age groups, United Arab Emirates, 1975, 1980, 1984

Age	Total population		
	1975	1980	1985[a/]
0 - 14	157,238	297,933	441,600
15 - 64	388,842	731,122	852,400
65 and over	11,807	13,044	12,200
Total	557,887	1,042,099	1,306,200

Sources: United Arab Emirates, Ministry of Planning, Central Statistical Department, Population Census 1975, Part III, (Abu Dhabi, January 1977).
United Arab Emirates, Ministry of Planning, Central Statistical Department, Population Census 1980, (Abu Dhabi, May 1981).
United Arab Emirates, Ministry of Planning, Central Statistical Department, Annual Statistical Abstract: 9th edition, (Abu Dhabi, 1984).

a/ Abu Dhabi, Ministry of Planning estimates.

In 1980, 81 per cent of the population and 85 per cent of households lived in urban settlements. In 1975, urban population and urban households constituted 84 per cent of the respective totals, which indicates a trend towards smaller urban households (see table 2).

Non-national population increased from 66,000 persons (36.5 per cent) in 1968 to 390,000 (69.5 per cent) in 1975 and 714,000 (68.5 per cent) in 1980. According to estimates of the United Nations Economic and Social Commission for Western Asia (ESCWA), in 1984 it was slightly over 1.0 million which represented 75.4 per cent of the total. The same source estimated the 1986 non-national population at 74 per cent of the total.

The United Arab Emirates is basically a single-resource economy as nearly the whole of its income originates from oil and gas exports. During the decade 1975-1985, however, the three largest employers were the following:

Sector	(Percentage of total employers) 1975	1985
Construction	25.6	20.3
Trade/restaurant/total	17.6	15.5
Government services	15.1	15.5

Table 2. Households by regular/irregular building type and urban/rural location, United Arab Emirates, 1975, 1980

Year	Building type	Household Urban	Rural	Total
1975	Regular[a/]	69,625	9,477	79,102
	Irregular[b/]	13,125	6,592	19,717
1975	Total	82,750	16,069	98,819
1980	Regular[a/]	138,982	20,949	159,931
	Irregular[b/]	18,320	6,080	24,400
1980	Total	157,302	27,029	184,331

Sources: United Arab Emirates, Ministry of Planning, Central Statistical Department, Population Census 1975, Part III, (Abu Dhabi, January 1977).

United Arab Emirates, Ministry of Planning, Central Statistical Department, Annual Statistical Abstract: 9th edition (Abu Dhabi, 1984).

a/ Households in villas, Arab-style houses, popular houses, low-cost houses (including extensions), apartments, two-storeyed and concrete houses, halls (shabra).

b/ Households in shanties, sheds, tents, caravans, shacks and other similar structures (including "not stated").

II. LAND AND SETTLEMENT PATTERN

The United Arab Emirates is a highly urbanized country with nearly 80 per cent of the population living in urban[1/] settlements, mostly along the coast. It has been estimated by ESCWA that in 1984 about 90 per cent of the population lived in settlements with 10,000 or more inhabitants, and nearly 88 per cent in those with 20,000 or more.

The highest urbanization ratios in 1980 occurred in Dubai (95.4 per cent), Ajman (93.2 per cent) and Sharjah (85.4 per cent), and the lowest in Al Fujayrah (39.3 per cent). For the United Arab Emirates as a whole, the ratio of urban population declined considerably from 84 per cent in 1975 to 81 per cent in 1980 and to 78 per cent in 1984. Four Emirates (Al Fujayrah, Sharjah, Ajman and Ra's Al Khaymah), however, are exceptions to this general trend. Al Fujayrah's urban population ratio more than doubled from 17.5 per cent in 1975 to 39 per cent in 1980. The largest decrease in the urban ratio over the same period occurred in Abu Dhabi from 84 per cent to 76.5 per cent. (See table 3).

The largest city of the United Arab Emirates is Dubai, followed by Abu Dhabi, Sharjah, Al Ain and Ra's Al Khaymah. Although this ranking was the same in 1975 and 1980, the rank-size distribution was closer to the ideal theoretical distribution[2/] in 1975 with the largest city having 1.4, 3.1 and 3.5 times the populations of the 2nd, 3rd and 4th largest cities, respectively. These proportions became 1.1, 2.1 and 2.6 in 1985 (see table 4).

1/ The definition of "urban" which can be deduced from the published official statistics on this subject is "... of or pertaining to the nine major cities of the country" (see table 4). This gives the following "average" and "minimum" urban settlement population sizes: 52,000/2,900 (1975) and 93,600/9,700 (1980). By 1984 the minimum urban settlement size had reached a level somewhere between 10,000 and 20,000.

2/ In its most general form, H.K. Zipf's rank-size rule is $r.p^q = k$ where: "r" is the rank and "p" the population of any given city in a closed system of cities, and "q" and "k" predetermined constants of unity and the population of the most populous city, respectively. This means that "the population times the rank of a city equals the population of the largest city".

As the underlying assumption of Zipf's rule is an absence of deliberate planning interference with the system of cities, the amount of deviation from the ideal distribution may be an indication of the overall effect of settlement planning.

