

A NEW SETTLEMENTS POLICY FOR EGYPT

**A Planning Policy for New Settlements Using the
Relevant British Experience**

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by

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ABSTRACT

A NEW SETTLEMENTS POLICY FOR EGYPT: A Planning Policy for New Settlements Using the Relevant British Experience

This study demonstrates how new settlements represent the main solution for population and urban problems in Egypt. It suggests a policy for the establishment of self-contained new settlements outside the Nile Valley and the Delta, making use of the relevant lessons from the British experience in the building of new towns, meeting social and aesthetic requirements for work and living places, which have been practiced since the late 1940s. Such a policy would let Egypt overcome congestion, squalor, lack of services, and the urban encroachment on the scarce agricultural land, and develop the natural resources of the country in a new environment with sufficient services, including housing, infrastructure and breathing spaces.

To suggest the proper policy, it is essential to study Egypt from the physical, social and economic points of view. The British practice is examined to determine lessons relevant and applicable to the programme of new settlements in Egypt, and what difficulties have to be overcome, and the procedures have to be followed. The Greater Cairo Region is studied to illustrate the conditions of the principal urban area in Egypt, and ways of relieving pressure upon it by establishing proper new settlements. It is also essential to describe the first attempt to establish a self-contained new community in Egypt, 10 Ramadan, as a case study to assess and quantify the proper needs for the newer settlements in Egypt. It became clear that the rate of construction in the new city especially in terms of housing and services, is insufficient to maintain a new community and hinders the development of the project as a whole, with the result that there are a lot fewer settlers than was planned. Before the discussion of the policy of the new settlements in Egypt, it is necessary to examine the available potential for development of the country to know how and where to establish the new settlements, and to form some guidelines to the needed policy for each aspect of that development. At the end of the study a policy is drawn to build the new settlements to match the natural, social and economic circumstances in Egypt. The relevant British experience was valuable. It became apparent that the provision of water, services, infrastructure form crucial bases in the establishment of the needed settlements in the desert. The employment of efficient staff and the establishment of a proper organisation will make it possible to apply the appropriate management and project co-ordination and to enforce planning principles, laws and designs. It is hoped that the study will help in the implementation of the programme of the new settlements in Egypt, creating a new taste of life not only free of congestion and urban problems, but with ample services, jobs and recreation.

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

To my late parents

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Abbreviations

DC	= Development Corporation
LA	= Local Authorities
CAPMAS	= Central Agency for Public Mobilization and Statistics, Cairo
GOPP	= General Organization for Physical Planning, Cairo
GCR	= Greater Cairo Region
NUPS	= National Urban Policy Study (Egypt)
£E	= Egyptian Pounds
UNDP	= United Nation Development Programme
NTC	= New Towns Commission
GDP	= Gross Domestic Product
GNP	= Gross National Product

CHAPTER ONE

A General View of Egypt

1.1 The Aim of This Study

Although Egypt occupies an area of more than one million Km², thousands of square kilometres are unoccupied, while the inhabited area is densely overcrowded. This maldistribution of population will be examined in detail in the following Chapter. Besides that unbalanced distribution of population, important planning considerations should include other factors such as the high rate of population growth, increasing from 2.31% per year in the period 1966-1976 to 2.99% per year in 1979(1), see Fig. (2-1); the urban invasion of the highly productive agricultural land, the acute shortage of housing and services, the apparent as well as the hidden and seasonal unemployment, and the social reflections of such problems upon the Egyptian communities.

In this thesis it is the intention to examine some possible solutions to these integrated and complicated problems.

Is the best solution to add more housing and development projects to the existing towns, following the pattern of the last four decades? That simply means adding to the burden on the urban areas and their overloaded services and infrastructure, and adding to the pressure for agricultural lands to be changed to urban use. The increasing prices of building lands are leading to higher population densities. Figure (1.1) compares the population, the cultivated area and the crop area in Egypt 1897-1974, while Table (1.1) shows the population, the cultivated area, the crop area, and the per capita share in Feddans(2) 1897-1974. The per capita decrease caused by the increasing population and the insufficiency of the agricultural land is clearly demonstrated.

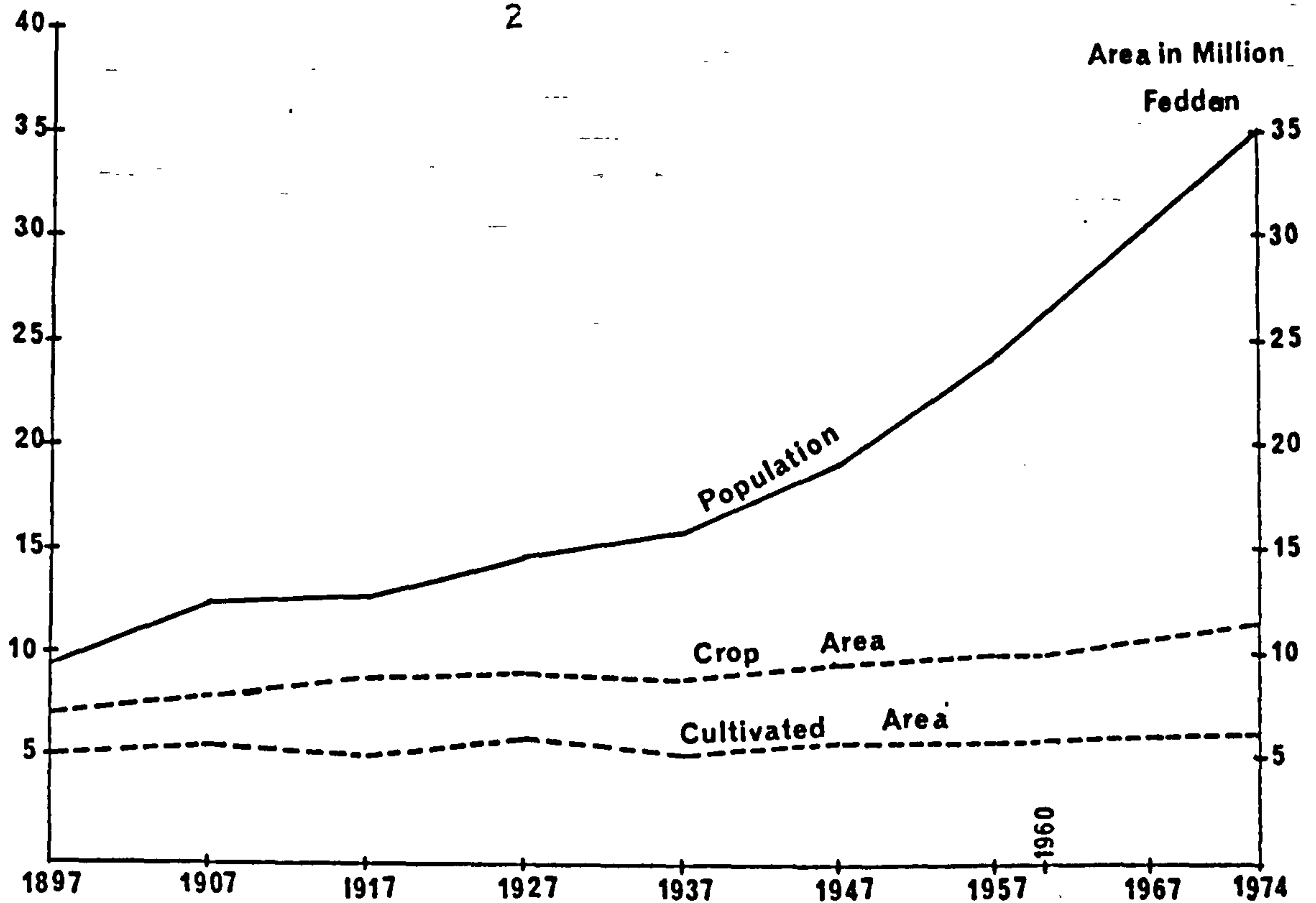
Population in
Million

Fig.(1-1)

Growth of Population Compared with Growth of Cultivated Area and Crop Area in Egypt (1897-1974)

- Sources : 1. M.S.A. Hakim, The Population of Egypt, A Demographic Study, p.36, for the years 1897-1960
2. CAPMAS, Population & Development, September 1978, p. 196, for the year 1974

Table (1-1) : Cultivated Area and Crop Area in Egypt
in Years 1897-1974

Years	Population (Millions)	Cultivated Area		Crop Area	
		Million Feddans	Per Capita	Million Feddans	Per Capita
1897	9.7	5.1	0.53	6.8	0.71
1907	11.2	5.4	0.48	7.6	0.67
1917	12.8	5.3	0.41	7.7	0.60
1927	14.2	5.5	0.39	8.7	0.61
1937	15.9	5.3	0.33	8.4	0.53
1947	19.0	5.8	0.31	9.2	0.48
1960	26.0	5.9	0.23	10.2	0.39
1966	30.1	6.0	0.20	10.4	0.34
1968	31.6	6.0	0.19	10.9	0.34
1969	32.4	6.0	0.19	10.9	0.34
1970	33.2	6.0	0.18	10.9	0.33
1971	33.2	6.3	0.19	11.5	0.35
1972	33.8	6.3	0.19	11.6	0.34
1973	34.5	6.3	0.18	11.8	0.34
1974	35.1	6.3	0.18	11.9	0.34

Source : CAPMAS, Population & Development, Cairo,
Sept. 1978, p.196

N.B. : See note (2) in this Chapter .

For a long time, since before the turn of the last century, it has been argued that the only way to prevent overcrowding in Egypt was to spread development outside the valley and the Delta into the desert. But there must be a development policy that will avoid the repetition of the existing development problems. In other words, there must be a policy to realise acceptable population densities, to prevent speculation in land, to reclaim more agricultural lands, to develop fisheries and tourist areas, to achieve progress in mining and petroleum industries, manufacturing, export and import trades and so on. This involves the creation of more job opportunities and a higher standard of living for the new communities whatever their form will be, new small settlements, villages or new towns or even new big cities, ensuring that all are provided with adequate networks of roads and communications, sufficient services especially housing, and places of recreation and entertainment. The general aim should be to create a new integrated atmosphere of life in Egypt on desert land beyond the cultivated area of the Nile and its Delta, taking care of the psychological factor which must have its importance in new settlement establishment, for people who used to live close to the Nile.

But how and where should new settlements be established in Egypt? A discussion of an answer to these questions is the aim of this study, with reference to the relevant British experience in the establishment of new towns.

1.2 The Effects of the Site Among the Three Continents

Egypt occupies the north-eastern corner of Africa and forms nearly 1/30th of its total area. It is bounded on the north by the Mediterranean Sea almost on latitude 32° N., on the south by Sudan almost on latitude 22° N., on the west by Libya almost on longitude 25° E., and the east by the Red Sea. It measures 1073 km in the greatest length from north to south, and

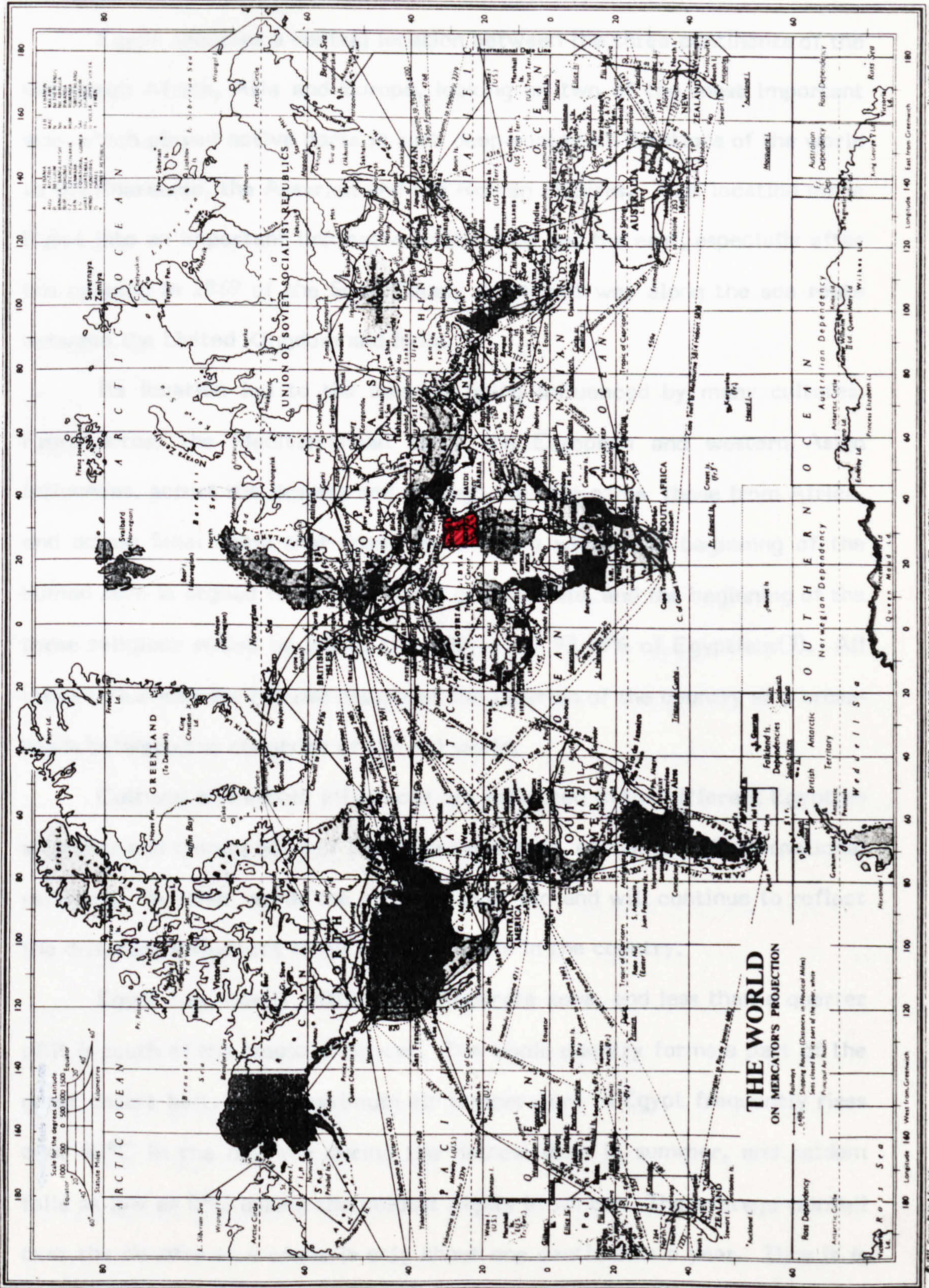


Fig. (1-2), Egypt in the world.

1226 km in the greatest distance from west to east. The area of Egypt considerably exceeds that of any European country except Russia, Fig. (1-2).

Egypt occupies a central location between the three continents of the old world: Africa, Asia and Europe, looking on two of the most important seas which played active parts in such deep-rooted civilizations of the world as the Pharaonic, the Assyrian and the Roman empires. That location made Egypt into an important link between the west and the east, especially after the opening in 1869 of the Suez Canal, about half way along the sea route between the United Kingdom and India.

Its location led to the country being influenced by many cultures. From across the Mediterranean came the European and western Asian influences, across the deserts and through the Nile came those from Africa, and across Sinai came that from central Asia where the beginning of the human race is argued to be in western central Asia, and the beginning of the three religions sealed by Islam, the religion of 93.68% of Egyptians(3). All these influences are natural results of the location of the country at a cross-roads between the countries of the old world.

Cultural and ethnic influences are reflected in the different Egyptian attitudes and trends; ways of living, architecture, economy and international relations. In other words the site of Egypt did and will continue to reflect the different influences on all aspects of life in the country.

Egypt lies mostly within the temperate zone, and less than a quarter of it is south of the tropic of cancer. The whole country forms a part of the great desert belt. The maximum air temperature in Egypt frequently rises over 40°C in the daytime during the hottest days in summer, and seldom falls as low as 0°C during the coldest nights in winter. The average rainfall over the country as a whole is only about one centimetre a year. Thus it is not surprising that by far the greater part of Egypt (more than 90%) consists

of barren and inhospitable deserts.

Table (1.2) shows temperature and rainfall in four different locations in Egypt.

Table (1-2)

TEMPERATURE AND RAINFALL IN DIFFERENT LOCATIONS IN EGYPT

City	Distance to Mediterranean	Mean Temp. C°		Average of Annual
		Max.	Min.	Rainfall
Alexandria	0 km	30	11	20 cm
Cairo	170 km	30	13	3 cm
Assyut	470 km	32	16	0.5 cm
Aswan	770 km	34	18	Almost none

The mean daily relative humidity increases from about 68% in winter to about 73% in summer on the Mediterranean coast. But inland, the relative humidity rapidly diminishes. Near Cairo, the relative humidity falls from 65% in winter to below 45% in summer. The cloudiest time of the year in Egypt is in December and January and the cloudiest part of the country is Alexandria, where at that time of the year the sky is 50% covered and the duration of sunshine amounts to 7 hours a day. But near Cairo the amount of cloud decreases to 40%, and to less than 10% in Aswan. In summer, the sky in Alexandria is nearly 20% covered, while in Cairo there is 10% cover and even less in upper Egypt where the maximum sunshine duration is observed.

The prevailing wind direction in December/January on the Mediterranean coast and the Delta is almost due west, but south of Cairo, it is due north. From June to September more than 96% of the winds are

either northwest or northeast. The average day velocity of the northerly winds in summer is about 9 km/h. But strong winds, sometimes reaching gale force, may occur during the passage of a winter depression from west to east along the Mediterranean. Velocities of 120 km/h at Alexandria and 103 km/h at Cairo have been recorded as exceptional cases.

1.3 The Main Regions of Egypt

Desert features prevail in the country except in the Nile valley and its Delta where fertile soils are brought into the alluvial plain by the waters of the Nile coming from Ethiopia and the Lakes Plateau. The contrast between the desert lands on both sides of the Nile valley is clear, the valley accommodating about 99% of the total population where the basic activities are practiced. The Egyptian desert is divided by the Nile valley into the Eastern and the Western deserts, while the Sinai Peninsula lies at the north-eastern part of the country between Al-Aqaba and Suez Gulfs.

Although the weather in the moderate latitudes on the northern coast of the Mediterranean Sea is somewhat different, the general appearance of the coastal plain is still one of desert lands.

For our purposes it will be convenient to consider the country by its traditional divisions which are:

1. The Nile Valley and the Delta
2. The Eastern Desert
3. The Western Desert
4. Sinai Peninsula.

In the following sections, 1.3.1 to 1.3.4, each of these divisions will be discussed in more detail as a geographical unit concerning features, potentials and activities, Fig. (1-3).

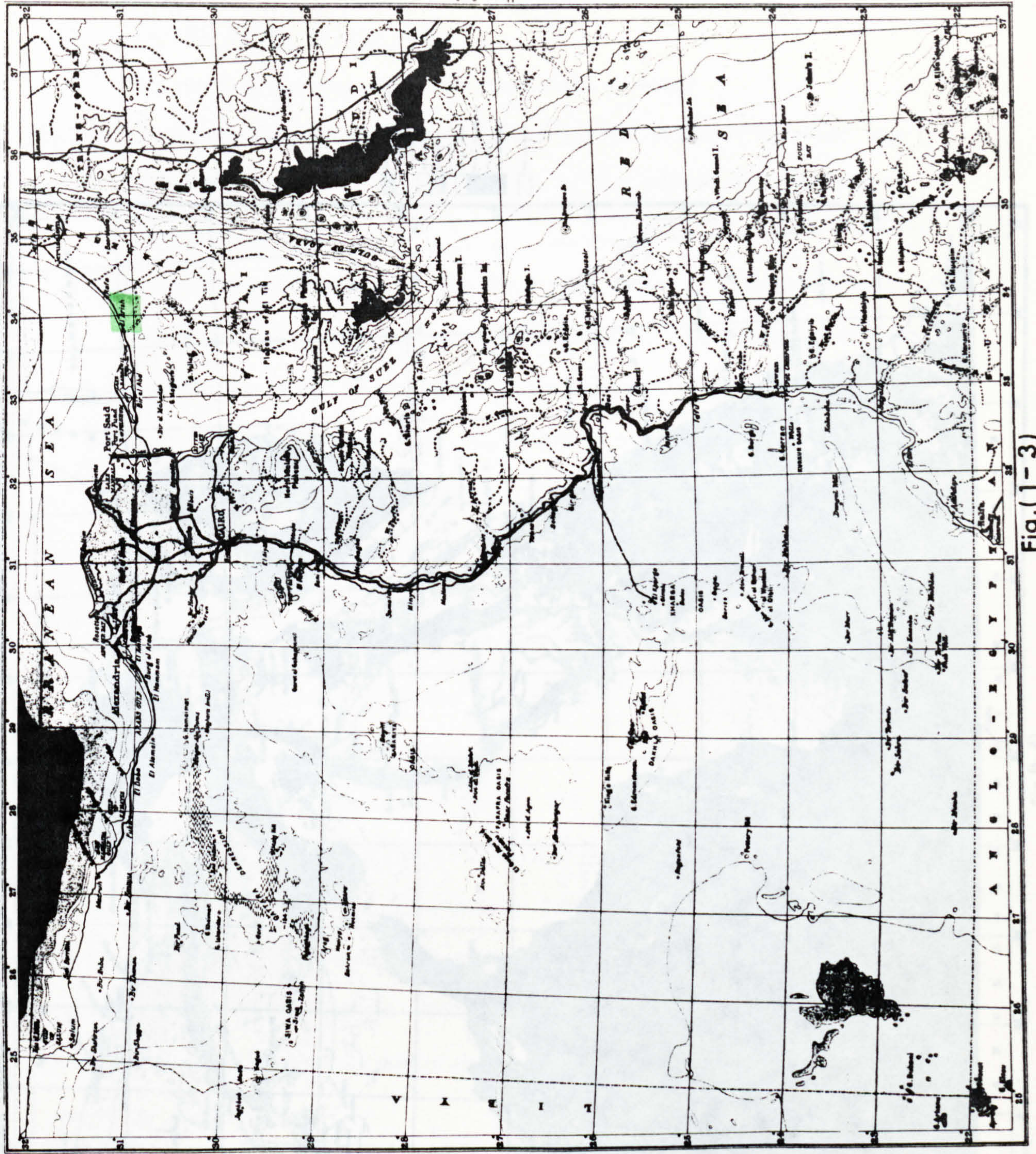


Fig. (1-3)
EGYPT (OROGRAPHICAL)

Kilometres 100 200 300
Miles 100 200 300

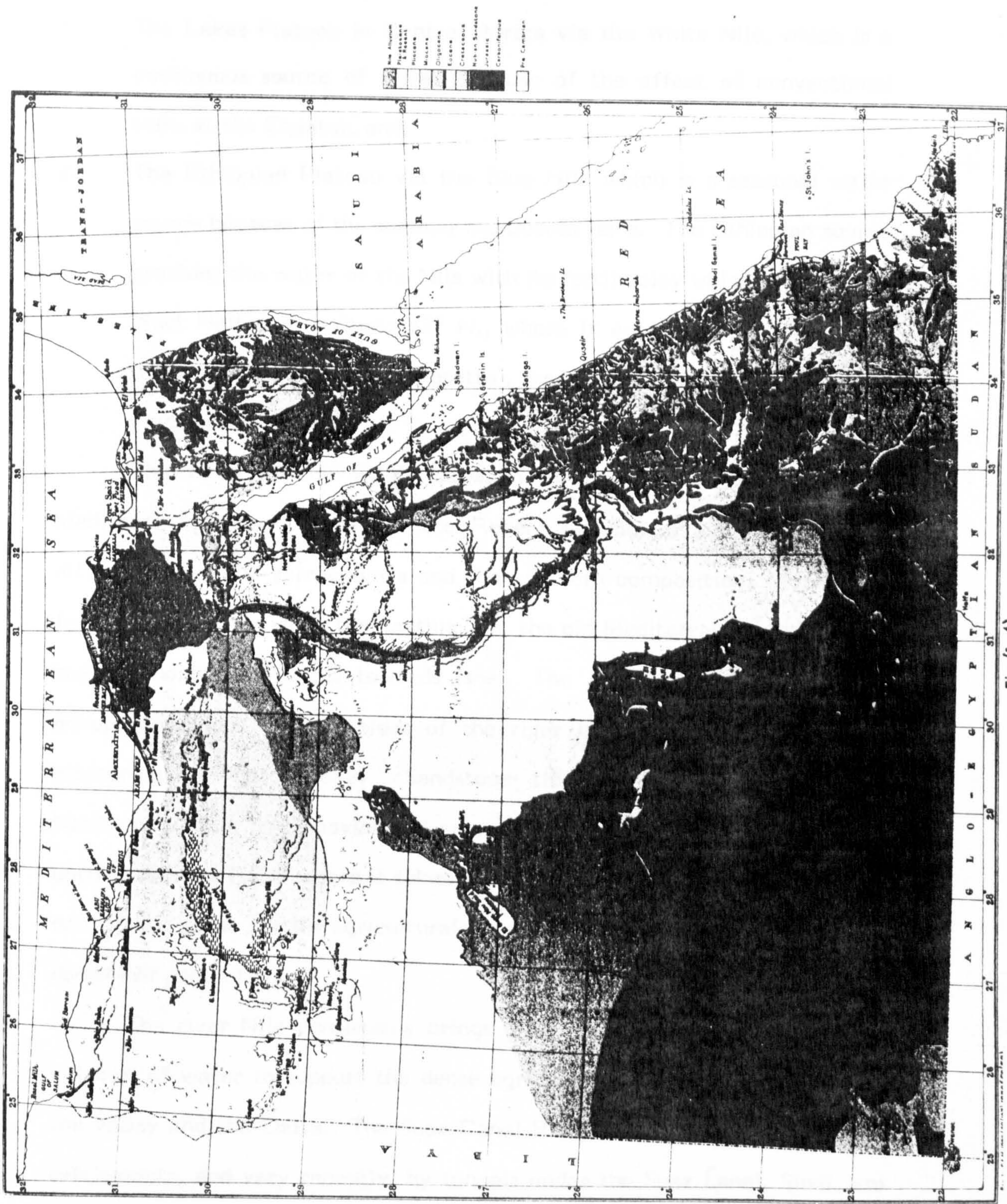


Fig. (1-4)
EGYPT (GEOLOGICAL)

1.3.1 The Nile Valley and the Delta

The river Nile draws water from two main sources:

1. The Lakes Plateau in Central Africa via the White Nile, which is a continuous source of water because of the effect of convectional rains at the Equator, and,
2. The Ethiopian Plateau via the Blue Nile which is a seasonal water source because of the summer monsoonal rains. The Ethiopian source provides the water of the Nile with its fertile clay which is carried to Wadi Halfa, at latitude 22° N., where it enters Egypt, to Dumyat (Damietta) and Rasheed (Rosetta), the two outlets of the Nile to the Mediterranean sea.

The lands of the valley between Isna in Upper Egypt and the Mediterranean were formed in the Recent Geological age, so they are different from the surroundings and the southern compositions which were formed far earlier when the Tsythis Sea, the old Mediterranean, had a long bay extending southwards towards Isna. The alluvial plains of the river occupy the lands on both sides of the river bed, mixed with sands and surrounded by the Nubian Sandstone till south of Isna, Fig. (1-4). Northwards from Isna heavier soil appears where the valley becomes wider until it reaches Cairo where it takes the fan-shaped form, the Delta. This is one of the most fertile agricultural areas in the world with a very high density of population.

The river Nile continually brings down into Egypt sufficiently large volumes of water to support the dense agricultural and urban population in the valley and the Delta. The Suez Canal Region, the north western coast settlements, and very recently, by tunnels under the Suez Canal, Sinai, are all supplied with fresh water by canals or pipes from the Nile. Temperatures vary considerably in this region because it extends for more than 9 degrees of latitude, or more than 1000 km. Also the extensive

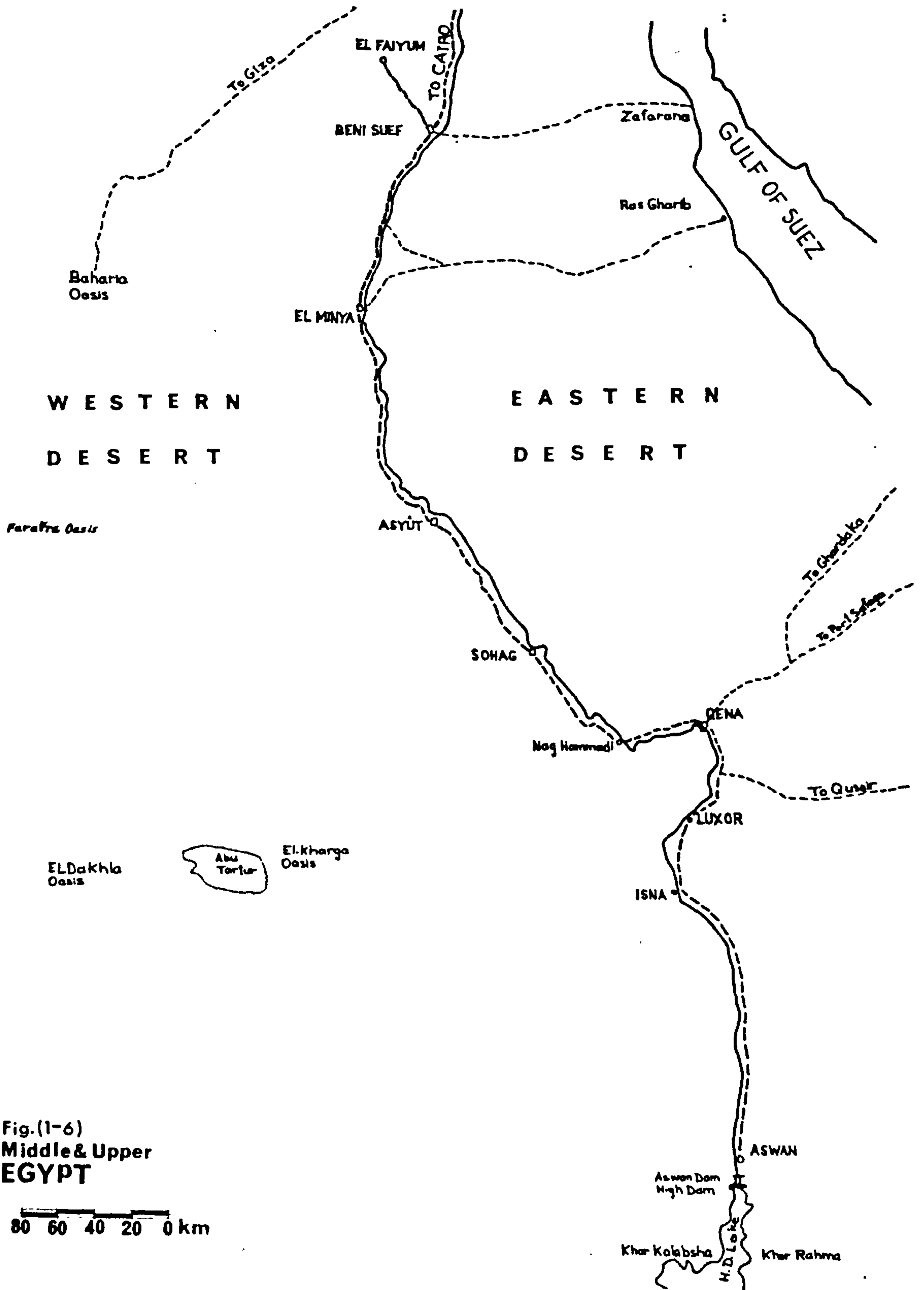


Fig.(1-6)
Middle & Upper
EGYPT

80 60 40 20 0 km

agriculture, plantation and evaporation decreases the temperature's effects especially when going northwards where the influence of the Mediterranean is apparent in the northern parts of the Delta where there are summer holiday beaches at Alexandria, Ras el Barr, and Baltim, fig (1.5).

The most recent change in the Nile valley was the formation of the artificial High Dam Lake after the construction of the dam in 1960(4). The lake is mature enough now for development projects to be going on round its shores for purposes such as agriculture, fishing, mining and tourism.

Sometimes dry valleys are flooded by storm water which follows rare cyclones escaping southwards from winter westerlies of the Mediterranean, especially when they reach the Red Sea mountains. The rapid run-off from this storm rain causes damage to some towns as for example every few years in Qena in Upper Egypt, where the town is situated at the mouth of Qena dry valley leading to the Nile valley close to the town.

The prevailing winds in the Nile valley and the Delta are the northern trades, the gentle effects of which decrease summer temperatures. But when "Khamaseen" or fifties blow from the south especially in April and May, the air temperature rises and there is a dry and dusty atmosphere.

In winter, pockets of the westerlies blow from the north bringing some rain to the Mediterranean coast and the Delta, but that rain decreases rapidly southwards, as shown in Table (1.2), section 1.2 above.

On each side of the Nile valley and the Delta lie the deserts. The Eastern Desert extends near to the Nile valley because of its relative height and its cliffs which approach directly to the Nile in some parts, leaving a very narrow eastern side to the valley, while on the opposite bank the Western Desert rises gently, leaving a wider side to the valley allowing more agricultural land and settlements than that in the case of the east.

In the region of the Nile valley and the Delta lie 18 of the 27 governorates of the country. So the region contains the big cities, towns,

villages and other settlements. In other words the region represents the backbone of the administration and the activities in the country(5) including agricultural and industrial development.

The general outline of the region has been linked to that of a lotus plant, the common flower in Pharaoh's time; the Nile valley representing the stem, the Delta the flower, and the Fayum depression a bud, Fig. (1-3).

Within the cultivated area, the smiling fields expand, dotted with country settlements and palm groves, and intersected by numerous irrigation canals, while in the deserts, the prevailing aspect is one of utter desolation, of bare mountains, hills and stoney plateaux. The contrast is heightened by the suddenness with which one type of landscape gives place to the other, for the green of the cultivation ends abruptly at the limits to which irrigation water can be led from the Nile, and the boundary between the desert and the cultivated land is commonly almost as sharp as if cut with a knife.

Of the total course of the Nile, which has a length of more than 6700 km from its source on the watershed between Lake Tanganyka and Lake Victoria in central Africa to its mouth in the Meditteranean, only the final 1530 km lie within the borders of Egypt, where the river receives not a single continuous tributary.

On entering Egypt near Wadi Halfa, and before the construction of the High Dam in 1960, the course of the river was incised between its banks, running through a canyon-like valley with dry gorges opening into it. The Nubian Sandstone is the common composition of those areas (see paragraph 2 in this section). But now the whole area south of the Dam is occupied by the artificial lake. Just north of Aswan the valley begins to broaden and flat strips of cultivated land gradually increasing in width northwards, extend between the river and the cliffs that bound its valley on either side. At Qena, the river makes a great bend round high limestone cliffs, more

than 300 m high. Near Asyut, some 260 km farther north from Qena, the cliffs on the western side of the valley become much lower than those on the east, and continue so for some 400 km to Cairo where the valley opens out to the Delta. The average width of the flat alluvial floor of the Nile valley between Aswan and Cairo is about 10 km and that of the river itself is about 750 m.

In many parts of the valley, marginal terraces of gravels containing flint implements can be traced at heights considerably above present cultivation levels, testifying that the river had flooded at much higher levels in older times than it does now(6). After Cairo the Nile flows in a north, north westerly direction for some twenty kilometres when it divides into two branches, each of which meanders separately through the Delta to the Mediterranean.

1.3.2 The Western Desert

The Western Desert extends from the west of the Nile valley and the Delta to the borders of Libya at about latitude 25°E, and from Sudan north to the Mediterranean. This desert represents more than two thirds of the total area of the country, or some 670,000 sq. km.

The land of that region slopes gently from the farthest south west, where Oweinat mountain rises to 1800 m above sea level, to the north and north east. The surface is mostly composed of bare rocky plateaux and high-lying stony and sandy plains with a very few distinct drainage lines which never reach either the Nile valley or the Mediterranean, Fig. (1-3). The continuation of the slope is interrupted by some groups of depressions where the oases occupy the lower parts, as Kharga, Dakhla, Frafra, Baharia, and Siwa oases, Fig. (1-3). These depressions occupy thousands of square kilometres descending often by steep escarpments to depths of more than a hundred metres below the general plateau-level. Some areas of these

depressions are permanently habitable by virtue of the existence of artesian water which can be used to irrigate limited areas of land. Baharia and Kharga oases are connected by railways and motor-roads with Giza and Nag'Hammadi respectively. Siwa, Frafra and Dakhla oases are reached via second class roads, which have recently been improved. The road between Matruh on the Mediterranean and Siwa oasis, 300 km, used to take 18 hours, but after its redevelopment will take only 4 hours, and will make it possible to transport the oasis products to the big cities. Improved accessibility will also facilitate desert reclamation projects, petroleum, water, and mining investigation besides tourism possibilities. The total costs of the Siwa oasis road is L.E. 11 m(7). The U.N. Food & Agricultural Organization (FAO) is providing money for a project to establish 800 reservoirs for storm water at the northern coast on the Mediterranean, to establish 800 farms, with 12,000 stone dykes at those farms to make the best use of the storm water. The project also includes the establishment of 800 houses to settle the nomads. It is reported(8) that a reservoir of fossil water exists under an area of 60,000 sq. km. east of Oweinat mountain. A reservoir of this size probably can irrigate 4 million feddans. There is a possibility that there may be huge quantities of petroleum beside that water. The cultivation of 500,000 feddans is being launched in a selected area.

Some depressions contain only salt marshes, and are consequently uninhabitable. The largest and the deepest of them is the Qattara depression, 134 m below sea-level, Fig. (1-3). A huge project is planned to dig a canal between the Mediterranean and this depression to generate electricity and to use the canal for navigation. The expected lake will change the appearance of the area, and may create a tourism attraction amidst the desert for resorts, water sports and fishing particularly, for quietness-seekers where the surface of the water will possibly be less rough than the Mediterranean's, and the air is less humid while the winter

temperature will be higher due to the effect of the desert. Recently, opposition is growing against the project because of the possible drawbacks especially for salt disposal (see Section 6.2.5.6).

The realisation of petroleum, agricultural and tourist potentials and the related projects may be able to change the desert features in some parts of the Western Desert in the coming decades, as for example the northern coast on the Mediterranean.

The western parts of that desert are covered by thick layers of loose sands, which are called in Arabic, 'Bahrel Rimal', or 'the sea of sand', where the moving sand dunes represent a danger for oases communities and their limited cultivated land and water wells. There must be some way to limit the sand dunes movement, perhaps by the cultivation of plantations, especially with palm groves, that resist dryness. Being a part of the great African Sahara, the Western Desert is one of the arid regions of the world. The maximum summer temperature is more than 45°C and rains are very rare except on the northern coast in winter where some rain falls occasionally. The prevailing winds, the northern and northern east trades, are dry, but when active, considerably decrease the temperature.

Although the ground waters in the Western Desert are hundreds of kilometres apart, they all have drinkable water in contrast to those in the Eastern Desert, which though more regularly spaced, sometimes contain water which even camels do not like.

1.3.3 The Eastern Desert

The Eastern Desert of Egypt extends eastward from the Nile valley to the Suez Canal and the Red Sea Coast. It has an area of about 220,000 sq.km. Viewed from the Nile valley, the Eastern Desert appears at first sight to be similar to the Western Desert, the cliffs of the two sides frequently matching each other, but it is noticeable that the eastern cliffs



Fig. (1-7) Views in the Western Desert



Fig: (1-8) Views in the Eastern Desert



Fig. (1-9) A Valley in Sinai
(Wadi Feiran)

are broken by larger and more numerous openings than the western ones: they represent the mouths of the dry valleys which can be followed for distances of a hundred kilometres or more to their heads near the tops of the Red Sea mountains. In their courses from the mountain-ranges to the Nile valley, these wadis are joined on either side by numerous other tributary valleys which cut up the plateau that extends between the mountain-ranges and the river, Fig. (1-3). This desert consists mainly of a great backbone of high mountains running parallel to the Red Sea at a shorter distance from its coast, flanked on the west and north by highly-dissected lower plateaux. These stretch along the coast giving interesting scenery which is not yet properly exploited for tourism. Many of the peaks of the mountain-ranges rise to more than 1500 m above sea level, the two highest being Gabal El Shayib, 2181 metres, south west of Hurgada, and Hamata, 1978 m, north west of Bernece, Fig. (1-3). In marked contrast to the Western Desert, the Eastern Desert is so mountainous in some parts, and so dissected by deeply incised valleys in the remainder, that the roads through it have to follow the lines of drainage. Very few of these wadis ever convey running water, and then only for short periods after exceptionally heavy rainfalls on the mountains(9), but many of them contain a certain amount of natural vegetation which affords grazing for the camels, sheep and goats of the nomads. Water resources exist in springs and rock pools in the mountains, and in wells sunk in the alluvium of the wadi floors in the lower areas. They are seldom more than fifty or sixty kilometres apart, but being entirely dependent on the rainfall, their yield is often barely sufficient for the nomads and their camels. Wherever artesian water is available, as in the oases of the Western Desert, very limited agriculture can be practiced.

The settled population of the Eastern Desert is found near the Red Sea coast where phosphate and other minerals are mined, and where petroleum is extracted, especially on the Gulf of Suez. Recently

administrative towns have been developed especially after the introduction of the local government system in 1962 after being considered as military territories. Those towns include Ras Gharib, Hurghada (or Ghardaqa) the capital of the Red Sea Governorate, Safaga, and Quseir, where water is carried by tankers, or distilled from sea water, or obtained very recently via pipelines from the Nile valley. Besides petroleum and mining, the region contains vast tourist and fishing potentials on the Red Sea coast and the near islands where the weather is marvellous and the sea attractive for diving and water sports, besides the places suitable for quiet resorts.

A French team of experts once remarked that the Eastern Desert is amongst the least polluted areas in the world, and recommended that there should not be any industrial development, especially near the coast, to keep it for tourism development. The area includes a magnificent mixture of beautiful cliffs, wadis, desert and camping areas and the variegated blue beaches. This region really needs extensive services, and more links with the valley to develop its potential and to open areas for new settlements which could help relieve the congestion of the crowded valley of the river Nile. The rate of the actual development in the region is far below what it is capable of supporting.

Facing the Eastern Desert in the Red Sea, there are some islands of which the principal are Ashrafi, Jubal, Gaysum, Tawila, Gafatin, Shadwan, Al Akhween and St. John's. They are of little importance except to navigation and strategy. Being devoid of water-sources, they are barren of vegetation. But some of them, like Shadwan, have importance for lighthouse keepers who subsist on supplies brought up by ships, or for strategic purposes. The attractive coral reefs, maritime fronts and fisheries can be exploited to create tourist resorts on some of these islands, often providing essential services.

1.3.4 Sinai Peninsula

The Sinai Peninsula is separated from the Eastern Desert by the Suez Canal and the Gulf of Suez. It has a total area of about 60,000 sq.km, stretching for 400 km from north to south and 200 km from east to west at its widest part. The southern part is formed of a complex of high mountains, many of which rise to considerably greater heights than any other mountains in Egypt, such as St. Catherine: 2639 m, Um Shomer: 2586 m and Eth'thebt: 2439 m, Fig. (1-3). The northern two-thirds of the peninsula is occupied by a great plateau sloping from heights of more than a thousand metres downwards to the Mediterranean where there is a wide coastal plain. The southern part of this plateau is called Egma, and its northern and wider part, El-Tih. The mountainous tract in the south is intensely dissected by deep canyon-like wadis, draining, on the one hand, to the Gulf of Suez, and on the other to the Gulf of Aqaba. Most of the drainage channels of the northern plateau, El-Tih are much shallower and more open. The great Wadi El-Arish collects water from a very large proportion of El-Tih plateau and debouches into the Mediterranean near the town of El-Arish. Along the coast between El-Arish and the Suez canal stretches a broad tract of high sand-dunes in which the drainage water from the country immediately to the south is largely absorbed. This water supplies numerous wells and palm groves situated in hollows between the dunes. The rainfall of the Sinai Peninsula, though very small, is markedly greater than that of the other two deserts of Egypt, consequently rain-fed water sources and vegetation are more abundant, in fact many parts of Sinai, especially the wadis, are more representative of wilderness areas than those of true deserts. The groves between the mountains are really attractive, Fig. (1-9). In some places, especially on the Mediterranean coast near Rafah on the international borders east of El-Arish, where the rains are heavier than elsewhere, there is a certain amount of agriculture.

Sinai is generally hot in summer, and stormy and exposed to cold air currents during winter.

There is scope for considerable progress with tourism in Sinai because of its monuments and places of special importance like St. Catherine's Monastery, on the mountain named after it.

Work is in progress to construct three big tunnels under the Suez Canal at Qantara, Deversoir and Suez, Fig. (1-5). That is to realize direct connections between the rest of the country and Sinai for the expected rapid development of the peninsula in different ways, and to facilitate the transport of Nile water to Sinai to help in its reclamation, besides the strategic affairs.

The principal town in Sinai is El-Arish, Fig. (1-3), capital of the governorate of North Sinai, formed after the 1973 war. It lies on the railway going to the east and at the mouth of Wadi El-Arish on the Mediterranean. The town represents a strategic point in Sinai especially since it lies on the coastal plain as the eastern gate of Egypt across which all the invasions came to the country from central Asia in olden times.

The second old town in Sinai is El-Tor, which was a quarantine-station on the Gulf of Suez, ^{that} flourished for pilgrims going to Jidda in Saudi Arabia by sea.

Since manganese and petroleum were discovered near the Suez Gulf, some other settlements have flourished. As an example is Abu Zonaima, an anchorage about half-way between Suez and El Tor, which was established in connection with the manganese mines of Um Bagma, a short distance inland. In the 1930s and 1940s, petroleum was discovered, so more settlements were established in Feran, Sudr, and Abu Rodais. In the late 1970s, Sinai petroleum wells began to provide Egypt with such considerable quantities that it has been possible to export some of it (see section 2.7.3). That will help Sinai towns and expanding settlements to realize more development.

In the south eastern corner lies Sharm El-Sheikh and the Tiran islands which have a strategic military importance since they control the access to Aqaba Gulf, the gate of Israel to the Red Sea. War became inevitable when the Gulf of Aqaba was closed in June 1967 when Israel attacked Egypt.

1.4 The Historical and the Recent Roles of the River Nile in Egypt

When Herodotus, the ancient Greek philosopher, said, "Egypt is the Gift of the Nile", he was totally right, because without this river, Egypt would be just a continuation of the Great Sahara. Besides its creation of the highly fertile agricultural lands and the provision of irrigation water, the Nile has played an active part in the history of Egypt. The ancient Egyptians settled round its banks and established their settlements making use of the fertile lands by cultivation, observing the times of the river flood and decrease, making the different measurements of time, quantities and dimensions. Later, in the reign of the Pharaoh Mina, about 3200 B.C., the river gave the Egyptians the idea of unifying the valley and its Delta and later made them think about how to control its annual flood, with detailed studies for big projects along its course. Consequently, Egyptian experts in irrigation, drainage and agriculture have been well known since the olden times. The Nile also helped to strengthen the economic and the cultural relations southwards with Sudan, Somalia and Central Africa, the prevailing winds helping boats to sail southwards against water current, while the latter helped the boats northwards against the wind(10).

The backbone of the Egyptian economy was and is still partly dependent upon agriculture which supplies the people with their food and raw materials, and helps realize a surplus in cash crops for export, including cotton, onions, rice and flowers. The recent policy of establishing new settlements in Egypt takes account of the value of Nile water, many of the settlements being planned as near as possible to the Nile or the irrigation canals branching from it.

The recent formation of the High Dam Lake will considerably change the whole area by the expansion projects which have started in the South Egypt Region for fisheries, agriculture, tourism and mining (see Section 6.2.7).

1.5 The Role of the Suez Canal in the Country

Before the opening of the Suez Canal in 1869, the desert between the Red Sea and the Mediterranean was unoccupied except for the small village of Al-Qalzam (now Suez) on the Suez Gulf, and a few other settlements and nomads' hamlets. There was also a route followed by camels carrying goods between the Mediterranean and the Red Sea before they continued their long journey to the east or to Europe.

The Suez Canal provided a direct shipping link between Europe and the countries of the East(11). As soon as the canal was opened, the villages flourished along the routes of the canal rapidly becoming towns, as at Port Said, Ismailia and Suez. Many other settlements were established to satisfy the necessary services for international navigation in the canal, or for defence purposes. The Sinai Peninsula represents the north-eastern gate of Egypt. (See Sections 1.3.4 and 1.7).

The establishment of the Ismailia fresh water canal, supported the spread of the extensive agricultural lands and orchards to satisfy the food requirements of the rapid population growth of the region and the growing international navigation route as well.

Table (1-3) shows the population growth in the three main cities on the canal, 1907-1976, and that of Dumyat (Damietta) City, west of Port Said on the Mediterranean.

When one compares the population growth in the period between 1917-1937, in each of the three canal cities and a similar port on the Mediterranean such as Dumyat, which lies on the mouth of one of the two

outlets of the river Nile, some 50 km west of Port Said, one can appreciate the effect of the Suez Canal. The three canal cities have grown far more rapidly than has Dumyat although it is far older than they are, and has an important location as a part on the Nile mouth and amidst an agricultural area, add to that the traditional fame of certain industries and trades such as furniture, confectionery and dairy products. Also from Fig. (2-7) showing the internal migration currents, it is clear that the Suez Canal has its pull effect because of the jobs it provided to satisfy the needs of an international waterway, as well as to meet defence requirements.

Table (1-3)
POPULATION GROWTH OF PORT SAID, ISMAILIA, SUEZ AND DUMYAT, 1907 - 1976

CITY	1907	1917	1927	1937	1947	1960	1966	1976 ⁽²⁾
PORT SAID	49,884	75,192	104,603	124,749) 245,932 ⁽¹⁾	245,318	282,977	262,620
ISMAILIA	11,448	15,507	25,194	36,397)	116,000	144,000
SUEZ	18,347	30,996	40,523	49,686	107,244	203,610	264,098	194,001
DUMYAT	N.A. ^(*)	30,984	34,907	40,332	N.A.	N.A.	86,328	N.A. ^(*)

(*) Not available

(1) Port Said and Ismailia were one governorate in 1947 census

(2) The 1976 figures are rough estimates

Source: CAPMAS, different reports

The Suez Canal has created a significant region with considerable potentials between the Delta and Sinai, in which giant projects are underway for land reclamation, free zones, petroleum refineries, comprehensive urban development, as well as the three huge tunnels under the canal itself, Fig. (1-5). The first of these, the Suez or El Shatt Tunnel, was opened in June 1982 with a capacity of 2,000 cars per hour and 34,000 m³ of water per day through a 167 km pipeline. Its total cost was £.E. 100 m(12). (For more details see section 6.2.4 below.).

1.6 The Existing Settlements in Egypt

As a country of more than 7000 years of civilization, Egypt has a long and diversified history during which many settlements of different types were established. Some of these settlements have features from Pharaonic, Roman, Coptic or Islamic civilizations. Monuments and sometimes whole districts still have the atmosphere of such civilizations. For example, one can inspect the Great Pyramids and the Sphinx, Coptic churches, famous Mosques and Fatimide quarters within a few minutes drive in Cairo.

Since the dawn of history, rural settlements have emerged round the Nile valley, where the Egyptians gathered around the cultivable lands to grow crops. The different settlements started to exchange products, and to organize themselves against aggressions by both other human beings or wild animals. Trading and services centres began to appear and have grown to become the cities of today.

Alexandria, or El-Iskandariya, was established by Alexander the Great and remained the capital of Egypt under the Roman empire till it was conquered by the Muslims. Al-Fustat (meaning tents on the hill) was established to be the capital of the country in 640 A.D., now called old Cairo or Misr al Qadima. Nearby, Al Askar (the soldiers), now Sayida Zeinab, was built in 750 A.D., and by 871 A.D., Al Qataie (the estates) were established to provide residential areas for each of the different Arab tribes (see Section 4.2.1 and Fig. (4-4) below). As a capital El Qahirah or Cairo was founded in 969 A.D. north east of the previous settlements which remained as commercial centres (see Fig. (4-2) below).

There are about 29,000 rural settlements spread along the Nile valley and the Delta, of which there are about 4,000 recognised as villages by the government. The rest are comparatively small settlements each of which is called "Kafr" or "Izba", that is a small estate of some 100 - 200 Feddans.

The distinction between a large village and a small town is determined by the government and does not reflect the size of population. Some villages have more than 30,000 people, see note (4) in Chapter 2, while some towns, or Madinas, like Kafr Saad in north east Delta have only about 5,000 people.

Most of the village houses are built of mud bricks and have one or two storeys. Very few of them use baked bricks or stones. The streets and paths are narrow, winding and unpaved. Mostly they are not serviced with lights or cleansing. They lead to public buildings like the Mosque, the Mayor's Dawwar (Hall), the primary school or the medical centre. The Egyptian village was neglected for a long time, resulting in a severe lack of services. That led to people moving to the cities, increasing the pressure on services there. No planning is provided in the Egyptian villages; building takes place everywhere including in the scarce agricultural areas and represents a very serious problem. No sewerage system is provided, and drinkable water is carried in jars from public taps. Only 3.7% of the rural families having water resources inside their houses(13). The water supply and sewerage situation creates a great health risk, particularly as regards endemic diseases such as bilharzia which weakens the people who suffer from it. It should also be noted that less than one-third of the villages have medical services. Electric networks have recently been introduced in some villages, 18.6% of the rural families having electricity at the time of the census in November 1976. Roofs are used to store straw for cooking, baking and for feeding the cattle, but this carries with it a risk of fire and there are not enough fire brigades.

There is a high percentage of illiteracy in the rural areas, up to 75% in 1976, because some farmers find in their children unpaid labour to work in the fields and therefore do not wish them to go to school. The poor rural primary schools lack sufficient and efficient teachers and equipment (see

Section 2.6.3 below). Poor housing, lack of services and medical advice and absence of any kind of public entertainment, are amongst the main causes of the internal migration from rural to urban areas, where migrants hope to have suitable opportunities (see Fig. (2-5) and section 2.4.2 below).

It is necessary to give an idea about the conditions of the towns which attract so many migrants in Egypt.

First, what can be considered a town in Egypt? It is simply the urban area where the people work in industry, commerce, official services and administrations, but not agriculture. Industry was developed in towns where facilities such as housing, services, transport were available, none of which were adequately provided in the rural areas. The administration is managed by a town council whose members are partly appointed by the government and partly elected by the citizens.

Physical, historical, economic and political factors have affected the siting and development of towns. Cairo and Alexandria are good examples, and as described in Section 1.5 above, the construction of the Suez Canal boosted the growth of a number of towns, such as Suez, Ismailia, and Port Said. The construction of the Aswan Dam in 1898, its subsequent heightening, and the building of the High Dam in 1960 to create an artificial lake resulted in the migration of the Nubians to new settlements, built by the government, while several urban centres like Aswan city, have flourished which converted to an attraction, or pull region, an area that had for a long time been losing population, or a 'push' region.

Spinning, weaving and dyeing are industries based on cotton cultivation introduced into Egypt by Mohammad Ali (1805-1848), which establishment led to the development of big industrial cities like Shoubra el-Kheima, El Mahalla and Kafrel Dawwar, Fig. (1-5). Similarly, sugar mills in Kom Ombo, Abu Qurqas, Armant, Hawamdiya, have been built to cater for the sugar cane plantations in Upper Egypt, see Fig. (1-6). Some later developing

settlements are based on petroleum and mineral resources as Ras Gharib, Shuqeir, Firan and Sudr on the Gulf of Suez; Safaga and Queseir on the Red Sea coast, see Fig. (1-6), and Abu Tartoor in the Western Desert. Other settlements have flourished partly on their historical importance for tourism and archaeological expeditions such as Luxor, Badrashain and recently Abu Simbel, while others are based on holiday beaches and vacations resorts such as Rasel Bar, Baltim and Sidi Abdel Rahman. The big towns owe their development to their location and to being capitals for the governorates, or as centres for communication such as Zagazig, Tanta, El Mansura and Damanhur in the Delta, and el Minya, Aswan in the valley, Figs. (1-5) and (1-6).

Rural/urban migration, Fig. (2-5) is concentrated on a few big cities such as Cairo, Giza, Alexandria, the Suez Canal cities, and Aswan region, following the electrification of the Aswan Dam in 1954 and the related industrial projects and the construction of the High Dam in 1960, (see Sections 2.4.2 and 6.2.7 below).

On the peripheries of these cities unorganized squatter settlements have developed, paralysing their expansion possibilities. Examples can be found in Zeiton, Mataria, Ein Shams and Shoubra, north of Cairo, and Einel Seira, Abussoud and Darel Salam, south of Cairo. Their populations can be estimated in tens of thousands all of whom suffer from lack of services and planning. Because they settled illegally the government is not prepared to provide most of the necessary services and the proper administration, Fig. (1-10).

The infrastructure of the big cities is insufficient. For example in 1975 20.1% of the buildings were not connected to the public sewerage systems, 26.7% were not connected to water networks and 41.1% were not connected to electricity networks(14). Urban areas lack gardens and open spaces. In Cairo, open space does not exceed 1.6 sq.m per person, while the

government recommend 8.0 sq.m per person(15). Enrolment in schools is much more dense than the accepted reasonable level or for example 30 pupils per class. Because of shortage of staff, buildings and equipment the average is often about 40 pupils per classroom, and some schools have two shifts of pupils every day(16) (see Section 2.6.3) below. Inadequacy is apparent in other services like health, justice, supplies and social and recreational facilities.

Public transportation is poor, especially in big cities where roads are over-crowded, noisy and mostly poorly paved. Some roads have a mixture of traffic: vehicles, bicycles, trams, cars, carts, buses and trolly-buses, along with pedestrians, thus hindering traffic flow. A trip of 15 km, for example, Heliopolis to Cairo centre, may take more than 60 minutes, particularly in the rush hours, hours 7.30 a.m. to 10.30 a.m., and 1.00 p.m. to 4.00 p.m. Roads connecting the villages are also insufficient, as are the regional roads. Most of those roads are of an average width of 10 m serving two directions: there are, in consequence, many serious accidents and traffic is slow. The railways are also insufficient in length, capacity and equipment. In 1951 there were 3,002 million passengers per every railway Km, increased to 6,773 million in 1971. The number of diesel locomotives increased from 37 in 1951 to 555 in 1971, while the trains are still overcrowded(17).

The transport deficiency in Egypt impedes economic progress, hinders development outside the Nile valley and impedes the proper use of existing resources. Communications, telecommunications systems on both national and international levels along with other infrastructure and water resources need considerable development and investment as an urgent matter to facilitate rapid urban development on the deserts outside the Nile valley (see Chapter 4 about Greater Cairo Urban Region).



(A) Slums sprawl on the peripheries of urban areas



(B) Squatting encroachment round the cities including the agricultural land
(After Soliman, Dec 1982)

1.7 The Effects of Wars and Politics on the Development in Egypt

It was the destiny of Egypt to be involved in the tide of the two world wars, in addition to the 1948, 1956, 1967 and 1973 wars with Israel and the war of attrition in between.

During World War I, the Turkish-German attack was stopped on Egypt's eastern frontiers and in World War II the Italian-German armies were defeated in the Western Desert near Alamein. During and after both of these wars, thousands of rural people migrated to the big cities such as Cairo, Alexandria and the Suez Canal zone(18). Their aim was to find security and jobs created by the war requirements and circumstances, besides escaping from the miserable conditions of the villages. Thus the problem of urban overcrowding and congestion started, but in a far less serious manner than that of two decades later. In May 1948, Egypt, as the leader of the Arab World, faced the start of the conflict with Israel which absorbed resources which might otherwise have been utilized in development and in providing the services needed by the growing population. Direct military expenditure between 1967 to 1976 exceeded L.E. five billion, while the cost of reconstruction following the 1967 and 1973 wars exceeded L.E. 3 billion(19). Add to that that Egypt was involved in some civil wars, like in Yemen in the early 1960s and Nigeria in the late 1960s. One consequence of the limitation of funds available for development is evident in the immense overloading of services and utilities, which because of lack of maintenance and renewal, have in some cases deteriorated to the point of being beyond repair. For example, the telephone, sewerage and water networks in Cairo have been under repair since the late 1960s, but without evidence of any progress.

A remarkable series of changes influencing development followed the political upheavals of the 1952 revolution. Socialism was the tool used by Nasser's government (1952-1970) to achieve the goals of the revolution(20),

especially after the November 1956 war in Sinai, following the nationalization of the Suez Canal in July 1956. That resulted in Egypt relying on eastern countries for armament and development. The late 1950s and the 1960s witnessed the nationalization of productive means and the introduction of higher rates of taxation for higher incomes, up to 90% tax for income exceeding L.E. 10,000 per year. Land-ownership was limited to 100 Feddans (42 ha) to each family.(21) The public sector was involved in almost all of the country's production of different types and sizes. Workers were not to be dismissed whether they deserved to be or not, and this, added to the lack of keen supervision and of basic materials and machinery, resulted in poorer quality products. Contradictions in regulations, as for example concerning customs policy, worsened the situation. The building and development sectors suffered from complications of a different kind; duplication of procedures and lack of materials and skills which resulted in a failure to fulfil the construction needs. The results of this situation, added to the accumulating of congestion and lack of services became clearly evident in the 1970s.

After the 1967 war, reliance on the Eastern countries diminished, and in July 1972 Sadat dismissed about 20,000 Russian experts, of different specialisations, from Egypt. After the 1973 war the open door policy was adopted and gave priority to the reconstruction and the establishment of new communities. But again this policy was faced by a lack of efficiency in terms of communication, accommodation, certain skills and the currency exchange facilities essential for western investors who established their branches in Egypt.

Although Egypt has been a one party state for twenty years since 1952, the Ministry of Housing (and Reconstruction, and New Communities in 1982), as many other Ministries, has been held by more than 15 ministers. Consequently policies are often changed before a building programme can be

completed. The same can be said about food supply and the deterioration of services. A mood of despair developed which eventually led to the rioting of 18th and 19th January, 1977 in the main cities, when the people accused the regime of being unjust and unaware of its people's problems. The government began to propagate the idea that peaceful relations with Israel would solve the problems of the country and whilst Sadat's trip to Israel in November 1977 led to the signing of the Camp David Treaty on the Middle East, that treaty resulted in the boycott of Egypt by most of the Arab States and in the ending of their financial support. A further consequence was the increase in the internal opposition, strengthened by lack of suitable policies and power to implement the issued regulations.(22)

The foregoing setbacks have their reflections on the development projects including the essential economic reform. Despite the government programmes for planning implementation are impeded by lack of finance and efficient skills. Such skills migrate abroad for higher wages or to have the appropriate climate to produce. These impediments have affected the establishment of the new settlements even after the start of building some of them where the actual settled population and the achievements are beneath the planned ones. (see Chapter Five).

1.8 The Reason for New Settlements Establishment in Egypt

As a country of more than one million sq.km most of which are desert lands, with a mild climate, and an October 1982 population of 45 millions, see note (2) Chapter Two, most of whom are young people, Table (1-4), with broad expectations, Egypt can be considered a suitable environment for the establishment of new communities since the necessary requirements, as water for example, are available or can be provided and the necessary economic base exists to provide employment in agriculture,

mining, industry or tourism, as will be discussed in Chapter 6, provided that finance and efficient skills are available to realise their potential.

Table (1-4)

THE PERCENTAGES OF AGE GROUPS IN EGYPT: 1960 AND 1976 CENSUSES

AGE GROUP	1960 %	1976 %
- 14	42.76	39.85
15 - 44	40.47	47.39
45 - 64	13.29	8.08
+ 65	3.48	3.58

Source: Dr A. M. Halluda, CAPMAS, The Actual Population Situation in Egypt and its Possibilities, (Arabic), Cairo, 3.4.1980, p. 16.

1.8.1 The Advantages of Desert Lands for the Establishment of New Settlements

In Egypt the government owns the desert lands, except limited areas which the nomads claim to own and which they use for breeding their animals. In the desert, there is nobody to ask for land compensation, no buildings to be demolished or preserved, no farms or forests to be kept. There is only clear land extending for thousands of square kilometres in need of infrastructure and water resources to help in development projects to attract the people ready to move from the congested areas in the Nile valley and the Delta.

The installation of infrastructure in the desert is easier than in the inhabited areas where traffic causes complications, and where certain buildings and green areas have to be preserved. So, the town planner has greater freedom to plan and to carry out the master plan in a more elastic way than that in the case even in countryside or forest areas, once water resources are available.

Most of the Egyptian deserts have plenty of building materials like sand, limestone, rock and clay which are essential for new settlement

establishments. The availability of building materials can be developed in parallel with the digging of new canals from the Nile and the exploitation of the ground water. There have been successful trials of land reclamation in the Egyptian deserts for both agriculture and the establishment of new communities. At the western side of the Delta, there is Al-Tahrir (liberation) province which is a vast agricultural area taken from desert land. At the eastern side of the Delta, there is the big Salhia project to reclaim 150,000 feddans between the Delta and the Suez Canal not far from the new industrial town 10th of Ramadan, Fig. (5-23). At the east of the north part of the western desert, there is the Wadel Natroon agro-industrial project. In addition to these examples, there are the traditional oases of the western deserts which give good examples of self sufficient communities far away from the Nile, amidst the deserts for thousands of years.

Professor J. Glowezewski(23) who worked some years in desert development in Egypt says,

"The demand for new human settlements in the deserts stems from two basic needs that emerged recently in the Middle East:

1. Overcrowding in traditionally habitable areas, and
2. Diversification of industrial developments related to exploitation of other natural resources found in the desert".

Professor Glowezewski's idea in reclamation projects in the western desert is based upon the exploitation of the belt of lowlands stretching roughly 150-200 km west of and parallel to the Nile valley from the latitude of Aswan in the south towards the Mediterranean coast and the Nile Delta in the north, Fig. (1-11). Several of the existing oases in these areas support some agriculture and human settlements. They were inhabited and flourishing in the times of ancient Egypt, Greece, Rome(24) and early Islam. But one cannot ignore the present problems such as harsh climate, lack of

water and cultivable land, besides the complete absence of infrastructure and services, especially those linking the region to the Nile valley. The assumption of Professor Glowezewski's project aims to double the habitable land in Egypt and is based on the adaptation to local conditions, on self help and suitable construction methods. There is a vast reservoir in this area which formed millions of years ago (see Section 1.3.2 above). Nubian sandstone forms a deep layered water-bearing rock in which are locked enormous quantities of water. At some points the aquifer is recharged by new water from the upper Nile valleys and the marshes of Sud Region in Sudan (see also Section 1.3.1-1 above). In some desert depressions, the water is visible on the surface, while it is possible to extract it through deep wells and pumping stations in higher areas.

In 1977, a five year long U.N. exploratory hydrology study was completed from which it became obvious that water exploitation is possible and may be compared to mining operations. The linear form of the lowlands makes it possible to think about a large pipeline linking all developable areas and carrying fresh water from artesian wells pumped through the system. These pipelines could be also connected at two points to the river Nile, at High Dam Lake and at Fayum, to form a closed circuit for the best water management and supply control. This integrated system would make it possible to use excess water stored in the High Dam Lake and to dredge the Nile silt deposited in the lake for desert reclamation(25). The face of the desert may be considerably changed as large areas of the depressions could provide good communication between the expected agricultural desert settlements with some industrial ones as well.

Although the suggested project by Professor Glowezewski seems interesting, more detailed studies and realistic field researches will be needed to prove its viability. The expected output of the project needs evaluation in the light of the circumstances of the desert environment and

NILE VALLEY AND WESTERN DESERT OASIS BELT

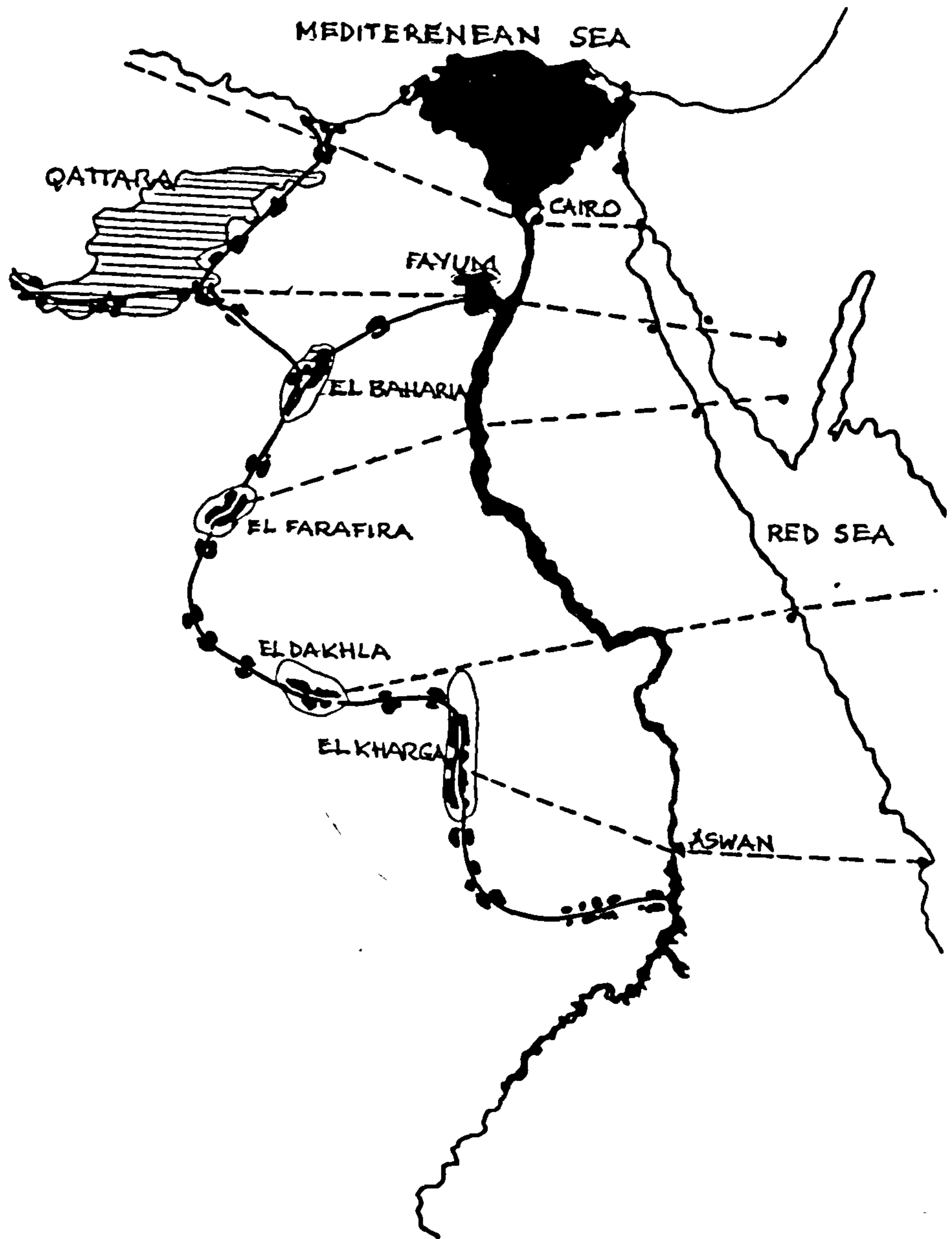


Fig. (1-11) SUGGESTED RECLAMATION PROJECT FOR THE WESTERN DESERT

After Glowezewski, IAHS, 1978, p.172

See also Fig. (6-14).

the nature of the ground through which the pipeline will be constructed. The extent of the need to spread outside the Nile valley must be carefully studied on a solid basis apart from any colourful hopes which may lead to a waste of time and money. On the other hand, the water reserved in the High Dam Lake now finds its way to Toshka Basin north west of Aswan via a canal of 22 km. length(26), and farms are spreading in the southern parts of the basin whose total area amounts to about 8 million Feddans.

As reclamation projects are taking place around the Delta in the northern parts of the country on desert lands, there are also big areas being brought under cultivation in the southern parts of the country, especially in the valleys and Akhwar (dry canyon-valleys) opening into the High Dam Lake as Toshka Basin and Khor Kalabsha west of Aswan, Fig. (1-12). A good example of industrial desert settlements is the case of the new town of Abu Tartoor with its large mining operations of rich phosphate deposits(27). That project will realize a combination of industry, mining and agriculture with some services in desert areas which will help the people to have a choice of available opportunities from amongst such variety of activities. It is expected that the annual output of phosphate will considerably increase, especially by 1984 when the related projects will be completed. Three hundred and fifty people are already employed in the project besides 20 foreign experts from France, U.K. and West Germany.

Another example of what may be done in the desert areas using local potential is to be found west to the city of Suez on North Jalala Mountain, 250 m above the Red Sea level, where there is a natural reservoir. Studies are underway for a pump storage generator project by which water from the Gulf of Suez will be pumped at night to that reservoir to generate electricity by day when the water is allowed to return to the sea. By 1984 it is expected that 150 M/W will be generated from the project. The second stage will provide a total of 300 M/W which will be followed by the third

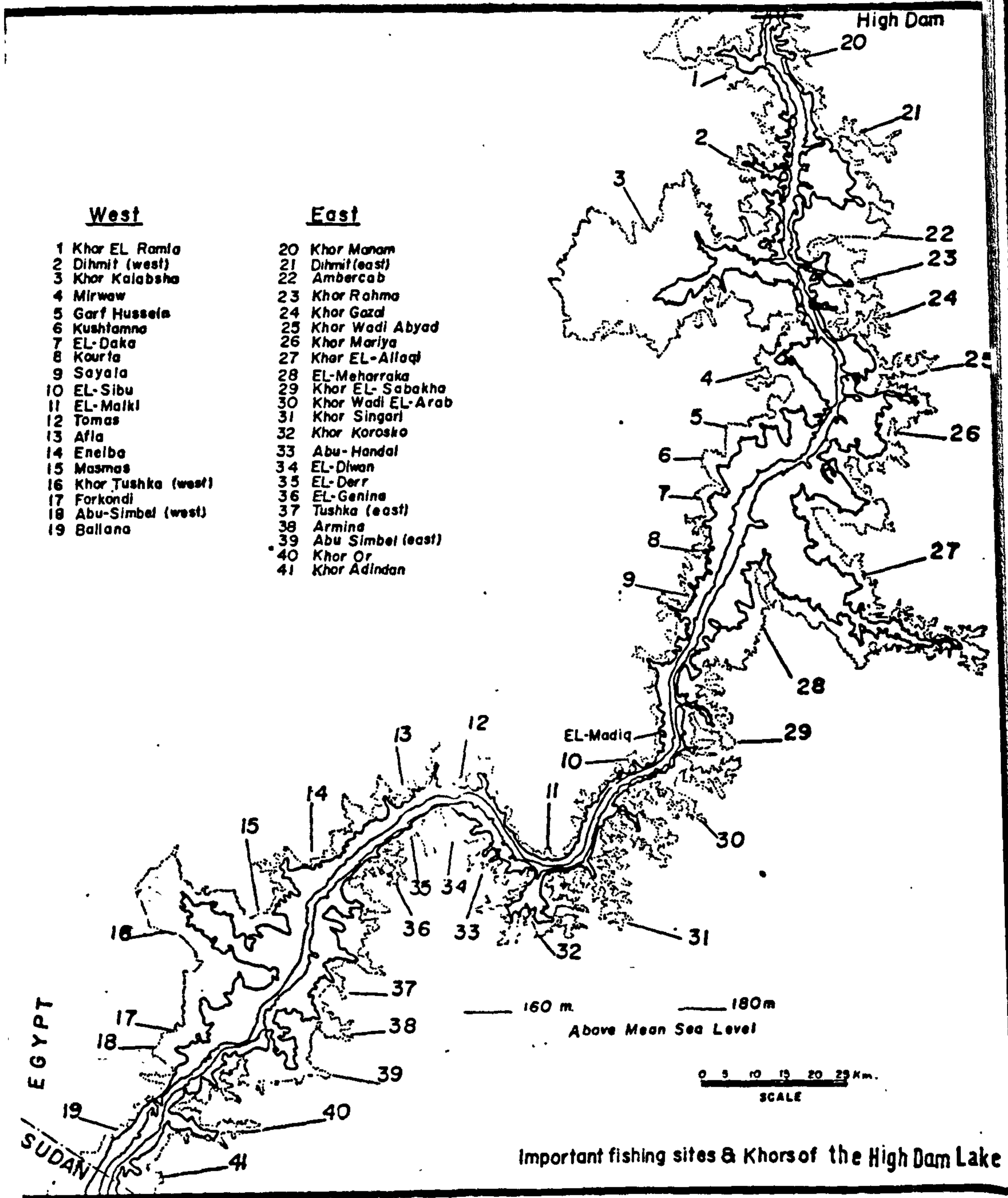


Fig. (1-12) The HIGH DAM LAKE

Source : The Development Organisation of the High Dam Lake, 1979

stage providing a total of 600 M/W(28).

Any new desert settlement should be located within an area suitable for agricultural development, close to main water resources such as a canal, pipeline or artesian well, with good access to mining or industrial zones and to the rest of the country. For example, in one of the new industrial settlements in the desert near El Bahariya oasis, every part of open urban land was taken over by the new settlers for planting trees, vegetable and even wheat cultivation. According to the town managers, this was a spontaneous reaction of new settlers to the severity of always seeing the same desert features and the psychological need for a view of lush greenery. The same attitude was observed in Ghardaga (Hurghada) on the Red Sea when the extension of the city as a capital of the new governorate started in 1962.

The form of a desert city should meet the needs of the people who live there and respond to two main objectives in design: adaptability to environmental and climatic conditions, and the possibility of executing the project in clearly defined stages by the least expensive construction methods. The dry weather, and the porous soil of the desert can provide a suitable environment for agriculture, health and tourism developments, provided that sufficient services and jobs, and above all, water resources are available. For example, agricultural plots and orchards have flourished around the early new cities in Egypt at 10 Ramadan and Sadat.

The effect of sand storms can be decreased by plantation and afforestation. Plants and crops must be carefully selected to find out which is more suitable for desert circumstances. Sufficient sunlight, warmth, good aeration along with easy drainage are factors to help growing crops and greenery. It is observed that some kinds of vegetables need only 40 days to ripen in Aswan, southern Egypt, because of warmth and sunshine all the year round.

On the other hand, we have seen in Section 1.1 that the duration of sunshine in Egypt, even in winter, is not less than 7 hours a day. This implies that solar energy is available all the year round especially in the deserts, and it could be exploited as an eternal source of clean energy for heating and for power supply, particularly for low-cost housing(29). Solar energy is readily available in the desert locations where the new communities of Egypt will be located. Wind energy is also available along the coasts in Egypt where its annual output is estimated to be about 650 Kwh per Km² of windmill swept area(30).

1.9 Conclusion

The vast desert areas in Egypt provide a wide choice of potential locations for the development of a comprehensive programme of new settlements to help to diminish overconcentration in the Nile Valley and the Delta. The site of Egypt provides a suitable climate for agricultural activity provided that water and services are available, while the location among the three continents gives a wide scope for the development on the international scale.

The potential of the deserts such as ground water, extensive areas available for reclamation, renewable solar and wind energy, mining and petroleum resources, fishing along the Nile shores, coastal and lake areas together form a diversified basis to cater for new desert settlements, that is to consider Egypt more than the Nile Valley and the Delta.

The problem of compensation for land acquisition does not exist since the government owns the desert land.

The huge quantities of water and fertile clay stored in the High Dam Lake can be used to cultivate extensive areas of the western desert.

Acute housing and services shortages in the existing settlements, worsened by lack of wise policy and by the expense of wars which Egypt was

involved in, will induce the crowded population of the existing settlements to move towards the new settlements if sufficient opportunities of jobs, housing and services are provided there.

Sufficient care must be directed to infrastructural services and greenery provision in the new desert communities to realize its success and to defeat the feeling of remoteness.

CHAPTER TWO

POPULATION AND THE SOCIO-ECONOMIC DEVELOPMENT IN EGYPT

2.1 Introduction

To define the quality and the quantity of new settlements establishment in Egypt, a general review of the country's population and economic situation must be made.

There can be few countries where virtually 99% of the population live on about a twentieth of its total area(1), only 1% of that population being scattered on 94.5% of its total area. Egypt has an area of 1,001,449 sq.km, or 386,200 sq.miles, and had an October 1982 population of about 45 million(2). Maldistribution is clearly noticed in population densities such that some districts in Cairo, the capital, have a density of more than 100,000 people per sq.km(3), and there are some "villages" of more than 30,000 people(4), while thousands of square kilometres, in the deserts, are vacant of population. In other words, the Egyptians still cling to the Nile Valley and its Delta, while desert lands lie empty around them.

The population problem in Egypt should be studied from different aspects to find the practical solutions for it. Since planning is concerned with the welfare of the people for whom plans are designed, the study of these people should be considered beforehand, including the associated socio-economic features, and a comparison with the circumstances in some foreign countries. Only then can any possible lessons from the experience of others be considered. Accordingly, this chapter will be concerned with population and its socio-economic influence on development, while in the next chapter we will examine the relevance of the British experience for application in Egypt.

The Tables of this Chapter are put together in Appendix "O" at the end of the thesis.

2.2 Population Growth and Distribution

The inhabited area of Egypt is only 52,651 sq.km out of which is 7,380 sq.km occupied by the Nile course and lakes(5). The desert and the Nile Valley are not only the principal physical features of the country (see Section 1.3.1 above), but they also set the pattern of the distribution of the Egyptian population living in the Delta and the narrow fertile strip of land in the valley. The total area of cultivation is approximately 3% of the total area of the country(6).

During ancient and mediaeval times the population of Egypt has been variously estimated at from 3 to 24 millions. However, it is doubtful that it exceeded 7-8 millions in any period then(7). Theodore, the Sicilian, estimated the population in Egypt in 1225 B.C., at approximately 7 million(8). During the Mamaleek (Mamluk) period (600-1200 A.D. approximately), Egypt witnessed the deterioration of the trade routes linking Europe with the East which caused the population to drop greatly, so that by 1800, Jomard, accompanying the French expedition in Egypt, estimated the population at 2.5 million(9).

In 1846 an estimation based on a census of houses showed Egypt's population to be 4.5 million(10). If the estimate is correct, it may be related to the economic growth and the order that prevailed in Mohammad Ali's reign in the first half of the 19th century. In 1872, a census revealed a population of 5.5 million, while another one in 1882, the first national population census, showed it to be 6.7 million. The second national census of 1897 recorded a population of 9.7 million(11). From 1897 till 1976, census-taking was carried out almost every ten years. The population rose from 9.7 m. in 1897 to 36.8 m. in 1976, and the crop area increased from 6.8 m. feddans to 11.9 m. feddans in the same period(12). At the present time, the per capita share of the cultivated land is estimated at one-sixth of a feddan, and at one-third of a feddan of crop area (see Section 1.1). This means that population growth in Egypt is much more than agricultural

production which necessitates to consider land reclamation, farming and the related industries as functions in the establishment of new settlements in the new opened areas. That is to satisfy the domestic needs of agricultural products and to realize a surplus for export. Table (2.1) shows the distribution of the total population by sex and annual rate of increase in the period 1882-1980.

From this table, it can be seen that the population of Egypt has increased steadily from about 10 million in 1897 to 30 million in 1966, ie 200% increase in a period of about 70 years, while the UK population were 38.2 m. in 1901 increased to 55.5 m. in 1971(12a), an increase of 45.3% in 70 years which reveals a big difference in population increase between the two countries, and this must be considered in the size of the new settlements when making use of the British experience. The annual rate of increase, see Fig. (2.1) below, is quite consistent. The upward trend of growth rates started in 1927 at 1.1% per year. Since 1960 it has decreased, but some officials predicted the possibility of its increase(13), perhaps because of the high fertility level, while the death rate will decrease (see Section 2.3.2. below). After the mid 1980's the growth rate is expected to decrease until the turn of this century, because of the expected improvement in the socio economic status. After the 1976 census the annual rate of increase had reached 30.6 per thousand in 1980, and the total population had increased by one million persons in about ten months to reach 42 million on 1st April 1980, including 1,445,000 Egyptians abroad(14). In November 1981, the population of Egypt was estimated by about 44 million(15). Unless the programme of new settlements can absorb most of this increase of population, it will not be possible for Egypt to solve its overconcentration problems. The following Section will analyse the causes of population growth.

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2.3 The Components of Population Growth

The natural increase represents the difference between the number of the live births and the number of deaths. Accordingly, births and deaths should be taken as the basis from which to study the components of population growth. In Egypt, the high birth rate is existing while the death rates are continuously decreasing, which results the upward trend of growth rates.

2.3.1 Births

The crude birth rate fluctuated around a high level from the beginning of this century, over 40 per thousand. Although the decline in birth rates started from 1961, a clearer downward trend took place from 1967. Table (2.2) shows the birth, death and the natural increase rates for the period 1906-1980. The total fertility rate has declined from 6162 per thousand women of the bearing age, i.e. 15-49 years old, in 1966 to 5552 in 1969 leading to a decline in the crude birth rate by about 10 per cent(16). It is noticed that fertility decreases with higher level of education and modernization. Indications showed that urban fertility is slightly lower than rural fertility(17).

Egypt birth rates were 41.00 per thousand in 1966 and 40.94 in 1980 which is very high if compared to the corresponding UK figures of 18.00 and 13.50. This high birth rate must be considered by the provision of larger dwellings and settlements in Egypt than those in the U.K.

2.3.2 Mortality

The death rate was high till 1945 when it started a continuing decline due to the improvement in medical services and public health. Decline in mortality makes fertility decline even more imperative in the short as well as in the long term. The crude death rate decreased from about 26 per

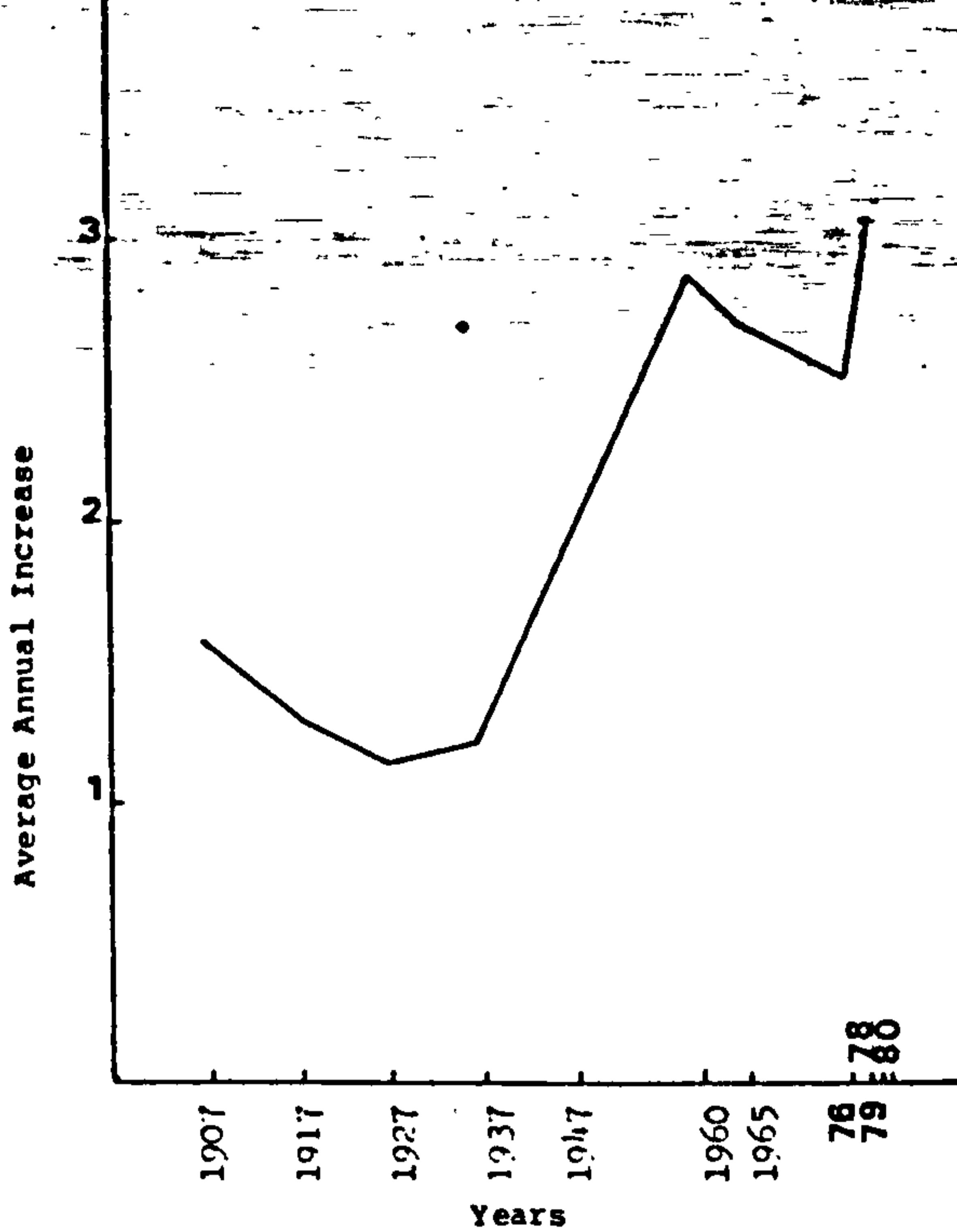


Fig. (2-1)
 AVERAGE ANNUAL INCREASE IN POPULATION OF EGYPT
 (1907-1980)

Sources : 1 - CAPMAS, Population & Development, Sept 1978, pl13
 2 - A.M. Halloda, The Present Population Situation in Egypt, April 1980, Table 7, p.17.
 3 - Population Studies, Dec 1981, p.70.

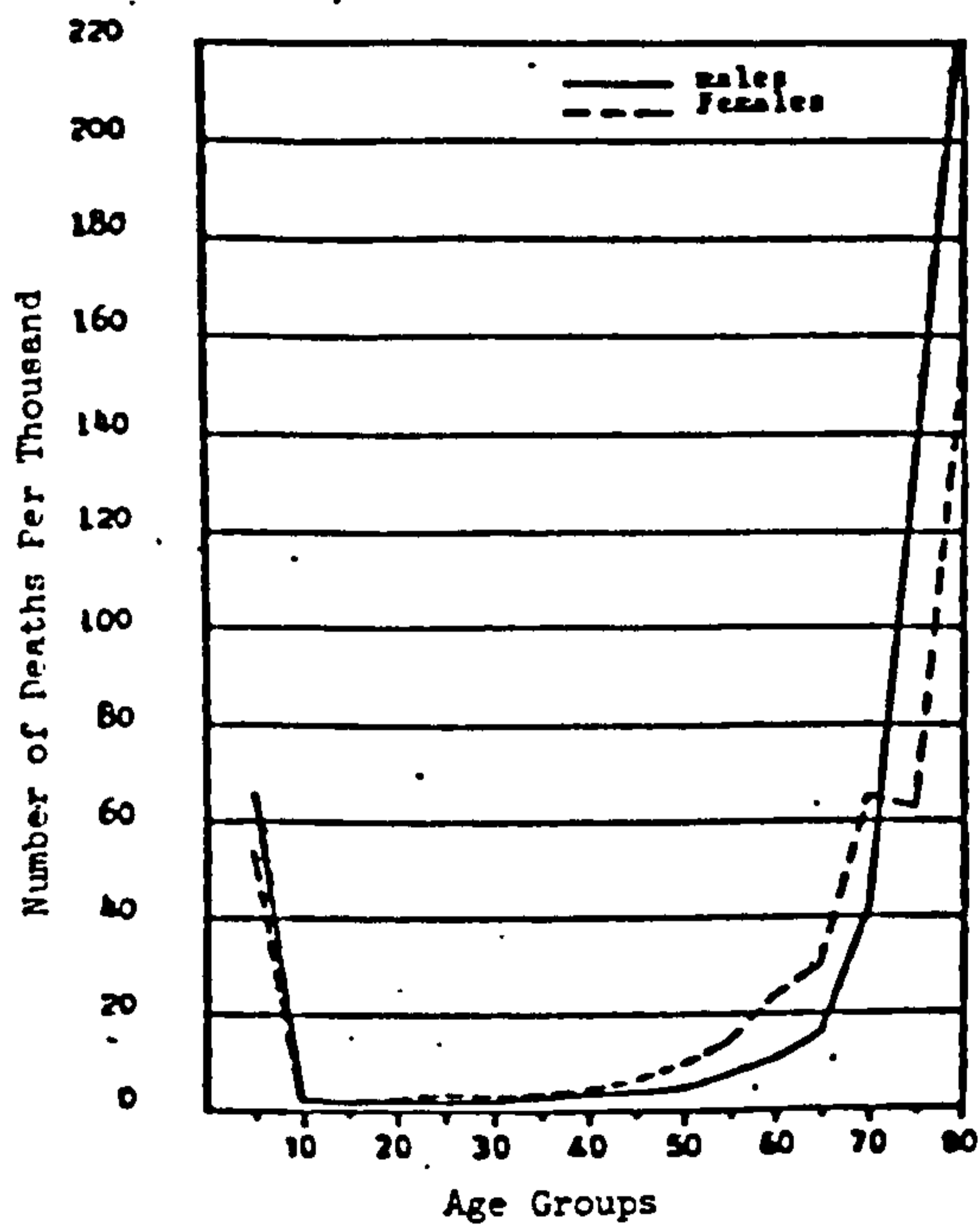


Fig. (2-2)
 AGE SPECIFIC DEATHS IN EGYPT 1968.

Source : Khalifa, The Population of Egypt, 1973, p.15

thousand in the first decade of this century, Table (2.2), to about 10 per thousand in 1980(18), that is less than the death rate in Europe generally which was 11 per thousand in the late 1970's(19). Thus Egypt can be considered in the second phase of the demographic revolution, that is of declining death rates without being accompanied by a corresponding decline in the birth rate. This means that there will be a steady increase of population. Table (2.3) shows Age Specific Death Rates in Egypt (1930-1970), selected years. See also Fig. (2.2). There is a gradual drop in the death rate among most of the age groups during the period 1945-1970, and a more marked decrease in the younger age groups, especially among infants as a result of more medical care, preventive hygiene, and improved nutrition for mothers and children though infant mortality is still high if compared with UK which was 12.9 per thousand in 1979(20).

It is noticed also that the life expectancy is increasing for all age groups for both males and females but it is still below that of the UK which is 70 years for men and 76 years for women in 1979(20). Table (2-4) shows life expectancy in Egypt for the period 1937-1966. Life expectancy for age groups determines the need for certain services such as medical care, housing supply, education, leisure facilities and so on. It should be noted that the life expectation for those who reach the ages of 5, 10 or 20 years old is more than that of the new born children which indicates the need for more care to be given to the problem of infant mortality which was 289 per thousand in the period 1906-1909, about 128 per thousand in the period from 1955-1960 and has continued to decline since then, Table (2.3).

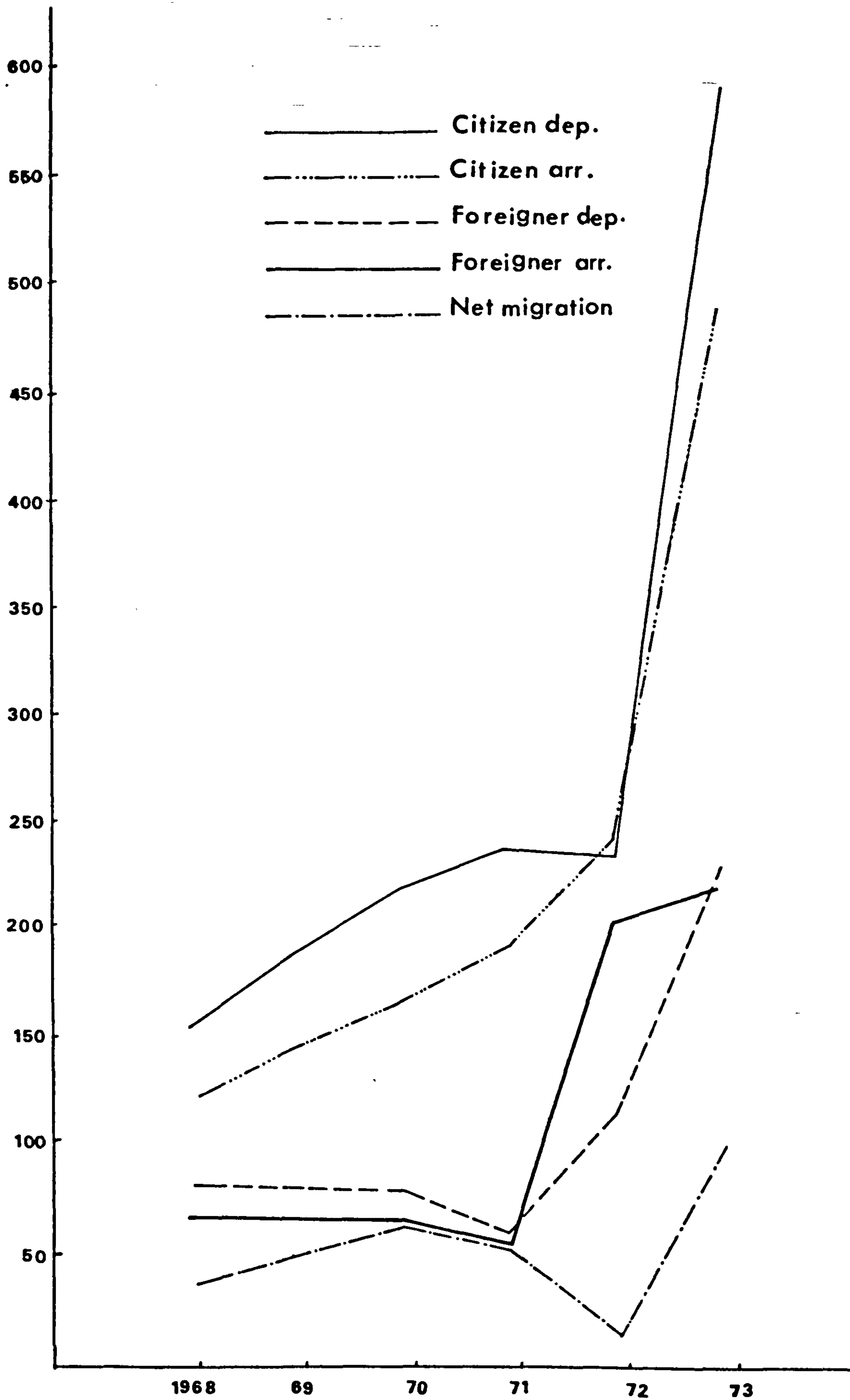


Fig. (2-3)

Departure, arrival and net migration in Egypt, 1968-1973

Source : CAPMAS, Movements across the Frontiers (Arabic), 1973.

2.4 Migration

While internal migration plays an active part in the population distribution in Egypt, especially from rural to urban areas, it is noticed that international migration was of no importance until the late 1960's when the number of those leaving the country began to increase. Before then, and since the dawn of history, it was well known that almost all the Egyptians rejected the idea of migration outside their own country.

2.4.1 External Migration

Data related to external migration began to be collected in 1965. It shows a clear, continuous upward trend. Fig. (2-3) shows the numbers of both citizens and foreigners departing from and arriving in Egypt, and the net migration, in the period 1968-1973.

It is clear that since President Sadat's rule began in 1970, the numbers of those leaving the country has risen rapidly. This may be related to the new facilities provided for getting a passport, cancelling exit visas, and the open door policy which was applied after the 1973 war. It may also be related to higher costs of living, while the vast majority suffer from limited income and lack of services (see Section 1.7 above). Table (2-5) shows the distribution of emigrants by sex and type in 1969.

It can be seen that the main migrants consisted a little more than one-half of the total migrating, in other words, almost every migrant was accompanied by one dependant. Females are less than 40% of the migrants because of religious, legal and traditional restrictions. Related data shows also about 60% of the total emigrants were less than 30 years old, 25% were 30-39, and very low percentage more than 40 years old. While 56% were single, 44% were married, and more than 60% were post-graduates, and only 12.7% were uneducated(21). This demonstrates brain drain which the new settlements, if properly equipped with services and opportunities, will reduce.

The principal receiving countries in 1969 were U.S.A., Australia and Canada. Other groups are going to the Arab countries to earn higher income. This includes both educated and uneducated people settling for a few years and then returning to Egypt, but lately, it seems that big numbers have begun to settle permanently in certain Arab countries, particularly Saudi Arabia, Libya, Iraq and Emirates. This must reflect a recent change in the Egyptian ideology after centuries of rejecting migration, an idea which is clear in the colloquial Egyptian proverb meaning: He who leaves his homeland loses his value! According to the 1976 census, the number of Egyptians outside the country in November of that year was 1,425,000 out of a total population of 38,228,180. This trend is increasing and may slightly reduce the demand on services, but measures should be made for those who will return with higher standard of living.

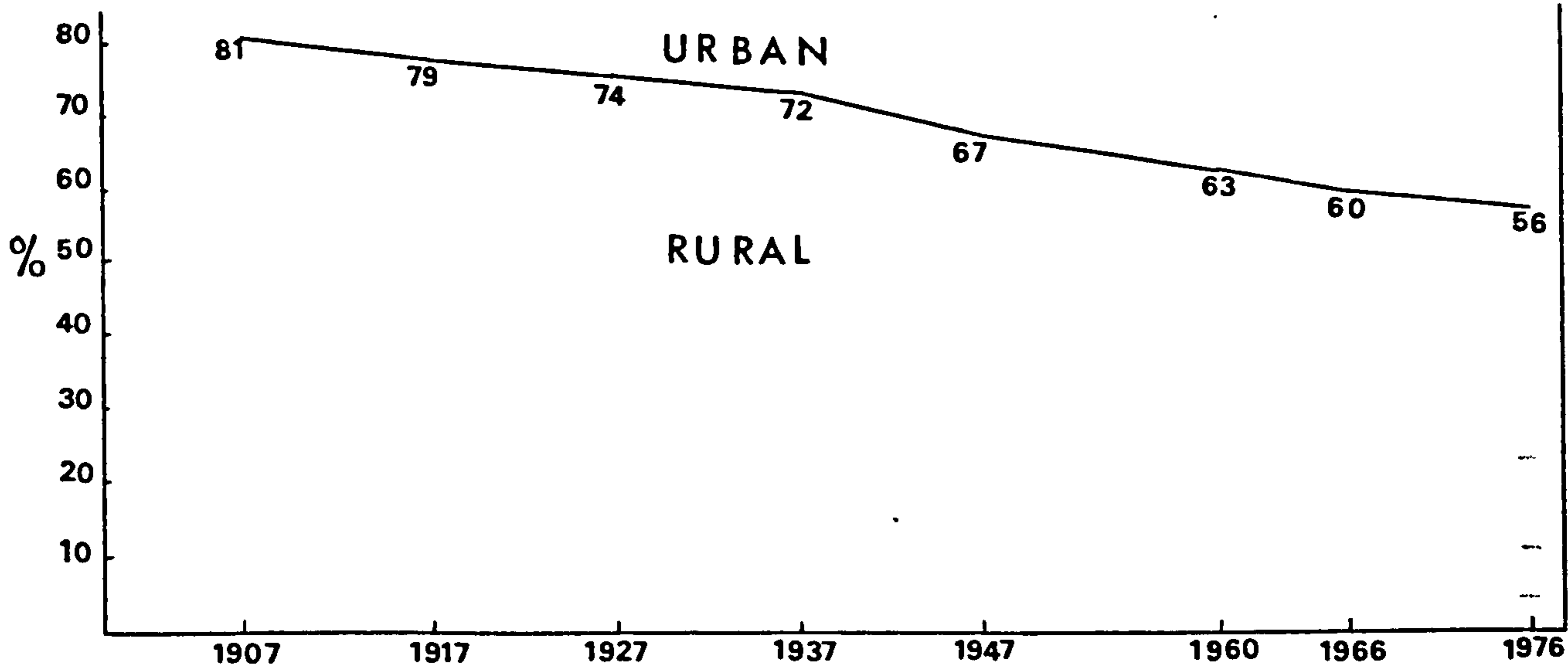
2.4.2 Internal Migration

Internal migration can be defined as the movement of citizens from one geographical unit to another within the boundaries of the country, taking permanent work and residence in a new locality. This pattern of movement greatly affects population growth, its age and sex composition, its social, economic and cultural structure and all other demographic features.

Regional population growth has varied markedly in different areas of Egypt, resulting in a clear population redistribution during this century. Fig. (2-4) shows the percentage of population in urban and rural areas in Egypt between 1907-1976 (Census years).

It can be seen that the urban percentage has increased consistently since the beginning of this century. Forecasts indicate that this will continue while the percentage of rural population will decrease (22).