Table 3. Emirate populations by urban/rural location, 1975, 1980

Emirates	1975			1980		
	Urban	Rural	Total	Urban	Rural	Total
Abu Dhabi	178,467	33,345	211,812	345,586	106,262	451,848
Dubai	179,926	3,261	183,187	263,449	12,852	276,301
Sharjah	64,068	14,722	78,790	135,983	23,334	159,317
Ajman	14,351	2,339	16,690	33,651	2,449	36,100
Umm Al-Qaywayn	5,642	1,266	6,908	9,652	2,774	12,426
Ra's Al Khaymah	22,924	20,921	43,845	41,435	32,483	73,918
Al Fujayrah	2,909	13,746	16,655	12,659	19,530	32,189
UAE	468,287	89,600	557,887	843,415	199,684	1,042,099

Source: United Arab Emirates, Ministry of Planning, Central Statistical Department, Population Census 1975, Part III, (Abu Dhabi), January 1977.

All major urban settlements of the United Arab Emirates except Al Ain City are located on the coast. Rural settlements are also generally located either on the coast or within coastal strips (see map). The most important locational factors behind this settlement pattern have been access to the sea and to fresh water sources. The only major inland settlement, Al Ain City, is located in an oasis whose wells, up to about fifteen years ago, were rich enough to allow water to be piped across the desert to Abu Dhabi. The city is now connected to the national network supplied mainly with desalinated water (see map).

Urban areas comprised an estimated 31,000 hectares(ha)[1/] and covered only a tiny 0.4 per cent of the total surface area of the country in 1980. In the same year, the agricultural area actually under cultivation covered 23,500 hectares (ha) or 0.3 per cent of the total area; 30 per cent of this agricultural land was located within the Abu Dhabi Emirate. The total cultivable area, that is land with agricultural potential, was estimated at 35,000 ha (0.45 per cent) for the same year.

1/ 100 hectares (ha) = 1 square kilometre (km^2).

Table 4. Ranking of main settlements by population size United Arab Emirates, 1975, 1980

Rank	1975 City (Emirate)	1975 Population	1980 City (Emirate)	1980 Population
1	Dubai[a/]	179,926	Dubai	263,449
2	Abu Dhabi	127,763	Abu Dhabi	243,257
3	Sharjah	58,053	Sharjah	123,214 [b/]
4	Al Ain (AD)[c/]	50,704	Al Ain (AD)[c/]	102,329
5	Ra's Al Khaymah	22,924	Ra's Al Khaymah	41,435
6	Ajman	14,351	Ajman	33,651
7	Khor Fakkan(S)[c/]	6,015	Khor Fakkan(S)[c/]	12,769 [b/]
8	Umm Al-Qaywayn	5,642	Al Fujayrah	12,659
9	Al Fujayrah	2,909	Umm Al-Qaywayn	9,652

Sources: United Arab Emirates, Ministry of Planning, Central Statistical Department, Population Census 1975, Part III, (Abu Dhabi, January 1977).
United Arab Emirates, Ministry of Planning, Central Statistical Department, Population Census 1980, (Abu Dhabi).
Abu Dhabi Emirate, Planning Department, Statistical Yearbook 1984, (Abu Dhabi, November 1985).

a/ "Comprehensive Development Plan Report I" (1986) published by Dubai Municipality cites the following settlement populations for 1985: Dubai City 299,000. Jebel Ali 4,000 Al Awir 2,000, Al Khawaneej 1,500, Hatta and Al-Usaili 1,000 each. The total 1985 population of Dubai Emirate was 310,300.

b/ Estimated by applying the 1975 ratio to the total of the two cities.

c/ AD = Abu Dhabi Emirate, S = Sharjah Emirate.

The overall population density of the country was 7.2 persons per square kilometre (p/km^2) in 1975 and 13.4 p/km^2 in 1980. Abu Dhabi, with 3.2 p/km^2 in 1980 is the only Emirate with a density below the country average. The overall population densities of the other Emirates are as follows: (in brackets: 1975 and 1980 values in p/km^2) Ajman (64.4; 139.4); Dubai (47.2; 71.1); Sharjah (30.4; 61.5); Ras Al-Khaymah (26.0; 43.9); Al Fujayrah (14.3; 27.6); and Umm al Qaywayn (8.9, 16.0).

The estimated average density of urban population of the country's major cities is around 27 p/ha (or 2,700 p/km^2) which means there is 36.8 ha of urban land for every thousand urban inhabitants (1980).

In Abu Dhabi all unused land belongs to the Emir who allocates plots allocated only to nationals who have applied for property. A United Arab Emirates citizen can sell or exchange his plot for another only with the approval of the Emir. Foreigners are not allowed to own real estate but can lease land from a national for a maximum period of eight years. Sharjah has less restrictive policies that permit expatriates to buy property there.

III. PHYSICAL DEVELOPMENT PLANNING

The known history of settlement of the United Arab Emirates dates back to approximately 3,000 B.C. on the coastal strip and to 5,000 B.C. around Al Ain. The first substantial settlements appeared in the 16th century in the form of forts built by the Portuguese on coastal sites. Later settlements were mainly fishing and pearling villages. Pearling continued to be vitally important for the economic survival of the Trucial States, as the Emirates were formerly known, until the early 1900s when the Japanese introduced the cultured pearl. The only inland settlements occurred in the Al Ain and Liwa oases (see map).

The Provisional Constitution of the Federation, drawn up in 1971 and still in force, foresaw the construction of a new capital, Al Karameh on the Dubai - Abu Dhabi border. Although Al Karameh has not been built, the decision remains valid and Abu Dhabi City is considered an interim capital.

An important pattern of the later phase of urban growth in the United Arab Emirates is the gradual merging of the major urban coastal areas especially those in the northern emirates, through greatly improved land transport facilities. Most Emirates have major port and airport facilities and competing urban functions. Daily commuting between main coastal cities is increasing encouraged by the various advantages for employment and residence offered by different cities. Average overland travel time between Dubai and Abu Dhabi was shortened sevenfold over a period of 15 years from 18 hours to 2.5 hours.

Although there is as yet no explicit physical planning at the national level, at the urban area level there has been comprehensive physical planning. The earliest physical development plan in the United Arab Emirates was "The Town Plan of Dubai", designed by John R. Harris in 1965. It included layouts for residential, commercial, industrial and shopping areas and for a network of main roads and streets in the city. This plan was revised in 1971 by the same planner.

In 1977, the United States Agency for International Development was called in to prepare the framework for a Comprehensive Development Plan for Dubai Emirate. On the basis of this the first comprehensive development planning project was started in 1985 under the guidance of the United Nations Department of Technical Cooperation for Development (UNDTCD) Team.

The project will produce physical development plans for Dubai Emirate Area for urban and rural centres, the central business district and the Old Town. Moreover, special studies on environmental planning, building and housing issues and codes will be undertaken. The plan has served as a blueprint for similar projects in Abu Dhabi, Al Fujayrah, and Sharjah and are likely to be carried out for the remaining emirates in the future. These developments have underlined the need for a national spatial strategy, which now exists in

the form of a project idea in the Fourth United Arab Emirates Country Programme draft (1978-1991) of the United Nations Development Programme.

The present master plans for most major cities are based on a gridiron, or rectangular pattern, of streets with roundabouts at the more important junctions, clearly delineated zoning for residential, commercial, industrial and other uses, and height restrictions on buildings. Environmental concerns led the larger cities to locate industrial sites outside the urban areas.

The Ministry of Planning coordinates the preparation of medium- and long-term plans with the other federal ministries and with the departments of all the emirates and is responsible for submitting them to the Supreme Council for endorsement. The other federal ministries actively involved in physical development planning are Finance and Industry, Health, Education and Youth, Labour and Social Affairs, Justice, Islamic Affairs and Awqaf, Public Works and Housing, Electricity and Water, and Communication.

The history of country-wide development institutions in the United Arab Emirates predates the Federation with the 1965 establishment of the Trucial States Development Office, which carried out important infrastructural projects in health, education, communication and agriculture. At the same time, a development foundation for long-term planning was established.

At the emirate level the federal ministerial functions are carried out by departments and the Emir's Office is responsible for their administration. The principal government agencies engaged in the physical development activity are, in the case of Dubai, the Departments of Electricity, Water, Land, Health and Medical Services, Ports and Customs, and Air Transport. In Abu Dhabi there is a separate Planning Department. Particularly in the richer emirates, the government departments are primarily concerned with the development and management of the rural areas.

The municipalities are the agencies responsible for physical development planning in the urban areas of the United Arab Emirates. In Dubai, for example, the main governing body is the Municipal Council, which consists of members appointed by the Emir. The Council has both advisory and supervisory functions as well as power to make contracts and to own land. The Council is divided into seven committees, the General Purpose, Finance, Planning, Rents, Traffic, Public Health and Compensation Committees. The General Purpose and Finance Committees approve the proposals of the other five.

In the reorganization plan of the Ministry of Public Works and Housing (see also IV: Housing), there is a proposal for a new Physical Planning Agency with overall policy-making responsibility for national land-use and physical structure planning.

The Provisional Constitution of the United Arab Emirates guarantees the inviolability of private property. Expropriation of real estate may take

place only when public interest dictates it and then only after fair compensation has been made.

In Dubai Emirate, property registration regulations were introduced in 1960 following a sharp rise in real-estate values. The Dubai Lands Department was established to deal with land disputes as well as with registration and valuation in cases of expropriation.

Physical development control is ensured mainly through the zoning regulations of the master plans and through building regulations. The building regulations currently in use in Dubai date from 1970, but currently contain many ammendments subsequently introduced by circulars and special decrees. Special circulars were also issued to regulate building setbacks, building heights, plot-construction ratios, and so forth in areas of new development. The main zoning categories of the current Dubai City Master Plan are: residential (including schools and shops); commercial (including properties with residential units on upper floors); buildings for public educational and recreational use; light industry and warehousing; heavy industry; and obnoxious trade. Limited residential accommodation is allowed in all these categories. The responsibility for issuing building permits lies with the Building Control Section of Dubai Municipality. The Section provides services for public housing and private sector construction to ensure compliance with standards and provision of services.

The procedures for land acquisition and compensation as well as the owner's right to develop the land vary with his status. The owner of a private property can freely develop, rent or sell his plot in accordance with zoning regulations and is compensated for both the land and the building on it. The owner of a granted property, however, can only develop his land; he may not rent or sell it and in the case of acquisition will be compensated for the house only if he himself paid for it.

The protection of the marine environment is governed by the "Kuwait Convention for Cooperation on the Protection of the Marine Environment", adopted in 1978 by all the Gulf countries. The Higher Environmental Committee of the United Arab Emirates, composed of members from all federal ministries and chaired by the Federal Minister of Health, oversees compliance with the Kuwait Convention.

In Dubai, air and water quality and industrial pollution are controlled by the recently established Environmental Pollution Control Unit under the Emirate Department of Public Health. Different sections of the Municipality are also involved with environmental protection in their own areas of responsibility.

Responsibility for physical industrial development planning resides with various bodies at different levels of government; these include the Ministry

of Finance and Industry, the emirate governments and municipalities, emirate chambers of commerce and industry, and the Emirates' Industrial Bank (established in 1983).