Fig. (2-4)

POPULATION PERCENTAGE IN BOTH URBAN AND RURAL AREAS IN EGYPT1907-1976

Source: CAPMAS, Population & Development, 1978, p159.

A high proportion of urban population increase relates to migration from rural areas to metropolitan areas, particularly Cairo and Alexandria. For example, Cairo's share of the total population was 8.2% in 1927 and this increased to 14% in 1966, see Table (2-6). In 1979 this proportion fell to 13.2% because Cairo began to be saturated, suffering from an acute housing crisis. Alexandria's share of population increased from 4.2% in 1927 to 6.00% in 1966(23) and to 6.33% at the time of the 1976 census. Taking 1907 as a base of 100, Cairo's size was 157 in 1927 and 617 in 1966. Similarly Alexandria increased from 162 in 1927 to 509 in 1966. The increase in other governorates was more modest. For example Sharkiya, east of the Delta, 100 in 1907 became only 248 in 1966, and Minya, in Middle Egypt, 261.

The main reason for these differentiations is the differences between the various internal migration currents from rural to urban areas, especially

to the two metropolises, Cairo and Alexandria which experienced growth at more than twice the national rate.

The main type of internal migration movement in Egypt is represented by those who move to work in agriculture, commerce and industry, including construction and services. That includes a high proportion of the rural population, especially those who suffer from unemployment, lack of housing, services and leisure facilities. Hence the great increase in urban population, which doubled between 1907 and 1960, is due to the large number of the rural population seeking higher wages and a better and more prosperous life in urban areas, see Fig. (2-5). This suggests that internal migration can be diverted to new settlements if they provide sufficient jobs and services. Properly planned it may result in a considerable reduction of the pressure on the existing urban areas, and may also reduce their growth. Seasonal migration forms another type of migration, like the movements of the nomads in the deserts in search of water resources and pasture for their animals, or on some occasions migration based on labour contracts in certain places or seasons.

The migration from rural to urban areas, not only involves a large proportion of the population, but also it has serious implications on population distribution and on the economy.

From the studies carried out by the General Organization for Physical Planning (GOPP), Cairo, Figs. (2-5, 2-6 and 4-7), it can be seen that the most attractive areas for migrants in Egypt in 1966 were the urban governorates of Cairo, Giza, Alexandria, Suez, Ismailia and Port Said, because of their large degree of development in industry and services, compared with the rest of the country, both urban and rural. On the other hand, the governorates losing population are those of Minufiya, Gharbia in the Delta, and Sohag, Asyut and Kena in Upper Egypt, see Fig. (2-7). Minufiya lost 20% of its population out of which 2 million lived in Cairo in

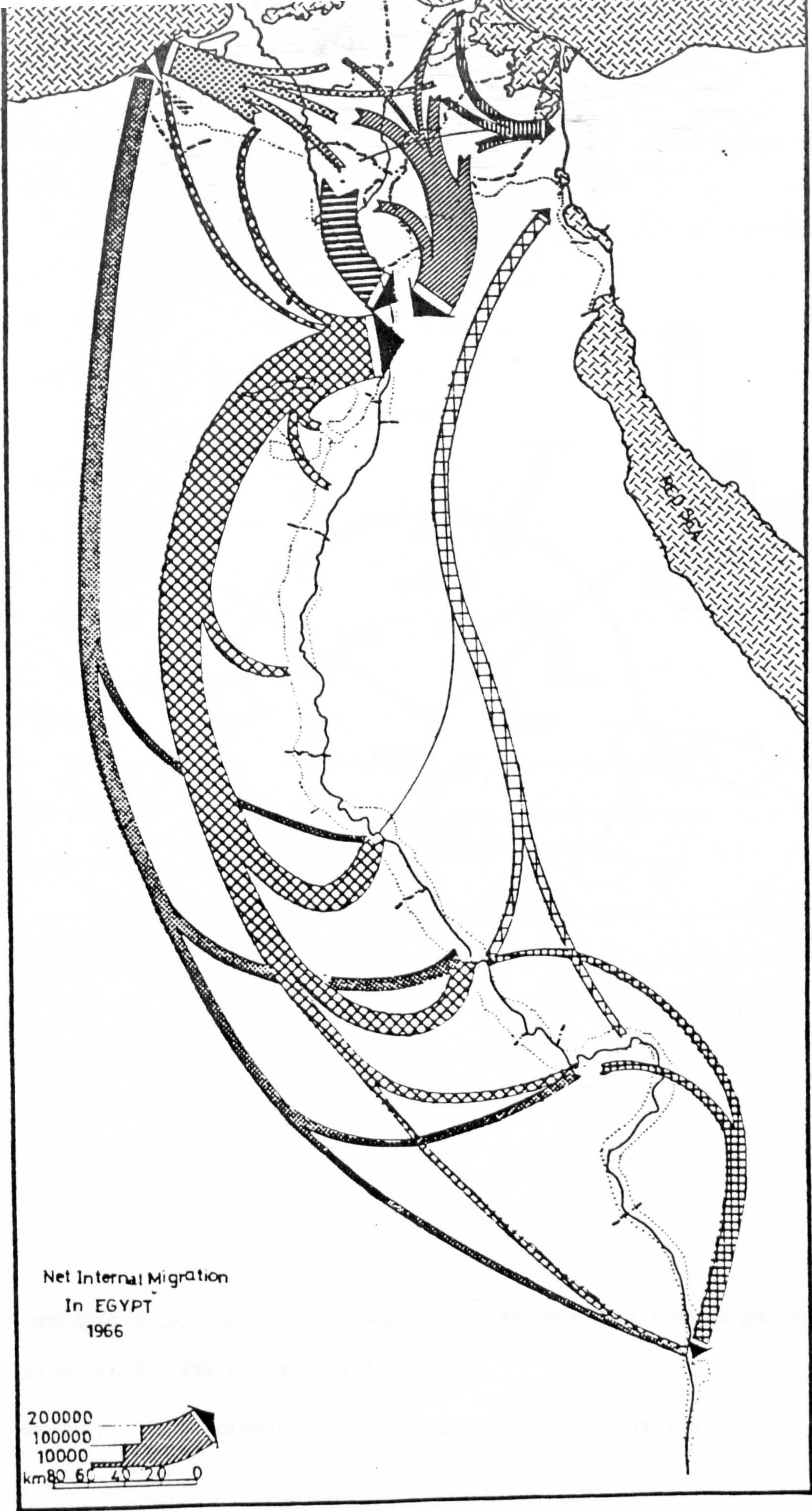


Fig. (2-5)
Source : The Author, GOPP, 1978

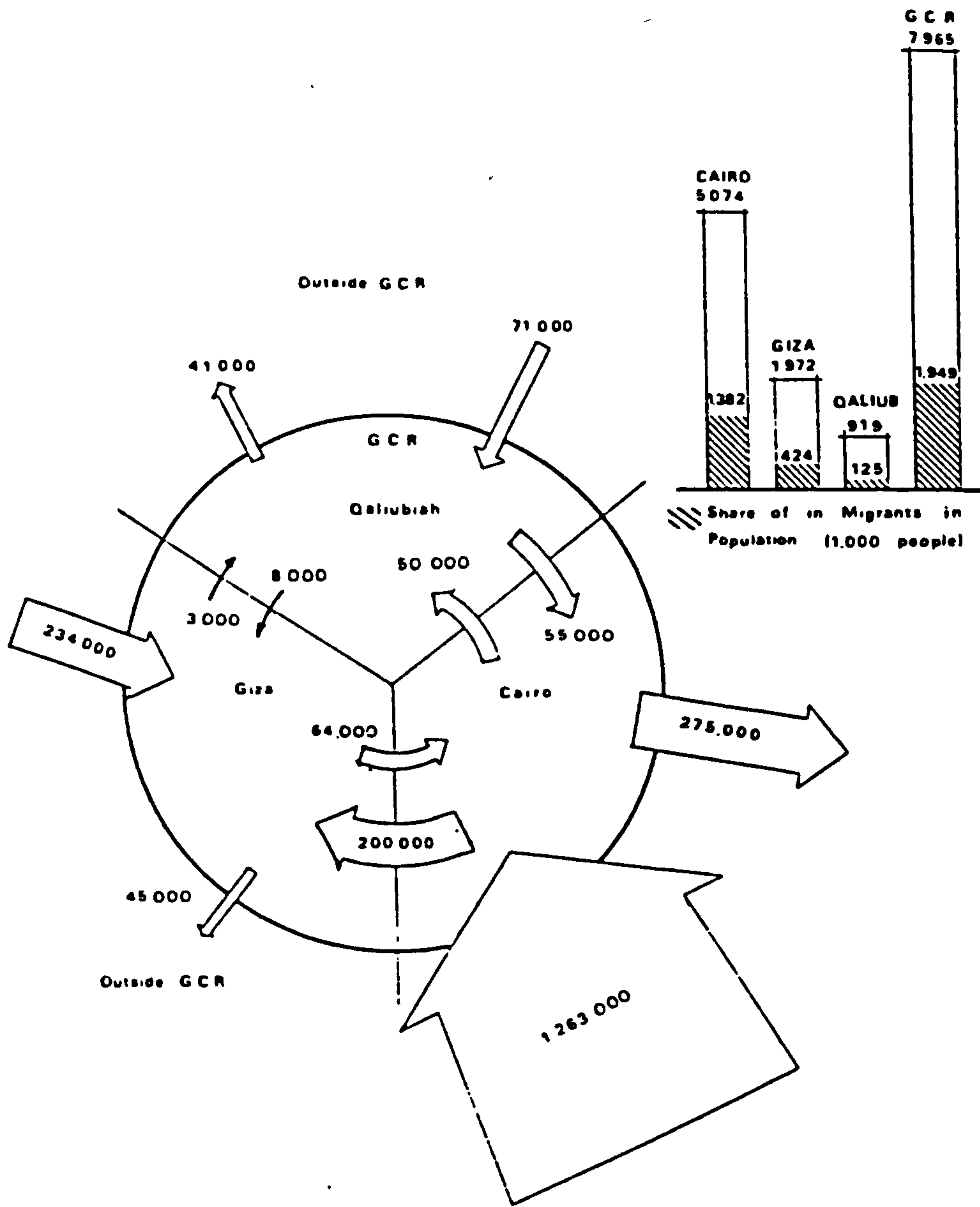


Fig. (2-6)

INTERNAL MIGRATION FROM THE PLACE OF LAST RESIDENCE CONDITIONS IN 1976, WITHIN THE GREATER CAIRO REGION.

Source: GOPP, Greater Cairo Region, Dec. 1981, p11.19a.

the early 1970's, and it is reported that migration from Minufiya to Cairo amounts to 22% of the total internal migration to Cairo(24). Reasons suggested include Minufiya's high population density, and the pigmy scale of land ownership (about 5/12 Feddan per person)(25). The other governorates lost population because of lack of jobs and services. Following the construction of the High Dam and the related development projects in the area, Aswan governorate has changed from a departure area in 1960 to a receiving one in 1966.

From 1966 to 1970, Cairo, Alexandria and Giza were still considered the most attractive governorates to live in. The Suez Canal cities, temporarily became departure areas as a result of compulsory migration after the 1967 war. In the late 1970's, Cairo became much less of a pull area, because of lack of housing units and being saturated with population, and the Suez Canal cities were being rebuilt and resumed their pull effects. Table (2-6) shows the percentage of Cairo population to the total population of Egypt in the period 1927-1980.

As Cairo attracts population, it also attracts investment and labour force, and dominates the national cultural pattern. This concentration has a deleterious effect on the development of other areas and tends to have a high consumption rate, as compared with production rate. It was found in the 1960 census that 31% of Cairo's population are immigrants from other governorates.

Most of the migrants from West and North West Delta move to Alexandria, see Fig. (2-5) as the distance factor plays its part in internal migration.

Beheira and Kafrel Sheikh have vast areas of agricultural reclamation lands west and north of Delta respectively. Those lands always need increasing numbers of agricultural workers. Again, the migrants from Minufiya are at the head of those who move to such reclaimed lands. Also,

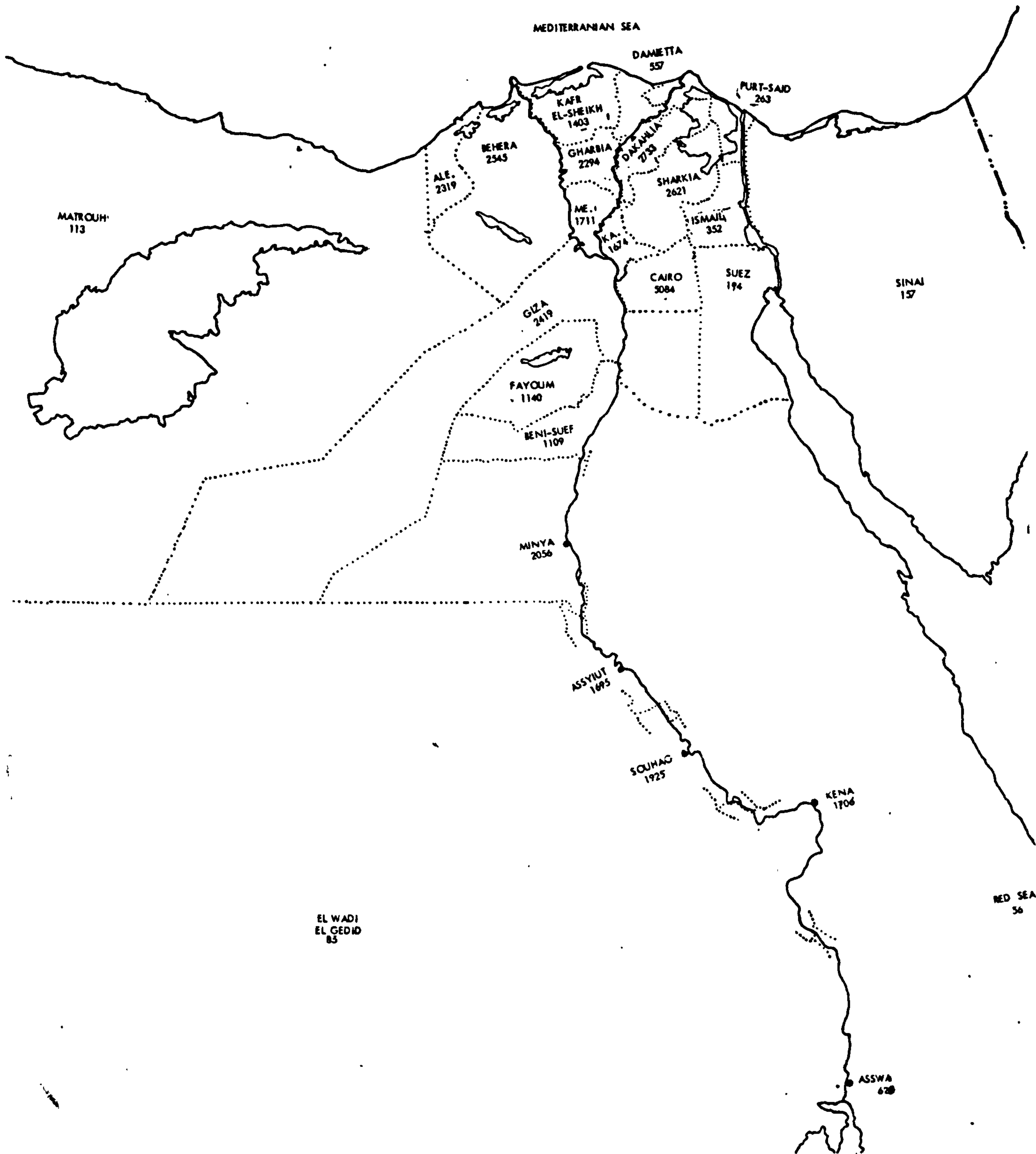


Fig. (2-7) The Governorates & Population (000s) in Egypt, 1976 Census
Source : Population & Development, CAPMAS, Cairo, September 1978, preface map

it was extremely significant that Minufiya was of prime importance while choosing the inhabitants of Mudiriyat el Tahrir, Fig. (1-5), the agricultural reclamation area West of the Delta.

There are two types of rural migrants to Cairo:-

1. The cream, consisting of bright young people, who migrate in search of education or to wider opportunities. These have both the drive and the facility for rapid assimilation into the culture of the city.
2. The second group are drawn primarily from the 'have nots' of the countryside. Numerically dominant, they are as much driven from the village by the dearth of land and opportunities(26) as they are attracted to the city. Rural push is perhaps stronger than urban pull.

Some of those migrants have settled in particular areas. There are a number of social agencies, on a district regional basis, in Cairo to help assimilate their members. Abu-Lughod mentioned that there are vast quarters within the mosaic of Cairo, where physically and socially, the way of life and characteristics of residence resemble rural Egypt. Rural migration to Cairo may be considered as a process of "ruralisation" of the city, but that is an exaggeration prompted by the existence of the rural features in some areas in Cairo, which were rural before, such as Maadi, Basateen, Shoubra, Mataria and Zeitoon, Fig. (4-5).

In addition to individual spontaneity, internal migration may exceptionally be a response to special circumstances, such as for re-settling the Nubians into Nasr District near Kom Ombo, before the inundation of Nubia by the High Dam Lake. In the 1960's a Prime Minister tried to compel some migrants in Cairo to return to their original birth places, but he failed completely because of lack of job opportunities in those places.

It is quite evident that the 'pull' regions are represented by the biggest towns and projects of developments expansion, such as the High Dam, Abu-

Tartur phosphate plateau in the western desert, and more recently the new town areas in the deserts. The daily commuters to Tenth of Ramadan New Town, by June 1981, were about 2,000 employees and workers besides 3,000 people gradually settled since August 1978, when the construction began(27).

If the attraction of the principal 'pull' factors of the migration from rural to urban areas, the attraction of industry and services, high wages compared with the agricultural labour market, which is too limited for the new educated generations with their aspirations for a higher economic standard can be directed to the new settlements in Egypt, a great deal of the internal migration from the rural areas will convert to the new settlements instead of swelling existing urban areas(28). In this way, the new settlements have to provide sufficient jobs and services, including agricultural activities, to attract big numbers of new settlers, and that necessarily need the new settlements to be big enough to absorb the present internal migration.

2.5 Population Densities

The contrast in the distribution of population between the Nile Valley and the Deserts was examined in Section 2.2.

In the November 1976 census, the Egyptian deserts were occupied by 382,758 inhabitants only, while the urban governorates like Cairo, Alexandria, Port Said and Suez, had 7,859,739 people. Lower Egypt had a population of 15,890,973 and Upper Egypt had 12,669,710. Metropolitan Cairo had 6,724,217 which was about 1/6 of the national population at that time concentrated in Greater Cairo, while the City of Cairo ranks among the seven biggest cities in the world in terms of population. Egypt includes another million city, Alexandria, which had 2,318,655 inhabitants in November 1976. Some of its districts have 133,464 persons per sq.km(29).

Table (2-7) shows population densities of the inhabited area of Egypt 1897-1966. (See also the introduction of Chapter 7).

This table shows that whilst the inhabited area had increased by only less than 3% in the period 1897-1966, both total population and the density increased by about 300% in the same period, which emphasizes the importance of opening new areas to accommodate the increasing population in Egypt.

In terms of the population concentration, Egypt is dominated by a few large cities which are growing at a faster rate than the smaller ones. During the period 1947-1960 the increase in metropolitan population was about 72%, which indicates the extent to which the metropolitan areas are the centres of immigration because of the relative availability of jobs and services. Cairo and Alexandria have accounted for about 50% of the urban population of Egypt since 1960(30).

There is the important feature of the density of population inside the Valley and the Delta. The density of population in rural Egypt is comparatively less than that in the towns, but the population density in the Egyptian countryside is one of the highest rural densities in the world. The high density areas in the Delta region are those nearer to the two branches of the Nile which enjoy the most fertile soil, abundance of water and the greatest communication facilities. The density decreases considerably further from the Delta branches where the above-mentioned factors decreased. In the Northern parts of the Delta, soil fertility decreases because of its high salinity, whereas in the Eastern and Western parts soil fertility decreases because of high sandiness. In the Northern parts more effort has to be made by both the government and the individuals to obtain sufficient agricultural production. The situation is similar in the Fayum depression, where there are also drainage difficulties, due to the irregularity in the surface and sandiness. A consequence is a relatively lower density.

The low density in some parts of Upper Egypt is due to the limited agricultural lands resulting from the narrowness of the Valley, which drives

the extra population, consisting mainly of farmers, away to other regions with better opportunities. That is contrary to the development areas such as Aswan and the High Dam Lake region, which have been attracting population because of the numerous projects there. It is expected that some parts of the Egyptian deserts will include higher density development as a consequence of expansion projects like the establishment of new settlements based on industry, agriculture, mining, services or tourism.

2.6 Population Composition

The composition of the population according to age and sex in a country is important in relation to several aspects of urban and regional planning. The expected population in the new settlements are mostly of the young people who look for a better life and opportunities to satisfy their venturesome attitude. Mostly, the older people do not like to leave their traditional living places.

The composition of population shows also the size of labour force and the burden presented by the children and aged persons on both the productive portions of the population and on the government(31). Also different categories defined by age and sex have their special needs, for example of consumption, education, social and medical services. These can considerably affect the policy of the establishment of the expected new settlements: their size, function and services, leisure facilities and last but not least, the number of jobs to be provided for the new settlers.

In general, it could be said that the age composition of the population of Egypt has remained more or less the same throughout the period 1917-1970 with only minor fluctuations. This is the characteristic of all developing countries with high and constant birth rates and rather slowly decreasing death rates.

Table (2-8) shows the percentage distribution by broad age categories (1917-1976).

From this table one can note the high percentage of the dependants, under 15 years old, which can be partly related to the high birth rate, i.e. 36.4 per thousand in 1976. The corresponding percentages of the U.K. in 1971 were 24.12% (0-14), 62.73% (15-64) and 13.16% (65+) respectively where the birth rate was 16.0 per thousand, decreasing to 11.9 per thousand in 1976(32). This clearly shows much less dependency and a higher percentage of the productive persons in the UK than in Egypt which favours the economic activities in the first and needs more services for the youngsters in the second.

It is noteworthy that the ratio of males to females is almost on a par under ordinary conditions. The proportion of female children under fifteen was always below the corresponding proportion of male children. On the other hand, the proportion of female adults of the age group (15-64) is higher than that of male adults. The percentage of old women was always higher than that of old men as almost everywhere. Consequently, the females have always a median age over that of males. The age composition in rural regions differs from that in urban areas. Table (2-9) shows the population ratios by principal age groups in 1960.

The proportion of those under 15 is 1.3% less in rural areas than in urban areas. This may be due to higher death rates or to omissions of recording in the census operations for some regional and/or traditional considerations. The proportion of the 15-44 age group is likewise less in rural areas than in towns, probably because of emigration of people of working age from rural areas to have better opportunities in towns, as discussed in Section 2.4 above. This also indicates that new settlements will not suffer lack of migrants if properly planned according to population trends and requirements especially for those with farming background.

The 1976 census indicates that the percentage of the children below 12 years old decreased in the period 1966-1976 from 35.5% to 31.6% respectively as a result of the decrease of birth rates.

But the Egyptian population is still young, as compared with that in most of the industrial countries where the proportion of the children below 12 years is less than 20%(33). Egypt is also distinguished by the highest proportion in the two last age groups 45-60 and 65+ among developing countries such as China, India and Brazil, while not being much below the corresponding proportions in Japan(34). Fig. (2-8) shows the percentage distribution of population by age from 1927-1970, while Fig. (2-9) shows a population pyramid in Egypt in 1966, the last year for which details are known.

From both figures, it can be seen that the percentage of the children was, and still is, high in Egypt while the general trend in Fig. (2-8) is that the age groups under 30 years are increasing.

2.6.1 Marital Status

The minimum legal age of marriage in Egypt is 16 for females and 18 for males. The majority of females get married below the age of 20 and males between 20 and 30. But the average age of marriage is increasing for both sexes as a consequence of better education and standards of living. The percentages of both married and widowed persons are higher in rural than in urban areas(35).

The marriage rate in Egypt is greater than many other countries. Between 1953 and 1962 it was 9.5 per thousand against 8.7 in Japan and 7.7 in England and Chile(36). Early marriage not only increases the number of children born, but also gives women who die at an early age a chance to procreate before their death.

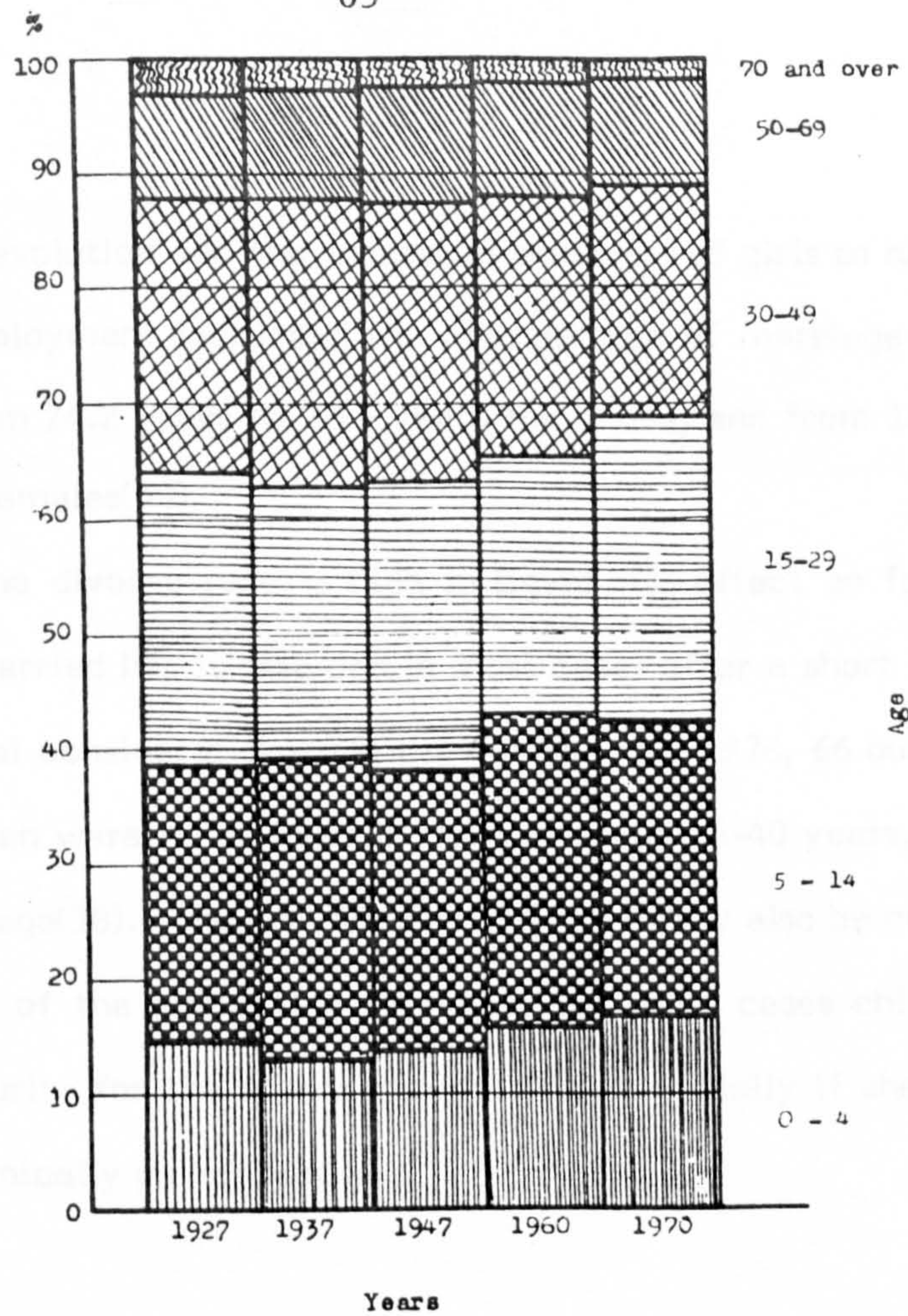


Fig.(2-8)

PERCENTAGE DISTRIBUTION OF POPULATION BY AGE IN A.R.E., 1927-1970

Source : Population & Development, CAPMAS, 1978, p.55

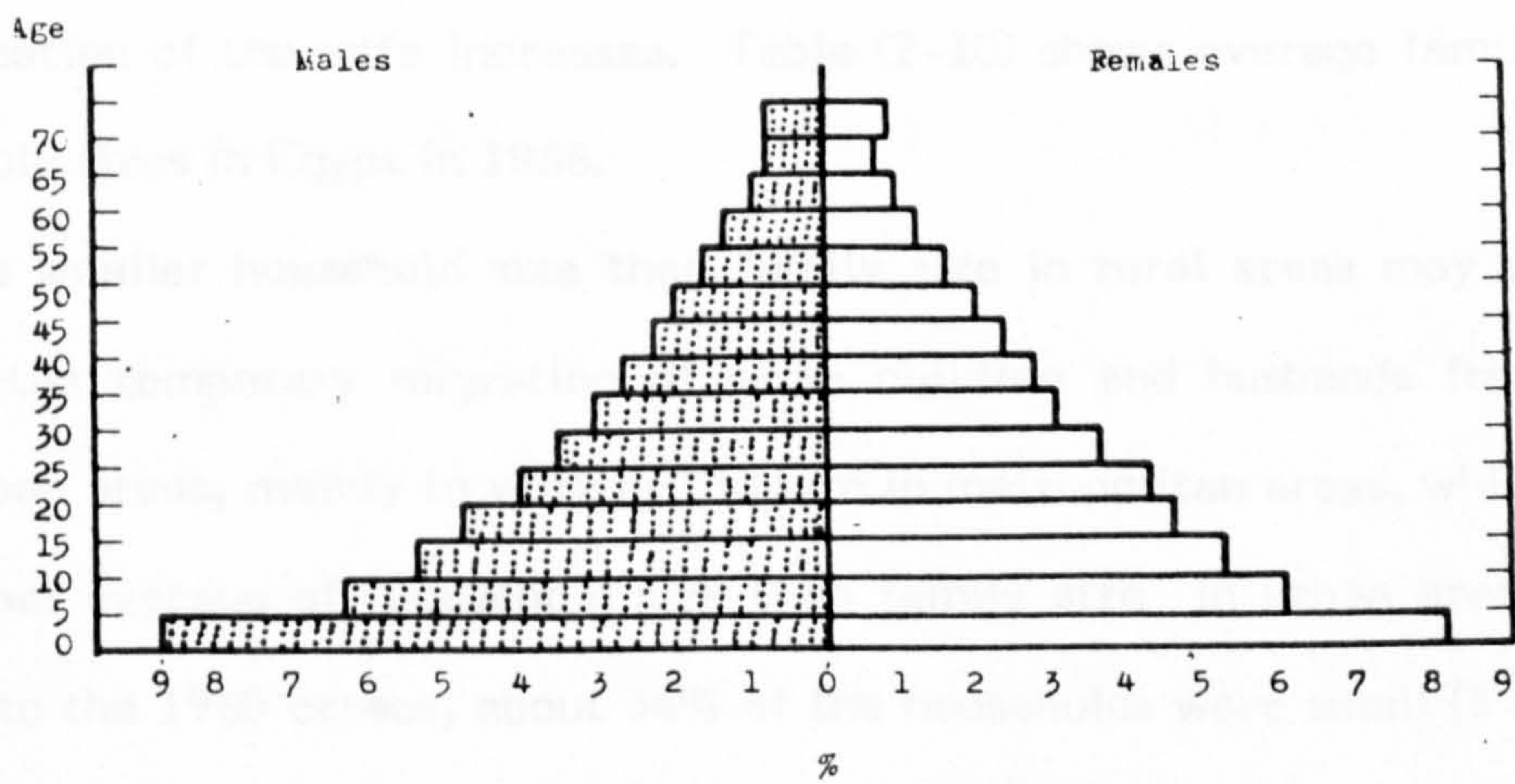


Fig. (2-9)

THE POPULATION PYRAMID OF A.R.E. ACCORDING TO THE 1966 CENSUS (SMOOTHED DATA)

Source : CAPMAS, Population and Development, Sept. 1978, p.71

The social evolution and the increased tendency of girls to have more education and employment increased the average age of marriage between 1947 and 1970 from 24.2 years to 26.3 years for males, and from 18.6 years to 20.2 years for females(37).

Although the divorce rate is high in Egypt, its effect on fertility is very limited as, married life is resumed in most cases after a short time, for religious and social considerations. In the census year 1976, 66 out of each 100 divorced women were re-married in the age group 25-40 years, which is the child-bearing age(38). The prevalence of divorce may also be considered an indirect cause of the population increase. In most cases children are thought to be security for the wife's married life, especially if she depends completely economically on her husband.

2.6.2 Household and Family Sizes

According to a CAPMAS sample survey in 1973, it was found that extended families constitute only 9% of all Egyptian families. The family tends to be nuclear and the number of children still alive tends to decrease as the education of the wife increases. Table (2-10) shows average family and household sizes in Egypt in 1966.

The smaller household size than family size in rural areas may be related to the temporary migration of some children and husbands from rural to urban areas, mainly to work or to learn in metropolitan areas, which have a higher average of household size than family size in urban areas. According to the 1960 census, about 34% of the households were small (3 or less persons), about 41% of the households were between 4-6 persons, and only 25% of households were 7 or more persons. In rural areas 31% of the households were larger as compared with 31% of the small households. Table (2-11) shows the percentage distribution of households according to size in Egypt in 1960. The relatively big sizes of both families and households essentially need to have large units and sufficient services,

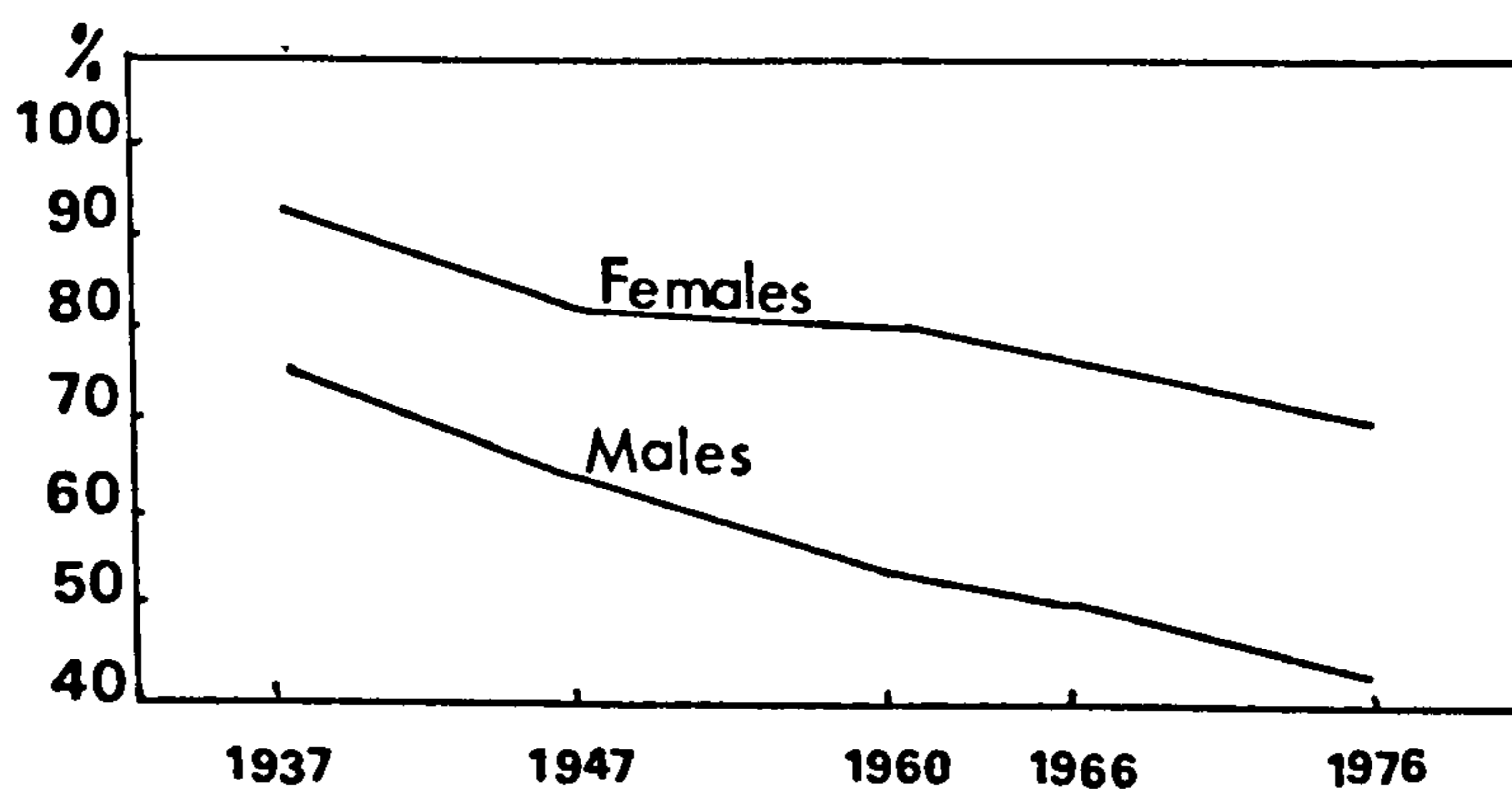
including medical care and education.

2.6.3 Education

Most developing countries suffer from a high proportion of illiteracy. In Egypt, the situation is gradually improving. Fig. (2-10) below shows illiteracy trends from the censuses of 1937-1976 by sex, 10 years and over.

Fig. (2-10)

ILLITERACY TRENDS IN EGYPT, 1937-1976 (10 YEARS AND OVER)



Source: CAPMAS, Population and Development, Sept. 1978, Table 3.3.3

Table (2-12) shows the distribution of population aged ten years and over by sex and educational status, in Egypt in 1960 and 1976.

From this data, it is clear that illiteracy is far more prevalent among females than among males. Also the downward trend of the proportion of illiterates is faster among males than among females. This may be related to the traditional attitude which considers the man as the backbone of the family, so his education should have more priority, but this attitude is changing so much that we find the percentages of females who completing

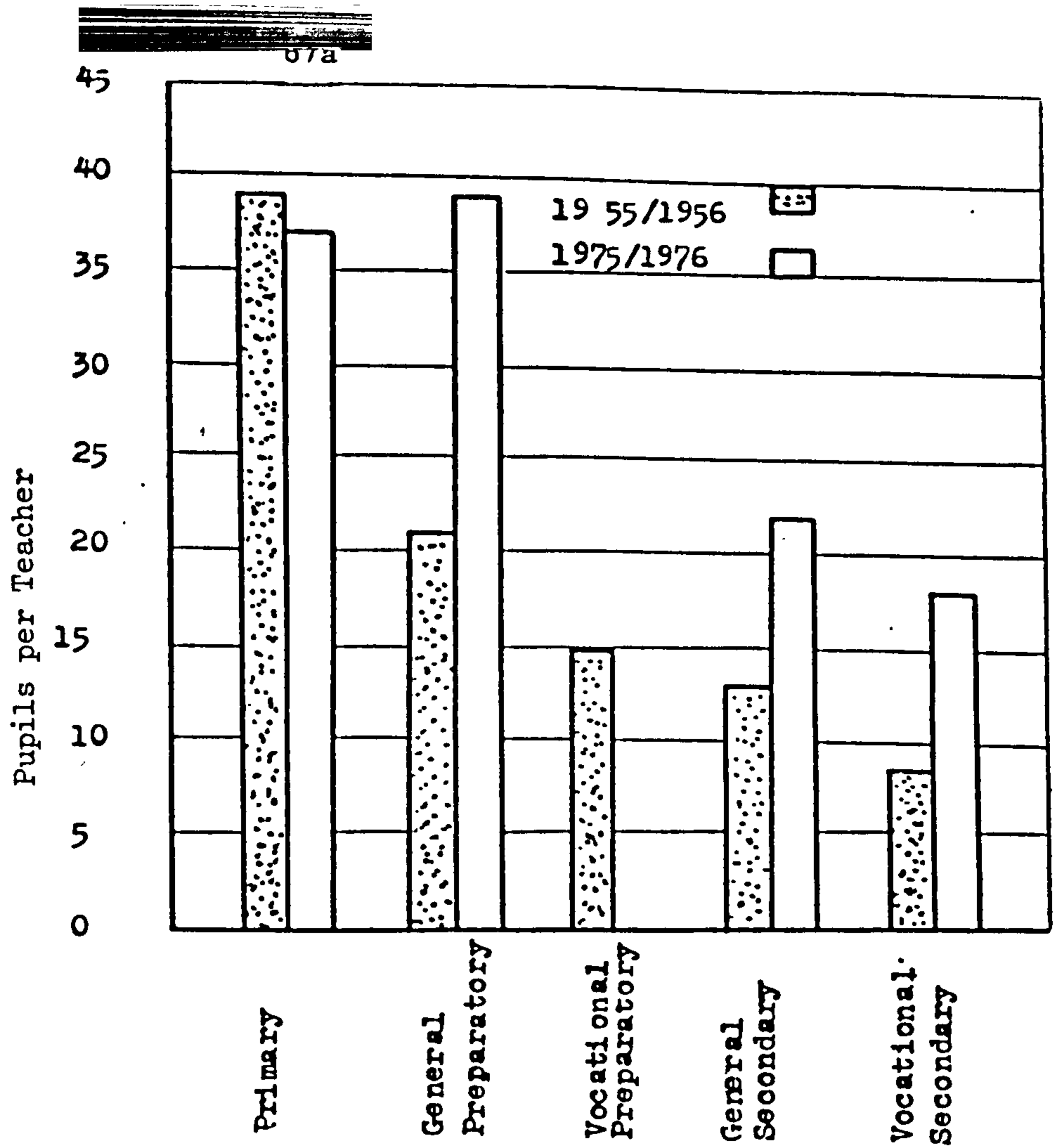


Fig. (2-11)

PUPILS-TEACHER RATIO BY VARIOUS EDUCATIONAL LEVELS
IN 1975/1976 COMPARED WITH 1955/1956

Source : CAPMAS, Population and Development

Sept 1978, p.247

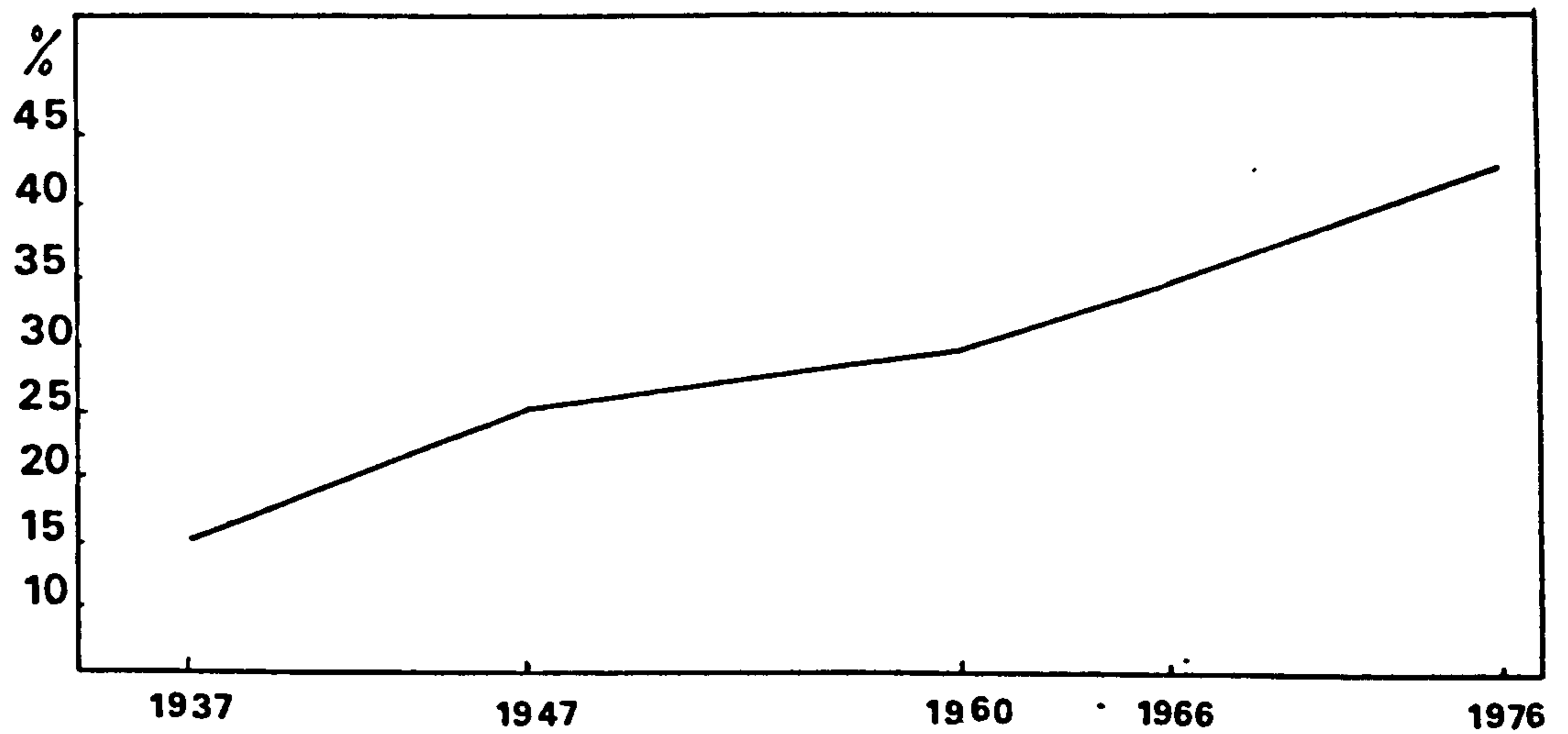


Fig. (2-12)

THE PERCENTAGE OF EDUCATED PEOPLE TO THE TOTAL POPULATION IN EGYPT,
1937 - 1976

Source: CAPMAS, Population and Development, Sept. 1978, p.231.

different categories of education is increasing faster than the corresponding percentages of males. For example, while the percentage of postgraduate males doubled between 1960 and 1976, that of females had multiplied six-fold in the same period(39). It is noticed that females' enrolment in other stages of education is also rapidly increasing. The rate of illiteracy in urban areas is lower than in rural ones, 45% and 80% in 1966, and 39.2% and 70.4% in 1976 respectively. The percentage of those over 10 years with intermediate qualifications, rose from 6.2% in 1960 to 16.2 in 1976(40).

Egypt is now undergoing an education revolution with regard to the number of students and the number of schools. In five years (1966-1971) the number of pupils in all stages of education increased by about 120%. For example, the technical education pupils (Industrial, Agricultural and Commercial education) were 128,000 in 1966, increasing to 275,000 in 1971 and to 377,000 in 1976(41). Table (2-13) shows enrolment in school and university and growth rates, in selected years.

The increase in the number of school enrolments was not accompanied by a similar increase in the number of teachers, resulting in an increase in the number of pupils per teacher in most of the stages of education which has its negative effects on the quality of education, Fig. (2-11). It is noteworthy here to mention the percentages of the people who have primary education or more in Egypt. They were 15% in 1937, increased to 29% in 1960, to 35% in 1966, and to 43.5% in 1976 (censuses), Fig. (2-12).

This increase in the number of educated people have to be met in the new settlements in terms of further education, training institutes and job provision for the different levels of education.

2.6.4 Labour Force

The Egyptian labour force grew from 5.8 million in 1937 to 7.8 million in 1960 and to 8.2 million in 1966, an increase rate of 1.27% per year(42).

Although the agriculture sector still employs more than 50% of the labourforce in Egypt, the output of that sector is only about one third of the G.D.P. (Section 2.7.1). That gives an idea of the low productivity (in cash terms) per capita and possibly of concealed employment. Government and public sectors have the same phenomenon owing to the policy of employing all the school leavers and the graduates in these sectors since the 1960's, even if there is no need for them. Very recently, the private sector has employed many people, a trend which the government should encourage and plan for, particularly in the new communities which are expected to be self-sufficient in job provision.

Table (2-14) shows employment by sector in Egypt in 1976. It is clear that agriculture is the profession of more than half of the people which requires to plan for more agricultural and agro-industrial opportunities in the new settlements of Egypt.

Owing to the young age composition of the population as a result of high fertility, the proportion of the total population in labour force is relatively low, implying a heavy burden of dependency.

On the other hand, a big proportion of females were not involved in work till 1960, owing to traditions. This was especially so in the rural areas. Table (2-15) shows the percentage of the labour force by sex and region to total population, in May 1970.

It is quite clear that female participation is still very low in all the regions in Egypt. About 94% of the Egyptian labour force is male, (see also Table (2-17)), with maximum participation in the middle-ages (19-49) decreasing sharply towards the margins. The decrease in the age group 6-11 may be due to the increase of enrolment of pupils in primary education. There is a slight increase for the ages 65 and over, especially in the rural areas, which may be attributed to migration of young males from rural areas for work or education in urban areas, leaving a higher proportion of old persons on the farms. It should be noted that the levels of age-specific

activity rates for the Egyptian males are clearly higher than those of industrialised countries round the same ages, but the female rates are among the lowest. The last trend is recently decreasing which requires to plan for more female employment.

Although Egypt has big numbers of unemployed people, it also suffers from a severe shortage of professional workers and skilled artisans, particularly in the construction and mechanical sectors. This crisis has become more complicated since the migration of such workers in great numbers to the Arab and some western countries. Such trends need more care towards training centres to develop the abilities of the unemployed or semi-employed people to provide different skills to the newly opened areas.

In the 1937 census, 70% of the labour force was engaged in agriculture. This proportion has gradually decreased to 62% in 1947 and to 57% in 1960(43). In the period 1960-1969 the percentage of the males working in agriculture decreased from 56.1% to 53%. That indicates that Egypt can be classified among the semi-industrialised countries, but it is still far from the situation in industrial countries where the rate of male participation in agricultural activities is not more than 30%.

While the percentage of employment in agriculture is decreasing, that in manufacturing is increasing. Table (2-16) shows the percentage of the labour force in each category of occupation (1937-1971). It can be seen from this table that both white and blue collar workers are increasing while the percentage of farmers is decreasing because of a combination of circumstances, including the limited area of the cultivated land, the growing number of educated people, the changes towards machinery in farming methods, and the attraction of industry and business to the young people, and the growing numbers of farmers who are migrants to the Arab countries. Such factors must be considered when planning for job opportunities in the new communities according to actual needs of development in terms of employment.

The 1960s witnessed a big change both in the number of the working females and their occupational structure. A big shift from agriculture to other sectors took place and there was a large increase in the proportion of female white collar workers, with a smaller increase in the blue collar groups. Table (2-17) shows the percentage of the female labour force according to occupation category 1961-1969. Females participation in agriculture is decreasing but in white collars is clearly increasing which must be considered in job provision.

In the early stages of development in the developing countries, most activities are carried out in small privately-owned enterprises. But as the level of development increases, this system gives way to more complicated types of economic development of large-scale and mass production. In 1960, 40.8% of the Egyptian labour force were self-employed and/or unpaid family workers, while the employees were 49.5%, whilst in 1970, the first category comprised 37.9% and the latter 46.8%. Both sexes experienced the same changes in employment category, but with varying rates of change as shown in Table (2-18).

It is noteworthy that while the agricultural labour decreased from 68.0% to 47.6%, the industrial labour increased from 11.5% to 18.7%. If the labour force of manufacturing industries of the other economic sectors, such as transportation, commerce and services, is taken into account, the increasing importance of industrial development will be clear, and that may provide the basis for the industrial new towns in Egypt if the right policies are pursued to encourage industry.

Table (2-19) shows the percentage distribution of the labour force by economic activity 1897-1974, while Table (2-16) shows them by category of occupation in 1937-1971. Both tables demonstrate a clear increase in the industrial labour force of the country which gives a wider scope for industrial development in the new settlements.

2.7 Economic Background

For a long time, agriculture was, as it still is, the main source of living for the majority of the people in Egypt, such that it constitutes 32% of the gross national product(44). The country has made a considerable economic progress during the last two decades, especially in the field of industrialisation.

2.7.1 Agriculture

As mentioned earlier in this study, the growth of population in Egypt is much greater than that of the agricultural land (Sections 1.1 & 1.2). This resulted in the drop of the per capita share in the cultivated area from about 0.53 feddans to about 0.18 feddans during the last 8 decades, Table (1-1). To keep the per capita share of the cultivated land in 1970 the same as that at the beginning of the century, the crop area would have to be increased to 23.3 million feddans. But the crop area of the country has been increased from 6.8 million feddans in 1897 to only 11.9 million feddans in 1974, due to the system of the permanent irrigation and the use of fertilizers and advanced methods of agriculture, see Fig. (1-1).

During the years 1962-1972, £.E. 350 millions were invested in agriculture and irrigation(45). The production per feddan has considerably increased but it is still less than many other countries. Self-sufficiency is the aim of development, especially in agriculture. Both the increase of the cultivated area and the promoting of animal wealth is vital in this connection. Securing different fertilizers and insecticides, mechanisation in farming, improving services, and organising marketing operations are also essential. Many projects are still needed to make more use of the High Dam and to avoid the possibility of its harmful side effects on the agricultural lands. Hopes are increasing in Asyut and South Egypt Region for a variety of development projects, especially agricultural expansion via irrigation

based on the surplus water stored in the High Dam Lake (see Section 6.2.7).

Cultivated land is still insufficient to provide the majority of the people in Egypt with their needs, although the area used for livestock is comparatively big, its production is insufficient. For example, cow's milk yield is about 1,500 pounds per year, whereas it reaches about 6,000-7,000 pounds per year in some other countries(46). This is due to exhausting the capacity of milk-producing animals in work. Another example can be found in animals of burden, like donkeys and horses which are still widely used in Egypt and consume lots of fodder which could be saved for milk-producing animals if tractors and mechanical means were used instead. Raising the productivity of the livestock needs selecting better species and advanced methods for breeding.

About one-third of the gross national product comes from the agriculture sector which provides the way of living for about 70% of the total population(47). So, the progress of agriculture and land reclamation will mean the progress of the general economic development of Egypt particularly in the new settlements. It will be necessary to overcome the difficulties such as the insufficient investment, the flow of migration from rural to urban areas or outside the country, the primitive agricultural tools, the high rate of illiteracy, the spread of epidemic and social diseases among the farmers, the pygmy land ownership and the lack of organised systems such as co-operatives and unions of the agricultural workers.

Agro-industrial projects, poultry and animal breeding, and dairy products can contribute a lot to agricultural advancement in Egypt to diversify the methods of utilizing the land, and to create more employment opportunities for the rural population in both existing and new settlements. This will give the latter more purposes.

2.7.2 Industry

During the period 1950-1970, industrial production has been increasing at a rate of 11.4% annually. In 1952, industrial production did not exceed £.E. 232 million, while in 1970-1971 it was more than £.E. 2424 million. The share of the industrial sector in the national income has risen from about 8% in 1952 to about 22% in 1970-1971(48).

The advancement of industry is considered as the most important base for economic growth in Egypt to raise the standard of living, support the economy, create more work opportunities, and to raise the manpower productivity.

Major industries are concentrated in metropolitan areas of Egypt. Industrial planning aims to distribute industry wherever possible. This was partly achieved in the 1960's and 1970's, but new towns are expected to play an active part in industrial decentralization in Egypt, similar to that role of the British new towns programme after the Second World War. Many of the problems of Britain at that time were similar to the problems of Egypt now-a-days: overcrowded urban areas with a concentration of industry, acute housing crisis, lack of building materials and resources, shortage of transport and other services. The new communities policy in Egypt should also aim to provide cheaper land and better environment and services for industry than those in old urban areas.

Most of the industries existing in Egypt before 1950 were consumer industries based on agricultural products such as food, textiles and furniture industries. After the 1952 Revolution, there was a defined industrial plan to consider the national interests not just for realizing quick profit. The foreign trade balance was a major aim, but the wars of 1956, 1963, 1967 and 1973, in addition to political complications, caused a great delay in the expectations of such a plan (see Section 1.7 above).

The total value of industrial production rose by 285% between 1952 and 1968, and Gross value added from industrial activity rose by 163% from 1970 to 1975(49). The spinning and weaving industries continue to make the greatest contribution to the national economy.

Plans must aim to establish small factories in the new rural and urban areas to provide more opportunities, decrease the present rural/urban migration and encourage more dispersal of industries.

Table (2-20) shows the distribution of factories of 10 workers and more, and those of 500 workers and more in selected governorates. The concentration of such factories near the big cities, such as Cairo and Alexandria, requires to establish industrial new towns to reduce the pressure on the existing cities.

2.7.3 Mining and Petroleum

The principal mineral products in Egypt are: petroleum, phosphate, manganese, iron and sodium. Building materials that are available include limestone, clay, aggregates and sand. There are still vast areas of the desert which are untapped, where exploration may reveal further resources.

In addition to the Suez Gulf and the Red Sea areas, the Western Desert is expected to produce big quantities of petroleum in the 1980s. Petroleum exports from Egypt reached \$3,000 million in 1981 which is 10 times as much as petroleum exports of 1976(50). But local consumption is increasing. It was 226,000 barrels per day in 1979-1980 increased to 270,000 barrels per day in 1980-1981. Such growth might continue, which will decrease the exportable surplus. Estimation of output is no less than one million barrels per day by 1983(51).

As already mentioned in Section 1.8.1, Abu Tartur Plateau in the Western Desert has started to yield huge quantities of phosphates. In this connection a new settlement is being established on the plateau while a railway is extended to Port Safaga on the Red Sea to form the first latitudinal line in Upper Egypt. The same development can take place at areas with such natural resources which will require to establish new settlements associated with sufficient infrastructure.

2.7.4 Production and Consumption

The short fall of finance from the local generation of income has resulted in the dependency to some extent on the external sources such as foreign loans and financial assistance encouraged by the open-door policy in the late 1970's which also had its side-effects (see Section 1.7 above).

The increase of consumption of consumer goods without a parallel increase in local production to match population growth led to increased imports of these commodities. Table (2-21) shows some imports of related consumer goods. The consistent increase in consumer goods must be met by land reclamation and agro-industries in the new settlements of potential regions (see Chapter Six).

There is a steady increase in the consumption of commodities in Egypt. From 1952 to 1975, food grains consumption has increased by 144%, oils by 397% and textiles by 163%. The rate of population increase in the same period was 2.7% annually, while the total consumption expenditure on food rose at a rate of about 22% annually.

On the other hand, although the total income has increased considerably, the rapid population growth has resulted in a much slower rate of increase per capita. Table (2-22) shows the national income and per capita income 1952/53 to 1975. It can be seen that while the total national income had increased from 1952-1975 about six-fold, the per capita income

had only increased by about three-fold. The large population increase was not accompanied by sufficient development of the available sources as agriculture, fisheries or mining.

Although the total per capita consumption of food is relatively high, that of certain foods like animal proteins, is far lower than many other countries. The daily per capita consumption of food was 933 grams in 1951, and 1227 grams in 1962, reaching 1301 grams in 1970. But the daily protein consumption was 68.5 grams in 1951 and reaching 85.1 grams in 1970. In 1975, the per capita consumption per day was estimated at 3,541 calories, and 90 grams of proteins of which only 15% came from animal proteins. That is a very low rate, compared with Sweden: 41% animal protein out of 80 grams, and U.K. 41% out of 88 grams, while in India the figure is 5% out of 45 grams(52). Malnutrition diseases are the outcome of lack of proteins, which necessitates to develop animal and fisheries products especially in the new opened areas, along with agricultural expansion.

The total consumption in Egypt increased from £.E. 1900.3 million in 1964/1965 to £.E. 2656.6 million in 1969/1970 with an annual average rate of increase of about 8%. Then it amounted to 4505.5 million in 1975 with an average rate of increase of about 11.6%. The Gross National Product (GNP) rose from £.E. 2191.8 million to 2926.8 million in the same period with an annual average rate of increase of about 6.7%(53).

The great increase in consumption led to a corresponding increase in the ratio of total consumption to gross national product. It amounted to 95.6% in 1975, Fig. (2-13). This resulted in the local saving falling short of financing the investments in some projects which led to dependency on foreign finance and loans, and increased the deficit in the payment balance which was about 4.8% annually from 1971-1972 to 1975(54), besides lack of foreign currencies essential to imported equipment and machinery for development projects.

f.E. Million

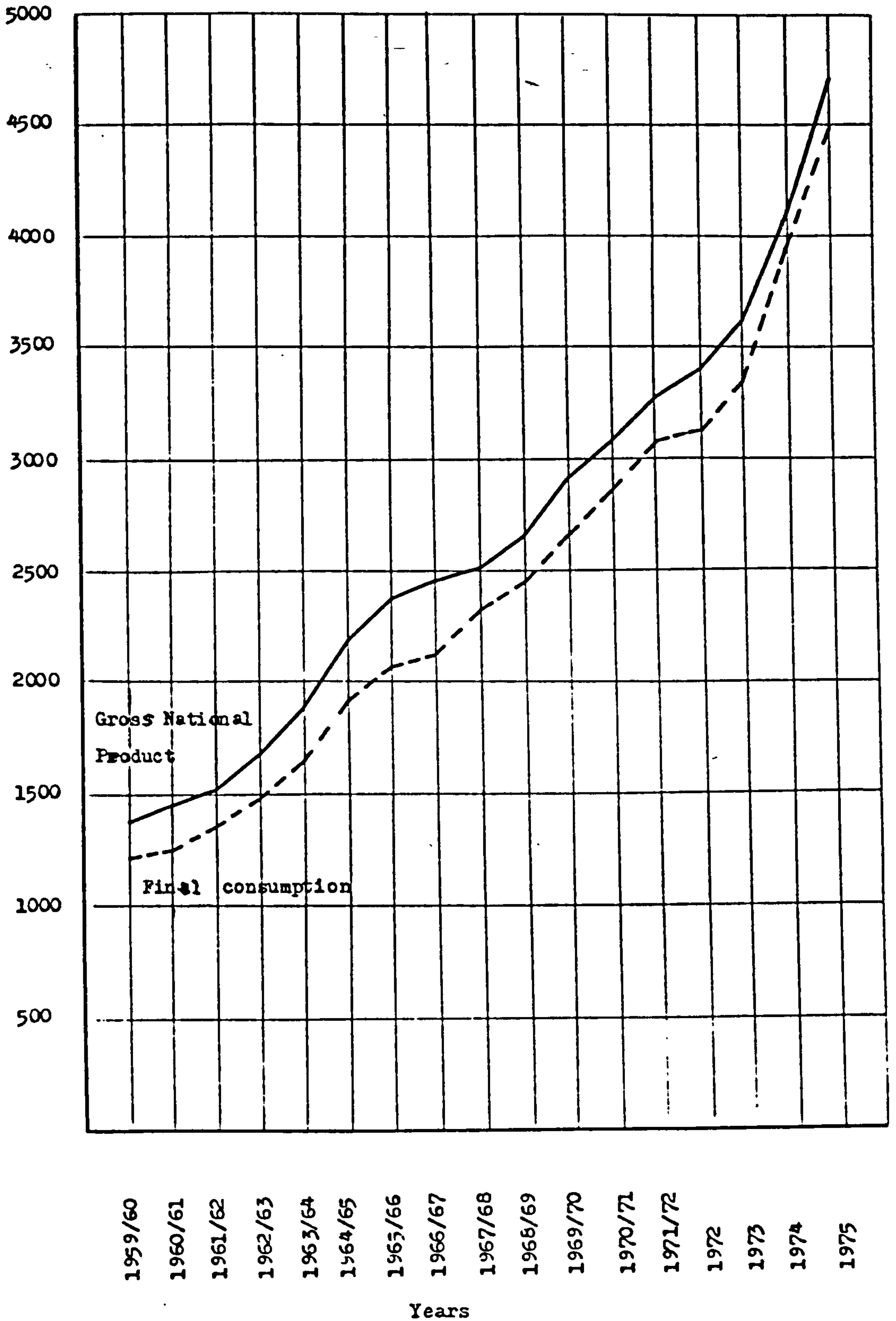


Fig. (2-13)
 FINAL CONSUMPTION EXPENDITURE AND GROSS NATIONAL PRODUCT
 1959/60 - 1975

Source : CAPMAS, Population and Development, 1978, p.289

Table (2-23) shows foreign trade in Egypt from 1973 to 1976 (\$ million). This table shows the deficit in the foreign trade balance which every effort should be made to improve, including the development of the desert potentialities. When satisfying the domestic needs, priority has to be given to production with the aim of export of rapid revenue products like cultivation of vegetables, fruit, flowers and dairy products, which can find their way to the European countries, especially in winter when the weather is still mild in the Egyptian deserts, besides satisfying some local needs for such products.

From 1930 to 1940, the rate of investment was almost constant: 7% to 8% of the gross national income. After World War II it ranged between 13% to 14%. In 1965-1970 it reached about 16.9%, and in 1972-1977 it reached 18.2%(55), but it is still below the requirements of expansion projects and services essential for the high rate of population growth.

Fig. (2-13) shows the final consumption expenditure and the gross national product 1959/1960-1975. It can be seen that while the gross national product is increasing, the final consumption is parallel or even approaching it.

2.8 Conclusion

The acute urban problem in Egypt has resulted from a large natural growth of population associated with a lack of proper development of the available potentialities for quite a long time. The increasing population is not accompanied by an equivalent increase in productive sectors, especially agriculture.

Overcrowding and high densities exist in both urban and rural areas, while desert lands with considerable potential are almost empty of population. Rural/urban migration has worsened the situation in metropolitan areas and big towns which already suffer from lack of housing

and services. Recently, external migration forms the problem of brain-drain and lack of skilled labour in different sectors, including industry, construction and agriculture. That adversely affects development plans.

High fertility accompanied by a decreasing death rate, especially infant mortality, and by the small per capita income, resulted in a higher percentage of dependency which hindered development plans. This situation is slightly improving and the elder age groups realize bigger percentages, while the numbers of educated and trained people are increasing in the last few decades. These population trends are important to provide the new settlements with the proper manpower and the professional skills essential for development.

The increasing consumption, without a parallel increase in gross national product, led to increasing imports of consumer goods, which means a deficit in foreign trade balance. That emphasizes the need to plan for more productive projects to be accommodated in the new settlements, not only to satisfy the national needs, but also for export purposes. Industrial development can contribute to production and absorb considerable numbers of the increasing population in the jobs it can provide. The development of other available potentials, like petroleum, mining and fishing, can provide more job opportunities and greater outcomes. To diminish the foreign trade deficit, or even to convert the balance in favour of the country, should be the aim of mapping any future plan, along with the provision of satisfactory services for new generations, particularly those who will spread development in the new settlements outside the Nile Valley. These new settlements should be much bigger than those of the UK where population increase is clearly less than that in Egypt.

CHAPTER THREETHE BRITISH EXPERIENCE FOR NEW TOWNS' ESTABLISHMENT IN EGYPT**3.1 Introduction - A Historical Background**

Since the dawn of humanity, the people have been building new towns. The Romans, Greeks, Pharaohs, Chinese and others before them, wrote about new towns(1), some of which were built and are now archaeological monuments. New towns help to re-structure the old urban areas by drawing people and activities away to more congenial new communities with sufficient jobs and services, giving the cities the space and time to improve conditions for those who remain.

The British new towns, Fig. (3-1), which have been developed since the second world war and which have their origins in the earlier private experiments at Letchworth 1902, and Welwyn 1920, near London, represent one of the social, economic and aesthetic achievements of the century. It is important to understand the background before any lessons can be drawn from this experience.

Before Ebenezer Howard, the industrial revolution of the 19th century led some of the more enlightened British industrialists to build good houses for their workers near their factories, as Cadbury at Bournville near Birmingham, and Levers at Port Sunlight, 1889, near Liverpool. Those were steps forward showing that the national conscience was beginning to stir and that the link between housing and industry was beginning to be reorganized(2). The path which we know today had appeared to build a whole new environment with its services, job opportunities, housing, schools and places of interest, recreation and entertainment. The starting point of the concerned new towns movement came in 1898 with the publication by E. Howard, then a shorthand writer, of his famous book, "Tomorrow: A Peaceful Path To Real Reform"(3), which was reissued in 1902 as: "Garden



Fig. (3-1)

THE BRITISH NEW TOWNS

Source : M. Aldridge, *The British New Towns, A programme without a policy*, 1979, p2.

Cities of Tomorrow". It was translated into five languages, including Japanese. Howard condemned the smoke and squalor of the industrial towns as "ulcers on the face of our beautiful island"(4).

To Howard, new towns were the way to escape from the congestion and social evils of urban life in Britain. He saw a town as a complete social and functional structure, with sufficient jobs to make it self-supporting, spaciouly laid out to give light, air and gracious living and surrounded by a green belt that would provide both farm produce for the population and opportunities for recreation and relaxation. Half-a-dozen such towns, separate but linked by a rapid transport system, should, he suggested, form a "social city" catering for the complete needs of about a quarter of a million people(5). To get support for his ideas and to be known, Howard founded the Garden City Association(6).

When Howard started to build his first garden city at Letchworth in 1902, and the second at Welwyn(7) in 1920 neither was anything like the theoretical shape given in the book in 1898. These proved that his ideas of the garden city were fundamentally sound, and Howard believed that the only way to get anything done was to do it yourself.

In 1921 the government set up a Committee under the Chairmanship of Mr N. Chamberlain, which reported in favour of the new town idea. Ten years later, and with the expansion of London continuing, the Greater London Regional Planning Committee recommended the building of new towns as a matter of urgency. A further committee, under Lord Marley, reported in 1934 in favour of new towns, but again nothing was done.

When Howard died in 1928, there were other equally powerful and determined advocates. The need for planning to tackle the national problem of over-crowding, and urban sprawl became acute in the late 1930s. More and more people were drifting away from the northern counties in search of jobs, and London was still expanding(8). While war was in sight, there were

a concentration of people and industry in the south, where the first blows of the war were expected. On 8th July, 1937 the Royal Commission on the Distribution of the Industrial Population was established, under the chairmanship of Sir Montague Barlow, to inquire into the causes which have influenced the geographical distribution of the industrial population and to suggest what remedial measures, if any, should be taken. The publication of the Commission's report was delayed by the outbreak of the war. This report recommended the establishment of a central planning authority and a further examination of the land problem; some members again pressed for a more forthright programme, including the building of garden cities and satellite towns. Meanwhile the jerry-built houses spread across the countryside, with ribbon development along the main roads though against the law, and bungalow settlements of converted buses and railway coaches were only 20 miles from London. The big local authorities sought to solve the housing crisis by building massive one-class housing estates without jobs, society needs, or sufficient services(9).

Lord Reith was appointed Minister of Works and Buildings in October, 1940 to advise on the post-war problems of reconstruction, while the determination not to return to unemployment, slums, and planless chaos of the 1930s prevailed. Lord Reith very quickly secured government acceptance of the need for national planning and in 1943, at the height of the war, the Ministry of Town and Country Planning was set up. Within a year, legislation was passed through Parliament intended to enable the war-damaged areas to be replanned as a whole and rebuilt. That was in the Town and Country Planning Act 1944 to follow a recommendation of the Uthwatt Committee, which Lord Reith set up in 1940(10), making the planning control of the 1932 Act (hitherto a matter of local option) compulsory throughout the country.

The Greater London Plan of 1944 firmly established the idea of the

new towns use in the U.K. In 1945 and at the end of the war in Europe, swift action was needed. Thousands of servicemen were returning home and desperate housing and shortages made the development of new towns a priority. A committee under Sir George Pepler had worked out the basic principles for planning new towns and the various possible ways of getting them built. But Lord Sillkin, the Minister, quickly saw that a departmental report was not enough. He needed the backing of influential and experienced people in the outside world of administration and finance.

Lord Reith, famed for his organising genius and first Minister in charge of post-war reconstruction, was an obvious choice. An advisory committee was quickly set up, not to advise on whether to build new towns, but how. Reith's first Interim report(11) on the question of agency was produced in only three months (March 1946). Government-appointed agencies were to be set up. These development corporations have proved their worth since their establishment as the most effective instrument for undertaking comprehensive development projects on a massive scale. Reith's second report dealing in detail with the legislation needed, followed a few weeks later (April 1946)(12). The final report, containing a remarkable exposition of the planning principles and of the necessary organization, was completed in a further three months (July 1946)(13). In eight months the New Towns Committee made an exhaustive study of the subject, called into consultation a great number of official and voluntary bodies, business organizations and individual experts, and produced three lucid and decisive reports with a maximum of content in a minimum of words. The committee collected and digested a vast amount of advice and converted it into terse and practical recommendations which was largely due to the skill of Lord Reith as chairman(14). Legislation was drafted even while the committee was still sitting, and the New Town Act, May 1946, was passed by Parliament(15).

Although there was much opposition and stormy meetings against new towns, between 1946 and 1950, 14 new towns were started(16) to meet specific needs such as to house workers or to accommodate particular industries, and eight of them to take overspill from London. The attraction of industry was the key to success because people would not move without jobs. The new and rapidly growing post-war industries welcomed the opportunity of cheap land and government capital for factory building(17).

The first new towns faced many problems including idealized plans, scarcity of labour and building materials, and financial shortages and complication. But it was the long-term vision that mattered the courage of the post-war Government to take the risk and learn by experience. New towns are now a well-tried instrument of physical and economic progress, accepted and supported by all the political parties.

Though accommodating a small proportion of the population at great expense, the success of the new town idea led eventually to design a "new city" in Milton Keynes in 1967 for about a quarter of a million people, to the doubling of size of some older towns and the expansion of many others.

In the sphere of professional thought and activity, new and far-reaching planning ideas have been developed, with a better understanding of peoples' needs and sophisticated methods of analysis, prediction and financial appraisal(18). Despite thirty years of propaganda, two half-built towns were all that was achieved in Howard's time.

Some people have said that Britain needs more new towns(19), because many areas of the big cities are still congested and over-crowded, too often with squalid conditions. Two such examples of old towns renewal is that carried out by Merseyside Development Corporation, in Liverpool, and on a bigger scale, in London; both of them is to develop the dock areas. On the other hand, it may be argued that Britain has got sufficient new towns for a country with virtually no population growth, or even too many, as

evaluation

in Merseyside where new towns represent a problem, when efforts should be directed to the renewal of the existing urban areas. Both opinions have their grounds, but it is wise to determine the solution according to every individual circumstance.

3.2.1 Legislation

An argument about the new towns legislation in the UK is essential to show their influence in the new towns success. The New Towns Act 1946 can be considered the legislative base of new towns development in the U.K. Despite the previous trials in Bourneville and Port Sunlight and elsewhere, or the pioneering work of E. Howard and his colleagues at Letchworth and Welwyn, there was no real knowledge of the organisation and finance required in the development of a new town. The social problems that might emerge were insufficiently understood.

The report of the Barlow Royal Commission on the Distribution of the Industrial Population, 1940, has since been described as the "essential basis of the post-war British planning system"(20). It established the principles of urban containment and the decentralization of population and industry which supported post-war new town legislation as part of wider planning. The Commission was concerned with the drift of population from the country to the cities and from the north and west to the south east, and how it could be held back. The predominant theme of the rest of the report, is physical health, not social disorganization(21). The Reith Committee's(22) quick and active discussions and its scope of recommendations gave a solid basis for the forming of the 1946 and subsequent acts, providing a strong administrative framework for new towns to develop the road ahead.

It must be appreciated that the opposition to the new towns was strong even after Parliament had given its blessing. Legal action in the courts and local resistance insisted that the new towns would never be built

or would be the biggest white elephants of all time! All these forces combined to try to stifle the idea at its birth, but the development went ahead until eventually it was said that 'new towns are the gold mines of the future', see note (28).

The Reith Committee's First Interim Report recommended that the development agency must retain the ownership of the whole site and be responsible for the plan and its execution as well, besides providing necessary services to be taken over later by the local authority. It was not to be expected that complete sites could be purchased by free negotiation, so it was necessary for the government to have "full powers for compulsory purchase of approved sites on behalf of the agencies appointed to hold and develop them"(23). The corporations were given powers to acquire sites sufficient for complete towns, to undertake all the necessary kinds of development, including the provision of houses, factories, commercial buildings and public services, to appoint and employ full-time officers and constructional workers - in fact, to have all the powers that an ordinary large-scale developing landowner would possess, plus one or two of the powers usually exercised by local authorities. They were not, however, to replace the local authorities, the site of each town was to be made a separate county district for which the authority would be elected in the ordinary way. The public loans advanced by the government were to be repayable over 60 years.

The New Towns Committee saw that there must be a single agency for each scheme for a new town to be responsible for planning and development. The most suitable form was thought to be a government sponsored public corporation free from day-to-day administrative control by government and consequently from interference, but with full and direct responsibility, and the freedom of a commercial undertaking. A mutual confidence must be developed with the citizens of the new towns. Local

employment and a representative mixture of social groups should be aimed at.

Silkin's New Towns Act of 1946 generalised the proposal to establish the new towns in a more thorough way than could have been expected, and together with the Town and Country Planning Act of 1947 created a system of land-use control and a machinery for positive town construction that was completely revolutionary.

There have been four major acts laying down the legislative status of new towns. Those of 1959 and 1976, dealt with the Commission for the New Towns and with the transfer of new town housing assets respectively, whilst the 1965 Act up-dated the original 1946 legislation, and consolidated the 1959 Act for England and Wales(24).

After the first New Town Act of 1946, a major modification to the legislation was introduced. The New Towns Act 1965 was merely a consolidating bill, bringing relevant acts of 1944, 1946, 1959 and 1962 into orderly form(25). Paragraph 15, of the 1965 Act, raised the number of board members of a developed corporation to a maximum of eleven, plus the chairman and deputy chairman. The Bill provided that, subject to central approval, schemes could be prepared to transfer the housing and related assets from the development corporations or the Commission for the New Towns, to the district council in those towns that are substantially complete.

Leasehold Enfranchisement is the general term used to describe various proposals, canvassed from time to time since the last three decades of the past century. That is to give a leaseholder the right to acquire compulsorily the freehold interest in his property if and when he chooses, irrespective of the landlord's wishes, on terms governed by statute. Under this scheme leaseholders would be enabled to obtain their freeholds at a price which, even if it does not ignore altogether the value of the reversion,

would be substantially less than the market price.

It is to be remembered that both landlord's interests and leaseholder's property are quite legitimately bought and sold every day at prices which reflect their market worth and take account of the rights attached to them(26).

3.2.2 Finance

┌ The greater part of the cost of building a new town is that of housing, factories and other buildings(27).└ The initial expenditure is on the purchase of the land and the provision of roads, sewers, open spaces and various services which will not produce a full return for some years.┘ The Reith proposal was that funds would be borrowed from Government until such times as income was sufficient to match expenditure. The money for the repayments would come mainly from the rents of the houses, shops and factories so that in a sense the people who live, work, or do business in the town actually pay for it. New towns may prove to be, as Sir Henry Wells predicted in 1968, the 'gold mines of the future'(28). During the first few years of development, there may be some burden on the rates paid by the new settlers. After a period there should be sufficient revenue to cover the loan repayments. If at a later date there is a surplus revenue, the corporation should make good to the promoting authority, in the central government, the amount of the original loan. If private capital is involved in the development, safeguards would have to be provided.

The risk is the government's of course. If there were an overall loss on any town it would fall on the taxpayer, and if a town were to make a surplus, the treasury could claim it.

The cost of building a new town is met from a variety of sources other than central government: the local authority services have to be met by the responsible authority in whose area the new town was situated and

are paid out of local rates. Some of these services, for example schools and roads, are themselves subsidised by central government as in any other town(29), and some costs, housing for example, would have to be met (privately or publicly) wherever people live. The corporations can also themselves contribute to the cost falling on the local authorities. Such monies are also borrowed from central government and again have to be repaid over a specified period.

3.3 The Way The British New Towns Were Built

To learn the lessons of the British experience in new towns establishment, one has to examine the way those towns' development took place, the difficulties the towns faced before they were built, and of course, the changes in their planning attitude during development.

Since the designation of the first British new town, Stevenage, on 11th November, 1946, and with changed circumstances and the evolution of planning thought, a number of significant changes have occurred in the physical planning of new towns(30), such as the size of population and social needs, neighbourhood planning, pedestrian segregation and road pattern, parking and garages and so on.

3.3.1 Designation Aims

In theory, all land in Britain is held on tenure from the Crown with the right of the Crown at any time to repossess, but this is a polite fiction. Solid justification is rightly demanded, and it must have the seal of approval of Parliament(31).

During the industrial revolution many acts were passed to facilitate the building of railways, docks and waterways, which were vital to the economy, and to make possible water supplies, sewerage works, and a whole range of civic action essential for the public health, for education,

recreation and housing which had become accepted as the responsibility of the State.

Indeed, the more advanced civilization becomes, the more dependant a nation becomes on ever-increasing industrial efficiency; the more prosperous its people become, the more demanding they are in terms of living conditions, both for work and leisure; and then the more important becomes the need to control and direct the use of land for the benefit of the nation as a whole.

The aim in most of the new towns in Britain was to relieve pressure on over-crowding in big cities such as London, Birmingham, Liverpool, Manchester or Glasgow. Social and economic reasons required that the new towns be sited within a reasonable distance of a major city, not too near to be in danger of coalescing, destroying green belts, or encouraging commuting, nor too far to destroy commercial and industrial ties or split up families too much.

In some cases new towns have been built to provide housing for workers and sometimes in particular industries, because the town must be built near the jobs, for example where established industries or raw material extraction is concerned. The social and economic well-being of the people who live or will be living in the town should be the paramount considerations, in keeping with the national interest as much as possible. There are two views of new town establishment. Development of a new town on a virgin site "gives better scope for imaginative planning and avoids the difficult problem of integrating new and old populations and possibly destroying established communities". On the other hand, "if an established town is taken as a nucleus, it has tradition, local character, a range of amenities, and a social life into which, given goodwill on both sides, the new population can readily be absorbed". "Both types of town have been built and in the long run may be equally successful"(32).

Water for domestic and industrial use is of first importance. A modern town of 60,000 people, with associated industry, will need over four million gallons a day. A gentle slope is advantageous for drainage, design and landscaping(33).

Transport facilities in relation to raw materials and markets are very important, while expected traffic within the town should be well organised.

The decision of the establishment of the new town does not rest with the minister alone, many other departments are concerned -notably the Treasury and the Ministries concerned with agriculture, transport, and industry. It is also essential to know about the site of the new town and to consult the local authorities, while a public inquiry gives individuals the opportunity to participate in the relevant discussions. Organized development may take less land than unplanned or disorganized building where waste of land usually occurs.

3.3.2 Management Institutions for New Towns

The corporation for developing town's land comes into being by an order of the Minister. Its constitution is a Chairman, deputy chairman, and eleven members. The corporation is a legal entity able to hold the title to land, take decisions and legal processes necessary in the course of building the town. The county council and the district council remain responsible in the new town's area for all the normal services. The Minister is answerable to Parliament for the activities of the development corporations. The local authorities are consulted on all development proposals. One or more of the members should be resident in, or having special knowledge of, the locality in which the new town will be situated(34). Members are appointed because of their ability to contribute something of value to the pool of knowledge or ideas. So members must have a variety of skills and professions, Fig. (3-2), and they must work as a team in the interest of building the best town they

can, and get on good terms with the local people and authority.

The chairman of the development corporation must keep a firm grip on policy and be able to understand technical details with confidence in the staff.

The first job of a development corporation is to appoint the staff. Planning consultants or outside firms are sometimes engaged to carry out feasibility studies or to prepare the initial Master Plans.

New towns cannot be built by departmentalism of numerous committees. The task demands a breadth of view that goes beyond the expertise of any one profession. That can come only by employing a great range of experts(35).

The corporation has to submit each of its projects for statutory approval by the Minister. It can proceed with considerable freedom of action so long as certain guidelines on public policy and expenditure are followed. A close liaison with the Department of Environment, and frequent consultations with Local Authorities and Organizations are important. The corporation is bound by the normal statutory controls on development as building regulations, Bye-laws and Public Health Acts.. and so on. It uses funds for the approved annual capital programme, and may also use private capital or institutional funds(36).

Management in the corporation operates from Board level downwards. Board members are drawn from localities, industrial and commerce experience or social services. They are appointed on a part-time basis for 3-4 years which can be extended. Because they are not elected, they can take courageouse approach to problems. Meetings are held monthly to discuss the reports of the General Manager and the Chief Officers and to consider recommendations. The General Manager leads the weekly meetings of the Chief Officers Committee. He is responsible to the Board for all the work of the corporation. The professional project-teams implement the programme within specific terms and budgets. The Chief

Officers can have direct access to the Board to explain technical matters including the budget. A small Section of project co-ordination forms a part of the General Manager's department to prepare the multi-year programmes for present and planned projects of the corporation and other development agencies, to control and review the programmes, and to give progress reports, to ensure that the planning and execution of development tasks are carried out in logical sequence, and to keep the General Manager and the Board fully informed of progress at all times. A statistical service is carried by a Monitoring and Evaluation Group including land use and demographic data. The Public Relations Section contact TV and press agencies and issues publications.

Under each Chief Officer is one of the specialized Departments. The Architecture and Planning Department including Quantity Surveying and Landscape works, The Engineering Department for Survey, Soil Investigation, Transport Drainage, Structure and Contracts. The Estates Department for Land Acquisition, Housing, Commerce, Industry, Marketing, Property and Maintenance. The Finance Department for Management, Accounting, Payroll, Insurances and Computer Services. The Social Development Department, for Social Survey, and Community Development, forms an important part of the corporation structure. The Legal Services Department looks after Conveyances, Leases and Contracts and Statutory Procedures. The Secretariate and Administration Department for Board Administration, Reprographic and Machinery Office Accommodation and Staff.

The number of staff members depends on the size of the new town and hence the responsibilities of the corporation. In 1981, Warrington Development Corporation had a total staff of 448(Fig. 3-2). As the new town progresses, the number of staff, especially manual staff , decreases, see Appendix 1a. This is because of the reduced need for construction. The

staff is employed on a full-time basis, but sometimes engaged only for particular works.

For the very large developments, the physical area could be divided up to be developed into a number of separate parts, each the responsibility of an area Executive with his own inter-departmental structure. When assets are developed and completed, they will be handed over to the local authority if there is one near the new town, otherwise the development authority has to run the new town particularly by housing, commercial and industrial assets.

Management accounting is necessary to translate the physical plan into a financial one, and proper forecasting and budgeting can be carried out. The authorisation of expenditure has to be within the budget, and designed to benefit the executive and the Board rather than as a system to assist central government in controlling and monitoring expenditure. A recent trend in Britain's new towns is to sell their assets to fund further development. This is reasonable with reduction of governmental funds. Selling houses and other buildings enables to use the capital receipts to encourage private builders to boost their output especially of low-cost homes(37). This idea could apply to Egypt to realize faster development especially for cheap housing and scarcity of funds. In the years 1979-1981, assets sales in the English new towns raised nearly £300m., the greater part was via The New Towns Commission responsible for eight completed new towns. The sale of industrial, commercial and housing assets may increase year by year(37a).

Each corporation has to submit an annual budget, but for every major idea of expenditure they require Ministerial approval, and the Ministry must get the consent of the Treasury(38).

All the bodies concerned need to recognize that they must make arrangements to co-ordinate ideas among themselves. The experience of

one town should be available to all. So, the Reith Committee suggested the establishment of a Central Advisory Commission(39).

Because of the importance of taking over and the management of the property of the completed new towns, the Government established, a new body, the "Commission for the New Towns", in 1961. The task of the Commission is to plan for the "town" which must gradually cease to be a "new town". For example, it has been found necessary to leave about a 25 per cent margin for the ultimate population beyond the initial development stage. Thus, a new town planned for 100,000 will have to stop trying to get more settlers when its population reaches 75,000-80,000, and it is calculated that the ultimate population will then be reached in twenty years or so, by which time the age structure will be getting more in line with the national average(40). More houses, factories, shops and services will be needed to meet both actual and future needs, but the emphasis will turn more towards management and less towards new construction. There were three possibilities for the period after the completion of the town. The assets could be:

- (a) transferred to the local authority, or
- (b) to a national body, or
- (c) they could remain in the ownership of the Development Corporation with a modified construction.

The New Towns Act, 1946, Section 15(1), gave the Minister power to wind up the development corporation when he was "satisfied that the purpose for which it was established has been substantially achieved".

The Commission for the New Towns was intended to hold and manage the land, housing, industrial and commercial assets of the new towns in England and Wales. The remit of the Commission was laid down in paragraph 2 of the 1959 New Towns Act, and subsequently consolidated in Section 36 of the 1965 New Towns Act. The Commission is primarily a

STRUCTURE OF WARRINGTON NEW TOWN DEVELOPMENT CORPORATION

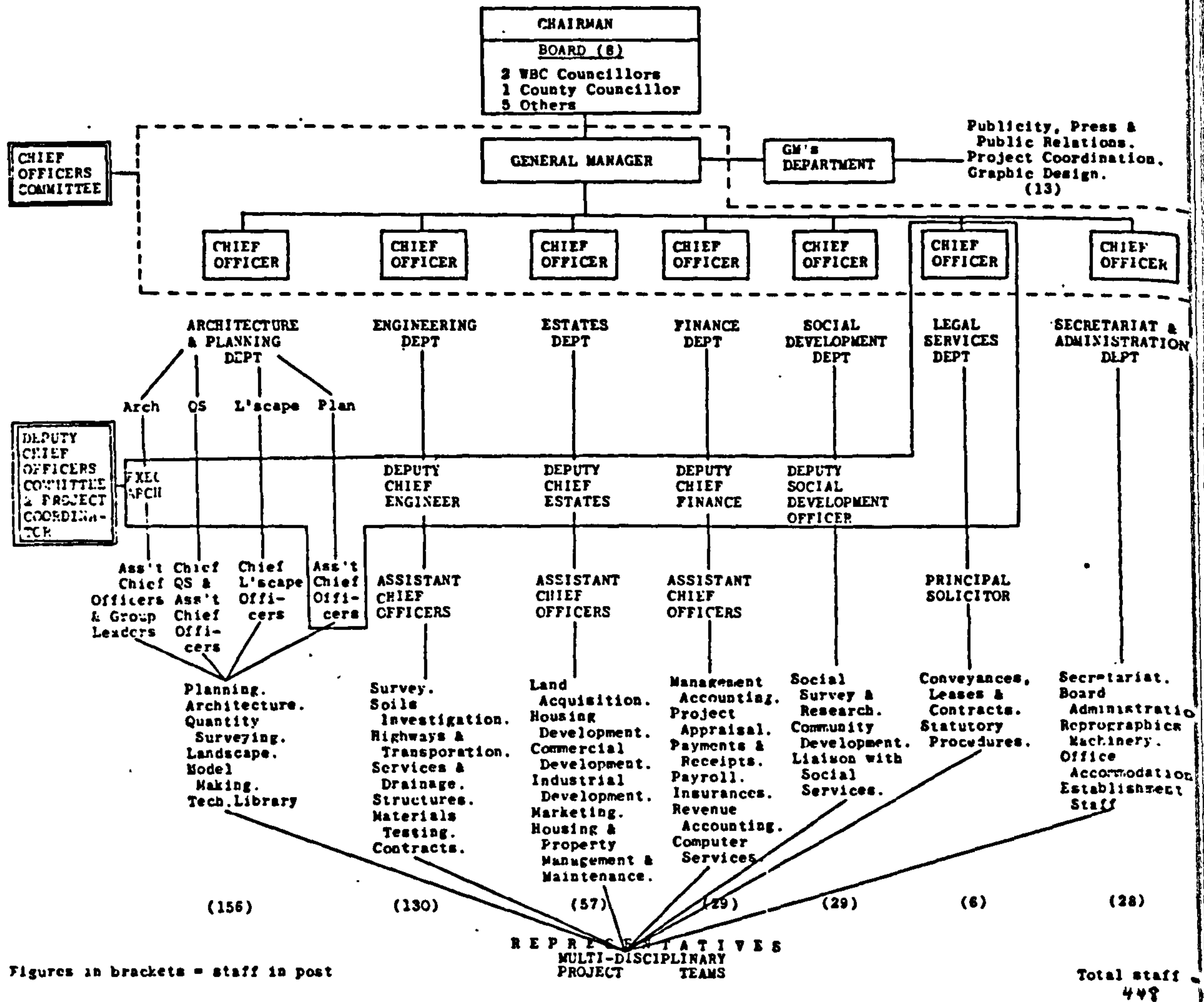


Fig. (3-2)

Source : Reg Thomas, The Project Co-ordinator, Warrington D.C. 1981

management rather than a development agency(41). The board of the Commission is of no more than fifteen members, including the chairman and the deputy chairman, based in London. It is appointed by the Secretary of State for informally, three years. In addition, there are local committees in each new town consisting of a chairman and eight to eleven members. The business of the committees is confined to the local application of policy including housing and facilities, maintenance contributing to local amenities and lending mortgage finance. They are served by a general manager and a staff many of whom transferred from the development corporation on dissolution.

All the new towns could be treated as a whole, especially from the financial point of view by the single Commission. Over the years, it will become responsible for assets of some £2,000 million or more(42). The relationships with the local authorities should become cordial and co-operative.

3.3.3 Planning Aspects

The Minister's statement of the total population proposed and the acreage of land designated must be according to the detailed studies for the preparation of the Master Plan. A great amount of information has to be assembled before the main structure of the town can be determined. Natural features such as contours, geology and archaeology, climatic conditions, landscape, and man made features as existing and anticipated population structure, ownerships, communications, buildings to be preserved, water and power supplies, drainage and sewerage, the economic and social structure of the area -are amongst the considerations that must form the basis of the new town's establishment. Changes in the national and international economic climate require the flexibility in a plan so that it can readily be modified. Many new towns are to be extended for a larger

population than originally intended which requires a very close re-examination of the whole thing.

The Master Plan must be based on the study of the expected traffic flow. Industrial development and its needs of acreage to provide sufficient jobs for the new town settlers should be calculated in the light of expected development.

Finally comes the programme. The building labour force is crucially important for the speed of construction. The existence of industry secures the number of available jobs and therefore the number of houses, shops and the needs of services and recreation facilities. Availability of finance must be carefully taken into consideration. The programme may last fifteen years or more which is a long time ahead for prediction and estimation. A programme that keeps in step with the growth of population must be carefully drawn up, implemented, and adapted when necessary in the light of experience and the changing financial basis. The programme must be achieved without shelving of responsibilities or the constant haggling about money. New and struggling communities must be encouraged to develop the richness of life that is essential to their success.

In each of the different stages of growth, especially the final one, it is important to define the age structure of the population, the number of children, the expected standard of living, the economic climate in the new town, and if there is any natural increase and its needs in terms of land and services expansions. Such studies are essential to determine the needed housing, jobs, shops, schools, health and recreation centres and so on.

In 1943, Forshaw and Abercrombie pointed out that the great sprawling mass of London had grown over the centuries from a series of villages and, although they had coalesced into one continuous built-up area, the old communities were still discernible, and in some cases were almost strangers. The County of London plan was based on the old villages and

towns as nuclei of communities. The same happened in some other conurbations all over the world. For example, in Greater Cairo one could find some rural communities until the sixties in Boulakel Dakroor, Aguza, Shoubra and many other districts(43).

It is not easy to weld the past growth with the planning and development of a new town. In 1898, the neighbourhood units were mentioned by E. Howard when towns of 30,000 people were to be divided into six 'wards', each with its own school and shops. Also the Greater London Plan included neighbourhoods in 1943 and 1944. In 1929 the American, Clarence Perry(44), had advocated traffic-free neighbourhood units. The Reith Committee(45) supported by the Ministry of Town and Country Planning recommended the idea. For many years the neighbourhood idea dominated new town thinking. But the neighbourhood should not be thought of as a self-contained community. It is necessary to create a sense of 'togetherness' in the new town to avoid the loneliness and separation. Housing should be such that people are neither too isolated nor too densely packed in crowded areas with consequent social problems.

Cumbernauld, designated in 1955 on a hill-top site, was planned as one unit, with a multi-level town centre including all the main shops, civic and cultural facilities. The surrounding houses are at a high density. Cumbernauld represented a revolt against the idea of separate neighbourhood planning, and was never so far repeated.

Traffic problems have been more carefully considered in the more recent new towns than was the case in the early examples. For instance, there are no traffic lights or pedestrian crossings in Cumbernauld, where the road accident rate is claimed to be only 22% of the national average(46). The consultants for Milton Keynes came to the conclusion that a high quality small bus service would give the best value for money.(47). But this can only be decided according to every individual case as in terms of number

of users, frequency demands and so on.

The 'Mark I' new towns of the 1940s and 1950s were designed with plenty of open space, green wedges and well-spaced out houses, very much influenced by the garden city enthusiasts. That resulted in the relatively low density as in Crawley, Stevenage and Welwyn Garden City. The 'Mark II' trend, represented only by Cumbernauld, aimed at higher densities to provide a more compact way of urban life. In time this trend gave way to the Mark III new towns with their low densities, as in Milton Keynes(48) which would have an overall density of about 8 dwellings to the acre (20/ha), see Fig. (3-3). A moderate density between the two trends, i.e. 12 dwellings to the acre, might apply if new towns are to combine the possibilities for a better life with making the best use of land.

Modern production methods need no longer cause pollution and factory buildings, especially the small ones, may be accepted even in residential areas, where people especially females, prefer employment close to their homes, shops and schools; and for decreasing traffic flows in the rush hours.

Master Plans must not follow a standard pattern because each new town has its own problems and its own taste. The planner must convince the authorities concerned and the general public of the validity of his proposals, and accept their criticism before the document is finally complete.

3.3.4 Population

The tendency towards larger new towns has been noted. The first group of new towns (1946-1950), Fig. (3-4), was influenced by Abercrombie's indication of about 60,000 population for each, and even more by the Reith reports. That might be called 'Abercrombie model' of decentralization and regional balance(49). Later on, this was gradually increased. In 1962 consultants of London's and Birmingham's housing needs concluded that it

would be cheaper per person in development areas to double the population than to add 50 per cent. Accordingly, the search was on for sites which could accommodate at least 150,000 with room for further growth if the need arose, without major problems(50).

The more recent group of new towns designated from 1967 to 1970 were much larger (200,000 to 250,000) such as Milton Keynes and Central Lancashire.

Also on the level of neighbourhood planning, numerous variations were shown. Some of the early new towns, such as Stevenage and Basildon, have had large neighbourhoods of 10,000 to 15,000 while others such as Crawley, Bracknell and Cwmbran have had relatively small neighbourhoods of 4,000 to 8,000.

By 31st December 1976, 704,433 acres had been designated for the U.K. new towns. The original population in the designated area increased from 1,169,209 at the date of designation, to 2,188,195 on 31st December, 1976. The increase of 1,018,986 people included the new settlers and the natural increase. The total employment in the new towns at 31st December 1976 was 1,005,253 of which 624,629 was for males and 380,624 for females. The number of school places was for males and 380,624 for females. The number of school places completed from designation to 31st December 1976 was 341,851. The estimated capital expenditure by DCs and NTC on housing since designation to 31st December 1976 was £1,330.945 m., while the estimated total capital expenditure including housing was £2,167.342 m.(51).

The housing units existing before designation were 89,544 owned by local authorities, and 223,912 owned by others. The completed units from designation till 31st December 1976, including DCs, NTC, LA and others, were 353,553 units (est.), while the total stock on the same date was 649,248 (est.), and 35,480 units were under construction. The total rented dwellings at 31st December 1976 was 220,348 (est.) of the DC, and 127,501

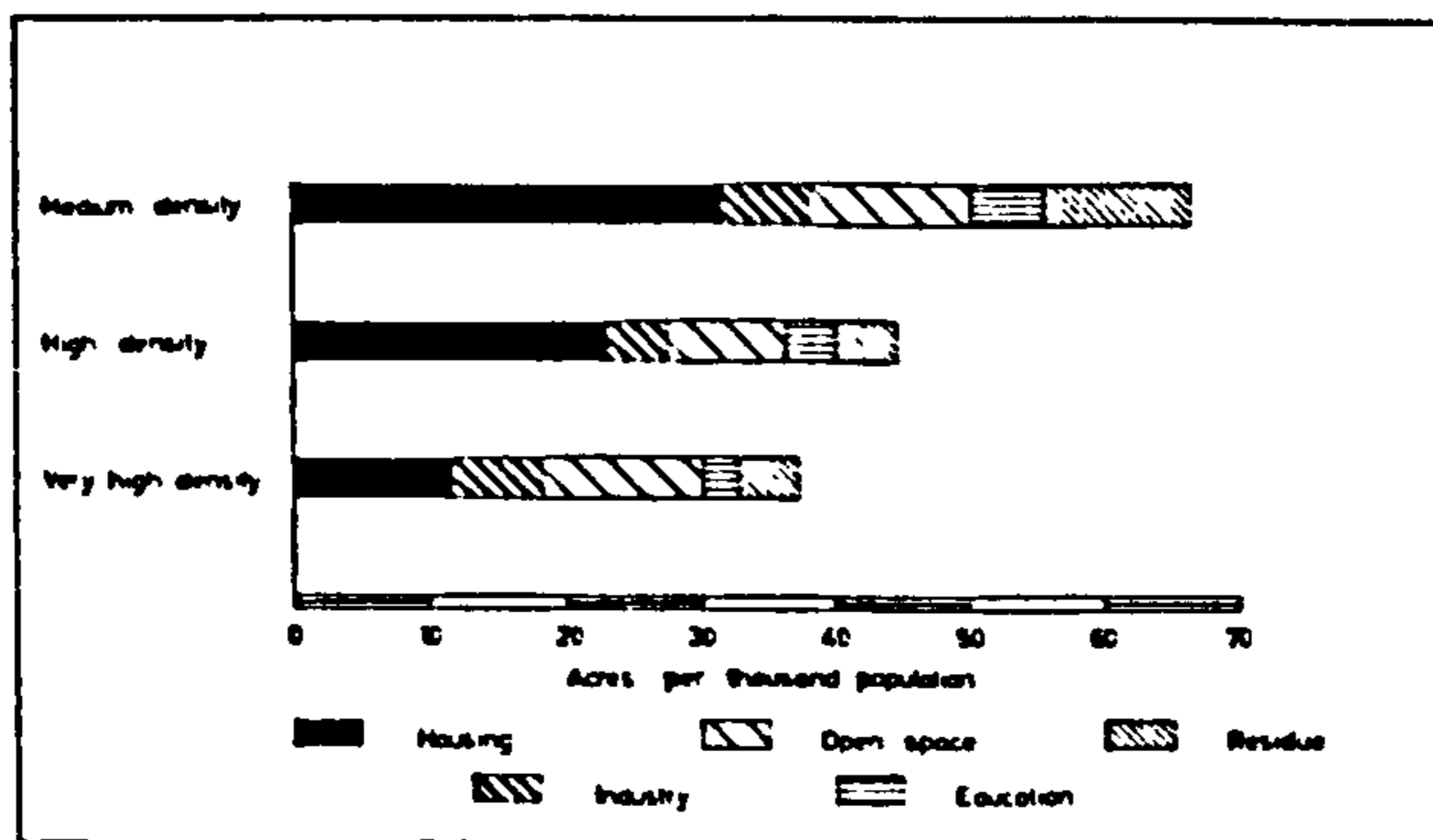


Fig. (3-3)

DENSITY TYPES OF THE BRITISH NEW TOWNS

Medium density : Average of Bracknell, Welwyn Garden City, Crawley, Stevenage and Hemel Hempstead.

High density : Average of East Kilbride, Harlow and Basildon.

Very High density : Cumbernauld only.