The main characteristics of industrial policy concern encouragement of industrial that utilize locally available raw materials, such as the oil, gas and cement industries and industries producing for the international market. Private sector participation is also encouraged. The freedom to choose the location of an industry is a significant incentive for the private sector in Abu Dhabi. At the same time, three large industrial zones have been established on coastal sites: Ruwais in Abu Dhabi Emirate, located 260 kilometres is too far west of Abu Dhabi City; Jebel Ali Free Trade Zone in Dubai Emirate, 36 kilometres south-west of Dubai City; and Al-Saja'a Development near Sharjah City.

At the national level transportation planning is implemented mainly by the Marine and Utilities Department of the Ministry of Public Works and Housing as an inter-city highway planning and construction activity. Urban transportation planning is integrated into the comprehensive development planning activity by the municipalities.

Conservation of sites of architectural and historical value is emphasized in the physical planning of urban areas. Urban change has been so rapid that there remains only a handful of buildings older than ten or fifteen years. The Old Fort of Abu Dhabi City, which today houses the National Archives, was built in 1793 around the only source of sweet water on Abu Dhabi Island. Along with the thousand-year-old circular rock tombs in the Hili Gardens, it is being preserved as a tourist attraction. Modern mosques, such as the Grand Mosque in Abu Dhabi, which accommodates up to 5,000 worshippers, are generally built on the sites of ancient mosques.

Tourism is now considered an untapped resource second only to oil in its economic potential for the economy and is already a component of physical planning. The Abu Dhabi Chamber of Commerce and Industry, among others, is looking into the possibilities of tourism as a revenue source. The main touristic resources of the United Arab Emirates are the desert, the sea and various aspects of Arab culture which constitute the "Arabian experience".

IV. HOUSING

The Ministry of Public Works and Housing (MPWH) is directly responsible for overall federal housing policies. The Ministries of public works and of housing were merged in 1977 and the latter became the Housing Department of the new MPWH. The MPWH is currently undergoing further reorganization.

In its present structure, the MPWH has two substantive functions, housing and utilities (or public works). The Housing Department deals with public housing for United Arab Emirates citizens only. Its main functions are to receive and evaluate citizens' applications, prepare designs and projects to satisfy demand, put out tenders for these projects and supervise implementation.

The MPWH concentrates its efforts on the poorer northern emirates. Indeed, the budget of Dubai municipality is alone larger than that of the MPWH.

The current reorganization plan, prepared in 1984 through United Nations consultancy services, proposes three policy-making agencies at the ministerial level: the physical Planning Agency attached to the Cabinet of Ministers, the National Housing Committee and the Projects Committee.

The Physical Planning Agency, proposed as the top level independent consultative unit responsible for national land-use and physical structure planning, will also make decisions on the nationwide locational distribution of public housing projects. There is also a proposal for a Non-Citizen Housing Unit under the Physical Planning and Housing Studies Section, which would give expatriate housing policy issues official status. This section would also be assigned the task of preparing comprehensive policies on human settlements and housing in collaboration with the proposed National Physical Planning Agency.

The most noteworthy characteristic of the housing market of the United Arab Emirates in the past decade has been the extreme fluctuation in demand for, and in supply of, housing units, which has resulted in parallel oscillations in real estate prices and rent levels. Rents peaked in 1975/1976 and again about 1980/1981. A three-bedroom flat that rented for 90,000 Dirhams (Dh) ($US 24,500) per year in 1981 would be Dh 30,000 - 40,000 ($US 8,170 - $US 10,900) per year in 1984.

The behaviour of the housing market varies greatly among the emirates. The Abu Dhabi market, where landowners tend to keep rents artificially high, is less responsive than others to supply and demand. Cities of the northern emirates generally offer more favorable rent and real-estate policies. Those that are within commuting distance of Dubai, particularly Sharjah and Ajman, tend to serve as dormitory towns.

The drastic drop in oil revenues following the international oil price crisis of the early 1980s forced many expatriate workers to leave the United Arab Emirates, thereby causing a sharp fall in the demand for housing. The allocation of federal funds to the public housing projects was stopped by the government in 1982. Even the rich emirates were affected.

The main tenets of the housing policy formulated soon after the declaration of the Union in 1971 were the following:

(a) Sedentarization of the nomads at their most favoured habitats through the provision of decent housing;

(b) Provision of housing for all United Arab Emirates citizens with priority on low-income groups;

(c) Assurance that the financial burden on the citizen is well within his capacity to pay;

(d) Provision of shelter to all residents, nationals and non-nationals alike;

(e) Assurance that implementation complies with the constitutional framework of the United Arab Emirates.

There are two sets of housing policies in the United Arab Emirates, one for nationals and the other for non-nationals. Part of the former aims to settle nomads, preferably not in cities but on the urban periphery, within the context of a progressive adaptation programme whereby a plot of land and an expandable house are both provided free of charges. A 1976 amendment provided for additions to the original building free of charge or cash assistance if the owner himself is willing to have it built. The other major principle of the housing policy for the United Arab Emirates citizens provides for the grant of a plot of land and, if the family is poor, also a cash allowance for building a house on the same plot. The plots granted are at least 350 square metres (m^2). Under this policy for the United Arab Emirates nationals through 1985, 50-55 per cent of households were granted free land and a house, 12.5 per cent assistance for additions, 6 per cent free land and cash, and 7 per cent land only.

The housing policy for the non-nationals operates through indirect provision of rental and company accommodation. Some citizens are permitted to build rental housing on grant land and the construction is financed jointly by the grantee, the government and commercial banks. This arrangement may take the form of mixed commercial/residential rental development if the developer is a local entrepreneur instead of a citizen. The government also leases land to private companies for staff housing. The cost of the expandable house given to the citizen free of charge ranges from Dh 85,000 ($US 23,000) to around Dh 235,000 ($US 64,000).

The public authorities directly involved in the financing of housing are the Ministry of Public Works and Housing, the municipalities, the Abu Dhabi Social Services Department, the Central Bank and Ittisalat (formerly Emirtel), the telecommunications monopoly. The proposal made in the early 1980s for a real estate bank has never been implemented. The establishment of a "housing finance institution for low-income groups" exists as a project idea in the Fourth Country Programme for the United Arab Emirates (1978-1991) of the United Nations Development Programme.

In spite of the financial squeeze of 1982, the municipalities of Abu Dhabi, Dubai and Sharjah continue to make reduced gift payments of up to Dh 200,000 ($US 54,500) to individual families; after building a house the family pays back only the amount in excess of the gift payment. This system of finance was started in 1984. In Sharjah, only newly formed families and the families of military personnel are eligible.

The Abu Dhabi Social Security Department builds and finances mixed commercial/residential units. Both the Central Bank and Ittisalat grant loans with five or ten years payback periods for their own eligible employees. Commercial bank loans and advances against real estate mortgages, an indirect source of housing finance, declined by 14 per cent between 1982 and 1983.

The preliminary results of the 1985 Population Census indicate a total stock of around 268,000 housing units in the United Arab Emirates, of which 86 per cent are occupied, 13.5 per cent are vacant and 0.7 per cent are institutional. For the larger emirates their proportion of the total housing stock correlates closely with their populations. The smaller emirates, however, represent a considerably higher proportion of housing units and vacancies than they do of population (see table 5).

Average household size increased from 5.24 in 1975 to 5.65 in 1980. Urban households are considerably smaller (5.36) than rural (7.4) (1980). The average private household had 2.2 persons per habitable room (1975). This indicator is considerably higher in rural (2.7) than in urban areas (2.1) (see table 6).

The average size of low-cost public housing units increased from approximately 120 m^2 to nearly 160 m^2 between 1981 and 1983. The average floor area per person in the low-cost public housing units increased from 21.1 m^2 to 28.2 m^2 in the same two year period (see table 6). The average number of habitable rooms is highest in villas (4.3) and lowest in shabra (1.9) (1975). The average private house has around 2.5 habitable rooms.

The Ministry of Public Works and Housing built 532, 337 and 142 low-cost housing units in the years 1981, 1982 and 1983, respectively. The total floor area of these units dropped by about two-thirds over the same period.

Table 5: Housing stocks by emirate, United Arab Emirates, 1985

Emirate	Number of Housing Units			
	Occupied[a]	Vacant[a]	Institutional[b]	Total
Abu Dhabi	96,085	12,157	1,129	109,371
Dubai	62,572	7,087	300	69,959
Sharjah	35,879	6,302	182	42,363
Ajman	9,440	1,471	18	10,929
Umm Al-Qaywayn	3,492	1,076	17	4,585
Ra's Al Khaymah	18,450	5,200	70	23,720
Al Fujayrah	13,105	2,643	45	15,793
Total UAE	239,023	35,936	1,761	276,720

Source: United Arab Emirates, Ministry of Planning, Central Statistical Department, Population Census 1985: Early Results (Abu Dhabi, 1987).

a/ Excluding institutional.

b/ Covers residential units (rooms, suites, cells, etc.) in institutional establishments such as hotels, hospitals, prisons, etc.

Table 6. Housing indicators, United Arab Emirates, 1975-1983

Indicator	Year	Value	Unit of Measurement
1) Household size:			
a) Average size:	1975	5.24	Persons per household
b) Average size:	1980	5.65	Persons per household
- Urban	1980	5.36	Persons per household
- Rural	1980	7.39	Persons per household
2) Persons per habitable room:			
a) Private households (average)	1975	2.2	Persons per habitable room
- Urban	1975	2.1	Persons per habitable room
- Rural	1975	2.7	Persons per habitable room
b) Collective households (average)	1975	4.0	Persons per habitable room
- Urban	1975	4.1	Persons per habitable room
- Rural	1975	3.7	Persons per habitable room
3) Size of residential unit: habitable rooms per regular[a/] private residential unit:			
a) Average (estimate)	1975	2.53	Habitable rooms per residential unit
b) By building type:			
- villa style	1975	4.34	Habitable rooms per residential unit
- Arab house	1975	2.28	Habitable rooms per residential unit
- popular house	1975	2.42	Habitable rooms per residential unit
- apartment	1975	3.07	Habitable rooms per residential unit
- portion of a single dwelling	1975	1.31	Habitable rooms per residential unit
- hall (shabra)	1975	1.91	Habitable rooms per residential unit

Table 6. (Continued)

Indicator	Year	Value	Unit of Measurement
4) Size of residential unit:			
Average floor area per residential unit (low-cost public housing units)	1981	119.30	m^2 per res. unit
	1982	155.88	m^2 per res. unit
	1983	159.49	m^2 per res. unit
5) Residential space standard:			
average floor area per person (low-cost public housing units)	1981	21.12	m^2 per person
	1982	27.59	m^2 per person
	1983	28.23	m^2 per person

Source: Data compiled by ESCWA using national sources.

a/ Regular dwellings are those for which number of rooms is published in national censuses; i.e. villas Arab-style houses, popular houses, apartments, and halls (shabra).