Source : New Towns, the British Experience, London, 1972 p.24

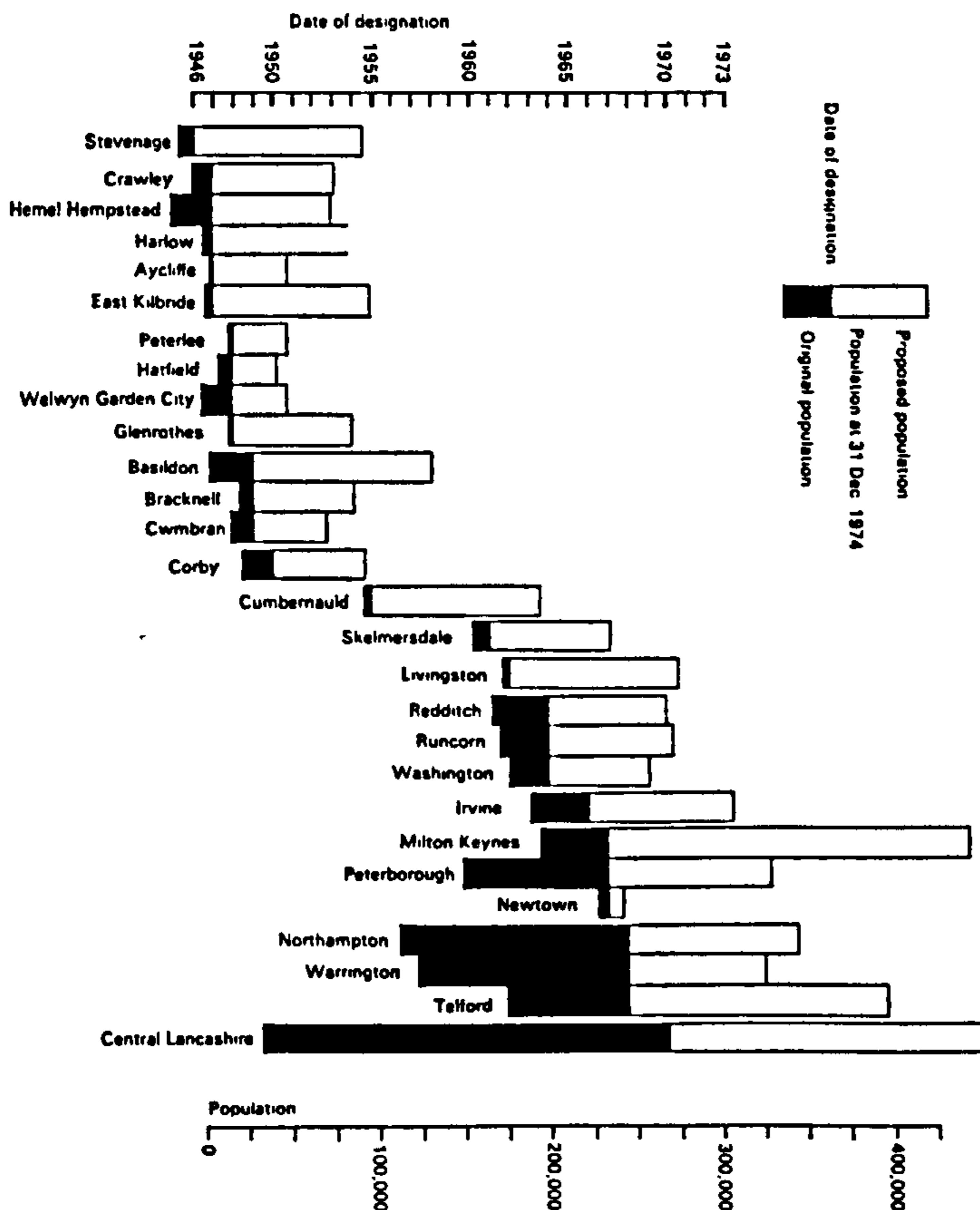


Fig. (3-4)

Population progress of the new towns.

Each new town is shown as a column proportional to the size of its population past, present, and proposed, and arranged in chronological order.

Source : Town and Country Planning, Feb. 1977, p90.

(For the 1981 population see Appendix 1).

of LAs, while the owner-occupied dwellings at the same date were 38,580(52).

Before designation, industrial employment in new towns was about 238,474, and this increased by 226,362 (est.) at 31st December 1976. 83,301,442 sq.ft. were added to factories including 439 units and 42 extensions, while 4,358,962 sq.ft. were under construction. The number of offices completed from designation to 31st December 1976 was 1,133 (est.) covering 10,422,065 sq.ft. besides 1,795,227 sq.ft. which were under construction. Completed shops covered 12,695,588 sq.ft.(53). Such considerable achievements indicate that new towns justify their existence, otherwise developments would overconcentrate the old urban areas.

In the Spring of 1977, the appraisal by the British Government of the future of existing new towns decided that induced growth in the first (1946-1950) and the second (1961-1966) generation of new towns should be allowed to continue until their current target populations were reached. But the target populations for the later third generation (1967-1970) new towns: Milton Keynes, Northampton, Peterborough, Telford, and Warrington were reduced to the point where the period of induced growth will continue only to the mid or late 1980s(54). There would be no enlargement of the designated areas of Bracknell, Harlow, Skelmersdale, or Stevenage, nor expansion of Basildon, Corby, Redditch or Runcorn(55).

3.3.5 Housing and Homes

The Government considered that the assets for housing were created by, and belong to, the nation. Housing was considered suitable for handing over in certain circumstances but not where it would make the local authority too large a landlord of housing in its own area.

In some cases a new town is but a part of a district council area, but in others it is clear that the new town forms part of a district.

In the residential areas of most new towns, except Cumbernauld, densities have been maintained at a 'suburban' level, with the majority of dwellings being houses with gardens.

There has been enormous variety in individual house design and this has in large part been the result of the different ideas which development corporations have adopted. Consequently, housing in the new towns is far less monotonous than in the old industrial cities where the quality of design, diversity and structure cannot be improved. But it is noticeable that all the new towns have favoured houses rather than flats, and low to medium rather than high densities. It is argued that the new towns should try to achieve a 50/50 split between owner-occupied and rented housing by the time they were complete(56). This was a requirement laid down by Crossman when he was Minister of Housing and Local Government in 1964-1966. Since the mid-60s there has been an impetus for the development corporations to encourage the building of a larger proportion of houses built for sale. This policy can save the agencies a lot of work in rent-collecting, and put more expense and important responsibilities for maintenance on to the owner-occupiers, the management of dwellings being in the hands of the occupiers themselves. In Peterborough, for example, a programme was drawn up with 90% rented housing and 10% owner-occupied housing in the early years, gradually swinging in the opposite direction to 10% rented and 90% owner-occupied in the years before the end of its period of induced growth. Table (3-1) shows the percentage of owner-occupied dwellings in British new towns, 1972-1978. The exceptional cases of some new towns as Milton Keynes, Northampton and Peterborough, were because a comparatively high proportion of population was living in their own dwellings, before the new town programme began. Also the development corporations intend to reduce the proportion of the total housing stock in the designated area in owner-occupation as in Runcorn and Reddich(56a).

On the national scale, over half of all dwellings are owned by their occupiers(56-b).

New town housing has been considerably affected by the economic and financial situations. For example, in the period of the strict control of

Table (3-1)

PERCENTAGE OF OWNER-OCCUPIED DWELLINGS IN BRITISH NEW TOWNS

	New Town	1972	1978
ENGLAND	Aycliffe	8.7	21.4
	Basildon	17.8	27.0
	Bracknell	25.6	29.3
	Central Lancashire	62.5	63.3
	Corby	11.0	20.6
	Crawley	37.5	42.8
	Harlow	13.1	23.9
	Hatfield	29.8	32.6
	Hemel Hempstead	31.7	40.0
	Milton Keynes	57.3	43.4
	Northampton	59.2	55.6
	Peterborough	54.8	48.2
	Peterlee	4.2	11.3
	Redditch	59.4	49.8
	Runcorn	36.1	29.3
	Skelmersdale	20.7	21.9
	Stevenage	16.1	37.8
	Telford	35.5	35.7
	Warrington	55.1	56.8
Washington	24.8	28.2	
Welwyn Garden City	27.2	28.3	
SCOTLAND	East Kilbride	12.0	17.5
	Glenrothes	8.1	13.8
	Cumbernauld	9.0	18.4
	Livingston	3.4	8.1
WALES	Irvine	26.1	18.3
	Cwmbran	18.6	21.2
	New Town	31.7	40.0

(FIGURES SUPPLIED BY THE DEPARTMENT OF THE ENVIRONMENT, 21 MARCH 1978)

Source: Meryl Aldridge, The British New Towns: A Programme without a Policy, London, 1979, p.101.

building materials in the immediate post-war period, the quality of housing was not up to the standard of later years. In the 1970s development corporations have been hard pressed to maintain the high standards which had been set in the late 1950s and during the 1960s.

Because tastes vary, houses that are praised by some can be criticized by others. That makes it essential to provide different types and standards of dwellings.

Financial crises leave their mark on building methods and standards of accommodation. Standards are lowered, designs modified, and fittings reduced or excluded. In 1952, the methods advocated in 'People's Homes' made it possible to build ten houses where nine were built before. Politically and economically it was, no doubt, necessary for homelessness had become a burning issue. Money, labour and materials were spread over more houses(57) which added substantially to the local authority housing stock and reduced waiting lists.

There should be houses to let at a wide range of rents including standards for low-income classes, houses for sale and land that can be bought, on which the purchaser or a group of purchasers can arrange for building. Housing and charitable organisations should be catered for. Local authorities also must continue to build houses of different standards to meet the housing needs of the original population of the area.

The main demand is for a family house, but there is also a growing demand for flats from single people or from the working couple without children. The rents of flats are usually higher than the rents of houses with similar accommodation. The first need more foundations, management and maintenance.

In most of the rented houses and flats in the new towns, repairs, external painting and other maintenance work is the responsibility of the corporation, while internal decoration is that of the tenant.

3.3.6 The Road Pattern and Pedestrian System

Extensive study of the traffic flow anticipated in the town at various stages of its growth must be carefully made, for the road pattern is a major consideration in planning for new towns. The move to much greater segregation of pedestrians was one of the major changes that accompanied the new towns. This segregation can be seen in the town centres, in neighbourhood centres and in the residential areas(58). One of the first examples was the Ongar study in the Greater London Plan, 1944. Off the main roads run a series of looped roads each serving one of the neighbourhoods(58a).

In the second period of the new towns, the residential neighbourhoods were often planned as pedestrian precincts. The neighbourhood is encircled by a distributor road from which roads branch. All cul-de-sacs are related to the houses round which garages are grouped, and there is no through road. There is generally a spine footpath to which the neighbourhood centre faces with near road access to the shops, and there are branch footpaths among the houses, some of which open to squares with seats and some accommodate children's playgrounds(59). Underpasses or overpasses can link footpaths and cycle tracks, as in Stevenage and Harlow, across the distributor roads, so that the whole town has a complete independent and safe footpath system.

The centres of Corby, Bracknell and East Kilbride, although they were originally built with main 'high streets', have since been converted to pedestrian precincts, while the through roads by the central squares at Harlow and Crawley have been paved over and converted to pedestrian areas. The town centres of the second period tend to be like vast departmental stores. The shopping city in Runcorn and recently the largest covered shopping area in Britain at Central Milton Keynes are two of the best examples with a variety of shops and services including car parks and public transport.

New towns need also a main road system to bring traffic into, around and out of the town. Improving the existing main roads and building new ones to be linked up with the main road system of the country is a major job of the corporation. Access and building on the frontage have to be severely limited in the interests of traffic safety.

3.3.7 Car Ownership and Parking Areas

The extent of car ownership is vital to any plan. As well as traffic generation it affects garage provision in housing which at first was one garage for every twelve dwellings being later gradually increased to one garage per house in many of the towns of the second period(60). But the latter were criticised for the prominence given to the private car. For example, the master plan of Milton Keynes is based too much on the assumption of universal car ownership, with its scatter of housing and jobs tied to a grid of highways. Ray Thomas argues for a better public transport system so that at least half of the houses are so located that people need not own cars for daily needs(61).

In Newton Aycliffe, one of the early new towns designated in 1947, the results of traffic survey showed that there are four categories of modes to travel to work:

1. Car driver or passenger	43.1%
2. Two-wheeled vehicles	25.9%
3. Bus or train	16.4%
4. On foot	14.6%(62).

The experience at Stevenage where transport from one part of the town to the industrial area had changed from private cars to buses when better bus service was provided, should be widely followed. The consultants employed by the corporation(63) reported that an improved bus service might be a means of effecting the change. The response of the public

exceeded all expectations and the number of 'superbus' passengers considerably increased(64).

During the 1950s the public transport was very inadequate, and people without cars in Stevenage and Crawley found it difficult to join in the social activities of the new town. Many of the development corporations realized this and tried to improve the public transport system.

In the 1970s, it is estimated that two-thirds of the families in new towns owned cars, with perhaps 10% owning two cars(65). As car ownership increased, more garages were provided in many of the new towns of the second period, while in other new towns, car-ports with a roof and one wall were provided, and car parking spaces make up the balance to about 1.25 to 1.5 spaces per house(66).

In city centres, multi-storey or underground car parks are to be preferred to large open car parks, as the surface area can be used for developments or for long-term visual improvement.

This argument indicates the importance of public transport and car parks in the new towns, and necessitates to provide their needs of land construction and equipment.

3.3.8 Leisure, Social Life and Visual Attractions

Most of the people who move into the new towns have come from an established community with a range of extensive opportunities but limited on a per capita basis. For example, parks are often available in big towns, but the per capita area of open space is inadequate. Many migrants from the big cities were used to shortages of open space, sports clubs and public halls, but entertainment and the bright lights were close at hand. The early new town dwellers became impatient before the full range of facilities could be provided for a sizeable population, and commercial entertainment cannot take place until the population is large enough to give adequate

support and sufficient demand. The development corporation has an important role to play, for it must decide from the beginning which land to reserve, and when to negotiate with other bodies to establish leisure facilities. Shortage of money may mean that only the most modest of buildings can be provided. Crawley Development corporation decided to put up temporary timber huts at the start, and whilst there was a good deal of criticism, they served their purpose, even though it was fifteen years before a start was made on replacing them with permanent halls(67).

The high percentage of children in the British new towns, especially in the early stages, made it important to provide youth clubs and nurseries. Individuals and organisations can do a lot in this regard. Sports trusts can be set up quite separately from departmental institutions but supported by them and by the leaders of industry and the professions, as well as the people of the town. The Family Recreation Centre now being built at Basildon was planned to include a 100-bed hotel, with a conference hall, a sports hall, facilities for sailing, fishing, and ice-skating and an oceanarium complete with performing dolphins(68).

As sports or amusements may come into fashion, they must be encouraged and catered for by the authorities concerned. Mobile means of entertainment, such as that for small theatres with similar or standard measurements can be prepared to fit in several towns.

Places of worship can play an active part in the development of the social life, and the development corporations have to support them by making proper sites available at the appropriate times.

It is now accepted that the social aspects are an essential part of the overall strategy of new town development, and building for leisure must be guided by local experience and popular demand, for it is people, not buildings, that make a town. So the staff of the Development Corporations must meet the people when they arrive and discuss the problems of the time

and place, and in this regard tenants and social associations are useful in giving the corporation real contact with the people for whom they are building. Corporation officers should be ready to cope with personal problems and report on them to their headquarters. If the town is build on a virgin site, lack of services may form a problem in the earlier days, and if it is built as an expansion for an existing town, the sense of unity between various communities and the newcomers must be encouraged.

In many new towns, welcome-parties are still held, so that newcomers can be brought together, especially as in a new town, there are often no family ties, no mothers-in-law, no uncles, no aunts, no grandmothers. Even in slum clearance, sociologists place great stress on the close family ties that exist, for example in London's congested East End, and on the need to protect and preserve these important relationships(69). To the children of the newcomers, a new town is neither new or strange, their roots are already there. Occasionally, members of the same family have followed each other until the whole clan re-establish. At Harlow, 52% of families in 1970 had relatives living in the town(70).

To defeat the feeling of remoteness from the original societies, the work of voluntary organisations must be encouraged in the new towns, especially in the early stages. The absence, or inadequacy, of suitable premises is a failure in a new town and has been a subject of complaint by development corporations. For example, Basildon New Town Corporation's report of 1954 stated that there were no buildings at all in the area, except the schools, of 5,000 sq.ft., (450 sq.m.), and the population then was about 30,000. In many of the new towns of the first period with populations of 60,000 or more, there was still after nearly 30 years no good multi-purpose hall in the centre of the town. The need for an arts centre has been apparent in Crawley since 1960, and many discussions took place between voluntary bodies and the local authority, but in 1977 the town was still

without this facility. The provision of such a central hall for meetings, entertainment or exhibition gallery should be made in the original plan because it may otherwise be difficult to establish after the completion of the town centre (71).

Schools can be planned to be used for adult recreational and cultural purposes in the evenings and during the weekends as they were at Cwmbran amongst the first new towns. In Stantonbury Campus, Milton Keynes, in addition to provision for the evening classes which can be arranged in the adult wings incorporated in the school design, there is one theatre for drama and concerts, serving three adjacent schools(72).

This Section shows that recreation and social facilities form basic elements that must be considered in the Master Plan of the new town to create a new taste of life.

3.3.9 Town Design

Town design is no less important than the provision of cultural and social activities, so new towns are expected to combine functional efficiency with visual attractiveness. That is a major contribution to modern urban planning.

Aesthetically, good urban design is largely a matter of effective spatial composition of the relating buildings, trees, roads and furniture to the space between and surrounding them. Many new towns' centres offer good examples. These include Parkway, the great central avenue in Welwyn Garden City and the disposition of trees and buildings on either side of the Boulevard at Crawley with its tall terminal feature; the central water garden partly enclosed by a block of offices and circular multi-storey car park at Hemel Hempstead; and the pedestrian square at Basildon with the transition to the smaller lower square with a block of flats and a pool with sculpture at its base. The whole form of the layout of Harlow was

developed to fit on the land form and planting as analysed by Sir Fredereck Gibbard. The garden city concept has influenced most of the earlier and the later new towns and played an important part in creating a constant aesthetic feeling, combining town & country features.

The housing layouts in many new towns reflect the blending of buildings with landscape, as irregular areas of lawn, trees and other planting linked by paths and roads give the impression of houses disposed in natural settings.

The authorities have tried to avoid the monotony of traditional streets enclosed by continuous building facades, by providing diversity and variation in the siting of houses in relation to paths, roads and surrounding spaces, giving more scope for architectural appreciation which is a distinctive experience afforded by many British new towns.

3.3.10 Communities' Self-Containment in Work and Services

New towns are generally established to be 'self-contained' and balanced communities for work and living' as it was described in the terms of reference of the Reith Committee(73). This statement of intent was repeated as each new town was designated, emphasising that people will go to live where there are jobs, in the areas that have an economic basis and sufficient services and facilities. Pre-war housing estates were built with occasional shops and little or no provision of employment, and this obliged people to give up their new houses and move back to the crowded cities where jobs were(74). Further, the lesson of the thirties of extensive unemployment showed the need for variety and stability of employment for men and women, and this was the aim of all the new towns, although it should be noted that jobs are not kept specially for a new town's people, and that some new towns dwellers travel elsewhere to work. The 1961 and the 1966 censuses showed a somewhat complicated pattern of cross-journeys.

In most of the London towns there is a certain amount of travelling in and out to work, but the number who go from new towns to work in London is very small(75).

It is not easy to attract industry to a new town, especially in its early days when transport is often inadequate and suitable labour is not available, and in the early days the(then) Board of Trade often interfered in determining the location of industry. Development corporations must support and persuade industries by cheap or free land, financial inducement or ready-built factories.

The size and success of a new town depends on the jobs it provides. Some objects of the eight new towns around London were to get industry and to provide alternative sites for it and hence to attract people(76). From 1946 to 1970 about a million jobs were provided in the development areas in the U.K.(77). It seemed logical to suppose that Government decision to build a new town should carry with it the possibility of a steady flow of industrial development certificates to ensure that the building programme can match houses with jobs.

The first response to industrial facilities in new towns came from firms needing room to expand or re-organize(78), because they found a range of ready-built factories available as well as financial incentives. Land was generally cheaper to buy or rent than in London or the major cities, and the fact that there were housing facilities was an important advantage.

Ideally information about age-grouping and birth rates should be studied to predict the job needs for many years ahead, (but in the economic circumstances prevailing in the early 1980's almost any employment opportunity is welcomed in any town new or old). Education standards in the new towns are higher than the national average, probably because of the available facilities and the mostly educated migrants in the new towns.

Besides the availability of jobs for the people of the new towns,

services must be available for it to be a self-contained community. Meeting the daily needs of the people is important, hence proper provision for shopping is a leading feature in the new town. In many, the shopping centre has replaced the traditional 'high street' with its congestion. The Master Plan must provide for the total shopping space that will be needed in the different stages of development of the town centre and, additionally, small shopping centres may be necessary in each neighbourhood to cater for day-to-day needs and perhaps in association with some social activities. Corner shops may be useful in some cases at various places in the new town, but duplication of services must be carefully avoided.

Many new and old towns have shopping areas closed to traffic where trees and seats take the place of cars and buses. Stevenage all-pedestrian main shopping centre was, for many years, one of the most visited and photographed places in Britain. It was one of the first of its kind in Europe, and the opposition to it was initially strong. The rents obtained show that a pedestrian precinct does not adversely affect land values(79).

Besides housing, work and shopping, supporting services must be woven into the fabric of a town to create a full pattern of living. That is mainly the job of local authorities and priorities should be settled in the light of the available funds and the needs of the new settlers. Development obstacles may have to be overcome, and costs increased accordingly. For example, to preserve oyster beds, Basildon Development Corporation was obliged to construct a tunnel to divert drainage into the Thames instead of the River Crouch, increasing costs by about 47%(80).

The road system is of great importance to a new town which needs both main roads and distributors.

Block-allocation for new towns can be extended, if it is necessary, to other services such as education, hospitals, fire, police, ambulance, library, welfare and social services. Sometimes it may be necessary to have

temporary accommodation for such services until the permanent buildings are completed(81).

Civic and social service needs are very important. A new town must be a whole town and this is impossible without the co-ordination of the supporting services and a proper order of priorities. Besides industrial prosperity, the success of a new town depends on its social services. Housing needs should be related to planning and economic policy at both local and national level. Careful records about the new towns must be kept by the Development Corporations and these are valuable in planning programmes of future growth and services.

3.4 Have the British New Towns Fulfilled their Aims?

Planning thoughts are rapidly changing, while the revolution that first found expression in the British new towns is still in progress.

The new towns designated in Britain have contributed only 4% of the national house-building programme, and people still live in overcrowded conditions in slums or near slums, or lack adequate bathroom and toilet facilities. But at the same time, new towns provided homes for about a million people in well-planned surroundings with jobs and services not far from their homes.

In the early 1970's, demographic studies and predictions taking account of the average size of future families, changes in age of marriage or death, rate of emigration and immigration, economic growth, distribution of incomes and number of households indicated that some three to four million more houses may be needed in Britain by the turn of the century(82). In addition, urban renewal of some two million of the existing stock of houses in Great Britain, 20.5m(83), is needed. This will largely depend on the standards to be set in relation to slum clearance. Out of this six million housing units only four millions can be built on their sites, because most of

the older houses are in congested areas where more open space and other facilities are badly needed. The other two million must go 'elsewhere' in areas of new development, the basis of which may be found in new towns.

In 1967, figures about Bradford were presented in the House of Commons. The population was 300,000. There were 28,000 houses with no inside toilet facilities, over 20,000 with no bath, and 13,000 without a hot water system(84). In the late 1970's, more than two families in every five were living in a post-1945 home, but there remain a large number of old dwellings(85).

New towns have moved a long way: from Howard's simple idea to a 'new city' of 200,000 people in Milton Keynes. They were intended to aid in drawing people away to more congenial new communities, giving the cities the space and time to improve conditions for those who remained. But in some cases there has been migration away from the big cities to the detriment of those cities not to the advantage of the new towns. On the other hand, the anticipated decline in population might have led to the cancellation of Stonehouse in May 1976. (See Appendix 2).

On economic grounds, new towns are attractive to private capital, where they have the advantages of close physical linkages to suppliers and a diverse labour supply with none of the disadvantages of high land costs, congestion, and the physical barriers to development which unplanned, built-up areas inherently possess(86).

When Howard's ideas were published, they were ridiculed by many authorities as utopian nonsense, but in the long-term, they have proved highly successful; economically, socially and financially. In the year to 31.3.1978, the four completed new towns, Crawley, Hatfield, Hemel Hempstead and Welwyn now managed by the New Towns Commission, shared a collective surplus of some £3.9m on revenue account, after paying unsubsidised loan charges on borrowings. But some newer new towns showed

losses, such as Milton Keynes, which had a deficit of £13.4m in 1978(87). This may be related to the fact that it was only a small part of the way towards completion since its designation in 1967.

Total net capital advances by 31.3.1978, for the new towns were huge, totalling £2,353m, and ranging from £41m to Corby and £86m to East Kilbride, to £266m for Milton Keynes(87).

In 1983, the total population of the British new towns was over two and a quarter million people, but only 1.25 million of this total were 'new' residents who have moved to them. Young people formed a higher proportion of the population than in the country as a whole. Some 400,000 dwellings have been constructed, over 700 new schools have been built and over 4,500 new shops have been opened(88). These figures can be compared with Table (3-2) which shows the figures added in 1976 only, the total to December 1976 and some available figures of the total to 31st March, 1978 (see also Appendix 1 at the end of this study).

Several new towns had pioneering features. Welwyn, Stevenage, and Harlow have retained wedges of woodlands striking right into their centres. Welwyn and Cwmbran have transformed worked-out gravel and clay pits into athletic stadiums. Some new towns include colleges of further education, higher institutes and research centres.

The most impressive achievement of the British new towns, after the provision of a convenient environment for residence and work, is that they are centres of efficient and advancing industry and commerce, and they are financially sound when they become mature enough.

It is believed 'that the new towns will not only look after their own internal social life and culture, but will contribute handsomely to that of the nation'(89). See also note (28) above.

Table (3-2)

NEW TOWN STATISTICS - A SUMMARY

	Added 1976	Total to December 1976	Total to 31 March 1978 (*)
New population	57,937	984,386	1 Million (Approx.)
Total employment	10,343	915,086	+1 Million
New Schools	36	676	700
New Shops	179	4469	4,500
New Factories (Number)	135*	3264	3,500
(Area sq. ft.)	5,769,860*	83,301,442	
New Offices (Area sq. ft)	1,156,720*	10,422,065	10,800,000
Capital expenditure	£298.5m	£2042.3m	2,353m
Capital expenditure (Housing only)	£204.1m	£1260.9m	
New dwellings completed:			
Development Corporations etc.	17,633	(251,730	(
		((
		((
Local authorities	4027*	(40,539*	(400,001
		((
Others	61,149	(6683	(

TOTAL		298,952	

* These figures underestimate totals

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Source: 1. New Towns, Their Origins, Achievements and Progress, Osborn and Whittick, London 1977, p.466.

2. (*) Fact sheets on Britain, British Information Services, March, 1978, pp. 2-3.

N.B. For the 1981 population see Appendix I.

3.5 Lessons from The British Experience applicable in Egypt

One of the leading recommendations for National Action at the United Nations Conference 'Habitat', Vancouver in June 1976, was to the effect that: "All countries should establish as a matter of urgency a national policy on human settlements, embodying the distribution of population, and related economic and social activities, over their national territory". Such a policy is essentially important in Egypt, where there are severe problems of urban maldistribution. Egypt has started a comprehensive programme of new settlements establishment, including a chain of new towns round Cairo, similar to that started round London after World War II, with the same purpose of de-congestion for both people and activities including industry. In the first fifteen post-war British new towns, industrial employment was a remarkably high proportion of their employment, despite the fact that they are self contained, i.e., they do have their own services such as shopping centres, schools, management offices, health centres etc. Table (3-3) below shows that in 1970, over half their employment was in manufacturing, compared with a national average of 39%.

This perhaps suggests that one of the main factors for the success of a new town is the industrial base and employment. In the Egyptian case, that argument will be double-edged. Self-sufficiency in a new town can help to decongest both population and industries from the old urban areas in the Nile Valley and Delta, where they suffer from lack of services and infrastructure, while land prices are immensely high. On the other hand, the industrial base can provide sufficient opportunities for the unemployed new settlers to maintain the new town. New industrial development, taking place on desert land, will help to spread out the inhabited area away from the scarce agricultural land, and may help to promote the reclamation of areas around the new town to support self-sufficiency by farm and dairy products, essential for the industrial community, besides the provision of

protection belts against sandination.

Table (3-3)

**INDUSTRIAL EMPLOYMENT AND TOTAL EMPLOYMENT, 1970, IN THE FIRST FIFTEEN
POST-WAR BRITISH NEW TOWNS**

In 000s

New Town	(A) Industrial Employment	(B) Total Employment	(A)/(B)
8 London New Towns	120	250	0.48
4 English and Welsh New Towns	41	71	0.58
3 Scottish New Towns	30	45	0.67
Total	191	366	0.52

Source: New Towns. The British Experience, London, 1972, p.80.

The programme for the establishment of new towns will not be faced with the problem of land acquisition which the British new towns faced. The land on which the Egyptian towns are being established is completely desert and owned by the government and no compensation is needed. What is required is a system by which the Development Corporation, as the agent of the freeholder, leases it. To sell the land would lead to the repetition of the common problems in the existing towns in Egypt, where very high prices of building land resulting in higher residential densities and a lowering of development standards (see Section 2.5).

The British experience of the establishment of the new towns has proved that proper legislation can settle the broad lines of plans which must be prepared on a regional scale and provide sufficient flexibility to cater for the future changes in people's needs which can not easily be predicted. In Egypt, planning legislation is important including the proper application to

all concerned sides. Such legislation is neglected for a long time which adversely affects the development.

One of the important lessons that Egypt can learn from the British new town experience is the low density adopted for residential development.

Raising densities via multi-storey construction increases the per capita costs due more foundations, lifts and management, Fig. (3-5)(90).

The main reasons for the low density in the British new towns is the provision of one or two story houses as a majority in the residential areas, which is related to socio-economic traditions in Britain as well as the influence of the planning ideas such as the garden city concept. But in the case of the Egyptian new towns, open spaces are relatively poor, as shown in Table (3-4), especially if compared, for example, to Harlow where 43% of the total area is open space or agriculture(91) in addition to private gardens which are limited in the Egyptian practice.

Plans must be flexible enough and have to be revised from time-to-time to meet the needs of the new settlers and to make the new towns more convenient and attractive to the businessmen to move their activities, or at least part of them, to the new towns. Incentives such as rate-free premises, tax allowance for a certain period, offering loans if required, can play a considerable role in this regard. If rents and rates of sites and buildings were to be nominal at the early stages of the development, they ^{would} have to be increased later. That is to enable the agency to repay the money it borrowed at the early stages of the construction of houses, factories, roads, sewers, open spaces and other services. In other words, firm cost-control is required to let the people who live, work, or do business in the town, pay for it and for more services to come. Rigidity and stiffness may stifle new community development. So, an agency must be formed to be responsible for the development in every new town. This is the *raison d'etre* for the Development Corporation. The whole site must be owned by this agency to

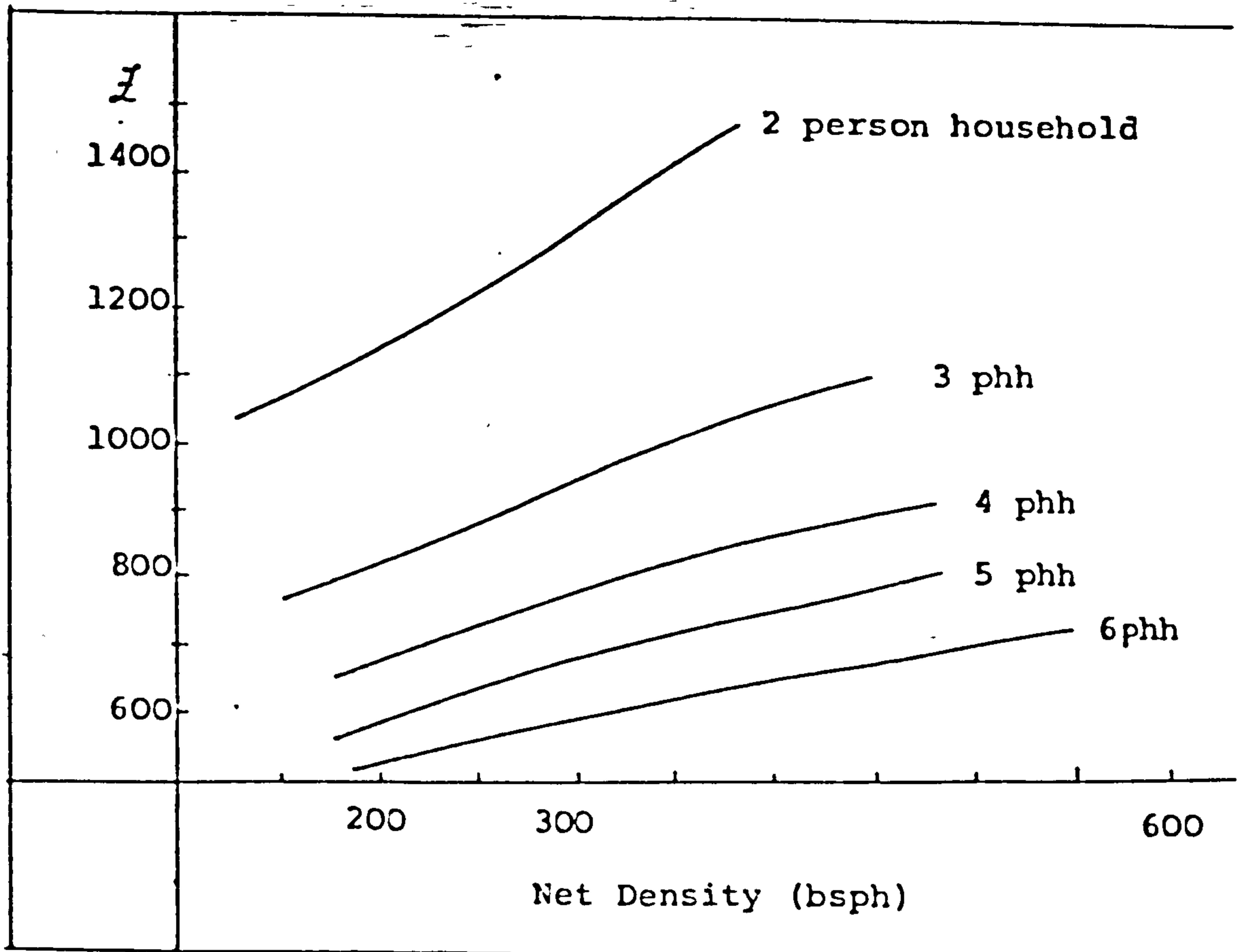


Fig. (3-5)

CONSTRUCTION COST PER PERSON MEASURED AGAINST DENSITY.

Source: Ayad, 1980, p.246 (After Beckett, 1972)

enable it to control all kinds of development.

Comprehensive consultation and enquiries with the different authorities and specializations can provide valuable aid and advice, which requires to have a variety of specializations in the corporation staff. All objections and remarks must be carefully recorded, studied and answered, before the final decision is taken. In the course of the development of the new town, its agency, the Development Corporation, is the legal entity to take the decisions. Also, a central advisory commission on the national level is advantageous to provide a central pool of information, experience and advice on different scales. The virgin site of a new town, for example in the desert can give scope for imaginative planning. Site selection is of prime importance in relation to main urban areas, water supply and suitable contours for drainage, landscaping and layout. In making Harlow's plan 1947, Sir Frederick Gibberd commented that, "the design seeks to preserve and develop the natural features which give the area its particular character... as 'pegs' on which the design is hung"(92). The feeling of remoteness of desert new towns can be in many cases overcome by exploiting ridges overlooking the Nile Valley, the sea or lake's, shores or any major land mark which can be seen from the new town, as the Pyramids in the case of 6 October new town, to give the feeling of being not far from the rest of the country.

In the case of Egypt's new towns which are mainly established on desert lands, the local authorities of the nearest existing towns can be consulted on social and administration or general policy issues, and some of their members may be chosen in the development corporation's membership. These authorities provide knowledge of the site and its requirements.

As mentioned earlier, a central advisory commission for the new towns can make the experience of one town available to other new towns, by pooling information via regular meetings of corporation chairmen, without

sacrificing independence. Such commission can take over the new towns after some 20 years of construction when they gradually cease to be 'new' towns and about 75% of the ultimate population are realized and identified in the new town with enough jobs and services. More houses, factories and services will still be needed, but at a slower pace, so management then be of greater importance than construction. A local committee for each town then takes over the housing management and maintenance which can be minimized by selling rented houses to sitting-tenants, see Table (3-1). Good links with the central advisory commission is essential to get the experience and the proper following up for the progress.

Table (3-4)

OPEN SPACES AND ROADS IN SOME EGYPTIAN NEW TOWNS

New Town	Open Space % of the total area	Roads
Sadat	21%	13%
10th of Ramadan	10%	25%
New Ameriya	11%	8%
15th of May	18%	37%

Source: Dr. N.A. Toulan, New Towns in Greater Cairo Urban Region, First Report Table (2) p.10, GOPP, Aug. 1979.

Note: The percentages of roads in the 10th of Ramadan and the 15th of May are abnormally higher than that in the other two new towns.

A single research centre on environment studies should be established to help new town authorities with further knowledge about planning and development. The solar energy institute in Sadat New City in Egypt is a good example of a way of exploring the use of the desert environment for the new town's progress.

The changes in both the national and international economic atmosphere demand sufficient flexibility of the plan so that it can readily be adapted to meet changing conditions such as economic depression or higher costs than planned.

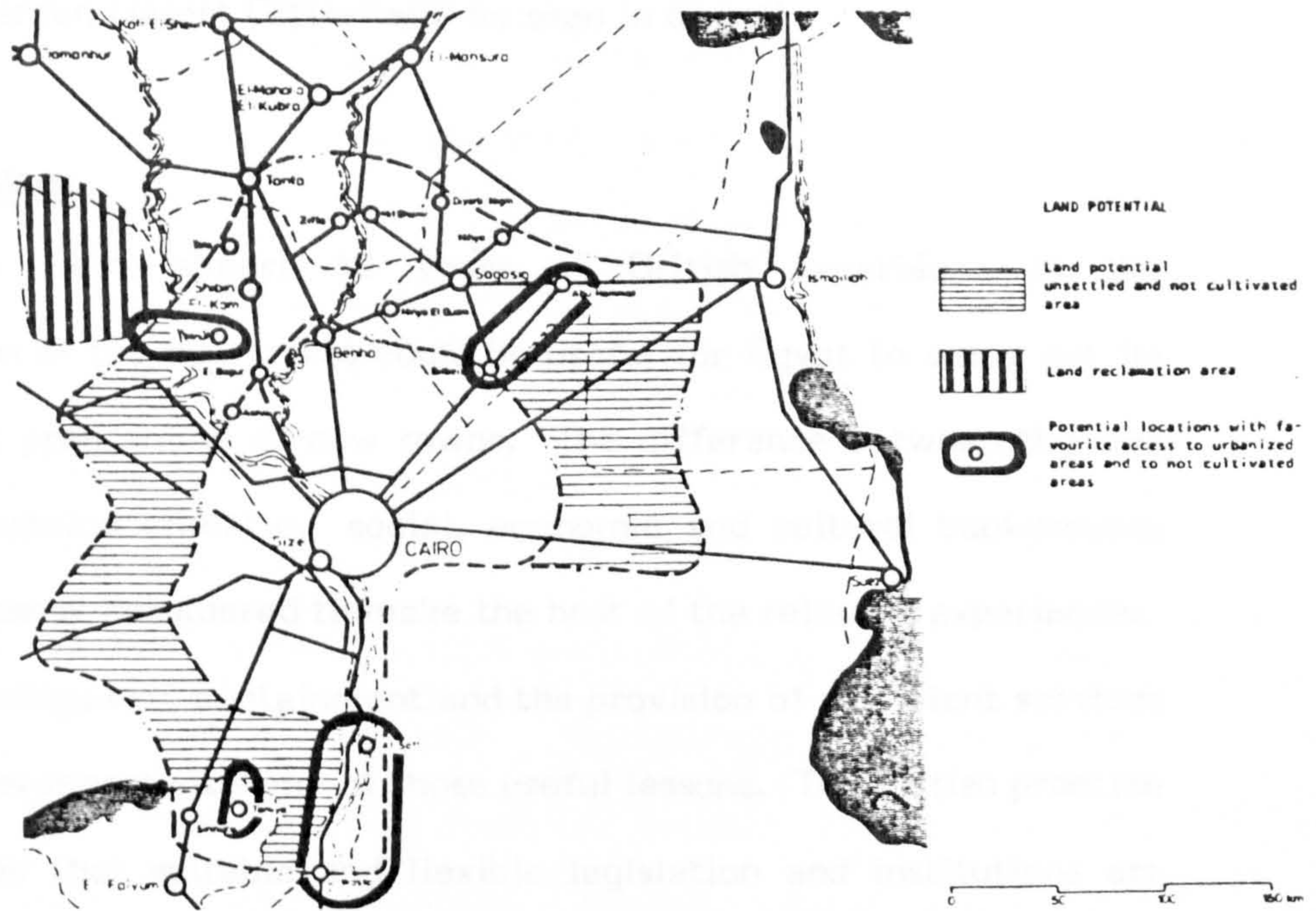
The implementation programme, for a long time ahead, is of crucial importance, so project co-ordination has to be thoroughly considered to provide the development needs for every year.

The application of the neighbourhood idea should keep up with the unity of the town, to create a sense of 'togetherness' in the new community and to avoid the loneliness and separation between its localities and between families in any one neighbourhood. A similarity could be found between the neighbourhood and the Egyptian village, where a strong sociable life is practiced by the community as one unit.

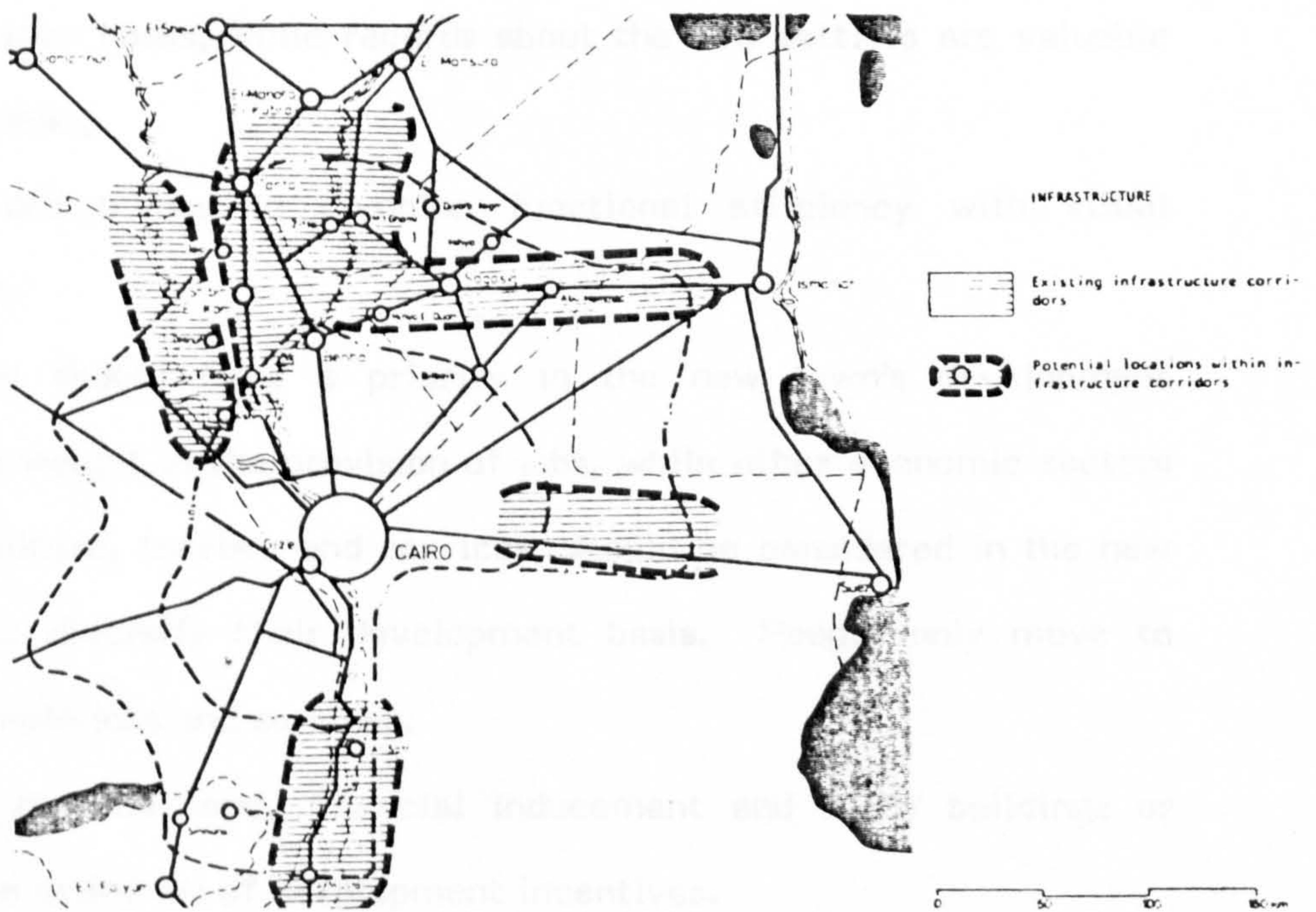
The British way of extending the existing settlements into larger urban areas can be applied in some cases in Egypt, if extensions will not affect the scarce agricultural land, they should be on desert land, see Fig. (7-2) for Sister settlements. This requires detailed studies for the potentialities of each region and the existing infrastructure to select the proper locations. Figure (3-6) illustrates some examples of land potential locations for relief poles not affecting cultivated area around Greater Cairo Region which can be used for urban extensions within infrastructure corridors. In Upper Egypt and oasis areas, desert land is closer to the existing settlements which can be easily extended away from agricultural land.

Appendix (3) illustrates Milton Keynes development as an example for a new city which was successfully extended from existing settlements, and sufficiently provided with services essential for its industrial development.

Every possible effort should be made to stop sand encroachment and to emphasise greenery when the idea of the establishment of new settlements comes out in the desert areas. That can considerably help to improve the environment surrounding the new settlements, and the day may



(A) EVALUATION OF POTENTIAL LOCATIONS FOR RELIEF POLES :
LAND POTENTIAL



(B) EVALUATION OF POTENTIAL LOCATIONS FOR RELIEF POLES :
INFRASTRUCTURE

Fig. (3-6)

RELIEF POLES EVALUATIONS

come when "Garden Desert Cities" will be seen in Egypt!

3.6 Conclusions

Lessons from almost 40 years of British experience in the implementation of the new towns could be useful for Egypt to carry out its comprehensive programme of new towns. The difference between the two countries concerning climatic, social, economic and cultural backgrounds have to be properly considered to make the best of the relevant experience.

Low density, self-containment and the provision of sufficient services and open spaces represent some of those useful lessons. The British practice has also proved that suitable and flexible legislation and institutions are essential for the success of the new communities to prepare and carry out the plans according to proper environment studies and possible forecasts. Pooling information about the new communities make one experience available to other cases, while records about the new settlers are valuable for future planning.

Town design has to combine functional efficiency with visual attractiveness.

Industry should have a priority in the new town's development because of its weight in the provision of jobs, while other economic sectors such as agriculture, tourism and services, should be considered in the new settlements to diversify their development basis. People only move to places with ample jobs and services.

Cheap or free land, financial inducement and ready buildings or equipment, are examples of development incentives.

Short term cost is not the only important factor; future heavy maintenance, essential changes and subsidy charges must be minimised. At the same time, cost control is required to adjust the revenues of a new town to pay for it.

Tastes vary, and new towns should provide wide varieties in housing, opportunities and services to fulfil their aims as attractive new environments for work and living for big numbers of people overcrowding in old urban areas. People must be free to choose which house they like or can afford. Leisure and sports facilities in the new settlements have their importance to compensate the new settlers for what they leave behind, such as social life, relatives and friends.

Each country has its own physical and climatic features, economic conditions and social and political life. Accordingly, new settlements establishment will considerably vary from one country, or region, to the other, in styles and fulfilments. The most successful ones are those which can create suitable places for work and living, making use of other adaptable trials of adequate experience and considering local circumstances.

CHAPTER FOUR
THE GREATER CAIRO REGION

4.1 Introduction

In Chapter Two, the problem of the over-concentration in Egypt was discussed in the light of its effects on the urban development and the congested areas in the Delta and the Nile Valley regions. Since the Greater Cairo Region is the most substantial of the inhabited areas of Egypt, and reflects most of the problems of congestion and ill-considered development, it may be useful to study it in some detail to show how essential it is to spread settlements outside the Nile Valley and the Delta.

In the case of the Greater London Region after World War II a substantial part of the overspill population went to small towns that were expanded, (See Section 3.1) and to new towns. In the Cairo case there are few small towns to expand, so if there is to be decongestion, new towns become more central to the planning policy. As noted in this chapter, there are some circumstances common to GCR and GLR. Both cities have suffered from internal migration from different regions of people in search of jobs and services, from the concentration of big institutions, firms and factories, and in addition Cairo has experienced the influx of war refugees and the return of the servicemen. But it should be borne in mind that in the Egyptian case, lack of services and the bad conditions in the rural areas, besides the insufficient means of communications, and the high percentage of illiteracy(1) worsened the situation. The problems of GCR exist on smaller scales in the big towns of the Delta and the Nile Valley. These towns are mostly surrounded by intensively cultivated agricultural lands which are scarce in Egypt. In these cases, as with Cairo, the only way to meet demands for urban development without encroaching on agricultural land is the development of new settlements outside the valley on the desert

lands.

So, it may be assumed that the study of solutions of GCR can be applied in the other urban areas in Egypt, taking into consideration the local circumstances of each case, as in the United Kingdom where overflows from the metropolises of Liverpool, Manchester and Glasgow, as well as Greater London were accommodated in new towns.

4.2 The National Scope

The 1978-1982 national plan in Egypt calls for the development of new towns and settlements to absorb 18 million persons by the year 2000. The private sector is expected to play an active part in relation to the housing and industrial elements while the services and the infrastructure are to be carried out mainly by Government and the public sector.

The GCR as defined in 1966, Fig (4-6), had a 1980 population of about 9 million persons. It is expected that this will increase to about 16 millions in the year 2000(2). The most concentrated areas are expected to lie along the north-east-south-west urban corridor, Fig. (4-1). If the population is to be stabilized at a reasonable level it will be necessary to channel it into new towns in the areas surrounding Cairo. In the north-east of the growth-corridor are Al Obur and the Tenth of Ramadan new towns, the latter the first developed new town in Egypt, and one examined in more detail in the next Chapter as a case study.

The 6th of October new town is intended to cater for the south-west end of the growth-corridor. Al Amal new town is designated to the south-east of the region to generate its own momentum outside a growth-corridor. Developments are expected to be along these corridors because of the roads branching to the north-east to Ismailia and Suez, and to the south-west to Alexandria, Wahat and Fayum desert roads. Mokattam hills restrict development in the east of the region. Additional new towns are still

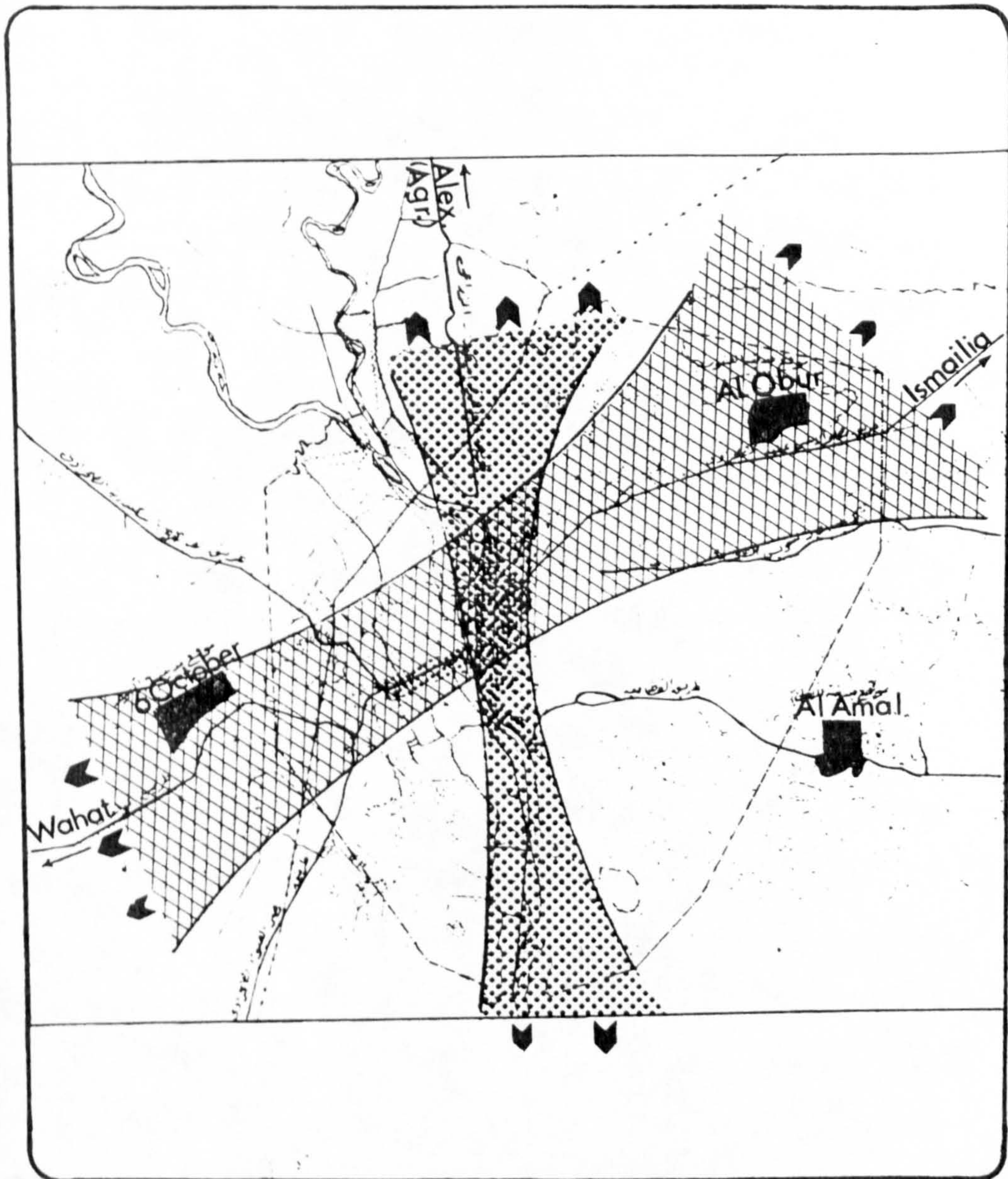


Fig. (4-1)

URBAN GROWTH CORRIDORS IN GCR

Source : GOPP, New Towns in GCR, 2nd Report, March 1980, after p.8

needed round GCR, because the above mentioned new towns will only take about 6% from the expected population of the region till the year 2000, while over-concentration is increasing in the region.

4.2.1 Historical Background about the Region

The historical background of the formation of the region may cast some light on the roots and development of its problems as the main urban region in the country. This is important to plan for the adequate solutions for such problems.

The idea of having the capital of Egypt at the vertex of the Delta dates back to the Pharaonic period when Eastern Memphis town was established on the site of present-day Maadi(3). Subsequently several capitals were established in the area, one of which was 'Oon' or the 'Sun Centre' on the site of "Ein Shams" district near Matariya in north Cairo(4). Afterwards Babylon, was established on the site of the present-day "Misral Kadima" or "Old Cairo" in the time of Ptolemy and the Roman period. Urban development remained scattered between the three sites until the Islamic conquest when in 640 AD 'Al Fustat', or the city of tents, was established near Babylon, to be the Islamic capital. In 750 Ali Ben Malek, the Islamic leader, established 'Al Askar', 'The Soldiers', on the site of the present-day "Sayida Zenab" to be the administrative capital. In 871 Ahmad Ben Tolon established 'Al Kataia' in the north-east of Al Askar for the new settlers and as a capital of the country while Al Fustat continued to be the main business centre. The fatimide leader, Jawharel Sikilli established Al Kahira (Cairo) in the year 969, north-east of the previous settlements to be the administrative capital, leaving the big open space between them. This settlement is now called Fatimide Cairo almost included in Gammaliya district, Fig. (4-5). When Al Fustat was burnt in 1068, Cairo became the administrative and business capital of Egypt, Fig. (4-1a).

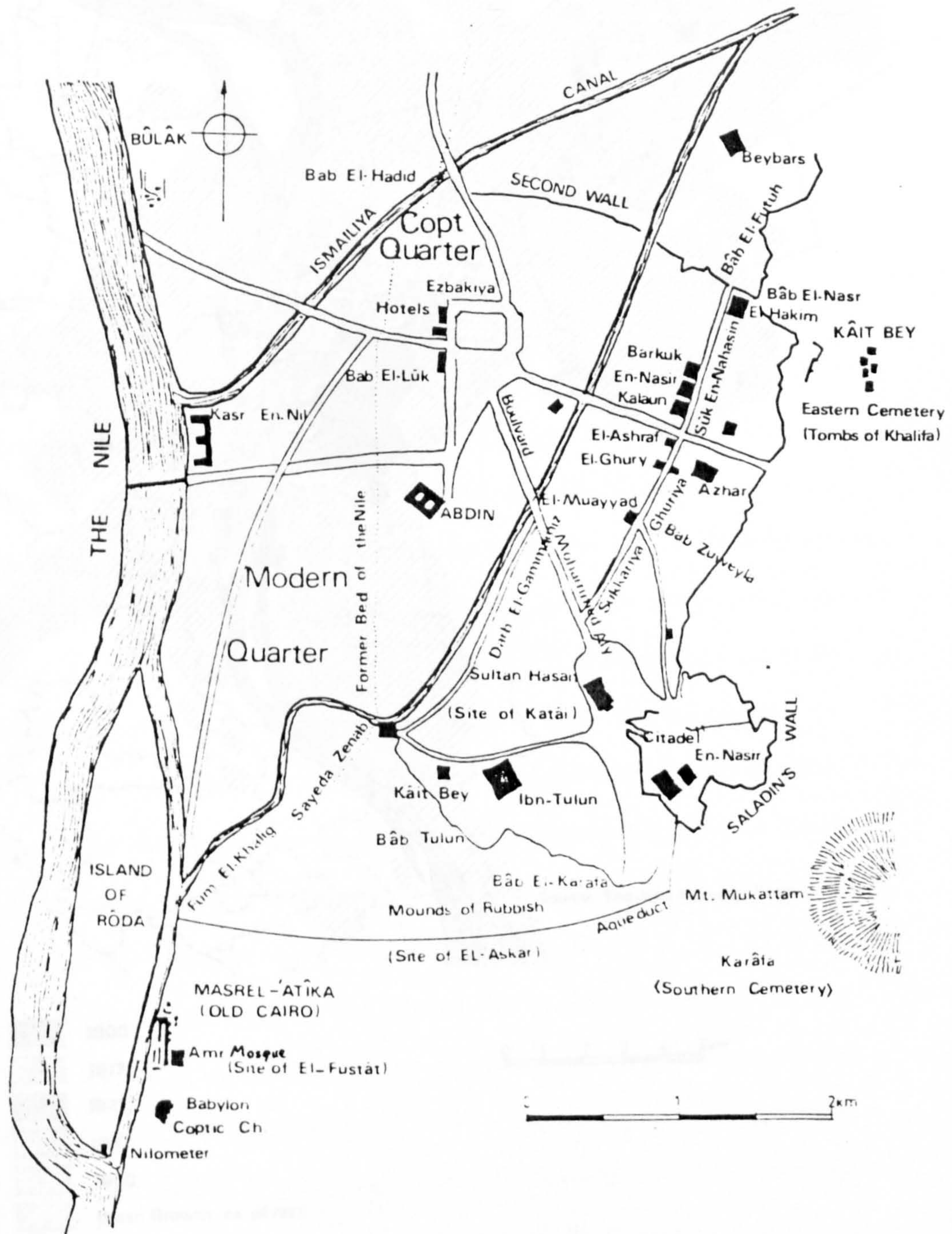


Fig. (4-1a)

HISTORIC CAIRO

Source : GOPP, Greater Cairo Region, Dec. 1981, p.15

Note: Zamalek Island is missing, see Fig. (4-3).

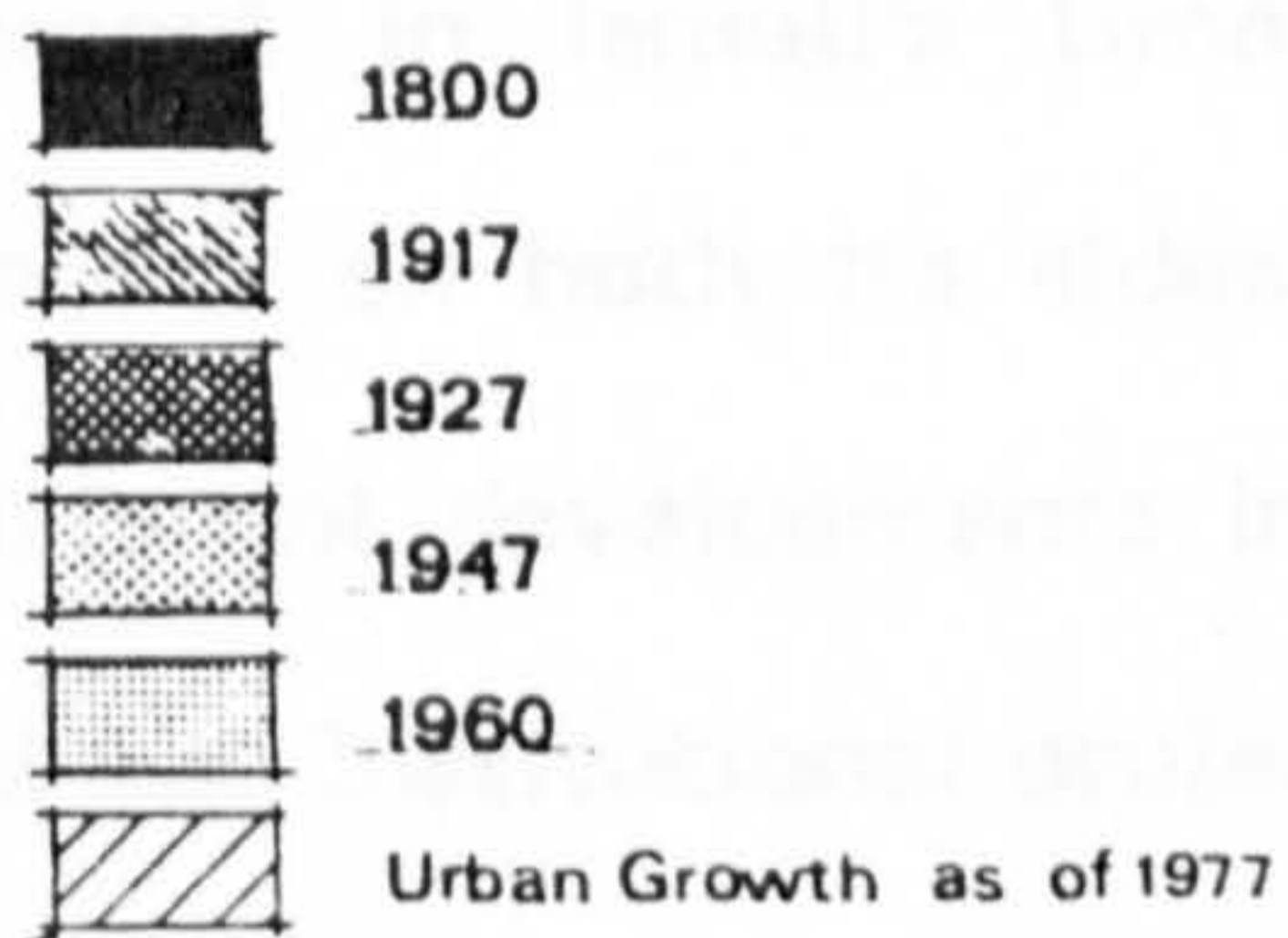
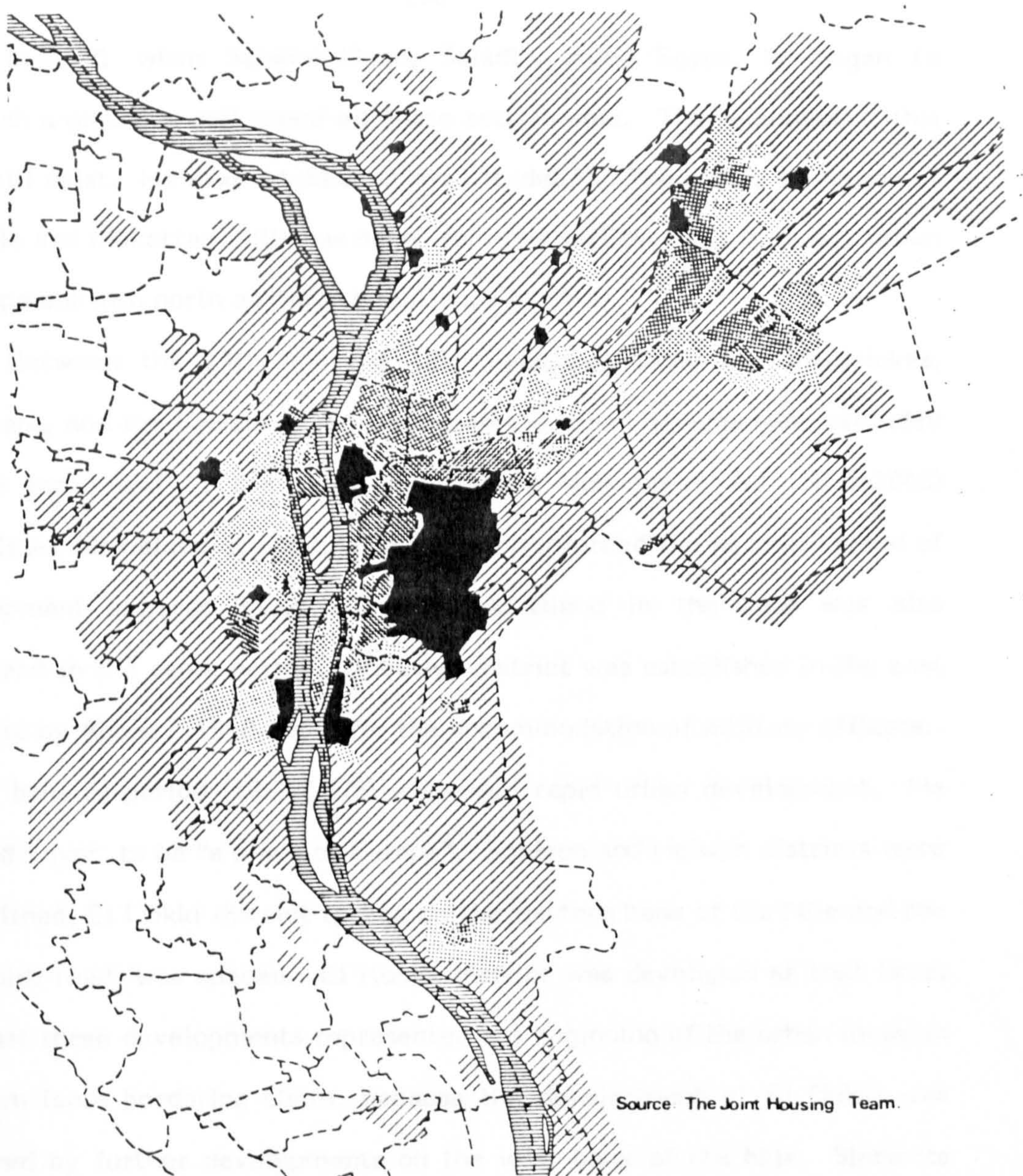


Fig. (4-1b)

THE HISTORICAL DEVELOPMENT IN GCR

Source : GOPP, Greater Cairo Region, Dec. 1981, p.1.6

In 1171 when Salahul Deen, Saladin, ruled Egypt, he began to establish a gigantic wall round all these settlements. The remnants of this wall still exist. He also established the Citadel(5). The effect of course of the Nile and Mokattam hills has been from the earliest days to direct urban development into north easterly direction, Fig. (4-4).

Between the 13th and the 18th centuries came the Mamelukes, Ottomans, and the French expedition when the urban development extended to the north and to the south. In 1805, Mohammad Ali (1805-1848) established his palace at north Cairo which reinforced the northern trend of development towards Shoubra. Zamalek Island in the Nile was also urbanized in the same period. Abbasiya district was established in the east of Cairo by Abbas I (1848-1854) for the accommodation of military officers.

Ismail's period (1863-1879) witnessed rapid urban development. He wanted Egypt to be "a piece of Europe". Abideen and Helwan districts were established, El Dokki district spread on the western bank of the Nile and the Pyramids road was opened. El Kobba district was developed at that time. The last three developments represented the beginning of the urban invasion of farm lands bordering Cairo, because the development of El Dokki was followed by further developments on the west bank of the Nile. Since its establishment in Ismail's time, the Pyramids road has spread tourist developments on both its sides between Giza city and the Pyramids and hence different developments including other residential, tourist and even industrial and institutional projects built close to the archaeological district of the Great Pyramids, while destroying the scarce farm lands. Legal and illegal sub-divisions prevailed in those districts in the absence of sufficient control to protect agricultural lands, under the pressure of the growing housing needs in the fifties and, to a greater extent, in the sixties. Much more recently, between 1968 and 1977, out of a total of 6,500 ha about 3000 ha were taken from agricultural areas for urban use in the region(5a).

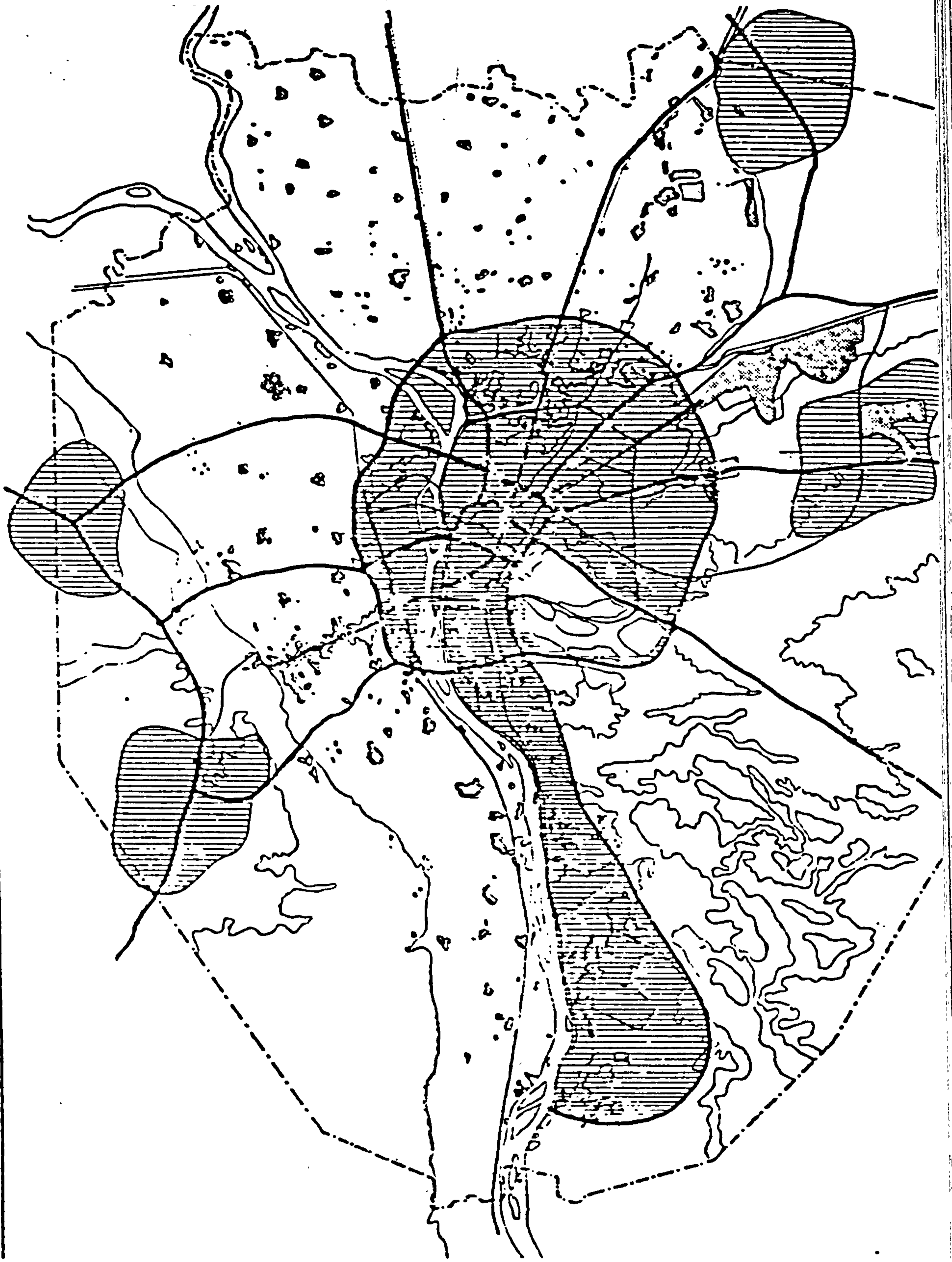
At the beginning of this century, there were attempts to overcome conventional urban expansion with the establishment of Heliopolis (1904) and Maadi (1910) districts on desert lands respectively, north-east and south of Cairo, Fig. (4-3). They were being developed at much the same time as Ebenezer Howard was introducing 'The Garden City' idea in the United Kingdom. They were planned as satellite communities and were intended by their designers to remain separated from the urban mass of Cairo, but they have been overtaken by the spreading growth of the city. They were not a part of a regional plan which could define their roles, nor a reflection of a conscious policy decision(6), but were private sector investments of foreign companies.

In 1968 a regional plan(6a) called for the establishment of four towns, Fig. (4-2), to accommodate 250,000 people each in 1990 round the GCR, to deal with the problem of rapid urban growth and its impact on agricultural land. Although no serious effort was made to implement it, that plan served as a statement policy, laid down the foundation for the idea of new towns as a feasible solution and represented the first effort to deal with the problem of rapid population growth and its impact on agricultural land.

4.3 The Limitations of GCR

The GCR boundaries were first delineated in 1966, Fig. (4-2), for planning and development purposes; that is to make possible the study of the factors affecting the region, such as land-use, transportation, potential for development and relief.

The region's boundaries were defined to include the cities of Cairo, Giza, Shoubra el-Kheima, Hawamdia, Kalyub and El Kanater El Khayria, besides 126 villages from Giza and Kalyubia Governorates, Fig. (4-5). By their inclusion, it was intended to extend the benefits of physical planning to those areas with their rural populations.



· Fig. (4-2)

THE PRELIMINARY PLANNING OF GCR, MARCH 1970

Source : The Supreme Committee for Greater Cairo Planning.

(1966 Plan)

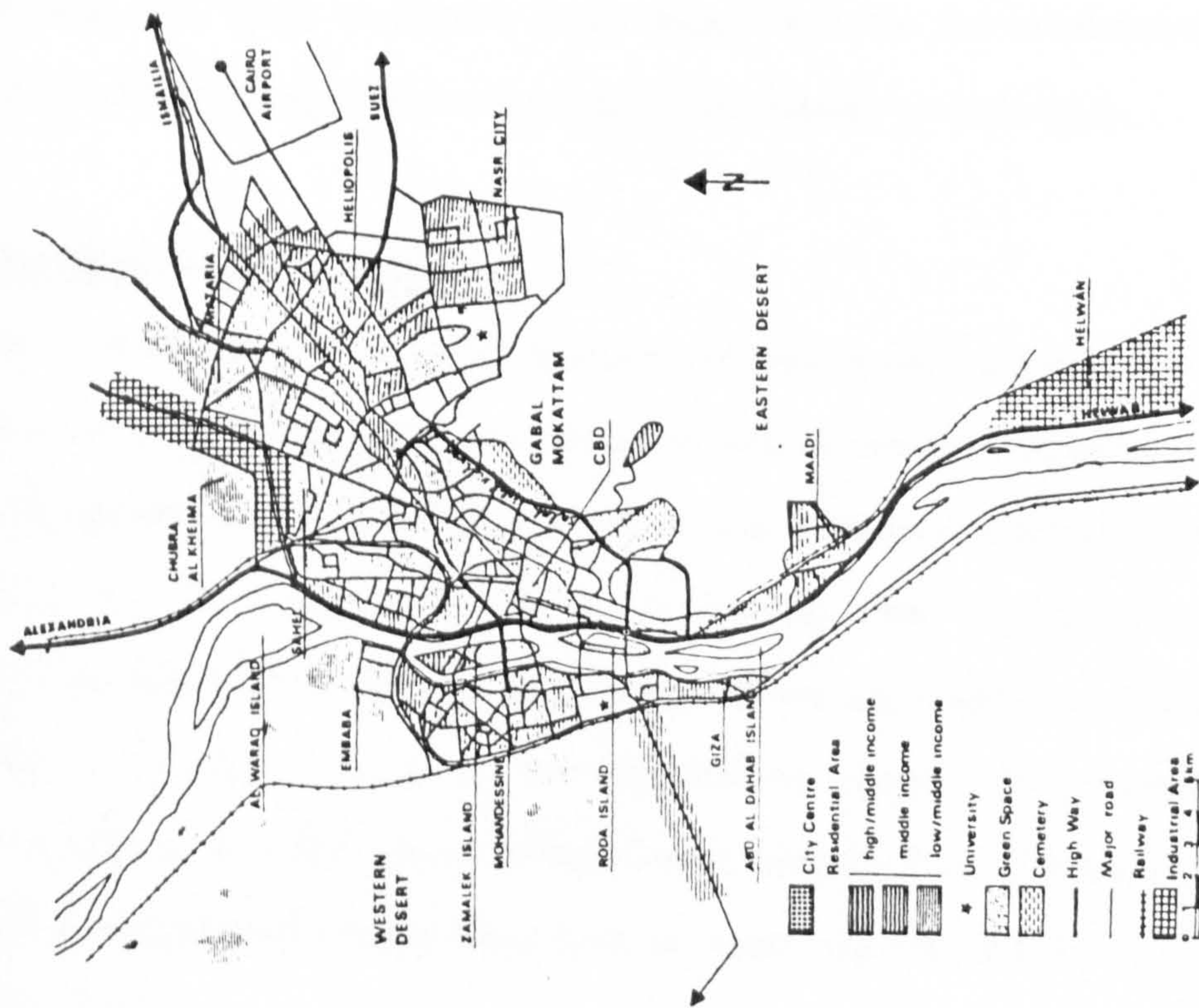


Fig. (4-3)
MAIN FEATURES OF THE URBANISED AREAS

Source : G O P P. Greater Cairo Region, Dec. 1981, pl.7



Fig. (4-4)

Source : GOPP, New Towns in GCR, 1st Report, Aug. 1979, p34

وزارة التعمير والبيئات الطبيعية
الهيئة العامة للتخطيط العمراني
دراسات الاقليمية للهدن الجديدة
اقليم القاهرة الكبرى
حدود الاقليم واتجاهات
النمو العمراني تاريخيا

نوسنتر
الشمال
K m
Growth
Islam-1800
1800-1900
1900-1950
1950-Now
PHYSICAL CHARACTERISTICS AND HISTORICAL URBAN GROWTH TRENDS

In 1975, the country was divided into eight major planning regions, of which the Greater Cairo Region was one, but its boundaries were modified from those of 1966 to include the whole of the governorates of Cairo, Giza and Kalyubia. Thus the region includes the city of Banha, 55 km north of Cairo, and extends as far as Baharia oasis, 450 km south-west of Cairo in the western desert, Fig. (6-2). In other words, by its 1975 definition the region included 490,000 acres of farm lands, besides the inhabited areas with 1975 total population of about 9.15 million people(7).

The region, by this definition, may be suitable for economic development, but it is too large to be treated as an urban region because it includes vast areas of desert land and numerous urban centres and regional capitals. This might be necessary after some decades, but it is suggested by GOPP for some time being that attention in this wider area be concentrated on the 1966 region with an anticipated year 2000 population of 16 million (see p.133), and with some extensions in the desert areas to the east and west, Fig. (4-6), to include more desert land for the establishment of new settlements for the accommodation of industries and overspill.

4.4 The Main Features of GCR

An analysis of the physical features of the region is important to learn about its components and their impact on the future development.

The suggested region, i.e., the 1966 official one, plus expansion areas to the east and west into the desert, has a total area of 3,685 square kilometres, of which 22% (840 square kilometres) are agricultural areas, and about 10% (370 square kilometres) are the built-up areas. The remaining 68% of the region, or 2,565 square kilometres is desert. The widest parts of the region extend 85 kilometres from east to west, and 60 kilometres from north to south(8).

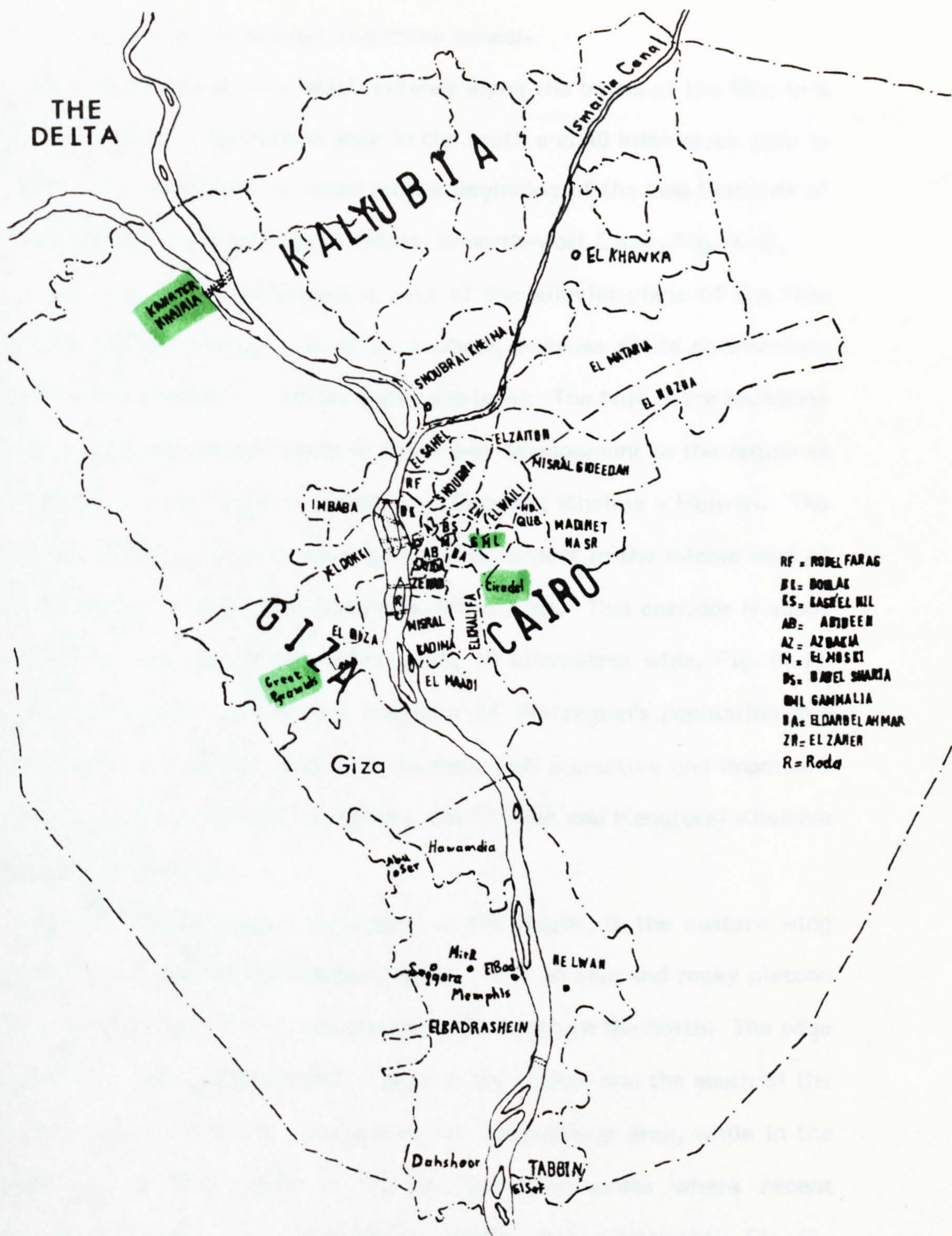


Fig. (4-5)

THE ADMINISTRATIVE UNITS AND SITES OF INTEREST IN GCR

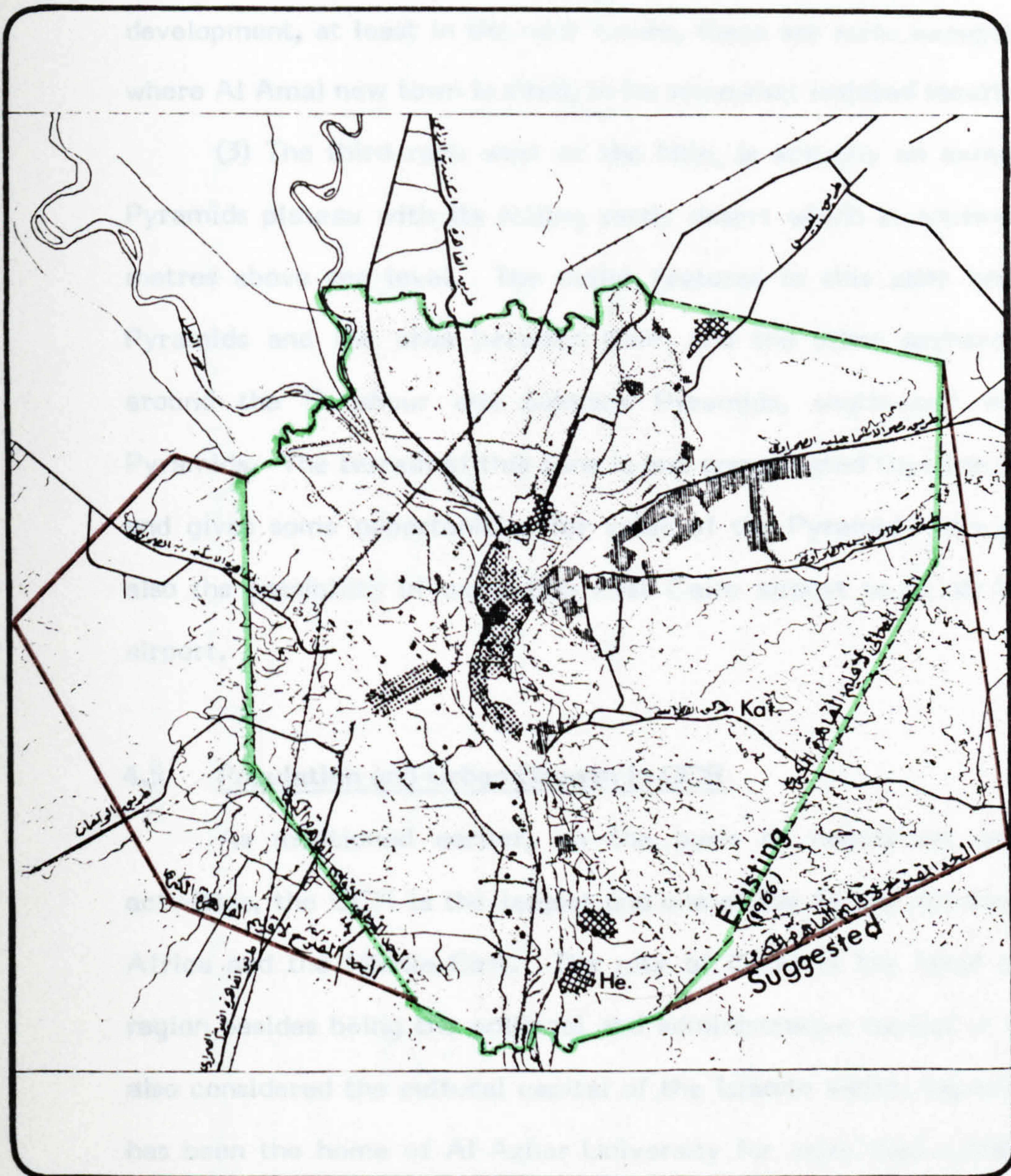
Sources: Maps from Survey of Egypt and GOPP,

The region can be divided into three zones:-

(1) The inhabited area which extends along the banks of the Nile in a fan-shape, of about 8 kilometres wide in the south and 40 kilometres wide in the north. This fan-shape is based on the beginning of the two branches of the Nile (Damietta and Rosetta branches) in north-west Cairo, Fig. (4-6).

The zone which represents a part of the alluvial plane of the Nile Valley (See Section 1.3.1), is level as a whole, because of its sedimentary clay base, and averages 20 metres above sea level. The Nile is the backbone of the zone and defines the trends of the urban development in the region as a first corridor from north to south, i.e., Shoubra el-Kheima - Helwan. The second corridor extends from the international airport in the middle-east of the first corridor, to the Great Pyramids in the west. This corridor is about 40 kilometres long and at its widest part, 10 kilometres wide, Fig. (4-1). This zone is occupied by the vast majority of the region's population and economic and institutional activities, besides such attractive and important features as the Pyramids and the Sphinx, the Citadel and Kanater el-Khairiya national park, Fig. (4-5).

(2) The second zone, the largest in the region, is the eastern wing which occupies a part of the Eastern Desert. It is an arid and rocky plateau sloping from the west to the east and from the south to the north. The edge of this plateau approaches the Nile Valley at the middle and the south of the region, leaving a relatively narrow area for the built-up area, while in the northern part of the region it leaves vast level areas where recent development is taking place in Matariya, Heliopolis and Nasr City, Fig. (4-3). Approaching as a ridge at the middle of the region are the Mokattam Hills (about 200 metres above sea level), and in the north this ridge is dominated by the sand dunes of El Khanka, near Al Obour new town, discussed later. The most complicated relief in the region lies in the south-east where there are many steep and dry valleys and a high plateau which is



وزارة التعمير والمجتمعات الجديدة
 الهيئة العامة للتخطيط العمراني
 دراسات الاقليمية للمدن الجديدة
 اقليم القاهرة الكبرى
 استعمالات الاراضي الحالية



- وسط المدينة Cer
- مناطق سكنية Res
- مبان ادارية وحكومية Ad
- مناطق صناعية Ind
- مناطق ترفيهية Rec
- اراضي زراعية Ag
- جبانات Cem
- الطرق الاقليمية Roc
- سكك حديدية Rai
- خط كهرباء ضغط عالى Ele

BOUNDARIES OF
 G.C.R. AND EXIST.
 LAND USE 1979

Fig. (4-6)

Source : GOPP, New Towns in the GCR, 1st Report, Aug. 1979, pl9

the northern part of El Galalal Bahariya plateau, west of the Gulf of Suez. It reaches 600 metres above sea level, and whilst most of it is unsuitable for development, at least in the near future, there are some exceptions such as where Al Amal new town is sited, in its somewhat isolated location.

(3) The third zone west of the Nile, is actually an extension of the Pyramids plateau with its rolling sandy desert which is approximately 200 metres above sea level. The major features in this zone are the Great Pyramids and the area between them and the other archaeological digs around the Dahshour and Sakkara Pyramids, south-west of the Giza Pyramids. The terrain of this zone is less complicated than the eastern zone and gives some opportunities for value of the Pyramids area and there is also the possibility of expanding west Cairo airport to be an international airport.

4.5 Population and Urban Growth in GCR

As mentioned earlier, on the basis of population and economic activities, the GCR is the largest and one of the fastest growing centres in Africa and the Middle East. The city of Cairo is the focal point of the region besides being the political and administrative capital of Egypt. It is also considered the cultural capital of the Islamic world, especially since it has been the home of Al Azhar University for more than 1,000 years, (see note 12 in this Chapter).

The GCR has a high rate of population growth. Table (4-1) and Fig, (4-9). Fig. (4-8) shows Cairo population to GCR, and the estimated GCR population to Egypt's population in the period 1897 to 2000. Since the beginning of that period, the region has always dominated the national scene because of the concentration of political, economic and cultural activities in it. Before the 1920s the region's share of the national population was about 10%, but later it began to increase gradually until the beginning of World

Table (4-1)

GCR POPULATION COMPARED WITH THE COUNTRY'S POPULATION 1897 - 1966 (000s)

Area	1897	1907		1917		1927		1937		1947		1960		1966	
		Population	Growth Rate %	Population	Growth Rate %	Population	Growth Rate %	Population	Growth Rate %	Population	Growth Rate %	Population	Growth Rate %	Population	Growth Rate %
Cairo	597	684	1.36	802	1.59	1,073	2.89	1,312	3.4	2,079	4.52	3,353	3.47	4,220	4.02
Part of Giza Gov.	239	272	1.3	330	1.3	386	1.15	452	1.59	574	2.38	1,002	4.02	1,293	4.45
Part of Kalyubia Gov.	150	177	1.67	205	1.48	217	0.6	253	1.51	309	2.01	465	2.99	600	4.44
TOTAL	986	1,133	1.4	1,337	1.66	1,676	2.25	2,017	1.85	2,962	3.8	4,820	3.54	6,113	4.15
EGYPT	9,669	11,190	1.46	12,718	1.28	14,178	1.09	15,921	1.16	18,967	1.74	25,984	2.31	30,083	2.57

NOTES

- The annual rate of growth in 1917-1927 had raised compared with before because of World War I which brought different activities to the region and resulted in more rural migration to the industrial and urban areas as a whole.
- Also there was a political concentration in the region after the 1919 Egyptian revolution.
- But the international economic setback in the late 20s and the whole of the 30s had shown its reflection on the region where unemployment increased and resulted in low migration from rural to urban areas which can be noticed in the lower growth rate of the period 1927-1937.

Source: The Greater Cairo Planning Commission, "The Preliminary Planning of Greater Cairo Region", March 1970. Appendix 1, Arabic.

War II, when its importance and weight grew considerably with increased internal migration, consequent upon the job opportunities the war provided. Internal migration to the region has not stopped since then(9), Fig. (4-7). The region continued to increase in population until the mid 1960s when the rate of increase reached its peak, Table (4-1). Today, the rate of increase in the region's population has reduced, but continues. In population terms, Cairo has always dominated GCR, at an increasing rate until 1947, and since then with decreasing, but still substantial emphasis, Fig. (4-8). By 1970, the city's population represented less than 64% of that of the region, and this percentage is expected to decline further, until by the year 2000 it will be only 56%, while the total population of the city and region will continue to increase, reaching about 16 million by the turn of this century, Fig. (4-9) and Table (4-1).

If the expected population increase between 1980-2000 in the GCR is 7m, it will be necessary to house more than 350,000 people a year or to establish 70000 dwellings every year in the region till the end of the century (see poor housing production at 10 Ramadan p.243), which gives plenty of scope for new towns in the GCR. The lower rate of increase of Cairo population may be related to the acute housing crisis in the city. That crisis which began in the 1960s was a consequence of several factors, including considering the housing sector as a non-productive sector, and hence allocating inadequate funds to it, and the acute shortage of the local building materials and difficulties of importing them. There was also a concentration of departments and job opportunities in Cairo, especially after the nationalization of most of the productive sector, where haphazard appointment of employees took place and none was sacked if he wished to work or not. This resulted in a daily commuting to the region, and caused more congestion and restraint to public facilities, Fig. (4-10). The continuous increase in GCR population as compared with the slower increase

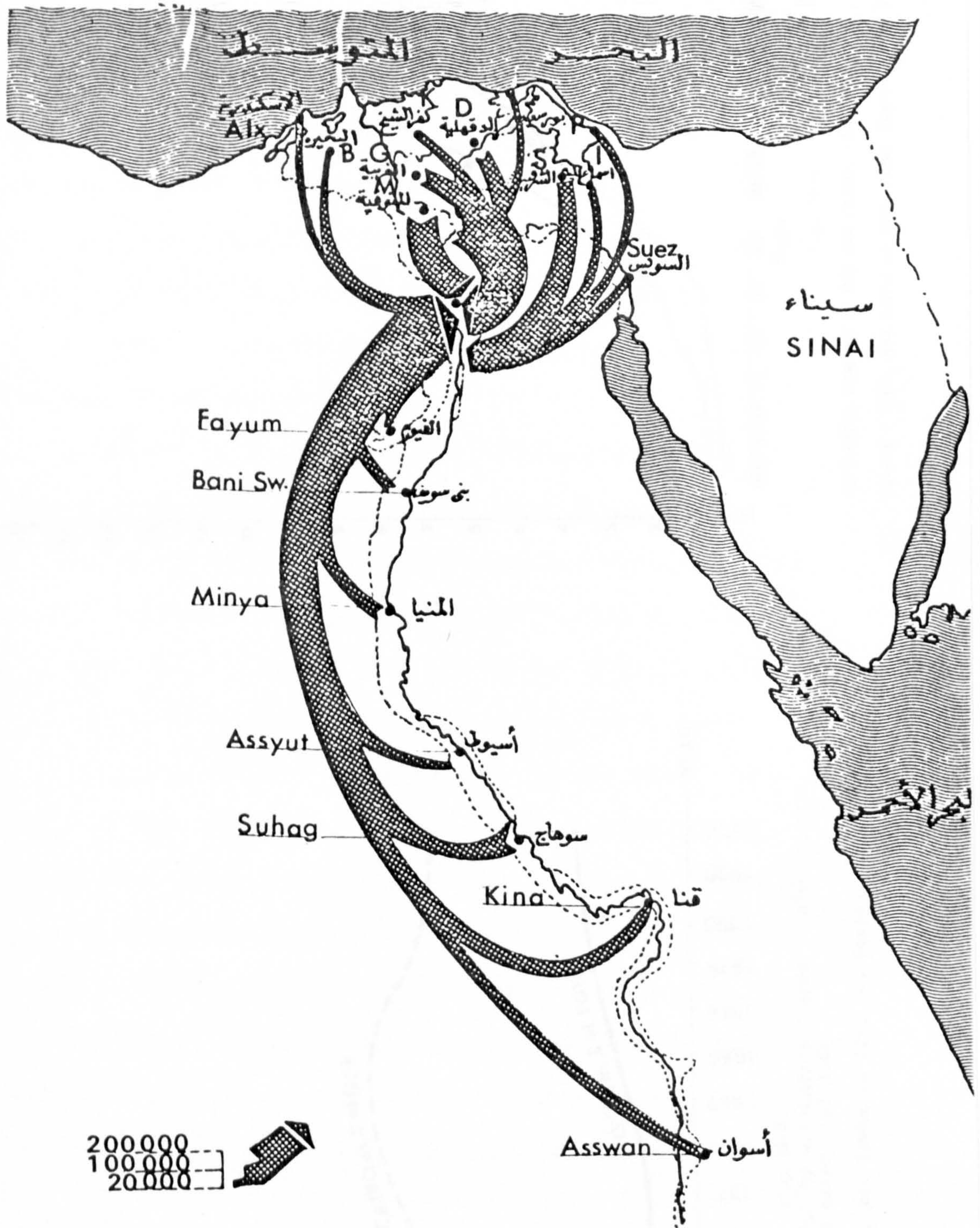


Fig. (4-7)

MIGRATION TO CAIRO FROM DIFFERENT GOVERNORATES IN 1976

Source : GOPP, Al Amal new town, second report, part 3, May 1980, pl4. (Arabic)

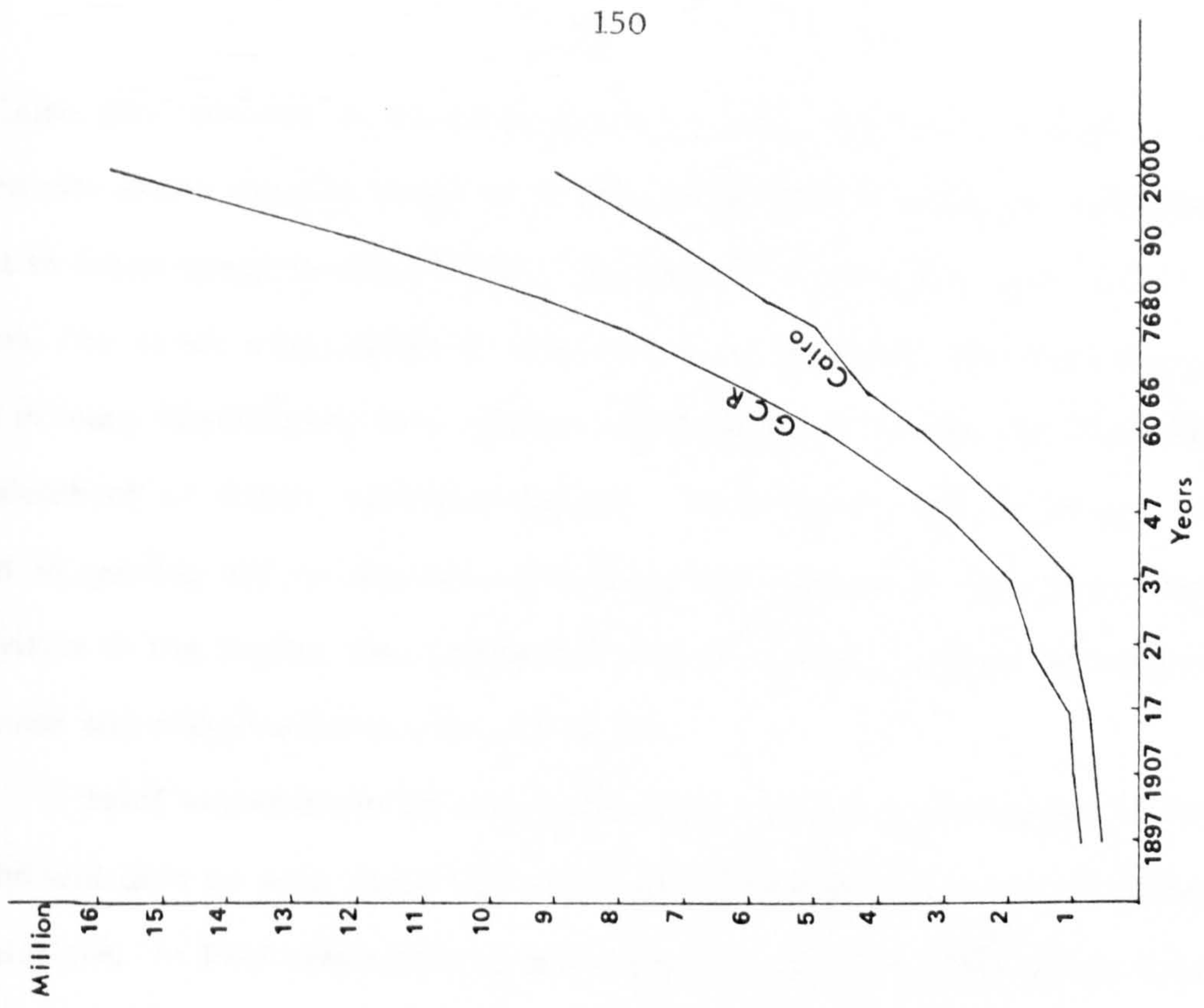


Fig. (4-9)

POPULATION CHANGES IN GCR AND CAIRO, 1897-2000

Source : GOPP, New Towns in GCR, First Report, Aug. 1979, table 4.