V. INFRASTRUCTURE

The Ministry of Electricity and Water is responsible for water supply and power policy, and the Ministry of Public and Housing for sewerage and sanitation. In 1981 the General Water Resources Authority was created to monitor a new federal institution and record underground water levels. In the five northern emirates the Ministry of Electricity and Water has the main responsibility for controlling the water and power supplies, although most of the emirates also have their own water and/or electricity departments.

The overpumping of ground water that results from poor management, particularly of agricultural water use, which accounts for over 70 per cent of the total, has led to a deterioration in the quality and quantity of water. Consequently reliance on desalinated sea water has become essential. In Abu Dhabi desalinated water accounts for 60 per cent of water use, the highest recorded in the country. The main proposals that have been advanced to solve the water shortage problem are the following:

(a) Cheaper desalination technology;
(b) A federal water supply network;
(c) The importation of water.

All the cities have piped water systems. Over 80 per cent of buildings in the country (85 per cent in urban and 65.5 per cent in rural areas) were connected to piped water in 1980; these systems provide water to 88 per cent of the urban and 50 per cent of the rural population (see table 7).

As the present desalination technology (multi-stage flash process) uses waste heat from power stations, power and water complexes are generally located on coastal sites. However, a new technology known as distillation by reverse osmosis will make it possible to supply cheap water through the treatment of brackish ground water in remote areas. Table 7 presents selected water indicators for the United Arab Emirates.

In the generation of electricity the United Arab Emirates is faced with problems of overcapacity that result mainly from the unforeseen termination of projects. Another problems is the uneven distribution of power production capacity among the emirates. One proposed solution to the distribution problem is a unified United Arab Emirates power grid. A region-wide power grid is also under consideration by the Gulf Co-operation Council.

Energy sources other than oil being considered for power generation are natural gas and nuclear and solar energy. The discovery of the Saaja gas field in Sharjah has been promising in this respect since even the smallest nuclear power plants appear to be too big for the northern emirates and extensive utilization of solar energy requires additional advances in photovoltaics to be economically feasible.

Ninety per cent of all buildings in the United Arab Emirates (94 per cent urban and of 78 per cent rural were connected to electricity networks in 1980; this represents a 10 per cent improvement over 1975 (see table 7).

Development spending in the water and power sector increased 4.6 times from 1980 to 1982 to reach Dh 541.4 million ($US 147.5 million) and accounted for one-third of the total development budget (see table 7) for other indicators).

Thirty one per cent of urban, 15 per cent of rural and 27 per cent of all buildings in the United Arab Emirates were connected to public drainage networks by 1980. The proportion of population served by some kind of sanitation facility is 93 per cent in urban areas but only 22 per cent in rural areas. In the largest cities around 60 per cent of the population is served by the sewerage network. Development expenditures on sewerage in Abu Dhabi represents approximately one fourth of the total development outlay of the emirate (1980-1983), a very high ratio compared to that of Dubai (table 7(2)).

The United Arab Emirates has an excellent system of 732 kilometres of highways that connect major population and industrial centres and neighbouring countries. Under consideration is a coastal railway that would link Kuwait to Dhahran, Doha, Dubai, Sharjah and Muscat.

There are 13 seaports in the country, only two of which are on the Gulf of Oman coast: (Khor Fakkan in Sharjah, and Al Fujayrah). Major ports on the Gulf coast are Mina Zayed (Abu Dhabi), Jebel Ali (Dubai), Mina Rashid (Dubai) and Mina Khalid (Sharjah).

By 1988 there will be seven airports operating in the United Arab Emirates: old and new Abu Dhabi, Dubai, Sharjah, Ras Al-Khaymah, Al Fujayrah, and Al-Ain, scheduled to open in 1988. All seaports and most airports are operating considerably under their capacities. Only Dubai Airport is fully used, owing to the open skies policy of that Emirate.

Telecommunications in the United Arab Emirates are operated by a single federal authority, Ittisalat, established in 1976. In 1984, the system had 86 exchanges with 228,000 lines serving 188,000 subscribers, as well as 7,000 telex lines. The United Arab Emirates has one of the highest telephones-to-population ratios in the Arab World.

A recent joint study of the Ministry of Public Works and Housing and the United Nations concluded that a nationwide intercity bus system would be feasible. At present, the only regular, frequent intercity bus service is that which operates between Abu Dhabi and Al-Ain.

The number of automobiles (including taxis) increased at an annual average rate of 22 per cent from 1976 to 1980 and at 4 per cent between 1980 and 1983 (see table 7).

The United Arab Emirates National University in Al-Ain, established in 1977, is the only one in the country. In 1986 it had a student population of about 5,700. A new campus is being built on a 20 square kilometres site and will accommodate approximately 16,000 students by the year 2000. Emphasis will be on courses in seaport and airport management, accountancy, mechanical and civil engineering, and administration. In 1986 there were only four colleges for higher technical education in the country.

A 1985 report to the Ministry of Health recommended that no more hospitals be built until at least 1990, and that a Central Hospital Administration be established. Owing to the high standards sought by the Ministry the establishment cost of a hospital bed in the United Arab Emirates can reach $US 250,000, which is more than twice the level prevailing in other Arab countries. The new emphasis in health planning is likely to be on preventive medicine. In 1983 there were 2.6 beds per thousand inhabitants and one physician for every 830 inhabitants.