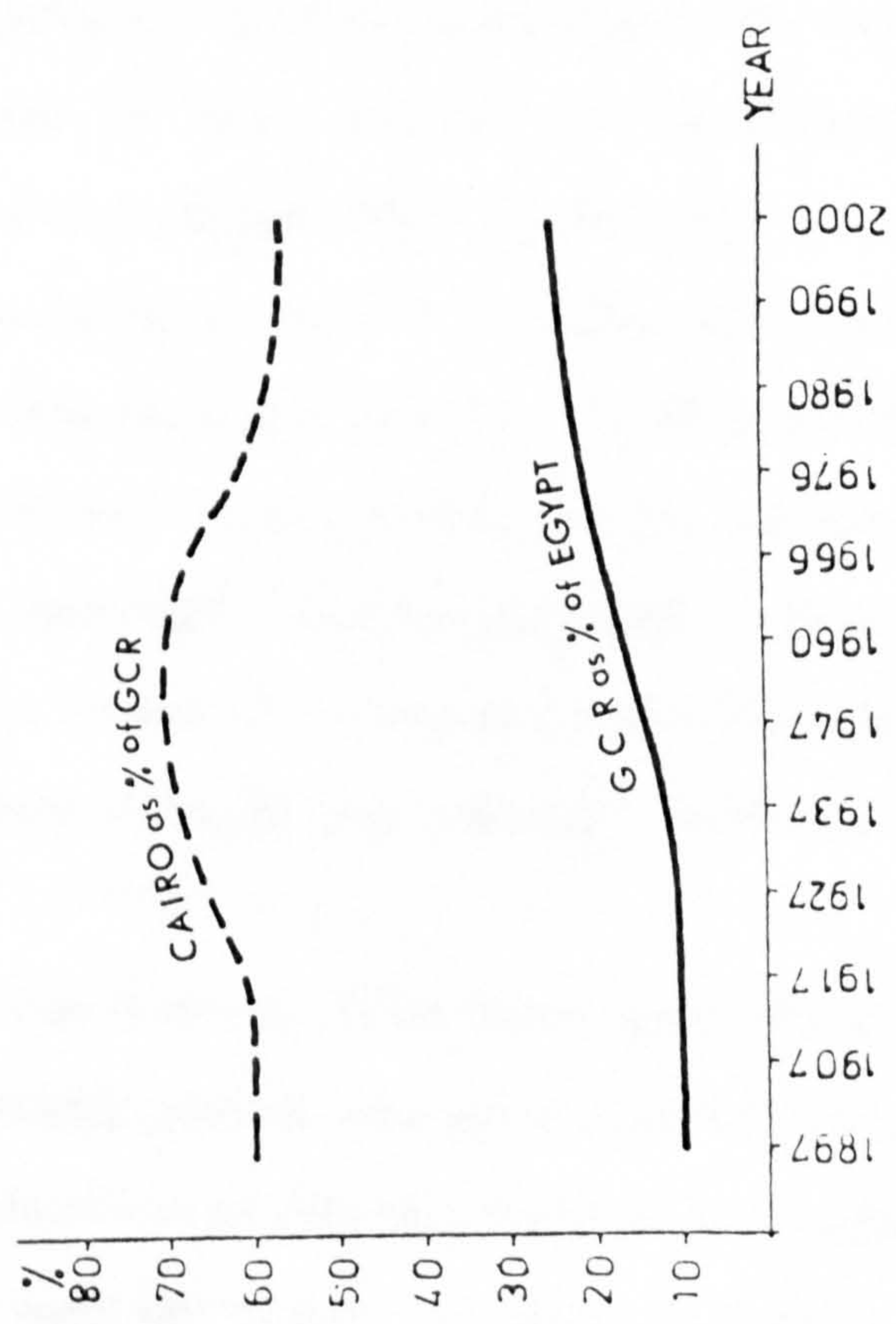


Fig. (4-8)

THE RELATIONSHIP OF POPULATION TRENDS : CAIRO TO THE GCR AND GCR TO EGYPT 1897-2000

Source : GOPP, New Towns in GCR, 1st Report, Aug. 1979, p22

in Cairo city, present a serious problem because the urban expansion of Cairo city is the least threatening to the agricultural land, but it is still the most to urban congestion and health. Whereas Cairo itself is far away from farms, the other urban areas of the region are nearer to the agricultural land in many districts and their growth results in the increasing pressure for development of scarce agricultural land. These facts have to be kept in mind in guiding future decisions affecting distribution of population and activities in the region, i.e., to plan for better serviced environment and to increase and preserve the existing farm land.

A brief examination of some changes in the agricultural areas of the region will give an idea about the relationship between the rural and urban populations. In 1947 about 19% of the region's population within its present boundaries, Fig. (4-6) and Table (4-1), (then about 3 million), lived in rural districts of Giza and Kalyubia. By 1976, the number of people in these districts had doubled to 1.1 million, but relative to the rest of the region, the rural districts had declined to about 14% of the total regional population. This trend is expected to continue until the year 2000. The bulk of recent population growth occurred in Giza in the west and Shoubra el-Kheima in the north of Cairo, where expansion took place on farm land that should have been preserved, whatever the circumstances. The districts of Dokki, Agouza, Imbaba of Giza and Hadaik Shoubra and most of Shoubra el-Kheima itself are sound examples of destructive expansion onto farm lands, while the earlier Cairo expansions in Maadi and Heliopolis were into the desert.

Between 1966 and 1976, two districts within Cairo, south and west, showed a decline of more than 100,000 persons between the pair of them, or 7.7% of their 1966 population, which can be related indirectly to the failure to replace housing units which were demolished during the period(10), or betterment projects as to widen some roads or to convert residential

buildings to office or commercial ones.

Emphasising the importance of the two main urban corridors already discussed, more than 48% of population growth occurred in the Cairo eastern districts and Giza through the north-east-south-west corridor. Similarly, more than one-third of all population growth occurred along the Helwan-Shoubra el-Kheima corridor. Since 1966, the region's population has grown at an average annual rate of 2.6% doubling in 27 years, and with the exception of two districts in Cairo, the growth of the rural population occurred at the same rate as that of the region as a whole. The two districts which exceeded the regional rate, with a lot of planned and unplanned growth, were in east Cairo; Mataria-Zeitoun-Heliopolis-Nasr City, and in south Cairo, Helwan and Maadi. In contrast, the rate of urban population growth in Giza and Kalyubia was more than twice that of the region as a whole, as a result of the urban expansion, including some in the surrounding villages. So the momentum of the longitudinal expansion along the two main urban corridors is still strong and active, and represents serious problems to the region's agriculture: it threatens the valuable farm land and orchards along the Nile, especially towards the north, which in turn endangers the supply of fresh vegetables and fruit to the region. So, growth must be stopped on both sides of this corridor.

In the case of the north-east-south-west urban growth corridor, there are also threats to farm lands in Matariya district and Giza Governorate. But this corridor ends in the east and west in the desert. The momentum for growth should avoid the farm land within the corridor and be siphoned off by the establishment of new towns at the ends of the corridor, including 6th of October in the south-west and Al Oubur in the north-east, the 10th of Ramadan further site to the north-east, and Al Amal in the south-east of the region.

4.5.1 Population Densities in the Region

The analysis of population densities in the region is important if plans are to be made to reduce or redistribute the region's population either within it or outside its boundaries.

The average population density of the GCR is 25 persons per ha., but this density is as misleading as the corresponding average national density because, 68% or 256,600 ha. of the region is desert, 22% or 84,000 ha. is agricultural land, and only 10% or 38,000 ha. represent the built-up area. When this area alone is considered, the average density becomes 250 persons per ha. But the average density is also very different from one district to another. The highest densities are found in the older districts such as Babel Sharia and Rodel Farag, Fig. (4-4), which had densities in November 1976, of more than 1000 persons per ha. Shoubra, Zeiton, Sayeda Zeinab and Boulaq also have very high densities of the same high order and suffer from narrow streets and paths, and lack of open spaces and parks, where buildings are too crowded. Outside these old districts, the densities are considerably lower, especially in the business and commercial districts, like Moski, (583 persons per ha) and Kasr el Nil (78 persons per ha), which have comparatively limited residential development.

Some high densities exist also in GCR districts outside Cairo, in Giza, Im^baba, Shoubra^l Kheima and Al Hawamdia. Imbaba, for example, has the highest density, more than 1000 persons per ha.

Population studies and projections for the year 2000 indicate that if the prevailing situation continues, the pattern of densities in the region will possibly change. The density in old Cairo districts is expected to decrease to less than 1000 persons per ha, to widen the roads and to leave more open space for improvement, add to that the fact that new couples prefer to move into newer districts, and the density peaks will move far from the

central districts to Zeiton in the east and Shoubra in the north where the densities are expected to reach 1970 persons per ha and 1605 persons per ha, respectively. Outside Cairo, the highest densities are expected in Imbaba (1188 persons per ha) and Shoubra el Kheima (940 persons per ha)(10a).

All the demographic studies point to the acute need for action to decongest the overcrowded areas that have caused most of the region's problems, for disastrous effects may be expected if the densities continue to increase in the region. The only way to absorb overpopulation is to open up new urban areas outside the existing ones. Bearing in mind the necessity to safeguarding agricultural land, this will clearly involve the establishment of communities around the region, on the desert land, to contribute to lowering the congestion. The present programme of the new towns will absorb only a small part of the expected population growth in the GCR. That means they must be considered as a first step on the long road of building many more new towns as a matter of urgency.

The November 1976 census shows that the region has a large number of young people, which affects the region's socio-economic condition and potential. In Cairo, 27% of population were under the age of twelve(11), while the other two governorates of the region had a higher proportion of this age, 33%, because they have a greater percentage of rural population than Cairo, and rural families like to have more children to help in farming. People of 65 years and over were but 2.4% of the total, less than one quarter of the percentage of population of that age in European and American cities, where the corresponding figure is 10%.

The higher percentage of young people represents an additional burden in relation to the provision of housing and schools and the improvement of social and community services and facilities, because the young people of today are the active ones of tomorrow. In new towns good planning can satisfy the needs of the new families in a way that is

impossible in the old overcrowded centres associated with a high rate of growth.

The above mentioned facts about the high population growth and congestion within the GCR suggest that there should be more new towns as was practiced in the UK, see Section (3.3.10) concerning London new towns. The present new towns programme in the GCR is insufficient and must go ahead much more rapidly to provide housing, jobs and services, as previously mentioned, for about 350,000 people per year till the year 2000, or about 70000 dwellings a year, which has never been approached by the government.

4.6 Factors Affecting the Development in the Region

This section represents an attempt to analyse the nature of factors affecting the components of the urban complex of the GCR. Almost the same factors on a much smaller scale, can apply to other urban areas of the country.

In small regions, it is possible to identify the relationship between the various elements and to describe the physical, social, cultural and finally the economic structure of the region. But in large urban regions, especially those which like GCR, have developed from several nuclei or urban centres, it is a problem of a different scale because of the complicated interactions of the urban structure. The fact that Cairo city was originally several separate cities or districts (see Section 4.2.1 above), which grew until they became one conurbation, or recently, megalopolis, increases the complexity of the region because of the different nature of its many parts especially if added to high growth rate. For example, rural patterns of life could clearly be seen side by side with the modern blocks of flats and shops in Dokki, Agouza and Manial districts until the 1960s and 1970s, and can still be seen in Giza and Imbaba districts in the peripheries of Greater Cairo.



Fig. (4-10) CONGESTION IN CAIRO

Cairo centre with one of its big office buildings (about 4000 rooms) which is daily used by huge numbers of people. Pedestrian problem is not practically solved. It should be via : pedestrian sub-ways. The passage is also poorly maintained.

(Attia, June 1981).



Fig. (4-10a)

Pedestrian mingled with traffic in Cairo centre which has narrow pavements. Illegal parking almost blocks the street because of insufficient parking areas.

(Attia, June 1981)

Conditions such as these make the task of the planner more complicated as he tries to analyse and plan for the region, Figs (4-10) and (4-10a). It is important at the beginning to identify the forces operating in the region that influence and shape it, to understand the nature of these forces, to evaluate the interactions between them and to take them into consideration when planning for the future urban pattern.

As the national capital, Cairo is the centre of political, economic and cultural activities in Egypt, and the GCR is of the greatest importance in the country. These activities dictate the trends of urban growth in Egypt as a whole and particularly in GCR and Giza is the Capital of the nearest governorate to Cairo, while Shoubra el-Kheima is the biggest city of Kalyubia, the other governorate nearest to Cairo. Actually, Shoubra el-Kheima in the north and Helwan in the south are two of the largest industrial complexes in Egypt. The cultural importance of the region extends beyond the national boundaries to include other Arab and Muslim countries and the Middle East. This means that the influences affecting the growth pattern of the region are not only local, but are deep-rooted both nationally and internationally(12), (see Section 4.6.2 below). Such facts have to be considered when building new settlements in the region to meet the required expansion away from the present congested areas.

It is clear that the gap between the region and the rest of the country is quite big and in its quality of urban life, only Alexandria approaches Cairo. Very recently, some big cities, in the Delta and Upper Egypt, have begun to develop in the other governorates, especially since the Government began to decentralise economic activities with the aim of increasing the attractiveness of other regions for private investment, in order to reduce the pull of GCR. The open door policy introduced after the 1973 war, has considerably encouraged that trend. Industrial and tourism projects are being developed outside Cairo and Alexandria such as the Aluminium

complex in Naga Hammadi in Upper Egypt and the tourist sites on sea shores at Sidi Abdel Rahman and Ghardaqa (Hurghada). Precautions must be taken not to approach the scarce agricultural land, as what happened in Zagazig, east of the Delta, and Assyut, in Upper Egypt, where universities and other institutions were established on agricultural lands.

The new towns policy in the GCR is an attempt to redistribute the urban growth of the region in better conditions, and to ensure that urban development will not take place on the scarce agricultural areas.

There are a number of major forces that influence urban trends in the GCR. These include physical, institutional and socio-economic factors.

4.6.1 The Physical Factors

The leading physical force in the GCR is the river Nile, the backbone of virtually all the different activities in the whole country (see Section 1.3.1). Second in importance are the Mokattam Hills to the east, and the Pyramids plateau in the south-west. The impact of the latter has become more evident after the recent extensive development of the region, especially in the last three decades. But the impact of Mokattam has been felt since the Arab conquest, when their first settlement Al Fustat, was established at Mokattam's feet, (see Section 4.2.1). The location of Fustat reflects the importance of Mokattam as a strategic point, and at the same time the need for the preservation of farm lands. Later, Salahul Deen (Saladin) established the Citadel and its fortifications a little to the north, but also at the feet of Mokattam Hills, to defend Cairo against the invaders' favourite approach, the north-eastern road (see Section 1.3.4). As the Mokattam itself restricted urban growth to the east, development followed a north-easterly direction around the plateau, which gives way to the plains northwards, Fig. (4-3).

Early in the 19th century, during Mohammad Ali's reign, it was essential to establish new industries along the Nile for shipment, because until then Cairo had insufficient of shipment industries, in spite of their growing importance for defence, commerce and transport. So, urbanization took north-west and south-west directions on the agricultural lands in Boulak, Shoubra and Giza (Fig. 4-3). But there is continuing evidence of the influence of Mokattam which dictated the crescent shape of the built-up area of the region, Figs. (4-12) and (4-13). The expansion of urbanism is continuing in Madinet Nasr (Victory City), through the steep northern ridges of the plateau and towards the east where the land slopes more gradually. Southward, from Cairo the terrain is much more hilly and rough, and the military fortifications in Wadi Hoof near Helwan form a barrier against urban development in the near future, to the south-east. These limitations also dictate certain passages for the roads to wind around the hills over longer distance than would otherwise be necessary like the link between Helwan and Katamia to the north-east, which is 70 km, while a direct route could be as little as 50 km, Fig. (4-6).

Apart from some scattered sand dunes near the Khanka desert, Fig. (4-15), there are no physical limitations to urban extensions to the north-east. The extension of Cairo towards both the north and south is limited by the agricultural land that should be preserved for the food supply of the region, for these are the nearest productive farm lands in Cairo.

There is also the western desert plateau. The parts which lie inside the GCR extend between the Great Pyramids and Dahshour, and contain areas of importance such as digging for archaeological and historical research, so there is great resistance to any attempt to introduce urban development. For example, in 1979 when a Chinese company supported by some politicians managed to get a contract to establish a tourist settlement on the Pyramids plateau, the archaeologists and the University Professors

protested violently and called for prosecution of the officials responsible. The project was cancelled, even though it had been approved by Parliament. (See Section 4.8.1.A below).

There are also some military and civil installations which can considerably affect any further urban extension in the region. These include airports and defence points bordering the region, especially its eastern and western sides, but they are not permanent obstructions and their importance may change over time, following changes in the strategic and armanent circumstances and technologies.

Cairo airport, in the north-east, has a limited capacity for passengers and there are arguments for the establishment of another airport in the north-west of the region to cope with the expected increase in the passenger-traffic in the future. It is argued that West Cairo military airport should be changed to an international airport.

Finally, one can conclude that the general fan-shape of the urban development of the GCR will continue for several decades to come, but with a more obtuse angle, owing to the conforming effect of the northern farm lands and the possibility of urban development towards north-east and north-west, Fig. (4-12). The possibility of using modern technology to overcome development difficulties in the Mokattam Hills and expanding Greater Cairo in that direction must be kept in mind, especially as these hills enjoy an attractive climate and are aesthetically appealing. The Summer temperature is about 5 degrees C. lower on Mokattam than in Central Cairo, and the air is far fresher and drier, while the scenes over Cairo are marvellous. The eastern side of the Mokattam hills is not as steep and undulating as the western side which looks towards the built-up area of Cairo, which may be connected with the eastern Mokattam side by a tunnel from Salah Salem Highway to save a long and difficult journey, Figs. (4-3) and (4-11). Because of its advantageous weather and proximity to central

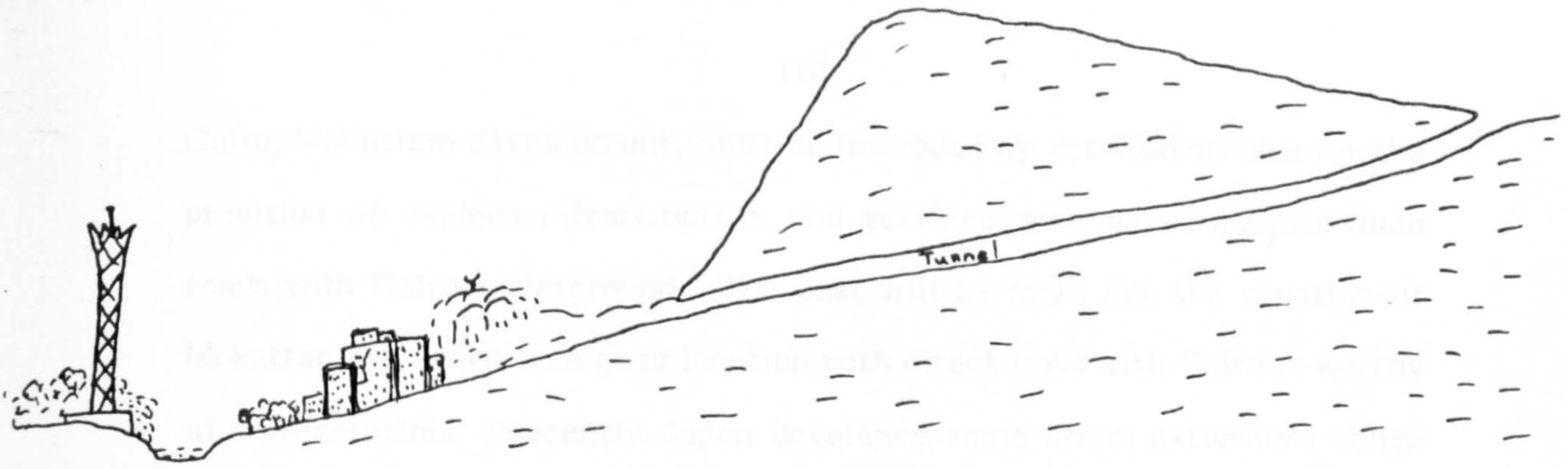
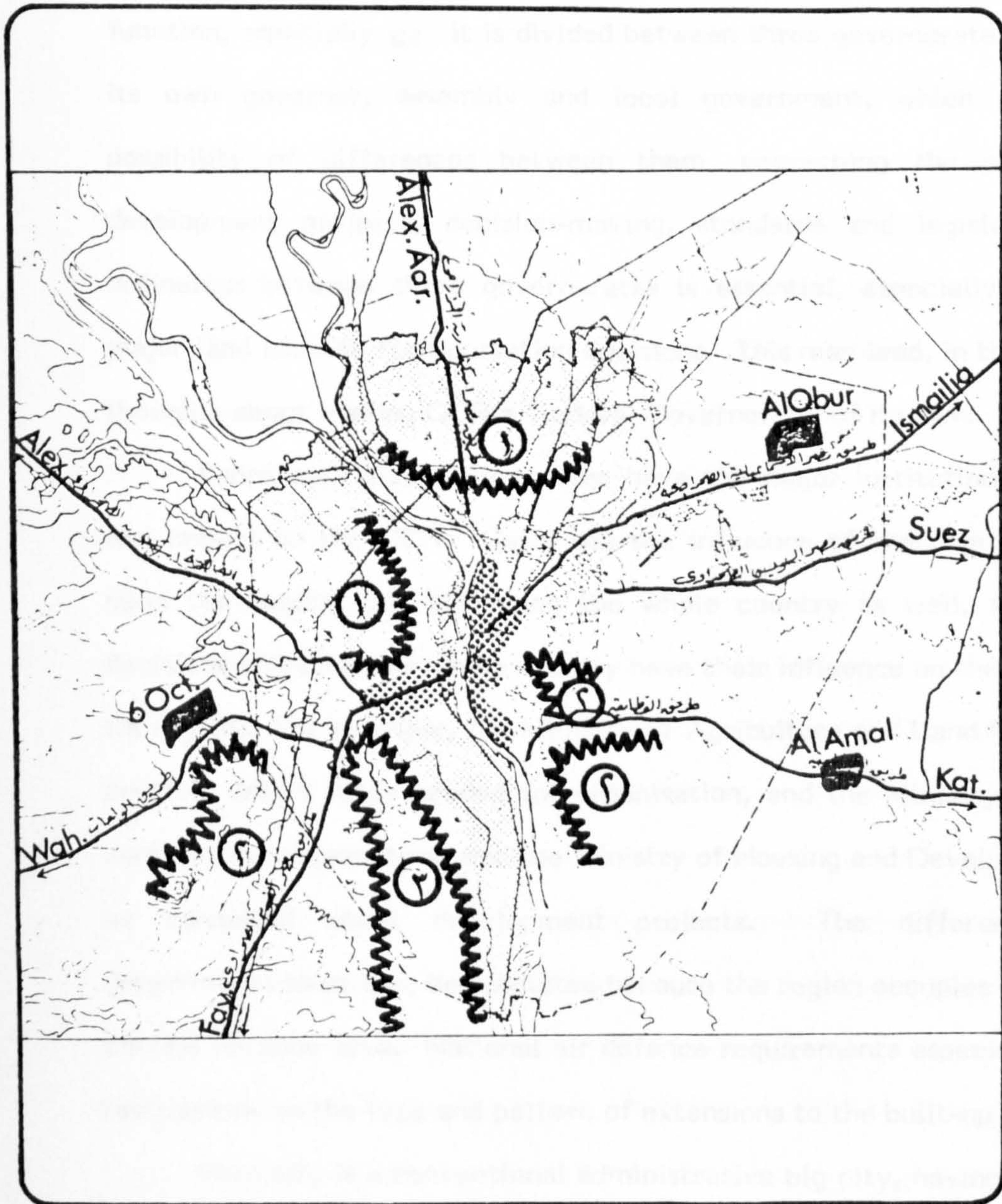


Fig. (4-11)

SUGGESTED PLAN FOR THE DEVELOPMENT OF EASTERN MOKATTAM AREA, CAIRO



وزارة التعمير والجمعات الجديدة
 الهيئة العامة للتخطيط العمراني
 لدراسات الاقليمية للمدن الجديدة
 اقليم القاهرة الكبرى
 الموانع الطبيعية
 لوقت رقم 9
 لوقت رقم
 الشمال
 Km 2 4 8
 AGRIC. ①
 HILLY ②
 ARCHEO. ③
 Fig.(4-12)
 PHYSICAL BARRIARS
 TO URBAN DEVELOP
 MENT & New Towns,
 G.C.R.

Cairo, Mokattam development, must be preceded by detailed studies for the provision of modern infrastructure and services such as linking its main roads with Cairo underground. The cost will be high, but the creation of Mokattam new town on a good location with direct links with Cairo is worthy of consideration. (Recently Japan developed some urban extensions above the sea!).

4.6.2 The Institutional-Cultural Factors

As a large metropolitan area, the GCR has a multiple administrative function, especially as it is divided between three governorates, each with its own governor, assembly and local government, which raises the possibility of differences between them, concerning the planning for development projects, decision-making, standards and legislation. Co-ordination between three governorates is essential, especially concerning major land use and transportation decisions. This may lead, in the future, to thoughts about making GCR a 'Federal Governorate' of its own.

Cairo and Giza governorates have the major institutional influence and impact on the GCR. Cairo has the influence of the capital, not only upon the region, but also upon the whole country as well, and national decisions affecting the whole country have their influence on the capital and its region. For example, the Ministry of Agriculture and Land Reclamation controls desert lands needed for urbanisation, and the Ministry of Finance controls the expenditure, and the Ministry of Housing and Development must be consulted about development projects. The different military departments must also be consulted because the region occupies much of the central defence area. National air defence requirements especially impose restrictions on the type and pattern of extensions to the built-up area.

Giza city is a conventional administrative big city, having 57% of the population of Giza governorate, and 81% of the governorate's population live

in the GCR(13). Giza city, besides being an extension of Cairo city across the Nile linked by seven huge bridges with related tunnels, flyovers and ramps, is the dominant force in a governorate which is of growing importance in relation to decisions affecting the urban development in the region.

The third governorate in the region is Kalyubia, north of Cairo. Although its capital Banha lies outside the GCR, 56% of the governorate's population live in the region, and the city of Shoubra el-Kheima, the largest city of the governorate(14), represents one of the two big industrial complexes of GCR, the other being Helwan in the south.

Besides the Ministries and the governmental departments in GCR, there are also five major universities and numerous higher institutes and colleges and many research centres related to the government, United Nations and the Arab League, all of which have their impact on the region.

Al Azhar University in Cairo is the oldest university in the world and has continued operating for more than 1000 years, making the city a major centre for the study of Islamic theology, (see also Section 4.5). For more than 1400 years, Cairo has attracted artists and artisans from all over the world, especially the Islamic world. It has provided a haven for writers, philosophers, scientists, historians and scholars, as a whole. For a century and a half, the city has been a meeting ground for civilizations from both east and west, linking Europe, Africa and Asia. A substantial number of international air and land routes passing through it.

The number of different governmental agencies exercising control or influence in the region was the main reason that led to the establishment of the Greater Cairo Planning Commission in 1966, which became The General Organization for Physical Planning (GOPP) in 1973. This organization carries out studies about the region including the new towns programme, as well as the national programme for development and new towns.

The GCR also contains many research centres and institutes. Its clinics and treatment centres attract thousands of Arabs all the year round for medical care and relaxation.

All these attributes lead to the growing importance of the region as the cultural and scientific headquarters of the nation, and any development programme must, clearly, take into account the cultural and scientific attraction of GCR.

4.6.3 The Socio-Economic Factors

As the largest industrial and business centre of the country, containing the main commercial and financial activities, the GCR has the capacity for continuing commercial and industrial development which makes it a powerful magnet for projects, investments and hence, employment. But insufficient and inadequate services hinder proper development in the GCR.

The shortage in the region's services resulted from the ill-considered policies such as the haphazard nationalization of the private projects in the early sixties and, as mentioned earlier, from considering the housing sector as being non-productive. Further shortages of services resulted from the influence on the economy by the wars of 1963 and 1967 to 1973, (see Section 1.7) resulting in an acute shortage of funds. These circumstances have left the region in need of both structure and infrastructure, such as housing, communications and sewerage. Remedying this situation will involve the growth of economic activities and employment opportunities. This is clearly evident in the five year National Plan (1978-1982) where 31% of the national investment is allocated to the Cairo governorate, while the nearest governorates, including parts of the GCR, Giza and Kalyubia governorates, received only 5.2% of the planned investment. The following Table (4-2) shows the distribution of the funds allocated in the 1978-1982 National Plan for Cairo, Giza and Kalyubia governorates as a percentage of the national

investments in the different sectors.

TABLE (4-2)
INVESTMENT PERCENTAGES IN 1978-1982 NATIONAL PLAN

Sector	Cairo	Giza	Kalyubia
Agriculture	6.1	2.8	2.2
Irrigation	1.8	2.3	1.5
Industry	33.0	3.0	4.1
Oil	1.0	4.4	2.6
Electricity	10.0	3.3	0.3
Transport & Communications	44.7	4.0	0.7
Commerce	56.0	-	1.5
Housing	42.0	0.8	1.8
Utilities	35.2	1.3	1.6
Services	35.8	5.4	2.0
Total	31.0	3.1	2.1

Source: GOPP, New Towns in the GCR, 1st Report, August, 1979, p.38.

In view of this concentration of development, Cairo continues to grow at the expense of other places, especially in relation to funds allocated to industry, transport and communications, commerce, housing, utilities and services. This means that the existing economic activities will continue their growth at least vertically, that is in a concentrated manner in the same space, rather than horizontally spread through the region. The concentration of the governmental departments and public sector activity in

the region has made those institutions one of the main sources of employment. If some of these employers, employees and families were to be transferred to the new towns, some of the urban growth could also be directed to them or would follow, along with industrial employment(15).

The economic importance of the existing 210,000 acres of farm land in the GCR will become more crucial in relation to future plans for new towns to be established in the region. In other words, the preservation, development and expansion of the agricultural land must be taken into account when developing new towns.

The weight attached to tourism in the GCR represents another 'pull' economic factor. The region contains historical and archaeological districts, religious places and aesthetic sites(16). Such resources makes the region one of the attractive places in the world. But International tourism will only increase when sufficient facilities and services can be provided in the GCR and its new settlements.

Besides the economic pull of the GCR, there are several social factors which led to its rapid growth. Although some of these have lost their impact recently, any attempt to establish new towns in the region must take them into account.

Some existing districts of the region are attractive and hospitable to rural migrants because they offer an extension of the village society. That is because the different generations of migrants developed their new environments in a manner similar to those in the countryside, from which they originally came, (see note 43 in Chapter Three). So we find some families cluster in the popular districts, and if they move, it will be to a location in the same radial sector to be as near as possible to their relatives, friends and shops. For example, those who grow up in Zeiton and El Waili are more likely to move towards the Mataria-Heliopolis axis which is nearer to their homeland, rather than to, say, Roda-Giza axis, Fig. (4-4). Such trends have to be considered in relation to the possible

success of the new towns to be built in the region(17).

There is a clear relationship between migration and university enrolment. Since the 1950s, there has been an increase in the number of university students coming from rural areas to GCR universities, but recently, the housing shortage in Cairo, and the opening of regional universities has changed this situation considerably. Recent experience has shown that the institutions of higher education can maintain the development of new settlements supported by educational buildings, hostels, sports and social centres and so on.

The attractiveness to the rural migrants of areas bordering the urban region near farm lands, must be taken into account when consideration is given to the establishment of new towns in desert areas. These new environments may not be sufficiently attractive to rural migrants because of their remoteness and different appearance from the rural environment. This difficulty might be overcome, partly at least by cultivation of areas of land reclamation near to the new towns, to create a similar environment to rural areas, but with better services and accompanied by agro-industrial projects for more employment.

4.7 Interactions Forming Urban Growth in the GCR

The main driving force behind the rapid growth in GCR is its socio-economic and cultural attractiveness. It is evident that the attractiveness and strength of these forces will continue. So it is necessary to evaluate the interactions that have an impact on the future success or failure of plans including the new towns programme in Egypt. Most of these influences are inter-related and cannot be considered in isolation, but to make the study and analysis comprehensible and simple, it is necessary to approach them separately.

4.7.1 Financial Provision for Services

The rate of urban growth in the region poses a problem because the financial resources are insufficient to meet the need for expansion of municipal services and infrastructure, a situation that is found even in the rich countries like the United States, where urban expansion is slower than GCR. An urban region of more than 9 million people in a developing country will face difficulties in this respect, especially as household incomes, levels of education and people's aspirations improve. Costs are likely to continue to be more than the region can bear, and the programme may be technically difficult, especially as it is expected that the region will have about 16 million people by the year 2000, (see Fig. 4-9). In these circumstances it is important to try to decrease the rate of migration into the region and to stabilize its population in order to avoid further deterioration of services, contributing to worsening socio-economic and development conditions. If planned new towns can offer a suitable alternative and a reasonable environment to living in the built-up area of the region, they could be of great benefit to the current situation in the region and, in the long run, new towns may represent a saving in financial resources, thus helping the region as a whole(18). Further more it may well be less costly to provide new infrastructural installations in new towns, in areas clear of existing development than would be the case in old urban areas. In the latter, it will generally be found necessary to take up the existing roads and constructions, or to change some of the old systems in order to expand them, which raise the overheads considerably, and imposes cost burdens by way of disruption to economic activity and transport flows.

4.7.2 Lack of Farm and Building Lands

As mentioned in Section 4.4 above, the Greater Cairo Region has a limited area of agricultural land, about 840 square kilometres (210,000 acres). The urban sprawl which has characterized the periphery of the expanding development has been accompanied by land speculation and illegal property building on agricultural land. The government owns the desert lands, while most of the agricultural lands are in private ownership. Agricultural land, where water resources, some services and infrastructure, in addition to existing development, are on hand, is always the victim of any increased urbanism. This trend might best be stopped by planning for new communities, including agricultural ones in reclamation areas, as an alternative field of development apart from the existing urban areas, and by applying strict regulations, via local authorities, governing the use of agricultural lands, and attracting some farmers to the reclaimed areas by incentives, such as cheap land, houses, equipment, services and employment. A system of planning control must be enforced via efficient staff and sufficient safeguards against corruption and unwillingness which hinder the application of the present controls as those preventing urban encroachment on agricultural land, or building specifications. Ignoring such regulations has led to the drop in farm land and the collapse in some projects. This control might become possible if there were alternative locations in the new settlements, to which people might reasonably be directed and where they could find shelter, jobs and services.

Since the 1973 war, building land prices have risen considerably, affecting the housing market, and making the farmers less resistant to the temptation of selling their land for urban development. A system must be devised to avoid competition for land use, thereby avoiding increases in the price of building lands in new communities, in order not to repeat the

problems of the old urban areas. It is suggested that housing land, in new towns, should be offered for lease only without selling the freehold, the owner paying a rent for using the land and utilities for a fixed number of years, possibly 99 years. If this can be associated with sufficient building land, building materials and services; speculation in building land may be substantially reduced.

4.7.3 Housing and The Urban Pattern

The possibility of changing the housing market is one of the most important factors in favour of building new communities in the region, because that change cannot be done through the existing built-up area which is already congested and threatening the agricultural land. High land prices in the existing urban areas have led to ever smaller plot sizes and to higher buildings to exploit every possible benefit from the site. Resort has been made to such devices as adding extra rooms on the tops of buildings or on the balconies, or even at the entrances, with consequential higher densities and health and social problems. A leasehold system should make it easier effectively to control urban growth, and the less money people will pay to buy land, the less eager they will be to add more floors or rooms to the building as they will do if they pay a lot to buy land and feel obliged to earn a good rate of return on investment. Instead they could buy bigger plots for extended families. Planning for lower densities than present ones must take place in the new settlements as part of a national plan to control the urban physical pattern.

4.7.4 The Development of Economics, Research and Technology

Modern technology is essential for economic development in Egypt, to compensate for a past accumulation of failures caused by lack of planning

or development of the available potentialities (see Chapter 6). Since GCR is the home for most research activities, it will continue to be attractive to firms needing to make constant use of technical and research services and new settlements established in the region may be provided with some research institutions and colleges which will also assist in developing other new towns if properly linked with communication systems, (see also Section 6.3 below about water requirements).

A further aspect of economic development in the region arises from its being a major centre for tourism and culture. New towns in the region can be planned to support this tendency which demands increasingly the facilities to serve tourists in the region itself, and those travelling to other tourist areas beyond it, such as the Red Sea Coast, Sinai, the North Western Coast on the Mediterranean, and Luxor, Aswan and the Abu Simble Temples in Upper Egypt. In these cases, new towns in the GCR, in addition to other functions, can accommodate tourists coming from abroad to examine the regions places of interest before they continue their journeys beyond the region.

Although compact development may have some advantages, such as having workplaces and services close to hand, or easy contacts with relatives and friends, the above-mentioned proposals could help to realize some aims in the GCR as follows:-

- A. Dispersal of the region's population to minimise social ills and problems, save farm land from urban development and reduce the pressure on municipal services.
- B. Constitute a good investment in the future of the region by providing new urban environments free from many of the deficiencies of the existing towns, facilitating the development of new national settlement patterns to exploit to the maximum the region's human and physical resources and potentials.

- C. Given appropriate planning controls, new towns can help to stabilize the estate market and land values and, thereby, lead to reduced population densities when everybody can easily own land.

4.8 The Programme of the New Towns in The GCR

Studies of Greater Cairo Region in 1968 led to the idea of the establishment of four new towns on the desert roads connecting Cairo to the cities of Alexandria and Fayoum in the west, and Suez and Khanka in the east, Fig. (4-2). It was suggested that these towns could accommodate 1 million people by 1990, with the aim of providing an alternative to the further growth of Cairo. They were to be 20-30 kilometres from Cairo centre at the edge of the agricultural zone of the region, along the corridors of the urban growth.

Except for 10 Ramadan outside the GCR, nothing was done for the region until 1979, when a decision was taken to build four new towns round the boundaries of GCR, using the same argument as the old plan but involving different locations, town sizes and implementation procedures. Three of the towns were to be located in the eastern half of the region and one in the west. Al Salam and Al Obur locations were almost the same as the 1968 proposals. The third eastern town, Al Amal, was proposed on the Maadi - Kattamia road, 40 kilometers east of Maadi. The western town, 6th October, is near the Cairo - Oasis road, shortly after its branching of the Cairo - Fayoum road. After detailed studies of the four locations, three were accepted by the Ministry of Development, while Al Salam had to be temporarily suspended because of safety considerations arising from the Cairo International Airport and the National Air Defence, Fig. (4-12).

Al Obur and 6th October new towns lie at the ends of the north-east-

south-west urban growth corridor to make use of its growth momentum. Al Amal is fairly isolated, and its attraction must depend on its own merits. The three towns are located outside the proposed outer ring road, but near to existing highways, from which they can derive benefits. Figure (4-12a) suggests the sources of new towns population in GCR.

An examination of the new town programme in the GCR is necessary after having examined the region referring to the factors and interactions forming its urban growth. It is important to see how far such a programme can help to solve GCR problems and whether it is sufficient or more new towns are still needed. On the other hand, the surroundings of a new town should be studied to help to secure sufficient planning controls against adverse development.

New towns outside the region, as 10 Ramadan, will draw some of their population and activities from the GCR to reduce the pressure on the region and to reduce its urban population. Fig. (4-12b). These new towns will also develop some projects which otherwise will overload metropolitan areas including the GCR, in addition to the redistribution of the region's population and activities within GCR boundaries via new towns such as 6 October and Al Obur.

Effective controls should be enforced to guarantee that areas occupied by activities moving from the GCR to new towns, such as factories and institutions, are going to be filled by proper amenities or essential services not by similar activities, that is to realize less concentration and more services and breathing space in the congested up areas.

Green areas, health and social centres give some examples to ensure that new industries are not going to replace the previous ones. Proper land compensation should be made to the original owners, probably in the form of larger areas of land in new settlements, with some incentives for building as loans or free services.

In fact the case of London in the last decade gives a good example for what can be done for Cairo deconcentration of population bearing in mind that rates of population growth in Egypt is much greater than those in Britain, see p.47. The latest set of population projections for London suggests a decade of stability. Over 1971-1981 the population of the GLC area fell by nearly 700 thousands from 7.5 to 6.8 millions. The 1991 population is projected to be 6.7 millions only. In the early 1970s net migration from London was running at 80-100 thousand per year(18a). It is expected that by the late 1980s emigration will be running at 40-50 thousand per year, more or less the same as the expected natural increase of population which will result in the above mentioned stability of population. These big numbers of people are mainly moving into new towns round London because of their effective management and monitoring which provided sufficient opportunities for the new settlers. The programme of new towns in GCR must be sufficient not only to absorb the expected population growth in the region, but also to attract some of the region's existing population in addition to absorb the internal migration which otherwise will add to the congestion of the region's conurbation area. This programme will only fulfil such aims if the management in each new town will be able to carry out the responsibilities to create the self-contained communities for work and living, leading a social life with sufficient services for the expected population increase in the region of about 7 million people till the year 2000.

The inter-relations between Giza city and 6th of October new town are discussed in some details to cast more light on Giza situation as a major component of the GCR, with an increasing weight in terms of population and development in the last few decades.

The following sub-sections will discuss the new towns programme in the GCR, planned till 1980.

4.8.1 6th October New Town

This new town is expected to accommodate 350,000 people in the year 2000 with an average urban density of 30.7 persons per acre and a neighbourhood density of 119 per acre. A suggested maximum size of 500,000 people, after the new town is completed in 20 years, divided into four stages of five years each(19).

The location of this town was defined in 1978 and the Development Corporation was established in mid 1981. The town is one kilometre north of Cairo-Wahat desert road, starting from the 32nd kilometre west, Fig. (4-14). The site is rectangular with an approximate length of 8.5 kilometres and width of 3 kilometres, Fig. (4-13). It is generally a plateau of gently rolling hills sloping down from east to west. Its highest point is 200m above sea level, and it goes down to 160m in the south-west. The eastern edge has a distant view of the Great Pyramids of Giza and the Nile Valley. The site has an easy access to the Cairo - Alexandria and Cairo - Fayum desert roads and is only 19 kilometres from the end of the Pyramids road, Fig. (4-14). A 33 kilometre connection could join the site with central Cairo, passing the 26 kilometre point on the Alexandria desert road. The site is 15 kilometres south of the military airport of west Cairo, which may be transformed into an international terminal as argued in the last few years, since the capacity of the present Cairo Airport is inadequate for the increasing number of passengers foreseen for the future.

The Tebbeen - Wahat rail road link passes near within 4 km of the location with an easy topography allowing for its possible extension and 18 kilometres from Cairo - Itaiel Barood railway. Both are single lines. The regional transportation plan includes some axial roads which can serve the site via easy extensions, Fig. (4-13).

The area surrounding the location is developing rapidly. The Pyramids Highway is the backbone of a rapidly-growing urban corridor. The area between the Pyramids in the west and the railway line to Upper Egypt in the east is witnessing very rapid and scattered urban growth, and the area is rapidly approaching urban saturation. Lineal development is also taking place along the Alexandria and Fayum roads, with extensions threatening nearby cultivated areas. Tourism facilities including hotels, restaurants and casinos, are being developed amongst agricultural lands. In the north, there are some industries, warehouses, transformer stations and other utility installations.

Co-operatives and individuals are claiming rights to land ownership around the location, Fig. (4-14) a trend which must be strictly forbidden by law to prevent any adverse effects on the planned new settlements.

The area west of the Alexandria road and north of the Fayum road is owned by two major co-operatives. In the north, The Co-operative Society for Reclamation of the Pyramids Desert owns about 4,000 acres, but without any sign of active work on its land. To the south, the Pyramids Residential Co-operative Society owns about 2,000 acres and is laying down the utilities and paving the local streets. The resulting community will certainly have an impact on the neighbouring areas(20).

To the south and west and along the Fayum and Wahat roads, there are numerous individuals and co-operatives proclaiming ownership of residential and touristic reclamation or office activities, as will be mentioned later. These developments guarantee that 6th October will not suffer from being isolated, but there may be some possibility of areas closer to Cairo siphoning development away from the new town. That could be avoided by the plan and the attractions it can provide for the new town, and

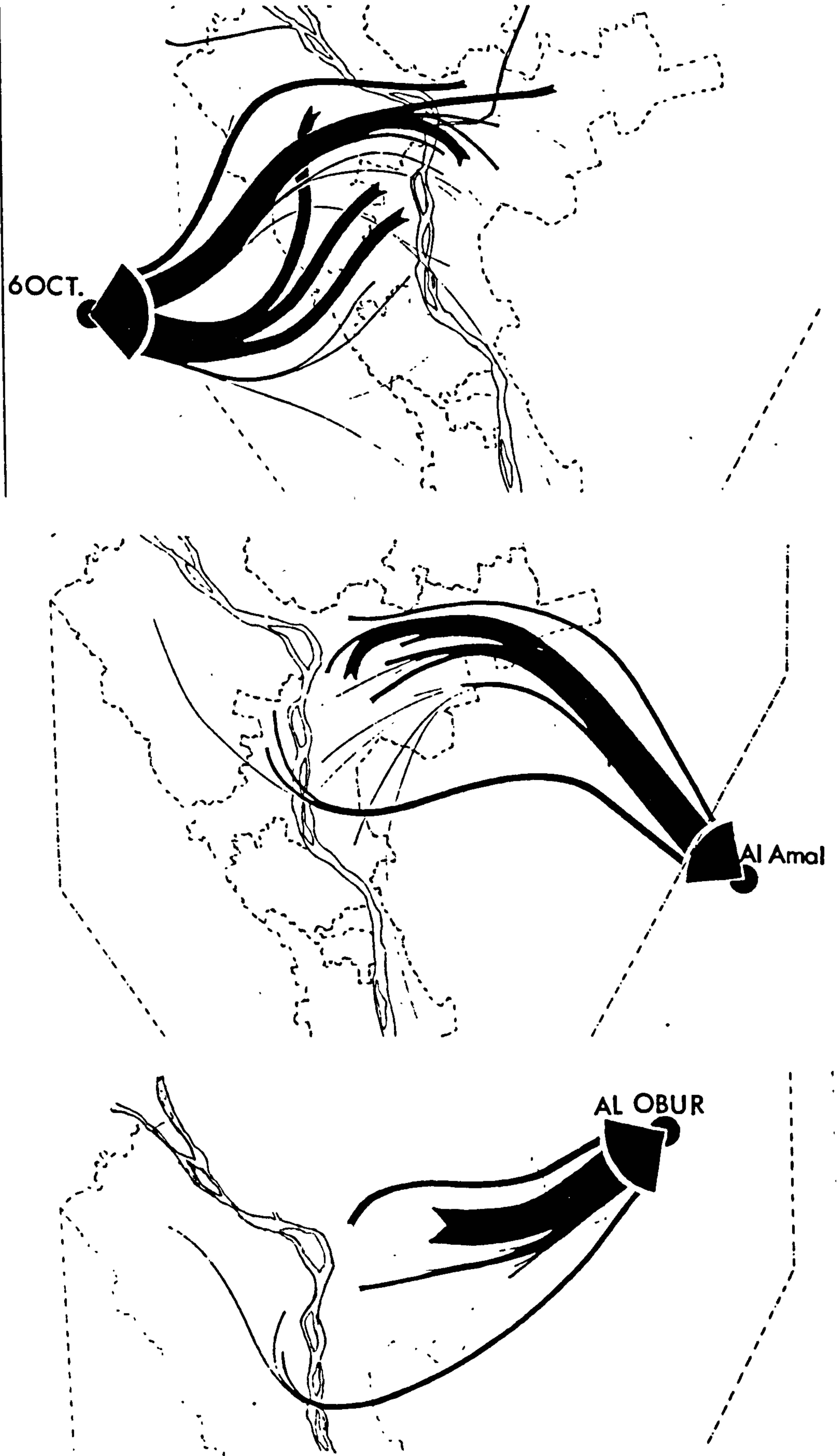


Fig. (4-12a)

SOURCES OF NEW TOWNS POPULATION IN GCR

After GOPP, New Towns in GCR, 2nd Report, March 1980 pp 1

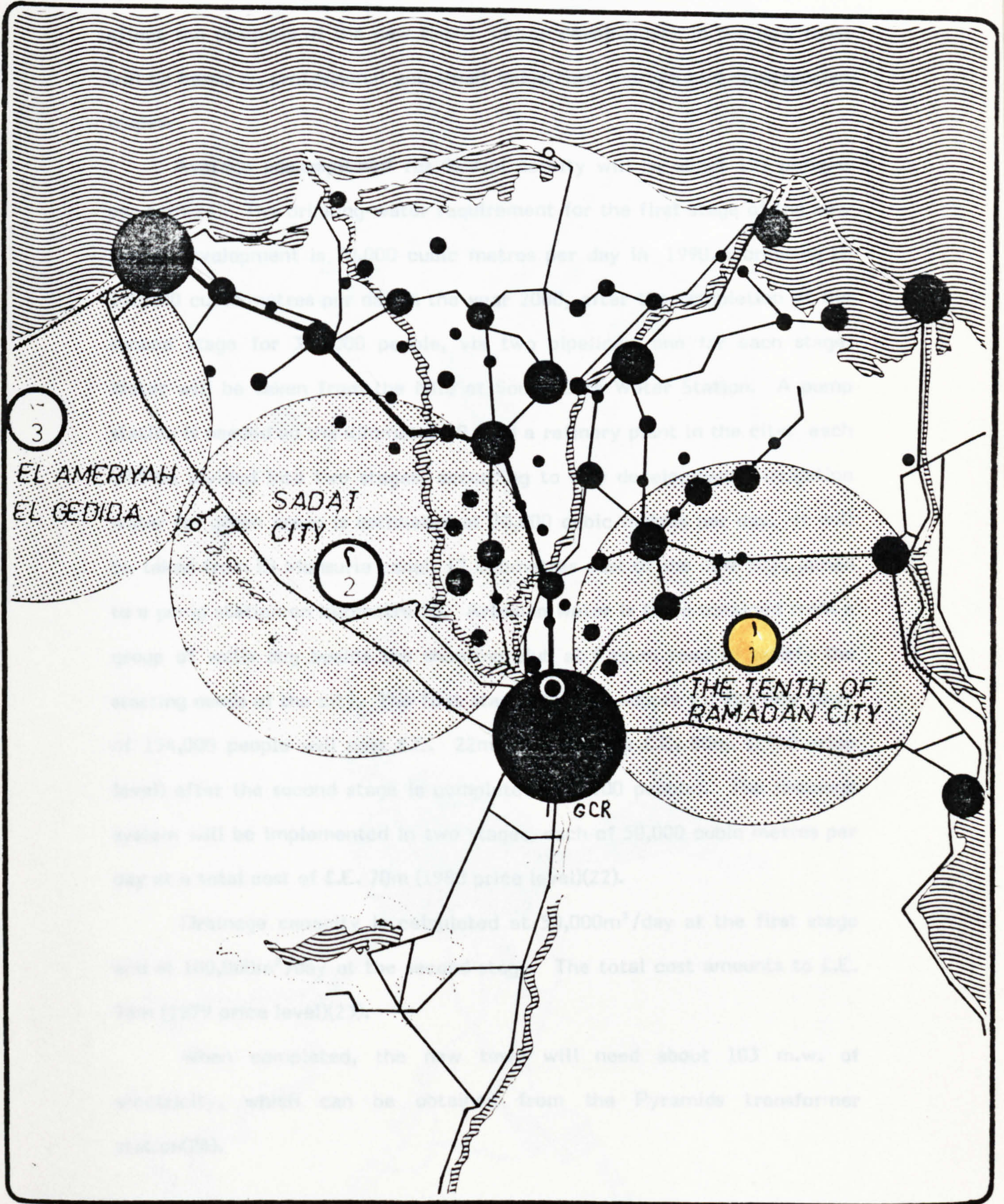


Fig. (4-12b)

The Effect of 10 Ramadan New Town on the GCR

Source: New Towns in GCR, GOPP, 1st Report, Aug. 1979, after p.16.

by enforced planning controls to stop any development that may adversely affect the progress of the new town. Urban development in the new town will be based on professional and small industries, tourism and construction trades.

Average ~~per capita~~ of residential density will be about 193 persons per acre(21). The drinking-water requirement for the first stage of the new town's development is 70,000 cubic metres per day in 1990, increasing to 140,000 cubic metres per day in the year 2000, after the completion of the second stage for 350,000 people, via two pipelines, one for each stage. Water will be taken from the Nile at South Giza Water Station. A pump station is needed on the kilometre 20, and a refinery plant in the city; each will be divided into two stages, according to city development. Irrigation water for green areas is estimated at 30,000 cubic metres per day. It will be taken from El Mansuria canal, 17 kilometres east of the new city, joined to a pump station on kilometre 20. Artesian water is to be obtained from a group of wells dug beside the shooting club at Fayum road to satisfy the starting needs of the city. The first stage of water supply for the new town of 154,000 people will cost £.E. 22m increasing to £.E. 80m. (1979 price level) after the second stage is completed (350,000 people). The drainage system will be implemented in two stages, each of 50,000 cubic metres per day at a total cost of £.E. 70m (1980 price level)(22).

Drainage capacity is calculated at 50,000m³/day at the first stage and at 100,000m³/day at the second stage. The total cost amounts to £.E. 76m (1979 price level)(23).

When completed, the new town will need about 103 m.w. of electricity, which can be obtained from the Pyramids transformer station(24).

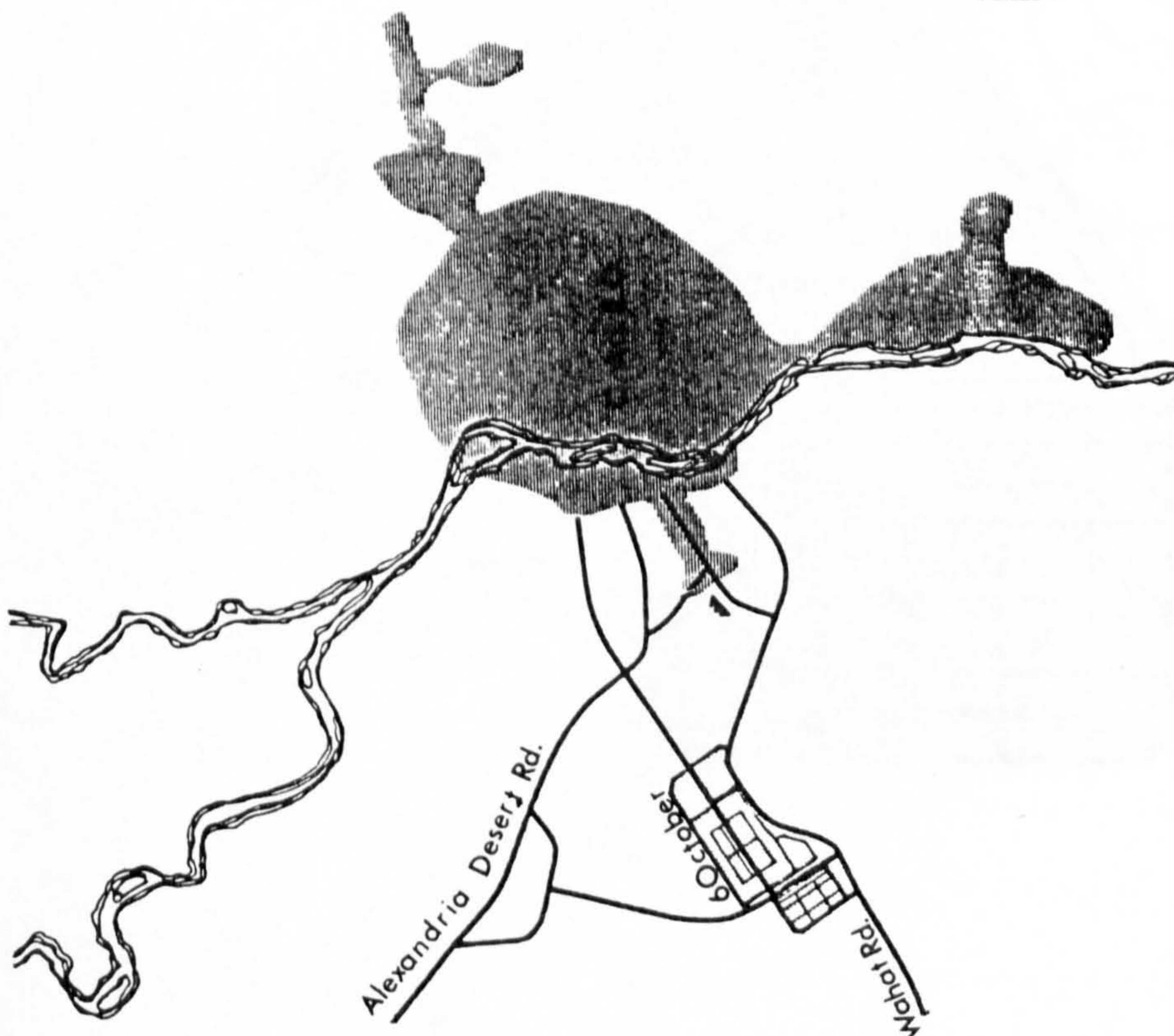
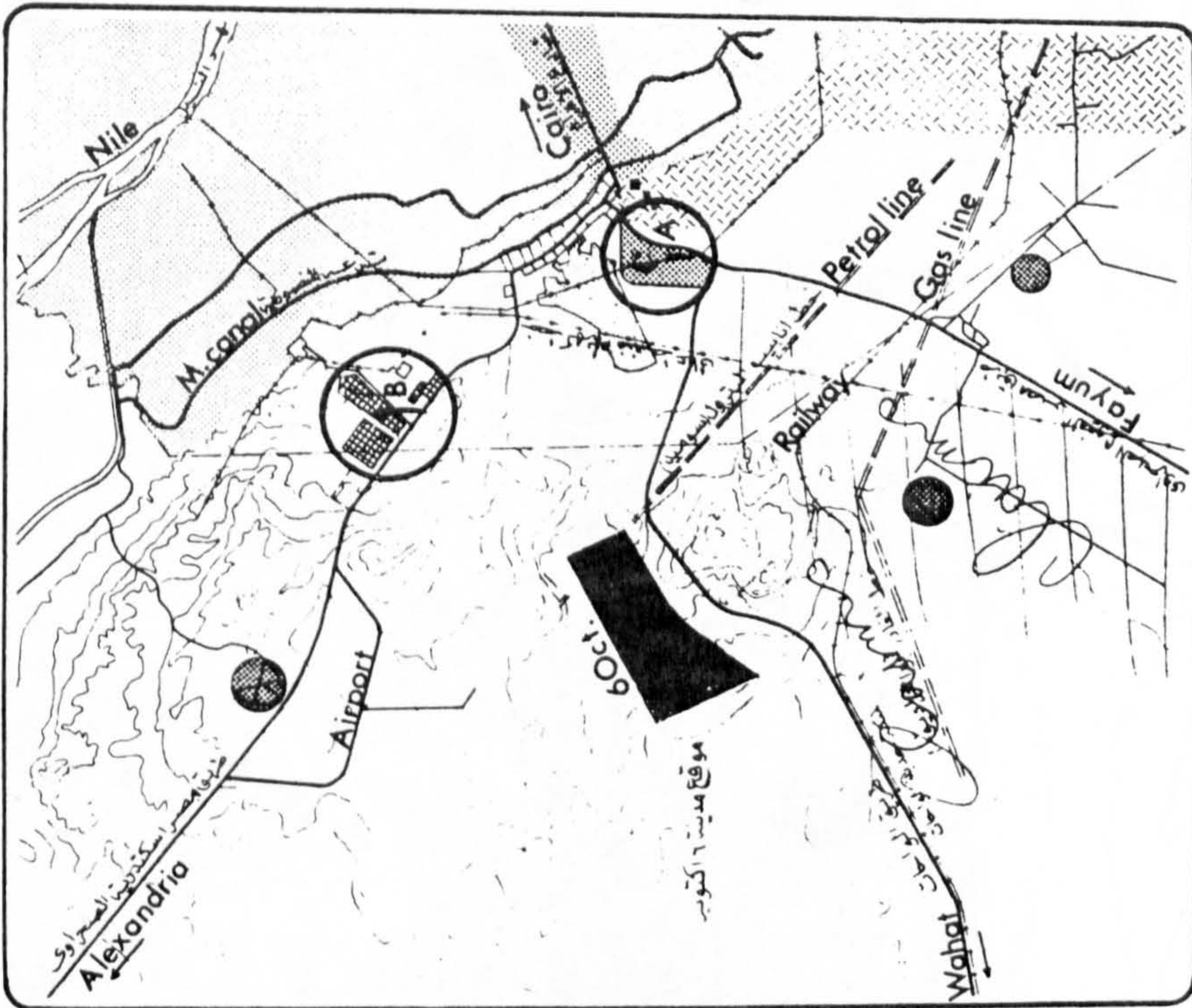


Fig. (4-13)

6 OCTOBER NEW TOWN AND GCR.

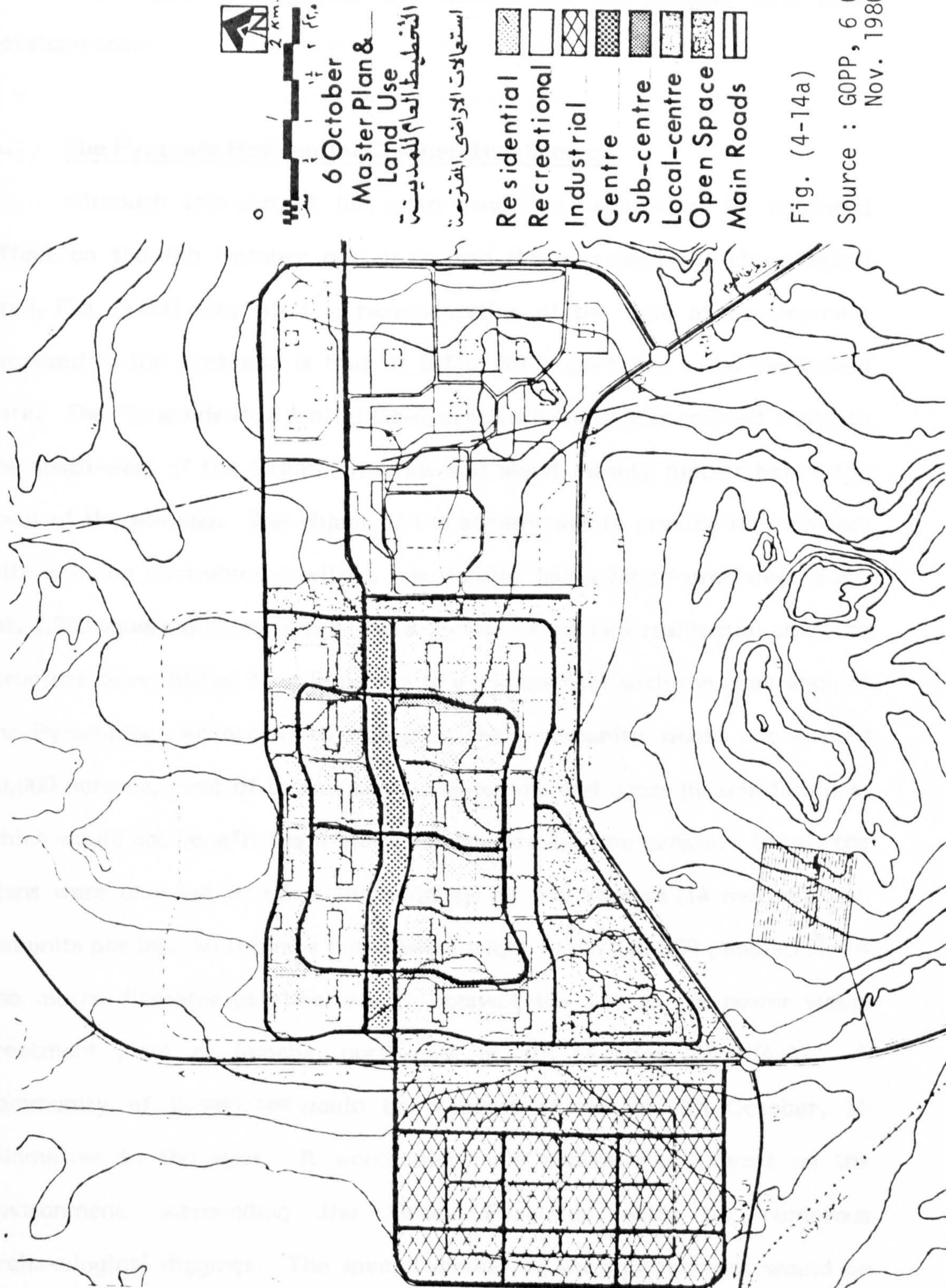
Source : GOPP, 6 October Report, The Industrial Area. (Undated)




وزارة التخطيط والمجمعات الجديدة
 الهيئة العامة للتخطيط العمراني
 الدراسات الاقليمية للمدن الجديدة
 اقليم القاهرة الكبرى
 التأثير السليم عن موقع
 مدينة 6 أكتوبر
 بؤرة 11
 الشمال
 A Residential
 B Industrial

Fig. (4-14)
 AREAS OF POTENTIAL NEGATIVE IMPACT ON THE SITE OF SIX OF OCTOBER

Source : GOPP, New Towns in GCR, 1st Report, Aug. 1979, p53





 2 Km.

6 October
Master Plan &
Land Use
 التخطيط العام للمدينة

استعمال الأراضي المقترحة


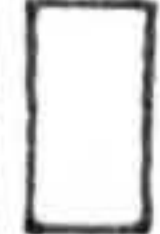






-  Residential
-  Recreational
-  Industrial
-  Centre
-  Sub-centre
-  Local-centre
-  Open Space
-  Main Roads

Fig. (4-14a)

Source : GOPP, 6 October Report
Nov. 1980, p.9

The following proposals may affect the 6th October new town development:-

A. The Pyramids Residential Co-operative Society.

Although this project has been cancelled because of its potential effect on the 6th October new town and the surrounding archaeological area, Fig. (4-14) Site A, it is representative of the type of development proposed in the area and is thus of sufficient importance to be mentioned here. The Pyramids Residential Co-operative Society was granted a site to the south-west of the Great Pyramids and about twenty metres below the level of the plateau. The object of the society was to provide its members with a living environment with a low density and a lot of greenery. Each lot, 1,000 square metres, was to have no more than two residential units, no structure being higher than 8 metres to avoid conflict with the appearance of the Pyramids. According to this plan the community would not exceed 50,000 persons, most of them from upper-middle and upper income families, which would not benefit the majority of the low-income people. Later, the plans were changed to allow for buildings of five storeys (14 metres) with ten units per lot. So the new community might reach 250,000 people(25). A one metre diameter pipeline was to connect the site to the newer water treatment plant at Imbaba, north-east of 6th October, Fig. (4-4). A community of 125 persons/acre would be a great threat to 6th October, 15 kilometres to the west. It would also have a disastrous impact on the environment surrounding the Great Pyramids with its numerous archaeological diggings. The special quality of the environment would be lost by the existence of 5,000 buildings, each of five storeys with their services and facilities on 2,000 acres within less than one kilometre from the Great Pyramids, which would no longer be in anyway remote from urban areas. There was a danger of pollution affecting the atmosphere, and of

rising underground water, dampness affecting the monuments(26). Growth of the Pyramids highway corridor would have destroyed more farm lands and ribbon development along Alexandria, Fayum and Wahat desert roads would have considerably affected 6th October as a new town. These considerations provoked strong public objections and the whole project was cancelled.

B. Wahat Al Salam.

This is another example of a project that was cancelled because of its adverse influence on the new town development in Egypt. The development of a new community was proposed by three of the companies of the Ministry of Housing. The suggested site was a 22,000 acre rectangle astride the Cairo - Alexandria desert road, 10 kilometres south-east of the Cairo West military airport, Fig. (4-14), Site B, and a Master Plan for a new city of one million people was prepared in 1978. The then Ministry of Development and New Communities rejected the idea because of its adverse impact on the proposed site of Sadat City, 6th October new town and the agricultural lands to the east. The recommendations for the establishment of 6th October new town pre-suppose no development in the vicinity of Wahat Al Salam, or any other district between 6 October and GCR which may syphon development away from the new town and deprive it from some important projects and services essential for its success. Such serious effects on 6 October must be legally stopped by the enforcement of sufficient controls and monitoring. At the same time 6 October itself must be attractive enough to activities and investments by the services it can provide for industry, tourism and other sectors, and by housing, social and health facilities for the new settlers moving into the new town for the jobs it will provide. In this way 6 October will be better for work and living than any surrounding area, and only then development can be stopped outside 6 October. The same will be

the case of any other new town if it provides sufficient jobs and services for the new settlers.

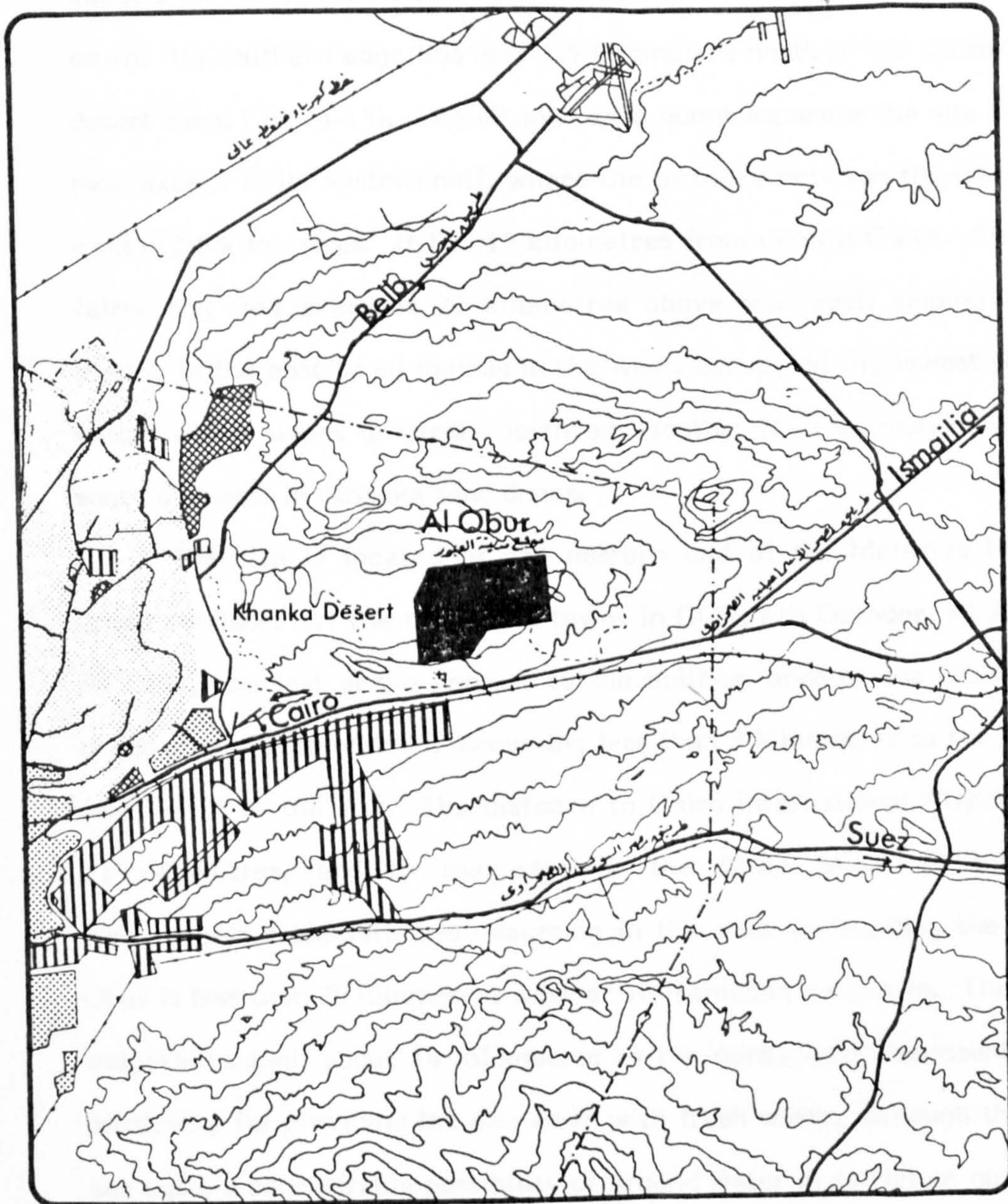
C. Giza City Development

The city council of Giza has prepared a plan to develop the area between the Upper Egypt railway line and the Great Pyramids. If all lands included in the city's proposal are developed at densities similar to those along the Pyramid road, the result will be housing of 2-3 million people in a poorly-planned and serviced residential area which is now agricultural land. Further, it could kill the 6th October new town which will depend on the growth of the south western corridor. This and other examples quoted shows how very important it is to study the development projects on a regional basis in order to avoid confusion or negative impact from unco-ordinated proposals, a point further emphasized by the following case.


D. The development of the area between Fayum and Wahat Roads.

The area between Fayum and Wahat roads is still vacant, Fig. (4-14), but claims to build there have arisen from individuals, the public sector and co-operatives, especially after the selection of the 6th October new town site on the Wahat road. It is essential for the success of 6th October that any development along the surrounding roads be stopped.

The proposed location of 6th October new town is ideal for a self contained community intended as an integral but independent part of the GCR. By virtue of its location near major and regional roads, water and energy resources, tourists and light industry possibilities, it has a very high potential for success, and could benefit from the current development momentums in the region towards the south-western corridor of development. Nevertheless, it still needs sufficient protection, on the



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 اقليم القاهرة الكبرى
 خدمات الاراضي الحالية
 عيطة بموقع مدينة العبور

1:20000
 الشمال

 Km — 12

Res. مناطق سكنية
 Adm. مبان ادارية وحكومية
 Ind. مناطق صناعية
 Agr. مناطق زراعية

Fig.(4-15)
AL OBUR SUBREGI

Source : GOPP, New Towns in GCR, 1st Report, Aug. 1979, p56

regional scale, from the other competing developments which may arise.

4.8.2 Al Obur New Town

Al Obur New Town occupies about 16.8 Km² in a rectangular shape, about 6 kilometres from east to west, and about 3 kilometres from north to south. Its southern edge lies only 1.5 kilometres north of the Cairo-Ismailia desert road, Fig. (4-15). The Khanka sand dunes separate the site from the road except in its eastern half, where the distance between the site and the road is 2.5 kilometres. It lies 19 kilometres from central Cairo. The site is fairly flat and averages 70 kilometres above sea level, sloping from 80 metres in the east to 60 metres in the west, occupying the lowest part of a valley which slopes upwardly north and south. It is surrounded from the south and west by Khanka sand dunes.

The site is located at the eastern end of the Matariya Heliopolis urban corridor. Of the three new towns in GCR, 6th October, Al Amal and Al Obur, the last is the nearest to the built-up area of the GCR. Urban development is remarkably occurring less than 9 kilometres to the west and south-west of the site. The distance to Cairo International Airport is only 11 kilometres, and to the edge of the Delta about 10 kilometres. Agricultural reclamation is occurring in the area surrounding the site. Al Obur is less than 20 kilometres west of 10 Ramadan new town. The Ismailia irrigation canal, about 14 kilometres to the north west, represents a good possibility for providing the new town with fresh water, although there is, in any case, a considerable possibility of ground water in sufficient quantities.

Some 10 kilometres to the west, and along the edge of the agricultural lands, there is a concentration of industrial plants and research institutions. The Atomic Energy Establishment, Inshas Hospital, and a number of chemical and military factories, lie not far west of the location. There are also some defence necessities for the expansion of military

industrial activities in the area.

Along the Cairo-Ismailia road, there has been expansion of residential development eastwards which has already reached Belbees road near the eastern end of Cairo airport, but it will be stopped by the sand dunes before it reaches the selected location of the new towns. From north-west of the site, it is protected against urbanism by the dictates of military and defence restrictions.

Infrastructural studies must be made about the new town location to decide how it may best be connected to road, railway and water supply systems. It could easily be linked to the Ismailia and Belbees roads, the latter providing an easy connection with the east Delta governorates. Via the Ismailia road, the new town is only 15 kilometres from the proposed Cairo outer ring road, through which there is an easy access to the industrial complex in Shoubra el-Kheima and the growing district of Matariya. A link of 10 kilometres with the Cairo -Suez desert road will put the new town within 80 kilometres of Suez and hence the Red Sea and Sinai. The distance to Ismailia is less than that to Suez, and rail and water terminals are possible along the Ismailia Canal. A link can easily be provided to the Cairo - Suez railroad, 5 kilometres to the south.

The town is located in a subregion of GCR that is ripe for development because of its relationship to the north-eastern corridor and the new town may help to siphon development away from that corridor to prevent coalescence. The region is so active that there is a possibility that without safeguards such as the afforestation or cultivation of Khanka desert, the town would not be safe from the expanding built-up area of Cairo, in which it might become engulfed in the long term.

The relationship between Al Obur and 10 Ramadan city should be carefully studied. If Al Obur is to become self-contained, it must provide for its own industry and employment. Al Obur is 19 kilometres closer to

Cairo centre than is 10 Ramadan new town, and investors may prefer the nearer site. So there must be effective monitoring for the projects of the two towns to avoid any possible urban or financial conflict, a lesson which must be observed in future new towns to be sufficiently apart from each other.

Because of its proximity to the rural areas of Kalyubia and Sharkia Governorates, the new town could attract a large number of rural migrants, as well as agro-industries and other activities that are related to farm lands, an advantage not likely to occur in the other new towns. This would result in a population profile different from 10 Ramadan and Al Amal new towns, that is to say a community with larger families and lower incomes. The surrounding areas have a number of very popular housing co-operatives which could develop the entire town, which will become, in the long run, an extension of Matariya and Heliopolis, representing the dependence of the new town upon commuters, a possibility which must be studied in advance to help in development policy. Firmness is needed here to control adverse development, and the surrounding areas may be occupied by palm groves or afforestation to ensure the prevention of any kind of urban development outside the town site.

4.8.3 Al Amal New Town

The selected location lies 40 kilometres west of Maadi suburb, 15 kilometres south of Cairo, along the Maadi - Kattamia desert road, almost parallel to the Cairo - Suez desert road and 25 kilometres to the south, Fig. (4-16). This site is separated from the nearest urban area by more than 30 kilometres. It occupies 16.8 km² (4,188 acres), in a near square, extending for 3.5 kilometres astride the road.

The designated areas are planned to be as follows:-

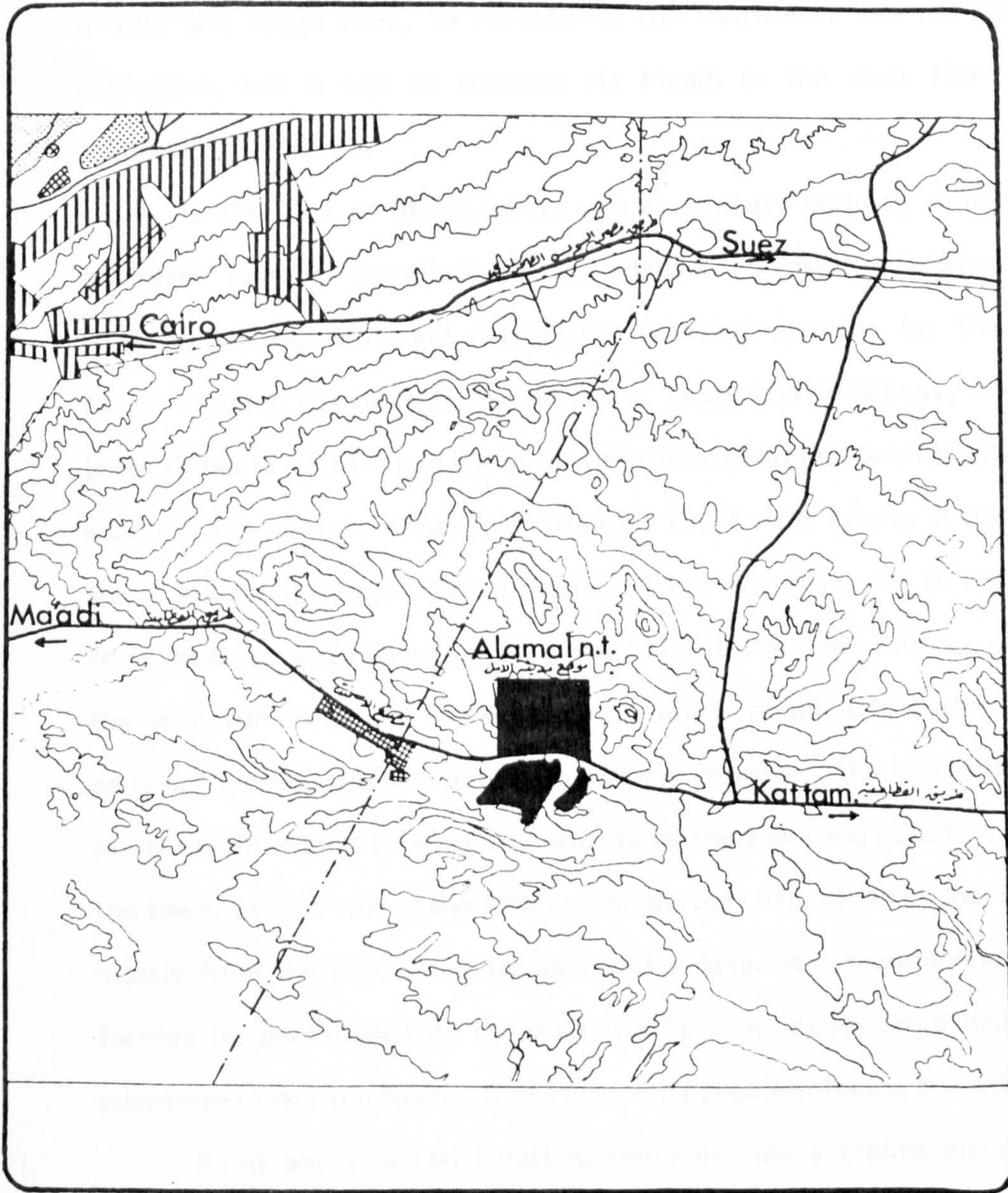
<u>Land Use</u>	<u>Areas in Acres</u>
Residential	1,525
Services	350
Town Centre	188
Open Spaces	150
Greenery	275
Roads	450
Industry	600
Agriculture	500
Cemetary	150
	4,188

The per capita area of services, open space, greenery, etc. is 16.2 square metres. The gross density is 60 persons per acre, while the net residential density is 164 persons per acre(27).

The lowest point is at the south-west, 400 metres, with the general slope of the land towards the west to the Nile Valley. Although there is a peak of 460 metres in the western half, the slope of this site does not represent an obstacle to urban development.

In the east, the ground slopes more gradually towards a level plateau of 450 metres in the north-eastern corner of the site. Because of its high level as a whole, the average temperature is expected to be four degrees below that of central Cairo, almost similar to the case on Mokattam Hills, east Cairo. The major problem of this site lies in the need to elevate the Nile water to its level, to supply drinking water.

The Kattamia road connects the site westward with Maadi from which the Cornishe road close to the Nile goes northwards to Cairo. The same road is connected from the east with a link, northward towards Mokattam and Nasr City, before it joins the Cairo - Suez desert road. More direct roads may be constructed to make the site more accessible. The Maadi - Kattamia road could be extended 50 kilometres eastwards to reach the Red Sea Coast near El Sukhna tourist district, south Suez, to make use



إزالة التعمير والمجتمعات الجديدة.
الهيئة العامة للتخطيط العمراني

إسكانات الأقليمية للمدن الجديدة
أقليم القاهرة الكبرى

نقطة بموقع مدينته الحالية
مخطط بموقع مدينة الأمل

لومتر 12
الشمال



Km 12

- Re مناطق سكنية
- Ac مبانى ادارية وحكومية
- Inc مناطق صناعية
- Ac مناطق زراعية

Fig.(4-16)
EL AMAL SUBREGIO

Source : GOPP, New Towns in GCR, 1st Report, Aug. 1979, p55

of the maritime front. Another road of 25 kilometres is suggested to connect the site with the Cairo - Suez desert road, and then continuing after another 20 kilometres to 10 Ramadan City. To the south of the site there is a hilly and rough area, so Helwan in the south-east can not be directly connected, but it can be reached via Maadi in the west first and then southward to Helwan.

To the east of Maadi, there are a military training camp and some scattered defence installations. In addition to these are several stone-crushing plants, and sand and gravel quarries catering for the needs of construction in the surrounding districts. Truck traffic is heavy and highway improvements will be needed before the new town can be started. There is also a brick factory under construction which will create a nucleus of a small industrial centre east of Maadi. Those activities are so far west that their location will not affect the new town in the near future, although in the long run they may. One project which could affect the site is the cement factory, just 4 kilometres away. However, the prevailing wind is mostly from the north-west and will move the resulting pollution away from the town, except during the Khamaseen period (fifties) when the wind comes mostly from the south-east for about fifty days. It is recommended that the factory be re-established at the east of the clay quarry at a distance of 8 kilometres from the town. That is the only problem facing the selected site.

As at any selected location, there are many claims along Kattamia road near the site to use land for agricultural purposes, but many of them seem to be just a pretext to convert the land to building purposes afterwards.

Soil tests indicate that Al Amal site is acceptable for construction purposes except for the existence of clay in the valley. Unlike 10 Ramadan and 6th October new towns, the site is not located on any of the major urban corridors of development in the GCR. This may be helpful to the region in

creating an additional corridor, for industrial and institutional development, besides the present ones, the north-east-south-west and north-south corridors, Fig. (4-1). A new corridor to the south-east could attract some activities from the GCR in that direction, leading to the Red Sea region with its potentials in tourism, mining and fishing. The site is comparatively isolated and the expected growth of the town will depend entirely on the level and type of investment that takes place. The site may be attractive for some light industries which can make use of Helwan steel complex and the other existing factories in Maadi and Helwan. But the main development expected in the new town will take the form of low density, higher income residential areas, besides the tourist possibilities favoured by the Red Sea shores some 80 km to the east, add to that some construction industries depending on the available building materials, like brick and tile-making.

4.9 Conclusion

The GCR built-up area represents one of the very congested regions in the world. The available services cannot meet the needs of growth of population which is resulting from rural-urban migration and the concentration of institutional, economic and industrial activities in the region. The built-up area is surrounded by extensive desert areas of the region (2,565 square kilometres) which can be utilized for the establishment of new towns round the region to enable it to accommodate the expected 16 million people in the region on the year 2000. The new towns under construction in the GCR, are not sufficient to absorb the expected extra population and activities. Their ultimate population is estimated to be about 950,000 in the year 2000 or about 5.94% of the estimated population of the region if they are built in accordance with the programme, and there is no sign so far that they are being or will be. That makes it essential to think now about more new settlements and developments on the desert areas

in the GCR. Industry, farming services and tourism can form quite a good economic basis for new settlements in the region, especially farming, which also helps to compensate for agricultural land lost for urbanisation and to meet food needs of the growing population. To direct the population in the region and other presently congested areas, and to open up new areas for development will require a corrected programme. Its success will be helped by the stabilisation of land prices which have been immensely increasing since 1973. Al Amal new town is a good example of a town opening up a new development corridor, to the south-east besides the existing north-east/south-west corridors, to provide more chances for expansions in the region in areas of better climate, aeration and scenery.

An efficient programme for the establishment of new towns in the GCR should not only aim to absorb some or all the expected increase of its population, but also it should realize the relief of pressure from the existing urban centres of the region like the case in Greater London since the late 1960s, see note (76) Chapter Three.

The services and open space so badly needed in the old urban areas of the GCR should be on the sites from which other activities, as industries and institutions, are moved away to the new towns, so as to give a lower density and more facilities for those who remain.

CHAPTER FIVETENTH OF RAMADAN, THE NEW INDUSTRIAL CITY"A CASE STUDY"**5.1 Introduction**

Meeting the requirements of the anticipated large growth in urban population in Egypt, Fig. (2-4), calls for a balanced policy with viable urban centres, decentralization and rural development. Such a policy should aim, in the first place, to increase national and regional income, and to create new development areas by dispersal of the industrial base of the country. The increasing demand from national and foreign investors for industrial sites especially in the regions around Cairo, and the need to relieve population pressure on Cairo and other urban centres in Egypt, has led, as we have seen, to proposals for the establishment of combined industrial/urban projects on desert areas. A small number of bigger centres will benefit industrial development, rather than a large number of smaller ones. Industries, especially the heavy ones, need considerable numbers of people and a variety of skills and services which makes it essential to have sizeable communities.

As mentioned in Chapter Four, earlier attempts, such as Heliopolis 1904, north-east of Cairo, and Maadi, 1910, south of Cairo, were not meant to fulfil these aims. They were private foreign investments to house the better-off: they did not provide job opportunities and were not far enough from Cairo to prevent the growth of large-scale commuting. The industrial development then needed in Cairo was concentrated in wrong places like Shoubra el-Kheima, Fig. (1-5), north Cairo, which made the latter liable to pollution because of the northern prevailing winds, besides the spread of urban growth on the scarce farm land close to Cairo.

By contrast the industrial complex of Helwan, south of Cairo, was established without housing which resulted in commuting from Cairo. So, Heliopolis provided housing without jobs north-east of Cairo, and Helwan provided jobs without housing in the south of Cairo, while Shoubra el-Kheima extended on the scarce farm land north of Cairo. These are but three of many examples which show the lack of proper planning, even close to the capital of the country.

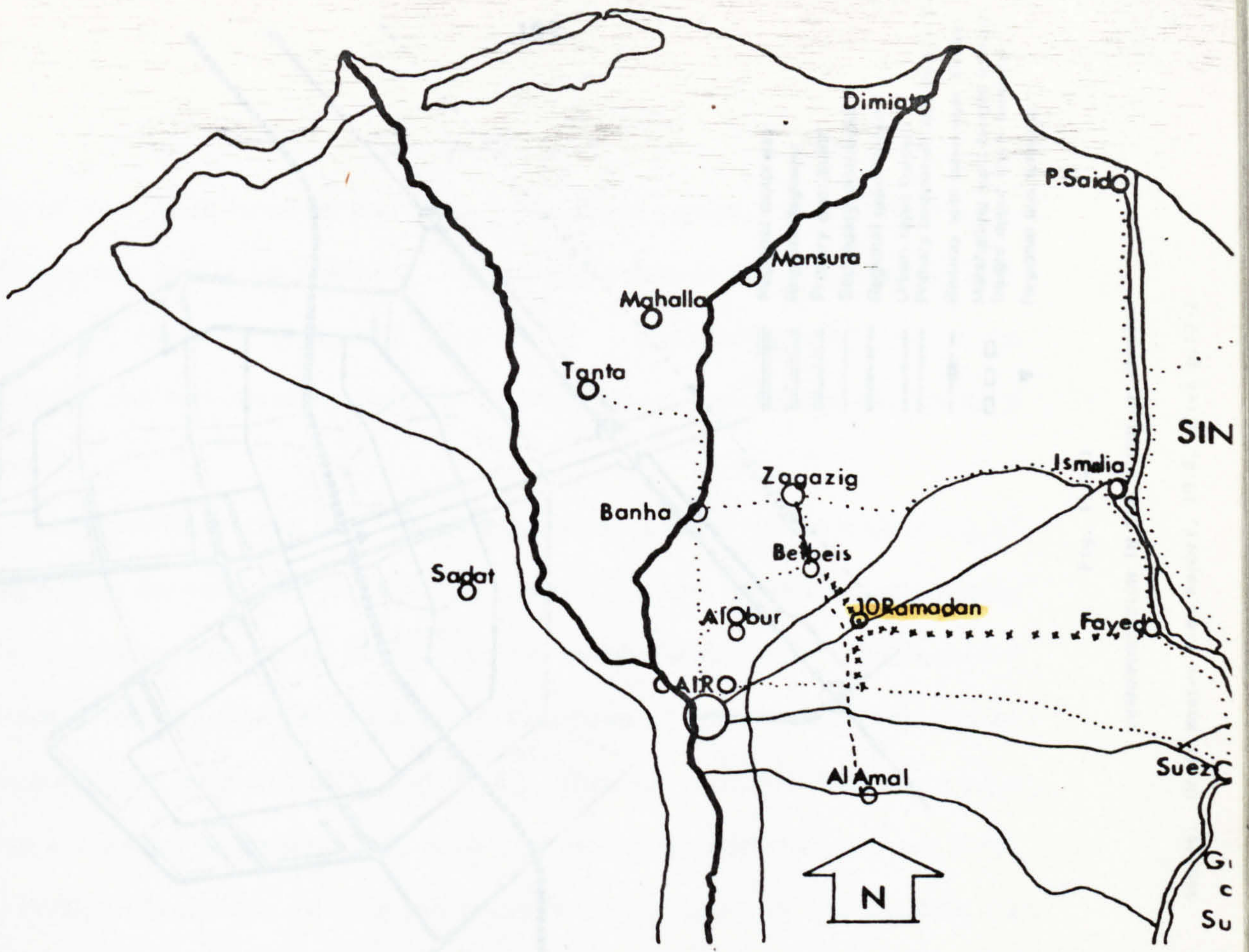
Tenth of Ramadan, the industrial/urban project, represents the first attempt to establish a self-contained community in Egypt and the starting action of the National Strategy for urban growth on the desert. A master plan study for the new city started in January 1975 and was completed in April 1976. Construction started in August, 1978.

This Chapter explains the project, analyses its aims, achievements and failures, and makes some suggestions, from the view of the author, which may add to its success.

5.2 The Plan-General

Tenth of Ramadan new industrial city was designed to accommodate 500,000 people in the year 2000. It is located between three of the fastest developing regions in Egypt: Greater Cairo, (see Chapter Four), The Suez Canal Region, (see Section 6.2.4), and the Delta Region with its intensive agricultural background, (see Section 1.3.1). The selected site is located along the Cairo-Ismailia desert road occupying an area of about 64 sq.km., 50 km. north-east of central Cairo, Fig. (5-1).

The new city is intended to be independent, with a social and cultural life that will be as complete as possible to let the inhabitants feel that the city is 'theirs'. The city region also includes a good access to the agricultural areas of the Delta and the directly exporting and importing



- Existing Roads
- - - Proposed Roads by the Ministry of Development
- Existing Railways
- ***** Proposed Railways by the Ministry of Development

Fig. (5-1)

10 RAMADAN LOCATION MAP.

Source: General Organisation for New Communities Development (Undated).

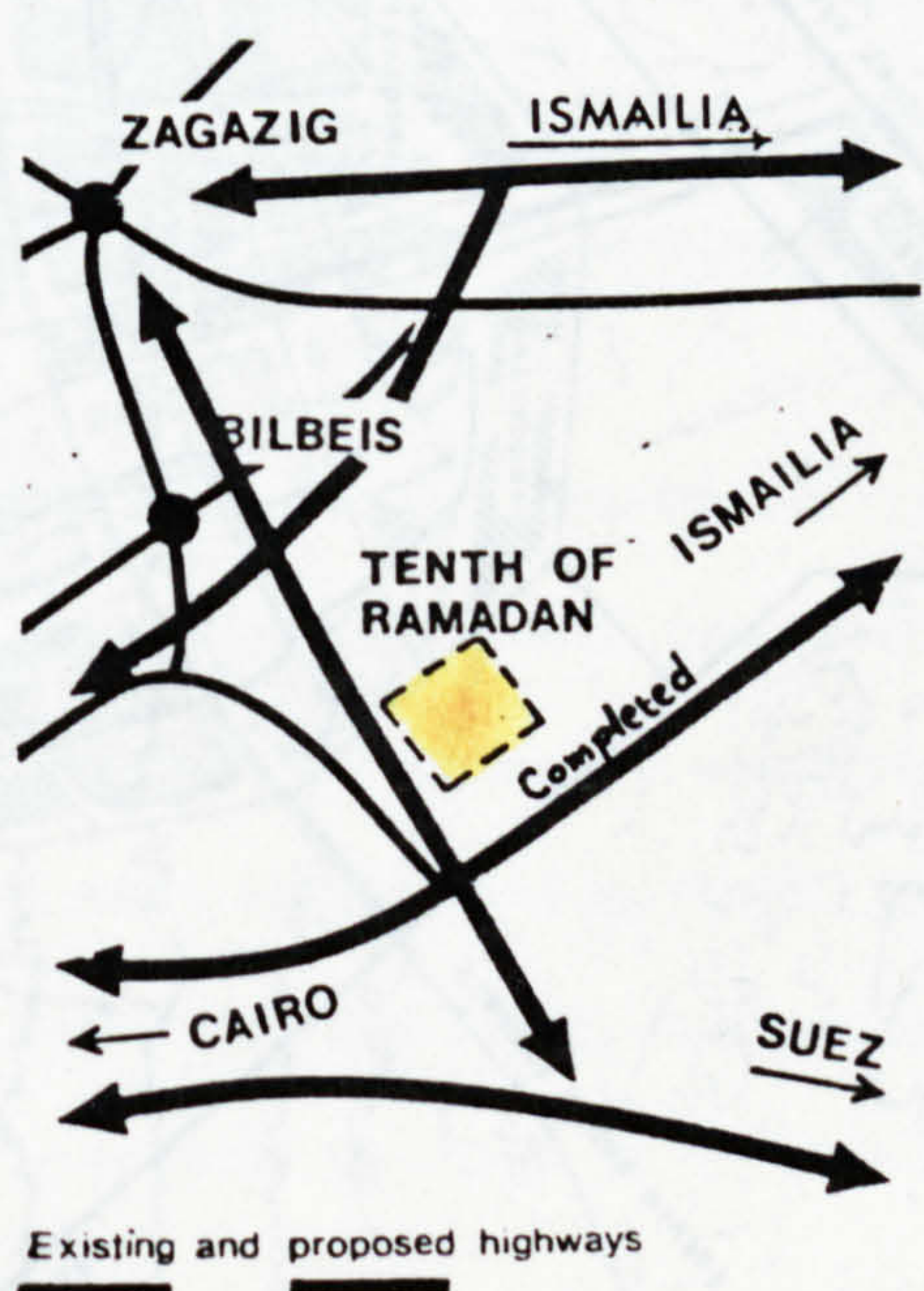


Fig. (5-2)

HIGHWAYS ROUND THE NEW CITY

Source: Draft Master Plan Report, Jan, 1976, p.12-1.

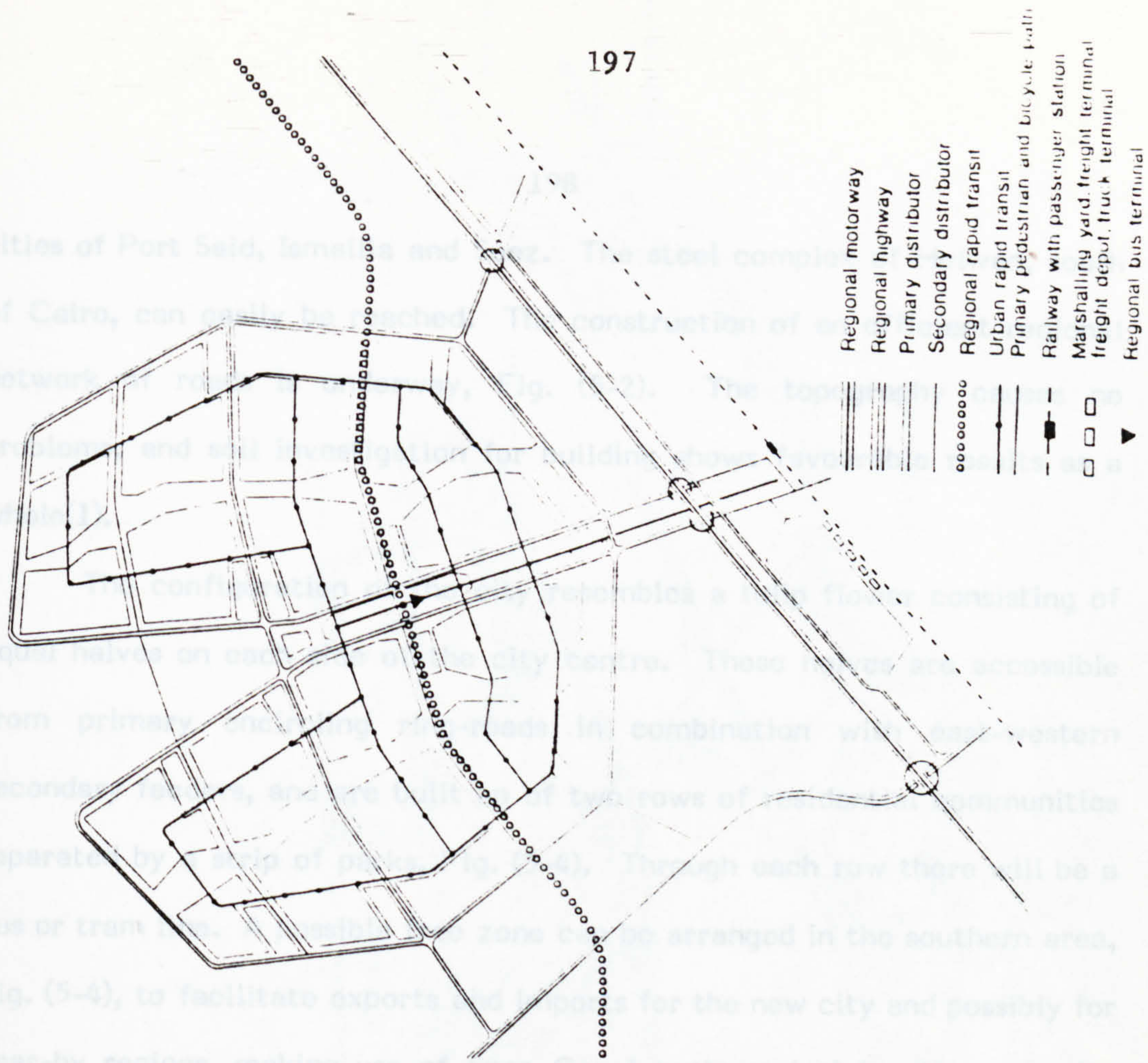


Fig. (5-4a)

TRANSPORTATION IN THE TENTH OF RAMADAN

Source: Draft Master Plan Report, 1976, after p.17-2.

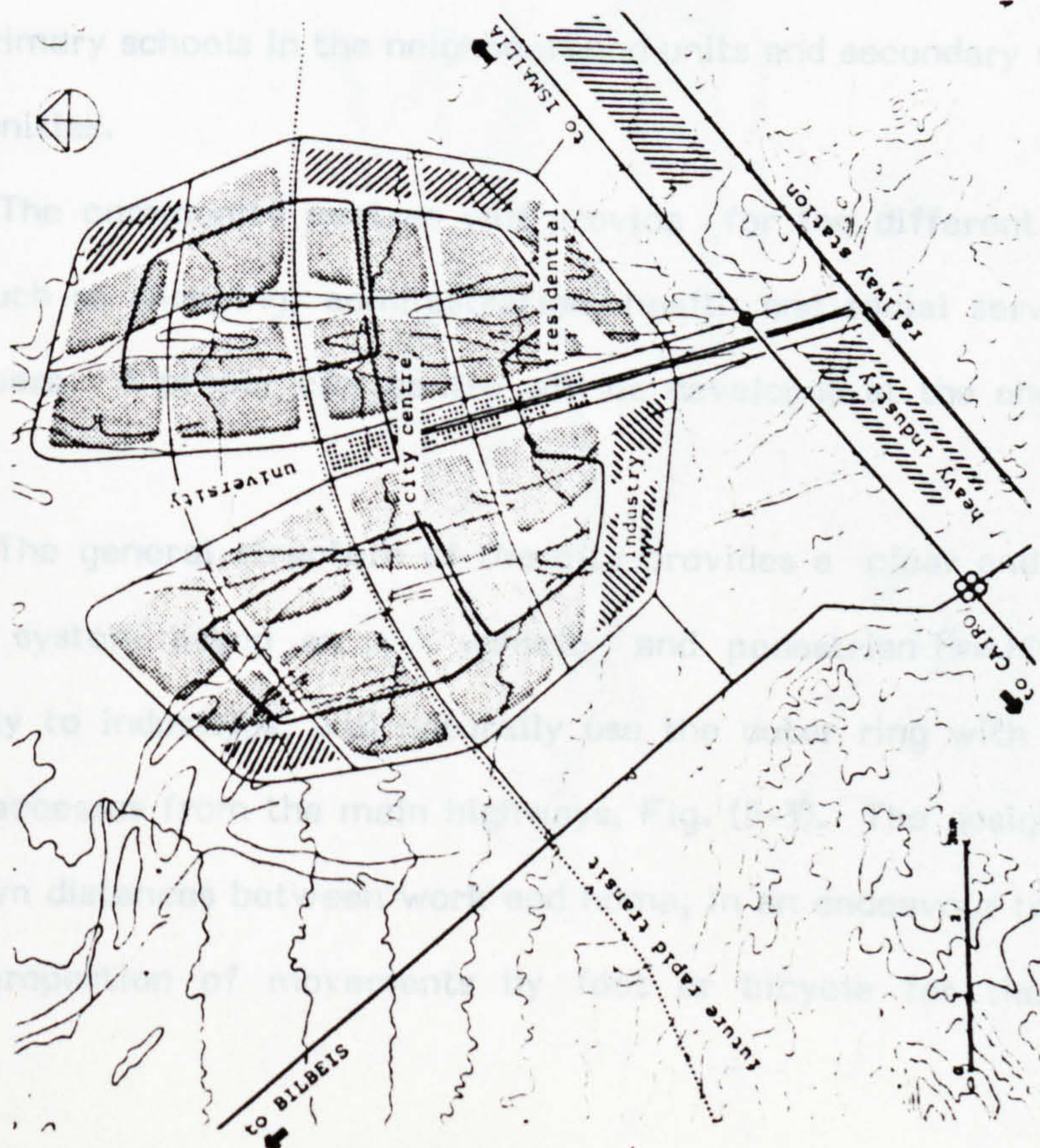


Fig. (5-3)

New Industrial City
Land Use Plan

Source: Ministry of Housing & Reconstruction, Programme of Reconstruction & Development, April 1976, p.67.

cities of Port Said, Ismailia and Suez. The steel complex of Helwan, south of Cairo, can easily be reached. The construction of an efficient regional network of roads is underway, Fig. (5-2). The topography causes no problems, and soil investigation for building shows favourable results as a whole(1).