Table 7. Technical Service Indicators, United Arab Emirates, 1975-1983

Indicator	Year	Value	Measurement Unit
Water			
Buildings connected to water network as a percentage of all buildings	1975	74.28	%
Total	1980	80.22	%
Urban	1980	85.26	%
Rural	1980	65.50	%
Population served by safe water as per cent of total population			
Total	1980	80.72	%
Urban	1980	88.00	%
Rural	1980	50.00	%
Production of water	1975	199)	liters per person per day
	1980	468)	
Consumption of water	1975	169)	liters per person per day
	1980	350)	
	1983	390)	
Actual Federal Budget allocation to the Ministry of Electricity and Water as percentage of total actual budget	1975	11.25	%
	1980	2.68	%
	1983	3.31	%

Table 7. (Continued)

Indicator	Year	Value	Measurement Unit
Sewerage/Drainage			
Buildings connected to drainage:			
Total	1980	26.97	%
Urban	1980	30.97	%
Rural	1980	15.28	%
Population served by sewerage network (Abu Dhabi, Dubai, Sharjah, and Al Ain cities only)	1983	60	%
Population with access to sanitation services[a]			
Total	early 1980s	80	%
Urban	early 1980s	93	%
Rural	early 1980s	22	%
Development expenditure on sewerage as per cent of Emirate government development expenditure			
Abu Dhabi Emirate	1980	26.75	%
	1983	24.97	%
Dubai Emirate	1980	8.16	%
	1983	3.24	%
Electricity			
Installed capacity per person (in kilowatts)	1975	0.86	
	1980	2.15[b]	
	1983	3.01	
Generated energy per person (in kilowatts/hours)	1975	2.450	
	1980	6.040	
	1983	8.280	

Table 7. (Continued)

Indicator	Year	Value	Measurement Unit
Percentage of buildings connected to electricity network:			
Total	1975	80.21	%
	1980	90.06	%
Urban	1980	94.25	%
Rural	1980	77.80	%
Transport			
Vehicles (private and public):			
- Automobiles	1975	57.73	
(per thousand inhabitants)	1980	125.74	
	1983	140.11	
- Buses	1976	0.44	
(per thousand inhabitants)	1980	3.36	
	1983	3.33	
- Goods vehicles	1976	14.07	gv/000 p
(per thousand inhabitants)	1980	29.67	gv/000 p
	1983	25.41	gv/000 p
- Heavy vehicles	1976	0.65	hv/000 p
(per thousand inhabitants)	1980	3.30	hv/000 p
	1983	3.49	hv/000 p
Actual Federal Budget allocation	1975	2.34	%
to the Ministry of Communications	1980	1.76	%
as a percentage of the total	1983	1.48	%

Source: Compiled by ESCWA based on national and international sources.

a/ Sanitation includes public sewerage, pit toilets pour-flush latrines, septic tanks, communal toilets, etc.

b/ Excludes Khor Fakkan and Kalba power stations in Sharjah Emirate.

VI. BUILDING MATERIALS AND CONSTRUCTION

As of 1985 the building materials industry in the United Arab Emirates consisted primarly of ten cement plants, five iron/steel rolling mills, one major aluminium smelting plant (Dubai: Dubai Aluminium Company, established in 1975) and more than fifty other factories for various types of building materials.

Imports of a very wide spectrum raw or manufactured building materials far exceed exports. In 1983, imported building materials, which ranged from roughly squared wood to equipment for plumbing, heating and lighting totaled $US 8.436 in comparison with $US 469 million worth of building materials exports. Aluminium products accounted for 67 per cent and cement lime for 19.4 per cent of all exports in the same year.

The ten cement companies are listed as follows, with the emirate and year of establishment in brackets: Union (Ra's Al Khaymah, 1972), Al Ain (Abu Dhabi, 1976), National (Dubai, 1978), Jebel Ali (Dubai, 1978), Gulf (Ra's Al Khaymah, 1981), Sharjah (1982), Al Fujayrah (1982), Ajman (1984), White Cement (Ra's Al Khaymah, 1985) and Asbestos (Umm Al-Qaywayn, under construction in 1986).

Continuous reductions in construction projects owing to sharp falls in oil revenue, coupled with unco-ordinated competition among emirates seeking to establish their own cement plants, have resulted in overcapacity, overproduction and problems of capacity under utilization. In 1986, the average output/capacity ratio was approximately 52 per cent with an estimated production of 4.8 million tons per year and a total production capacity of 9.3 million tons per year. Even at this rate of production, the output of cement is 2.7 times the consumption of 1.8 million tons per year (see table 8). As a consequence, the price of cement has been falling sharply since 1982; a standard 50 kilogramme bag of cement cost about Dh 20 ($US 5.5) in 1981, but only Dh 5 ($US 1.4) in 1986. In the two months from early December 1985 to early February 1986 alone cement prices fell 8 per cent and 11.5 per cent, respectively. Table 8 gives selected indicators of the cement industry.

The primary iron/steel building materials produced in the United Arab Emirates are reinforcing bars. The five main iron/steel factories operating in the country are: Ahli (Dubai 1976), Middle East (Sharjah), Shattaf Anand (Sharjah), the Ra's Al Khaymah scrap smelter (1976), and the Abu Dhabi scrap smelter (1977). As no iron ore exists in the United Arab Emirates, the mills use imported material. In 1983 the country imported iron and steel products valued at $US 423.2 million, while it exported products worth $US 1.64 million.

Per capita iron/steel consumption increased from 387 kilogrammes in 1978 to 557 kilogrammes in 1980. It is estimated that it will continue increasing at a reduced rate in the future to reach 694 kilogrammes in 1985 and 970 kilogrammes in the year 2000 (table 9).