The configuration of the city resembles a tulip flower consisting of equal halves on each side of the city centre. These halves are accessible from primary encircling ring-roads in combination with east-western secondary feeders, and are built up of two rows of residential communities separated by a strip of parks, Fig. (5-4). Through each row there will be a bus or tram line. A possible free zone can be arranged in the southern area, Fig. (5-4), to facilitate exports and imports for the new city and possibly for near-by regions, making use of Suez Canal ports and giving the new city more functions.

The residential areas are planned on a hierarchy of residential groups with primary schools in the neighbourhood units and secondary schools in the communities.

The community centres will provide for the different needs of the city, such as shopping, administration, health and social services, for the first years. A proper city centre will be developed at the end of the first stage.

The general structure of the city provides a clear and well-defined traffic system based on vehicle and pedestrian flows. Heavy traffic, basically to industries, will naturally use the outer ring with its short and direct accesses from the main highways, Fig. (5-3). The design is based on minimum distances between work and home, in an endeavour to encourage a large proportion of movements by foot or bicycle for the low-income classes.

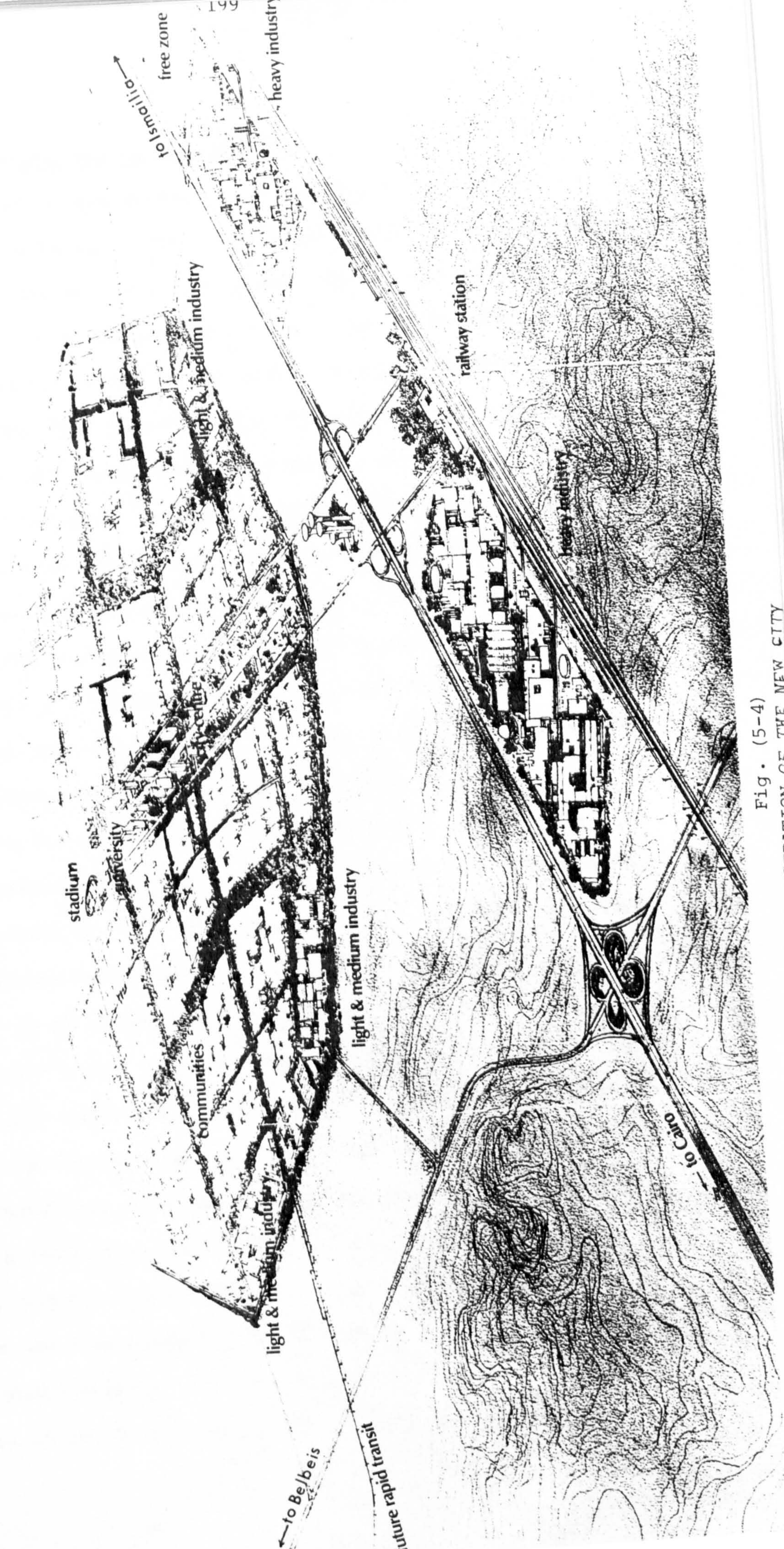


Fig. (5-4)
ILLUSTRATION OF THE NEW CITY

5.2.1 Basic Planning Aspects in the New City

Cities used to develop over a considerable time, and adjustments and replacement of worn parts did not cause much trouble, for they took place in the natural course of events. But the new towns are very different.

Like all new development in our time, Tenth of Ramadan should be growing fast enough to meet the demands of activities expansion in Cairo, but this is not the case (Section 5.5.1). For the city to function properly, all elements, allocated areas and their interrelations must be correctly estimated. At the same time, a physical plan of today must have qualities to meet population and economic changes that can generally only be anticipated at the present day, but can not yet be quantified. An 'instant' city needs a high degree of independent flexibility for its major elements, large versatility of employment options, fast construction of communication elements, and early local social life. Sections (5.5) and (5.5.1) represent an assessment whether 10 Ramadan has met these needs.

Bending the city around its future centre, and inscribing the open ends in an approximation of the 'concentric' form, Tenth of Ramadan has the positive qualities of both linear and concentric systems. Travelling distances between home and work are minimized so that members of the same family can be employed in different parts of the city.

The new city is growing roughly along the arms of Wadi Gaffra, leaving the city centre to grow independently in between, Figs (5-4) and (5-14). That has the advantage of making the total form at any stage of growth concentrated, combining a minimum of transportation distance and costs with a maximum of social contacts between all parts.

The long-term growth possibilities are considered in the proposed plan, under which development can be extended to the north, permitting a larger population than that which was originally planned, more than 500,000 inhabitants. A city is never static, and it is difficult to define an upper or

an economic limit to its size. But we recommend to establish a series of new cities surrounded by green areas, well related in the region of the city and connected with a good transit system, instead of an unlimited growth of the Tenth of Ramadan, to spread out the inhabited area on the desert between the Delta and the Suez Canal. Although on a larger scale, this may be compared with Howard's Garden City idea, where when the size of one unit exceeded 30,000 people, a new unit was added in the same regional plan, rather than expanding that town further.

Since the city is meant to be largely independent, social and cultural life must be as complete as possible. Services and facilities should be sufficient to minimize travel to Cairo or to the regional towns.

The city has a hierarchy of residential areas, neighbourhood units and communities. Each neighbourhood has its own primary school, to save the small children crossing dangerous main roads, in addition to other services of the needs of the neighbourhood.

Industry is located at the perimeter of the city, Fig. (5-14); whence the direct heavy transport routes to the outer primary roads with short and direct accesses from the main highways to Cairo, Ismailia and the Suez Canal, the Delta via Zagazig, and to Suez.

The highway network is being improved round the city, Fig. (5-2). For freight and passenger transportation, a railway connection south of the Cairo-Ismailia desert road is to be constructed to accommodate the large transport demand arising out of the expected activities in the new city, Fig. (5-7). Public transport is based upon a rapid transit system connecting all residential areas to industrial and central areas, Fig. (5-4a). This rapid transit system corresponds to that of Runcorn, south-east of Liverpool, where it takes the shape of the figure '∞', and where other vehicles are prohibited on the special bus routes. Segregated paths for pedestrians and cyclists cover the whole city.

The city centre has land allocated for some specialized activities catering for the whole city, Fig. (5-4). It is anticipated that the community centres in the separate neighbourhoods will cater for the needs of the city for the first years, and that a proper city centre will develop at the end of the first period, about 1988.

The wedge-shaped open area in the north between the halves, is reserved for future expansion as development progresses. Soil conditions and topography have their effects. Large parts of the site are covered with salty soils, which are very unlikely to be useful for farming. Wadi Gaffra and its branches comprise of less salty soils and have, therefore, been utilized for green areas, Fig. (5-14). More and earlier planted vegetation is considered for parks, residential and industrial areas, besides the main streets which are lined by trees and green strips, Figs. (5-8a) and (5-9).

5.2.1.1 Industrial Areas

Industrial areas of different character, corresponding to the different needs of the diversified pattern of industry are located at the perimeter of the city and on its leeward side. They have been divided into several parts all round the city to minimize the journey to work for the maximum number of workers within walking or cycling distance from home. This is important in a society with a low level of car ownership, Fig. (5-3). Special industries in need of direct railway access or with a direct environmental impact such as noise or air-pollution, form an enclave a short distance to the south of the city at the proposed railway line, Fig. (5-14). Hence, for planning purposes in Tenth of Ramadan, industries are classified in three categories:-

1. Type A, or separated industries, or heavy large scale and pollutant industries. This type is located south of the new city with direct railway access in the leeward of the prevailing wind.

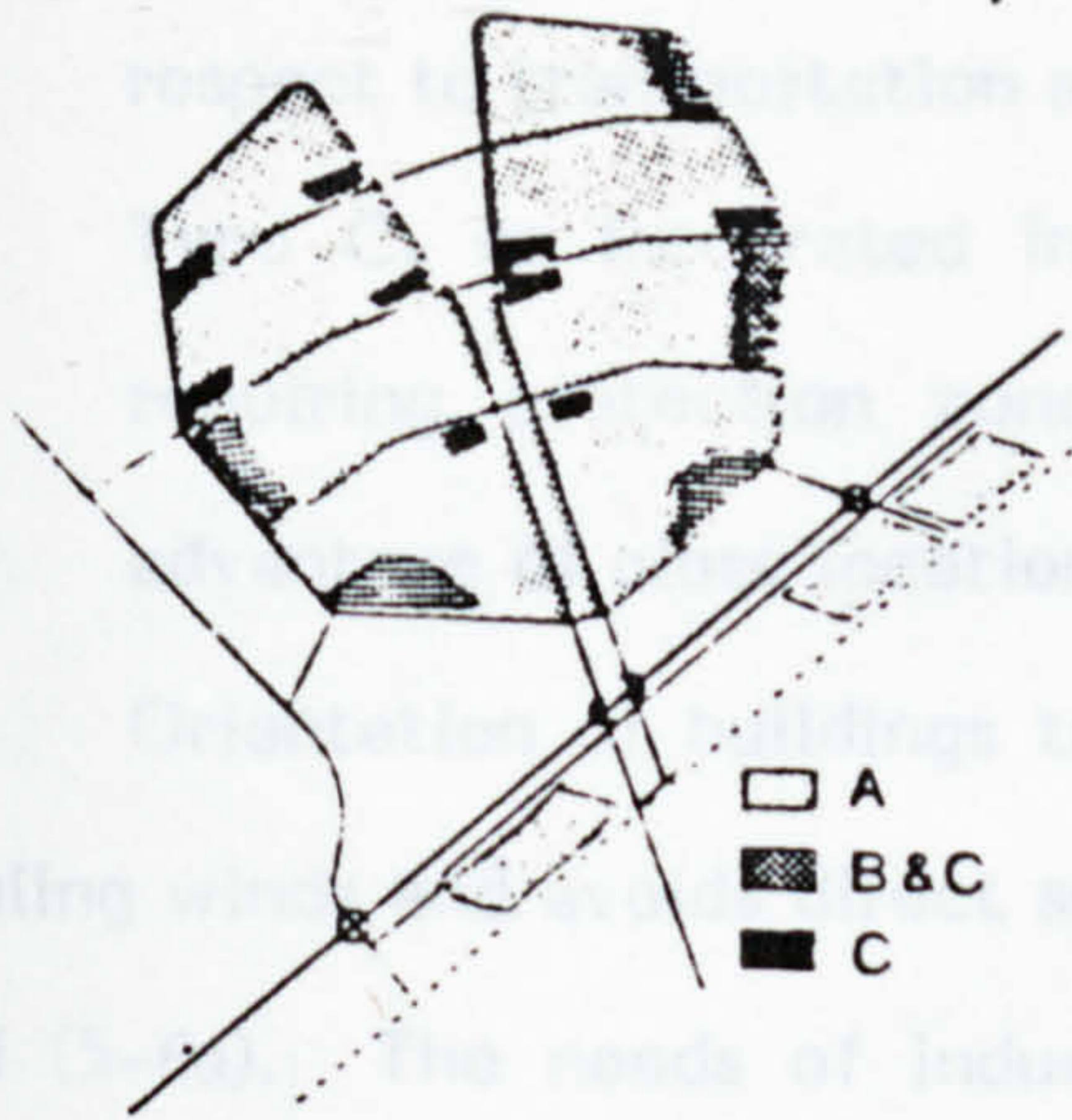


Fig. (5-5)

DIFFERENT KINDS OF INDUSTRIAL PRODUCTION

Source: Draft Master Plan Report, 1976. p.14-4

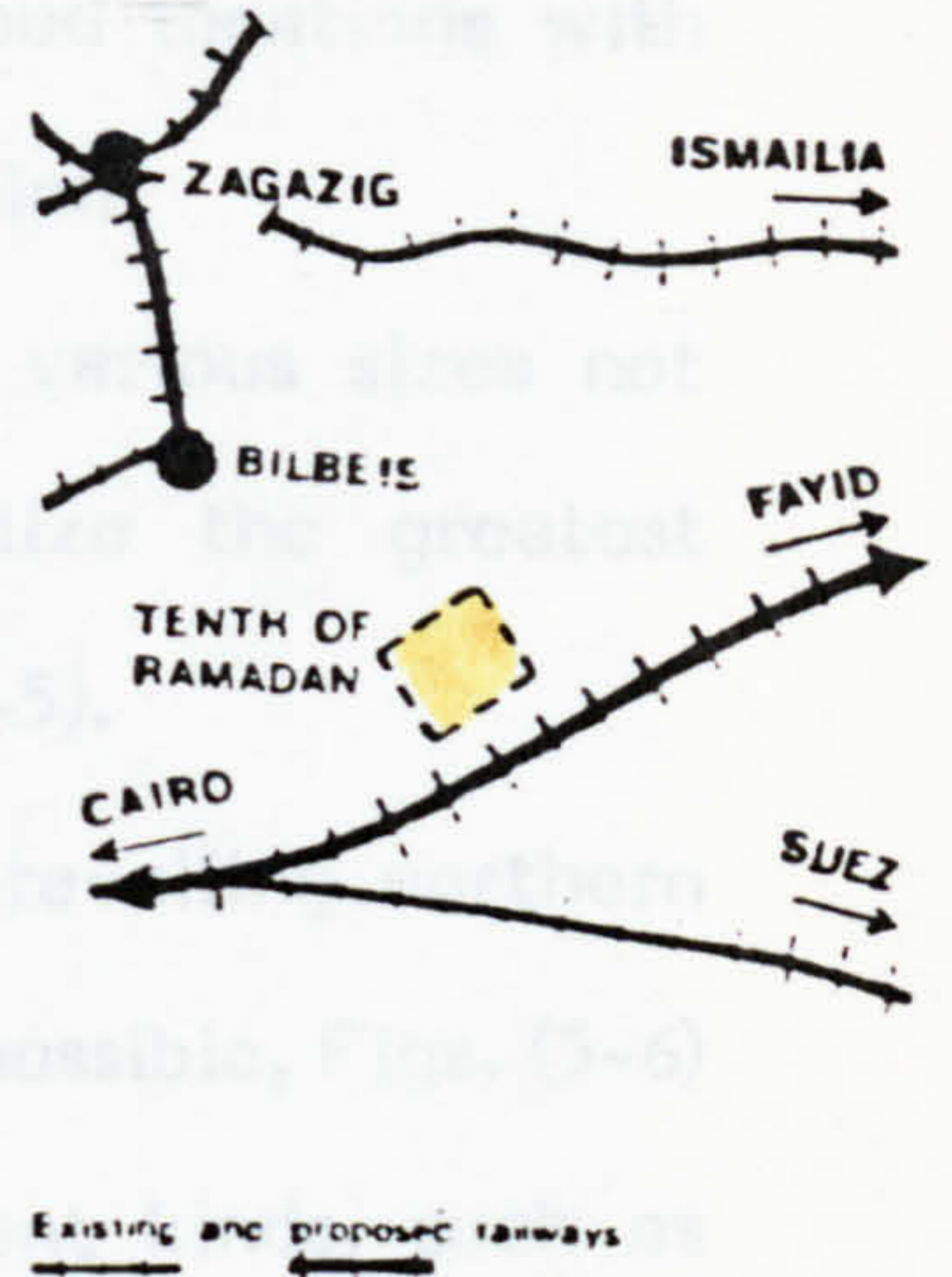


Fig. (5-7)

RAILWAYS ROUND THE NEW CITY

Source: Draft Master Plan Report 1976. p. 12-1

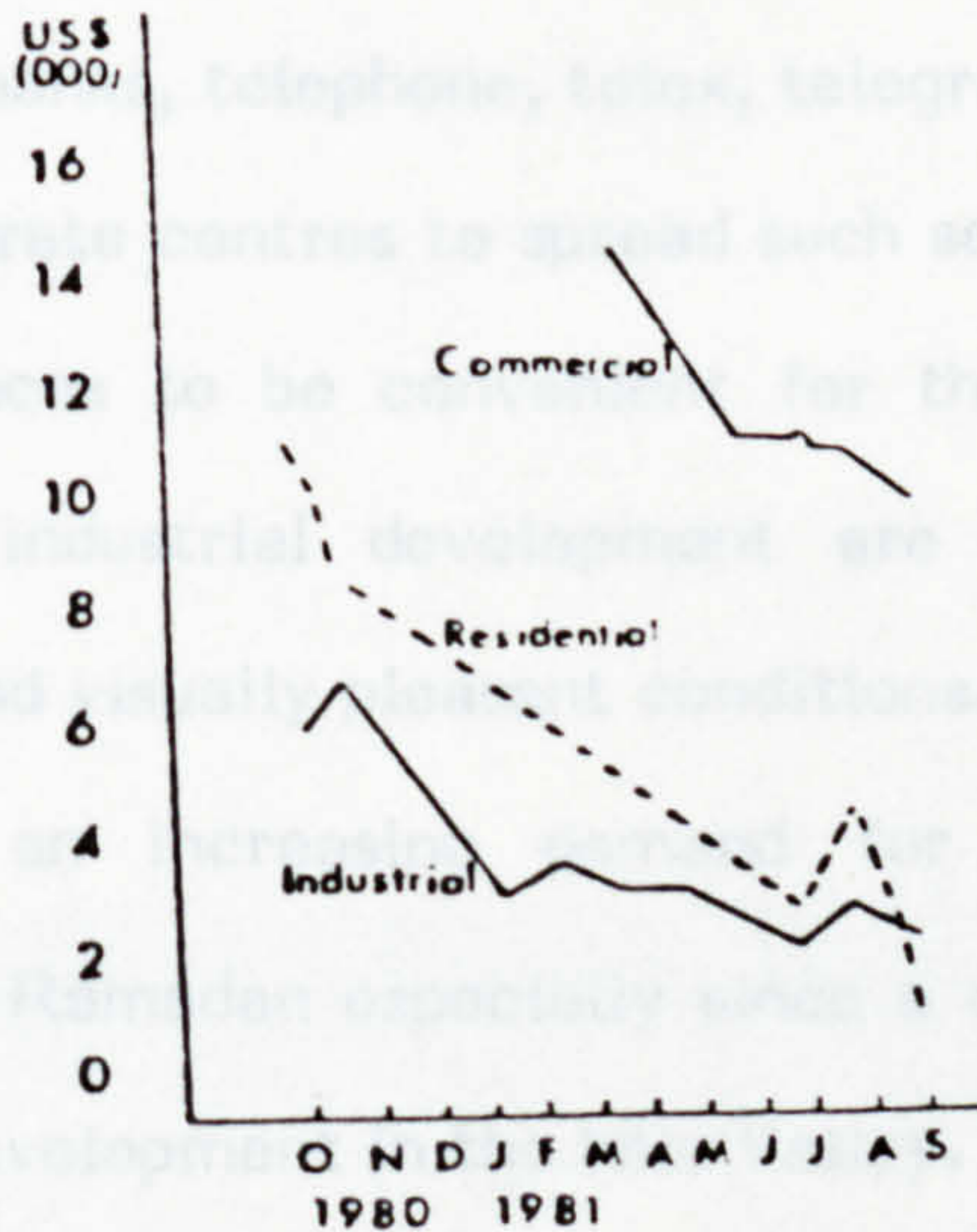


Fig. (5-8)

Prices (per Sq.m.) at government land auctions & tender sales (Urban areas only) in Hong Kong.

Source: Far Eastern Economic Review, Oct. 9, 1981, p.93

2. Type B, or medium industries. This type has good locations with respect to transportation and prevailing wind direction.
3. Type C, or integrated industries, necessarily of various sizes not requiring protection zones. This type can utilize the greatest advantage of close location to communities, Fig. (5-5).

Orientation of buildings takes the advantage of prevailing northern cooling winds and avoids direct solar radiation as far as possible, Figs. (5-6) and (5-6a). The needs of industrial services of different kinds, such as technical and commercial services and maintenance, have to be met in the new city. Secondary technical schools and vocational training centres are suggested to be located close to industrial areas to provide and to develop demanded labour skills.

Governmental services, such as municipal and administrative services, have to be available to industrial and business enterprises free of departmental bureaucracy to facilitate their work and to give it sufficient support. Other commercial services important for the industrial success, such as post offices and banks, telephone, telex, telegraph and shops have to be provided in small separate centres to spread such services to many more areas including work places to be convenient for those who work there. Regulations to control industrial development are required to achieve healthy, safe, efficient and visually pleasant conditions.

There has been an increasing demand for land for industrial development in Tenth of Ramadan especially since a decision was taken to limit further industrial development in the Nile Valley. When industrial land was first ready for sale, average land prices of sites for industrial development was £.E. 1.5 per square metre, which increased to £.E. 4.5, then to £.E. 7.5, owing to the increasing costs of infrastructure and ^{to} market demand. Sites that have especially favourable locations on main roads or corner plots are more expensive. In spite of these increased land prices, the



Fig. (5-6)
INDUSTRIAL ESTATE, TENTH OF RAMADAN
(Attia, June 1981)

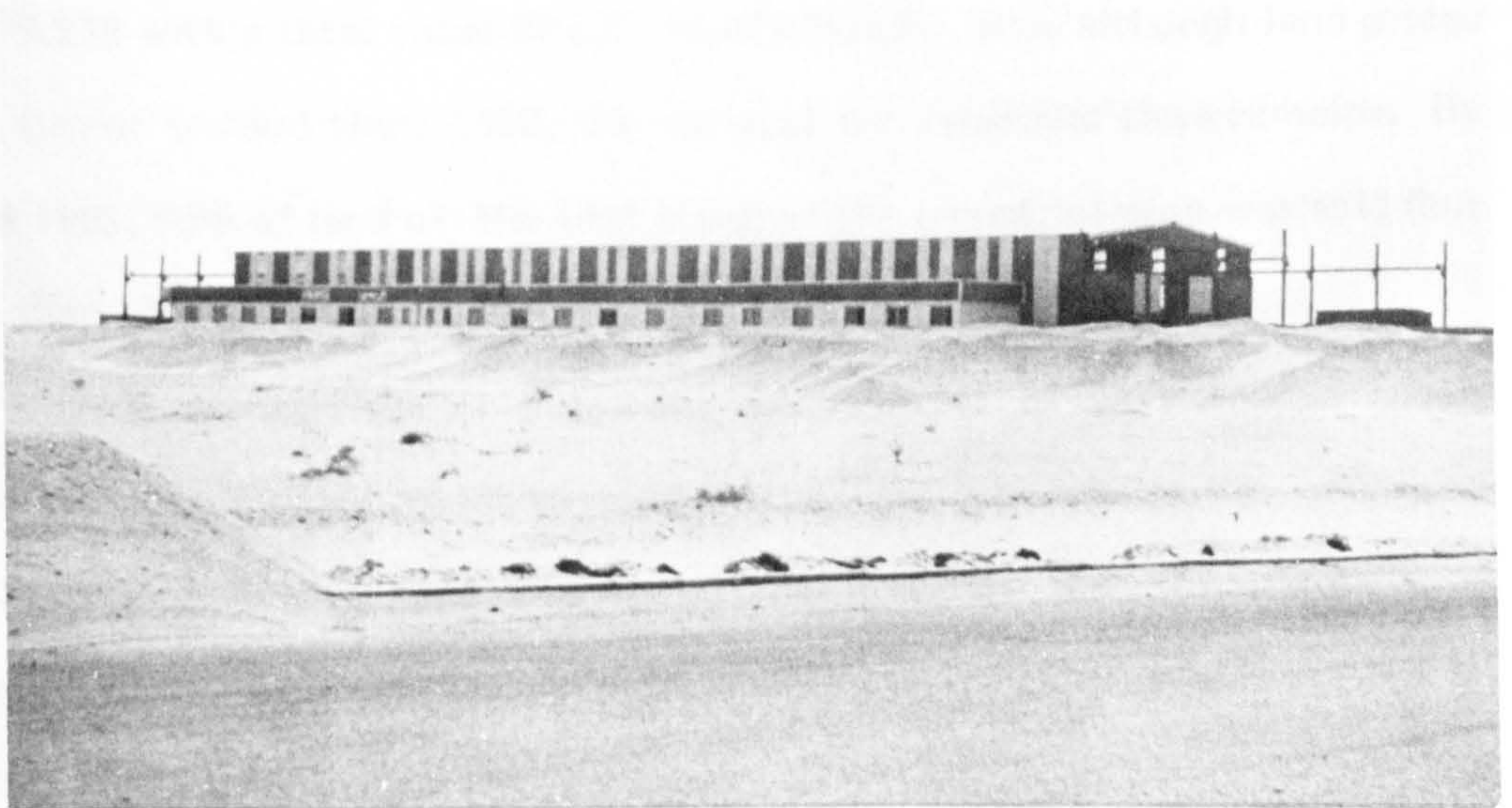


Fig. (5.6a)
A CARPET FACTORY, FOREIGN INVESTMENT
TENTH OF RAMADAN
(Attia, June 1981)

numbers of industrial projects and the areas of each are increasing. Before 1980, 105 projects, with an average of 20,679 square metres, were registered with a total area of 2,171,336 square metres, the total price paid being £.E. 7,653,777, an average of £.E. 3.525 per square metre. The government gets the extra cash and finances further development, done by the Development Corporation.

In 1980, several building and construction companies had started to establish factories in the new city including:-

1. A concrete pipe factory, Fig. (5-26).
2. A pre-fabricated concrete products factory.
3. A carpentry factory to produce doors and windows.
4. Several firms to produce paints, tiles, pipes, electrical equipment, renewing car tyres, food stuff, weaving, artificial sponge, forging and artificial fibres.

The investors are from both private and public national sectors, joined in some cases by foreign companies.

In 1981 land was provided for 69 projects with an average area of 21,726 square metres with a total area of 1,499,127 square metres, an increase in area per site of 5%. The average price per square metre reached £.E. 9.238 with a total value of £.E. 13,848,960(2). Thus although land prices had almost trebled since 1980, the demand for industrial sites remains. By June 1981, 90% of land of the first stage of the industrial area was sold (but less than 13% of housing was completed for this stage of the city).

This examination of industrial development in 10 Ramadan shows good chances for industrial success in the new city but so far sufficient services including housing and social facilities are not provided, on a commensurate scale see Section 5.5.1.

5.2.1.2 Residential Areas

The bases of the whole residential planning are the needs of the individuals of different housing categories. The layout and design of housing must meet the requirements, including the financial capability of the inhabitants. So, a long-term plan should include a flexible framework for future changes that cannot be anticipated today such as migration rates, household sizes, economic standards and so on. The availability of restrictions on construction techniques and labour, and the available materials have to be taken into consideration. The largest percentage of housing should be in the form of low-cost units which can be extended and improved over time to meet the needs of the majority of the low-income people. To defeat the desert feeling, most of the housing units have to be provided with a private garden or patio, allowing a number of households to grow fruits and vegetables and even keep poultry. The height of housing is limited to a maximum of four floors, Fig. (5-8a), except in the city centre. But the majority should be of one or two storeys leaving a chance for extension and modifications, and keeping the costs as low as possible. Self-help or core-housing give good examples to fulfil these aims.

The overall density measured over the whole town, will be about 128 persons per ha., while the average density at the community level has been set at 180 persons per hectare(3). The four residential areas of the new city are of community unit size with an average of 36,000 inhabitants each, occupying about 180 hectares, resulting in a net residential density of 200 inhabitants per hectare approximately. A community will have eight neighbourhoods of 4,500 inhabitants each with sub-divisions into residential groups of 100-200 houses or 500-1000 inhabitants.

The implementation schedule indicates a housing production of 3,000 to 4,000 units per year. The actual rate of implementation has so far been much less than this, in fact about half. Completed housing units were 3,213

till 1980, distributed as follows:-

1,768 units of traditional housing

528 units of prefabricated housing

500 units of core housing, Figs (5-21) & (5-22)

417 units of villas, Fig. (5-9)

TOTAL 3,213

Out of these numbers, only 2,000 units, or about 62% were delivered, and life began in the city in April 1980(4), (see Section 5.5.1).

10 Ramadan is planned to house 500000 people in 22 years (1978-2000). Since the average household size is 5 persons, about 100000 dwelling units will be required when the whole city is completed. So the rate of housing production should be at an average of 4546 units per annum. The programme schedule is only 3000-4000 units per year, while as mentioned above, the actual completed units were only 3213 in the first two years of construction, 1978-1980. This means that neither the programme schedule nor the rate of production can fulfil the target need of dwellings. This requires a close revision of the housing programme to make it more realistic according to the actual needs of population growth in the new town, and a firm monitoring from the project management to achieve a proper rate of housing production according to the revised plan. On the other hand, housing costs have to be within the limits of the acceptable rents to the majority of the expected inhabitants of the new town as low income classes.

Self-help housing can help to achieve such capacity with the technical assistance of the Development Authority to encourage people to build their own cheap dwellings. Housing must be designed to fulfil climatic and environmental requirements, and to use cheap materials in a very simple



Fig. (5-8)
DIFFERENT HOUSING CATEGORIES IN TENTH OF RAMADAN
(Prof.Dix, December 1981)

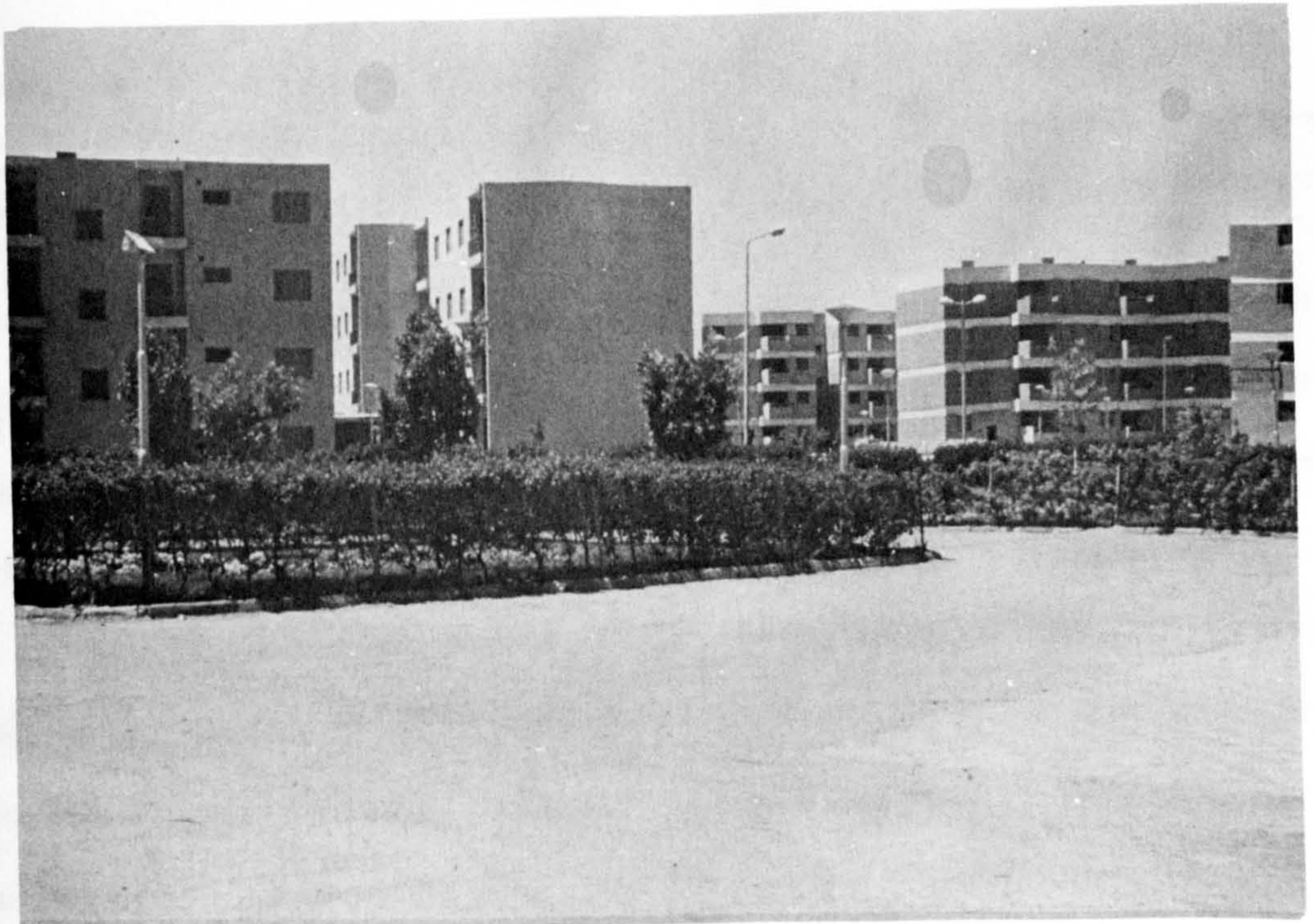


Fig. (5-8a)
FOUR STOREY HOUSING IN TENTH OF RAMADAN
(Attia, June 1981)

and straight-forward way. Table (5-1) illustrates the percentages of type of housing, floor areas and the acceptable rents by inhabitants in the new city. (see also Section 7.2.6).

TABLE (5-1)
HOUSING IN RELATION TO ACCEPTABLE RENTS FOR THE INHABITANTS
OF 10 RAMADAN

Type of Housing	Share of Dwelling units %	Share of Floor Area %	Floor Area Per Inhabitant m ²	Assumed Accept. rent £E/year	Share of Total Population %
Lower Cost	60	44	7	< 40	20
				< 80	40
Middle Level	36	45	12	< 200	36
Upper Middle Level	3	11	20	< 900	4
High Level	1		30		

Source: Draft Master Plan, Jan. 1976, pp.21-1 & 21-2 with additions and adaptations.

It may be appropriate here to compare housing conditions in 10 Ramadan with those in Hong Kong to know the differences between the two cases concerning the per capita floor area, the income, rent or ownership relations, and if it is possible to reduce costs and rents in 10 Ramadan.

The Hong Kong Government flats offer families just 2.25 square metres per person, which is 32% of the 10 Ramadan lowest standard. An argument could rise here if 10 Ramadan areas of low income dwellings could be reduced to decrease building costs and hence rents, and to produce more dwellings for the same area of land, and with little increase in labour and

building materials . Monthly rentals in Hong Kong starting at less than U.S. \$40 (about 15% of the average income of about U.S. \$260 a month, almost as the ratio in 10 Ramadan, p.240 and Table (5-7), while at the other end of Hong Kong Island, on the Peak, bankers often pay more than 150 times this amount for apartments(I). According to government statistics(II), of Hong Kong's 1,093,220 dwelling units private housing totals 601,960 units (55.1%), the rest are public housing including home ownership schemes.

All the land in Hong Kong is owned by the Government, which leases it to individuals or corporations for a period of time. Proceeds from auctionery of leases are paid directly to the Government. Land sales, i.e., of leases, in the 1980-1981 budget were 24% of the total Governmental revenue(III), see Fig. (5-8b).

But some in Hong Kong Government now accept that in order to buy an apartment, a family needs an income approaching U.S. \$2,800 a month. The average industrial wage is nearer U.S. \$260 a month and that of office workers no more than two or three times that(IV). This comparison shows that the lowest rents in Hong Kong are almost 24 times those in 10 Ramadan (for the same area), while the prices of dwellings in Hong Kong are more than twenty times of those in 10 Ramadan, and the needed income to buy a moderate flat in Hong Kong is about 88 times that in 10 Ramadan. This can be related to the cheaper land and lower standard of living in the latter.

Where homes are built around cul-de-sacs, social contacts are stronger than where streets with heavy car traffic dominate. In Tenth of Ramadan, private gardens and balconies form open air extensions of living areas and facilitate the observation of outside life, Fig. (5-9). Communal open spaces form local meeting places for people of different ages, and

safe children's playgrounds. From the local centres, there is a further extension to the city centre using the rapid transit route, or across the parks by footpath or cycle track.

A possible average area of the neighbourhood, based on the elementary school, shopping and services centres in relation to population basis, would be around 25-30 hectares(5). Preliminary calculations of the city plan indicate that approximately two-thirds of the active population should be able to find employment within their community(6), with the help of distributed industrial areas.

5.2.1.3 The City Centre

Services are sufficiently provided in the city centre, which is about 500 metres wide and 3 kilometres long, on a whole scale from community level up to city level. All pedestrian walks and squares are enclosed in the centre and the sub-centres as well, Fig. (5-10).

The city centre will have a good public transport connection with the whole city and a concentration of services, shopping, administration and entertainment. The centre will consist of a rather large area to provide a great degree of flexibility. The buildings will enclose public walks and squares all preserved for pedestrians. Shops will be served from individual service areas which will have enclosed service road access connecting with the circulatory road. There should be sufficient population living within walking distance to guarantee an immediate shopping demand.

The concentration of numerous activities and services in the main city centre might lead to high land values and increased traffic circulation. Such trends could be decreased by more development in the sub-centres to include some similar activities to those in the main centre on a smaller scale, and by providing generous traffic facilities in and around the main centre, such as bus terminals, sufficient parking areas and pedestrian parades and open spaces.

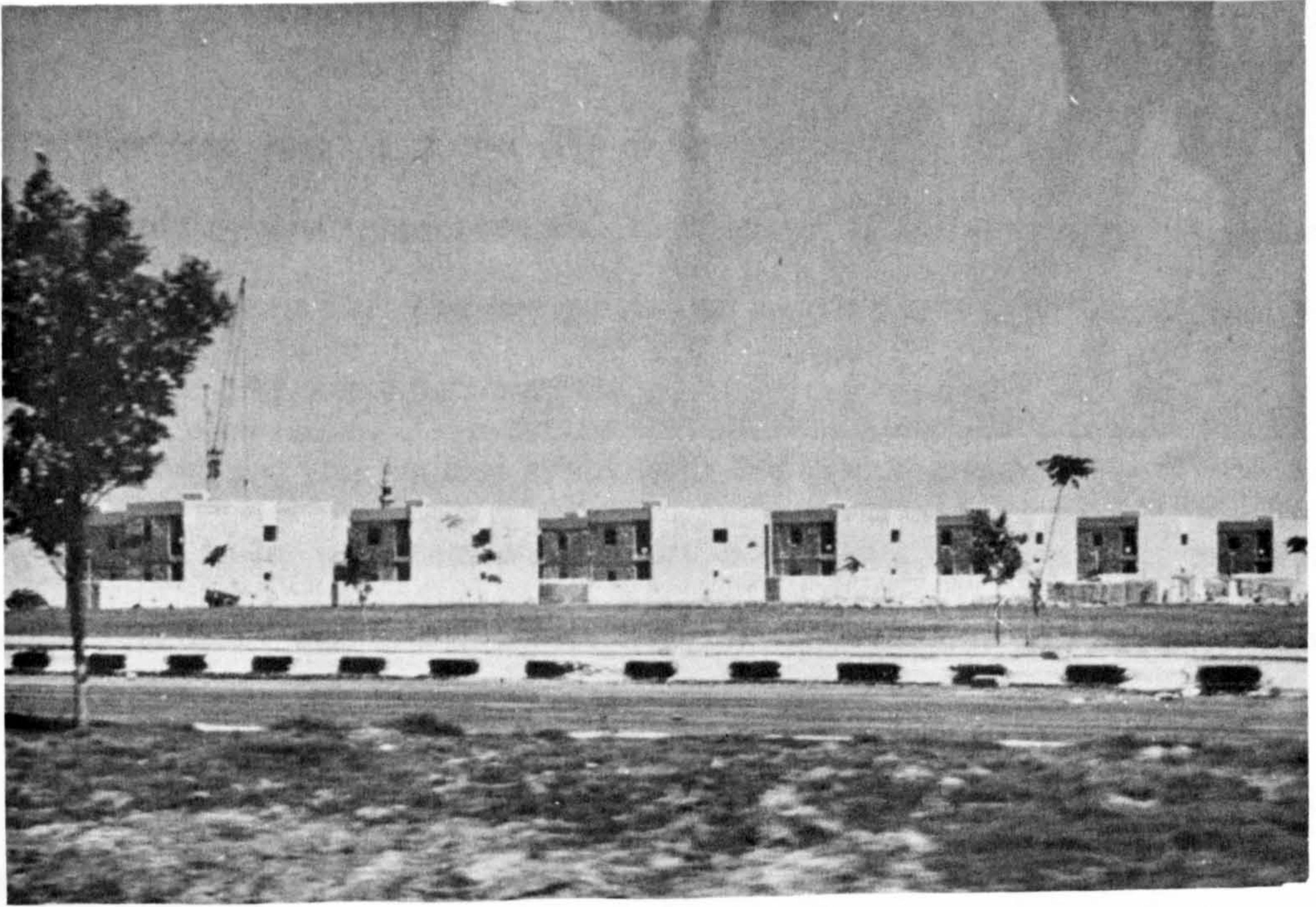


Fig. (5-9)
 UPPER MIDDLE CLASS HOUSING IN TENTH OF RAMADAN
 (Attia, June 1981)



Fig. (5-10)
 THE FIRST ALL PEDESTRIAN SUB-CENTRE (SUKEL-FATH)
 (Prof.Dix, December 1981)

The first section of the city centre contains a substantial proportion of the whole centre to provide the first stage of the city with immediate shopping requirements. The completion of the centre will follow the natural growth of the city itself northwards.

Connecting the central areas with the major green areas of the city it is possible to have recreational facilities at hand, while general hospitals, higher education institutes, hotels and similar buildings can be located on these green extensions of the centre, Fig. (5-4).

Open ends to north and south allow for unpredictable changes and additions to the city centre.

5.2.1.4 Utilities

It is foreseen that consumption of electricity in the new city for a normal household of about five will be 2,000 KWh per year, increasing to 3,000 KWh per year in 10 year's time, with a rising standard of living(8). Cooking and hot water are provided for by bottled butane gas. The above-mentioned family will need 300 Kg of gas per year increasing to 400 Kg per year over 10 year's time. The energy demand for services and light industry represents about 50% of the total energy demand for housing(9). If solar and wind energy are exploited, these estimated demands will be correspondingly decreased.

Energy consumption for heavy industry depends on the types and sizes of plant and these cannot be foreseen accurately. Figure (5-11) illustrates the expected energy consumption in the different stages of the new city development.

Compared with energy demands for housing, services and industries; transportation will only require about 5 to 10 per cent of the total energy demand in the city.

The provision of various forms of energy for the city is most important. Electricity can be transmitted from Belbeis, Zagazig and Heliopolis (Cairo), Fig. (5-1). It is unlikely that electricity can be generated in the area due to lack of cooling water.

Table (5-2) shows anticipated load and energy requirements in 25 years of city development.

TABLE (5-2)

LOAD AND ENERGY REQUIREMENTS FOR TENTH OF RAMADAN

Year	10		25	
Population	150,000		500,000	
Demand & Consumption	MW	KWH	MW	KWH
Residential	24	130	80	500
Services & Light Industries	12	50	40	200
Industries	80	350	225	900
Total	116	230	345	1600
Consumption KWH per capita	3500		3200	

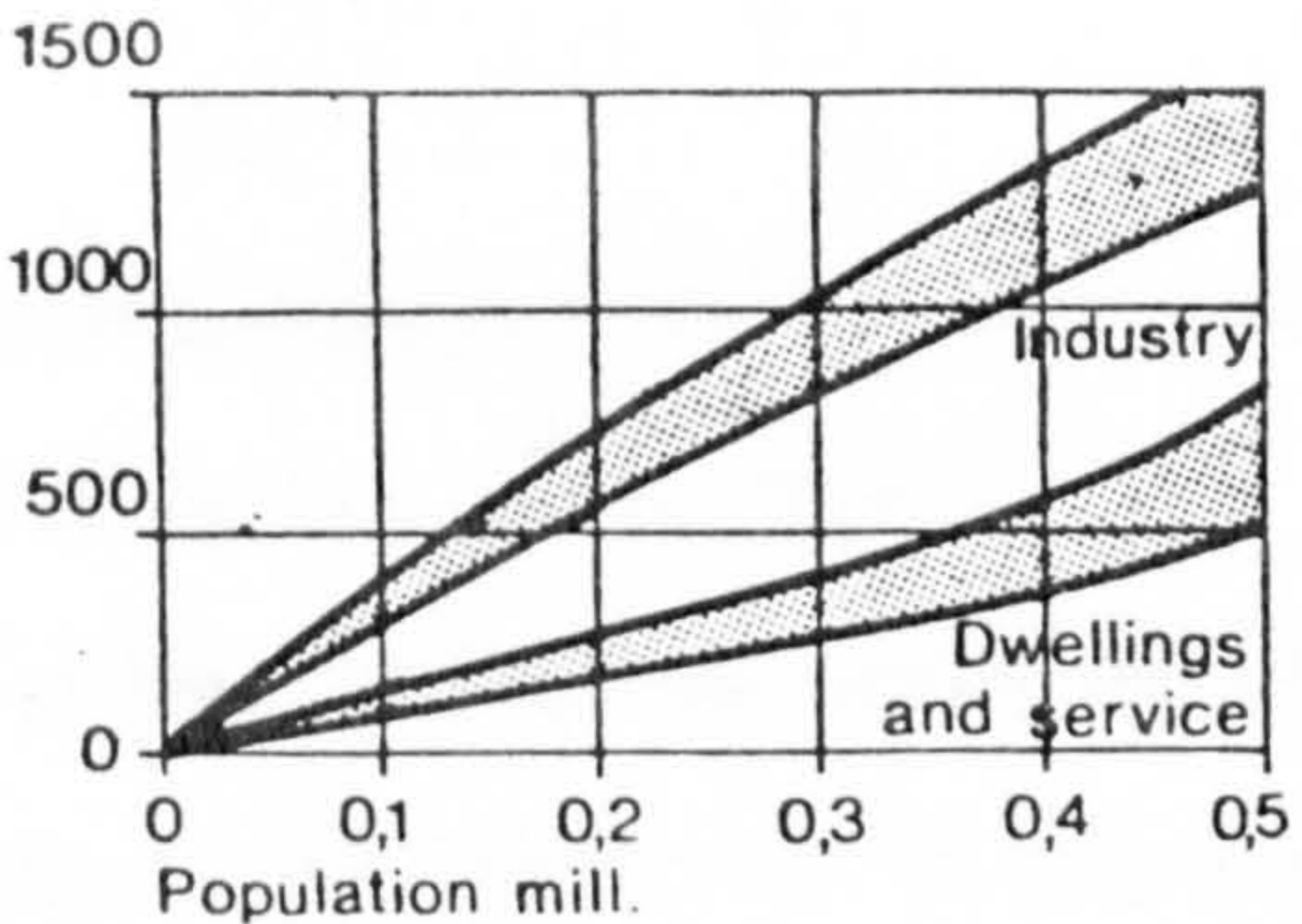
Source: Ministry of Development and Housing, Community Planning and Development Challenges, International New Town Association Conference, Cairo, Oct. 1980, p.31.

Electricity authorities have started to construct a high tension network including:-

- One transformer sub-station 220/66 KV suitable to be connected to the National Grid through Abu Sultan, Ismailia, power station, to Heliopolis sub-station in the Cairo area by a double circuit 220 KV transmission line.
- Two transformer sub-stations 66/11 KV in the city area.

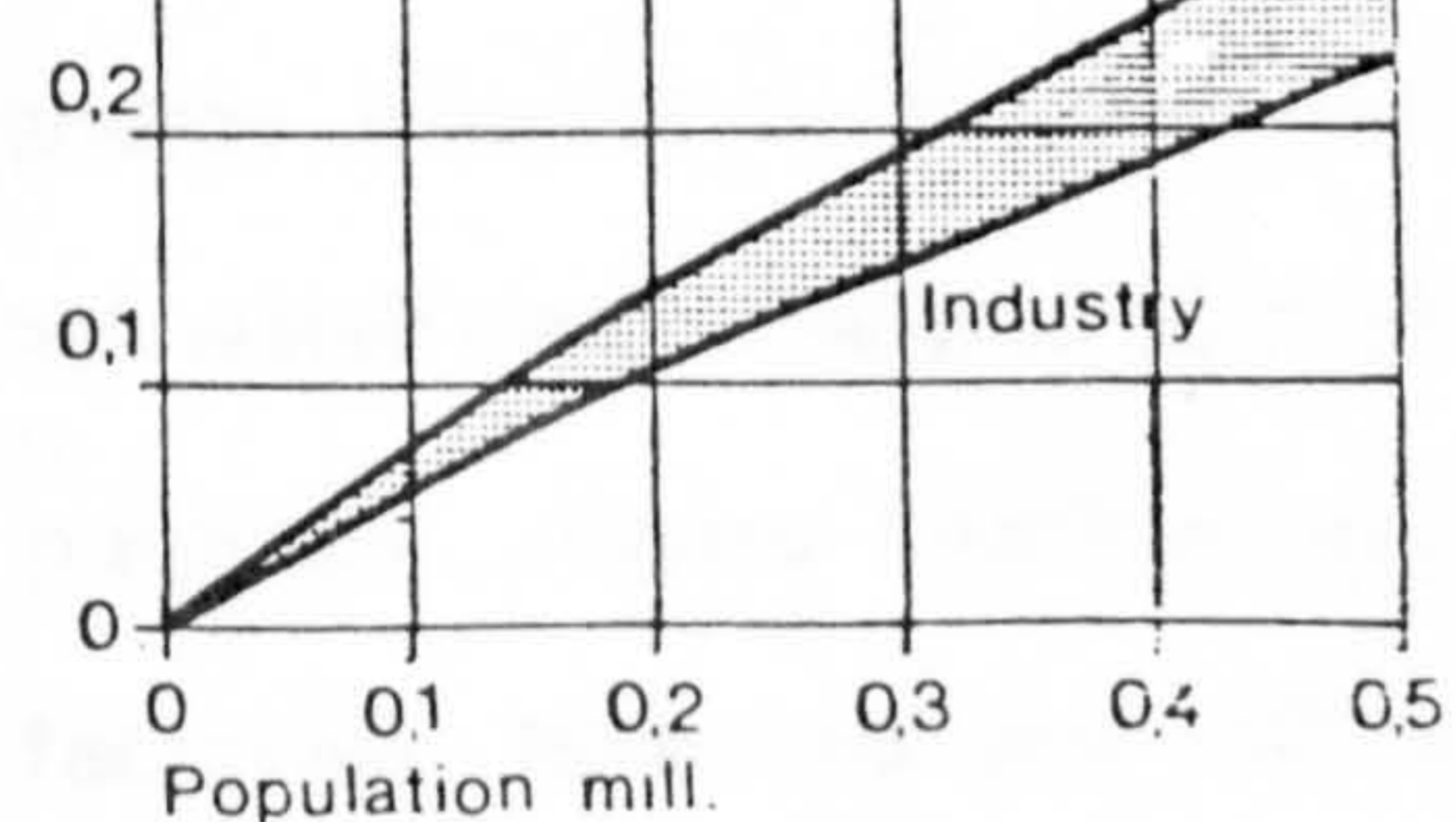
ELECTRICITY

GWh year



OIL

mil. ton year



BUTANGAS

mill. ton year

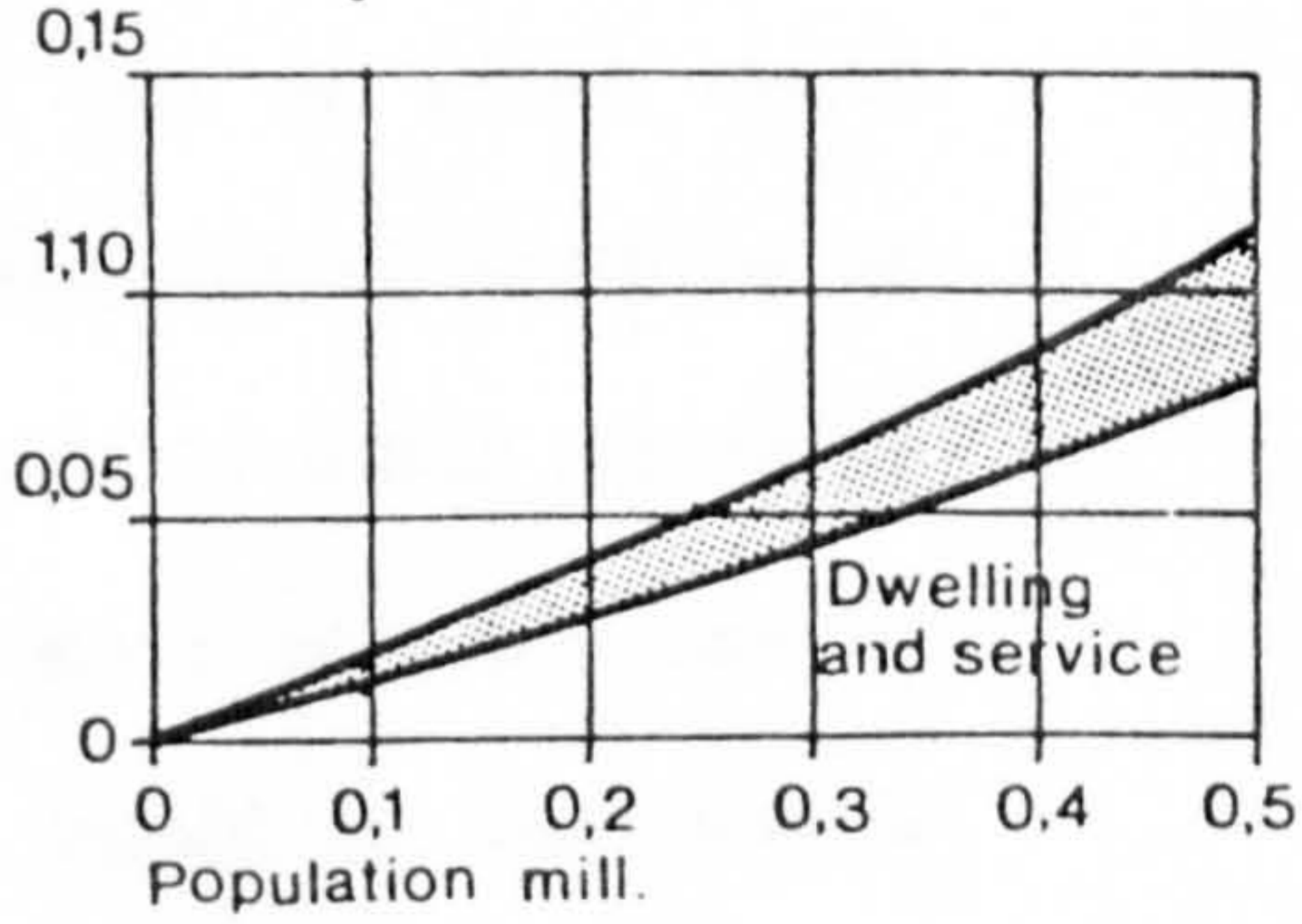


Fig. (5-11)
 ENERGY CONSUMPTION PROGNOSIS IN IO RAMADAN
 Source: Draft Master Plan, January 1976, p.18-3

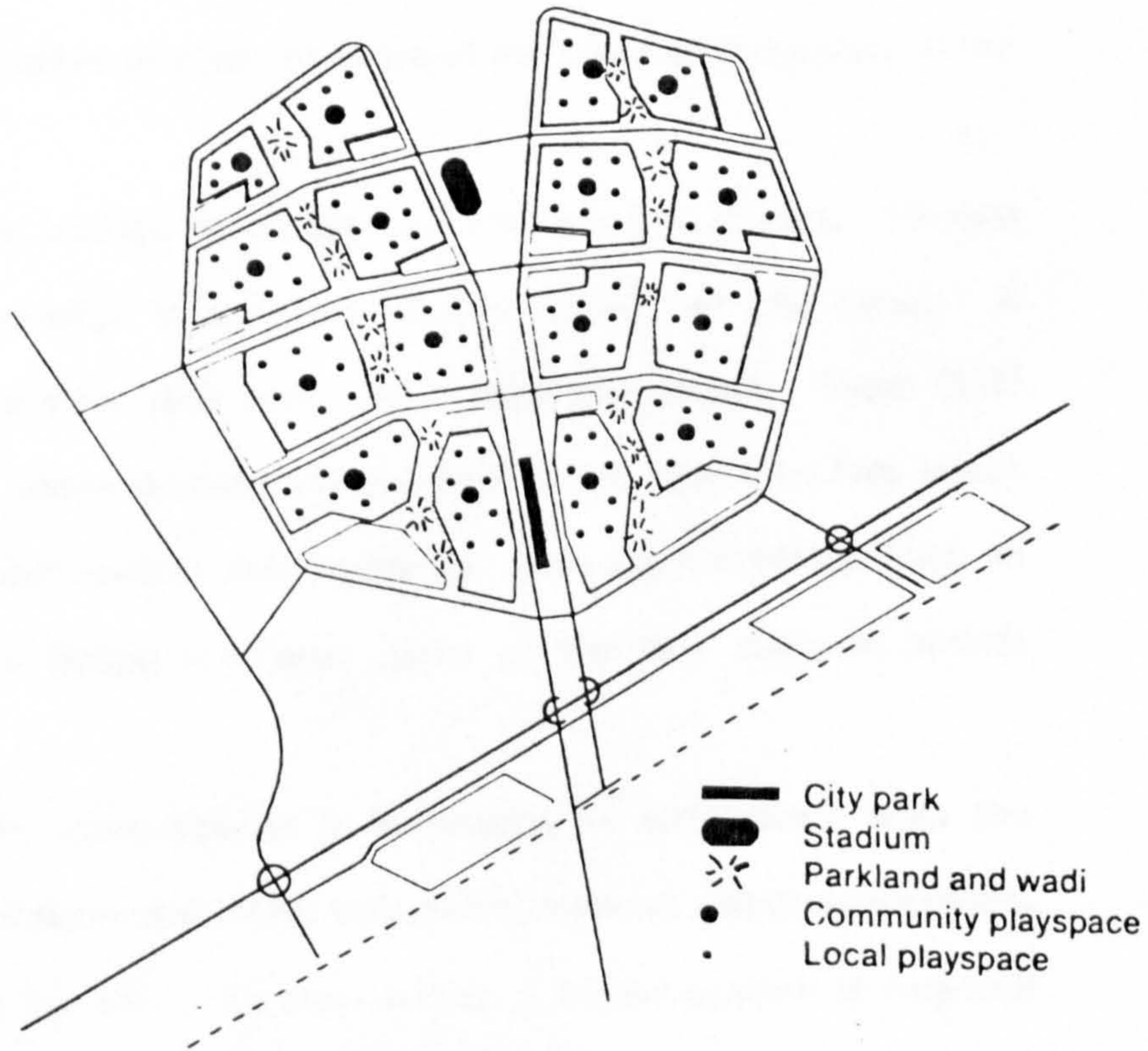


Fig. (5-12)
 OPEN SPACES AND RECREATION AREAS IN IO RAMADAN
 Source: Draft Master Plan, January 1976, after p.13-3.

- 220 and 66 KV overhead transmission lines for inter-connection with the National Grid and the other two sub-stations.

Refined oil products and butane gas bottles would be transported by road to the new city, but a petroleum pipeline from the Suez-Cairo line may be considered to feed the industrial area of the city. Further advantages could be gained from using solar energy, and the use of which could minimize energy imports to the new city. Roof construction could be so arranged that water can be heated by solar collectors for domestic and some industrial purposes. Space heating and cooling of some public buildings including factories, hospitals and office buildings, could be facilitated. Solar-driven pumps can help in water supply for irrigation or other purposes. The possibility of using wind energy is also worth considering,(see Section 5.6 below).

Natural gas has already been found in Abu Madi gas field north of the Delta and more in future will probably be found within the Nile Delta. The use of gas could be of great interest to some of the planned industries in the new city.

Water supply is mainly dependant on the Ismailia Canal. Ground water of acceptable quality is available in the vicinity of the canal. A common distribution system will serve the whole population, Table (5-3) illustrates the future water demand estimations in the new city. Two water projects of 150,000 cubic metres daily capacity each are completed from an intake of the Ismailia Irrigation Canal north of the new city, to secure regular water supply.

Industrial water consumption is estimated in accordance with the type of industries. Water-consuming industries, such as paper production, are not considered in the city. To save water, a closed system is required for cooling. Water is also required for irrigation of parks, recreational areas, gardens and green belts giving protection against desert conditions(10).

The Ismailia Canal will be enlarged considerably to give the new city about half a million cubic metres per day before 1990(11). From a water treatment plant near the Ismailia Canal, and from groundwater works, the necessary water will be pumped to the city. Water towers and reservoirs will have a total volume of about 50% of the maximum daily consumption.

TABLE (5-3)

EXPECTED DAILY WATER DEMAND IN TENTH OF RAMADAN

Indication	Unit	Year 10	Year 25
Population	Person	150,000	500,000
Maximum average per capita dom. consumption	lit/p.d	260	315
Domestic consumption Maximum	m ³ /d	39,000	157,000
Industrial consumption Maximum	m ³ /d	21,000	83,000
Allowance for water-consuming industries, if any, Maximum	m ³ /d	50,000	100,000
Irrigation, Maximum	m ³ /d	36,000	120,000
Total Consumption rounded off.	Max	150,000	460,000

Source: Tenth of Ramadan Draft Master Plan January, 1976, p.18-4.

Note: The estimation of domestic consumptions of water in 6th October new town (Section 4.8.1) is apparently higher than that in 10th Ramadan. That may be related to the different basis on which the two estimations were made.

⌈ Sewerage can be served by gravity in the main parts of the city because of the slopes of the Wadis. Thus, sewerage systems are provided according to land undulation of every district, see Fig. (5-14). Only at a few

points are pumping stations required. The drainage of the First Stage of the new city was completed in 1980. Evaluation of different types of treatment plants has shown that waste stabilization ponds are favourable. They are rather simple to construct but need large areas of land, which are available in the desert. The future area required for the ponds would be in the order of 750 hectares. This area is sited in the northern part of the city not less than 1 kilometre from the nearest building to avoid nuisance for the public. Careful records on industrial wastes should be kept to check the fulfilment of required treatment in order to avoid toxic influences. The sewage effluent could be, preferably, utilized for irrigation and other purposes by water recycling. Dripping irrigation has proved to save water by about 50% in the Salhiya reclamation project, north-east of the new city.

The quantity of stormwater is rather small, and it is suggested in the plan to keep the two natural Wadis traversing the city as open canals. A solid waste disposal plant is to be constructed near the sewage treatment plant.

5.2.1.5 Groundwater

Since water resources form a crucial element in the new city development, it is appropriate to discuss the groundwater study of the city region.

The groundwater in the area is already used for rural irrigation, Fig. (5-15), industrial and military purposes(12).

The potentials of the groundwater is considerable in the Tenth of Ramadan district, and was used to satisfy the needs of the new city in its early development in such a desert environment(13). Figure (5-18) shows a storage basin of the groundwater and a new farm (14) & (15). At present, the groundwater supplements the surface water resources from the Nile via the Ismailia Canal in meeting the needs of the growing city. The maximum



Fig. (5-13)
PLANTATION & PROTECTION ZONES
(Attia, June 1981)

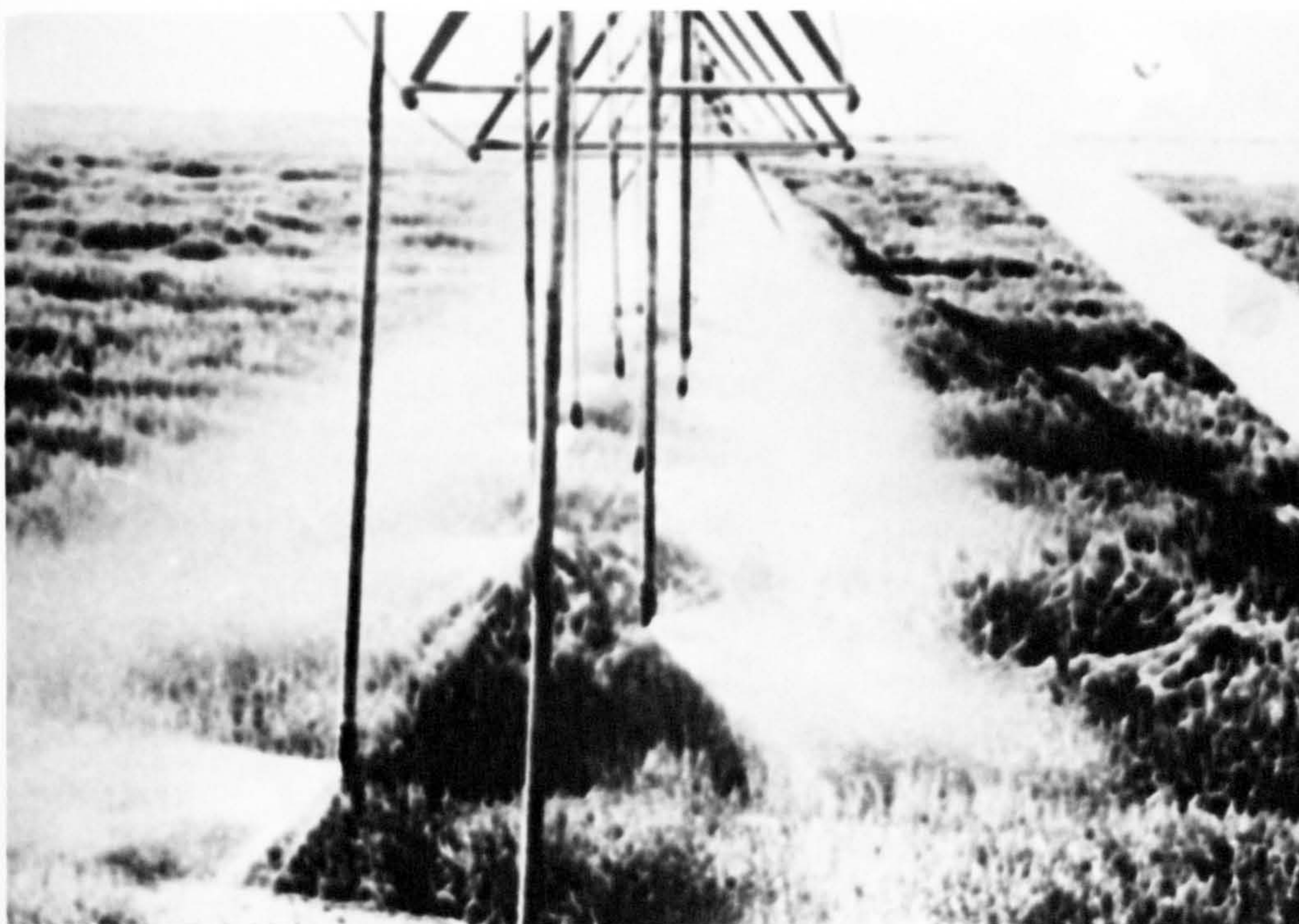


Fig. (5-15)
PIVOT IRRIGATION IN SALHIYA RECLAMATION
LAND NORTH EAST TENTH OF RAMADAN
(After Arab Contractors)

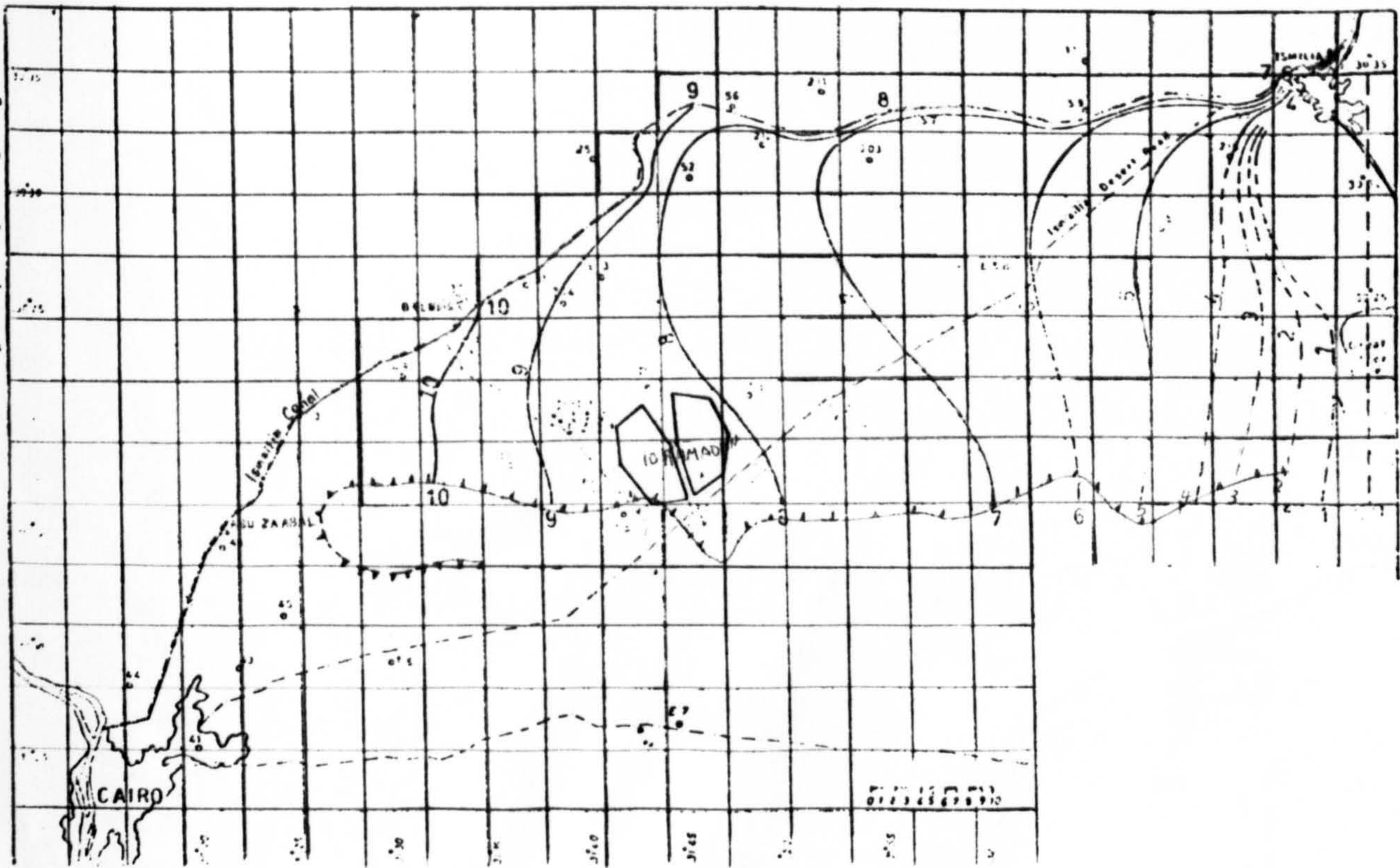


Fig. (5-16)
 GROUNDWATER CONTOUR MAP FOR 10 RAMADAN
 Source: Ministry of Irrigation,
 Research Institute for Groundwater



Fig. (5-18)
 GROUNDWATER & EXPERIMENTAL FARM
 (Attia, June 1981).

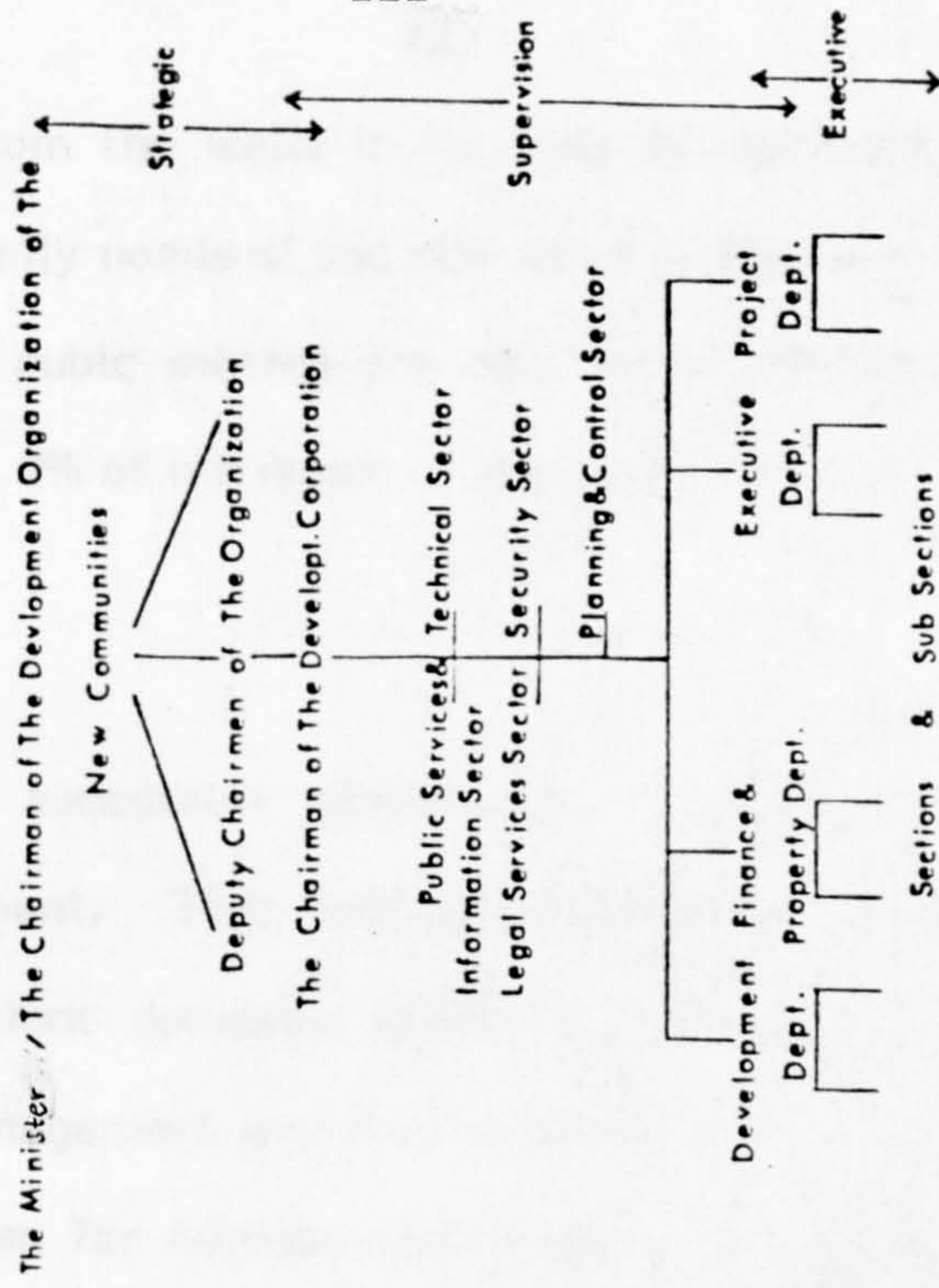


Fig. (5-20)

MANAGEMENT LEVELS IN 10 RAMADAN

Source: Ministry of Development, The 1982 Development Plan of 10 Ramadan, April 1982, p.3 Chapter 3 & p.8-28 Appendices.

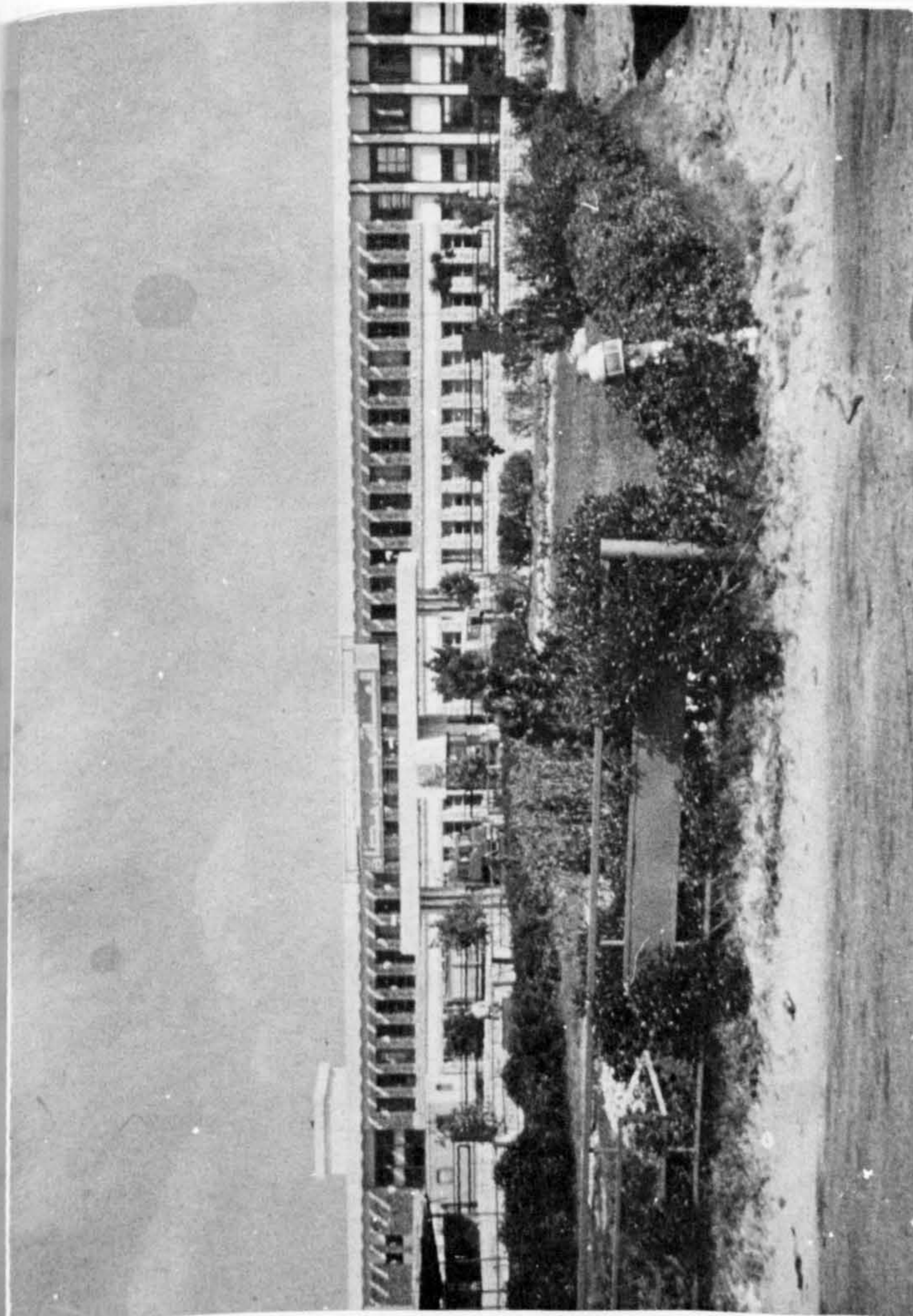


Fig. (5-19)

THE DEVELOPMENT CORPORATION OF TENTH OF RAMADAN

The building will be converted to a general hospital for the new city after the First Stage of development. It is about 5 Km. away from the new city. Another building for the DC is under construction.

(Attia, June 1981)

daily withdrawal from the wells in the city is estimated at 20,000 cubic metres, while the daily needs of the city after completion is estimated to be more than 300,000 cubic metres per day, which means that groundwater represents less than 7% of the needs of the new city when completed.

5.3 Management

The key to successful development of a new town is carefully organized management. That includes the ability to make quick, sure, practical and efficient decisions throughout the life of the project. A master plan for management and decision-making is, perhaps, more critical than the master plan for development because it provides the formula for continuing accomplishment. The best plan can be spoiled by poor management, while good management can draw the best out of a poor plan. The management master plan and procedures must be continually tested and refined. See Section (3.3.2).

For example, the way in which the industrial land has been taken up was evidently far more rapid than was anticipated. That could mean wrong estimation, and hence, there will be an extra demand for housing and services. It could also be related to the cheap land prices which encourage to purchase larger areas to expand the factories in future. This will result less people per unit area in the near future and more industries later on. This essentially needs revision of the programme, and clarifies the importance of data collection and monitoring, and hence the importance of having specialized people in the new town management as demographers, town planners, and social workers. Information about the staff is not available and it should be for better programming in future new towns.

Tenth of Ramadan is a large new city, so its implementation requires organisational and managerial efforts on a similarly large scale.

The Development Corporation, represents the authorized body for all matters concerning the implementation of the city, Figs. (5-19) and (5-20).

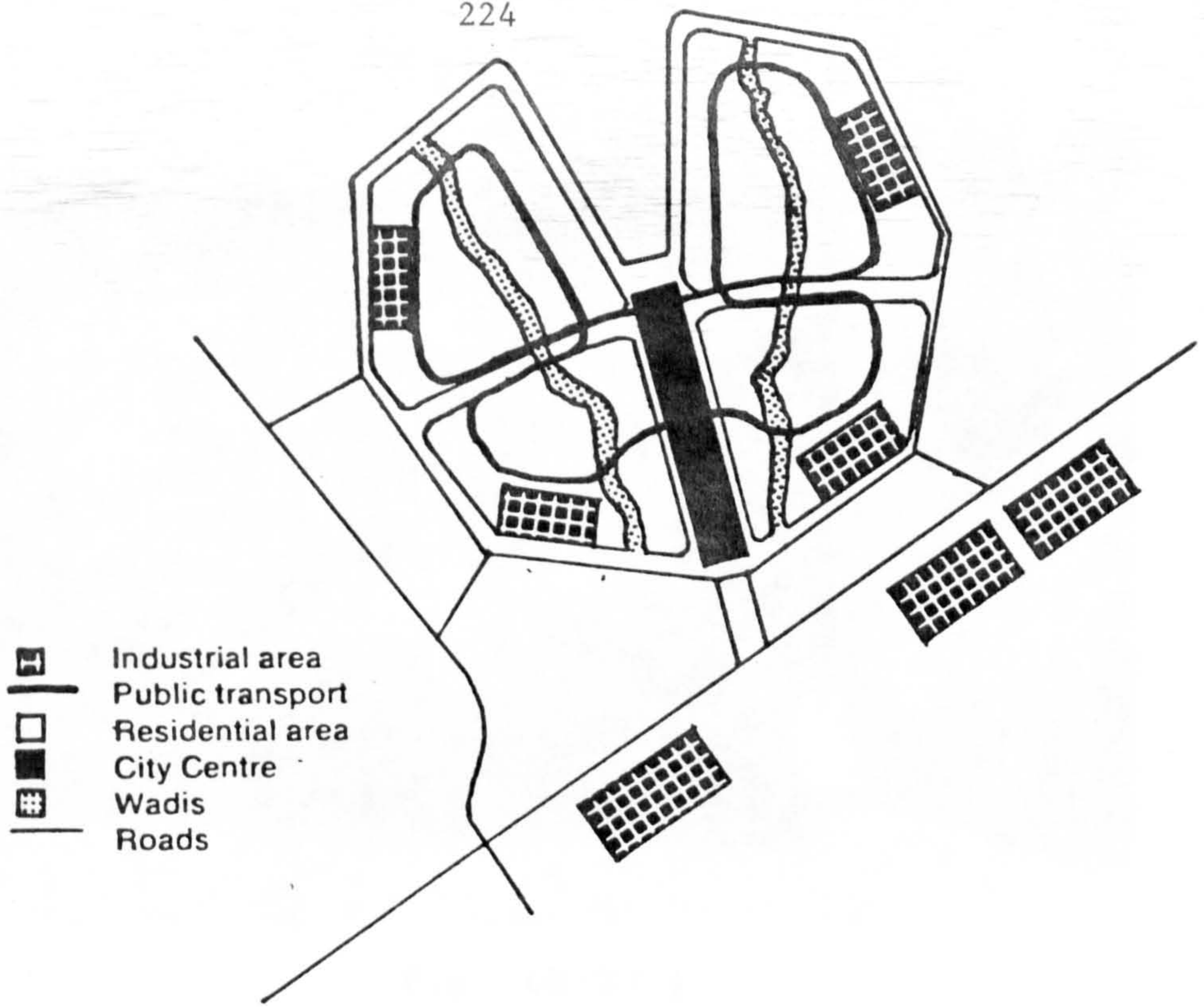


Fig. (5-14)
 BASIC CONCEPT OF TENTH OF RAMADAN
 Source: Draft Master Plan, January 1976, after pl2-1.

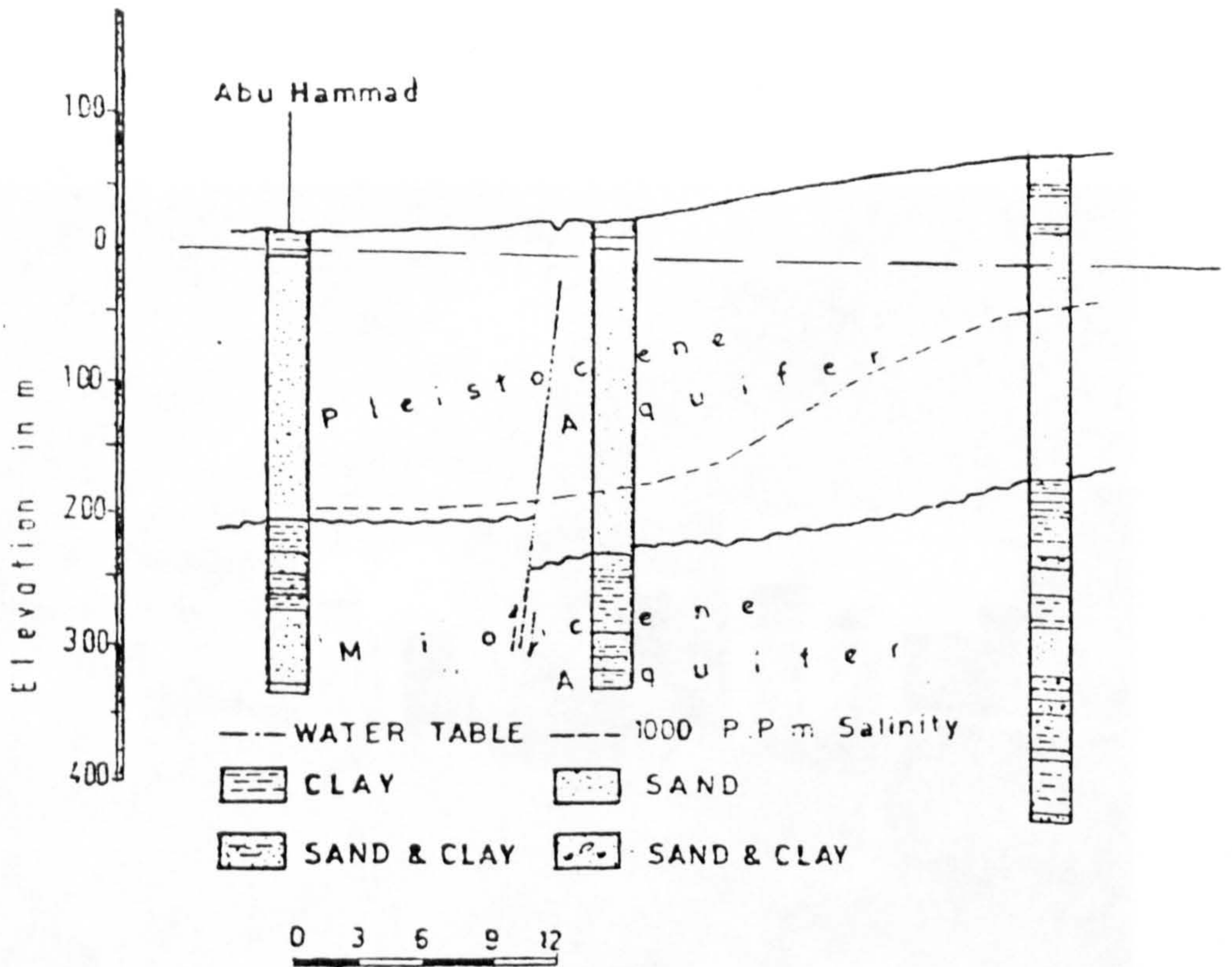


Fig. (5-17)
 SCHEMATIC HYDROLOGICAL CROSS SECTION NORTH TO RAMADAN
 Source: Ministry of Irrigation, Research Institute for Groundwater.

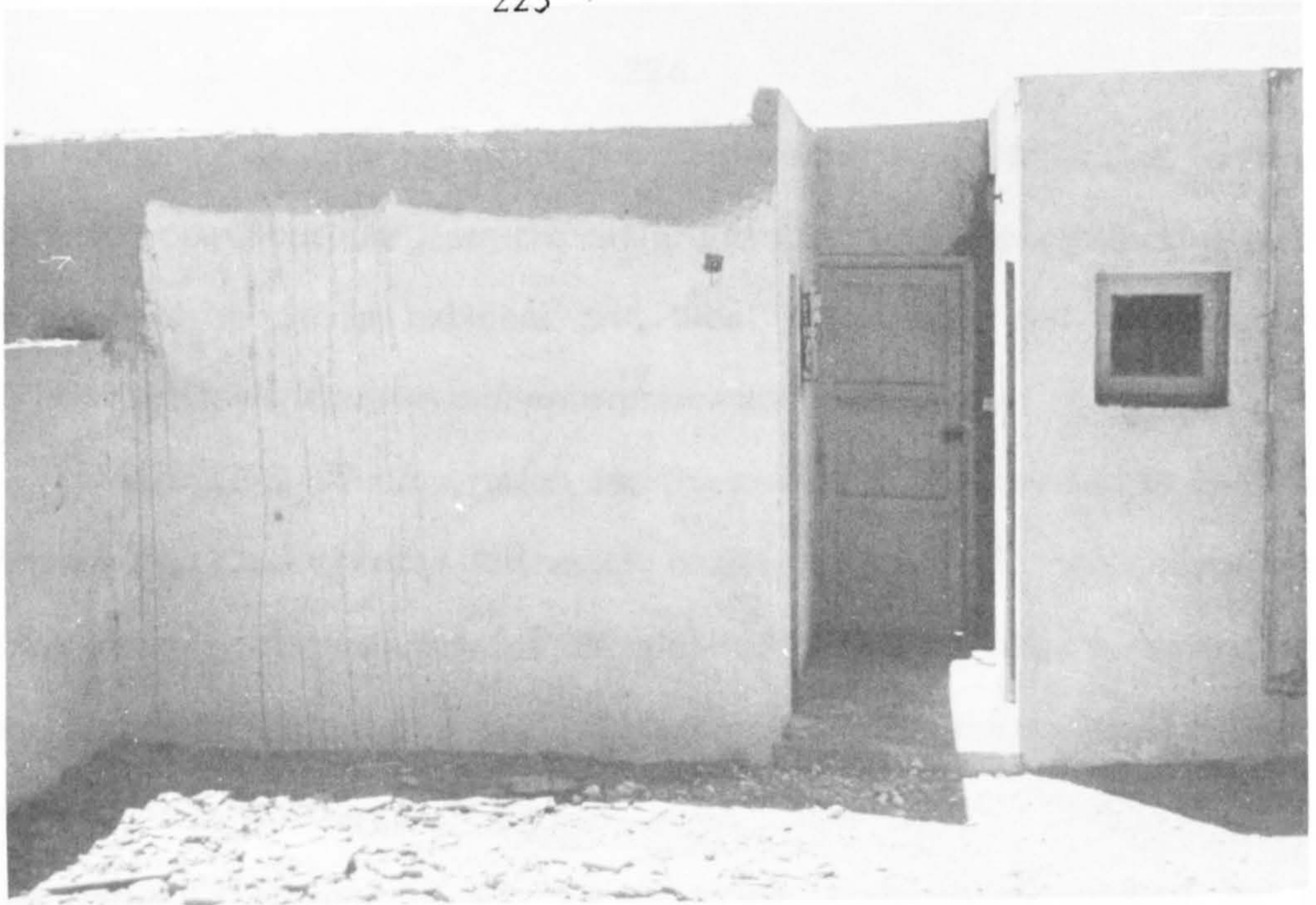


Fig. (5-21)
 A Core House in Tenth of Ramadan
 (Attia, June 1971)



Fig.(5-22)
 A Group of Core Houses in Tenth of Ramadan
 (Professor Dix , December , 1981)

The Authority is charged with the responsibility of initiating and co-ordinating contributions from the different other bodies participating in the development, such as national and local authorities and organisations, private industries, commercial enterprises and individuals.

The overall administration for the new city is entrusted to the New Communities Development Authority, closely connected to the government, represented by the Ministry of Development. This Authority defines the general objectives related to basic national policy taking availability of resources into account.

The Chairman of the Development Corporation helped by his Deputies including different specializations, initiating and co-ordinating all activities with the help of the Executive Management.

The management of a complex building of a virgin city needs to be relieved of routine work in favour of providing the broad issues of general policy, finance and execution.

The management in Tenth of Ramadan D.C. is divided into four sections:-

- A. The project Department which is concerned with preparing the plans of development.
- B. The Executive Department which supervises the execution of the different projects of development in the new city such as water and sewerage systems, electricity, building and so on.
- C. The Finance and Property Department Section which is concerned with monetary allocations, legislation, management, supplies, personnel and so on.
- D. The Development Department, responsible for the provision of maintenance of different services such as education, provision of supplies, health, social services and so on.

5.4 City Size and Population

As mentioned earlier in this Chapter, the basic objectives for the establishment of a city of half a million, Tenth of Ramadan, are both industrial and urban, and form part of the national strategy response to the continuous increase in urban population, (see Section 2.4.2), by massive urbanization based on industrialization(16).

The first stage of the new city, after 10 years, is planned to have a population of 150,000 people while the ultimate population, after twenty-five years, is planned to be 500,000 people with 150,000 job opportunities.

Table (5-4) illustrates the planned population size and labour requirements in the different stages of city development. It is noteworthy that the planned figures of 1982 were not realized at all, see Section (5.5.1) below.

TABLE (5-4)

POPULATION PROJECTIONS IN TENTH OF RAMADAN

Year	Year of development	Population	Active Persons	Construction	Industry	Services
		000S	000S %	000S %	000S %	000S %
1982	5	70	29 41	15 52	10 34	4 14
1987	10	150	53 35	17 32	21 40	15 28
1992	15	280	90 32	23 26	36 40	31 34
1997	20	410	123 30	20 16	49 40	54 44
2002	25	500	150 30	16.5 11	60 40	73.5 49

Source: Derived from Ministry of Development and Housing, Community Planning and Development Challenges (In Egypt), International New Towns Association Conference, Cairo, Oct. 1980, p.30 (with corrections).

Note: Percentage of active persons from population, and other percentages from active persons.

As mentioned in Section (5.2.1.2), the average density at community level has been set to 180 inhabitants per hectare. As the city does not have to bear high land costs the adoption of a low density does not involve excessive investment in land but opens the opportunity to use low-rise building and thus to keep construction costs low while road and infrastructure costs will increase. One to two storeys can be built in very simple construction and also partly by inhabitants themselves, as self-help houses or core houses, Figs. (5-21) and (5-22). Lower density at Community level could be applied to provide more open space and playing fields, provided that maintenance will be available to keep them tidy.

Size has its effect on the economic and social life of a new settlement which should contain industry and be self-contained, so as not to be dependent on the existing settlements which are already overloaded. A city of half a million is expected to be large enough to cater for nearly all the requirements of its population and, to the extent that specialized services cannot be supplied in the city, they are obtainable in Cairo within an hour's travel.

Further growth of the city, in the sub-region, should be foreseen and facilitated. Care should be taken to avoid unplanned and dispersed squatter settlements on the periphery, where they may occur as a result of lack of housing and the large and uncontrolled rural-urban migration of unemployed or under-employed workers to the new city. The majority of those migrants will be concerned primarily with securing productive employment. So, training and re-training centres should be available in the new city along with the provision of jobs, shelter and services for the inhabitants. The urbanization pattern in Egypt for the next two decades indicates that there is likely to be a large enough population potential for rapid growth of the city(17), although the new town programme in Egypt is still too small to solve the urban problem in the country since the started new towns, ^{may} absorb

less than two millions till the year 2000 while the expected population growth is about 21 millions. The supply of employment will attract a large number of predominantly unemployed and under-employed workers from Cairo and the rural areas. The first stage of the city is expected to provide 21,000 jobs in industry for some 1,000 establishments, the majority of which are small and fairly labour-intensive, besides a number of medium and large industries. This job calculation is based upon 150,000 inhabitants in the first stage considering financial, physical and social constraints.

The service sectors will also employ about 15,000 people including the agricultural sector. Being in its most vigorous stage of growth after 10 years, the new city will then employ at least 17,000 workers in building and construction sectors, Table (5-4). A high rate of growth will probably bring about a higher share of unskilled labour. This will have repercussions on the implementation, especially on the housing programme(18). The family size is expected to be relatively small, 3 persons for example, in the initial stage of development because most of the newcomers will be newly married couples. As the society settles down and the age composition becomes more balanced, family size is expected to increase to 4.5 persons in year 25(19). The economically active part of the population is, on average, estimated in the city plan at 1.35 persons per household. This will lead to an active part of about 30% of the total population in the stabilized situation in year 25(19). Industrial employment has been set to 40% of the active population. An average of three man-years per household for construction of dwellings, workplaces and infrastructure has been assumed, which in turn defines the employment in the construction sector. Employment in the service sector is estimated at about 50% of the active population in the stabilized city, but lower during the period of rapid growth, see Table (5-4). Investments in the service sector, especially in infrastructure, education, trade and finance, and other social overheads, should have a two-fold function of raising

productivity in the economy as a whole, and of generating income and employment and thereby enlarging the market. Skilled labour may become a scarce factor in production. A necessity in the creation of more jobs for unskilled labour will then be the education of supervisory personnel(20). In Egypt, the shortage of skilled labour is worsened by emigration to middle-east countries in order to earn the higher incomes available there, see Section (2.4.1). Given a rapid increase in demand for labour in Tenth of Ramadan including unskilled workers, and the continuation of large wage differentials between rural and urban areas, the increased probability of getting a job in the new city should lead to a strong in-migration. That may result in an unemployment problem if this in-migration takes place at a higher speed than job creation in the city. The city plan suggested an informal sub-sector in medium and small industries and services to be encouraged and given maximum support. This sector will be short of capital and hence will have to be labour-intensive, with low overheads, using local materials, transferring no profits abroad and re-using products. Facilities such as nominal land charges, capital loans and grants should be available to informal sector development.

The policy of Tenth of Ramadan should provide maximum job opportunities with satisfactory standards of living. Job opportunities have to be diversified to include skilled and the trainees of the unskilled.

To fulfil basic objectives, the new city plan suggested diversified industry: modern, intermediate and informal people, see Section (5.2.1.1). Building the town presumably will include simple jobs such as digging, paving, rubbish collection, cleaning, caretaking, which needs limited training, from these skilled labour could gradually be trained. Modern technology should be introduced in industrial development in the city. The latter must be based on domestic and nearby raw materials to avoid

transportation expenses as much as possible. At the same time, industrial development has to satisfy both regional and national requirements and export aims. Industries that could be moved from Cairo and help such aims should be given priority. The situation of the new city at the hub of a dynamic region, i.e., Cairo, Delta and the Suez Canal zones besides the reclamation projects, Fig. (5-23), makes it an appropriate location for industrial development related to the manufacture and servicing of equipment and provision of services for agricultural developments, distribution and communications which may unload some existing towns like Zagazig, Fig. (5-1). Market studies should be undertaken to show the fulfilment of the objectives of industrial, service and commercial investments in the city, and the infrastructure linking it to the surrounding region.

5.5 Investments and Achievements

Being established on a virgin desert site, the Tenth of Ramadan project needs large amounts of funds for both urban and industrial investments. On the assumption that the population will reach 150,000 in year 10, the first stage, and 500,000 in year 25, costs for different components per five-year period are shown in Fig. (5-24).

These financial requirements are based on 1975 price levels, and refer only to construction costs excluding operation and maintenance costs and subsidies.

The total investments of the new city on that basis are estimated at £.E. 1,035 million(21). Table (5-5) and Fig. (5-27) show the cost components and the scheduling of the investments.

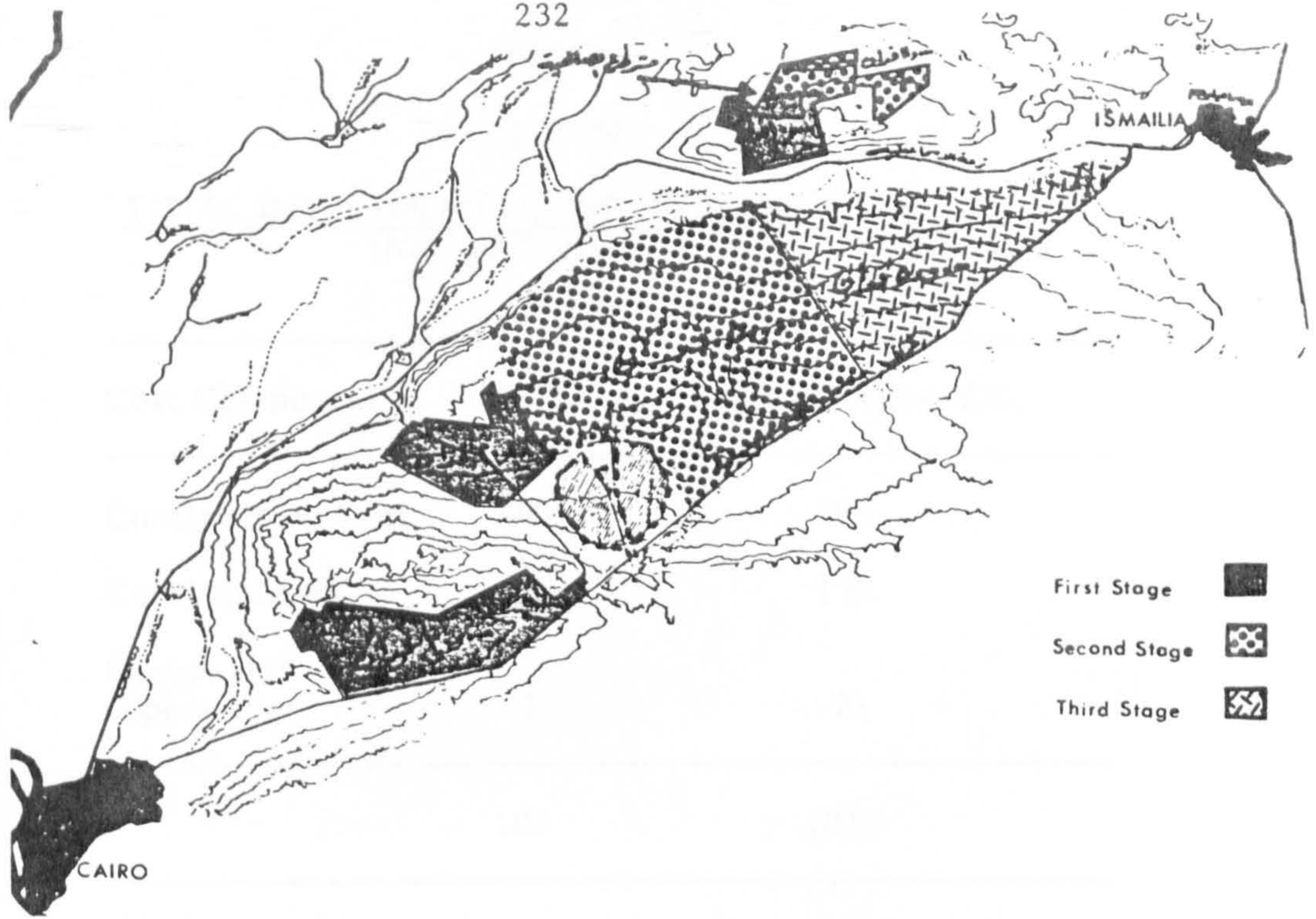


Fig. (5-23)

LAND RECLAMATION NEAR CAIRO ISMAILIA DESERT ROAD

(After Arab Contractors, Cairo, Jan. 1980)

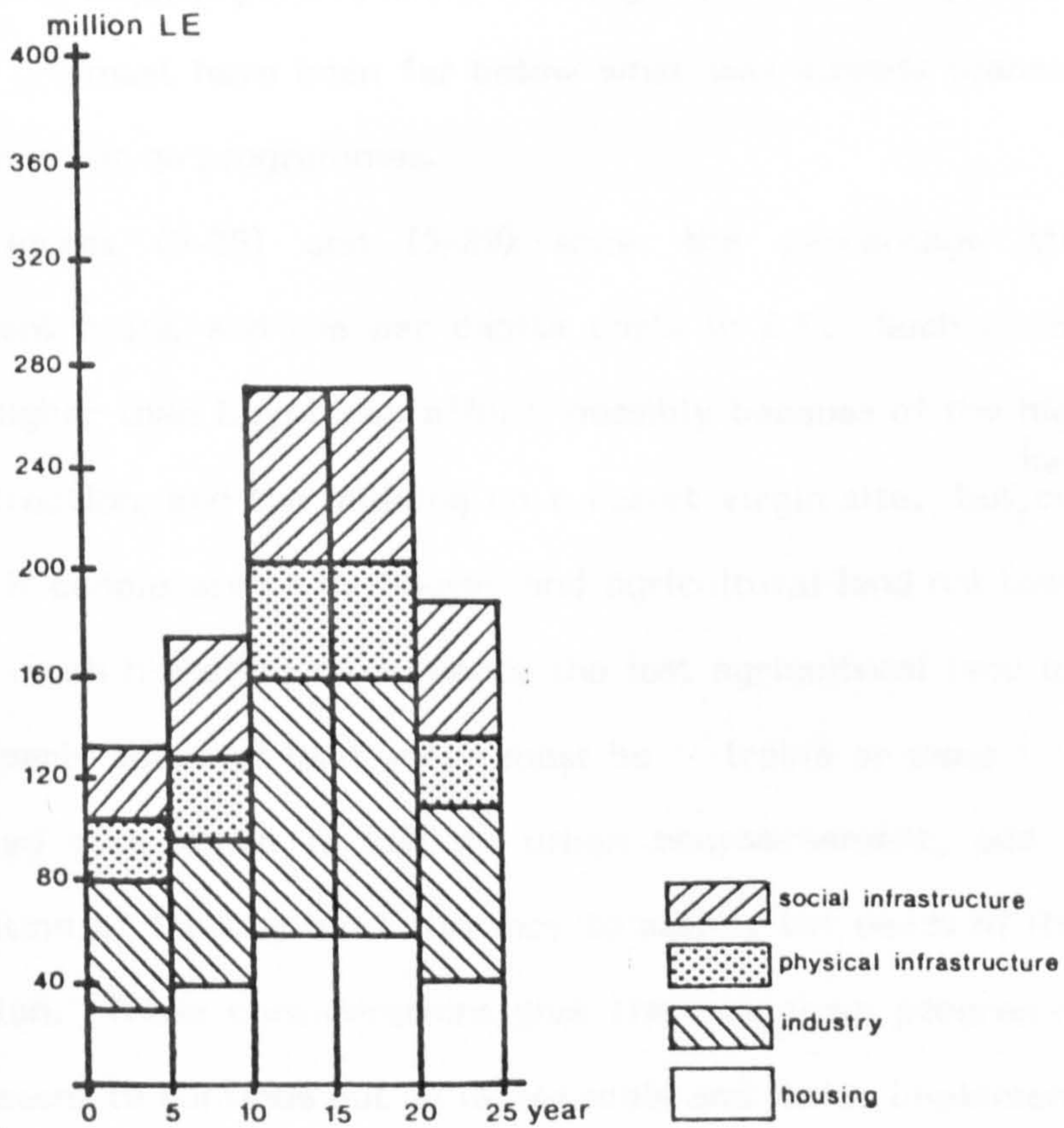


Fig. (5-24)

INVESTMENT BY COMPONENTS IN 10 RAMADAN
(1975 prices)

Source: Draft Master Plan Report, Jan. 1976, p.19.

TABLE (5-5)

TOTAL INVESTMENTS COSTS FOR THE CITY
(May 1975 prices)

Cost Component	%	Total in Million £.E.
Construction Cost	76	790
Contingencies	17	175
Design and Supervision	7	70
	100	1035

Source: Draft Master Plan Report, January 1979, p.21-4.

As will be mentioned in Section 5.5.1 below, the completed housing units till 1982 were less than 4000, while the actual settlers were only about 3200 people. The planned number was about 70000 people in that year, Table (5-4), requiring about 14000 housing units. These figures indicate that ~~the town~~ must have been far below what was already planned, and that the town is not on programmes.

Figures (5-28) and (5-29) show the percentage allocation of investment costs, and the per capita costs in £.E. Such investments are rather higher than Egypt can afford, possibly because of the high standards of construction, and the building on a desert virgin site, but ^{these} costs have to be faced if people are to be housed and agricultural land not used up. Costs may be much higher to compensate the lost agricultural land by reclaimed and properly serviced land which must be ~~three~~ treble or more ~~than~~ the already cultivated area which is lost by urban encroachment, add to that the importation of food by hard currency to satisfy the needs of the increasing population. These considerations give the new town programme in Egypt good reasons to continue but on larger scale and faster implementation.



FIG. (5-25)
EXTENSION OF ROADS IN TENTH OF RAMADAN
(Attia, June 1981)

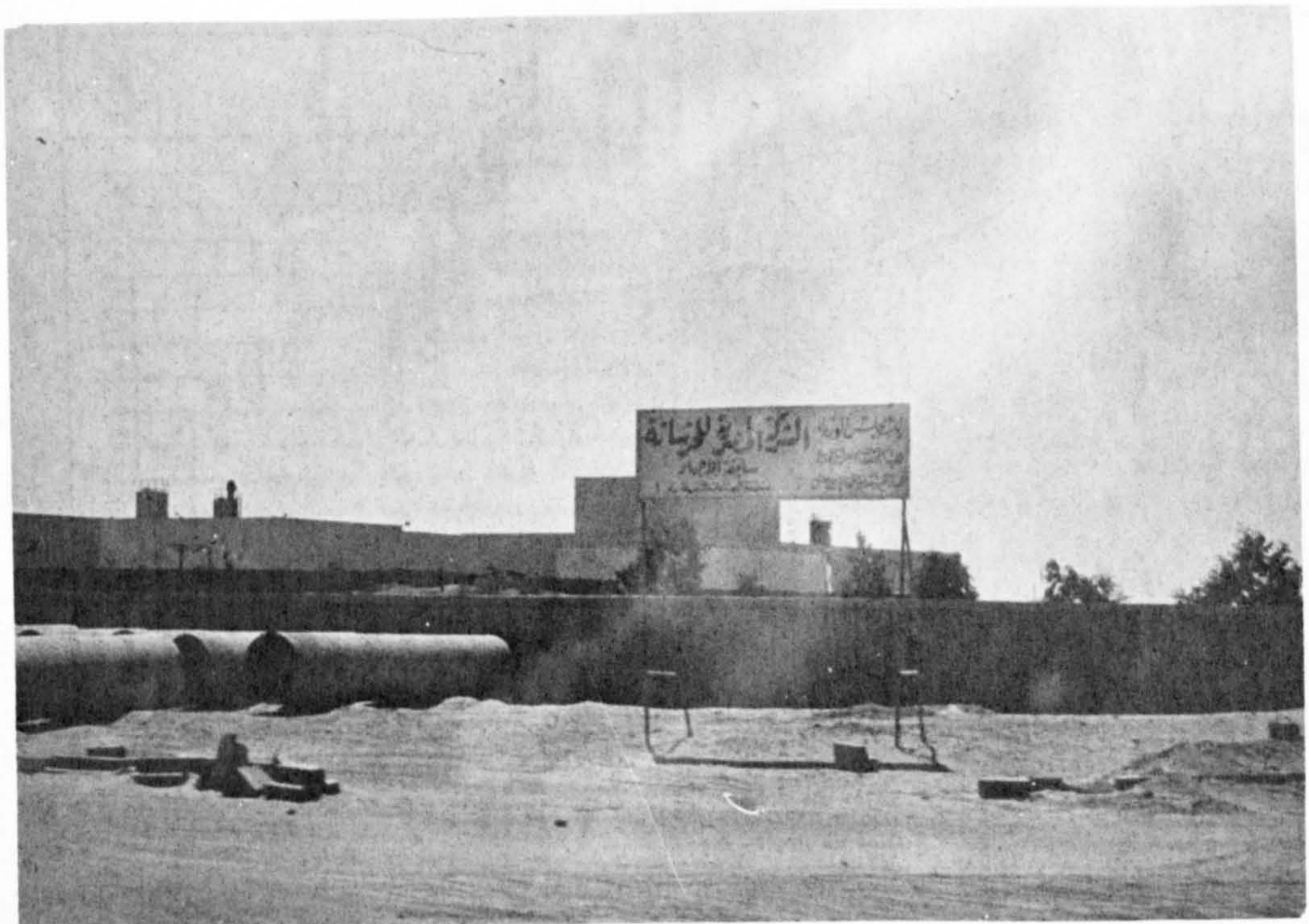


Fig. (5-26)
A FACTORY FOR CONCRETE PIPES IN THE
INDUSTRIAL ESTATE OF TENTH OF RAMADAN
(Attia, June 1981)

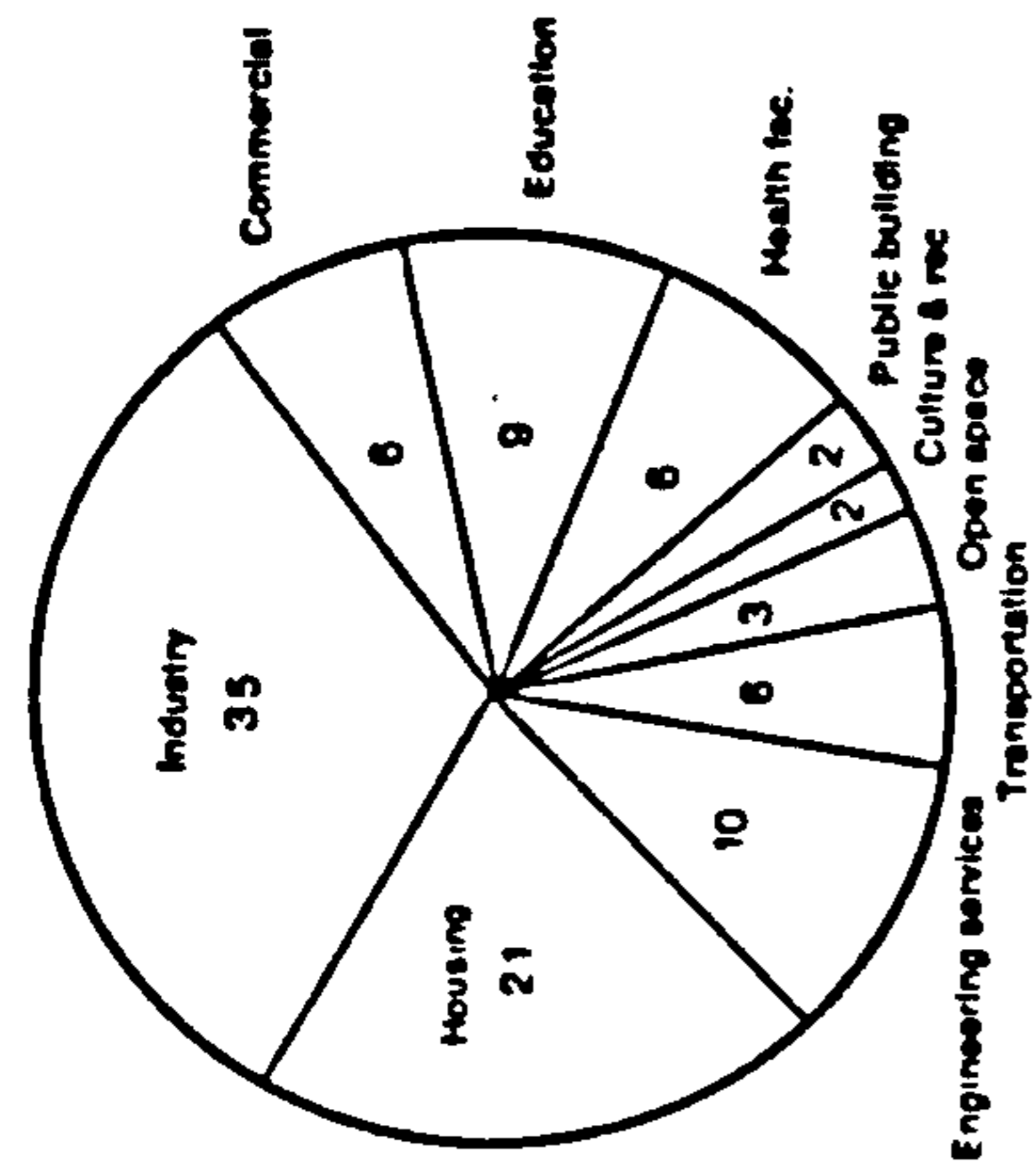


Fig. (5-28)

PERCENTAGE ALLOCATION OF INVESTMENT COSTS

Source: Draft Master Plan, Jan. 1976, p.21-4

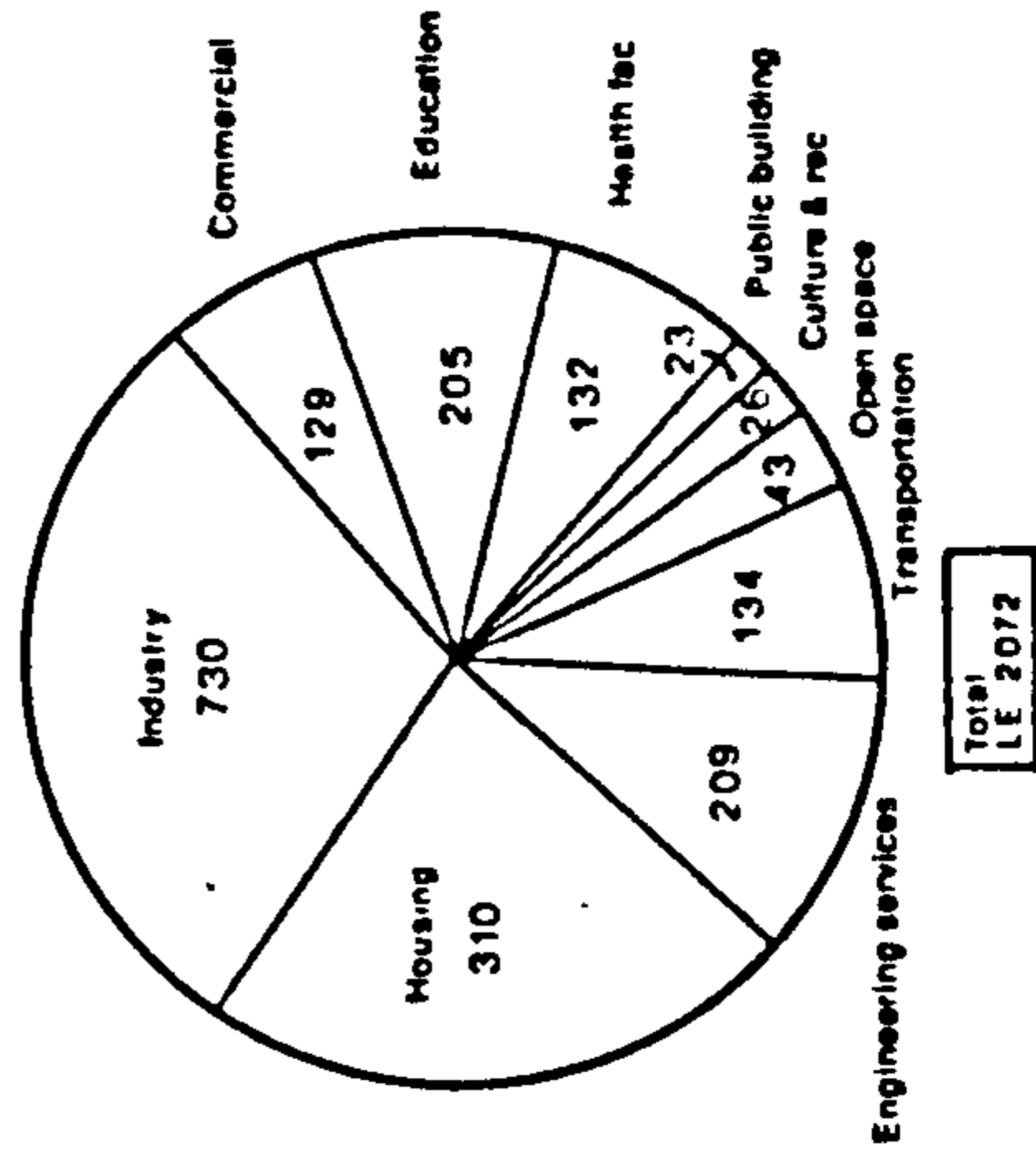


Fig. (5-29)

COST PER CAPITA IN LE

Source: Ibid.

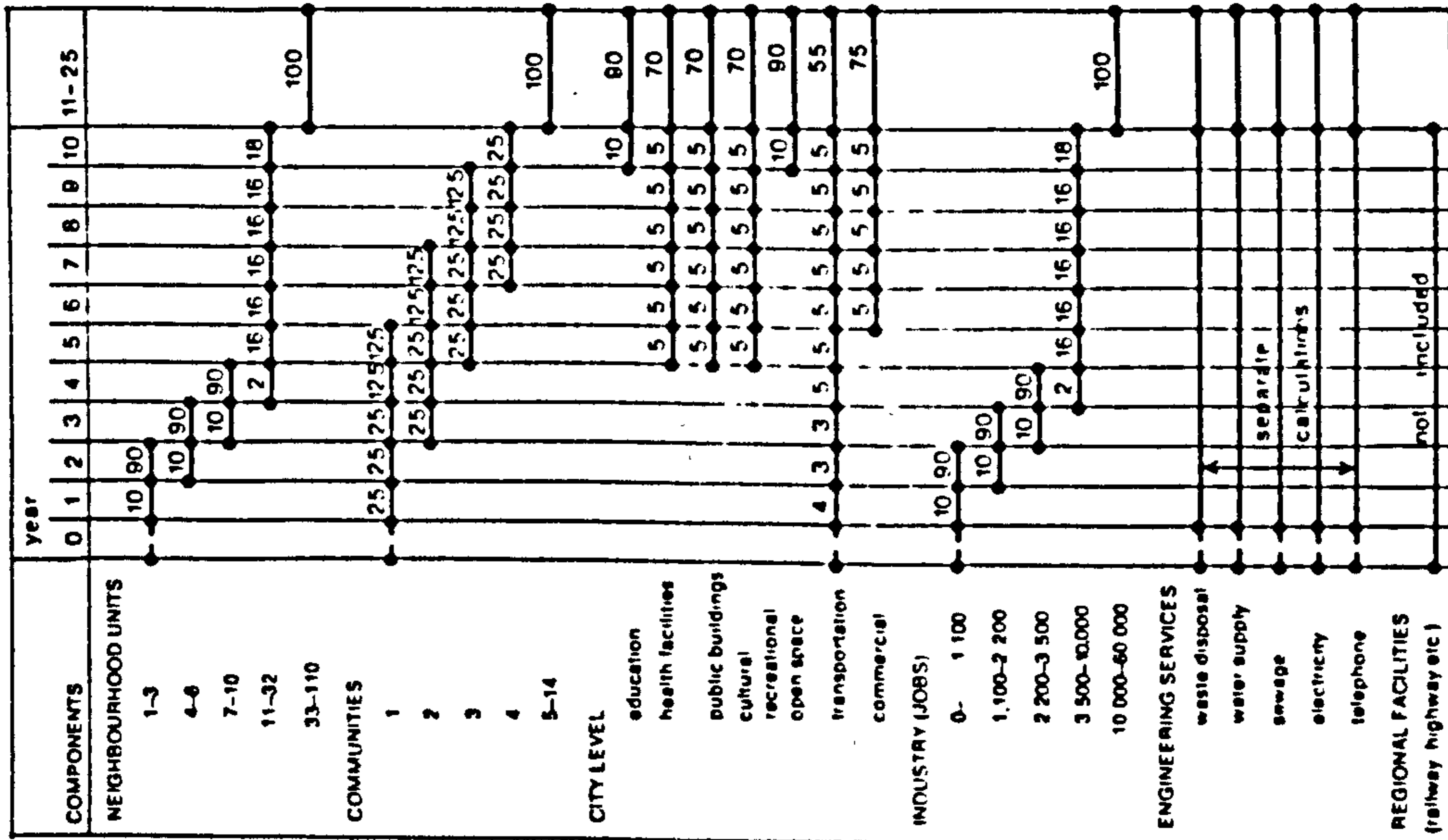


Fig. (5-27)

SCHEDULING OF CAPITAL INVESTMENTS

PERCENTAGES OF TOTAL COSTS FOR EACH COMPONENT

Source: Draft Master Plan, Jan. 1976, p.21-3

It can be observed that the housing component is only 21% of the total investment costs. The experience from the establishment of new towns in developed countries shows that housing ratio normally varies between 45-55% of the total investment costs(22). The relatively low percentage of housing cost in this calculation about Tenth of Ramadan is mainly due to the assumption of the limited number of houses compared to the target population, the relatively low cost of £.E. 50 per square metre floor area, and a number of self-build houses too, although in some housing cases the standard is too high, see Section (7.2.6) on the suggested housing policy.

Construction in the new city, mainly infrastructure, began in August, 1978. In June 1981, the settlers numbered about 3,000 and the commuters, workers and employees, were about 2,000(23). The annual investment for the development of the city (services and infrastructure) excluding housing, amounted to £.E. 30 million, while housing investment was £.E. 10 million annually, i.e., about one-third of the total and about 12% higher than the anticipated full development proportion. In June 1981, the first stage implementation of building was as follows:-

Public Building	890,000 sq.m.
Residential	6,850,000 sq.m.
Industrial	23,640,000 sq.m.
Commercial & Residential/ Commercial	<u>3,920,000 sq.m.</u>
	35,300,000 sq.m.

The total cost of infrastructure are estimated to reach £.E. 160,640,000 in the first stage, as follows:-

	£.E.
Water Works	32,550,000
Sewerage Systems	21,660,000
Electricity	76,050,000
Roads	30,435,000
	<u>160,640,000</u>

About 60% of these sums were spent in the first three years of construction. The relatively high proportion of expenditure in the first years is due to the fact that construction was taking place on a virgin site which needed full infrastructure, especially the roads and to transport every component from the neighbouring regions. The ring road of the first stage was completed in 1980, in addition to the pavement of the distribution roads of the neighbourhoods, the industrial estate, and the main entrances of the city.

Decentralization of services is applied in the new city. Service sectors are independent from the central government and all the service sectors like supplies, health, housing, labour force, education, and police are related and administered by the Development Corporation.

Besides the planned health units it has been decided by the Development Corporation that the present building will be changed to a general hospital, after moving the D.C. offices into the city, since the present location is 5 kilometres away from the city, Fig. (5-19). The social life is being provided for in a sports club and a youth centre, while some societies have been formed to render social services to specific groups.

The first all pedestrian shopping centre, Soukel Fath, was opened in 1979, including 20 shops, Fig. (5-10). Three other shopping centres were under construction. Telephone, post and telegraph offices are opened to link the new city with Cairo and other urban areas. The following Section is to evaluate the situation of the new city and the efficiency of the provided services till mid 1982.

5.5.1 The Situation till Mid 1982(24)

After five years of construction a review and analysis of the city development is essential to trace progress, failures and expected problems and to make proposals for further development. The main aim of Tenth

Ramadan is to be an industrial city. That is being achieved in a remarkable manner in spite of the development problems, as will be mentioned later. A total of 1,800 jobs was created in 25 working firms in addition to 2,400 service jobs. About 55 new factories were in the process of being established in mid 1982, while 11 industrial projects had reserved sites. This will add 10,000 more jobs, in addition to 20,000 ^{more} jobs, ^{which} are expected in the next 6-7 years. The mid 1982 jobs (1,800 in industry and 2,400 in services = 4,200 jobs) is less than the planned employment of about 29,000 jobs, Table (5-4), which may be related to delay of project implementation including housing and services.

City population was estimated in the master plan to reach 70,000 in 1982. The actual number of settlers in March 1982 was not more than 3,200, in addition to about 2700 commuters. The estimation might be too optimistic, but the number of settlers is far below what was expected. Field investigation(25) revealed the following probable causes:-

- i) It is difficult to buy a flat, or a piece of land in the new city. The building was behind schedule, while the land in the first stage was almost sold to people mostly not interested in building.
- ii) The private sector is not sufficiently encouraged because of lack of loans, building materials and construction labour.
- iii) Entertainment and social facilities are inadequate.
- iv) Services are still limited, especially schools and transportation.

Only 30% of those who work in industry in the new city live there. A high rate of daily commuting, of about 2,700 was recorded in mid 1982, two-thirds are from Belbeis and one-third is from Cairo. About 70% of service workers live in the city. Many unskilled workers live there as well, and they must be encouraged to settle there for training and contributing to the different sectors of the economy including construction and industry, in addition to simple works, as rubbish collection and digging, which do not require high skills.

Educated people represent a higher percentage of Tenth of Ramadan's inhabitants, not only than of Egyptian society as a whole, but also than the old industrial communities in Egypt. More than 41% of the male settlers have intermediate and higher education certificates, while illiteracy is far lower in the new city than in other communities because the migrants include many young educated people looking for better opportunities. Table (5-6) compares education levels in Tenth of Ramadan new city with those in some old industrial cities in Egypt, 1982.

TABLE (5-6)

COMPARISON OF EDUCATION STATUS IN TENTH OF RAMADAN AND
OTHER OLD INDUSTRIAL CITIES IN EGYPT, 1982

Education Status	Tenth of Ramadan	Shoubral Kheima(1)	Al Mahalla(2)
Illiterate	11.5	42.56	50.07
Read and Write	21.1	19.64	21.45
Elementary Education	28.4	25.81	23.14
Intermediate Education	19.7	1.66	4.66
Upper Intermediate Education	6.3	0.23	0.13
Higher Education	13.0	0.10	0.55

(1) North Cairo and a part of Greater Cairo.

(2) Middle West Delta, Fig. (5-1)

Source: The Ministry of Development, ^{Humanities,} March 1982, (Arabic) pp.12-13.

Out of the completed 3,600 housing units in 1981, 2,000 dwelling units for the middle and upper classes were empty. They are mostly reserved for the workers by the industrial companies, which have not yet started working to their full capacity. There were about 3,200 settlers, of whom 750 live on their own. Some of them are single people, but most are married and have

left their families to get jobs in the new city. Single persons occupy about 90 flats offered by the Development Corporation. Each 2-3 of them sharing a room, mostly free of charge. About 650 families live in Tenth of Ramadan with an average of 3.9 persons. About 20.32% of these families came from Sharkiya Governorate and 11.11% of them came from Cairo. Most of the families live in flats, 40% of these families being owner-occupiers, who have paid 10% of the construction cost in advance, and the rest being paid in installments over 30 years, with 3% interest, Table (5-7). About 40% of the owner-occupier units are empty, Fig. (5-30). About 50% of the families are tenants as their incomes are insufficient to buy flats. This may indicate that the proportion of low cost houses is too small and that of high cost houses is too high, or perhaps all the housing is too expensive for the needs of the intended inhabitants, which necessitates to find ways to provide cheaper houses. They pay 15% of their income for rent, and their tenancy terminates if they finish their work in the city. 30% of the completed 3,600 units were saved for people in certain employments, 50% were owned by the occupiers, and the remaining 20% were still under consideration. There are also about 40 tents scattered in the city for gardening workers and some construction workers which indicates the shortage of housing. It is noticed that the average cost of a housing unit in 1982 (£.E. 4,000-9,000= is higher than the payment ability of most of the settled families (£.E. 1,900-4,500) which means a big gap between the two sides. This probably would help to estimate the order of subsidy as follows in Table (5-7).

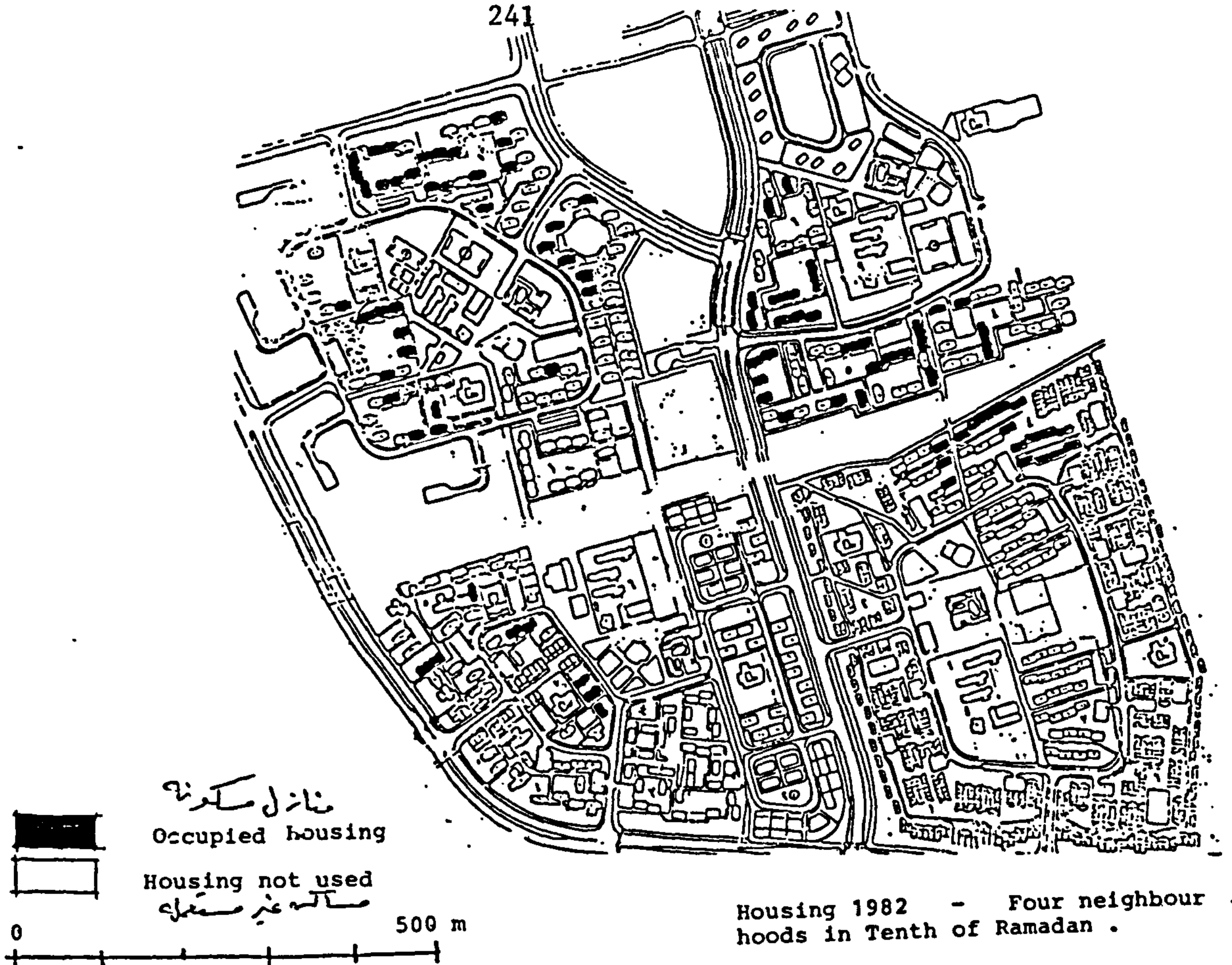


Fig. (5-30)
OCCUPIED & UNOCCUPIED HOUSING IN 10 RAMADAN

Source: Ministry of Development, 10 Ramadan, Dev. Plan, April 1982, (Arabic) p.1-36

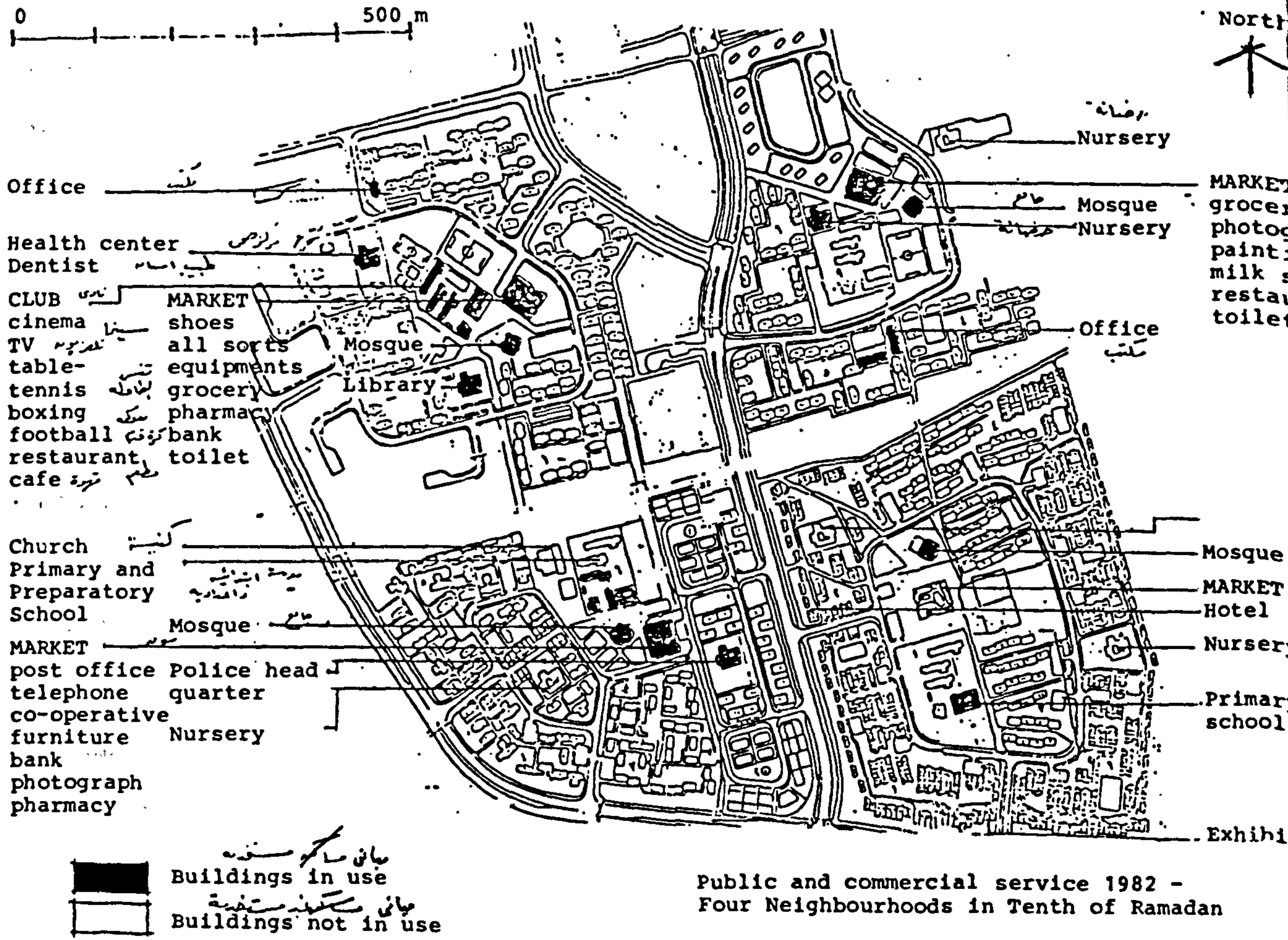


Fig. (5-31)
SOME SERVICES IN 10 RAMADAN

Source: Ibid, p.1-37

TABLE (5-7)

ESTIMATION OF THE REQUIRED SUBSIDY FOR THE RESIDENTIAL UNITS
IN 10 RAMADAN

Form of Payment	£.E. 4,000 Flat	£.E. 9,000 Flat
	£.E.	£.E.
10% in advance	400	900
Remainder	3600	8100
Total with 3% interest over 30 years	8738.15	19660.83
Monthly Instalment	24.27	54.61
Payment ability (1982 income)	$\frac{1900}{360} = 5.28$	$\frac{4500}{360} = 12.50$
Required subsidy per month	18.99	42.11

From this table, it is noticeable that a subsidy of about 75% of the monthly installment is required, which restrains the city budget, and reveals the need to reduce costs per housing unit.

Were the city to be free of further development bottlenecks, it is proposed that there should be 12,000 workers in 1985, and 22,000 in 1987.

If construction workers have sufficient facilities to settle down, development and thus population may considerably increase. But it is noticeable that the housing construction rate is far below the expected rate, or that necessary to keep up with industrial development, resulting in a high rate of commuting. There are no dwellings for construction workers, although the new city needs a considerable number of them for the present stage, especially the skilled and semi-skilled ones. They should be offered building land or core houses as part of the plan with the chance to upgrade or improve them later on their own as construction workers. This might

suggest more core or basic housing in Tenth of Ramadan and in the other new settlements in Egypt to meet the rental/ownership problem, and it might also help over numbers. Unless industry is established in the new settlements, it will either fail to be established or go to Cairo or Alexandria, in neither of which it is wanted. but this will be the case where housing for the working class are not provided.

Lack of dwellings for construction workers has created squatting problems in several new settlements all over the world. In 1962, Brazilia's population was 148,000 of whom 60,000 (41%) lived in uncontrolled settlements. In 1966, Ciudad Guayana, Venezuela, had population of 86,000, of whom 34,000 (40%) lived in squatters. Circumstances were much the same in Chandigarh, India, and Akosombo, Volta, Ghana. In each of these cases, big permanent squatter settlements, which were very difficult to either move or improve, were formed round and inside the new settlements, a trend which every effort should be made to avoid in the new settlements of Egypt.

It is proposed that there should be 35,000 jobs in industry alone in 10 Ramadan in 1990, that creates a need for a change in the housing plans for the next few years. Housing units completed in June 1982, plus the units expected to be completed on 31st December 1982, totalled:(26)

<u>Class</u>	<u>Units</u>
Core houses	500
Villas of two storey	425
Prefab units (Belbeis)	840
Prefab units (Arab Contractors)	264
Traditional Housing Units	<u>1,928</u>
Total	<u>3,957</u>

In the next five years, it is planned to construct 4,000 more units of different classes per year. But 20,000 more people per annum is insufficient for making up the backlog according to the Master Plan. It is obvious that these numbers are quite inadequate to meet the target for growth of the town over the total period, and are insufficient for industrial workers whose factories should take their responsibility to contribute to housing construction (27) as factories do in some other places, i.e., sugar-cane plantations or oil fields. Lack of housing for construction workers resulted in lack of the needed manpower which is estimated at 15,000 construction workers by year 5 in 1982, Table (5-4). Add to that the shortage of building materials and the provision of high standards in relation to resources. Industrial construction capacity in the next four years will have to be 8 times that of 1978-82 to fulfil industrial needs.

The total employment of all kinds except construction but including industry, services, administration etc., is planned to be 35,000 in 1987 in addition to construction workers resulting a total of about 150,000 inhabitants, ie 30000 dwellings. Accordingly, the annual increase in housing units in 1982-1987 should be about 5,200 which is nearly 13 times the 1982 rate. That needs concentrated effort of management and monitoring to provide and train construction workers, for this should have been foreseen, and to encourage co-operatives and individuals to build their houses by making loans and technical help available.

The industrial success of the city is remarkable especially in the private sector. By February 1979, the reserved industrial area was about 6 million square metres. In 1982 there were 25 industrial projects in production, and 50 others are under construction, while 120 projects have been allocated the land but have not yet started construction. The present working firms employ between 20 and 500 workers each. The present 175 industrial projects are expected to provide 20,000 jobs in 1987, increasing to 60,000 in 1992, see note (26). But the rapid development may result in some

failures, especially in housing and water supply. That may lead to a bad effect on the trust of future investors in the new city. So, industrial strategy needs careful monitoring and action to avoid any set-backs. Construction products were the first industrial outcome, but gradually, other industries became operational. On the completion of the first stage in 1987, it is expected that there will be factories to produce machines, metals, weaving, food, consumer goods, medicines, and industrial services and maintenance, a variety showing good expectations for industrial development in Tenth of Ramadan(28). £.E. 50 million have been invested in industry in both public and private sectors in completed projects and those under construction by 1982. The 120 projects which obtained land are expected to invest more than £.E. 300 m in the next 5 or 6 years from both national and international investments. An assembly factory for 'Mazda' cars is expected to involve an investment of about £.E. 30 million, while a steel factory will represent about £.E. 25 million. The importance of housing for the industrial workers is demonstrated by the fact that some were attracted from one firm to another which obtained flats for its workers. On the other hand, industrial services such as repairs and maintenance are still not available in the city, besides which transportation is inadequate as are the retail trades and medical care, which are very important in the early stages of development.

These last aspects concerning lack of housing especially for construction workers, lack of industrial services and transportation and projects that have not yet started, should be closely examined and sorted out. They indicate the need for monitoring requirements and action to solve problems within available resources. Early in 1982 an investigation(29) was made about the actual needs of the new settlers. It was found that they need bakeries, internal public transport, more shops of different kinds, secondary schools, health centres, a general hospital, leisure facilities and a

public library. This means that some basic services were not available till the fifth year of construction, which added to the causes of less numbers of settlers.

In 1982, the daily water consumption was 7,000-8,000 cubic metres and two reservoirs, each of 5,000 cubic metres, were constructed. All the working industrial areas were provided with water. Because water consumption is critical, a proposal to establish a paper factory was refused because of its high rate of water consumption. If the planned industrial projects are to be achieved, and the number of inhabitants reached, at the lowest estimation, 20,000 in 1984, the groundwater capacity will be insufficient to meet the needs of further development. The 1,500 m.m. pipe line from the Ismailia Canal is expected to be completed in 1984-1986. Any delay in its completion will cause severe problems for the city development.

Electricity is obtained from Belbeis, while some projects have their own generators for emergency use. Water and electricity failed to reach neighbourhood No. 14 when it was already half completed, yet these services were available in some parts of the new city which will not be habitable for the next several years(30). This and other similar examples show lack of adequate management and monitoring in 10 Ramadan, and the essential need for project co-ordination, a trend which should be carefully avoided in the new town programme.

Transportation is still dependent on individual means. The proposed railway line, Fig. (5-7), might be useful to industries in the city but in the meantime, buses are working between the new city, Cairo and Belbeis, and they are not sufficient to meet the needs of the large numbers of commuters who work in industry till accommodation and services will be adequately provided in the new city.

From a traffic field survey at the entrances of the new city, the following data was obtained about the daily commuters:

TABLE (5-8)

PERCENTAGE OF COMMUTERS TO THE CITY
BY ORIGIN AND EMPLOYMENT

Place of Origin	D.C. Employees	Industry & Construction Workers	Others
Cairo	22%	36%	32%
Belbeis & Zagazig	51%	62%	58%
Ismailia	27%	02%	10%

Source: SWECO, The Development Plan, April 1982 (Arabic) p.5-6.

Telecommunications are still insufficient and this hinders business development, especially in relation to foreign investment. Business headquarters are reluctant to move to the new city. In 1982 there were only 4 telephone lines, one of which was working via Ismailia, while the only telex line was out of use. Some industries have installed their own radio links to contact their offices in Cairo. No telephone cables were installed till 1982 in the city, but a central building for 20,000 telephone lines and a microwave set were being established(31). Connecting the city with the national and international telecommunication networks is very important both for domestic and foreign industrial development. No business with international connections will move now without telex access, and telephone availability should be taken as granted.

One kilometre of 12m wide road costs about L.E. 150,000. Unused roads represent a lavish waste of money. About 50 km of double road was established in the new city. If such roads were constructed as single roads as it was planned in 1977, until it becomes essential to construct double roads, it would be possible to construct, instead, for example 18 primary schools of 4,200 sq.m. each. The per capita planned road space is

considerably bigger in Tenth of Ramadan, 30 sq.m., than that in 6th October new city, 22 sq.m., and in Sadat new city, 12 sq.m. Another example, in 1982 there were 8 nursery schools, out of which one only was used as a nursery, while the others were used as a police station, health centre, library and so on. Much the same is the case of schools(31a).

Besides the basic services such as the provision of a shelter, roads and water, migrants to the new city must be catered for in social terms. They mostly look at the city as a place to improve their income and to have better conditions of housing and services than those which they left behind in Cairo or in the Delta. It is recommended(32) to establish the following institutions in the new city to realize more development:

1. A hostel for the newcomers to have a temporary residence as soon as they arrive in the city, and a reception office to guide them on how to rent a flat or get a piece of land to build on.
2. Savings Bank to help the settlers to keep their savings wisely and to provide essential loans to buy flats or building land.
3. Co-operatives to advise and help in building or obtaining building land.
4. Stores for building materials to make construction needs available in the proper time.

Unfortunately, the lessons of the past, supported by data that has been collected and, hence progress reports, are ignored. One of the lessons from the British new towns is the great care about data collection and inter exchange between the different new towns. Future development should be based on such data which should be issued monthly to show progress and failure in the city development. This emphasises the importance of management and monitoring (see Section 5-3 above). All data business can be done in practice by efficient staff using simple computer programmes related to basic data. Micro-computers are becoming much cheaper, less

than £100 each , and could be used for many management and monitoring processes.

5.6 Contributions to Promote the New City

Tenth of Ramadan represents the first project of a new community development in Egypt. Every effort should be exerted to make it a successful experiment for the creation of a self-contained community on desert lands. Besides the industrial and institutional projects included in the city plan, additional projects may be useful for the future progress of the city. To get the best value from this experiment, it is necessary to monitor closely all developments to see how they match the plans and how to meet the changing requirements. Investigation has to be made to discover as much as possible about people and life in the new city as a new community planned for better life. Following are some recommendations to contribute to the promotion of the new city.

5.6.1 Desert Reclamation and Satellite Villages

The scarcity of agricultural land in Egypt requires the reclamation of the possible desert areas in the country if the increasing population is to be housed properly as well as being properly fed. Tenth of Ramadan new city with its expected services, industries and facilities can help to expand agricultural development into the surrounding desert areas. Thus policy should be followed in the case of any other new town to be established in Egypt, which already suffers from shortage of food, (see Note 36 of Chapter Six), and possibly to export some agricultural production to earn foreign currency essential for development projects. Land reclamation can bring many advantages for a new city:-

1. It can help to meet the local needs of food, including cereals, vegetables, dairy products and fruit, minimal costs for transport and storage especially when the new city becomes mature.

2. It may provide the raw materials for agro-industrial production in the new city such as canning, preserving and packing, spinning and weaving, to create more jobs.
3. It helps to stabilize desert soil round the city and diminishes the effect of sandstorms, besides improving the climatic conditions in the city(33). Afforestation and growing trees which resist dryness can also help in this connection, especially the provision of shadow in the desert, besides the provision of timber, which Egypt lacks and badly needs for furniture, construction and other industries.

Some reclamation projects have been launched between the Cairo-Ismailia desert road and the Ismailia Irrigation Canal, Fig. (5-23). Planting in this area depends on ground water or on the Ismailia Canal. Such reclamation projects can form a base for satellite villages round the new city(34). The agricultural labour force is available from the Delta region or from upper Egypt, while services will be in hand from the new city. Satellite villages, established on a modern basis, will provide good examples for the essential rural reform in the country, and for new farming communities to be established on other desert sites, to expand further the agricultural and inhabited area in Egypt.

5.6.2 Regional Links with the New City

Roads connecting the new city with the rest of the country should be considered in the development programme for the city itself. Access roads are required to facilitate the growth of and traffic to export-import oriented Canal Zone cities with their free zones, and to the steel industries of the Helwan Complex south Cairo. A southward road of about 40 km connects the new city with the Cairo-Suez desert road. Further extension of this road can connect it with the Maadi-Kattamiya desert road on which Al Amal new town is to be established. The north-west road to Belbeis and

hence to Zagazig requires widening to allow increased traffic between the new city and the Delta region. A future eastward road of about 70 km between the new city and Fayed near the Bitter Lakes of the Suez Canal, would give a good access to the beaches and summer resorts of those lakes for the new city residents, Fig. (5-1).

Railway links between the new city and the Cairo-Suez railway in the south, and to Belbeis in the north-west are of great importance to connect the new city with the national railway system. But such good ties must not affect the idea of the independent town via the provision of sufficient services and facilities in the new town.

5.6.3 Airport

In some circumstances airports can help considerably in a new town's development. Tenth of Ramadan can make use of Cairo International Airport, some 35 km to the south-west. But this airport is not expected to keep up with the increasing number of passengers for a long period. The establishment of an alternative airport has to be thought about as a long term planning. Tenth of Ramadan can have business aims besides its industrial/urban base. A domestic air terminal with the possibility to expand to an international one, might release the pressure on Cairo Airport or be used as an alternative in emergency cases. Ramadan airport can become the second Cairo International airport with easy road links with Cairo, Delta and the Suez Canal.

5.6.4 Research Centres

As a country whose total area comprises of 94% desert land, Egypt can promote a desert research centre for land reclamation and solar, wind and biogas energy. In Mataria district, north-east Cairo, there is the Institute for Desert Science. Also the Institute for Groundwater Research

represents a part of the Ministry of Agriculture and Irrigation in Cairo. The Solar Energy Institute sponsored by the American University in Cairo is established in Sadat New City. Being established in a desert area, Tenth of Ramadan can accommodate a desert centre to carry out researches and applied experiments concerned with desert development should a further centre be required to include applied techniques and field studies rather than small scale experiments. The suggested centre can give useful examples on how to overcome desert difficulties, and to exploit the available resources to create successful new communities in the desert areas. Training to realize such purposes can represent another aim of the centre to prepare qualified generations of able people to develop desert areas in Egypt and outside it in African and Middle-East countries which have desertification problems. The United Nations(35) show a growing interest in such problems, and could be approached to help to establish desert research centre on the site where qualified people are available.

The site of the new city is not far from several universities in Cairo and other regions and this means that the high medical skills are readily available for a medical treatment centre away from the congestion and dampness of the Nile Valley. The dry and quiet atmosphere in the desert area is suitable for the establishment of a medical research centre to cure certain diseases, like skin psoriasis or obesity (overweight) which needs long term treatment, in an airy, sunny and dry climate, besides natural and recreational treatment. Such a centre can be attractive for local and foreign cases especially from the Arab World. Successful treatment centres are known in the British countryside.

The above mentioned are two examples of the types of research centres that could be established in a new city to give it more functions and to make use of its available space and services. In Milton Keynes (see Appendix '3'), the Urban Studies Centre ^{and the Open University} are good example of what can be

done for urban research amidst a practical experiment. A similar centre in 10 Ramadan could benefit the new city and the other new settlements in Egypt as well.

5.7 Conclusion

Tenth of Ramadan new industrial city represents the first attempt to establish a self-contained community in the desert of Egypt outside the Nile Valley. In addition to being an industrial-urban project, the new city design has introduced a number of modern planning ideas in Egypt, and greater concern than previously with the agreeable siting of industrial and residential estates which are well connected by sufficient road networks throughout the whole city.

The Development Corporation should have more power to draw the best out of the plans and apply them properly. A master plan for management is, perhaps, more critical than the master plan for development. Efficient town planners should be employed for proper evaluation of success and failure of the city plan and to suggest improvements in both methodology and proposals. They also have to do project co-ordination in the light of experience to meet the changing conditions and to advise the decision-makers.

The location of the new city between populated regions will only enable it to attract a full measure of commercial activities and investments if adequate services are available, while it will be easy to market its products. The plan of the city centre should be reviewed to ascertain whether it can maintain all the activities proposed in the master plan without excessive increase in land values and traffic circulation as a result of concentrated activities. In this respect the development of sub-centres could help the main centre.

Although industrial development is rather successful, some basic

needs have so far been inadequately met which resulted in a smaller number of settlers and a larger number of commuters than had been anticipated.

The housing production rate is much too low for the pioneering new town in Egypt, while co-ordination is still needed concerning water and other supplies. Self-help and core houses, the availability of land and building materials, training more construction workers and accommodating them in the new city are some factors that might increase housing output. The relatively high building level has raised the final costs compared with payment ability of most of the people, which discourages the owner-occupation and increases the burden of subsidies. Only if housing is provided at a rate, and of a type to meet demand (and rent paying ability) will it be possible to prevent squatting in the new city resulting from housing shortage. Education institutions and training centres, should be generously provided to supply skills and to form catalysts of development.

Roads, railway and telecommunication links between the new city and other regions should be strengthened, particularly with the Helwan industrial complex south-west of the new city.

Water supply, including that from the Ismailia irrigation canal, has a vitally important role to play in the city's industrial progress in addition to facilitating the agricultural expansion suggested in this study. Cultivation round the city and the generous provision of green spaces, will give the city a new taste of life. Water recycling, the use of sewage effluent and dripping irrigation will help to make better use of water.

Experience gained from Tenth of Ramadan can considerably help in planning for further new communities in Egypt. Records of success and failure and some of the Development Corporation experts, can help to apply learned lessons in the newer communities. To attract the new settlers, one needs skills able to create an attractive environment for work and living, a job essentially for those with experience.

CHAPTER SIXPotential Development Regions in Egypt**6.1 Introduction**

After the review of Egypt's circumstances, the British experience in establishing new towns, the Greater Cairo Region typifying the urban problems in Egypt, and the Tenth of Ramadan new industrial city, the first attempt to realize a self-contained new community in Egypt; questions have to be answered about the development potential of the various regions in the country able to support the establishment of new settlements. Are there any potentially developable regions in Egypt outside the present inhabited area which occupies little beyond the Nile Valley and its Delta? If regions with sufficient resources exist in the desert area, they must be examined so that we know where new settlements may best be situated on a solid basis of development, to relieve some overconcentration from the existing inhabited area. Only then can one think about appropriate guidelines for the establishment of new settlements in Egypt. That will be the concern of the next Chapter.

As mentioned at the beginning of this study (Section 1.1), the best way for Egypt to overcome development problems is to disperse the different activities and population outside the Nile Valley, and therefore on the desert land, for there is no other way we can develop the production capacity of the economy other than by diversifying and increasing the available resources of the newly opened-up areas and by preserving the existing agricultural land.

The urban fabric must be much more organized and monitored in order to reduce transport requirements of goods and people when fair distribution between production and consumption is realized. Living

conditions should be improved by deconcentration of population and by the provision of better housing, with more open and green areas for recreation facilities. In well-organized new communities, access to public services and utilities will be easier, while the supply of building land for low and medium income households will be possible. The people from older neighbourhoods, squatters and slum areas should be rehabilitated in the new settlements close to better housing, services and job opportunities as was the case with the British new towns. Air pollution will decrease when less density of activities *and* more open areas are provided. Water resources will have to be protected against domestic and industrial wastes by the provision of adequate sewerage and recycling systems.

The aim of this Chapter is to discuss possible locations which have the potential appropriate for the establishment of new settlements in Egypt. Since new communities will mainly be on desert areas, stress is being made on two large desert regions in Egypt, the North West Coast Region and Assyut and South Egypt Region. An additional example of an expandable region which is already developed to an extent is the Suez Canal Region with its natural continuation into Sinai Peninsula. One of the three tunnels under the Suez Canal was opened in June 1982, so this region, which mainly extends on desert land as well, is also discussed in some detail in this Chapter. One has to examine and assess some of the resources of the regions including ground and surface water, agricultural and industrial potential, mining and fishing. Other regions are briefly noted avoiding the repetition of analysis of their potentialities, already mentioned in different places of this study.

The examination of such resources is necessary to determine how far it may be possible to develop the areas outside the Nile Valley and to establish the required new settlements within the limits of the available

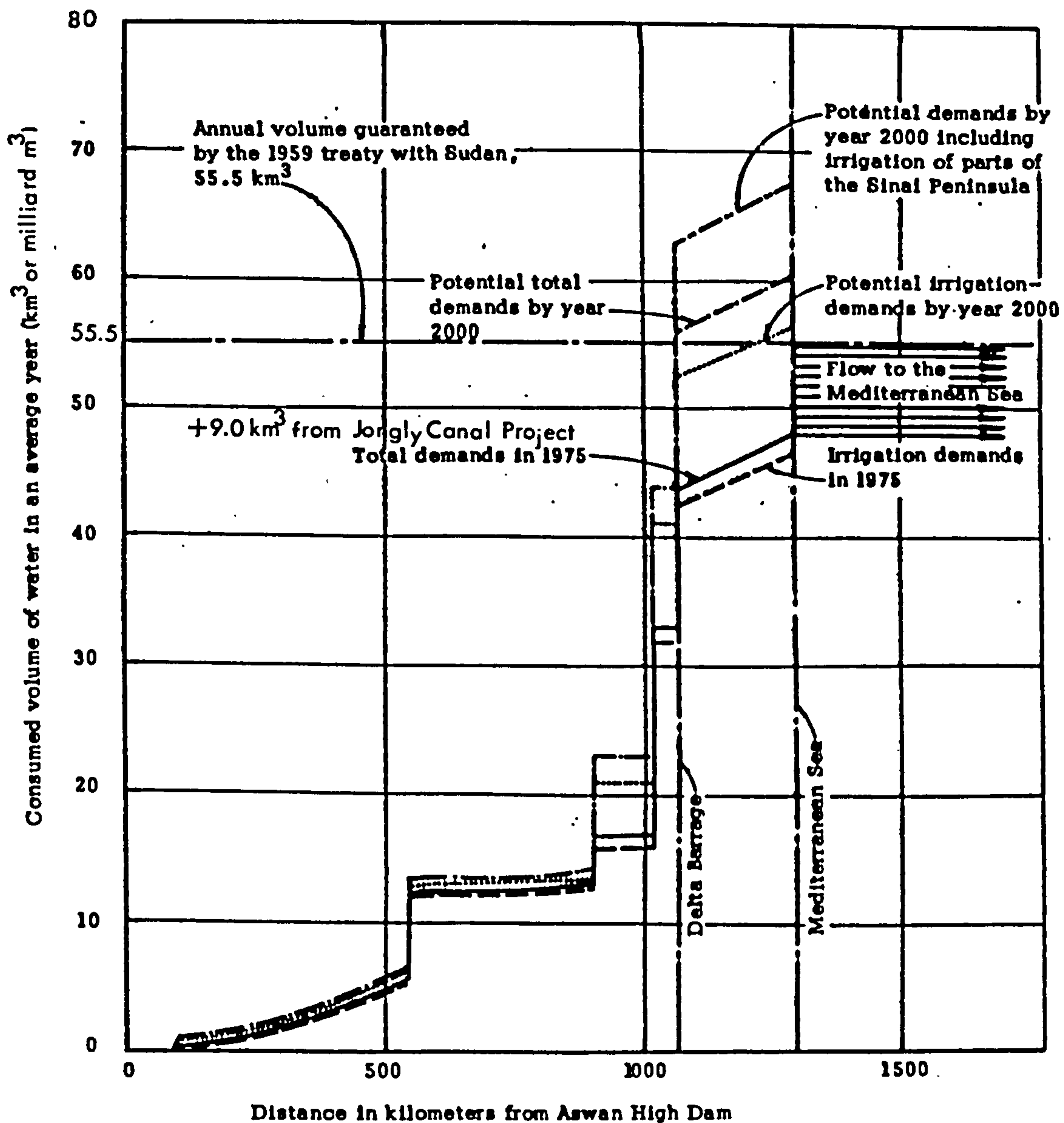


FIGURE (6-1)

PRESENT AND POTENTIAL DEMAND FOR NILE RIVER WATER

Present and future irrigation demands are based on areas delineated on map of Horizontal Agricultural Expansion, furnished by the Ministry of Agriculture and Sudan Affairs. Total demands include irrigation and domestic - industrial demands computed on basis of population growth.

Source: Ministry of Housing and Reconstruction, Status Report No.1, Regional Plan, Suez Canal Zone, June 1975, after p.15. (with additions).

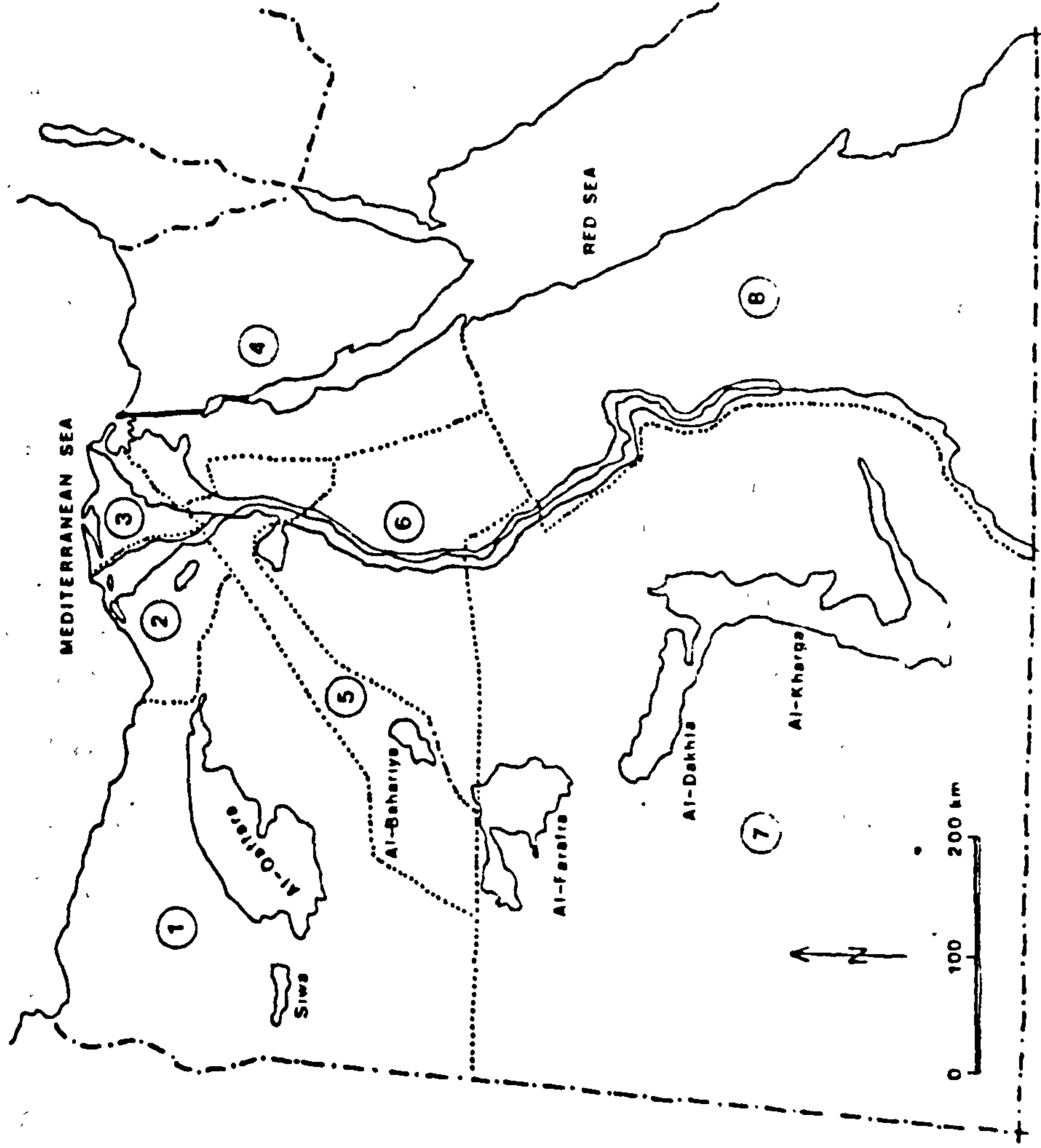
water resources, especially those of the Nile at present and in the future, see Fig. (6-1). Presumably the function and size of each settlement will greatly depend on the potential associated with its location, and that needs services to be properly sorted out in a self contained community in a manner similar to those realized by the British experience where generous provision of open and green areas are provided, while low residential density prevails. Because of the necessary agricultural expansion, the area round each new agricultural settlement could be determined, at least, by one feddan of reclaimed land per inhabitant of the target population including those with non-agricultural jobs. For the major industrial or urban centres, one half of a feddan could be provided per inhabitant to satisfy the needs of food in these new areas, in addition to the provision of agricultural raw materials for food industries. In the case of 10 Ramadan this would therefore involve 250000 feddans.

6.2 Potential Regions

After forecasts made by various institutions, including CAPMAS, United Nations organisations like Cairo Demographic Centre, in addition to the National Urban Policy Study (NUPS), a population of 67.5 millions has finally been forecast in Egypt for the year 2000. This increase of population growth can be accommodated by opening-up new areas with adequate resources for economic development, since the present inhabited area is overconcentrated and services including housing are scarce.

As mentioned in Section 4.3., Egypt was divided into eight major planning regions in 1975, Fig. (6-2). This was for economic development purposes. In 1978, the Ministry of Planning made another division of planning regions on which the estimations of absorption capacity of population were based.

Outside these developable regions are the areas which would be better left undeveloped till the need for them arises, or until encouraging

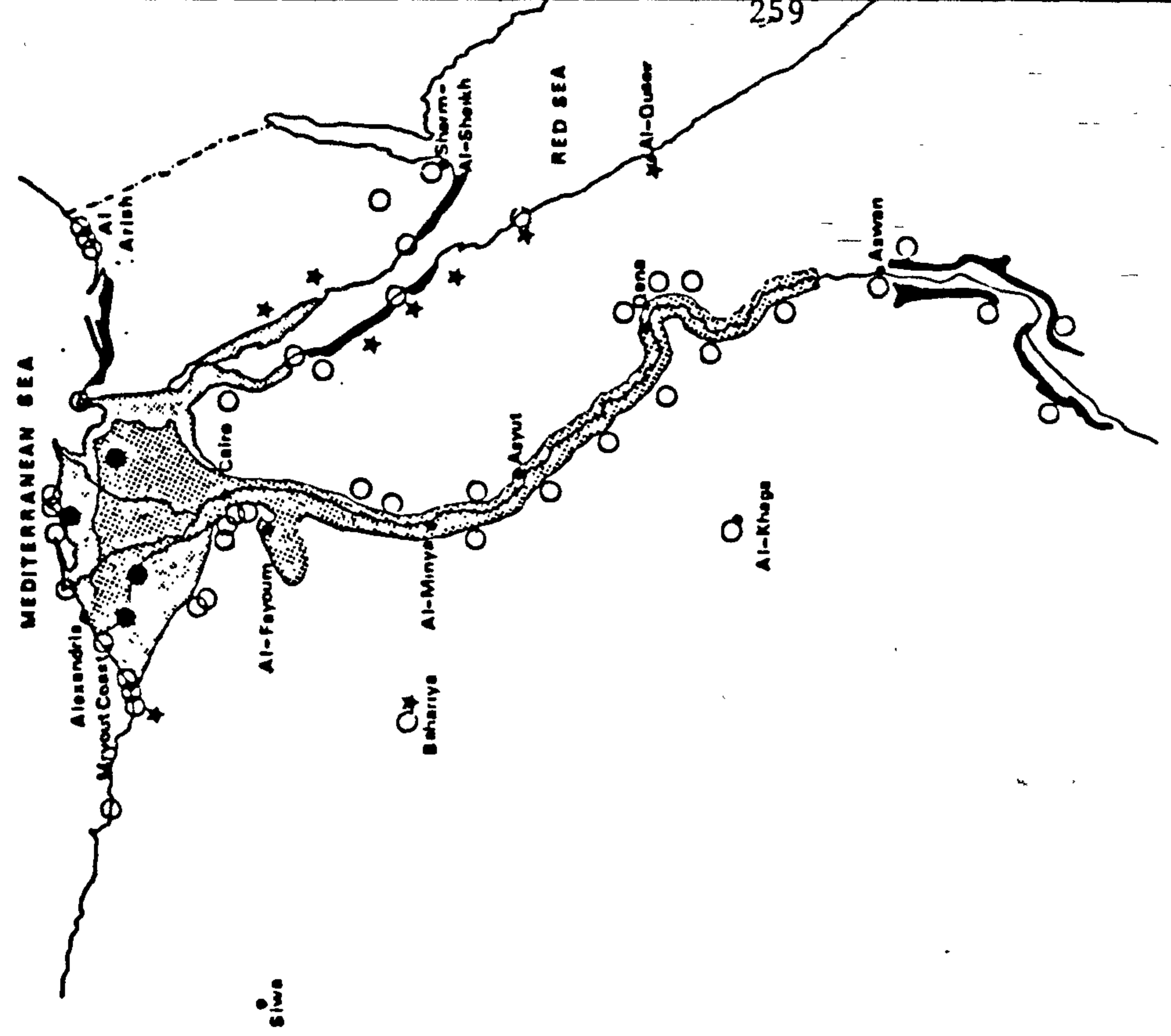


- International boundaries
- Regional boundaries
- ① Matrouh Region
- ② Alexandria Region
- ③ Delta Region
- ④ Suez Canal Region
- ⑤ Greater Cairo Region
- ⑥ N. Said Region
- ⑦ Asyut Region
- ⑧ S. Said Region

Fig. (6-2)

THE RECOMMENDED PLANNING REGIONS OF EGYPT, 1975

Source: Aida Beshara, Planning New Development Regions in Egypt, Third World Planning Review, May 1981



- Nile Valley & Delta
- ▬ Horizontal Agricultural Development (1st phase)
- ▬ Horizontal Agricultural Development (2nd phase)
- ★ " " & Manufacturing Devel.
- ★ " " & Manufacturing Devel.
- ★ Petrol & Mining Center
- Tourism Center

Fig. (6 - 3)

MAIN ACTIVITIES IN EGYPT

Source: G.O.F.P., Greater Cairo Region, Dec. 1981, p.1.4a.

potential is discovered in them.

The selection of the development regions is based on what potential each has, such as natural resources, location and development history, Fig. (6-3). That would help to define their capacity for economic activities and population absorption, including migration and natural growth. Assuming that the average family size in Egypt is five persons, and every family will have an average of 1.5 working members, job provision is considered as 30% of the population figures mentioned below to be accommodated in each region.

Following are the assumptions of the Ministry of Planning for the development areas and the possible numbers of people that can be accommodated in the different activity sectors illustrated in Fig. (6-4)(1). The figures represent the absorption capacity from the natural population increase of the concerned regions and that of the country as a whole from 1978 till the year 2000.

6.2.1 Cairo Region

This region is considered a closed area because it is already saturated, with a total density of 4,143 persons per square kilometre. Since the 1960s, several attempts have been made to divert migration flows from Cairo. (See Section 4.2.1). The failure of such attempts was possibly because of the shortage of opportunities for work, housing and services outside the big cities. What is essentially needed for Cairo region is the redistribution of its population, either within the region itself, by having much more equal distribution of development on the desert land which constitutes 68% of the region, the built-up area being only 10%, (see Section 4.4), or elsewhere in the developable regions outside the valley. This region is excluded from discussion here.

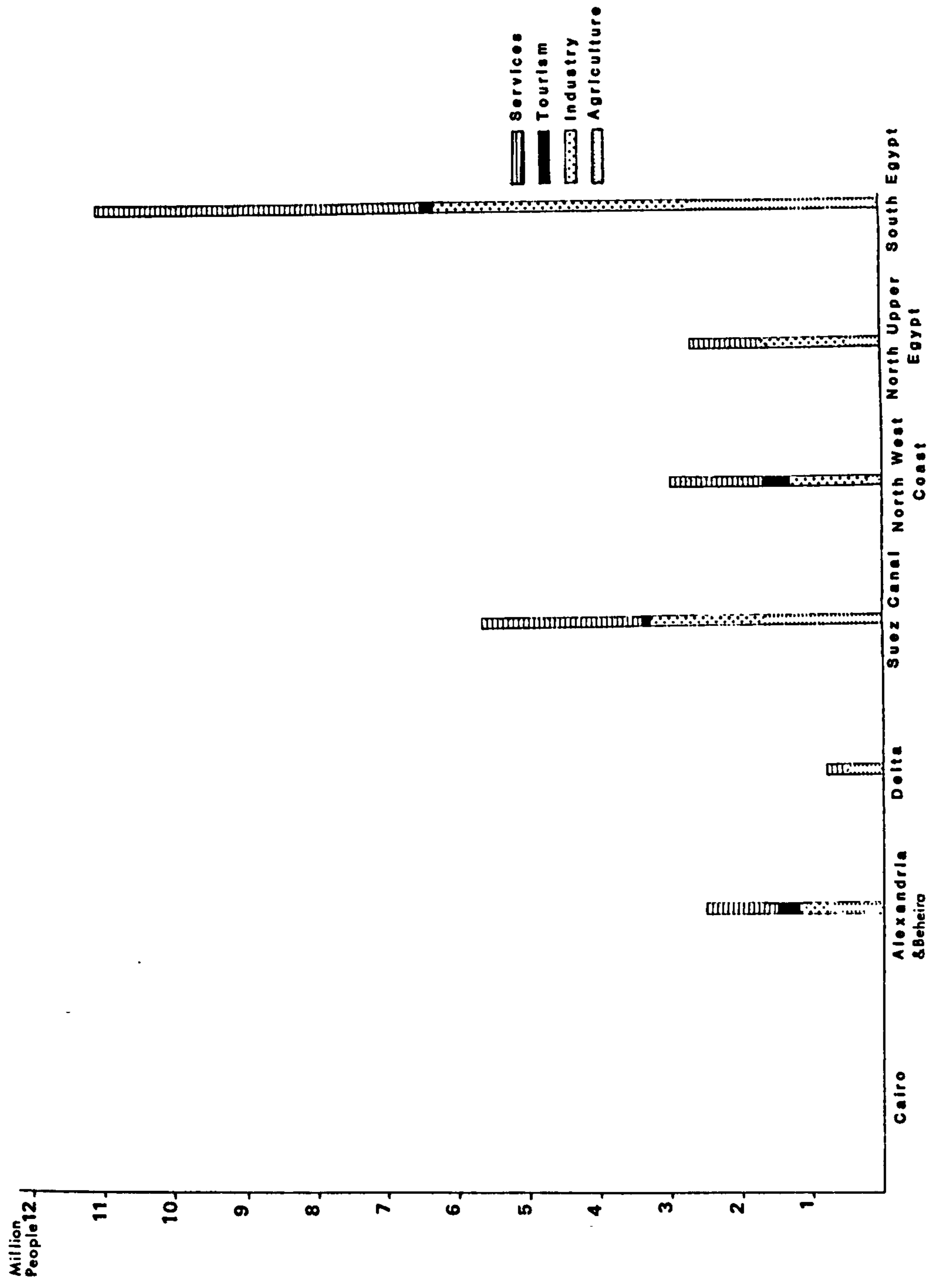


Fig.(6-4)

POPULATION IN NEW COMMUNITIES ACCORDING TO ACTIVITIES & GEOGRAPHICAL REGIONS

Source: The Ministry of Development, 1978.

6.2.2 Alexandria and Beheira Region

It has been suggested (1) that this region could absorb an extra 2.5 million people by the year 2000 as follows:

800,000 in agriculture where there are vast areas of cultivable land west of the Delta, part of which is the reclaimed land of Mudiriyatel Tahrir, Fig. (1-5). These areas have good access to Alexandria and New Amyria in the north, Sadat new town in the southeast, and the Delta in the east. 80 villages of 10000 inhabitants each could be established in future in the reclaimed areas, which the Ministry of Development had initially estimated by 200000 feddans, to cultivate the new opened areas and to administer them.

400,000 supported by industry and petroleum discoveries in the Western Desert, agricultural production from reclaimed areas in the region and port development in Alexandria and Dekheila as its western part in the recent planning of the city. The capacity of Dekheila only is planned to be about 40 m. tons in the year 2000. That will be more than the present capacity of the port of Alexandria, the first port in the country. The two of them will be run as one. That is to keep up with the growing import-export needs of the country. About 200000 inh. could be supported by port development and services while two industrial new towns of 100000 inh. each could be established for agro-industrial projects based on land reclamation in the region.

300,00 supported by tourism services based on Pharaonic and Roman monuments in addition to the attractive beaches of the coast west of Alexandria.

1,000,000 supported by the expanding service sectors on education and training, business, storage, construction and transportation.

2,500,000 at a total density of 575 persons per square kilometre, i.e. the density of the original population, the migrants and the natural increase in Alexandria and Beheira Region, Fig. (6-2).

6.2.3 The Delta Region

This region can accommodate only 800,000 more people because of its relative high density of agricultural communities. Hence employment expansion will be limited to activities and services connected with agriculture such as agro-industries, storage and transportation. The expected total density is 864 persons per square kilometre. But a wise policy should plan to move some people out of congested areas in this region to reclaimed areas outside the Valley. See Section (7.2.7).

6.2.4 The Suez Canal Region (with reference to Sinai Peninsula)

This region is ideal for urban expansion. It has both assets and potentials which, if exploited, might bring about real and tangible benefits possibly throughout Egypt as a whole. The region has two of the possible assets for market-oriented manufacturing, proximity and accessibility for markets, through the Mediterranean and the Red Sea, and land for development. Its nearest ports are approximately 130-220 kilometres from Cairo. Most of its inhabited area has developed infrastructure, but there is ample desert land for expansion and excellent accessibility to Mediterranean and Arab Markets through the Canal ports, Fig. (6-7). These factors have lead the region to become the third "urban-industrial" region of Egypt, after

Cairo and Alexandria. This would make the innovation and experiment in land development techniques particularly appropriate in the Suez Canal Region as a 'pilot' region. For example, in Ismailia, there has been a development of new approaches to housing upgrading.

The employment potential has attracted immense numbers of people since the opening of the Suez Canal in 1869 and especially World War II. (See Sections 1.5, 1.7 and note (18) from Chapter 1.) Table (6-1) illustrates the scale of attraction in the region compared to the rest of Egypt 1937 - 1966, showing the importance of the Suez Canal region long after the opening of the Canal. Apart from limited exceptional periods in Cairo, the Suez Canal Region has had the greatest percentage of annual population increase of the country, giving an indication of its growing potential considered as a 'receptor region'. (See Fig. (2-5). Assuming the continuity of the prevailing conditions till the year 2000, the Region's population will reach 5.679 millions (2). If they are to have jobs and proper accommodation, a maximum utilization of the available potentials in the region has to be done.

Table (6-1)

AVERAGE ANNUAL PERCENTAGE INCREASE IN THE POPULATION
OF VARIOUS AREAS OF EGYPT

<u>Period</u>	<u>Canal Zone</u>	<u>Cairo</u>	<u>Alex.</u>	<u>Lower Egypt</u>	<u>Upper Egypt</u>	<u>The Republic</u>
1937-1947	4.9	5.9	3.4	1.4	1.2	1.9
1947-1960	4.7	4.5	4.4	2.6	2.1	2.7
1960-1966	3.8	4.5	3.3	2.6	2.1	2.7

Source: Ministry of Housing and Reconstruction, Status Report No. 1, Regional Plan, Suez Canal Zone, Vol.II, June 1975, p6 (Population Trends)

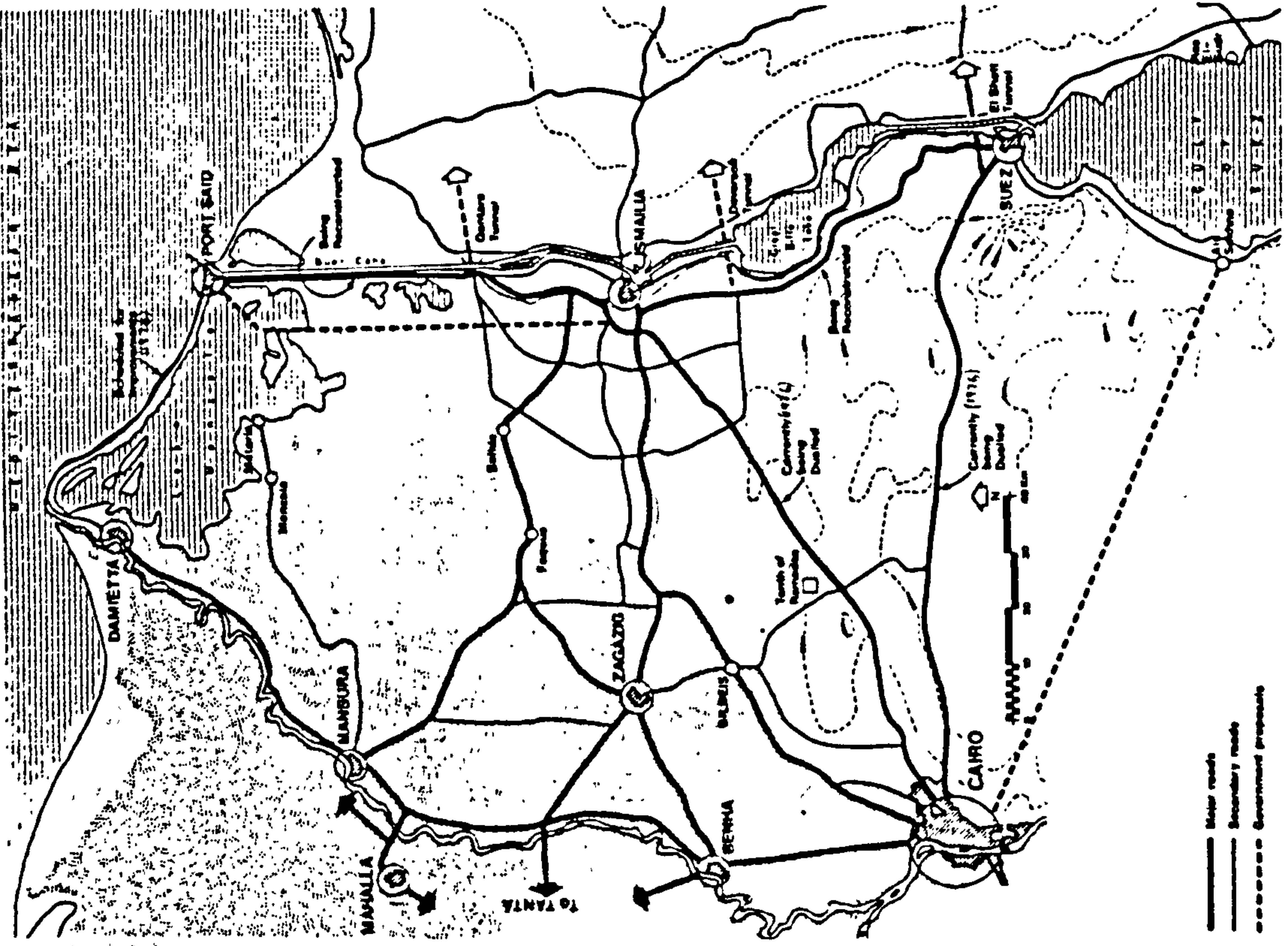


Fig. (6 - 5)

EXISTING HIGHWAYS AND MAJOR GOVERNMENT PROPOSALS

Source: Ministry of Housing and Reconstruction, Suez Canal Regional Plan, 1976, p.116.

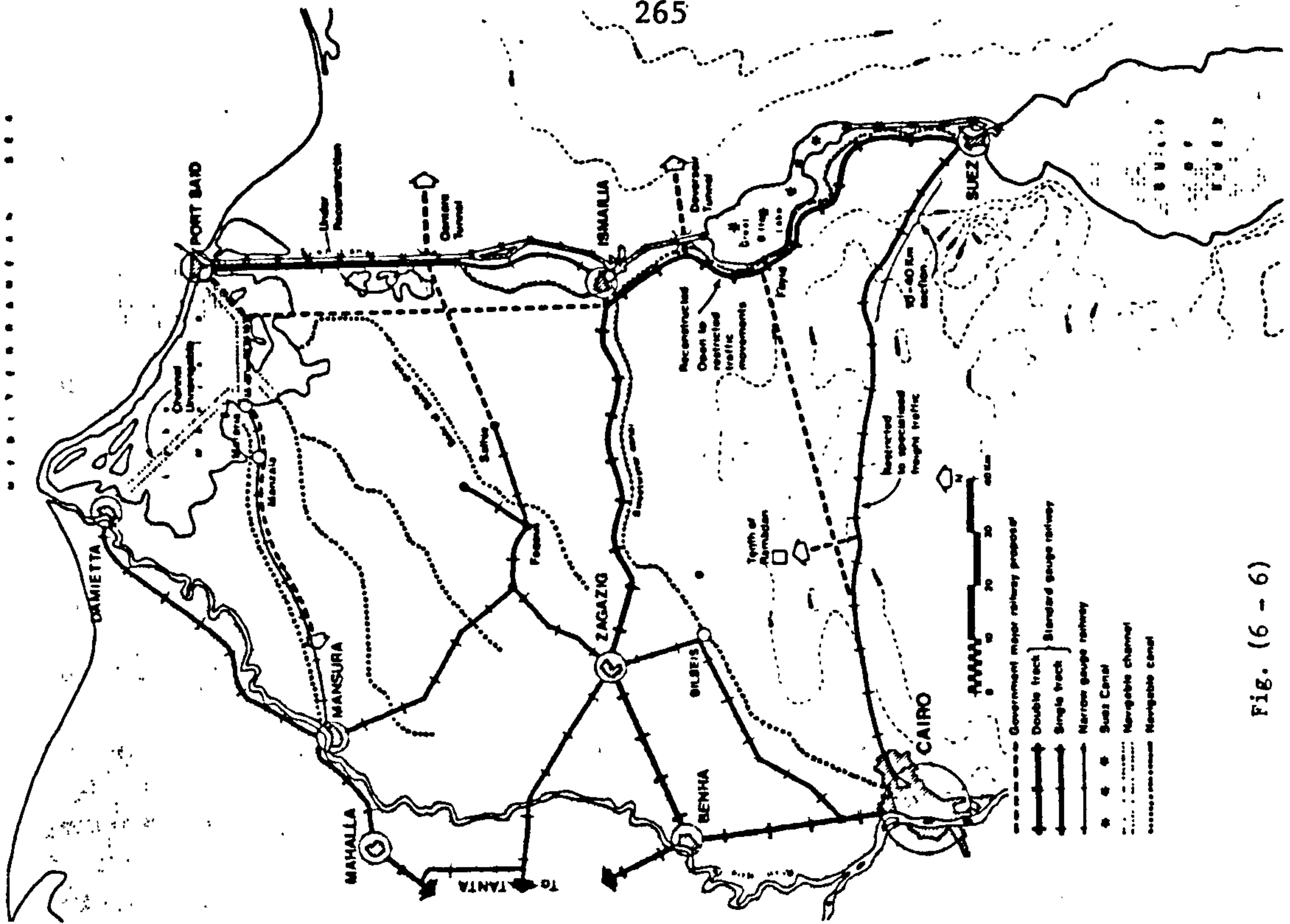


Fig. (6 - 6)

EXISTING RAILWAYS AND MAJOR GOVERNMENT PROPOSALS. AND EXISTING NAVIGABLE WATERWAYS.

Source: Ministry of Housing and Reconstruction, Suez Canal Regional Plan, 1976, p.118.

Facing the Suez Canal Region is the Sinai peninsula which is three times the area of the Nile Delta. It is expected to form another expansion area by virtue of its northern plain and the valleys opening to it, which sometimes carry considerable quantities of storm water, sufficient for agricultural expansion, as in the case in Wadi El Arish, north Sinai. To that must be added the Sinai petroleum and mineral resources, Sinai historical and religious sites along with the highest mountains in the country and the wilderness and palm groves in the valleys or on the beaches, which represent a potential for quite a variety of tourist development if adequate infrastructure is provided. The agricultural and tourist potentialities were very much exploited by Israel when occupying Sinai between June 1967 and April 1982. Big areas were brought under cultivation in the north and coastal parts of the peninsula, to produce crops, including mangoes and apricots, while a number of big hotels were established in different parts of the peninsula. (3). The three tunnels under the canal will increase the importance of Sinai, especially that Nile water will be carried in pipes through those tunnels. (See section 1.5).

The Food and Agricultural Organization, United Nations, Rome (FAO) carried out a soil survey, based on aerial-photo mosaics, over a very large area of Egypt in connection with studies for utilization of the regulated water supplies from the Aswan High Dam. Areas of varying potentiality were identified in the Suez Canal Region, as in Fig. (6-8). Although the figures for the overall investigation area are approximate, they give an indication of gross area that is worthy of study for reclamation purposes. Preliminary studies of the Salhiya - Hooseinea - Port Said areas showed that about 473,000 Feddans are physically cultivable. The Salhiya area includes the better soils of the region. Because of the suitability of the soil, climate and availability of water in the region, crops can be harvested within three

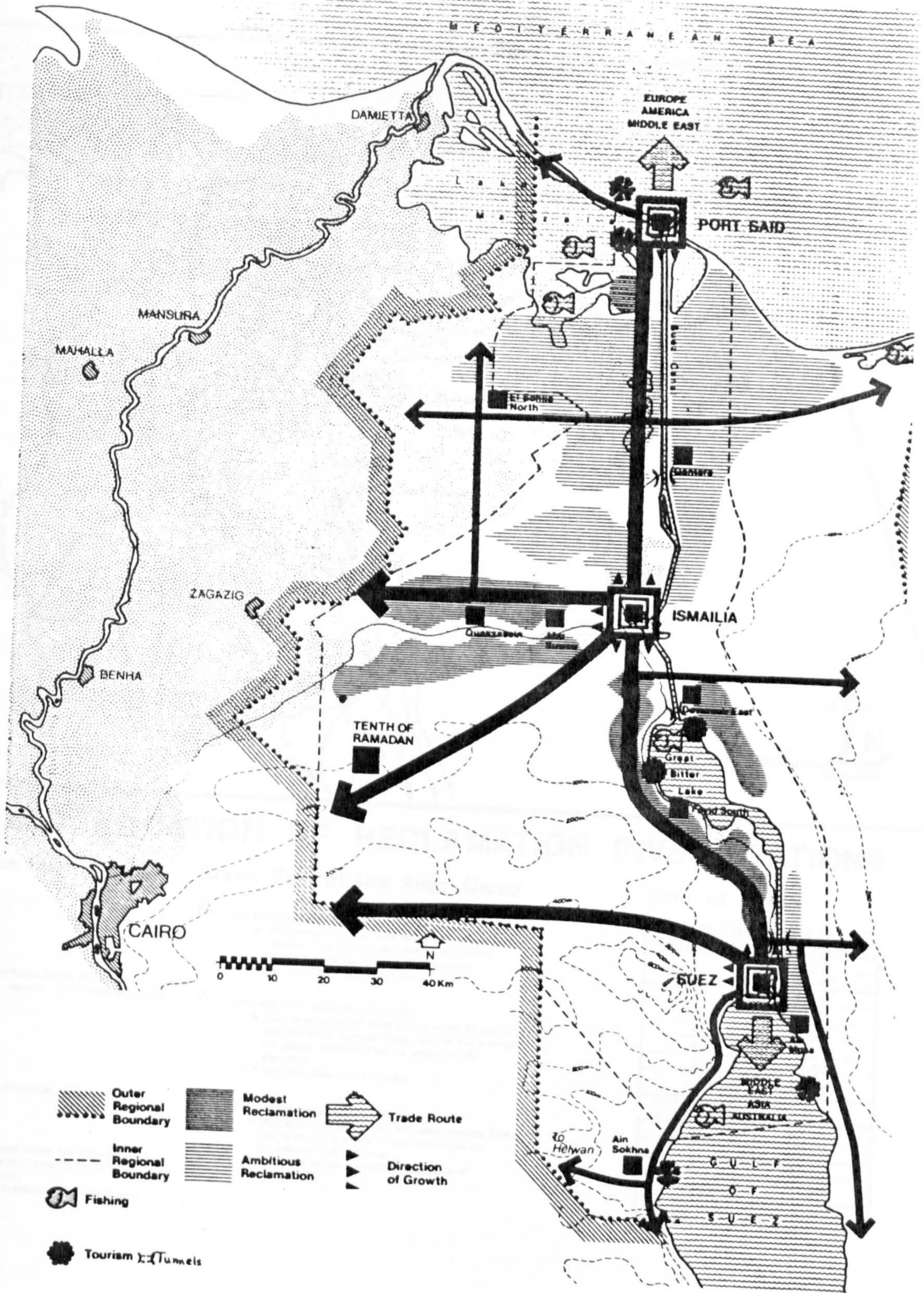
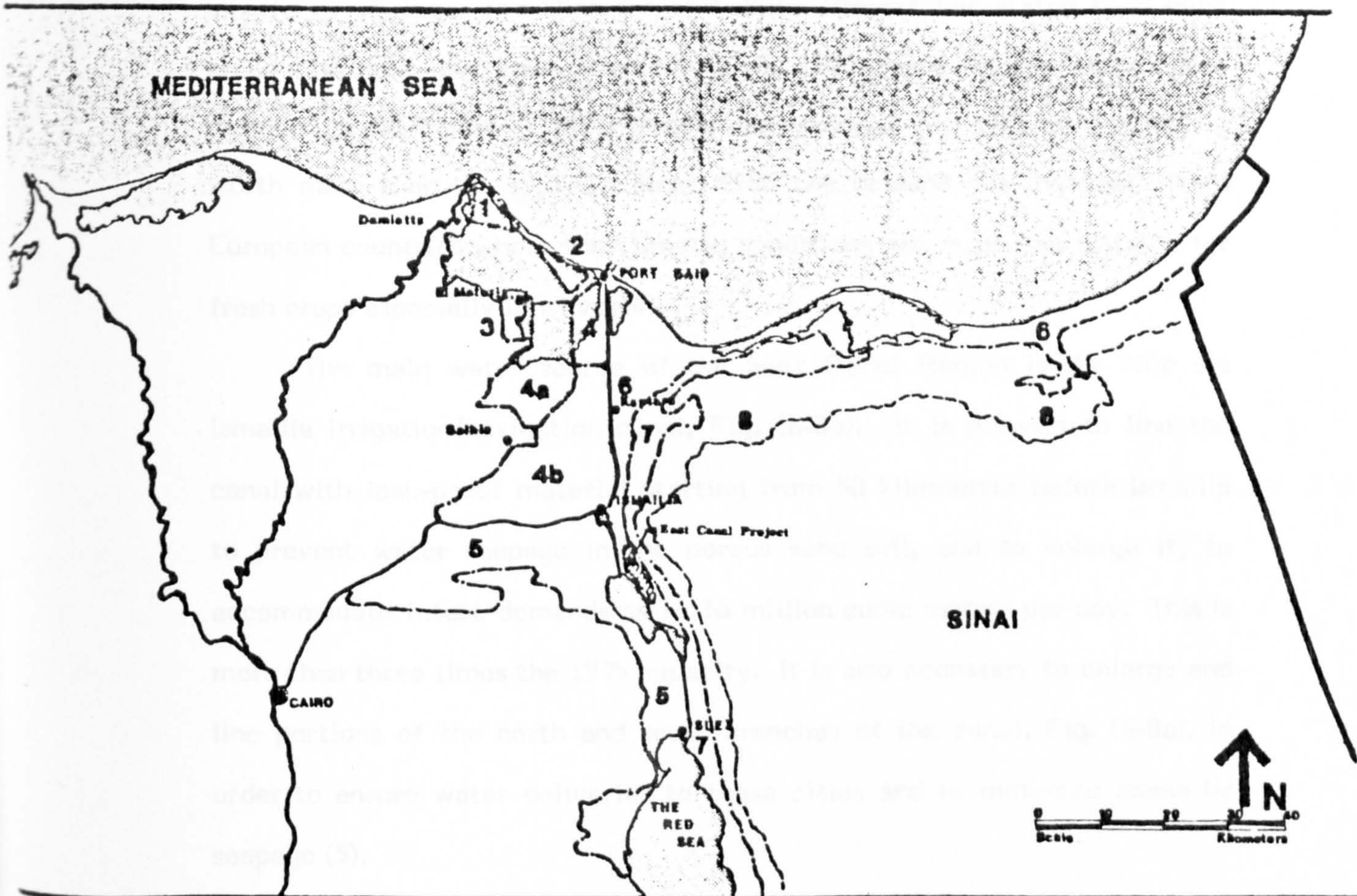


Fig. (6 - 7)

SPATIAL REGIONAL DEVELOPMENT STRATEGY

Source: Ministry of Housing and Reconstruction, Suez Canal Regional Plan, Nov.1976, p.37.



GENERALIZED LOCATION OF RECLAMATION INVESTIGATIONS

Areas West of the Suez Canal

- 1. EL BORGUE - EAST
 - 2. PORT SAID - WEST
 - 3. EL MATARIA
 - 4. PORT SAID - SOUTH
 - 4a. EL HOBBELINIA
 - 4b. BAHIG
 - 5. UN-NAMED
- These areas are to be reclaimed largely from Lake Menzala.
- Some soils data are available over most of the Bahig area.
 - This area contains land below the 100-meter contour line south of the Ismailia Canal and west of the Suez Canal.
 - Some soils data are available in a small part of the area.

Areas East of the Suez Canal

- 6. SUB-REGION (NORTHEAST COAST)
 - This area contains land below the 30-meter contour line, and is designated for future investigation for irrigation by gravity.
 - No soils data are available.
- 7. SUB-REGION (NORTHEAST COAST)
 - This area contains land between the 30-meter and 50-meter contour lines, and is designated for future investigation for irrigation by sprinkler.
 - No soils data are available.
- 8. SUB-REGION (NORTHEAST COAST)
 - This area lies above the 50-meter contour line and is designated for future investigation for shelter belt purposes.
 - This area is not included in the Sum of Areas total.

Sum of Areas

AREAS WEST OF SUEZ CANAL	EXTENT OF AREA (IN FEDDANS)
1.	27,000
2.	20,000
3.	24,000
4.	473,000
4a.	
4b.	
5.	100,000
SUB-TOTAL	649,000
AREAS EAST OF SUEZ CANAL	
6.	300,000
7.	365,000
8.	(100,000)
SUB-TOTAL	765,000
TOTAL	1,414,000

Fig. (6 - 8)

Source: Ministry of Housing and Reconstruction, Status Report No.1, Regional Plan, Suez Canal Zone, Vol.II, June 1975, after p.5.

months of sowing. The Director of Salhiya Project has stated that some crops have actually been exported since 1980 from Salhiya reclamation project (23,000 Feddans). One Feddan can produce two tons of vegetables, worth more than US \$2,000. Since 1980 the demand has increased from European countries where the climatic conditions are much less suitable for fresh crops especially in winter(4).

The main water source of the Suez Canal Region is the Nile via Ismailia irrigation/navigation canal, Fig. (6-8a). It is planned to line the canal with leak-proof material starting from 50 kilometres before Ismailia to prevent water seepage in the porous sand soil, and to enlarge it, to accommodate future demands up to 38 million cubic metres per day. This is more than three times the 1975 capacity. It is also necessary to enlarge and line portions of the north and south branches of the canal, Fig. (6-8a), in order to ensure water deliveries to those cities and to minimize losses by seepage (5).

Ground water is available in the Suez Canal Region, but it will be necessary to control the withdrawal rates to prevent overdraft on the aquifers. The protection, and conservation of ground water resources can be achieved only through government monitoring to limit its usage to licenced locations only. Ground water possibilities are indicated by springs and water holes in some districts, like Uyun Mosa, (Springs of Moses) south-east Suez, Einel Sukhna, (The Hot Spring) south-west Suez. Greater concentrations of wells exist in the Mediterranean coastal plains of Sinai. Starting from south Tallel Kebeer - El Salhia plain, there is water at 5 - 10 metres from the surface.

Unlike agriculture, fishing can be advanced without immediate major infrastructural investment and be served directly by existing centres, with limited overheads and transport development, connecting the extensive coastal areas on the Mediterranean, the Red Sea, the Canals and Lakes of

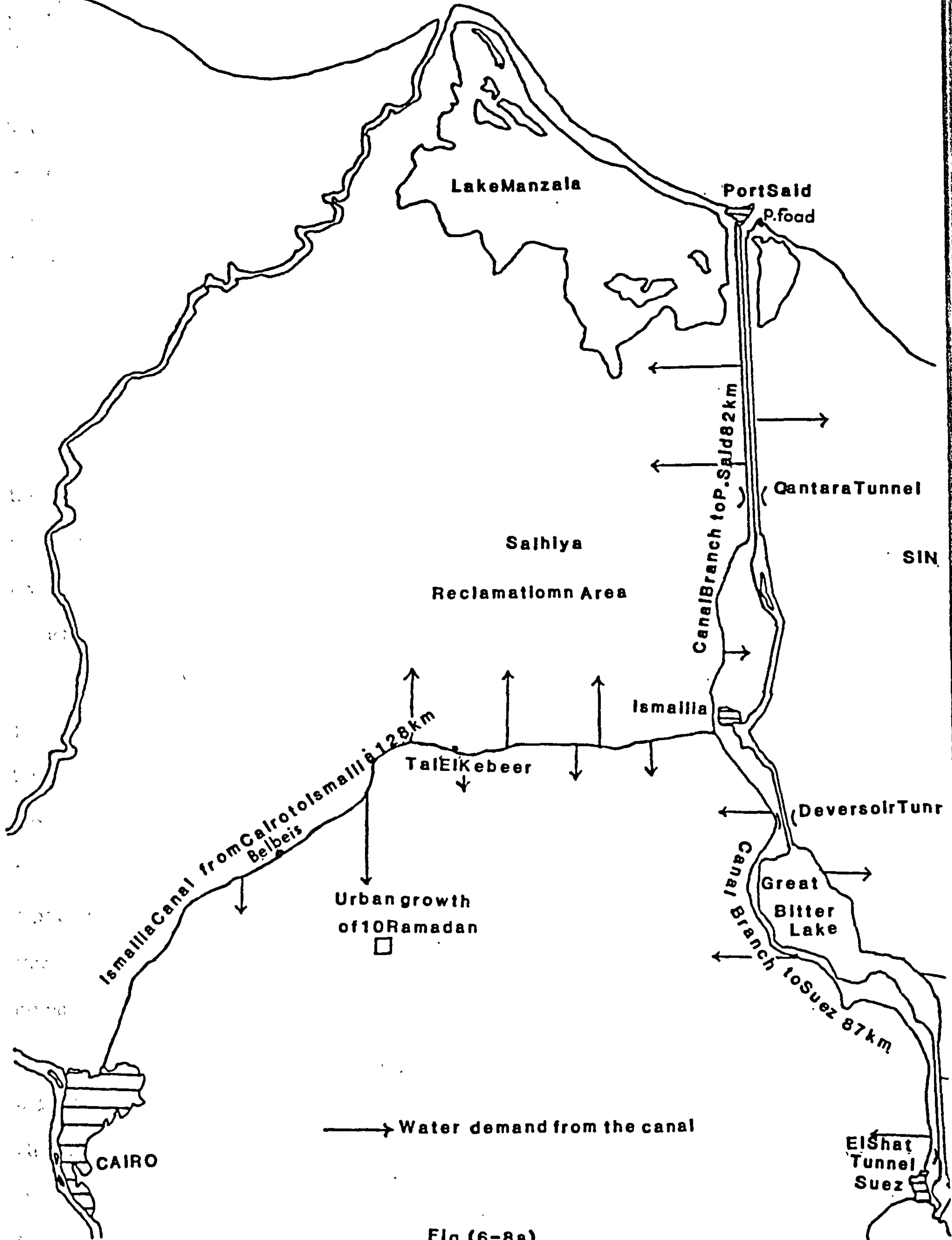


Fig.(6-8a)

Ismailia Canal & Its Branches to Port Said & Suez

Manzala, Timsah and Bitter Lakes, with the areas of consumption in the metropolitan areas and big towns. Possibilities for fish freezing, drying, canning and preserving may lead to some industries growing in the region, for domestic and commercial purposes, Fig. (6-7)

The region has accessibility to saline water which gives the advantage of water desalination when technology and economics achieve sufficient progress.