Table 8. Development of the cement industry: employment, capacity, production, consumption, United Arab Emirates, 1975, 1980, 1986

Indicator	1975	1980	1986
Number of cement plants	1	4	10 a/
Employment (in persons)	81	939	3,003
Capacity (in thousand tons/year)			
Clinker	---	2,260	4,480 a/
Cement	250	4,630	3,300
Cement production (in thousands tons/year)	50	2,301	4,814
Cement Consumption:			
Total (in thousands tons/year)	954	1,640	1,800
Kilogrammes per capita	1,710	1,574	1,380 b/

Source: Data compiled and/or estimated by the Economic and Social Commission for Western Asia.

a/ Includes the Asbestos Cement Company plant in Umm Al-Qaywayn which was under construction in 1986 (clinker capacity: 500,000 tons/year).

b/ Calculation based on the 1986 population estimate of 1,304,700 persons of the Ministry of Planning.

Table 9. Projected demand for reinforcing bars, United Arab Emirates, 1978-2000

Year	Demand (in thousands of tons per year)
1978	360
1980	580
1985	907
1990	1,230
1995	1,560
2000	1,880

Sources: Iron and Steel International August 1984.
Economic and Social Commission for Western Asia and United Nations Industrial Development Organization, The Iron and Steel Industry in the ESCWA Region, (Baghdad, 1987) (E/ESCWA/ID/87/6).

The gross fixed capital formation (GFCF), an indirect indicator of the total construction activity in all sectors of the economy[1/], has followed a much more stable course than the gross domestic product (GDP) in the decade 1975-1985. The GFCF increased steadily up to 1978 when it reached 44 per cent of the GDP, its highest level for the decade. The GFCF remained at Dh 30 billion[2/] ($US 8.2 billion) to Dh 32 billion ($US 8.7 billion) up until 1983 when it declined as a result of the sharp fall in oil revenues and the consequent investment squeeze. The GFCF fell 8 per cent from 1983 to 1984 and 16 per cent the following year, declining to Dh 24.4 billion ($US 6.65 billion) in 1985.

1/ GFCF consists of the fixed investments of all construction sectors, (residential, non-residential and other), land improvements, producers' durable goods (transport and other machinery/equipment) and livestock. Construction can account for a very high percentage of total GFCF, especially in rich, rapidly-developing countries like the United Arab Emirates. Therefore, GFCF can serve as an indicator of investment in construction.

2/ Thousand million.

The share of the federal government in GFCF reached its highest level (6 per cent) in 1982, the peak year of the construction boom.

The construction sector itself accounted for 3.4 per cent of the total GFCF in 1975 but for only 2.4 per cent of the total in 1985. With 1980 as 100, the GFCF index of the construction sector reached a maximum of 151 in 1983 but fell to 82.8 in 1985. Mining/quarrying, manufacturing and transport/communications accounted for 67.8 per cent of the total GFCF in 1985.

Abu Dhabi Emirate accounted for nearly two-thirds of the country's total GFCF in 1985. Dubai followed with 17 per cent and Sharjah with 14 per cent.

The construction sector was the largest employer during the decade 1975-1985. It represented more than one fourth of the total employment in the country from 1975 to 1980. Since 1980 the share of the construction sector employment has been falling steadily. In 1985 the sector employed about one fifth of the total work-force of the United Arab Emirates.

The construction companies in the United Arab Emirates are privately owned but may be staffed totally or predominantly by expatriates. In 1975, there were a total of 985 building and construction contractors in the United Arab Emirates, of which 874 were operating in urban areas. Table 10 gives selected indicators of the construction sector.

In the United Arab Emirates there are legally binding specifications for building materials adopted from ISO, BSI and ANSI[1/] standards. These exist for sand, aggregates, cement, concrete mixes, bricks, building blocks, metal parts, structural steel, paints, aluminium doors and windows.

The building regulations and codes of practice for the construction companies have been adopted from British, American and Indian texts. All building activity is controlled by regulations which are enforced by the municipalities, the Ministry of Public Works and Housing and the public works departments of the various emirate governments.

In their reply to a questionnaire survey administered by ESCWA in 1986-1987, the Directorate of Standardization and Metrology, which is part of the Ministry of Finance and Industry and functions as the federal authority for building materials regulations and codes for construction practice, indicated a need for further research into heat insulation in buildings and into the resistance effect of salts in building materials.

1/ ISO = International Standardization Organization
BSI = British Standards Institute
ANSI = American National Standards Institute.

Table 10. Construction Indicators, United Arab Emirates, 1975, 1980, 1985 (in current prices)*

	Indicator		1975	1980	1985
1.	GDP in construction	Dh million	4,308	9,834	8,882
		$US million	1,078	2,679	2,420
2.	GDP in construction as percentage of total GDP[a/]		10.82	8.71	8.84
3.	Total GFCF	Dh million	12,059	30,155	24,370
		$US million	3,017	3,285	6,639
4.	GFCF per capita	Dh million	21.6	28.9	18.7
		$US million	5.4	7.5	5.1
5.	Total GFCF as a percentage of GDP[a/]		30.43	27.05	24.81
6.	Employment in construction		73,870	142,700	116,500
7.	Employment in construction as a percentage of total employment		25.61	26.38	20.33

Source: United Arab Emirates, Ministry of Planning, National Accounts of the United Arab Emirates (Abu Dhabi, 1986).

* $US 1.0 was valued at Dh 3.997 in 1975, and Dh 3.671 in 1980 and 1985 (using the average of the buying and the selling rates).

a/ At cost value.

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