The Gulf of Suez area was the first in the Middle East where oil-bearing strata were discovered early in this century. Since then petroleum production has been developed in the Suez region at different sites, inside, east and west of the Gulf of Suez and refineries and petrochemical industries were established in Suez. In 1974, the Suez Canal Region was estimated to have 96% of the total resources of oil in Egypt (6). Before 1952 the only pipeline in Egypt for the transportation of oil products was the Suez - Cairo pipeline (120 kilometres). Subsequently, two additional oil pipelines were built between Suez and Cairo with an annual capacity of 4.1 million tons (6a). In addition, there is now also the SUMED Suez -Alexandria pipeline, which was established to benefit the national and international oil industry (6b). Industrial development in the region should benefit from a number of important by-products of petroleum such as lubrication oils, natural gas, synthetic fibres, synthetic rubber and plastics, solvents and asphalt essential for pavements. Petroleum production in the Suez Canal Region is a considerable proportion of the total oil production in Egypt. (See Section 2.7.3). The Gulf of Suez is likely to remain the mainstay of Egypt's oil output, despite the exploration and development push, onshore and offshore, elsewhere. At one time it had the country's most productive oilfields, and counteracted the loss of the Sinai fields to Israel.

Many other industries can develop in the region such as ship maintenance and maritime industries. Some of such industries have existed

since the opening of the Canal, but they need more development and investment to keep pace with the international standards and needs.

Industries for the storage, canning, packing of food and other products can develop in the region especially with the extension of agriculture, fishing and mineral production. That will create more jobs especially if the export industry is to be considered after meeting the domestic needs of such products. If national capital is not sufficient for such investments, foreign companies should be encouraged to join the national companies and the public sector to carry out development of the available resources.

Quarry resources at Ismailia and Suez indicate the existence of limestone, salt (Lake Mallaha) dolomites (Gabal Ataka) gypsum (Ismailia and Sinai) sand, clay and basalt. Although quantities are relatively less than those in some other places in Egypt, these minerals can be used as available raw materials for various industries including fertilizers, cement, road construction, building materials and chemicals. Sinai also has considerable minerals including copper, manganese, iron ore and coal, some of which were exploited in the Pharaonic times as colouring materials.

An efficient inter-city communication system within the region should be connected properly with the rest of the country's networks. Fig. (6-7).

The main problem is that the region possibly lacks the diverse skilled labour pool necessary for rapid industrial development. Therefore it is essential to train the existing manpower and to attract and train new manpower from the overcrowded regions of Egypt, for the new industries which should exist on desert areas of the region to expand its inhabited area. The growth in the number of jobs will depend on the growth of the national economy. In the year 2000, there may be 15 million jobs in Egypt if the annual economic growth rate is 4% and about 20 million jobs if it is 6½%, (7).

In 1975, it was estimated that if development is successfully pursued in the Region, the total number of workers could increase from about 170,000 in 1975 to over one million by the year 2000 (8). Care should be directed to the supply of housing categories, according to the needs and payment ability of the workers, good education opportunities, and health and social care for their children. Such services can considerably promote the new settlements in the region as the case of the British new towns where social development was one of their leading achievements.

Free zones policy in the region encourages the development of transit and possible entrepot activities and also industrial production combining the foreign capital and materials with the Egyptian labour and services. The extension towards Sinai supported by the three tunnels under the Suez Canal will give more room for activities and sister settlements on the east bank of the Suez Canal, especially where lack of land forms a problem as in Port Said which would be better if it were connected by a fourth tunnel with Port Foad as a long term planning. The Suez Canal Region also has considerable potentialities for domestic and Arab tourism by virtue of its mild climate and attractive beaches on both the Mediterranean and the Red Sea.

Because of these potentials, and the fact that the Suez Canal Region has considerably developed, the normal progress in the region can achieve more advancement in the future to become the third metropolitan region of Egypt besides Cairo and Alexandria, (9) and to form self-contained communities for work and living as in the case of the British new towns.

After the 1973 war, the region was given priority for reconstruction. Till 1976, about 20,000 new housing units were built in the region, besides the restoration of 50,000 units which were partly damaged in the conflict.

It is estimated, ^{by the Ministry of Planning,} that this region may be able to absorb an extra 5.7

million people by the year 2000 besides the existing inhabitants, as follows:

1,700,000 supported by agriculture where cultivable land surrounds the canal towards both the Delta and Sinai regions. Suitable irrigation projects are required for adequate agricultural expansion round the Suez Canal and north Sinai where some 1.4 million feddans could be reclaimed, Fig. (6-8), to maintain about 110 new villages of an average of 12,000 feddans and 12000 people each.

1,600,000 supported by industry, oil and mining resources in Sinai and the Gulf of Suez, in addition to the international waterway requirements such as maritime works and ship maintenance. Petroleum refineries, petrochemicals and agro-industries are expected to have their weight in the region's industry. This number can be accommodated in new extensions of the existing urban centres.

100,000 supported by tourism and the related services owing to the international navigation route with attractive scenery and beaches on the lakes and sea shores, on the Mediterranean and the Gulfs of Suez and El Aqaba.

2,300,000 supported by the services such as commerce, free zones, investment project, storage, transit, packing and freezing, transportation, regional institutes, research, education and training centres. This number needs the establishment of six urban centres of about 400,000 each, two in the Suez Canal Region and four in the north Sinai plains to serve the above mentioned activities. The

British way of extending some of the existing settlements could be applied in this region since it will not affect the agricultural land. Qantara, Devresoir and El Arish are three of such expandable examples where desert areas are available round the inhabited areas.

5,700,000

at an average total density of 218 persons per square kilometre.

Assuming that the activity rate is 1.5 persons per family, or 1,710,000 potential workers, housing, services and job opportunities should match these figures.

6.2.5 The North West Coast

This region has a priority for expansion and development because of its vast potentialities, such as agriculture, fishing, tourism and urban expansion. It also has a mild climate. Efforts must be made to maximize self-sufficiency especially in food and small scale industrial production, and, as far as possible, in water supply.

The North West Coast region extends about 540 kilometres west of Alexandria till Sallum town on the borders with Libya. Its width varies between 30 - 50 kilometres.

The prevailing wind in the region is the north-east trades from the Mediterranean, while in winter the westerlies bring some rains to the coast. Average annual rainfall is 150mm, and is most regular on the plateau south of the coastal plain, whence it flows northwards through the valleys to the sea.

Transport activity can exist in this region because of its location facing the Mediterranean countries, and leading to the western wing of the Arab World. The region also has future possibilities to release pressure on

Alexandria region especially if more and direct ties connect it with the Nile Valley and the Western Desert, and more development is achieved in the region which will need a local port.

In one view (10), the North West Coast region can be considered as a part of a crescent of new communities including Sadat City and new Ameriya City, both of which culminate in the north-western coastal zone. At the south east corner of the crescent lies the Greater Cairo Region including the heaviest populated area in Egypt. At the north-eastern corner of the crescent lies the City of Alexandria, the second largest city in the country, Figs. (6-9) and (6-9a).

The annual volume of storm water which runs through the valleys is estimated at 11 million cubic metres, but only 2.2 million cubic metres are used locally in agriculture (11). More soil tests should help to indicate priorities of land for reclamation and the selection of successful kinds of crops. A pipeline for drinking water was established in 1936 between Alexandria and Matruh, but its capacity has been reduced because of wilful damage to get water. Drinking water is also carried by railway tankers or is obtainable from the Roman wells and from sea water condensers.

A new pipeline to carry raw water from the western Delta has been considered for New Ameriya City and the north west coast. But very recently, and to overcome lack of water in the region, a new canal of about 10 million cubic metres per day is planned to carry its discharge from west Delta to the region. When this canal is completed, the coastal area of the region will be able to sustain a population of one million in addition to those in the hinterland.

Domestic water requirements are estimated at 150 - 250 litres per capita per day varying by income groups, and 120 litres per capita per day for industrial use. Most agriculture will be under dripping or sprinkling irrigation methods with water requirements of 3,000 - 5,000 cubic metres

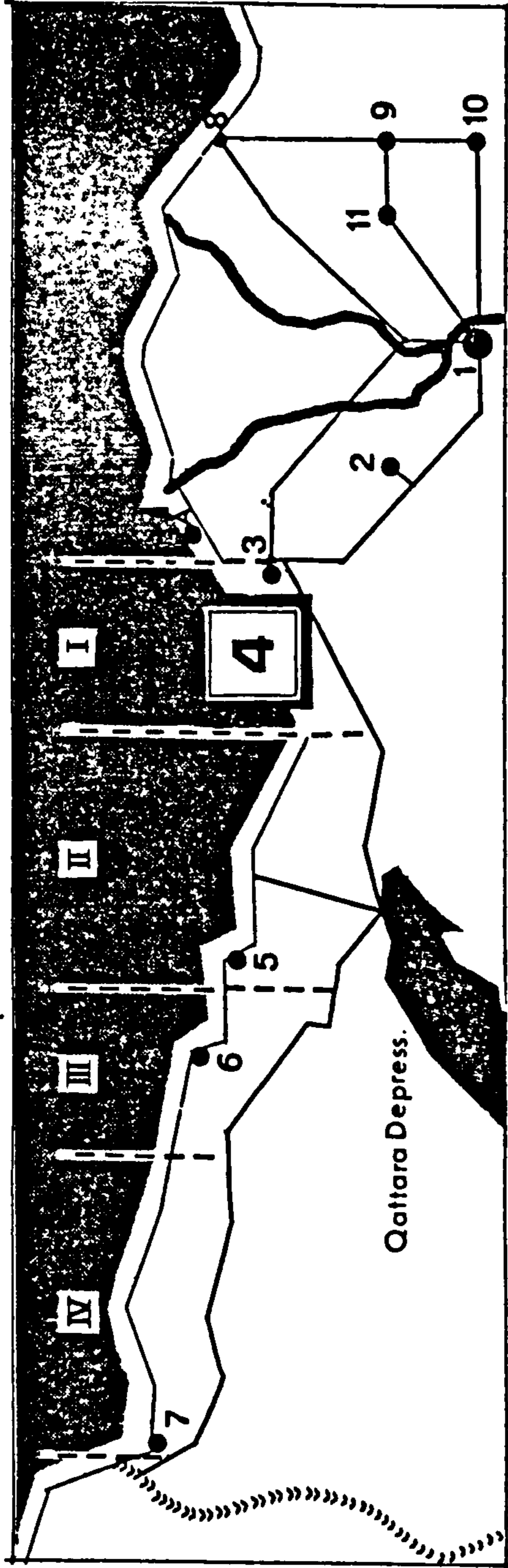


Fig.(6-9)

North Western Coastal Zone and Crescent of New Communities Pivoting on Cairo

- 1. Cairo
- 2. Sadat City
- 3. New Ameriyah City
- 4. North Western Coastal Zone Development Area I
- 5. Ras El Hekma
- 6. Mersa Matruh
- 7. Sallum
- 8. Port Said
- 9. Ismailia
- 10. Suez
- 11. IORamadan
- II, III, IV North Western Coastal Zone future development areas

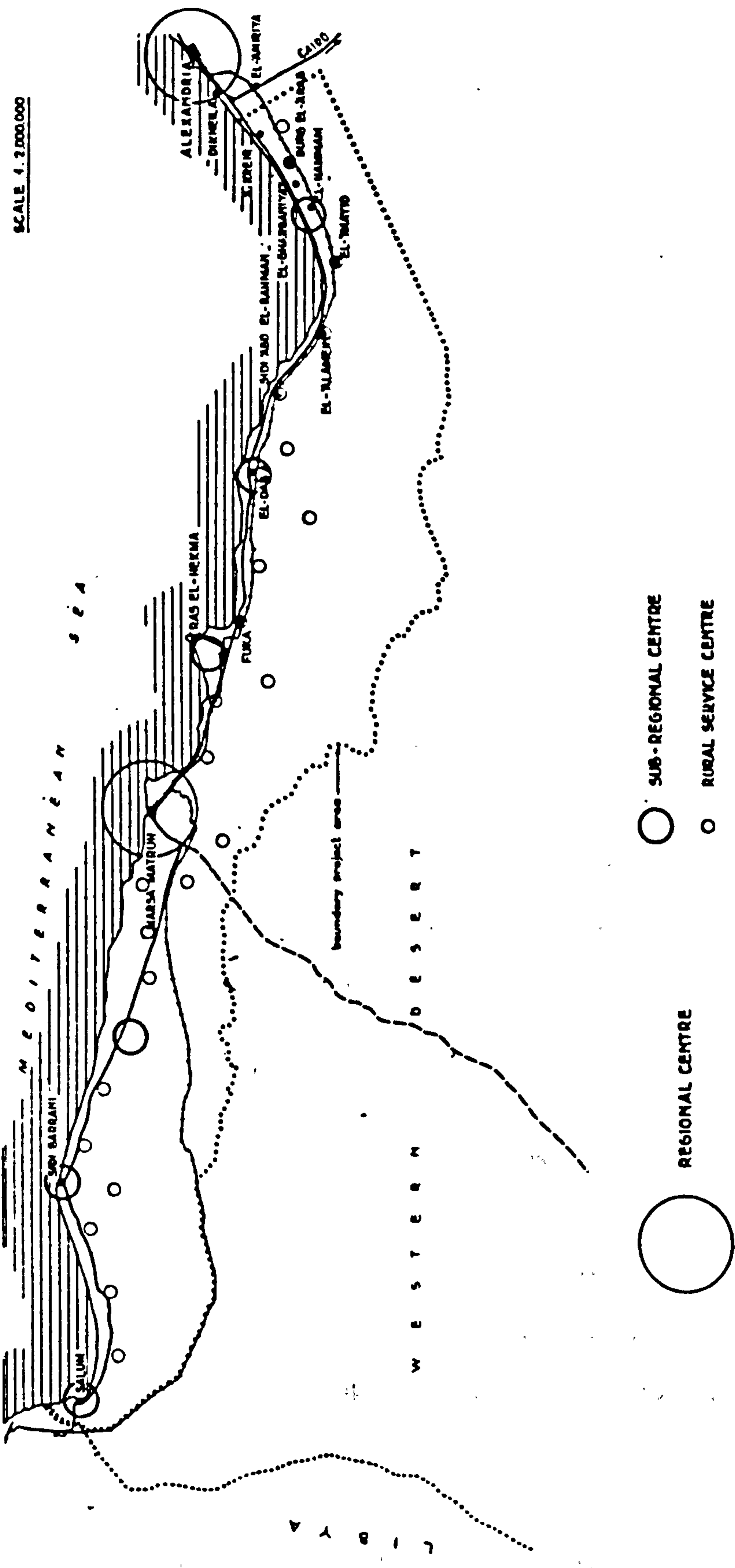


Fig. (6-9a)
THE NORTH WEST COAST

Source: Ministry of Housing & Reconstruction, Programme of Reconstruction & Development, April 1976, p.73.

per Feddan annually. Water treatment plants are required in several sites of the coast to refine and re-cycle water (12), in order to make more use of the available water. The sewerage system can be serviced by a gravity-type collection system. Waste water could be treated in aerobic-anaerobic stabilization ponds and re-cycled for use in irrigation, producing a well sludge for fertilizers (13), or in appropriate conditions, it can be used directly for cultivation purposes. A proper drainage system will then be needed to ensure that the water table is not adversely affected.

It is planned to connect the region to the Republic network of electricity, but in 1980 the region had 6 diesel generators in addition to the private generators. Studies are being undertaken for other energy projects such as the atomic generator, solar energy, wind and sea waves energy, to select the more suitable to apply.

The only road serving the region extends between Alexandria and Sallum with a width of 6.5 metres. It is of a moderate standard and its reform is underway to cope with the growing traffic. It has a recent extension from Matruh to Siwa Oasis (see Section 1.3.2). There is a single track railway extending between Alexandria and Sallum. The number of trains increases in summer time, especially as far as Matruh, to meet holiday and tourism requirements.

The only airport in the region is that in Matruh which is a military airport with civil facilities as well. It might be useful to plan for some more conventional airfields to help in transport needs, especially in case of emergency.

Telephone services are being developed to satisfy the growing needs, but a telex service has, ^{yet} to be installed to benefit the activities in the region.

The ports of the region are Matruh (or Mersa Matruh) and Sallum, each of limited capacity, besides the oil pipeline's terminals in El Alamein and Sidi Krare west of Alexandria where oil pipes are extended under the

sea water for petroleum exportation from the SUMED line. Other oil terminals are suggested at Sidi Barrani and Ras Alamel Room (Roman Cape).

The importance of productive activities is paramount. Agriculture, husbandry and dairy products should develop, depending on the experience of the existing population in such activities. Fishing along the Mediterranean coast, can be a very successful way of satisfying the growing need for protein in Egypt, and of supporting some industries aiming for export. Extraction industries, such as petroleum and mining can absorb some of the population in the next few decades. These products can also be exported to the Mediterranean countries.

The great need for foreign currencies can be satisfied by oil and mining exports in addition to cutting food imports to purchase the productive facilities not available in Egypt.

6.2.5.1 Tourism in the Region

Scenic and recreational assets of the North West Coast region must be simultaneously exploited and preserved. Historical sites, such as Alamein, Cleopatra baths, Romel cave facing Matruh, and the recreational beaches such as those at Sidi Abdel Rahman and Sidi Krare, can play an active part in tourist development in the region. But the North West coast will only top the list of tourism when properly developed and adequately provided with facilities and infrastructure. This will require a lot of money which necessitates to make every possible incentive for local and foreign investments in tourism to reduce restraints on government money.

6.2.5.2 Agricultural Potential

As mentioned earlier in this Section, agriculture is important as potentially a main activity in the region. On the basis of detailed studies of

water resources and soil categories in the region, it is possible to state that 320,000 acres can be cultivated in the region under its present circumstances regarding water and soil, i.e. without much effort in reclamation and the development of water resources. Presumably, if sufficient water supply and services are secured, much more cultivation could be realised in the region including crop and dairy production, afforestation and natural parks. An emphasis on water recycling for cultivation is useful here to overcome lack of irrigation water in the region. Only 12,000 acres, from the above mentioned area, are cultivated at present (14), growing a variety of crops including barley and figs. The cultivation of plants with medical uses can be encouraged in the region, especially that some of them are already cultivated in the desert and have an increasing demand from domestic and international companies (15). Such plants can be grown wild with very limited effort and little irrigation demand. An example can be found in one of those plants, named 'Erqsoos', of which one acre crop sold in 1973 at about £E835, a figure which may now be trebled. This plant also resists plant diseases, while its green leaves can be used as cattle fodder. Its extended roots stabilize desert soil, which represent another advantage, (16). Similarly, many other plants growing wild have economic values.

Since climatic conditions in the region are less harsh than that in the inner desert areas, agricultural development in the region is favoured. At the same time, such climatic conditions are mild, especially in winter compared with those in Europe and this gives the region considerable potential for agricultural production for cutting food import, and probably later for export to the other side of the Mediterranean. Agricultural activities should form a good basis on which to establish new settlements in the North West Coast Region. A certain part of the agricultural production can be considered as raw materials for industrial activities including food canning, packing and freezing.

6.2.5.3 Industry and Petroleum

Industrial activity is represented at present by two factories for gypsum and olive oil extraction, in addition to small industries for individual use. The industrial labour force represented only 2% of the total labour force in the region in 1975. This small percentage of industrial workers makes it essential to plan for industrial development and training in the region to provide employment for its growing population. Oil and mining production, farming and fishing represent some of the raw material provision for industrial progress in the region. Oil and natural gas have an increasing importance for the region. A project for a refinery plant is planned beside Sidi Krare or Ameriyah, with a capacity of 25 million tons per annum. Another petro-chemical plant is planned near Sidi Krare or El Hammam.

Such industrial potential in the region should form a base for the establishment of some new settlements in the North West Coast associated with sufficient services.

6.2.5.4 Human Resources

By the existing development, the region can accommodate 750 thousand people, in addition to 130 thousand who were living there in 1975, of whom 30% were nomads, (17). About 80% of the households breed animals, mainly sheep, in addition carrying out some other activities such as agriculture, oil extraction, carpet making and commerce. The people are not experienced in work such as building and construction, mining or administration, tasks which are mainly performed by those who came from the Nile Valley. In 1975, the per capita annual income in the region was about £E 100 which was higher than that in many parts of the Nile Valley. In 1967 there were not more than 350,000 sheep but by 1975 they had increased to more than 800,000, because of the higher prices they could command in the Libyan markets.

Health services are insufficient and scattered in the region because of the long distances between settlements, lack of specialized doctors and proper equipment. The region depends on Alexandria for higher medical care, but urgent cases become critical because of lack of adequate communication. Helicopter pads at selected sites may be useful for urgent matter, especially with the increasing population and activities in the region which will presumably increase the number of urgent cases. The military forces might help in this respect.

Illiteracy is higher in the region than the national average because of lack of qualified teachers owing to the migration of the educated people for better wages, especially in Libya to the west of the region, and also because of lack of schools and education equipment in such remote settlements.

Health and education services must be provided to a reasonable standard if development plans are to be realised, so helping the progress of other activities such as agriculture, industry, tourism and commerce. Some developments near to the North West Coast have their impacts on the region's plans. It may be useful to mention briefly two examples of such developments, a new town and a suggested project.

6.2.5.5 New Ameriyah City

New Ameriyah City is 60 kilometres west of Alexandria centre not far from water and energy supplies. The designated area is located on high lands not suitable for agricultural development. Land reclamation for farming extend round it. The total designated area amounts to 48 square kilometres or about 11,380 acres, Table (6-2).

The new city is meant to act as a growth centre in the region. It will provide an industrial base, especially for agro-industries and services, for the coastal zones nearer to it than Alexandria. The city can benefit from resources and infrastructural elements available in the region

especially water supply, electricity and highways.

Table (6-2)

Land Use in New Ameriyah City

Land Use	Acres	%
Residential	3,500	31
Services & Public Utilities	3,094	27
Industry	1,571	14
Education	976	9
Recreation Areas	1,310	11
Roads	928	8
Total	11,380	100

Source: The Ministry of Development, The Five Year Plan (1979-1983) of the New Settlements' Development in Egypt, 10.10.1978 (Arabic).

6.2.5.6 Qattara Depression Project

The Qattara Depression occupies about 22,000 square kilometres south of the North West Coast, almost equal in area to the Nile Delta. The Qattara project is based on the generation of electric power.

The idea is based on the digging of a canal between the Mediterranean and the Depression whose lowest area is 134 metres below sea level representing the lowest area in Africa. If implemented, the project may provide five times as much electric power as is obtained from the High Dam (18), besides forming a huge lake.

However, the project of Quattara Depression is faced by some criticism. For example, it is feared that saline water may percolate through the sandy bottom of the depression to cultivated areas especially if cracks exist somewhere. Also the even evaporation from the expected lake will concentrate salts in the lake which will hinder fishing development in the long term. (18a). In fact the proposal needs more feasibility studies in the light of the benefits of the project to reach a final solution, if the project is applicable or not to consider it in the comprehensive plan of the North West Coast. It is also important to consider the priorities of projects according to their expense and getting some people settled.

6.2.5.7 The Region's Absorption Capacity

The survey of the potentialities on the North West Coast and its connections with the surrounding regions should indicate the possibilities of population absorption in the region. In 1978, the Ministry of Planning estimated that if the region will be properly developed, it can absorb three million people in addition to its existing population of about 150,000 till the year 2000 (19). This estimation is too optimistic especially considering that the region is mostly desert land and needs a considerable development of infrastructure and water resources. One third of the above mentioned estimation could be more realistic till the year 2000 to be accommodated in new or expanded urban centres shown in Fig. (6-9a). The main regional centre in Matruh city could accommodate 200 thousand people in services, administration, tourism and port activities, and the other 6 sub-regional centres of about 50 thousand each for agro-industries, management and services, in addition to 25 rural centres of about 20 thousand each in land reclamation areas. If properly developed, the region is expandable for the long term planning especially that its climate is less harsh than the inner deserts, and the maritime front on the Mediterranean is useful for commercial activities.

6.2.6 North Upper Egypt Region

This region can be considered as the southern extension to the congested Greater Cairo Region (Chapter Four). Industry can be developed on the output of agriculture and building materials in the deserts of the region. It can absorb large numbers of the region's population in addition to the extra labour force available from the neighbouring regions. There is also the possibility of agriculture expansion in some desert sites on both sides of the Nile Valley. To that must be added the tourist potential in the three governorates of the region, Bani Sueif, Minya and Fayoum, Fig. (1-6), related to Pharaonic monuments and the natural scenery of Lake Qaroon and the Nile shores.

The Ministry of Planning has estimated population absorption in this region till the year 2000 by 2.7 million people as follows:

500,000	dependent on agriculture expansion on both sides of the Nile Valley in the three governorates of the region where 100 villages of 5000 people each could be established to cultivate the new reclaimed areas of the deserts.
1,100,000	dependent on industry such as agro-industries, quarries and building material in the Eastern and Western Deserts.
1,100,000	dependent on tourism and services in the existing and new opened areas of development as communication, administration and education.
<hr/> 2,700,000	at a total density of 507 per square kilometre.

This estimation is optimistic especially concerning tourism potential in the region compared to that in Alexandria and The Suez Canal Regions. So a more realistic number could be 1.5 millions (0.5 m. in agriculture, 0.6 m. in

industry and 0.4 m. in tourism and services).

6.2.7 Assyut and South Egypt Region

In the long term, this region is expected to absorb as much population as all the other regions put together because of its comprehensive potential for expansion in agriculture, industry, mining, fisheries, tourism and services. Assyut and South Egypt region can be divided into three axes: Eastern, Middle and Western.

The Eastern axis lies along the Red Sea Coast which is very suitable for fisheries development, by means of several fishing sites which can contribute to the catching and the processing of the several species of sea fish available, by canning, smoking, freezing and marketing. Fishing in the Red Sea still needs further studies and development to increase present output. Agriculture possibilities are limited by the absence of water resources and the difficult relief. Ground water is mostly unsuitable because it contains salts with a nasty taste, such as magnesium and sulphur, which even camels are reluctant to drink.

The Middle axis comprises Assyut, Sohag, Kena and Aswan Governorates including The High Dam Lake and the canyon valleys surrounding the lake (Akhwar). Agricultural expansion Fig. (6-10), North and South as well as East and West, can take place along with industries related to crop development such as sugar manufacture and food canning, packing and freezing. The development of the lakes' fisheries is possible, in addition to husbandry and dairy products in the new agricultural areas. Water resources are ample from the River Nile and the High Dam Lake. The area of the lake is about 5,000 square kilometres. Its length is about 500 kilometres with an average width of about 10 kilometres. The variation in the level of the lake during the year will result in the inundation of huge areas along the banks of the lake. In the times of lower levels, these areas

can be cultivated after being saturated with water and having a thick layer of the fertile clay suspended in flood water. Hence, these areas are not in need of irrigation or drainage projects. It is also possible to use the surface of the lake for transport between its shores and southwards (20).

It is estimated that the region has about 368,000 Feddans of cultivable land of different soil categories in addition to which more than 2 million Feddans can be examined and a good proportion of them can be used for agricultural expansion (21). Air survey shows that in addition to the 368,000 Feddans, the land of the valleys of Karkar, Toshka, Abu Simbel and Kalabsha include about 250,000 Feddans of cultivable land existing round the lake shores with ample water resources directly from the lake, see Fig. (1-12).

On the other hand, this lake can be considered as a huge basin for breeding different kinds of fish. Its output increased from 7,500 tons in 1966 to 16,000 tons in 1976 and to about 23,000 tons in 1978. Studies by the Ministry of Scientific Research show that the catch could reach more than 30,000 tons per year, provided that modern equipment is used.

The Middle axis has iron ore east of Aswan in the Nubian sandstone, in addition to phosphate, caolin, parite and building materials.

The Western axis includes the New Valley Governorate. It is estimated (22) that the Nubian sandstone bed of that axis contains 234×10^{12} cubic metres of underground water but further studies are still needed to assess the availability and cost of this water as compared with the cost of digging canals or the establishment of pipelines in order to carry the Nile water to the vast areas of this axis within the limits illustrated in Fig. (6-1) and mentioned later in this Sub-Section.

Agricultural studies show that 213,000 Feddans (23) are cultivable land in the depressions of the region, like Farafra, Dakhla and Kharga oases, besides the other areas of this axis, outside the depressions. These increase

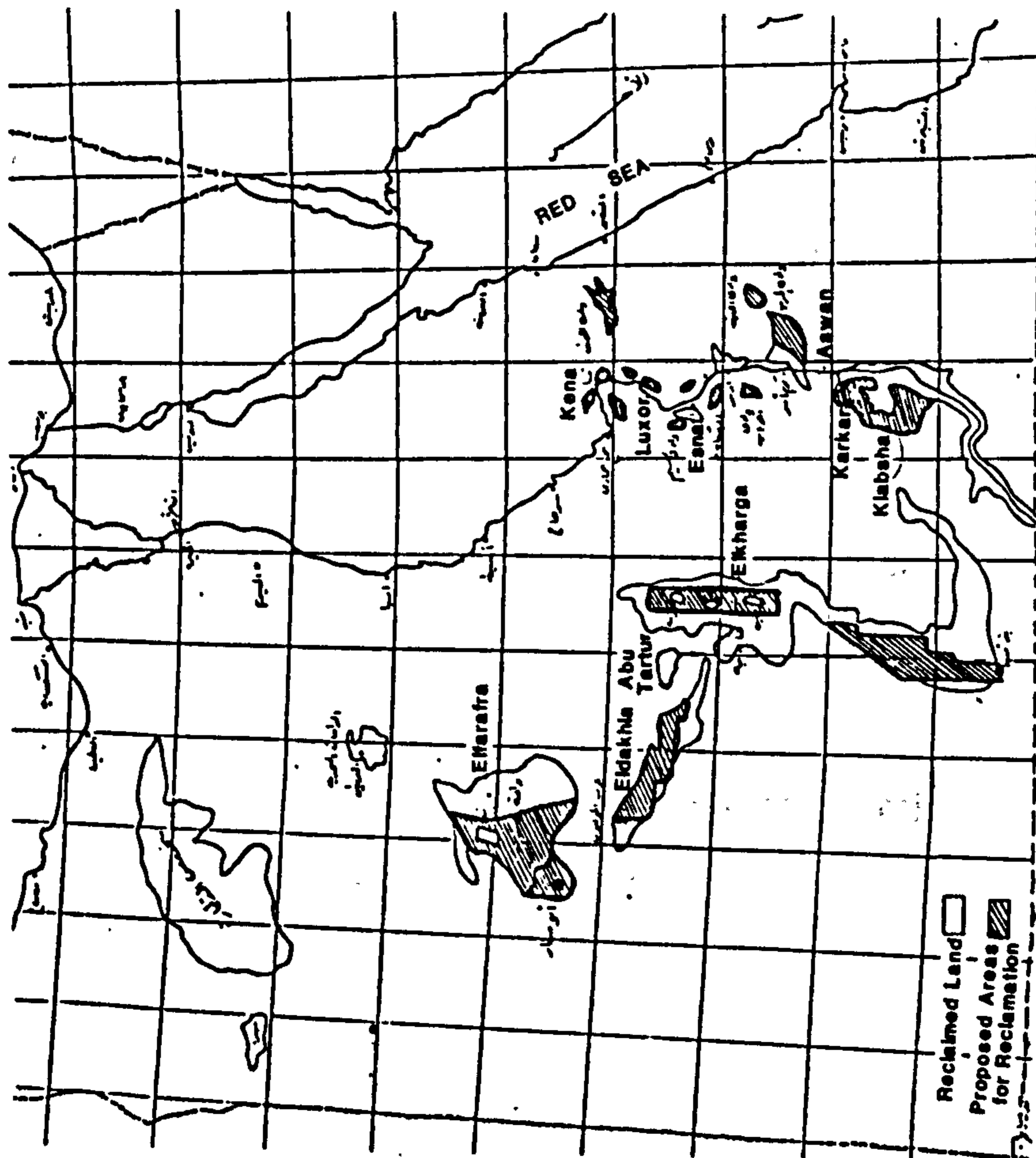


Fig.(6-10)

LAND RECLAMATION POSSIBILITIES IN SOUTH EGYPT

Source : The Development of South Egypt, Institute of National Planning, April 1978, p28

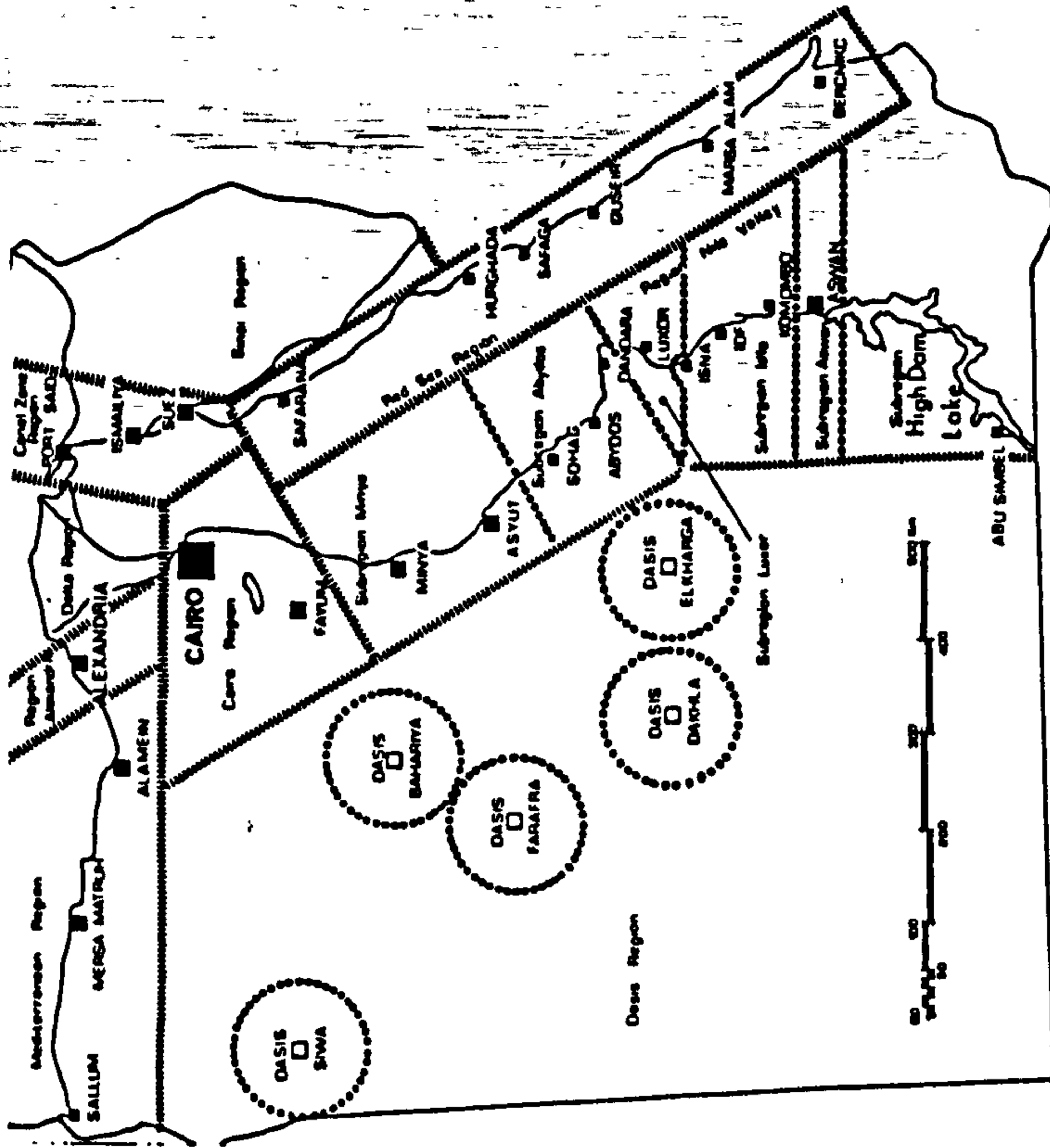


Fig. (6 - 11)

TOURISTIC REGIONS IN EGYPT

Source: Ministry of Development, North West Coast Development, (Undated), p.15.

the cultivable land to about 2,243,000 Feddans, 50% of which can be irrigated by the water available at present. Fig. (6-10) shows the possible land reclamation areas in South Egypt Region.

Mining research and work carried out in South Egypt Region shows that it has vast potential which can add considerably to the future economy of the country, and can provide new horizons for labour opportunities and industry as well as maintaining new settlements for large numbers of people. For example, it is estimated that the phosphate reserves in the Eastern axis of the region round Safaga, Quseir and Hamrawin amount to about 33 million tons in an area of 896 hectares. There are also other minerals like manganese, talc and quartz, besides building and industrial materials including limestone, marble, serpentine, sand, pebbles and salt.

The Western axis has iron ore and building materials. In 1977, huge amounts of phosphate were discovered extending over about 12,000 square kilometres in Abu Tartur Plateau (see Fig. (1-6) and Section 1.8.1). Production capacity is expected to be 10 million tons annually for at least 63 years. The total costs of the project will be £E 250 million, with a profit of £E 56 million per annum. A ground water reservoir is reported to exist under the plateau, and can possibly produce 12 million cubic metres annually, enough to serve about 30,000 Feddans of reclaimed land round the project (24).

Mining in the South Egypt Region is faced with the following difficulties:

1. Lack of water in the desert areas, unless water projects are fulfilled, such as from the High Dam Lake and from ground water.

2. Lack of infrastructure, including roads, railways and telecommunications.
3. Lack of housing, services and social facilities.
4. Lack of equipment and construction essential for continuous excavations to compensate for the expired mines.
5. Lack of skilled miners who prefer other industries in large towns where social life is at hand.

These difficulties have resulted in high costs and slowness of mining production and expansion. The industrial potential is abundant in this region for both extractive industries such as mining, and manufacturing industries depending on agriculture, fishing and dairy products. The only 1978 projects in South Egypt were estimated to sustain about 153,000 people including the dependants (25). Energy resources are available in the form of electricity from the High Dam and the Aswan Dam in addition to the possibility of using wind and solar energy available in the desert (26). The latter resources can increase the development potential of the region, especially at sites far from the existing networks.

Satellite research projects proved that there are sedimental layers in Southern Egypt carrying petroleum and international companies are competing in vast areas for test drilling (27).

The South Egypt region enjoys considerable tourism potentialities, as Pharaonic monuments in Luxor and Aswan, the Red Sea beaches and historic areas. In 1974 domestic and international tourism income in Egypt was only £E 75 million (28). The efforts exerted for tourism development are far less than what should be done to realise the potential of the valuable tourist attractions of Egypt, which if properly exploited would produce much more income, especially in the South Egypt Region which is the richest region in the world for archaeological tourism. It has numerous Pharaonic

monuments and historical centres in the Luxor and Aswan areas, as well as the aesthetic attractions of the Red Sea coast and the oases. To realize such potentialities, it is essential to provide adequate services including infrastructure, accommodation and airports round the tourist centres. It will also be necessary to spread information about tourism in the region at both national and international levels.

The present capacity of the hotels in the South Egypt region is not more than 3,000 beds, while the demand was estimated to be about 11,000 beds till the year 1982 only (29). Unless tourism requirements such as accommodation and infrastructure are met, Egypt will continue to lose this trading and employment opportunity. It is also essential to decide which types of buildings and ways of extension are more appropriate for such environments, to conserve the appearance of aesthetic or monumental sites. Should one have low buildings or bungalows or even sunken homes in the desert's ground like those in the South Tunisia Desert at Matmata, Fig. (7-2), in order to secure quiet and cool shadows in the heat of summer.

According to some estimations, the South Egypt Region can accommodate a population of 5-10 millions by the year 2000 (30). Agricultural expansion can take place in the New Valley Governorate and around the High dam Lake in Aswan Governorate on the proposed areas for reclamation. Fig. (6-10). In these areas the greatest number of population will settle to cultivate the land or to take part in other nearby activities such as fishing, mining and industry. About 260 new settlements of 25000 inh. each, and 5 major centres of about 200,000 inhabitants each, would have to be established to accommodate the activities in the region including land reclamation, agro-industries, mining and services in addition to the administration required for these new settlements. The main places for such new settlements will be in El Farafra, El Dakhla and El Karga oasis in

the Western Desert, and Toshka Basin and the High Dam Region in the Nile Valley. Fig. (6-10).

It is estimated that about 80% of the expected population of South Egypt will be involved in agriculture or related activities, 15% will be employed in industry and mining, and 5% in tourism and services (31).

It can be noted that the South Egypt Region has a range of diverse potentialities, though in most cases they are not exploited. Agricultural development in the region is important to increase the per capita share of the cultivated area in Egypt, which is now as little as 0.18 Feddans in the last few years (32).

The establishment of the different projects in the South Egypt Region will have to be accompanied by sufficient housing of suitable categories and services to match the requirements and the standards of those who will settle there, mainly of the low income classes, and to realise self-contained communities for work and living.

6.3 Water Requirements for Expansion Projects in Egypt

After the examination of the possibilities of expansion projects in the different regions of Egypt, the question of water sufficiency has to be discussed here to see if water is secured for the required new settlements. Nile and underground water supplies are expected to satisfy such developments especially in agriculture. The huge storage of fertile clay in the High Dam Lake can be used to improve the sandy soil in the reclaimed desert areas to make it heavier and more suitable for agriculture.

The studies of the expected water usage carried out by the Ministry of Irrigation (33) indicate that the total available water resources in Egypt as a whole amounts to 68.168 milliard cubic metres (a milliard is one thousand million), as follows:

55,500	milliard cubic metres, the agreed share of Egypt from the Nile Water
12,168	milliard cubic metres from re-cycling the drained water
00.500	milliard cubic metres of the ground water in the Delta region

68.168

The present need of irrigation, domestic and industrial water amounts to 51.408 milliard cubic metres, so the surplus water available at present for agricultural and urban expansions, is 16.76 milliard cubic metres. In addition 9 milliard cubic metres, as Egypt's share, will be gained in the late 1980s as a result of the completion of the Sudd Projects round Bahrel Jabal, Bahrel Zaraf, Sobat and Bahrel Ghazal in the Nile Heights, in West Sudan which will avoid the immense loss of water by transpiration and evaporation in the Sudd Region caused by the thick plants which block the Nile tributaries in that region. (Sudd in Arabic means 'block'). Fig. (6-13) and Section 7.2.4. This implies that $(16.76 + 9.00)$ 25.76 milliard cubic metres, which is equivalent to about 50% of the present water needs, can be used for urban and agricultural expansions. Presumably less water will be needed if more efficient irrigation methods are followed as drip or sprinkling irrigation and water recycling, for more use of water in the desert, see Appendix (4).

6.4 The Development Form in Egypt

The review of potential regions in Egypt makes it essential to suggest particular assumptions about the general form of development in future including the establishment of new settlements. The development of both the North West Coast Region and the Suez Canal Region implies the continuation of an "East-West Development Axis" along the northern parts

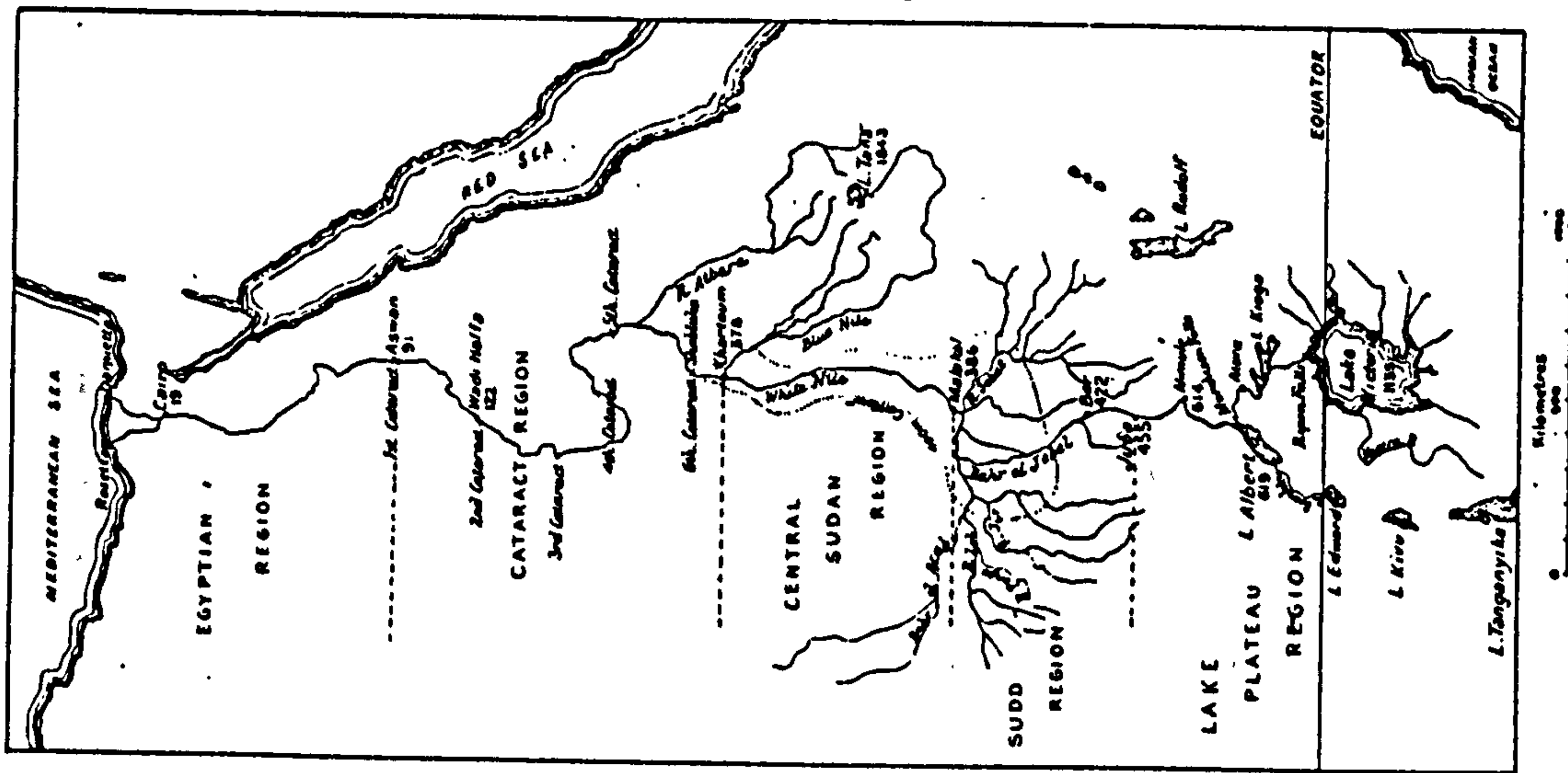


Fig. (6 - 13)

THE NILE AND THE SUDD REGION

Source: J. Ball, Contributions to the Geography of Egypt, 1952, p.71.

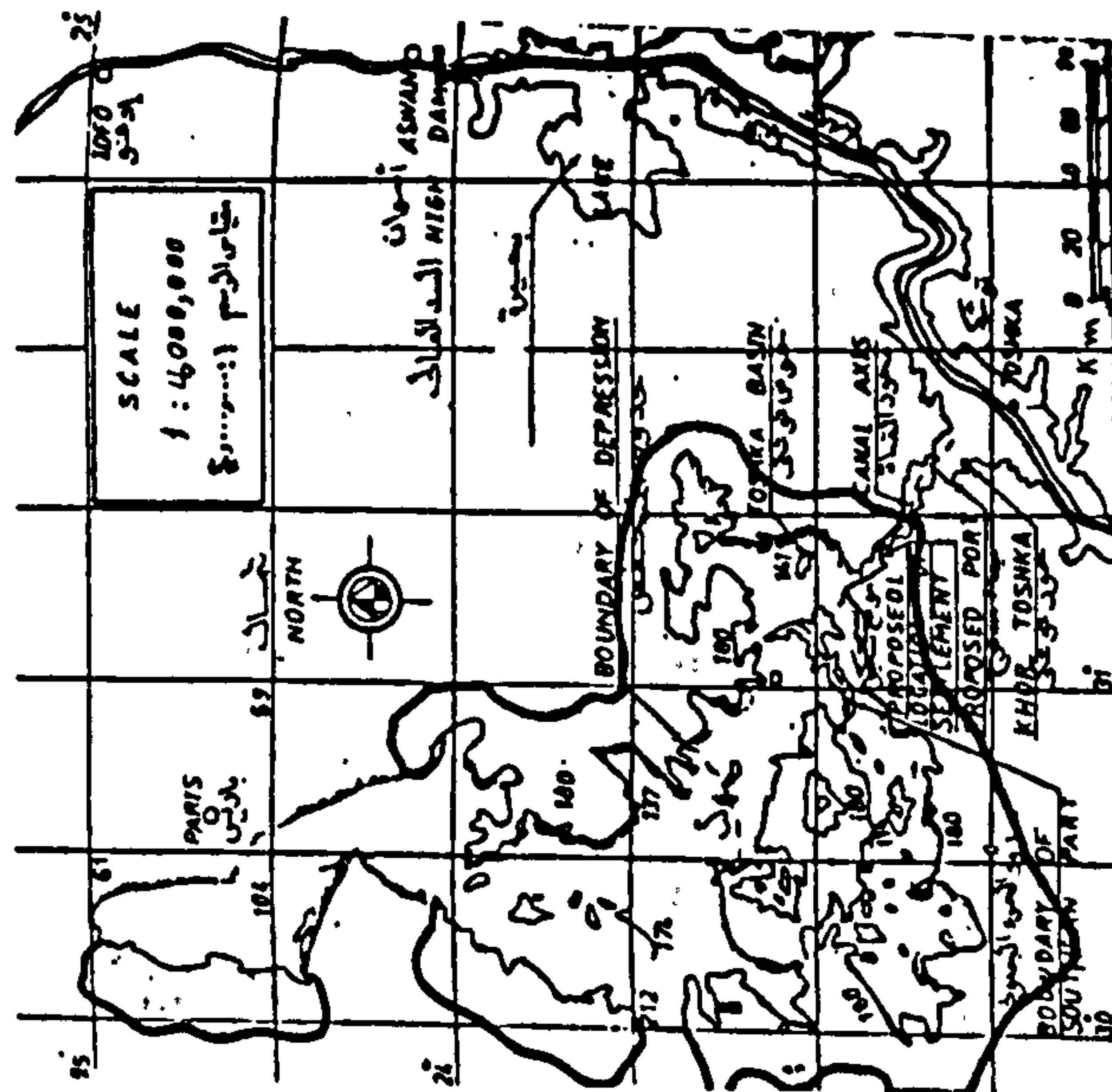


Fig. (6 - 12)

TOSHA BASIN, KHOR AND THE PROPOSED CANAL

Source: Late Dr A. Ata, Egypt and the Nile after the High Dam, (Arabic), Jan. 1978.

of the country across the Nile Delta which has always been the main developed area in the north of Egypt. Overcrowding of the Delta might be diverted into the wings of the axis which has the potential for land reclamation, industry and services. This may result in a more balanced distribution of population in the northern parts of the country including the northern areas of the Sinai peninsula and the North West Coast.

Similarly, the development of the Western Desert depressions would lead to a "North-South Development Axis" parallel to the Nile Valley at a distance of about 200-300 kilometres. To that must be added, on a smaller scale, the expansion possibilities towards the desert from both sides of the present inhabited area in the Nile Valley itself, and the potentialities round the Red Sea Coast at the eastern part of the country. Fig. (6-14) illustrates such assumptions of the development axes in Egypt for the long term planning. Both of the East-West Axis and the North-South Axis of development necessitate comprehensive regional plans aiming to spread development, probably doubling the present inhabited area of Egypt to absorb population growth and to reduce the overconcentration of the present inhabited area.

The development of desert areas will mainly depend on water supply. As mentioned in Sections (6.2.4) and (6.2.5) above, the regions of the East-West Axis can make much more use of storm and ground water. The United Nations FAO has started a programme to establish storm water dykes at the North West Coast to irrigate more cultivated areas, see Section (1.3.2), and the Nile water which will be carried via irrigation canals, such as the Bahig Canal, which takes water from the north-west of the Nile Delta and runs westwards parallel to the Mediterranean coast. The same methods can be applied in the eastern wing of this axis towards the Suez Canal and Sinai Region. Storm water, including that flowing from the Sinai Valleys to its northern plains, can considerably help in the development of this axis. The

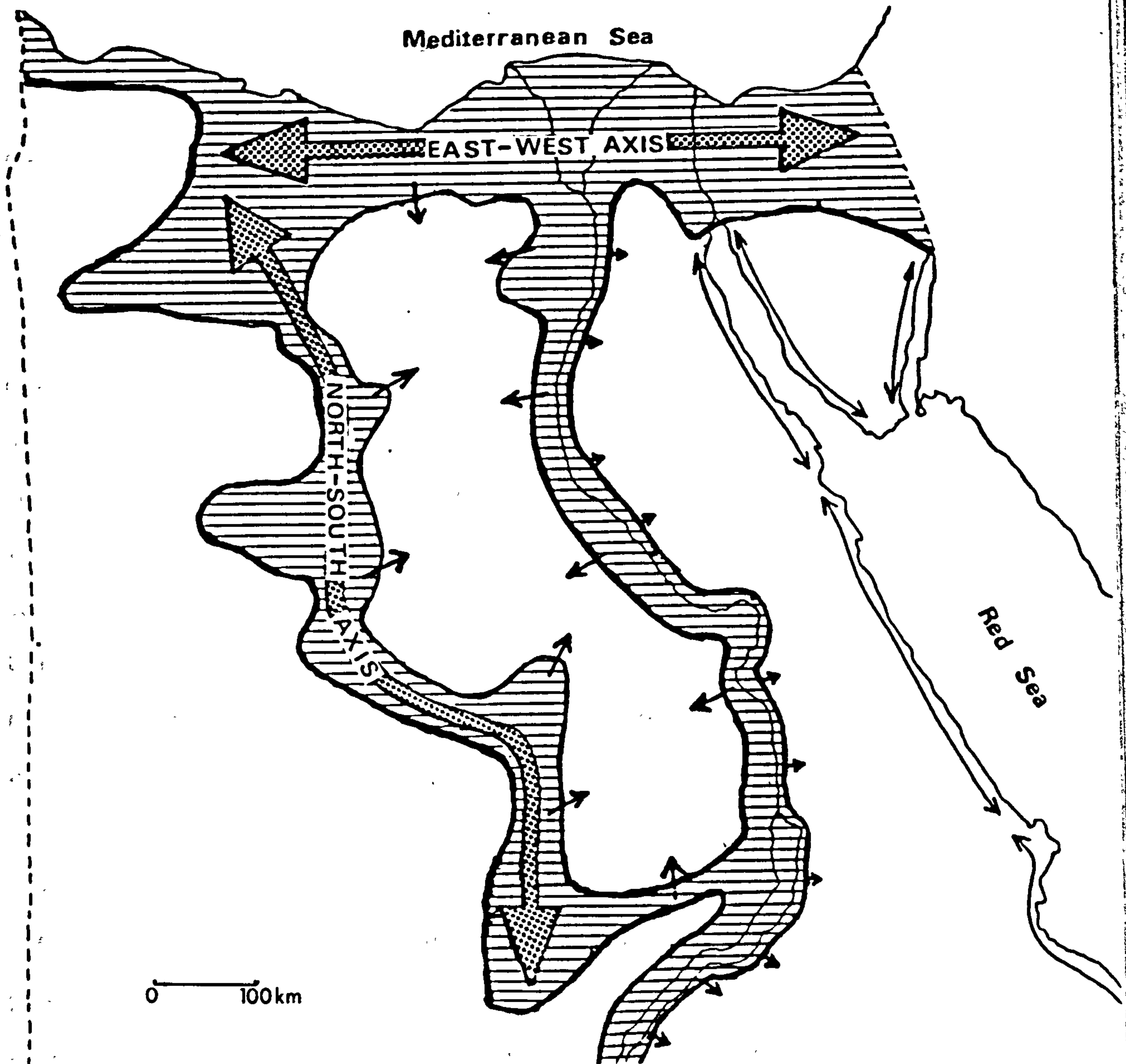


Fig. 6-14

Development Axes In Egypt.

See also Fig. (1-11)

N.B. The development of the North-South Axis is based on the potential of the Western Desert depressions particularly water resources. (See also Sections 1.3.2. , 1.8.1 & 6.2.7).

existing Ismailia Sweet Water Canal is being widened to satisfy the increasing needs of development projects including the Tenth of Ramadan new industrial city (see Chapter Five), and the reclamation areas between the Nile Delta and The Suez Canal. Sinai is also being supplied with the Nile water through the tunnels under the Suez Canal. In this way, water supply for the East-West Axis does not form a problem if adequate water projects are carried out to make the best use of water.

For the North-South Axis and the development of its potentialities already mentioned in this Chapter, the storm water is negligible but the ground water is obtainable especially at the bottom of the depressions. Stored water and fertile clay from the High Dam Lake can be used in the development of the depressions of the North-South Axis. It can be seen that water resources do not form a problem in the development of the North-South Axis, but money, skills and marketing have to be adequately provided to establish proper and sufficient settlements. Lack of finance in Egypt has to be overcome via the development of resources for more exports and less imports, while foreign loans will be sometimes inevitable.

As mentioned above, comprehensive regional plans are essential to realise the exploitation of the available potentialities in each of the two axes, and to establish the new communities on a solid basis to accommodate population growth in a well-planned environment. On the other hand, the development of the North-South Axis might encourage more development towards the parts of the Western Desert between this axis and the Nile Valley. The time may come when the inhabited area of the country will cover the whole area between the Nile Valley and the depression line of the Western Desert.

Opening up new desert areas needs a wise policy and effective management and monitoring to organise the establishment of the new settlements to make the best use of money and planning science, and to

provide sufficient jobs and attractive places for the new settlers to live in, or new environments for the working classes similar to the UK practice in new towns with differences in social, economic and climatic circumstances.

6.5 Conclusions

The development resources of the unsettled desert areas of Egypt are abundant and diversified. Some of these resources are partly exploited, while others are still untapped. The establishment of new settlements equipped with infrastructure and services is essential for the proper exploitation of desert resources. The adequacy of the water supply has to be carefully studied before considering any other aspect of the plan.

Efficient communications between the new settlements are of prime importance to make one experience available to others, while direct links with national networks must be secured to get anyone to live there and for adequate communication and experience from the existing settlements.

Where soil and water resources are appropriate, reclamation areas can support the establishment of the new settlements including those having non-agricultural aims, such as industrial or tourist settlements to satisfy their food requirements, and to increase the cultivated area of the country. In other words land reclamation should be a common factor in the new settlements establishment. Salhiya experiment (Section 6.2.4) gives a good example to be followed for desert reclamation. Some crops of economic importance can grow wild (naturally) in desert areas. Their needs of water and skilled labour are quite limited, while they can support economic industries such as medicine and perfumes. Other natural resources, like petroleum and mining products give further bases of desert development for new settlements.

New Energy resources like biogas and solar and wind energy are more suitable for desert areas where networks, installations and maintenance required for other kinds of energy are not very easy to achieve. Animal and

plant remnants in the agricultural communities can produce biogas energy, while solar energy can be used directly in heating and cooking and indirectly in cooling, lighting and industry.

Both the existing and expected potential, including land reclamation, has to be developed properly to provide more opportunities for the absorption of the increasing population of the country. The establishment of new settlements, as major industrial service centres of 200,000 - 400,000 people, or smaller agricultural villages of 10,000 to 25,000 inh. (since industry and services need much bigger communities than farming) represents the best way to exploit such potential by the provision of places of living and work for the new settlers, and the services they need.

In addition to the virgin regions, there are the developed regions, such as Suez Canal Region and its natural extensions in the Eastern Desert and Sinai, where many existing projects and services, and the character of the virgin desert areas with ample resources. These considerations are important in relation to development continuation of another habitable axis from the North-West Coast, across the Delta to Sinai in the east, with two major southward extensions: the existing one represented by the Nile Valley, and the expected extension on the depressions' line in the Western Desert parallel to the Nile Valley and known as the New Valley, Fig. (6-14).

CHAPTER SEVENGUIDELINES FOR THE DEVELOPMENT OF SETTLEMENTS IN EGYPT**7.1 Introduction**

As mentioned since the beginning of this study, the aim is to establish principles and methods applicable in making plans in a new town policy in Egypt to reduce the concentration of activities in the limited inhabited area, using as a pattern the United Kingdom new town practice. The urban fabric of the country has to be organized in the most efficient way to realize the essential dispersal of urban growth in relation to the available resources of the developable areas. This solution can be best found through the planning of new settlements, in addition to the expansion of some existing ones as practiced in the British new towns, in regions with the potential for development as those discussed in the previous Chapter. At the same time, any policy to redistribute the population must be coordinated and integrated with development plans, because such plans are for the benefit of the people who are expected to realize development aims. These aims can only be achieved by the extension of economic and social development to increase the national income and to secure sufficient employment and services for the increasing population.

When laying-out a national planning framework for Egypt, a balanced distribution of development projects and services in places with available sources especially in industrial and agricultural terms, can diminish rural/urban migration, while realizing the essential dispersal of the population whose overall density in the inhabited area reached 1072 persons per square kilometre in 1978(1). Population densities in three selected city areas are shown in Table (7-1).

Table (7-1)

AVERAGE POPULATION DENSITY IN SOME BIG CITIES, 1976

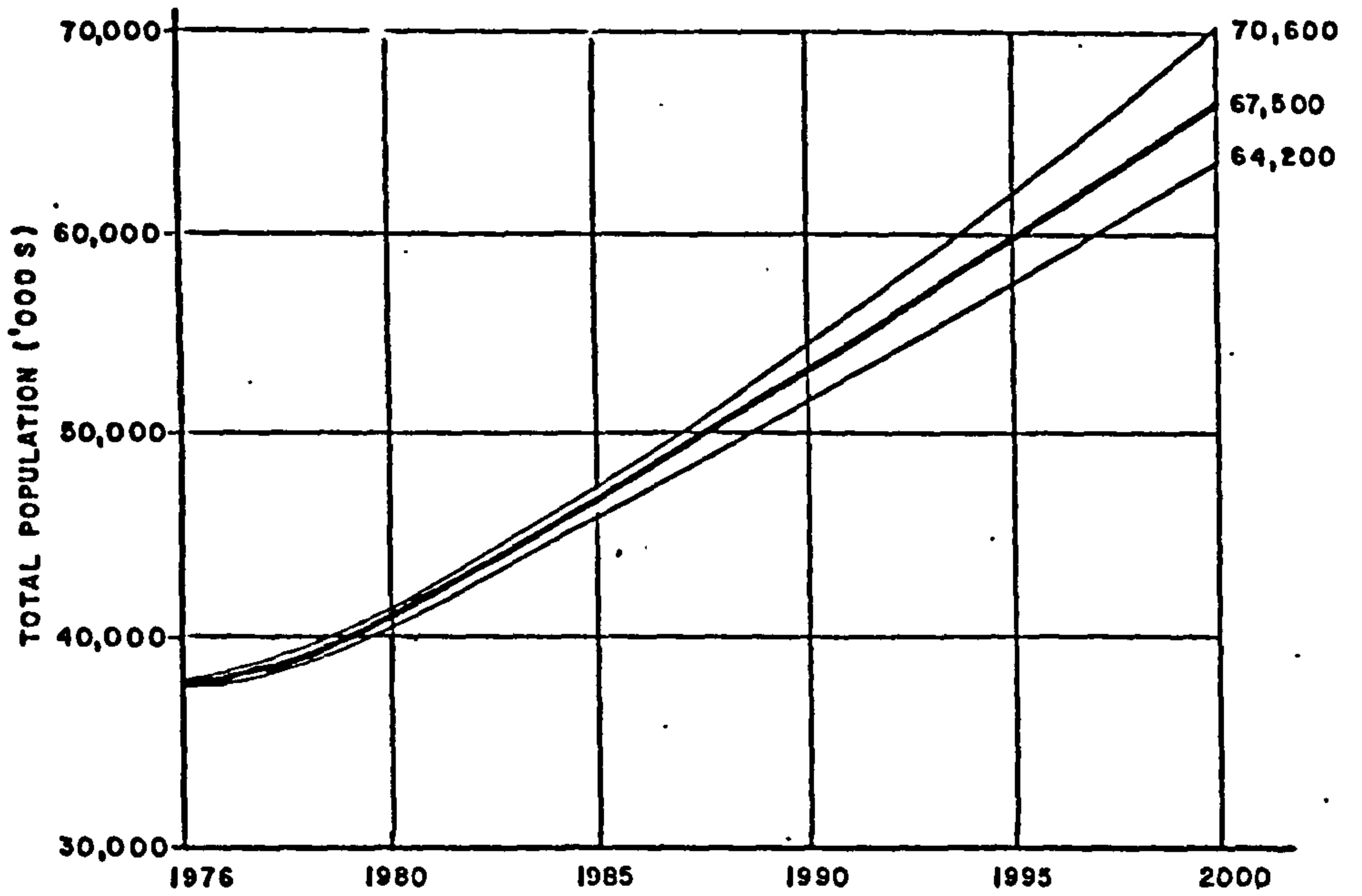
City	Average Population Density Per Sq. Km.		Increase
	1966	1976	%
Cairo	19,593	23,737	21.15
Giza, the Western part of Greater Cairo Region	7,591	16,381	115.79

Source: CAPMAS, The 1976 Census. (adapted).

These figures show clearly the continuous increase in density of urban population and illustrate the pressure on urban services and the neighbouring agricultural areas. The difference is clear if compared with densities in some urban areas in Britain: Greater London 4,238 per Km², Liverpool 4,516 and Birmingham 3,814 (Britain 1982). The case in Egypt rural areas is hardly better than that in many urban areas, for one can find some villages of 30-40 thousand people increasing at a high rate of about 3% annually amidst the valuable agricultural land.

However, if settlement expansion were limited to densities equal to the 1976 average urban gross density, which is quite high - 23,737 persons per square kilometre in Cairo Governorate for example - only an additional population of 6.2 million could be accommodated within the boundaries of existing settlements(1a), yet the increase of the urban population over that of 1980 is expected to be about 19 million in the year 2,000, Fig. (7-1). Almost the same result can be obtained from another estimate(1b) which

EGYPT TOTAL POPULATION 1976-2000



EGYPT URBAN POPULATION 1976-2000

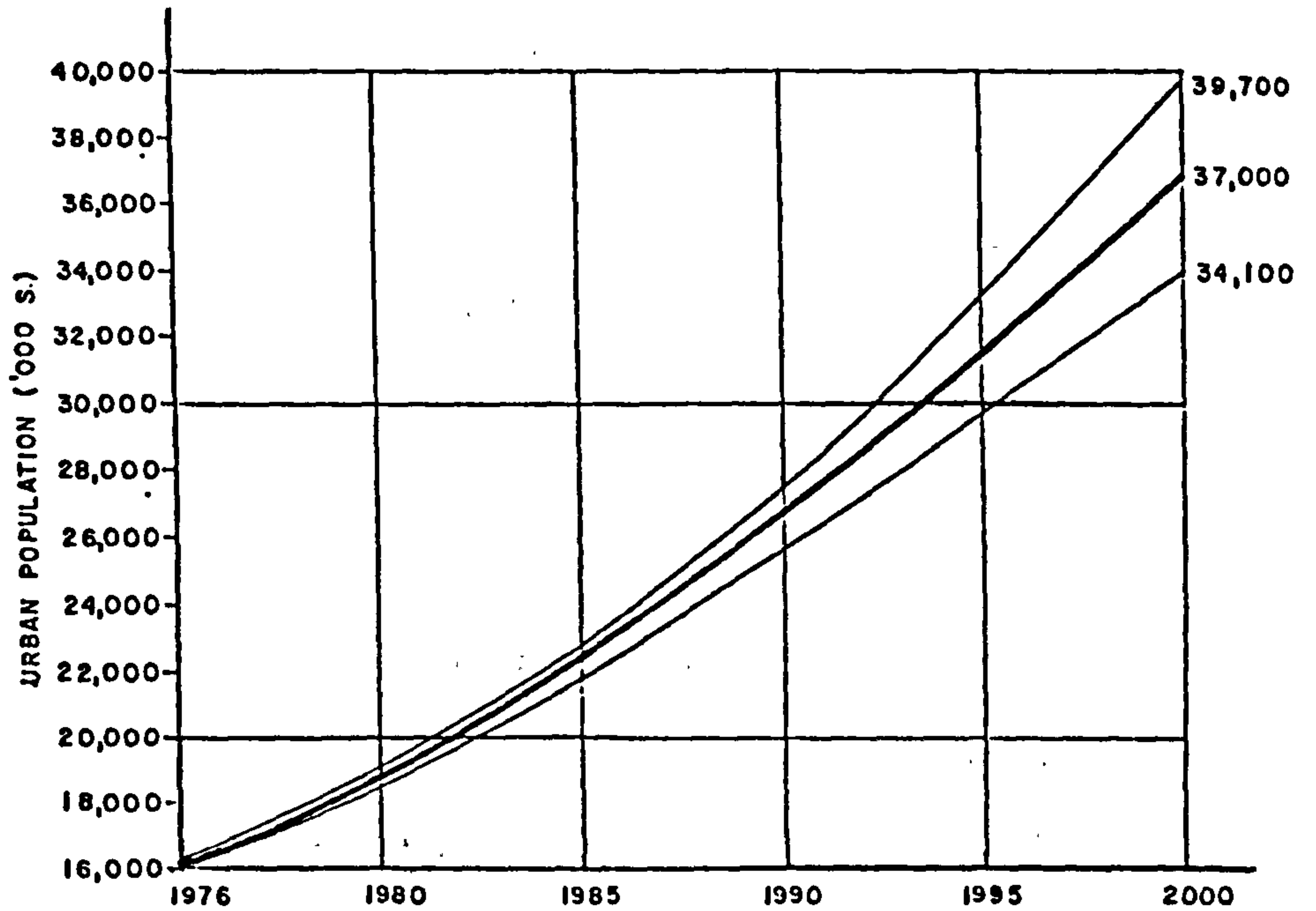


Fig. (7 - 1)
TOTAL & URBAN POPULATION IN EGYPT, 1976 - 2000 .

Source: Ministry of Development, N.U.P.S.,
Jan. 1981, p.89.

indicates that the total increase in urban population up to 1990 will be about 9 million, of which it is hoped that about 4 million could be settled in the new settlements in regions outside the Valley, another 4 million in the new extensions of the existing urban settlements onto desert land, and one million in the old urban settlements themselves. As for the increase in the rural population for the same period, about 3.7 million, it is hoped that half this number could be settled in land reclamation outside the Valley, and the other half inside the Valley. Any additional population would require expansion of settlement boundaries, often within arable land, or would better require the establishment of new settlements far enough from the scarce agricultural areas to preserve the latter. Since most of the services of the existing settlements are overloaded, the latter solution is much more reasonable.

Technical and economic research is important to test the practicability and to show the feasibility of resources exploitation, marketing, and the financial and legal framework of economic planning and added value. Historical data may help in a diagnosis of the shortcomings and in finding adequate resolutions for present and anticipated problems. Ideally the development plan should be designed to co-ordinate the economic activities of production, investment, income, employment, social services and consumption rates. Contacts with the experience of others is important, as is making use of relevant experience from abroad applicable to local circumstances.

If the industrial revenue exceeds the agricultural revenue, raising the standard of living can be remarkably realized since the per capita income from industry is higher than that from agriculture. This would involve a radical conversion of the economy of Egypt from an agricultural into an industrial/agricultural economy. See Table (7-2).

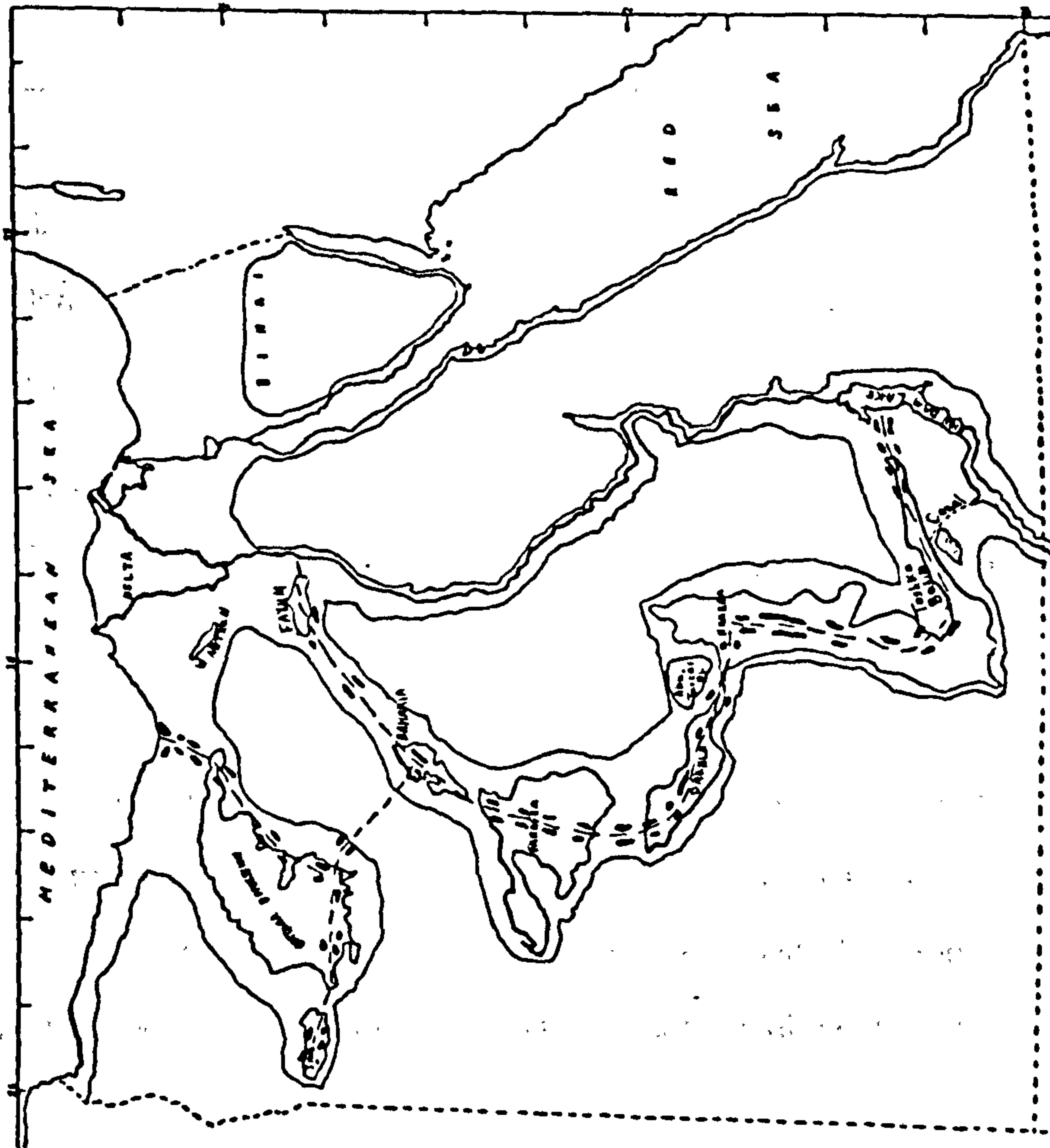


Fig. (7-1a)

SUGGESTED AREAS FOR THE ESTABLISHMENT OF THE NEW SETTLEMENTS IN EGYPT

Glowczvski's Proposals:

- The Pipeline
- - - The Human Settlements

Proposed location for New Settlements in Toshka Basin by Late Dr A. Abul Ata, the former Minister of Irrigation, in "Egypt and the Nile After the High Dam", Arabic, Jan. 1978.

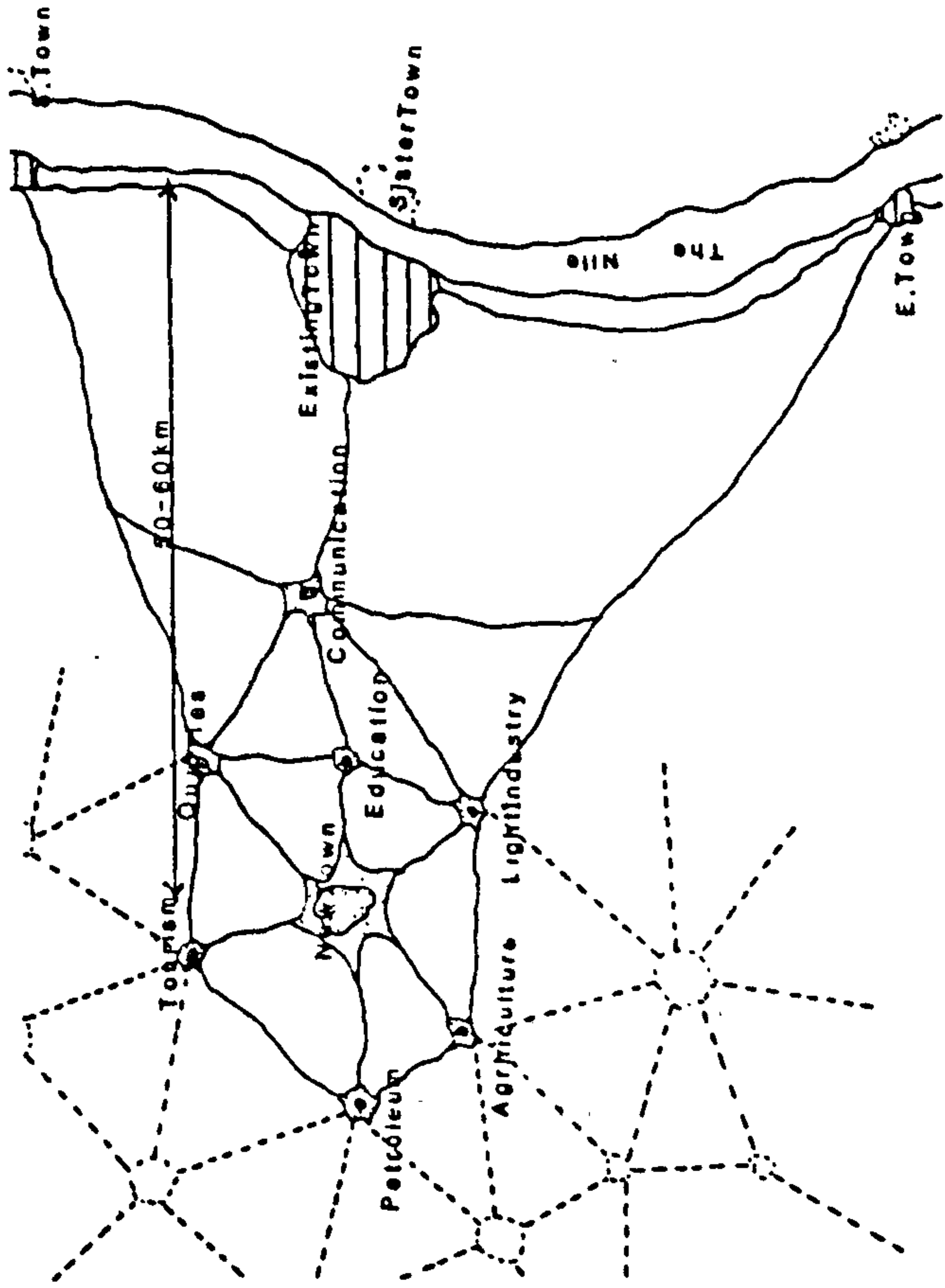


Fig. (7 - 2)

A theoretical assumption of the new settlements as satellites to a new town according to the available natural resources of each site, and the other alternative of developing sister settlements on the other side of the Nile.

We have seen that Egypt has a considerable agricultural potential, enjoying such attributes as suitable weather and water resources from both the River Nile and the ground water. Land for reclamation is abundant, and the skilled labour force for agriculture will not be a problem if sufficient training programmes are provided for young people. The expansion of the cultivated land must take priority in order to produce more crops to satisfy the growing population's needs and to eliminate or reduce importing food commodities. It may also be possible for Egypt after satisfying the domestic needs to export surplus fresh, canned, frozen or processed crops, thus helping to improve the balance of payments situation and to pay for the import of more advanced equipment for production. The same possibilities exist in dairy and fishing products.

TABLE (7-2)

GROWTH OF EMPLOYMENT IN EGYPT, 1960-1973

Sector	1960	1973	Growth %
Manufacturing Industry	602,000	1,139,000	89
General Services	1,100,000	1,800,000	64
Agriculture	3,245,000	4,164,000	28

Source: UNDP, Suez Canal Region Plan, 1976, p 57.

NB: Population in Egypt increased from about 26m. to about 36m. in the same period.

In addition to agricultural raw materials, the increasing petroleum(2) and mining production can support substantial industrial development.

Domestic and foreign companies must be encouraged to open subsidiary companies in new settlements to achieve faster development and

more jobs as was the case in some British new towns. Tax and customs exemption for the first years, land lease or cheap land prices and services provision, and if possible, financial support and grants represent some incentives to attract more investment in the newly developed areas.

7.2 The Aspects Affecting Development

Since all new communities are established to realize specific development aims, their formation should be purpose-designed, related to recent development requirements. That may give them a form different from that of the existing communities which continue to have their traditional characteristics. To offer the new settlers the chance to contribute to the new communities' success, planning for the communities should be on an integrated and efficient socio-economic basis. Raising the standard of living could be based on the re-adjusting of the structure of production, with more industrialization and advanced technology. Service projects have to be decided in the light of the interests of the people, which must be the basis of any successful plan for new settlements.

It should be noted that human and natural resources as well as any other available potential have to be developed on an agricultural/industrial base. The following sections illustrate some guidelines for the development of new settlements in Egypt, to make the country more than just the Nile Valley and the Delta, bearing in mind some relevant lessons from the British new towns practice as a successful experiment in the century.

7.2.1 Selection of Location

The location of a new settlement forms a vital factor in its success or failure. The different alternative locations should be carefully studied and evaluated in relation to requirements and to available resources in the light of the ties with the surrounding regions, Fig. (7-1a). Restrictions of

resources and development priorities may determine the form and location of new settlements, as the case of the British experience in the Greater London Plan, 1944, where 8 new towns were planned to be built round London.

As mentioned in Section 1.3.1, the Nile Valley and its Delta form the backbone of the country. That might be used as an argument to establish some of the new settlements within a suitable distance from the valley and its agricultural lands, possibly 50 - 60 kilometres, near enough to secure an easy and continuous water resource directly from the river, but far enough to minimise commuting to existing settlements, as in the case of 10 Ramadan. That compromise distance also allows reasonable accessibility to existing national networks, including roads, railways and electricity lines, and to places offering some specialised services including those of development, medical and social care and education. At the same time, this average distance should be sufficient to prevent urban encroachment onto the scarce agricultural land. When a new settlement is sited far enough from a major city, many dangers can be avoided. These include the risk of coalescence, the destruction of the green belt, if there is any, and the possibility of commuting. If a new settlement is too far from an existing one there is a danger of collapse of commercial and industrial ties and the splitting-up of families. A virgin desert site for the development of the new settlement gives more freedom to the master plan. It also avoids the need to integrate the new and old population that is present when an old settlement is expanded, ^{and} gives more freedom to the master plan(3), but it needs to start all the social life and services from scratch to create the community spirit.

On the other hand, the selected site must be capable of being drained and sewered at a reasonable cost, which is one of the heaviest overheads that a new settlement has to carry. So, gentle contours, not steeply sloping

or flat, are important for good design, lay-out, landscaping and drainage.

The Nile Valley crosses the country from north to south which gives a comprehensive variety of sites along its sides from which to choose the most agreeable location in relation to the natural resources essential for development, while access to a permanent water resource is easy. The western side will generally be more suitable for such development because it is wider and the land is less steep and more accessible to the desert than the eastern side (see Section 1.3.1).

Alternative locations for new settlement can be found near the Mediterranean and the Red Sea shores with their tourism and fisheries potential and water desalination possibilities, and the export-import possibilities.

The third possible location for new settlements is to be found in the depressions of the Western Desert. There it would be possible to make use of ground water resources and land reclamation potential which can be of importance in increasing the cultivatable and, hence, inhabited area of Egypt, while shortage of food production could be reduced, if not eliminated.

On the other hand, the new big towns in Egypt might be considered as nuclear urban centres in the desert, on which to base the development of 'satellite' new settlements, each at a distance of about 20-30 kilometres from the new town and directly connected with it. Fig. (7-2) shows how villages based on, for example, reclaimed land, quarries for building materials, mineral or petroleum sites, communication or tourism sites, could be related to one new town. 'Education settlements' can also be established round the new towns to accommodate colleges and specialized institutes to cater for citizens and foreign students, especially from other Arab and Muslim nations. Around such new settlements, including the new town itself, land reclamation should take place wherever possible to provide food

and green areas for the new settlers, similar in principle to the garden city where a combination between urban and rural areas is realized with strong links between the communities.

Outside this basic hexagonal development, other hexagons could theoretically be placed, as shown by dotted lines in Fig. (7-2), to spread out the inhabited area wherever possible to form a balanced pattern of settlements and to allow flexibility in development. The aim must be to make use of the available services and potentials in the new towns such as administration, infrastructure, education, health and social care, entertainment and shopping facilities. This idea might result in the reduction of the per capita cost in such new communities through their dependence on some of the central new towns' services, while providing more inhabited areas outside the Nile Valley.

As mentioned above in this Section, the western side of the Nile Valley is wide enough to accommodate possible new towns and satellite villages. But the eastern side is mostly narrower. So smaller 'sister settlements' might form another alternative to be located in the desert on the eastern side facing major existing cities in Upper Egypt, Fig. (7-2), making use of the latter's services wherever possible via some bridges across the Nile, as the case of Beni Sweif city.

These proposals for the location of the new settlements aim to avoid the extension of the existing settlements, because about 66% of those having more than 50,000 population are surrounded by agricultural land so that any expansion of them would take place on arable land, especially in the Delta region(4).

Consideration should be taken before site selection is confirmed, to avoid sites of any archaeological or historical possibilities, and to protect such invaluable heritage against urban growth. So it is essential to consult archaeologists before a final decision can be made for site selection.

The foregoing analysis shows the importance of a policy to locate new settlements in Egypt as a prerequisite to any new town programme. The following check list would help to determine the site of a new settlement in Egypt:

- Proximity to water resources.
- Availability of space for designation objects as population size, density or employment.
- Suitability of topography for drainage, lay-out and landscaping.
- Accessibility to existing networks.
- Availability of resources.
- Proximity to land reclamantion potential.
- To avoid archaeological and historical sites or mining locations.
- Being far enough from existing agricultural and urban areas.

Table (7-2a) evaluates some priorities in site selection for a new settlement:

Table (7-2a)

CRITERIA	SITE X	SITE Y	SITE Z
A - Proximity to Nile and Water Resources (times 5)	15	5	10
B - Availability of Space for Present & Future Develoepment	1	3	3
C - Suitability of Topography	2	3	2
D - Accessibility to Infrastructure & Networks	3	1	1
E - Availability of Resources and Building Materials	2	1	2
F - Proximity to Reclaimable Areas for Agriculture	2	2	3
G - Far-off from Archaeological Sites	1	3	3
H - Far-off from Agricultural Areas	1	3	3
I - Far-off from existing Settlements	2	3	3
J - Proximity to Port and Beach Sites	1	1	3
TOTAL	30	25	33

For Table (7-2a)

PRIORITIES OF SITE SELECTION FOR A NEW SETTLEMENT IN EGYPT

Criterion:

Highly Satisfactory	3
Moderately Satisfactory	2
Not Satisfactory	1

N.B.: Water Resource's scores are multiplied by 5 as a decisive criterion in dry areas.

7.2.2 Finance, Management and Co-ordination

The capital needed for the establishment of the new settlements has to be borrowed or obtained from the government or from somewhere else such as development banks or the UN organisations. This capital has generally to be repaid, along with other expenses such as those for management and legal procedures, over a specified period by the people who live and work in the new settlement. That means that the new settlement is bound to show a deficit in its early years before it becomes fully revenue-producing. It also means that private capital must be involved in industrial or commercial projects if the needs of the new settlements are to be met without restraining the country's economy. So it might be appropriate to establish 'development banks' to finance the sectors of the new settlements, especially the housing and projects sectors which can be built partly for sale. It should be noted that it is mainly on the success of industrial and commercial projects that a development authority can rely for profit, other things, such as roads, infrastructure, social and medical care, being considered as non-productive service sectors.

On the other hand, in the establishment of some investment-designed settlements, like oilfields, mining or sea resorts, payment could be made for the privilege by a national or international company with fixed terms of controls, of development or management, for a specific period of investment, say 20 years, after which the assets would be handed over to the

government which has had to provide the regional infrastructure and governmental services. The state with land, and the private sector or the co-operatives with money, could participate in such investments. The primary purpose of such institutions would be to direct finance to the area and eventually be the means for the self-financing of later developments.

Rents of houses must cover the cost of repairs and maintenance, a policy which has to start even when houses are new, to make a balance when major repairs are needed. Concerning the low-cost housing, the only possibility is to subsidise, to an extent, from certain revenues or taxes generated in the new settlements, perhaps as oil or mining revenues, or to help people build their own houses according to approved designs and densities, and to do their own repairs.

The several responsibilities require that the development corporation must have numerous specialized sections and departments. Fig. (7-3) represents the author's idea, with backgrounds from U.K. and Egypt's practice, for a suggested structure of management for the development corporation. The Advisory Committee of Development is appointed by the Minister of Development representing the Central Government, and helped by a Central Planning Authority(GOPP). The Minister also appoints the Chairman of the Development Corporation who selects the Board members and appoints a general manager and the staff. By this system, a hierarchy of management is secured to work for the corporation within the national plan and requirements.

An important point arises here about the difference between the U.K. and the Egyptian practice concerning the Development Corporations. The British system makes the county council and the district council remain responsible in the new town's area for all the normal services, including such things as the provision of schools. The local authorities are consulted in all development proposals (see p.93). For this concept is applied in Egypt, a

new town would have to form a part of the concerned governorate plan. But this is not the case. Fig. (5-20) on p.222 shows management levels in the 1982 Development Plan of 10 Ramadan prepared by the Ministry of Development. It indicates that 10 Ramadan new town, and presumably the newer new towns, are directly related to the Minister of Development, or his organizations, but not to any of the governorates. 'The overall administration for the new city is entrusted to the New Communities Development Authority, closely connected to the (central) government represented by the Ministry of Development', (see p.226) and 'all the service sectors like supplies, health, housing, labour force, education and police are related and administered by the Development Corporation', (see p.237).

This system of independence of the new towns could be accepted in the early stages of development as most of the Egyptian new towns will develop in desert areas, away from the present inhabited area, and will need some skills which may not be available in the present governorates. But when these new towns become fully developed and must not be left to run on their own, they have to be transferred to the local authorities, ie to the concerned governorate, to be well related to the national plan, and to have greater co-ordination with the rest of the country

The Central Advisory Committee of Development, with a membership representing different specializations as planning, engineering and demography, is needed to prepare a co-ordinated national policy for the new settlements and to define their functions, sizes, finance, planning and construction. The management of the new settlements, the development corporation (see below), should be the responsibility of an 'independant' governmental department related to the Advisory Committee, to follow a

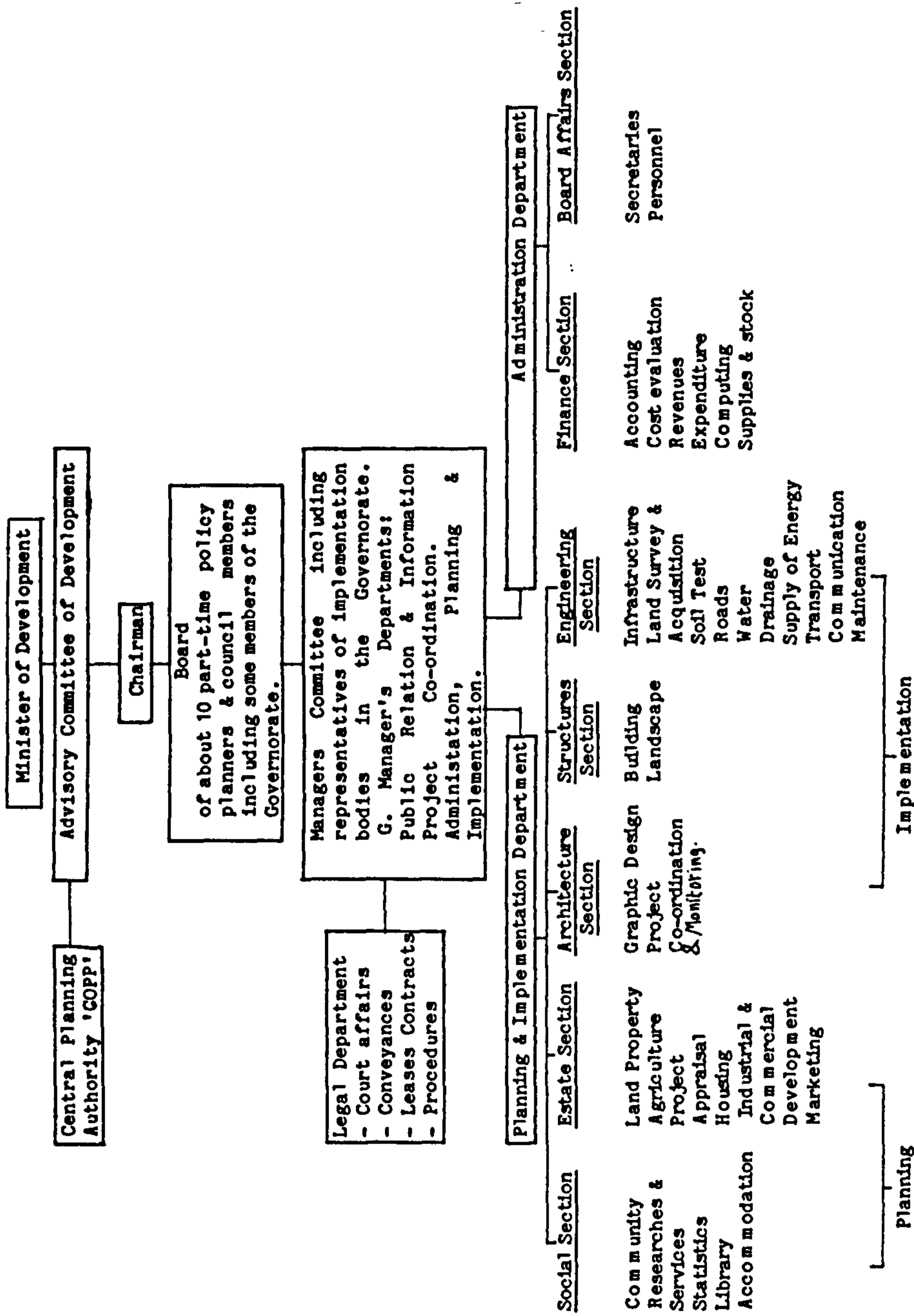


Fig. (7-3)
A SUGGESTED ORGANISATIONAL CHART FOR A NEW SETTLEMENT IN EGYPT
See also Fig. (5-20)

fixed national plan to take essential decisions for development. Its relations with the governorates should be co-operative and integrated. A Board of about 10 part-time members, including some of the Governorate counsellors and some planning skills, and led by a Chairman, can prepare for the plans and take the decisions, Fig. (7-3). Its main responsibility should be to develop the land, enter into contracts and carry out other functions and legal processes in the course of building the settlement. To save management costs, one corporation in a new town could also supervise a number of satellite villages of relatively small sizes, 10,000 - 20,000 people for example, Fig. (7-2) and Section 7.2.1 above.

Decision-making for master planning and policy matters should be the responsibility of the Advisory Committee. In fact, the British experience showed that the corporation will need all the powers that an ordinary large-scale developing landowner would possess, plus some powers usually exercised by the local authorities. The development corporation powers should be carefully defined by the Advisory Committee and free from day-to-day administrative control by the government. A corporation will also need to have direct government responsibility, and to have the freedom of a commercial undertaking. A system of land use control has to be adopted along with a machinery for positive settlement construction. Schemes, prepared by the Advisory Committee should be subject to Central Government and Parliament approvals to assure that they are within the national framework and requirements. Only then such schemes will be ready for the development corporation to apply.

The corporation staff should be a group of individuals with varying specializations, assisted by professionals working as a team with a desire to render public service. They have to consult the local authorities on development aspects, so the relationship between the corporation and the local authorities should be of full partnership. The number of staff should

be related to the target population. The UK number of staff of the development corporation is in the order of one employee to every 291 people of the target population (as an average of 1979-1983 in Basildon, Milton Keynes, Warrington, Runcorn and Washington). The Egyptian practice could be less, such as one employee for every 500 people to save staffing cost especially if the quality of staff improves, and self help houses increase. This number will presumably vary according to implementation and monitoring requirements. The more advanced is the new town the less need for staffing especially the manual labour.

The information about every new settlement concerning development principles, materials, costs, building types, needs to be carefully studied and recorded by the development corporation, and to be sent to a central planning authority, probably attached to the Advisory Committee of Development, to make experience gained in a new settlement available to others.

After about 20 years, or when the new settlement becomes a place for work and living for about 75% of the target population, with sufficient services, a local council should be elected and a staff employed to replace the development corporation and to take care of the normal services such as maintenance and small works. In this stage, management and monitoring are needed more than construction. The corporation staff, or part of them, who know a lot about the settlement could be a reasonable choice for the local authority.

Proper attention should be paid to economic factors to secure capital repayment over a reasonable period via commercial revenues as from selling some of the assets of the new settlements as lately practiced in some British new towns (see note 37 in Chapter Three). The corporation staff members have to explain to the new-comers what they are doing and consider criticisms and suggestions. They have to encourage public participation in building core houses or self-help houses which form an

important element in low cost housing.

The neighbourhood idea is appropriate in Egypt. It provides a small community of 4,000 - 5,000 people, with some ties between them, similar to the traditional Egyptian village. GOPP included its assumptions in a report on 'Planning a Neighbourhood' (undated) that it is an area for residence equipped with sufficient services at a distance of not more than 10 - 15 minutes walk, including a primary school and a shopping centre, free from heavy traffic, railways, rivers or administrative boundaries, to secure safety of the children. Management in the new settlement should notice that the neighbourhood idea must not detract from the unity of the new settlement which is necessary to create a sense of 'togetherness'.

The establishment of a new settlement requires co-ordination and programming for its different projects. That makes it essential to schedule flexible plans for the implementation, to select priorities that provide services at the proper time, and to consider forecasts about population and their needs, traffic circulation, industrial growth and other activities requirements in the new settlement in relation to available resources. Also, integration between the places of residence, work and recreation should be considered in the Master Plan to minimise daily traffic needs and facilitate life in the new settlements. Essential services and facilities should be no more than a walking distance from residential areas on the neighbourhood level. The Hook plan, London 1961, gives a good example to what can be done to plan for a new settlement as for population structure, services, master planning and programming.

The question of how, where and when to build particular elements is a matter on which success or failure depends. Failure could result from not following a proper chronology in building the components of the project. So, programming and phasing of every project is important to make efficient use of the employed capital, especially in a country with capital scarcity

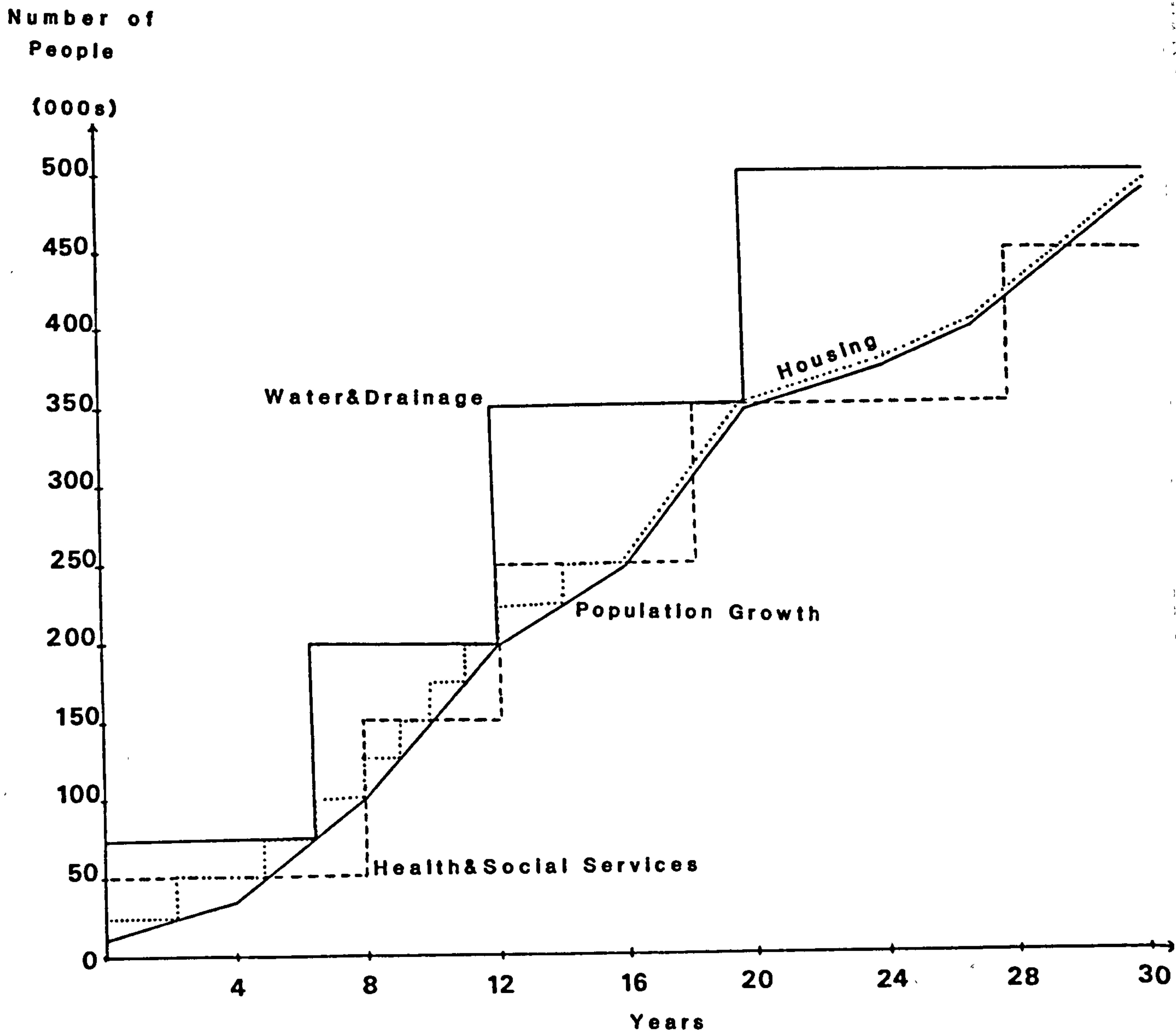


Fig.(7-4)

SERVICES INCREASE IN RELATION TO POPULATION GROWTH

like Egypt. For example, planned dual carriageway roads can be built in the initial stage as single lane roads until demand rises, so that the capital temporarily saved can be put into some more urgent projects, such as water or sewage systems, schools or nurseries, civic or health centres. The extensions of the projects, or expanding of capacity should follow the same pattern, being done at the proper time, as the need arises. Fig. (7-4) illustrates such ideas graphically concerning housing, health and social services, water and drainage capacity for a settlement of about 500,000 people. The figure integrates thresholds for three elements: the quantity of services, the population growth and the time to expand each service. If population growth rates vary, the time of expanding the capacity of such services will also vary accordingly. Lack of services at the start makes the population growth relatively low (years 0 -4). As population increases, services including housing and amenities have to be increased too, (years 4 - 12). Any financial or managerial setback will affect the growth (years 13 - 16 and 20 - 27). When matters settle down, growth is expected to increase consistently (years 27 and on). Some facilities can be more intensively used until full provision is made such as health centres or schools, whereas others such as drainage and water supply cannot easily be so used. Service buildings such as town halls, shopping centres, schools, courts, social and recreational centres also need a programme of how, where and when to be established. Their construction or expansion should be considered before the need arises to proper provision for money and materials according to population size, particularly for services which do not yield a profit to anyone.

This discussion about co-ordination and the importance of chronology in project implementation requires to establish a monitoring unit in the Project Co-ordination Section of the Development Corporation, Fig. (7-3), to control expenditure and to provide services at the proper time.

7.2.3 Construction Labour Force

As mentioned in Section 2.6.4, Egypt has a peculiar phenomenon in its labour market, for there is a marked shortage of skilled workers in the different professional sectors including construction and related activities, while unemployed and semi-employed people exist in both urban and rural areas. Add to that the continuous immigration of skilled and semi-skilled construction workers for higher wages outside the country which has resulted in the deterioration of construction quality while wages, and consequently, resulting higher final costs, are exaggerated. That simply means that basic professional and technical education and training programmes are insufficient and unable to achieve their aims.

Traditional building methods involve a lavish use of labour (and materials) which increases costs, perhaps more than would be the case if recent technology and construction methods and machines as mixers or power tools were used, especially now that labour wages are high.

On the other hand, the lack of attention to the needs of the construction workers in the new settlements, especially in the early stages of development, impedes construction progress as witness^{ed in} Tenth of Ramadan (see Section 5.5.1), where no accommodation was built for them although their houses should be the start of the town. Till March 1982 most of them were commuters, and some used to stay at the building sites or in tents(4a). Housing, or provision of land, for the first building workers should form the first part of the settlement site, and it will become permanent wherever it is (see Section 5.5.1).

Between 1970 and 1975 about 100,000 dwelling (excluding houses built on a self-help basis) were built in Egypt by about 788,500 workers who were involved only in housing construction(4b). The productivity rate is 0.127 dwellings per man per year(5), or 7.87 man year labour per dwelling. This is very low if compared with the British rate of 1.0 dwellings per man per year(5a).

In 1978 the Ministry of Housing estimated the shortage in urban housing at more than 1.2 million units, in addition to 300,000 units from the then existing stock that required immediate replacement. Units needed to meet the requirements of new population by the year 2000 were estimated at 2.5 million. Thus the total need by the year 2000 was in the order of 4 million housing units(6), an annual rate of 181, 818 units for 22 years. Further, as mentioned in Section (7.2.1), it is difficult to expand the present urban areas and most of the four million units will be established in the new settlements which accordingly are expected to accommodate large numbers of construction workers. According to the 1976 census, the number of construction workers, excluding self-help and core house builders, was 231, 263 which is much lower than the needs of such a massive housing programme, especially with a low rate of production which resulted in meeting only about 16% of the need.

There is a need for an increase in both the quantity and quality of construction workers, to be achieved by training more workers, and by using more developed technology, to increase workers' productivity. Although types of houses are very different in the two countries, comparison with British productivity should lead to reconsideration of housing types in Egypt, such as introducing simpler styles and easier methods of construction. This comparison also indicates the importance of the training centres for construction workers which exist nowadays in the country. More centres and technical schools are needed, especially in the new settlements which can take on the added function of training on the job where there is a need for numbers of skilled construction workers. Military training camps could contribute a lot in this connection, where large numbers of construction workers could be trained every year during their compulsory service period in the armed forces. The firm military spirit and the available facilities of the troops might provide a solid basis to produce large numbers of

construction workers needed in the period till the year 2000.

Advanced building technology may facilitate the mass production of building materials. Mixers, bulldozers and cranes save time and effort while providing more efficient work. Equipment and machine hiring systems might help to reduce mechanisation costs and maintenance responsibility especially in small contracts. In such cases relatively less manpower will be needed for construction works in new settlements, especially those in remote areas where the early stages of development will require big excavation works, digging and paving.

7.2.4 Water Supply

Although the River Nile discharges huge quantities of water, Egypt is considered one of the countries with a lack of water. It has a hot and dry weather, wide desert areas, increasing activities including agriculture and industry, and a growing population which decreases the per capita share of water. That necessitates following a wise water policy which can encourage the spreading activities to new settlements on desert land within range of available water resources, saving unnecessary consumption and re-using water. This could be realized by following some trials of minimal use of water as will be mentioned later in this section.

As mentioned in Section 6.2.7, there is a surplus of the Nile water of about 16.76 milliard cubic metres, in addition to 9 milliard cubic metres which will be Egypt's share when the Sudd Project is completed. This means that 25.76 milliard cubic metres will be available for urban and agricultural expansion which will mostly be in desert areas. Concrete or plastic pipelines have to be used to get water there to prevent water seepage in the sandy soil of the desert, and to avoid evaporation in the dry atmosphere. Installation costs of such pipelines will be high, but they will also secure a reliable water resource in the remote areas in addition to

saving the valuable water in the desert. Sufficient reservoirs are necessary for each new settlement to store enough water for sometime ahead for emergency cases.

Storm water in the northern desert areas of the country, the north west coast and north Sinai, goes deep in the porous sandy soil. So it is more protected against evaporation than if it stayed at the surface soil. It is important to find out where such stored water exists, its quantity and quality, the costs and the best ways to bring it into use to estimate its value to establish new desert settlements. (See. Appendix 4 about the better use of water).

Crops that need relatively small amounts of water while producing ample food of economic value are to be cultivated round the new settlements in desert areas such as cereals, figs, olives, palm trees, barley, vegetables and melons to avoid importing food from distant areas for the new settlers consumption. The results of field studies and experiments, like those which were made in Mudiriyatel Tahrir and Salhiya desert reclamation areas, and the outcomes of national and international conferences on desert development must be used to provide information about the development of ground water in the desert. It is necessary to know the quantity of water resources, their quality and the optimum withdrawal rate for the benefit of new settlements. Waste water in big quantities, with good nutrient value must be considered in the planning of the reclaimed areas near the new settlements bearing in mind that agricultural production per feddan is lower in new cultivated areas compared with those long cultivated. In 1959 when the digging of water wells started in Kharga Oasis, excessive withdrawal lessened the ground water pressure until the only obtainable water was that from the deep wells. The result was a setback in the reclaimed areas. Experience of a different kind is noted from Dakhla Oasis, where most of the reclaimed land of the New Valley lies in the Western

Desert. Water pressure was very strong, and the surface soil heavy and almost non-porous. As a result, water accumulated on the soil surface. The bottom layer is composed of the Nubian sandstone which is saturated with groundwater. These factors caused difficulties in drainage and required considerable difficult and costly drainage projects. That possibly points to consideration of the merits of recycling the drainage water to be pumped to other areas with better conditions of drainage.

A policy to control the use of irrigation water has to be adopted to save water for the areas of expansion and to avoid the consequences of the extravagant use of water. For example, one milliard cubic metres of irrigation water could be saved if the parts of irrigation canals with porous bottoms, which form about 15% only of the total length of the irrigation canals in Egypt (28,000 km. approximately)(7), could be embedded with concrete layers or plastic sheets to save water percolating into the earth(8).

The extravagant use of irrigation water(9) increases the problems of the limited water resources in the reclaimed desert areas by raising the level of the ground water under the agricultural land, and this has a bad effect on crop quantity and quality. Some farms west of the Delta have less production now especially of fruit and palm trees than in the past. Dripping or pivot irrigation systems are more suitable for desert areas, for they not only save water, but also do not adversely affect the productivity of the surrounding agricultural areas. As mentioned earlier in this section, the use of concrete or plastic pipes or sheets is suggested in the newly-reclaimed areas to reduce waste of water in sandy soil. It has been estimated(10) that more than 10 milliard cubic metres of water, or more than one sixth of Egypt's share of the Nile water, could be saved annually if drainage water were to be recycled instead of flowing into the Mediterranean. Additionally, there would be cost savings in overheads for drainage stations and installations and their periodical maintenance and associated

requirements which are estimated at £E 2 million annually(10). Dripping and sprinkling irrigation save at least 30-50% of water, increase crops by 15-20% and do not need any canals, see Appendix '4'. One Feddan can be irrigated in two hours instead of five hours required in normal irrigation(11).

In other words it is technically possible to increase the cultivated areas in Egypt within the present water resources if improved methods of irrigation are applied(12). The purpose must be the benefit of the new settlements to provide more food and green areas for the new settlers since the present cultivated area cannot fulfil the needs of the existing population.

These and many other considerations require concrete study of water resources and the possibilities of making better use of the available irrigation water for agricultural expansion in Egypt, upon which a reclamation policy could be planned.

In Appendix 4, there are described some experiments practiced in different arid regions of the world to overcome water scarcity in desert areas by making better use of water in agriculture. They could be tested in Egypt's deserts to determine the most practicable methods for each individual case.

7.2.5 Energy Supply

A number of new settlements in Egypt will be established in remote areas, so every possible effort should be made to find energy sources that may be used with limited fuel equipment, installations and maintenance. Wind and solar energy and biogas are available and almost free of pollution. Energy resources from fossil fuels such as petroleum, natural gas or coal, are not eternal and mostly need to be transported, while renewable resources are widely existing and are becoming increasingly important.

Energy considerations will necessitate planning for the new settlements in Egypt on the basis of renewable sources of energy along with the traditional ones and by installing more hydro-electric stations where new settlements are situated near the Nile or seashores(13) if feasible and economic enough. Biogas can be produced by dumping animal and plant wastes in covered ditches which are chemically treated at a temperature above 15°C to get flammable gases which can be used for domestic, transport or industrial purposes thus saving fossil fuels and avoiding their pollution(14). Care should be taken to guard against health hazards in biogas production.

The annual rate of increase in energy demand in Egypt is 7.5% which means doubling in 9.3 years(15). If continued at that rate till the year 2000, it is estimated that the per capita consumption in the year 2000 will be about 967 Kg. equivalent of petrol, a total increase of 140% over that of 1982(16). The energy demand in the new settlements in Egypt will be more than the national average, because the standard of living and industrialization is expected to be higher than the average standard of the country.

Renewable and traditional sources of energy must compete to promote the new communities, and be properly calculated for in the long term master planning.

7.2.6 Housing Requirements

A proportion of the capital invested in new settlements is expected to go into house building. (See note 27, Section 3.2.2.). New urban settlements are proposed primarily as a means of solving the housing problem, at the same time fulfilling economic strategies

In Egypt, the open door policy and the free market can provide an adequate atmosphere for local and foreign investments which must be

encouraged towards some development sectors in the new settlements like the relevant trades to housing such as building materials and equipment. Rent controls and subsidy have only to apply to the low income state housing, or the provision of sites while private housing should be left to market prices to give it sufficient incentive to develop.

Houses for people of all classes, or those built for sale, must be encouraged and supported by the government, so as to be given priorities in building materials supply, either local or imported, to help people to build their own houses. This policy can save the agencies a lot of capital investment and management, rent collecting and maintenance which will be the owner-occupier's responsibilities as encouraged in the British new towns (see Section 3.3.5). Subsidised building materials must only be supplied for the poorest people. In this way, more houses could be built using less funds which will be circulated in a shorter time. But government subsidy must be limited to a specific period to have less burdens on public expense. Because standards, tastes and needs vary, housing in the new settlements should be of different varieties to meet every possible requirement. The creation of adequate housing for industrial workers is important to get them settled without the need for commuting.

Financial shortage might result in housing below required standards, which may later cost more than original savings, for maintenance and putting things right. Simple design to match the basic requirements of the majority of the people will be the best to suit their circumstances and low incomes. A variety of building land should be available for purchase and rent, with security of tenure to arrange for building by individuals, housing associations and co-operatives. Private investment in housing should be free of government rent control to encourage the private sector to build more houses and to maintain them properly.

Maintenance grants should be introduced in new settlements to encourage landlords of poor houses to repair their premises. A certain amount of housing tax could be allocated for such grants to make houses healthier, more durable and more habitable. This practice is successfully applied in the U.K.

Housing stock, shortage and replacement in the existing urban areas must be calculated to enable accurate forecasting and planning for new settlement forms. As mentioned in Section 7.2.3, the shortage in urban housing was estimated in 1978 at more than 1.2 m. units, 0.3 m. units required immediate replacement, and the new population till the year 2000 will need 2.5 m. units. In the 1950s, housing in Egypt represented 28% of the national investment, but this decreased to 8.5% in the 1960s when it was considered a non-productive sector! In the same period, the annual production of housing units decreased from 7 units for every 1,000 people to 2.5 units, then to 1.5 units for every 1,000 people. Most of these units were governmental. The international average is 7-10 units for every 1,000 people, reaching 13 units in some countries(16a).

The private sector in Egypt has been reluctant, since the late 1950s, to contribute to housing because of the haphazard legislation against the landlords, including that which reduced the rents, by 60% in some cases. The reasons were political, but this was one of the main causes of the present acute housing crisis in Egypt which makes it essential to have a very much higher rate of housing production to meet the need for 4 million housing units by the year 2000. It would have been wiser to introduce some sort of rate rebate for the low-income classes than to reduce the rents, ignoring the adverse effects which might happen and lead to an acute housing crisis which the new settlements can largely solve.

Because the standard of living in Egypt is mostly low, more space should be allocated to poor and middle class families in the new settlements.

Housing and planning regulations must be enforced as for instance, building specifications, lower densities, sufficient open and green areas, pollution control and garbage disposal. On the neighbourhood level, authorities should provide more open space where private and shared gardens could be provided and more road provision made. So, healthier environments and lighter traffic could be realized.

Cheaper methods of construction should be introduced to replace the traditional manual ways which are mostly expensive, especially with the increasing cost of labour.

Dwellings, especially in desert areas, should provide a comfortable shelter particularly to decrease summer heat. In a recent experiment in Egypt(17), tests showed that hollow concrete blocks could give a reduction in diurnal range of temperature and also cool faster at night. The use of such blocks should be encouraged by the establishment of mass production factories, especially since sand and aggregates are at hand in desert areas, while cement production is expected to increase in the next few years. The final cost of this kind of blocks is expected to be less than baked clay bricks which have to be left in the kiln for several days, and have to be carried from the valley to remote areas, while they adversely influence land fertility by the consumption of the fertile clay. The Tunisian Matmata housing type, Fig. (7-5), of the sunken houses might be tried in some ^{quarrying} desert sites. Construction costs might be much cheaper, implementation is simpler, summer heat is far lower in the bottom soil away from direct sunlight, but drainage and ventilation would require careful consideration. Where available, limestone or the Nubian sandstone could be used as local building materials. Expensive mortar cover or plastering should be avoided where possible, especially if more care is directed to bricklaying. Plastic and PVC pipes are cheaper and easier to fit than iron and cast iron ones which need skilled labour and solder. Standard fabricated doors and windows

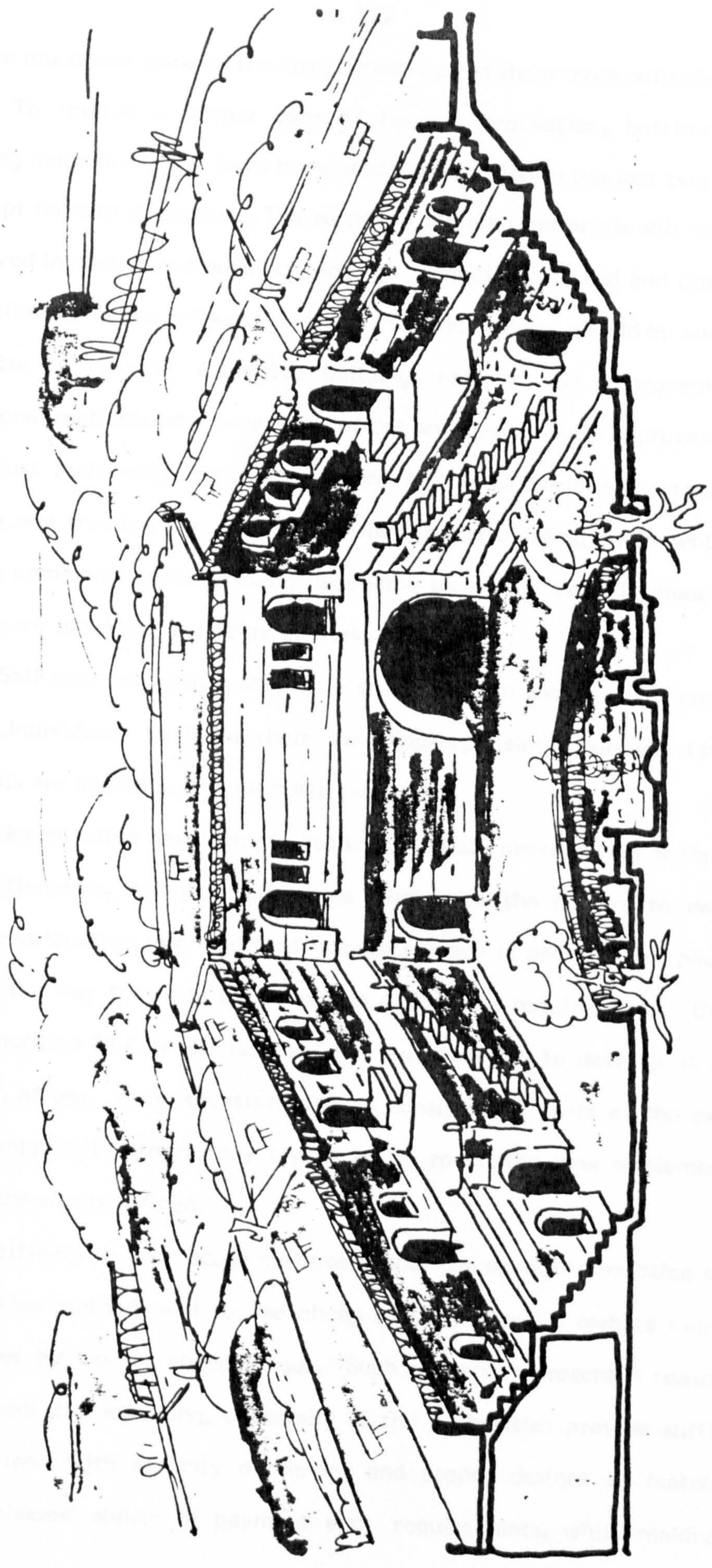


Fig. (7 - 5)

MATMATA TYPE OF SUNKEN DESERT HOUSING,

Might be combined with quarries in appropriate areas.

require much less work on the site, which makes them more suitable to fit.

To realize a proper rate of housing production, bottle-necks of building materials which have hampered construction in the last two decades in Egypt have to disappear. The supply of building materials will have to be improved in quality and quantity, and the production of sand and lime bricks and hollow concrete bricks increased. Housing designs should be adopted to minimise the use of expensive building materials by improvements to traditional methods which can save effort and costs. Such improvements as those just mentioned, should be taught in the Universities, architectural schools and training centres. Easily maintained building equipment should also be commonly used to avoid depending on scarce skilled labour and to avoid much breakage and delay of work.

Self-help techniques should be encouraged in the new settlements to enable individuals to build their own houses, since building land and materials are available, ^{and} this will reduce costs.

Uncontrolled development has to be strictly prevented in or round the new settlements, and the authorities must have the powers to demolish illegal construction provided that adequate space is provided for people to build in the way they can afford within acceptable requirements. Because the authorities fail to provide land for the squatters to develop at a cost they can afford, some squatters occupy considerable parts of the existing settlements while others may try to settle round the new settlements as soon as the site is defined.

Self-help or core house systems enable the people to practice simple construction methods and to use cheap materials, while owners may help each other by free or cheap labour. Such systems represent a reasonable replacement for squatting, especially if the authorities provide sufficient building land with security of tenure and proper designs to match low income classes' ability of payment and requirements, while making the

building materials available at reasonable costs. This necessitates to study households to know the appropriate proportion of income to allocate for housing. It is suggested in the Urban Project Manual (University of Liverpool, 1983) that for most low-income households, a range between 10-30 per cent of net household income is generally appropriate for calculating the ability to pay for housing and related expenditure(17a). The average annual low income of the household, eg. in Ismailia, Egypt, is about £.E.345 (£.E.300-390) (Table 1 in the Manual) which means an annual ability to pay for shelter about £.E.69 as 20 per cent of the income including other housing expenses as property tax and utilities. This more or less agrees with what is mentioned in Table (5-1) of this thesis about housing in relation to acceptable payments in 10 Ramadan new city where 60 per cent of the inhabitants can pay between £.E.40-80 per year as an acceptable rent for low cost housing. This limited ability necessitates low building costs and more subsidies for the majority of the people.

Housing policy has to be concerned inter alia with residential density. With reason the lower the density the more services and amenities can be provided on the neighbourhood level. Net residential density relates number of bedspaces to the building site and surroundings. Other measures relate persons, rooms or dwellings to unit area. High residential density, high rise building and small floor space provision per person are trends which must not be allowed in the new settlements to avoid overcrowding as that of the existing inhabited area. It is noteworthy that low density may have its disadvantages from the social point of view. For example, those used to living in crowded societies close to relatives and friends, and near shops, when moving to lower density communities may feel cut off from their traditional atmosphere, a feeling which must be carefully avoided in the new communities. Relatives and friendly families could have dwellings close to each other when this is possible. On the other hand, lower densities may be

associated with higher costs of infrastructure such as roads and networks, while demanding more policing and maintenance to cover wider areas which may suffer from vandalism.

The generous provision of social clubs, specific and professional societies, and playing areas strengthen the relations between the new settlers (see Section 7.2.9). Recreational and resort facilities can enable the people to get together.

The trend of family houses should be encouraged along with blocks of flats, not more than five storeys to keep costs low, for single people. With similar accommodation, family houses are less expensive than high rise blocks of flats which need more foundations, staircases, lifts, management and maintenance. Houses can be built with less labour, less skilled workers and can be maintained by the people who occupy them and who will mostly do their best to keep them in good condition, which is often not the case with flats. Such trends are tried in both old and new settlements in the U.K.

From this Section, one can appreciate that housing policy is of great importance to promote the new settlements and to create a convenient environment for the people to come while helping to solve housing crisis in Egypt.

7.2.7 Agriculture And The New Settlements

As mentioned in Chapter Two, the increasing population and the urban invasion on the cultivated land in Egypt(18) had led to a significant decrease in the per capita area of agricultural land, see Tables (1-1) and (7-3). The reclaimed land cannot be compared with the quality of the already cultivated areas, and it has been suggested that these areas need 10-15 years to reach their proper productivity. Although between 1952 and 1978, 915,000 Feddans were reclaimed, at an annual rate of about 35,200 Feddans, Weidman(19) considered only 770,000 Feddans to be cultivable. Of this area,

large parts either have not been brought into cultivation or have subsequently reverted to desert, so that only about 60% of reclaimed land is actually under cultivation. Thus, a more realistic figure for the land made available between 1952 - 1978 might be 460,000 Feddans.

Even more disheartening is the more recent record of land reclamation between 1970 and 1978, a total of only 48,000 Feddans have been reclaimed - an annual rate of just 6,000 Feddans(20). Thus the rate of land reclamation has sharply dropped since 1970 resulting in a serious accumulation in the shortage of agricultural land. It is assumed by the National Urban Policy Study, 1980, that about 50,000 Feddans are lost for urban encroachment each year, nearly one half of this area is lost in the GCR only(20a). If reclaiming a single Feddan costs about £E 1900 at 1980 prices, £E 95 millions are required annually to compensate the lost agricultural areas for ^{urban} expansion. Allowance must also be made for the number of years that must elapse before the new reclaimed areas can be equivalent in output to the lost areas.

Table (7-3)

LANDSAT DERIVED LAND USE IN QALYUBIA GOVERNORATE
(In Feddans)

Class	1972	1978	Change
Urban	7,295	14,125	+ 6,830
Water	9,343	9,343	-
Agriculture	203,429	196,647	<-6,782 >
Bare	8,927	8,879	<+ 48 >
Total	228,994	228,994	-

Source: NUPS, p 11.

Every possible effort should be made to use as little cultivable land as possible for non-agricultural purposes, in order better to satisfy the food needs of the growing population and to diminish necessity for the importation of agricultural products. It has been stated(21) that Egypt imports more than 75% of its wheat, about 40% of its corn, and about 90% of its lentils. A policy should also be adopted to select and cultivate early ripening crops of rice, wheat, corn and other cereals in addition to oil seeds, vegetables and fruits, so as to increase the production per Feddan when land is cultivated several times every year, each time by a different crop.

New settlements could provide the opportunity to realize a considerable increase in the cultivated area if land reclamation is taken into consideration when such settlements are planned, whatever their original purpose. In other words, if two sites are equal in their industrial potentials, for example, while one of them is located close to land with agricultural possibilities, this site should be developed as an industrial centre. When the time comes agricultural expansion can take place, where it may make use of municipal and industrial waste water for irrigation (see Section 7.2.4). This necessitates, where possible, locations nearer to reclaimable land for other activities of development (see Section 7.2.1).

It is suggested here that priority to own the reclaimed land should be given to farmers from selected villages in the Nile Valley where over-population and dearth of cultivable land is common (see Section 2.4.2), and that government policy should encourage the farmers of the new settlements to produce food and cut imports. The people of such villages would prefer to move to new agricultural settlements equipped with improved services, including the agricultural facilities and better houses,

clean drinking water, appropriate sewerage systems and electricity supply. In this new environment each farmer should have ^a bigger area of agricultural land than ~~the~~ he used to have to compensate ^{for} the low productivity of the new land, along with some grants and selected seeds, cattle and poultry and shared agricultural machines as incentives. More incentives might include transport, storage and freezing, and the purchase of the crops from the farmers at reasonable prices. In this way, the cultivated area will be increased while population density and hence urban pressure, will decrease and the living conditions improve in both old and new rural areas.

New villages with agricultural aims should be sited on reclaimed desert land near to the Nile Valley, or on the sites where adequate water is available. Sites with additional potentialities such as quarries, petroleum or fishing are to be preferred so that there is more than one resource for the support of the new community, and to secure a local food provision for the non-agricultural people.

In the new agricultural areas, it is important to concentrate on the production of crops such as grains and other staple foods wherever the water supply is sufficient. Medical and perfume plants, which mostly grow naturally with limited needs of water and experience, can be grown in the newly reclaimed areas to provide a base for medicine and perfume industries. Vegetable and fruit requirements of water supply and labour requirements are limited while they have considerable importance and revenues (see Section 6.2.5.2).

New agricultural settlements, with some industrial aims, will attract a number of people from the over-crowded areas to work in farming and the related activities including agro-industries, dairy products, storage and transport. Hence the following aims could be realized:

1. Lower population density in the existing rural areas and more employment in the newly opened areas,

2. More inhabited area based on the provision of services on a proper scale for the migrants, and
3. A more convenient and healthy life for more production in both the existing and the new communities, which will demonstrate that Egypt is more than the Nile Valley.

One of the problems in the old agricultural areas, which must be avoided in the new reclaimed areas, is the pygmy land ownership. This has resulted from dearth of land and a growing population, and the 1952 Land Reform Act which distributed the big estates of agricultural land on the landless families at five feddans each. Although this Act gives the impression of securing justice for the needy people, it has its adverse effect on agricultural production. The big estates used to operate on a mass production basis and had much more potential and control than small parcels of land, with farmers lacking experience. After a few generations, pygmy ownership prevailed in those estates leading to complicated problems which were:

1. The difficulty of using any machines in agriculture,
2. The decreasing quality and quantity in the yield of farms,
3. Greater dependency on animals for agricultural work leading to,
4. Less dairy and meat products from the exhausted animals and,
5. The use of big numbers of the non-milk and meat-producing animals, such as donkeys, making it essential to use more land to produce fodder, which land could otherwise have been cultivated with much more useful crops.

Although mechanization is important in the new agricultural settlements with their large plots of land, one has to consider the costs of machinery, operation and maintenance, and the effect of machines on

employment bearing in mind the increasing wages of the agricultural labour.

The foregoing analysis shows the importance of the agricultural policy in the new settlements. It implies that land reclamation should be associated with the establishment of new settlements to provide sufficient services essential for the people who will live and work there to reclaim more land.

7.2.8 Industry in The New Settlements

New settlements policy has to cater for industrial development exploiting location-bound natural resources to provide growth poles in terms of regional development. In most cases, the success of the British new towns was based on industrial development associated with sufficient services and recreation facilities. The following discussion represents some aspects of the British experience in industrial development in the new towns adapted to the Egyptian case.

The attraction of industry must be recognized as the key to the success of new settlements. People do not move without jobs. So, full support in the new settlements must go to industry and its requirements including the workers' needs, such as housing, services, recreation and social provision. Legislation must be enforced to restrict industrial development outside the new settlements, especially when industries move from the existing urban areas, to provide a good basis for employment in new settlements. They must be replaced by amenities and services including recreation, health and social ones via land acquisition with reasonable compensation which may be in the form of much bigger areas in a new settlement. Both public and private industries have to participate in the new settlement development to minimise vulnerability to market fluctuations and depressions. Wherever possible, some industrial development should be moved to the new settlements to increase their

attraction to new inhabitants (see note 76 Chapter Three). The economic structure of the new industrial settlements should match the planned employment in the basic industry.

The provision of better housing and services has to be co-ordinated with the different stages of the industrial development. But the pilot plans must be flexible as well as being able to respond to any unpredictable change. The labour force in the new settlements should be trained to be employed mainly in industry and its related activities such as the preparation of raw materials or transport and maintenance services, see Table (7-2). At the same time, protection of the environment against noise, pollution and traffic generated by industry has to be provided for in the master plan, using the advanced methods of pollution control which perhaps allow residential areas to be located close to industrial ones. Smoke and fumes are treated and need no longer be toxic. Waste water could be purified and noise is absorbed to the minimum. In the desert new settlements with limited water resources, industries should be of those which need a minimum water consumption. Industries consuming large quantities of water such as paper and steel industries have to be avoided.

Good means of communication are of great importance especially for heavy industry associated with bulk goods. The layout of the industrial settlement is best determined by the desire to minimize the daily trip to work even if cheap transport is available. Saving time, money and effort is valuable in planning for the new communities.

Because of capital limits in Egypt, alternatives to capital intensive industries are required, and because of unemployment and underemployment in Egypt, industries have to be labour intensive, including diversified job opportunities for the skilled, semi-skilled and the unskilled people. New 'industrial' settlements could be taken as a breeding ground for industrial skills especially with the migration of such skills for higher wages.

Industrial schools and training centres can find a suitable 'environment' in such settlements to develop the required skills.

Whilst industries may initially have to rely as much as possible on local materials, mainly from agriculture, mining and fishing, to save importation and foreign currency, imported raw materials can help industry to export manufacture products, as in the case in Hong Kong, Korea or Malaysia. At the same time, some new industries employing modern technology, such as computation and electronics have to be gradually introduced in the new settlements in Egypt either by national or international firms. This will develop the domestic experience in industry, and will enable the country to break into the overseas trade markets.

Industrial structure in the new settlements have to be linked, integrated and timed with the regional and national development of industries to form a kind of harmony in industrial development all over the country. The provision of intermediate energy products and equipment, installation, maintenance and repair services, industrial studies and consulting services are very important for the progress of industry in the new settlements, along with infrastructure provision.

Industry can help in the development of other sectors in the new settlements like housing, infrastructure and some services which are directly connected with industries' demands and output.

In this way one can conclude that industrial development can provide jobs for the new communities' inhabitants more than any other sector, while it helps the development of other sectors in the new settlements. So, corporations should attract manufacture or assembly factories as a way to start their own industries.

7.2.9 Social and Cultural Facilities

It is people, not buildings, that make a new community. So plans must satisfy what those people need today and what they are likely want tomorrow, according to social change. Also it should be noted that each

settlement will have its own function, problems and taste.

In the newly-formed communities, social activities may be limited because of the different cultures of the groups of the new settlers, or because of the concentration of interest on economic and production activities. Most of the people who move into new communities will have come from crowded communities with poor housing and services, noise and smells, but with a range of opportunities, though limited in quantity. Such people are accustomed to a shortage of open space and a lack of sports clubs, but some bright lights were close at hand, such as cafes or casinos, cinemas or theatres, playing grounds or societies. These activities and commercial entertainment can only be provided in communities with populations large enough to give adequate support. Unless the new settlement offers a pleasant living environment, industry and other activities will suffer from a high turnover of key personnel who used to lead a social life. So more social and cultural care is required to strengthen the ties between the residents themselves and between those in the nearby existing communities.

Social and cultural life can be considerably helped in new communities by the formation of societies and social clubs to let the people 'get together' and to do things rather than watch them being done(22). It may be fifteen or twenty years before the full range of social facilities can be provided, apart from financial shortage which may take place at any stage of the development. Social, health and economic circumstances are expected to be more satisfactory except for those who would be dissatisfied wherever they go. For them, plans should be arranged to return to their original communities to avoid the problems they may cause in the new settlements.

The development corporation must decide from the beginning what land to reserve for social and cultural purposes according to the anticipated

size of population. A place where people can see each other is essential. Small community halls of about 10 x 20 metres for every 5,000 inhabitants, in each of the housing neighbourhoods might be sufficient in the early years of development, while bigger halls have to be built in the city centre later on to meet the growing needs of the people. Mobile means of entertainment such as circus or small theatres can serve a number of new settlements, especially at the early stages of development. Youth clubs and playgrounds have to be established for the expected high percentage of children in the new settlements. Swimming pools are of great importance and an attraction in the hot climate, especially in the desert, and to give the young the opportunity of learning to swim. Schools and educational institutions should play an active part for such purposes to be available to the new communities in the evenings and at the weekends if they are considered in the town plan. Industrial companies should be encouraged to have sports grounds for their staff. They can be granted free land to establish such grounds not essentially near the factories. Big contract-companies working in the new settlements can contribute in such activities by building playing grounds at cost only. They might have some facilities from the development corporations as incentives to do such services so as to be granted free or cheap land for their own use.

Religious organizations can play a very active part in social life of the new communities especially as a considerable proportion of citizens in Egypt are religious.

One of the important lessons from the British experience in new towns is that social and cultural development is not a thing apart and must be the direct concern of every one of the corporation officers with relevant popular demands and experts' opinions especially for the working classes. It should be recognized that the social aspects form an essential part of the overall strategy of development. Forecasting the leisure habits of many

years ahead must be considered by reserving sites to meet their building needs, which will vary as the age-groupings change or as new fashions emerge, such as the advent of mass T.V. Also adaptable buildings must be thought of to meet such changes.

Some social diseases of the old communities may be carried through individuals moving to the new settlement, such as drug-taking or vandalism, which can be minimised via the provision of sufficient sports and social services including libraries and hobby centres.

An information office could be established to help the newcomer to find out about the available jobs, residences, education, health or leisure centres and social provision generally. After being settled down, people will need to know about the legislation and the rules of housing, building land, saving and loan systems, to purchase flats, houses or pieces of land.

Primary schools which exist at the neighbourhood level at about 10 minutes' walk from any house, have to be more attractive for children and to provide a training role for the grown-ups and housewives. The same can be said about health centres, to avoid the causes of epidemic diseases via media, visits, meetings and so on.

From the foregoing analysis of social and cultural services, one can realize their importance in the formation of the new communities especially in their early days. Many examples of such services could be found in the British self contained new towns including the newer ones as Milton Keynes (Appendix 3), and, on a bigger scale and for different purposes, in the U.S. new towns.

7.2.10 Green Areas and National Parks

The per capita green and open space of the built-up areas in Egypt is apparently very small, with some exceptional cases where such areas are badly maintained. For example, the open space in Cairo in 1975 was not

more than 1.6 square metres per person(23). Congestion and urban pressure lead to the use of such scarce open spaces for traffic or essential buildings. An example can be found close to Cairo centre, at Al Tahrir Square, where the former green area has been replaced by bus terminals, roads and car parks. Even the gardens of private houses or villas are built-up when rebuilding occurs. Many other examples can be found in other cities and towns.

Except for Kanater El Khairia National Park, some 30 kilometres north of Cairo, one can scarcely find a recreational green park in Egypt on the national scale, while town parks and open spaces are very scarce, crowded and badly kept. The establishment of new settlements in Egypt provide a good opportunity to spread out green and open spaces in the newly-opened areas. Good examples of the generous provision of green areas could be found in the British new towns. The provision of open spaces between houses is important for children to play in, especially where dwellings do not have their own gardens.

Afforestation can also help in the creation of green areas in addition to the timber supply which Egypt badly needs. Certain trees can be selected for planting in desert areas, especially those which have deep and strong roots, with sizeable trunks and branches to resist desert harshness and dryness(24), while providing shadows and greenery in the environment which can also help in the provision of shelter belts(25). Green areas have their importance in modern planning as the garden city shows. In a country like Egypt where desert areas prevail, this importance becomes much more pressing to stop sandblowing which adversely affects agricultural areas(26). Landscaping could be utilized as well where land formations take interesting shapes as a result of weathering and the different components of the relief. Some Pharaonic monuments, rock specimens and desert fossils can be the subjects of landscaped places to create more sites of interest in the 'desert

parks'. Landscape analysis should be considered in the design of new settlements. If ridges, valleys and terraces are planted, an aesthetic composition could be created in the new environment.

Undoubtedly, the establishment of green areas in the desert will face lack of water resources. Some of the recycled water after domestic, agricultural and industrial uses can irrigate such parks. This can be especially realised near the sizeable new communities, where domestic and industrial consumption of water is quite high, and the sludge of sewage effluent, after being treated, can help to make the desert soil much heavier to maintain cultivation, mainly for food production in addition to the irrigation of green areas(26). Water recycling will need some considerations to be taken in the design of sewage systems, and will need installations and refinery plants, which are quite costly, but the benefit of re-using water in the desert is really valuable in an environment of lack of water.

The spread of green areas on the desert gives the feeling of continuity when going out of the Nile Valley, and can reduce the feeling of remoteness which comes to many of those who travel even for a relatively short distance, for instance the 80 kilometres from Cairo to Fayum, as soon as they get on desert roads.

In this way, the new settlements in Egypt could be taken as foci to spread green and open spaces in desert areas where land is abundant, and water resources can be more utilized and secured using recent ideas of making better use of water in arid lands, see Appendix (4).

7.3 Conclusion

The development of new settlements represents an essential need in Egypt to relieve over concentration and to expand the inhabited area of the country. Development requirements as for industry, agriculture or mining, have to be examined to determine the way the new settlement is going to be built.

The function and the potential of every new settlement will largely determine its site and size. Co-ordination of development, financial and managerial requirements have to be properly organized. An Advisory Committee could administer the Development Corporations to carry out the national planning requirements and to advise and provide experience. Care is needed to train and to accommodate the construction workers in the new settlements to avoid slums and squatting, and to build up the essential skills for development programmes. The establishment of the new settlements in desert areas necessitates a wise water policy to realize the utmost development with a minimum use of water, and the energy supply has to be secured, including renewable energy, to satisfy the expected high rate of consumption in the new settlements. Land reclamation should take place wherever possible round the new settlements to fulfill agricultural and farm needs, and to provide sufficient green space round the new settlements similar to that in the garden city concept.

Housing standards in the new settlements should match the payment ability of the low income classes as a majority of the people. Low housing production emphasises the need for taking a more positive approach for getting the houses built.

As experienced in the British new towns, industry should provide sufficient job opportunities for the new inhabitants and form a solid base for new communities development. Social, cultural and sport facilities have to be sufficient in the new communities to get the people settled in a place they like.

The foregoing considerations imply the need for a policy to organize the establishment of the new settlements in Egypt which is the concern of the next and final Chapter of this study.

CHAPTER EIGHT

A NEW SETTLEMENTS POLICY FOR EGYPT

8.1 Introduction

The previous chapters illustrated the existing urban circumstances in Egypt and the development of its problems. An emphasis was placed on the social, economic and aesthetic achievements of the British experience in the establishment of new towns for work and living places, to see what lessons from that experience would apply to the relevant practice in Egypt. The first attempt to establish a self-contained community in Egypt, 10 Ramadan, has been examined to evaluate its successes and failures, to find out the most suitable way for the country to establish new settlements to relieve the overconcentration of the inhabited area of the Nile Valley and the Delta. Potential development regions and guidelines for assessing the suitability of potential development areas for the new settlements have been discussed.

It is now necessary to consider the appropriate policy for the establishment of new settlements in Egypt. This is the concern of the final chapter of the study.

8.2 The Policy

A new settlements policy must open the door for a new national pattern of development to exploit to the maximum the human and physical resources of the country.

As mentioned earlier in this study, population increase in Egypt cannot be only accommodated by the extension of the existing settlements, because in most cases it would be at the expense of the cultivated land which surrounds most of the existing settlements. At the same time, the present urban services are already over loaded and any extra load will lead

to the collapse of such services with consequent economic, social and health deficiencies. So, urban development has to be away from the present inhabited or cultivated areas, but on locations close to land with potential of natural resources including agricultural expansion, which in due course must take place round every new settlement. This means that land reclamation should be a common factor in the development of the new settlements in Egypt, in addition to other urban functions as industry, mining or services and administration, aiming to increase the cultivated area of the country to match population growth and probably to export any surplus food produced. In this way the new settlements in Egypt will be similar to the Garden City concept in the creation of new and well-serviced places for work and living surrounded by fields and green areas. They should be healthy and pleasant, and above all places for producing food for the new settlers. Like the British new towns, they should combine functional efficiency with visual attraction. Also the establishment of the new settlements must be on a self contained basis but at a rate sufficient to solve the existing urban problems, not at the slow rate of 10 Ramadan new town. It is essential to bear in mind the services and housing needs of the poor, low income families who form the majority of the people, a problem which has been neglected for a long time because of wars, lack of finance and political complications. The owner occupier system is now successfully applied in the British new towns, and must be encouraged in Egypt's new settlements to reduce management demands and to let the people be responsible for their own houses. The town development and housing systems essentially need to find out the way to cheap housing to match the low payment ability of the majority of the people.

A realistic new settlements programme to solve the existing urban problems in Egypt should be at least 9-10 times the size of the present programme till the year 2000. This will involve reappraisal of standards

and priorities of programme in relation to materials, manpower and improved skills to keep up with programme not as the slow progress in 10 Ramadan (see Section 5.5.1). The new settlements started round the Cairo Region, if properly implemented, will only accommodate less than 6% of the region's population in the year 2000, bearing in mind that at the present rate of construction they will not reach even that level. The policy of population re-distribution should be co-ordinated with development plans for the extension of economic and social activities over larger areas of the country to raise the standard of living, especially in the new settlements where lower population densities should exist. The advantages of low densities are obvious in the British new towns. Urban expansion has to open-up desolate areas as well as areas ripe for development, to make use of the available potentials, to provide sufficient employment and services for the increasing population, and to restrict rural-urban migration. The national urban policy must identify areas with sufficient infrastructure (as the Suez Canal Region), and areas with natural resources which need infrastructural facilities (as the North West Coast and the depressions line in the Western Desert) in addition to parts of the desert surrounding the already inhabited areas. These desert areas will only be able to accommodate new settlements if sufficient water supply, infrastructure and services are properly provided. Nile and ground water supplies must be well organised to make the best use of limited resources by the adoption of modern ways of irrigation and water re-cycling. It is also essential to promote the projects of the Nile Heights for more water discharges necessary for further development in the Egyptian deserts.

The British practice of expanding some existing settlements will not essentially work in Egypt where most of towns are surrounded by agricultural land that must be retained. Unless urban expansions can take place on desert land, new settlements must be established on virgin desert sites away from the existing built up areas. The existing urban areas in

Egypt are expanding in a disorganised way, and their continued growth adds to the per capita operating cost resulting from the collapse in some public services as in some areas in Cairo. In these cases still more new settlements are needed like those established round London, Liverpool and Birmingham. Proper planning must consider Egypt to be more than the Nile Valley and the Delta, based on realistic population forecasts and calculations of adequate provision of housing, jobs and services. Indeed the cost of establishing new settlements is very high, but it is an investment in the future of the country, and if British experience is anything to go by, would eventually begin to pay off.

The British experience shows that, though costly, new towns may help to reduce housing and slum problems, and these exist in most of the urban areas in Egypt which badly need regional redistribution as it was the case in London in the 1940s. If properly implemented, new settlements will help Egypt to solve the acute housing crisis especially for the low-income classes, who should have every governmental support. The building programmes have also to match houses with jobs. Squatting is caused by conditions that lead to despair and hopelessness, mainly as a result of lack of security of tenure. The prevention of squatting will only be possible with sufficient provision of the right sites, housing and jobs to satisfy the needs of the people, since the existing settlements cannot provide enough space for the required houses and activities. New housing types and materials must be tried to reduce construction costs. Core-houses and self-help houses have proved to be good approaches for housing the poor. This requires adequate management and monitoring, sufficient building land, building materials, services, networks and technical advice to help the people to build their own cheap houses. Thus owner occupied houses will make the people responsible for their dwellings with minimal governmental management. In many British new towns, houses were initially built for rent, but later, and with the encouragement of the Development

Corporations, many were turned to owner-occupied houses.

The neighbourhood idea is applicable in the new settlements as it allows for the same kind of social cohesion and interaction as that obtained in traditional Egyptian villages, but this should not detract from the unity of the whole settlement. People must neither be too crowded as in most inhabited areas in Egypt, nor too separate by very low density as in some Mark I British new towns. Segregation of pedestrians provides a complete independent and safe footpath system branching from the centres and going among the houses as for example in the Greater London Plan, 1944, where the Ongar study included a pedestrian shopping centre. Residential areas should not be divided by distributor roads, but they should have good access to such roads. Across the distributor roads, underpasses and overpasses must link the footpaths and cycle tracks as in Stevenage and Harlow.

High streets in the centres of the expanded towns in Britain were converted to pedestrian precincts as in Corby, Bracknell and East Kilbride. The town centres of the later phases of the British new towns programme tend to be like vast departmental stores as the Shopping City in Runcorn and in Central Milton Keynes, each with a variety of shops and services. Such ideas, though quite expensive, could eventually be applied on a smaller scale in some of Egypt's new settlements in addition to the neighbourhood centres, to make shopping easier and to reduce road accidents. Improving roads and linking them with the national road system is a major job of the new settlement's Corporation. The increasing importance of public transport necessitates that houses must be accessible to roads, probably via footpaths, for daily needs.

The leasehold system, rather than freehold sale may be suitable for application in the new settlements provided that sufficient controls on prices on sale of lease are enforced. Leasehold can cut down land speculation and will reduce the high population densities resulting from inflated land values. To increase building productivity, skilled construction

workers should be available and cared for, especially in terms of housing, with construction training centres accommodated in the new settlements.

Projects organisation, co-ordination and monitoring are essential in the new settlements to spread opportunities, to avoid waste of time and money, and to realize proper development and greater exploitation of the potential. The enforcement of planning laws and regulations was behind the success of the British new towns, and this will be necessary in Egypt to avoid repeating the problems of the existing settlements. The selection of the staff of the Development Corporation should provide a range of experts able to realize the planned aims. Planning consultants are sometimes essential to help in feasibility studies to prepare the initial Master Plans. Historical data and analysis help in the diagnosis and clarification of past situations to find proper solutions for the anticipated problems. Consultation with the relevant institutions must start before a decision is taken to establish a new settlement. Well organized management is the key to successful development. The best plan will fail by poor management, while good management will draw the best of poor plans. When a new settlement starts, the Development Corporation must carry out the plan according to the programme prepared by the Central Advisory Committee for Development of the Government. When the development has matured, and the ultimate population is reached, in twenty years or so, the management of the new settlement should secure its continuation as a part of the national plan, and emphasis should turn more towards management and less towards construction. Flexible plans are essential to accommodate unpredictable changes and needs, as for example in the cases of many British new towns which were expanded more than was planned, while others were not fully implemented.

Because of capital scarcity in Egypt, domestic and foreign private capital should be encouraged to invest in the new settlements to provide

more jobs and faster development. The completed new settlements will only start to realize a surplus on revenue account if they become centres of efficient and advanced industry and commerce. Taxes and customs exemptions, free or cheap land and buildings ready for use are some examples of incentives to attract developers to the new settlements, provided that they match the national plan. Some of these incentives were successfully applied in British new towns, but capital provision in this case was much more readily available than in Egypt where free or cheap land can be provided instead of capital grants as incentives to development.

Industrial development in the new settlements must have suitable sites and adequate serviced plots, and industrial workers should find more services and facilities to match their needs and numbers. The provision of industry is mostly the key to the success of the British new towns because of the jobs provided. The same should apply in Egypt if the new settlements are properly planned especially as industrial employment is increasing considerably in the country. Industry will help to promote other sectors and services such as industrial housing, social or medical centres and the manufacture of productive equipment and machinery. Modern production methods with minimum pollution will allow the building of small factories close to residential areas to make it more congenial for people, especially females, to get employment close to their homes, shops and service centres, while traffic in the rush hours will be decreased through the reduction in transport needs and travelling distances.

In addition to establish new industries in the new settlements, the attraction of some of the existing industries from the old urban areas must be the aim to let the latter have more breathing spaces and less pollution. This aim will not be fulfilled if new industries or activities are allowed to replace the ones that have moved. In the new settlements of Egypt, labour-intensive industries with minimum consumption of water should be preferred

as much as possible, rather than capital-intensive industries. Also industries should mainly rely on local raw materials as for agriculture, petroleum or mining, to minimize importation and to conserve foreign currency. On the other hand, some materials could be imported, manufactured and exported. Larger industrial new settlements are better than small ones because they allow for a variety of skills and services essential to promote industry. Big new towns in desert areas with sufficient resources give scope for the establishment of small satellite settlements around the big ones to benefit from the latter's services. New settlements that are primarily concerned with other functions, such as agriculture or fishing, need not to be big.

In a dry and mostly hot country like Egypt, water supply is of prime importance and should be carefully considered in the site selection of the new settlement where agriculture and industry will expand. Pipelines will restrict water seepage and evaporation in desert areas more than will the digging of canals. Water recycling is essential to make multiple use of the available water. The suitability of terrain for the drainage system should be considered in site selection.

Energy supply in the new settlements is of special importance because of the expected high rate of industrialization and increasing standard of living which will involve greater consumption of energy. Renewable energy will eventually perhaps replace fossil fuels. Solar energy is available all the year round in the desert especially for the direct use with simple equipment, and biogas can be obtained from animal and plant wastes. Such means of energy supply are less pollutant and will require less construction and networks than conventional methods, provided that they are considered in the town and building design. This is advantageous in the remote areas where construction is costly and implementation is difficult. In all cases the access to national networks must be secured for energy supply in the new settlements.

Infrastructural provision, including roads, should be adequate for the success of the new settlements and to strengthen their ties with the rest of the country, especially in the early stages of development. Howard's recommendations, confirmed by the Reith Committee Reports, about good transport links are equally applicable in the case of the Egyptian new desert settlements to diminish the feeling of isolation from the rest of the country. Public transport must be encouraged especially, as in Egypt, where car ownership is low, but studies must be carried out to determine future road capacity, transport kinds and requirements and car parks even before the start of building.

Social, cultural and entertainment facilities should form essential components of the programme. Unless the new settlements offer a pleasant living environment along with employment, they will suffer from a high turnover of key personnel who have been leading a social life. It should be noted that education and health centres are important in the master plan, to reduce illiteracy and provide education and training needed in new settlements, and to eliminate the danger of epidemic diseases. Schools can play an active part for recreational and cultural purposes in the evenings, weekends and holidays. Unemployment and scarcity of professional skills make it essential that a variety of training centres be accommodated in the new settlements. Social activities represent an essential part of the overall strategy in the British new towns. The provision of these facilities should be in accordance with population growth and in a location easily accessible from residential areas, and the Development Corporation should make staff available to guide newcomers to the facilities and services, and to help them to settle down.

Green and forest areas will help to create a new taste of life in the new settlements in Egypt, with ample breathing space. The Garden City concept in terms of green space provide a good lesson for application in

Egypt, especially as so far, green areas are insufficient in the designated new settlements. Private and common gardens in the residential areas will provide more green spaces which represent an advantage in the British practice, where visual attraction has been kept in mind and one can find green areas right at the town centres, with buildings located in natural settings in the landscape. The generous provision of trees and green belts in the desert new settlements will protect them against sandstorms and will decrease direct and reflected sun-heat and may in addition (in the long term) diminish the timber shortage in the country. Open spaces have to be provided for present and future requirements, while natural features must be preserved to give a special identity to every new settlement.

The location of the new settlements should be strictly away from the invaluable archaeological and historical sites as a national heritage.

The relevant foreign practice and consultancy is useful for Egypt in building its new towns, providing useful lessons and helping to avoid mistakes already made elsewhere. British experience shows that the application of planning and management principles in the new settlements is the only way to overcome the problems of lack of services, congestion, squalor and social evils of the old settlements. This experience also combines between work and living places. Unless the programme of the new settlements solves such problems in Egypt, it will scarcely fulfil its aims. The British new towns were basically built to relieve pressure on overcrowding in big cities, or to provide housing for the workers near particular industries, or raw materials. New towns in Egypt must realize many of these same aims but with a much greater capacity to absorb the population growth which is far greater than in Britain, where the size of the new towns ranges between 10000 and 220000 people. The consultants of London and Birmingham housing needs concluded, in 1962, that bigger new towns would be cheaper per person than smaller ones.

To be successful, or even worthwhile, the establishment of new

settlements in Egypt must be implemented in a way that will attract large numbers of people mainly the working classes, from the overcrowded areas which lack jobs and services to new environments with adequate opportunities to maintain self-contained communities.

From this study, particularly from the examination of the British experience, and the policy for the establishment of new settlements in Egypt, considering circumstances in the latter, four sets of conclusions can be derived:

A. The scope for new settlements:

1. Many more new settlements are needed in Egypt than are under construction at present.
2. New settlements are investments in the future provided that adequate management is available for them.
3. Urban expansion has to open up ripe areas for development, and desolate areas with natural resources.
4. Big new towns give the scope to establish satellite villages round them including the educational ones to benefit from their services.

B. Criteria for location of new settlements:

1. New settlements have to be located away from the existing inhabited areas, but close to land with potential especially for agriculture, the primary occupation of the majority of the people.
2. The access to the national transportation networks is essential for new settlements success.
3. Water supply should be enough for the selected site, with efficient use of water.
4. Energy consumption will be high in the new settlements. The access to energy sources and the use of renewable energy would be essential.

C. Implementation of the new settlements policy:

1. The analysis of planning data and consultation with the relevant national and international institutions will help in decision making,

and in accommodating unpredictable changes. This can be done by an improved staff able to avoid mistakes made elsewhere and to apply successfully planning principles.

2. The enforcement of planning laws associated with organisation, co-ordination and monitoring realise proper development and necessitate the selection of efficient staff.
3. The leasehold system should apply, especially to residential areas, to reduce final costs.
4. Domestic and foreign private capital should have incentives to invest in the new settlements to reduce demand on government budgets.
5. Training and accommodating construction workers in the new settlements are essential to increase building productivity and to prevent slum formation.

D. Specific aspects of the new settlements:

1. Cheap housing for the poor majority, and self-help methods should have every government support.
2. The owner-occupier system should be fully encouraged.
3. Population density must be low enough to make it possible to realise a better way of life.
4. Industrial new settlements would be better larger than others which need not to be large.
5. Industrial development is essential and must have full support including industries which move from old urban areas into new settlements.
6. Adequate health, education, social, recreational and shopping facilities are basic to start a new community.

The above mentioned points sum up steps that could be taken for the promotion of the programme of new settlements to consider Egypt more

than the Nile Valley and the Delta, and to exploit the untapped resources outside the present inhabited area.

Information about the development plan and the corporation staff should be available to detect and amend any deficiency in implementation procedures.

It is clear that a successful implementation of the new settlements programme necessitates proper administration and financial resources associated with adequate skills especially the quality and quantity of staff, which are the concern of the development corporation.

APPENDIX (0)TABLES OF CHAPTER TWO

Table (2-1)
THE DISTRIBUTION OF TOTAL POPULATION BY SEX AND ANNUAL RATE OF INCREASE
1882-1980

Year	Male (000s)	Female (000s)	Total (000s)	Annual Rate of Increase %
1882	3345	3367	6712	-
1897	4914	4755	9669	2.9
1907	5917	5573	11191	1.6
1917	6369	6349	12718	1.3
1927	7057	7120	14178	1.1
1937	7967	7954	15921	1.2
1947	9392	9575	18967	1.9
1960	13118	12967	26085	2.6
1966	15176	14900	30076	2.6
1976	18699	17957	36656(*)	2.3
1980	21364	20636	42000	3.57

(*) Excluding 1425 outside the country at the time of census

Sources: CAPMAS, State Year Book 1969, p.14. The Preliminary Results of the 1976 Census, p.8, and Population Studies, Cairo, December 1981, p.70.

Table (2-3)

AGE SPECIFIC DEATH RATE, PER THOUSAND, IN EGYPT, 1930-1970

Year	Infant Mortality	1-24	25-44	45-65	64 plus
1930	151	17.5	8.1	18.5	93.9
1940	162	19.4	8.6	18.8	115.5
1945	153	19.9	10.1	23.7	105.3
1950	130	12.1	5.6	12.4	90.0
1955	136	12.2	3.1	10.2	90.0
1960	109	10.9	3.8	11.8	103.4
1965	113	7.2	3.1	10.9	86.1
1970	116	8.4	3.5	14.0	108.0

Source: Khalifa, The Population of Egypt, p14.

Table (2-2)

BIRTH, DEATH AND NATURAL INCREASE RATES IN EGYPT
(Per Thousand)
IN 1906 - 1980

Year	B.R.	D.R.	N.I.R.	Year	B.R.	D.R.	N.I.R.	Year	B.R.	D.R.	N.I.R.
1906/09	43.0	25.5	17.5	1937	43.5	27.2	16.3	1959	42.8	16.3	26.5
1910/14	42.0	26.2	15.5	1938	43.3	26.4	16.9	1960	42.9	16.9	26.0
1917	40.1	29.4	10.8	1939	42.2	26.0	16.2	1961	43.9	15.8	28.1
(*)1918	38.9	39.6	-0.7	1940	41.6	26.5	15.1	1962	41.2	17.8	23.4
1919	37.7	29.4	8.4	1941	40.8	25.9	14.9	1963	42.8	15.5	27.3
1920	42.2	28.0	14.3	1942	38.2	28.7	9.5	1964	42.0	15.7	26.3
1921	41.8	25.0	16.8	1943	39.6	28.3	11.3	1965	41.4	14.0	27.4
1922	43.1	25.1	18.0	1944	41.0	26.8	14.2	1966	41.0	15.8	25.2
1923	43.1	25.8	17.3	1945	43.9	28.6	15.4	1967	39.2	14.2	25.0
1924	43.8	24.9	18.9	1946	41.2	25.0	16.2	1968	38.1	16.1	22.4
1925	43.5	26.5	17.1	1947	43.7	21.4	22.3	1969	36.8	14.4	22.4
1926	44.2	26.7	17.4	1948	42.7	20.4	22.3	1970	35.6	15.0	20.6
1927	44.0	25.2	18.8	1949	41.8	20.6	21.2	1971	35.1	13.2	21.9
1928	43.6	26.3	17.3	1950	44.2	19.0	25.2	1972	34.4	14.5	19.9
1929	44.2	27.6	16.6	1951	44.6	19.2	25.4	1973	35.7	13.1	22.6
1930	45.2	24.9	20.6	1952	45.2	17.8	27.4	1974	35.7	12.7	23.0
1931	44.5	26.6	17.9	1953	42.6	19.6	23.0	1975	36.0	12.1	23.9
1932	42.5	28.5	14.0	1954	42.6	17.9	24.7	1976	36.4	11.7	24.7
1933	43.8	27.5	16.2	1955	40.3	17.6	22.7	1977	37.3	11.8	25.5
1934	42.2	27.8	14.4	1956	40.7	16.4	24.3	*1978	38.6	10.6	28.0
1935	41.3	26.4	14.9	1957	38.0	17.8	20.2	*1979	40.9	11.0	29.9
1936	44.2	28.8	15.3	1958	41.1	16.6	24.5	*1980	40.94	10.37	30.57

(*) Exceptional period of influenza epidemic that resulted in high death rate and low birth rate.

* Provisional

References

- (1) Dr. A. Khalifa, The Population of Egypt, Cairo, 1974, p.5 for 1906-1914.
- (2) Dr. M.S.A. Hakim, The Population of Egypt, Cairo, 1972, p.41 for 1917-1970.
- (3) Dr. A.M. Halloda, A Statement on the Population of the A.R.E. 3rd April, 1980, p.17 for 1971-1979.
- (4) The Supreme Council For Population and Family Planning, Population, Studies, No 59, Oct/Dec. 1981, p.70.

Table (2-4)
LIFE EXPECTANCY IN EGYPT (1937-1966)

Census Years	Males				Females			
	0	5	10	20	0	5	10	20
1937	35.7	50.4	47.4	39.8	42.1	58.3	45.5	46.1
1947	39.6	51.8	48.6	40.6	42.5	54.0	50.8	43.0
1960	46.2	55.6	51.9	45.9	46.2	57.8	54.2	45.9
1966	48.5	56.9	53.1	44.5	48.5	59.3	55.5	47.0

Source: CAPMAS, Vital Statistics of A.R.E. from 1930, Cairo, July, 1968.

Table (2-5)
DISTRIBUTION OF EMIGRANTS BY SEX AND TYPE IN 1969

Type	Males	Females	Total	%
Main	2625	493	3118	55.2
Accompanying	816	1711	2527	44.8
Total	3441	2204	5645	100
%	61	39	100	-

Source: CAPMAS, Ref. No. 75, 1970.

Table (2-6)
PERCENTAGE OF CAIRO POPULATION TO THE TOTAL POPULATION IN EGYPT, 1927-1980

Year	1927	1937	1947	1960	1966	1976	1978 (Aug)	1979 (Jan)	1979 (Jun)	1980 (Apr)
%	8.2	8.2	10.9	12.9	14.0	13.3	13.2	13.2	13.2	13.1

- A. Figures of 1927 to 1976 are based on census data.
B. Figures of 1978 to 1980 are based on estimations.

Source: Symposium on Population and Development Issues, Cairo, April 20-22, 1981, Memo, Dr. A.M. Halloda, CAPMAS, p.7.

Table (2-7)
POPULATION DENSITIES OF THE INHABITED AREA IN EGYPT: 1897-1966

Year	Pop.(000s)	Inhabited area 000 Km ²	Pop. Density person/km ²	Pop. Density per acre
1897	9,669	35	276	1.1
1907	11,190	35	320	1.3
1917	12,718	35	363	1.5
1927	14,170	35	405	1.6
1937	15,921	35	455	1.8
1947	18,967	35	542	2.2
1960	25,984	36	722	2.9
1966	30,075	36	836	3.3

Source: CAPMAS, Statistical Year Book, Cairo, 1973.

Table (2-8)
PERCENTAGE DISTRIBUTION BY BROAD AGE CATEGORIES IN EGYPT 1917-1976

Years	Age Group		
	0-14	15-64	65+
1917	39.01	55.71	5.28
1927	38.68	56.83	4.49
1937	39.20	56.50	4.30
1947	38.07	58.83	3.10
1960	42.75	53.78	3.47
1970	42.40	54.40	3.20
1976	39.94	56.46	3.59

Sources: Khalifa, p.25 and CAPMAS, The Detailed Results of 1976 Census, The total of the Republic, Sept. 1978, Arabic, p.72.

Table (2-9)
POPULATION RATIOS BY PRINCIPAL AGE GROUPS IN EGYPT - 1960

Age Groups	Rural	Urban	Total
- 15	109	104	107
15 - 44	96	102	98
45 - 64	91	111	97
64+	82	96	86
All ages	100	104	101

Source: Khalifa, p.27.

Table (2-10)

THE AVERAGE FAMILY AND HOUSEHOLD SIZES IN EGYPT, 1966

Areas	Average Family Size	Average Household Size
Metropolitan	5.09	5.45
Upper Egypt	5.00	4.60
Lower Egypt	5.67	5.56
Frontier Governorate	9.00	8.80
Total	6.19	6.1

Source: CAPMAS, A.R.E. Annual Statistics for 1970, Cairo.

Table (2-11)

PERCENTAGE DISTRIBUTION OF HOUSEHOLD'S SIZES IN EGYPT, 1960

Size	Urban %	Rural %
1-3	33.5	30.6
4-6	40.5	38.3
7+	26.0	31.1

Source: Khalifa, p.32.

Table (2-12)

PERCENTAGE OF POPULATION 10+ YEARS BY SEX AND EDUCATION

Educational Status	1960			1976		
	Male	Female	Total	Male	Female	Total
Illiterates	56.9	84.0	70.5	43.2	71.0	56.5
Read & Write	32.6	12.4	22.5	33.2	16.2	25.1
Qualified below degree	9.0	3.4	6.2	20.4	11.6	16.2
Higher qualified	1.5	0.2	0.8	3.2	1.2	2.2

Source: Arab Manpower, J.S. Birks and C.A. Sinclair, LONDON, 1980,

p.218.

Table (2-13)

ENROLMENT IN SCHOOL & UNIVERSITY AND GROWTH RATES IN SELECTED YEARS

Stage	1972/3	1974/5	Per cent Growth Per Annum	1976/7	Per cent Growth Per Annum
University	218,899 (1969/70)	301,170	17.2	307,500	1.0
Secondary	559,867	718,225	5.1	754,666	2.5
Intermediate	797,895	1,199,801	8.5	1,435,529	9.3
Primary	3,618,750	4,074,893	2.4	4,151,956	1.0

Source: J.S. Birks and C.A. Sinclair, Arab Manpower, LONDON, 1980, p.219.

Table (2-14)

EGYPTIAN EMPLOYMENT BY SECTOR IN 1976

Sector	Number	Per cent
Agriculture	6,490,000	50.7
Government	1,740,000	13.5
Public Sector	1,210,000	9.4
Private Sector	950,000	7.4
Armed Forces	342,500	2.7
Workers Abroad	600,000	4.7
Unemployed	1,449,000	11.5
Total	12,811,500	100.0

Source: J.S. Birks and C.A. Sinclair, Arab Manpower, LONDON 1980, p.226.

Table (2-15)

PERCENTAGE OF LABOUR FORCE BY SEX AND REGION TO TOTAL POPULATION, MAY 1970

Region	Males	Females	Average
Cairo	43.5	5.8	24.4
Alexandria	45.6	6.1	25.6
Total Urban Govs.	44.1	5.9	24.7
Lower Egypt	49.0	3.2	25.9
Upper Egypt	53.3	2.6	28.0
All areas	49.4	3.6	26.4

Source: Khalifa, p.53.

Table (2-16)

PERCENTAGE OF THE LABOUR FORCE IN EACH CATEGORY OF OCCUPATION IN EGYPT, 1937-1971

Occupation	1937	1947	1960	1971
White Collar	11.70	12.40	16.60	17.06
Blue Collar	12.20	15.60	19.30	19.00
Farmers	68.60	60.50	53.10	52.63
Services	7.20	9.00	8.80	9.06
Others	0.30	2.50	2.20	2.25

Source: Khalifa, p.59.

Table (2-17)

PERCENTAGE OF FEMALE LABOUR FORCE ACCORDING TO OCCUPATION CATEGORY 1961-1969

Occupation	1961	1969
White Collar	19.4	38.3
Services	27.6	24.4
Agriculture	43.0	22.4
Blue Collar	6.7	11.0
Unstated	2.3	4.9

Source: CAPMAS, Women in 20 years, Cairo, 1972.

Table (2-18)

PERCENTAGE OF LABOUR FORCE BY STATUS AND SEX IN EGYPT, 1937-1970

Status	Males		Females		Both Sexes			
	1947	1960	1947	1960	1937	1947	1960	1970
Employers	12.1	7.7	5.1	1.9	13.6	11.3	7.3	12.6
Self-employed	23.9	23.6	24.0	8.2	22.8	23.9	22.4	19.8
Employees	43.9	49.0	43.8	55.3	62.9	43.9	49.5	46.7
Family workers	18.7	17.6	26.7	28.2	not	19.6	18.4	18.5
Others	1.4	2.1	0.4	6.4	1.2	2.3	2.4	2.4

Source: Khalifa, p.62.

Table(2-19)
PERCENTAGE DISTRIBUTION OF LABOUR FORCE BY ECONOMIC ACTIVITY IN EGYPT, 1897 - 1974

Years	1897	1907	1917	1927	1937	1947	1960	1968	1969	1970	1973	1974
Agriculture	68.0	70.0	68.5	67.0	69.0	62.4	58.0	54.7	52.5	51.3	51.5	47.6
Industry	11.5	11.5	11.5	10.6	10.6	12.3	12.6	17.0	17.4	18.6	17.7	18.7
Transportation, Commerce	8.0	7.6	10.0	12.9	10.4	12.1	11.7	12.8	13.3	13.9	13.9	16.2
Services	12.5	10.9	10.0	9.9	10.0	13.2	17.7	15.5	16.8	16.6	16.9	17.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: CAPMAS, Population and Development, Sept. 1978, p.198.

Table (2-20)
DISTRIBUTION OF FACTORIES, 1970-1971

Governorate	Factories of 10+ Workers	Factories of 500+ Workers
Cairo(*)	1964	58
Alexandria	778	45
Giza(*)	373	20
Kalyubiya(*)	360	38

(*) Mainly Greater Cairo Urban Region

Source: CAPMAS, Population and Development, Cairo, Sept. 1978, p.190.

Table (2-21)
IMPORTS OF CONSUMER GOODS IN EGYPT FROM 1939-1971, SELECTED YEARS
IN £E. 000s

Years	Food Grains & Flour	Meats	Edible Oils & Fats
1939	54	124	73
1945	3,357	324	77
1950	22,066	1,363	248
1960	26,291	1,619	2,874
1965	66,415	3,013	4,023
1970	30,524	3,226	13,012
1971	70,749	3,673	16,910

Source: Khalifa, p.86

Table (2-23)
FOREIGN TRADE IN EGYPT 1973-1976
 (\$ million)

	1973	1974	1975	1976
Imports	1,664	3,475	4,329	3,465
Exports	1,003	1,674	1,568	1,605
Balance	-661	-1,801	-2,761	-1,860

Source: J.S. Birks and C.A. Sinclair, Arab Manpower, LONDON, 1980, p.223.

Table (2-22)

NATIONAL INCOME AND PER CAPITA INCOME 1952/1953 - 1975 IN EGYPT

Years	National Income L.E. Millions	Annual Increase %	Per Capita Income L.E.	Annual Increase %
1952/53	806.0	-	37.1	-
1953/54	847.0	5.1	38.0	2.4
1954/55	920.0	8.6	40.3	6.1
1955/56	965.0	4.9	41.3	2.5
1956/57	1067.0	10.6	44.6	8.0
1957/58	1126.0	5.5	46.1	3.4
1958/59	1157.0	2.8	46.3	0.4
1959/60	1288.6	11.4	50.3	8.6
1960/61	1365.3	6.0	51.7	2.8
1961/62	1410.6	3.3	52	0.6
1962/63	1557.2	10.4	55.9	7.5
1963/64	1733.2	11.3	60.5	8.2
1964/65	1953.3	12.7	66.3	9.6
1965/66	2109.4	8.2	69.6	5.0
1966/67	2158.6	2.3	69.3	0.4
1967/68	2164.5	0.3	67.5	2.6
1968/69	2300.0	6.3	71.7	6.2
1969/70	2508.3	9.1	76.2	6.3
1970/71	2641.3	5.3	78.4	2.9
1971/72	2821.8	6.8	81.5	4.0
1972	2943.0	4.3	82.3	1.0
1973	3188.0	8.3	87.1	5.8
1974	3999.1	25.4	109.6	25.8
1975	4630.5	15.8	124.1	13.2

Source: CAPMAS, Population and Development, Sept. 1978, p.270.

Appendix(1a) NEW TOWNS: STAFF IN POST

TOWN	1.4.79	1.4.82	1.7.82	1.10.82	1.1.83
AYCLIFFE/ PETERLEE	Non Manual	190	154	154	154
	Manual	46	31	31	21
	Total	236	185	185	175
BASILDON	Non Manual	448	419	419	417
	Manual	262	236	228	224
	Total	710	655	647	641
CLNT	Non Manual	349	358	354	349
	Manual	90	104	106	104
	Total	439	462	460	453
MILTON KEYNES	Non Manual	1260	982	971	980
	Manual	269	136	117	116
	Total	1529	1118	1088	1096
NORTHAMPTON	Non Manual	259	215	184	168
	Manual	56	45	58	42
	Total	315	260	242	210
PETERBOROUGH	Non Manual	607	566	550	523
	Manual	184	154	155	149
	Total	791	720	705	672
REDDITCH	Non Manual	379	274	266	250
	Manual	83	90	90	90
	Total	462	364	356	340
SKELMERSDALE	Non Manual	383	328	321	298
	Manual	158	149	147	143
	Total	541	477	468	441
TELFORD	Non Manual	778	584	577	580
	Manual	382	309	281	269
	Total	1160	893	858	849
WARRINGTON & RUNCORN	Non Manual	907	872	861	615
	Manual	296	277	274	248
	Total	1203	1149	1135	863
WASHINGTON	Non Manual	362	278	278	276
	Manual	178	180	180	175
	Total	540	458	458	451
COMMISSION FOR THE NEW TOWNS	Non Manual	561	292	286	247
	Manual	177	93	102	95
	Total	738	385	388	342
TOTAL	Non Manual	6483	5322	5221	4857
	Manual	2181	1804	1769	1676
	Total	8664	7126	6990	6533

Source : New Towns Association , London, Nov. 1983.

APPENDIX (1)

SELECTED DATA ON THE NEW TOWNS

(Tables reproduced by courtesy of The Town and Country Planning Association)

Area and population data

	Date of Designation	Designated area in acres and in hectares in brackets	Population			Average Annual Increase 1961-1981	
			Original	Proposed ¹	31 Dec 1976		1981
Basildon	4 Jan 1949	7818 (3165)	25,000	103,600 130,000	91,890	100,100	2,025
Bracknell	17 June 1949	3303 (1337)	5149	55-60,000 55-60,000	45,000	47,500	1,411
Crawley	9 Jan 1947	5920 (2396)	9100	- 85,000	75,000	72,756	936
Harlow	25 Mar 1947	6395 (2588)	4500	Undecided Undecided	81,000	79,276	1,279
Hatfield	20 May 1948	2340 (947)	8500	25,000 29,000	26,000	25,160	232
Hemel Hempstead	4 Feb 1947	5910 (2391)	21,000	65,000 85,000	78,000	76,776	1,091
Stevenage	11 Nov 1946	6256 (2532)	6700	80,000 100-105,000	74,000	74,365	1,569
Welwyn Garden City	20 May 1948	4317 (1747)	18,500	42,000 50,000	41,000	40,496	266
Newton Aycliffe	19 Apr 1947	3103 (1254)	60	Undecided 45,000	26,500	25,600	616
Central Lancs.	26 Mar 1970	35,255 (14,267)	234,500	271,000 Not estimated	248,000	255,000	951
Corby	1 Apr 1950	4423 (1791)	15,700	Not estimated 70,000	53,500	47,772	584
Milton Keynes	23 Jan 1967	22,000 (8900)	40,000	150,000 200,000	77,000	97,000	3,193

APPENDIX I (Cont'd..)

	Date of Designation	Designated area in acres and in hectares in brackets	Population				Average Annual Increase 1961-1981
			Original	Proposed ¹	31 Dec 1976	1981	
Northampton	14 Feb 1968	19,966 (8080)	133,000	173,000	158,000	159,000	1,638
Peterborough	1 Aug 1967	15,940 (6453)	81,000	180,000 160,000	109,000	122,440	1,911
Peterlee	10 Mar 1948	2799 (1133)	200	28,000	27,500	26,500	471
Redditch	10 Apr 1964	7180 (2906)	32,000	30,000 70,000 90,000	53,200	64,700	1,613
Runcorn	10 Apr 1964	7234 (2930)	28,500	71,000 100,000	54,600	63,900	1,784
Skelmersdale	9 Oct 1961	4124 (1669)	10,000	73,300 80,000	41,000	40,600	1,440
Telford	12 Dec 1968	19,300 (7790)	70,000	135,000 150,000	99,700	104,800	2,126
Warrington	26 Apr 1968	18,612 (7535)	122,300	160,000 170,000	135,400	140,200	942
Washtington	26 July 1964	5610 (2271)	20,000	65,000 80,000	46,000	55,915	1,488
Cwmbran	4 Nov 1949	3160 (1278)	12,000	55,000	45,000	45,700	676
Mid-Wales (Newton)	18 Dec 1967	1497 (606)	5000	Not estimated 11,500	7700	8,660	182
Cumbernauld	9 Dec 1955	7788 (3152)	3000	13,000 70,000	45,000	50,748	2,164
East Kilbride	6 May 1947	10,250 (4148)	2400	100,000 82,500	76,200	76,100	1,967
Glenrothes	30 June 1948	5765 (2333)	1100	90,000 55,000	33,700	38,000	986
Irvine	9 Nov 1966	12,440 (5022)	34,600	70,000 116,000 120,000	52,305	58,000	1,128

APPENDIX 1 (Cont'd..)

	Date of Designation	Designated area in acres and in hectares in brackets	Population				Average Annual Increase 1961-1981
			Original	Proposed ¹	31 Dec 1976	March 1981	
Livingston	17 Apr 1962	6692 (2708)	2000	70,000 100,000	29,000	38,677	1,722

Sources: Development corporations, Commission for the New Towns and Peter Shore's statement, April 1977.

¹ Two figures are given: the first is the population size when planned migration is to stop; the second is the proposed ultimate population for natural increase.

² Planned migration has already stopped.

³ 1981 and average annual increase figures are obtained from New Towns Association, London, and Town and Country Planning, November 1982.

APPENDIX(2)OUTLINE CHRONOLOGY

- 1898 Ebenezer Howard publishes Tomorrow: a Peaceful Path to Real Reform
- 1899 Howard et. al. found Garden Cities Association
- 1902 Garden City Pioneer Company founded
- 1903 Pioneer Company starts Letchworth
- 1912 F. J. Osborn goes to work at Letchworth
- 1918 New Towns after the War by F. J. Osborn et. al. published (Osborn, 1942).
- 1919 Howard buys land for Welwyn Garden City
- 1920 Welwyn started
- 1921 Chamberlain's Unhealthy Areas Committee reports
- 1933 A Hundred New Towns for Britain published by A. Trystan Edwards under the pseudonym Ex-serviceman J47485
- 1935 Marley's inter-departmental committee on garden cities and satellite towns reports
- 1936 F. J. Osborn becomes virtually full-time worker for Garden City and Town Planning Association
- 1937 Barlow Royal Commission on Distribution of Industrial Population set up
- 1940 Barlow report published
- 1942 New Towns after the War republished. Uthwatt Committee on Compensation and Betterment reports. Scott Committee on Land Utilization in Rural Areas reports
- 1945 Lewis Silkin appoints New Towns Committee under Lord Reith
- 1946 January: Reith committee publishes Interim Report
(New Towns Committee, 1946a)
- March: Stevenage announced
- April: New Towns Bill introduced into Commons

APPENDIX 2 (Cont'd..)

- 1946 April: Reith committee publishes Second Interim Report
(New Towns Committee, 1946b)
- July: Final Report of Reith committee published
(New Towns Committee, 1946c). New Towns bill completes
parliamentary passage.
- November: Stevenage designated under New Towns Act
- 1947-50 Thirteen other towns designated in England, Wales and Scotland
- 1952 Town Development Act passed
- 1955 Cumbernauld designated
- 1959 New Towns Act passed, setting up Commission for the New Towns
- 1961 Skelmersdale designated. Fourteen more towns designated between
1962 and 1973, ending with Stonehouse
- 1965 New Towns Act passed, amending and consolidating first two major
Acts
- 1966 Government announces shift to 50 per cent owner-occupation
- 1968 Parallel Act to 1965 Act for Scotland
- 1974 Expenditure Committee starts hearings. Consultative Document
for England and Wales (DOE, 1974) published
- 1975 Consultation Document for Scotland (Scottish Office, 1975)
published. Expenditure Committee publishes Final Report
(Expenditure Committee, 1974/5a)
- 1976 May: Stonehouse new town ended
- September: Government published as White Paper (Cmnd 6616).
Peter Shore's 'Manchester Speech'. New Towns (Amend-
ment) Act passed, allowing for transfer of rented
housing to local authorities
- 1977 New Towns (Scotland) Act passed allowing for winding up of
development corporations (the 1959 Act did not apply to Scotland)

APPENDIX 2 (Cont'd..)

1977 April: Result of review of new towns' targets announced
 September: White Paper on the inner city (Cmd 6845) published
1978 Inner Urban Areas Act passed.

Source:

Meryl Aldridge, *The British New Towns, A programme without a policy*, London, 1979, pp.205-206.

APPENDIX (3)

MILTON KEYNES NEW CITYINTRODUCTION

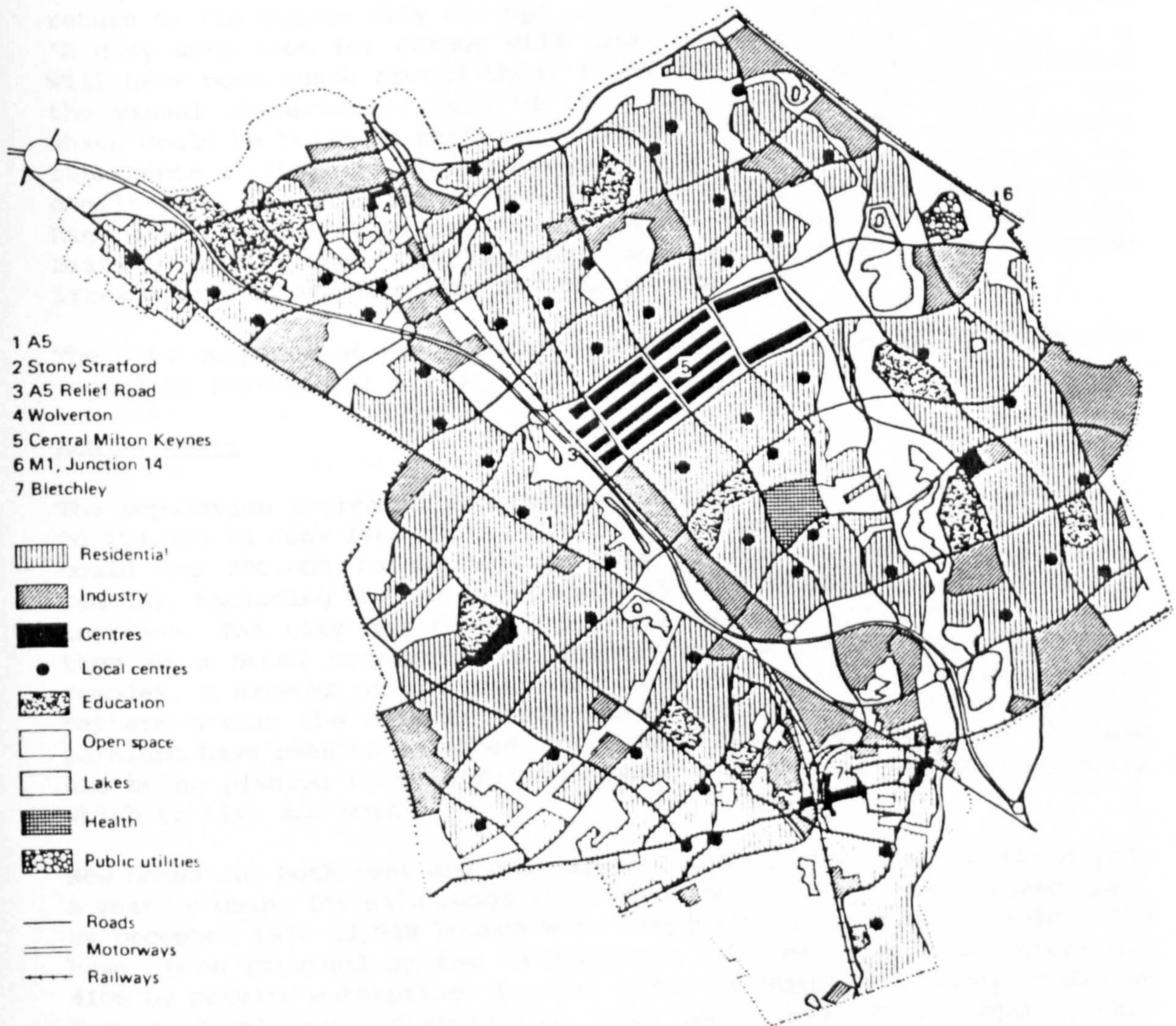
Milton Keynes was planned as a city for 250,000 inhabitants. It is about halfway between London & Birmingham. Its area is about 22,000 acres, roughly 5 x 5 miles. Densities were planned at an average of eight homes per acre in most of the city. This figure is similar to that proposed by Buchanan in the South Hampshire study, 1966, although Milton Keynes is planned on different design principles.

The target population of Milton Keynes is among the nearest of the British new towns to those of the Egyptian new towns such as Sadat & 10 Ramadan, which are situated at almost similar distances from the capital city. Industry forms a main function in each case. So an examination of some ^{aspects} of the planning of Milton Keynes might be useful in providing the results of relevant experience of planning and implementation that could be applicable to the Egyptian new settlements programme. Low population density, and the provision of work and shelter in a new environment with sufficient green areas and social and recreation services represent some of this experience.

The Goals of Milton Keynes

The goals set for the planning of the new city of Milton Keynes were reached following a series of seminars and discussions extending over three months, and preceded all design work on the plan. These goals were:

1. Opportunity and freedom of choice, so that people can exercise choice between schools, shops, work and different services. There were to be no specific catchment areas and no neighbourhood idea.
2. Easy movement access and good communications. If there is to be freedom of choice, freedom of movement, easy direct access from any point in the town to any other point not only from home to work but also to certain points in the city as the centre or recreational facilities. So solutions limiting freedom of choice in mode of transport or leading to certain areas of the town were rejected.
3. Balance and variety can be realized when plans provide locations where social and commercial services can spring up or die away easily, according to needs.
4. A city could be realized that would be attractive as well as catering for overspill. A new city has to meet expressed demands as people arrive. Public awareness and the participation of the new comers helps to meet their wishes. The plan must leave as many decisions as possible open for the future.
5. The efficient and imaginative use of resources must have their proper weight in planning. The plan must be tested against a cash-flow analysis. Economic study is a vital design tool.



Milton Keynes Outline Plan.

Source: *New Towns*, Osborn & Whittick, 1977, p.237.

The Development

Milton Keynes Development Corporation was formed in 1967. An interim report was prepared in December 1968, and a final report was published in March 1970. A public exhibition of the plan raised 127 objections which were justified, and work started in the city in late 1970.

The generous provision of open spaces in Milton Keynes is largely a return to the garden city concept. As the consultants said it should be 'A city with room for change will look more open; homes that can grow will have more space around them, trees and landscaping will establish the visual character of much of the city including the primary roads which could be built as parkways' (Osborn, 1977, p. 238). Milton Keynes represents a return to more spacious siting with an all over average net density, for the majority of dwellings, of 8 to the acre, instead of the high densities and close building in some of the second generation of the British new towns development. Housing standards are similar irrespective of whether they are for sale or rent.

The city composed of environmental areas, each of one kilometre square including residential areas.

Achievements

The population increased from 40,000 in 1967 to 89,000 in Spring 1980, to 103,500 in June 1982 and to 107,000 in December 1982. By the 1990s it could top 200,000 to reach a maximum of 250,000 by the end of the century, including the intake of about 150,000 in addition to the natural increase. The city was developed round three existing towns, linking them in a broad crescent that incorporates a superb new city centre complex. A network of new roads has been established in a logical grid pattern across the city to make travel fast and easy. Great areas of parkland have been established, new lakes created and thousands of trees are being planted to make Milton Keynes a green and pleasant place in which to live and work.

New homes for both rent and sale are being built at a rate of about 2000 a year. Housing for sale range in price from £14,000 to £50,000 and more. By December 1976-13,948 houses were completed since 1970, of which 6764 have been provided by the corporation, 3078 by local authorities and 4106 by private enterprise. In June 1982, the completed houses on Milton Keynes Development Corporation land and were 21317 while other completions in the designated area were 5080 units.

Every housing development is different and the styles range from modern to traditional. All houses have gardens and a parkway space. Most have a garage or car port. There is no high rise living in Milton Keynes. Priority in housing is given to those who want to move to Milton Keynes to relieve housing pressure in London, but others who live elsewhere can still qualify. Special housing opportunities are offered for retired and elderly people, ex-servicemen, the disabled and the trainees in Milton Keynes Skill centre. By 1976, 152 industrial firms started work on land provided by the Development Corporation of which 116 are advance factory units built by the corporation.

Large scale industries are located towards the periphery and the smaller industries within the city.

About 30,000 new jobs were created by June 1982. Between 2400 and 3000

dwellings were being completed each year in Milton Keynes in the late 1970s.

The City Centre

The largest covered shopping area in Britain, and one of the largest in Europe, was opened in August 1979 at Central Milton Keynes. More than 130 shops, ranging from the small specialist to the largest department stores are housed in one building. The shops are arranged in two half mile long arcades each planted with trees and shrubs from around the world. The light airy building, with its wide variety of shops is already proving to be a major attraction to the region. Free street level parking for more than 6000 cars is just a few minutes walk from the building.

Offices are already open including new Civic Offices, with others under construction. Office floorspace completed in the city by December 1982 was 176,670 m², while shopping floorspace in the centre was 93,000m², in addition to 41,062 m² of shopping floorspace elsewhere (other than the local centres.)

The Local Centres

Local shopping centres are being built to augment the city centre shops. Each serves an estate or a group of estates., and has a supermarket, post office and newsagent. Some have many other facilities such as a chemist or laundrette. In December, 1982, the completed local shopping floorspace was 29,861m².

Industry

Experience in most of the earlier new towns indicates that the speculative provision of good factory premises is one way of attracting industry and therefore of contributing to the rapid growth of the town. Industrial estates in Milton Keynes have a standardized frame construction and standardized cladding units which permit adaptations to various requirements. The monotonous appearance of such units could be overcome by size variations and the introduction of trees. Firms also have the opportunity to build their own premises on land provided by the corporation.

By December 1982, the completed industrial floorspace was about 660,224 m² on land made available by the corporation of which 99,610m² represented the increase in 1981-82. A further 488,709m² were developed elsewhere. Over 3000 new jobs are expected to be generated annually in the 1980s in the new industrial areas.

Major sites for industry are spread over the entire new city. Appropriate small scale industry is encouraged within the residential areas to provide more jobs for women to work near their homes.

Services

Education

Thirty seven new schools have been built including first schools for 5-8 year olds, middle schools for 8-12 year olds, and comprehensive schools from then on. Another twenty schools were extended.

Health

Doctors, midwives, district nurses and health visitors are based at seven health centres throughout the city. A 100 bed Community Hospital has been opened, and in 1984 the Milton Keynes District General Hospital will be opened, capable of providing the full range of in and out patient care. Four general hospitals already exist within 20 miles of the new city.

Roads and Transport

The new roads in Milton Keynes are laid out in a logical grid pattern east-west and north south. On all main routes into the city there are roadside information points containing maps for finding the way about. Linear parks run through the city to form continuous green belts. It will eventually be possible to cross the city through parkland alone.

Till December 1982, completed city roads amounted to about 72 Km, while city footpaths and cycleways were 110 Km. About 53Km. of the new main roads in the city were single carriageways (7.3 m. wide), and 19 Km. were dual carriageways (14.6 m.wide). Some 50 Km. of the pre-new city main roads have been retained as part of the city road network.

Considerable emphasis is placed on providing an effective public transport service to all the developing and existing areas of the city and two bus stations are in service. In October 1981, the new railway station was opened, with Inter-City services to London.

Social Services

Social services are available in a wide range.

A. The Development Corporation employs arrival visitors to call to give advice and information to help people to settle down and encourage the formation of self help groups. Community workers also help to organize social activities.

B. The city has its own Community radio station.

C. One community house is available in every estate where residents can meet. Also these houses are used as bases by the arrival visitors.

D. Community workshops can be joined by any one to carry on a craft or hobby such as wood work, painting or dress making. A small charge is collected for the use of equipment. Expert help and advice is available.

E. Day centres are established for old folk or the disabled as meeting places, craftwork or reading, otherwise they are left alone at home during the day.

By December 1982, 193 leisure and recreation projects and 53 social and welfare projects were completed.

F. At a start of a housing development, a temporary shop and meeting places are provided for the first residents. As more people arrive and the estate grows, they are replaced by permanent buildings.

Information About the New City

'A guide to housing', 'How to get a job', 'What is Where' and 'What is What' are some of the headlines shown in Milton Keynes guide for the people considering moving to the new city to give them a full information about everything there. Milton Keynes Report is frequently published to update the information about the new city.

Milton Keynes Financial Review.

by 1981-1982

The total investment in Milton Keynes/amounted to £1,025 million, 42% from the central government, VIA MKDC, 36% from the private sector, 7% from the Borough and the County Council and 15% from other public bodies. In 1981-82 alone, the investment in MK totalled £150m. 29%, 52%, 6% and 13% respectively as above.

The fixed assets of the corporation are as follows.

	£m
Housing	227.
Roads, footpaths and other development	93
Commerce	56
Industry	28
Land preparation	25
Major amenities as recreation and community halls	3

Conclusion

The circumstances of Milton Keynes as mentioned in the introduction of this Appendix, as a 'new city' of a scale approaching that of the Egyptian new settlements are worthy of study in relation to the comprehensive programme of the establishment of the new towns in the Greater Cairo Region (Chapter Four). In these cases big numbers of jobs, houses, services and recreation projects are essential. Emphasis must be put on housing provision in quantity to meet the actual needs of Greater Cairo and the other metropolitan areas in Egypt. Housing provision has to be at a price that the people can afford, and the programme must match both needs and resources. These considerations need programming to achieve the goals of planning for the new settlements, which Milton Keynes gives one of the examples.

References

1. Milton Keynes Development Corporation, A special letter to the author, 14th February, 1983.
2. Ibid, Facts on Milton Keynes, June 1982.
3. Ibid, Progress Report and Financial Review, 1981-1982.
4. Ibid, Milton Keynes Report, Spring 1980.
5. F. Osborn, New Towns, London, 1977.
6. P. Self and others, New Towns, The British Experience, London, 1972.

APPENDIX (4)

BETTER USE OF WATER IN ARID LANDS

1. RAINWATER HARVESTING

Rainwater harvesting is possible in areas with as little as 50 - 80 mm average annual rainfall. During a year with only 24 mm of rain, a water-harvesting catchment in the Negev Desert (Fig. 1) still yielded a usable runoff. In one Hectar, 10 mm of annual rain equals 100,000 litres of water. This means a lot in regions where other sources are too distant or too costly. Rainwater harvesting is particularly suited to supplying water for small settlements or limited activities to avoid much relay or seasonal changes of rainfall. A water-harvesting system, once installed, will provide water without requiring fuel or power.

Runoff water is collected in ditches or rock walls along hillside contours. Cleaning away rocks and vegetation usually increases runoff water. This method may be applicable in Egypt in the North East Coast and Sinai regions.

Soil sealants can considerably help in rainwater harvesting. Asphalt offers low-cost impermeable catchments while it also stabilizes sand dunes. It can be easily applied by spraying heavy oil on the sand. Asphalt can be reinforced with plastic or fibreglass. Parafin wax has recently been used as a soil-sealant where granulated wax is spread on the ground melts in the sun and flows into the pores to produce a surface that readily sheds water. In tests⁽¹⁾ wax-treated plots yielded average of 90 per cent of the rainfall as runoff, compared to 30 per cent from untreated plots. Runoff water from wax plots had low salt content and almost undetectable organic matter. This method is practiced in Arizona, U.S.A. (Fig. 2).

Runoff farms using modern ways and crop varieties selected for local conditions could benefit many desert regions. Artichokes, asparagus, flower bulbs, some fruits and nuts, barley, sorghum, pearl millet, and forages all are potentially important crops for runoff agriculture, because they can use runoff water stored deep in the soil, safe from surface evaporation. (Fig. 3)

Runoff agriculture needs care in selecting : the site, the system and the crop. If crops mature in 60 days instead of 80 days, soil would not have to store so much water, and the risk of crop failure would be lessened while management requirements would be reduced.

2. IRRIGATION WITH SALINE WATER

If saline water could be used for irrigation, more desert land could be cultivated, and non-saline water could be saved for human use, while reducing the need for expensive desalination schemes.

New irrigation techniques are showing that with careful management, saline water can be used to grow a variety of crops. Cotton, barley, wheat, sugar beets, rye grass, Burmuda grass, and the wheat grasses are known to be salt tolerant. Salt-tolerant trees include the date palm, olive, pomegranate and pistachio.⁽²⁾

Irrigation water whose salts are below 600 mg/l may be used on almost any crop. Water from 500 to 1500 mg/l is widely used if leaching and drainage are adequate. Water of 1000 - 2000 mg/l can be used for crops of moderate tolerance, especially if frequent irrigation is employed to prevent salts from building up in the soil. Water of 3000 - 5000 mg/l will produce high yields only from highly tolerant crops.⁽³⁾ Sea water has a total salt content of about 35000 mg/l, greatly exceeding the tolerance of even the most salt-tolerant crop as Suwanee Burmuda

grass which can tolerate about 12000 mg/l. High sodium and other salts ratios affect soil structure and plant nutrition. More irrigation carries the salts down below the plants' roots. New irrigation methods such as trickle irrigation, can increase the crop's tolerance to salinity by frequent irrigation which minimize salt stresses. Some crops yield, including cotton (Fig.4), is higher by brakish water (2500 ppm) than with fresh water irrigation. Saline water containing 2000 - 3500 mg/l of salt is today used in Tunisia (Fig. 4a) for irrigation on a large scale in the Medjedah Valley and other locations.(4)

3. REUSING WATER

In a sense, reuse of water is not new. It has been practiced ever since people have taken water from rivers where communities and industries reuse the water many times over.

Reusing water can greatly lower the overall demand for water resources particularly in arid countries like Egypt where spreading wastewater on marginal land can create new farmland. Using such water first for irrigation filters it through soil and removes all particulate matter, while some salts are absorbed and organic matter is decomposed by soil bacteria. Thus plant nutrients are contributed to soil (Fig. 5). Municipal wastewater for irrigation is especially attractive where agricultural lands are located close to the settlements. Biological treatment of sewage should precede land application, with little technology and capital investment. Irrigation systems are to be connected to municipal systems.

Industrial wastewater may also be fit for irrigation, but it may require treatment if detrimental chemicals to plant growth exist in water.

Municipal wastewater from secondary treatment plants can be used for cooling, ore separation, and other purposes that do not have severe water-quality requirements.

Wastewater must usually undergo secondary and tertiary treatment to make it potable. Processes for removing ammonia, nitrates, and phosphates are available. Residual, potentially toxic compounds and dissolved organic substances can be reduced to very low levels by absorbtion on activated carbon. Dissolved mineral matter can, if necessary, be reduced to acceptable levels by ion exchange, electrodialysis, or reverse osmosis. However, adding these processes can double or triple the capital and operating costs of a conventional treatment plant.

Reuse of water can reduce by several fold the demand on water from natural sources and the required installation and maintenance. Continuously recycling 50% of wastewater in effect doubles the water supply. In some arid locations, reusing wastewater in industry may provide additional water needed to permit industrialization that would not otherwise be feasible.

In any reuse scheme, major considerations should be taken about wastewater concerning pathogenic bacteria and viruses, parasite eggs, heavy metals, salts and nitrates. If more than 50% of the water supply is wastewater, salt accumulation can cause serious problems whether the water is for agriculture, industry or municipal use.

The cost and difficulty of reusing water depend on the treatment processes needed.

Reusing water will often require that all sectors : agriculture, industry and urban administration, should be integrated in management and policy.

Water reuse deserves a high research priority. Ways to reduce cost and answer concerns about virological hazards have to be found.

4. SOLAR DISTILLATION

Solar distillation uses sun's radiation which passes through a transparent cover on to a source of brine of which water evaporates and condenses on the cover which could be cooled by a current of saline water. Distilled water is collected, stored and used. Plants tolerant to saline water could be grown in the enclosure to transpire water as well. Solar distillation is used in small communities in isolated areas in Australia, the Mediterranean basin and the Caribbean.⁽⁵⁾ Research is carried out to use new materials and designs for economical and durable construction to reduce product-water cost. (Fig. 19)

5. REMOTE SENSING

Remote sensing for detecting water can help planners in arid lands by mapping underground structures that control ground water movement and distribution.

6. VAPORIZATION AND SEEPAGE CONTROL

Reservoirs and canals in arid lands are subject to heavy evaporation losses and often exceed the amount of water used productively.⁽⁶⁾ So, reducing evaporation increases water supply without new construction. The water surface must be covered with a barrier that inhibits vaporization, like wax, lightweight slabs or floating foam rubber. In this way, over 85% of the normal evaporation is suppressed.

Arid lands often have porous soils, so storage facilities and conduits suffer serious water losses through seepage, which can also cause serious waterlogging salinification and erosion of neighbouring soils.

Much seepage is caused by calcium in the soil which causes clay to bunch up, or aggregate, forming cracks and porous structure that lets water seep through easily. Sodium salt such as carbonate (Fig. 8) breaks up clay aggregates and causes clay particles to swell and plug the soil pores. This method is successful only where soil has a minimum of 15% clay for at least 30 cm deep, and have the chemical capacity to exchange calcium for sodium ions.⁽⁷⁾

Evaporation from soil surfaces wastes large amounts of water especially in arid lands where low humidity greatly encourages evaporation. From one-fourth to one-half of the water lost from a crop is evaporated from the soil surface. Planting directly into the standing residue of the previous crop is one way to retard evaporation and reduce evaporation. This could be done by minimum tillage and by spreading straw and cotton burs on soil which also retains the absorbed heat by day to keep the desert soils warm during cool nights which increases the chances of survival.

Plastic sheets can be used to collect run off water in depressions around plants (Fig. 9) especially for high-income crops. Sand dunes can be stabilized with heavy oil mulch to prevent soil to bury the young plants or blow away exposing their roots. (Fig. 10)

7. TRICKLE IRRIGATION

Standard irrigation methods are particularly wasteful of water in arid lands. 'Drip' or 'trickle' irrigation uses plastic pipes among the plants on or under the soil. Water carried in the pipes drips near each plant. So, evaporation and deep percolation losses are minimised, while rate and time of water application are adjusted for no runoff. It is agreeable for tree, vine and sow crops. (Fig. 11) It does not need land levelling or rock removal as in conventional irrigation. Fertilizers are injected with water. Since the water passes through very small cutlets, it should be filtered before it is distributed in the pipe system.

Trickle irrigation is useful where water is scarce or expensive, the soil is too porous, land levelling is costly, or where irrigation labour is not available or expensive. It provides great control over the amount of water supplied to the soil, the particular crop, and the climatic conditions. It minimises standing water which can breed mosquitoes, and digging or maintenance are needed as is often required by surface irrigation. Because irrigation water never touches the leaves, foliar salt damage is not a hazard, and many moisture-induced leaf and stem diseases, like fungal diseases, are minimised. The soil surface is not disturbed, so erosion is usually eliminated.

Designation and installation of trickle irrigation needs skilful and specialised people. Some serious problems exist in trickle irrigation such as clogging of the emitters by the contents of water like limestone, iron and algae, suspended silt or fine sand. Also careful control during construction and maintenance operations are needed. Filtration and chemical treatment increase costs. Expert advice is essential when saline water is used, especially in arid areas where surface accumulations of salt damage crops, while insufficient water for leaching can result in salt build-up in the root zone.

In 1974, it was estimated that 15000 ha were under trickle irrigation in Europe with an increase of 25% or more each year.⁽⁸⁾ California's trickle-irrigation acreage was 60 ha in 1970 increased to 16000/ha in 1973, where it is mainly for permanent crops, such as strawberries, tomatoes, citrus and nut trees, and grapes.

8. PITCHER IRRIGATION

Pitcher irrigation (Fig. 12) represents a new development using unglazed baked earthen pitchers buried in the soil and filled in clean water. Vegetable seeds are planted around it. Water soaks through the porous pitcher into the root zone to maintain plant growth. Experiments in India have grown melons and pumkins to maturity with very little water, less than 2 cm/ha for the entire 88-day growing period. This method could be developed to link closed pitchers with pipes equipped with floating bulbs to fill the pitchers automatically without much labour.

9. TRANSPIRATION CONTROLS

Only 1% of the water absorbed by roots is incorporated into the plant cells while 99% is transpired into the atmosphere. One ha of growing vegetation can transpire 94000 litres of water per day. So reducing transpiration could subsequently reduce water demand. That can be achieved by breeding plant varieties that transpire less or by enclosing crops to collect transpired water and reuse it to raise humidity and retard transpiration. Reducing air movement over the crop by, for example, windbreaks of interplanted rows of taller plants, reduce transpiration.

Removing the unproductive leaves and using the chemical anti-transpiration represent other trials in this concern.

Transpired water is passed out of the plant through stomata, pores in the leaves. Chemical anti-transpirants are sprayed, mainly onto the undersurfaces. Preliminary trials have reduced water losses by 40% in some experiments (Fig. 13). Anti-transpirants work by closing stomata or reflecting solar energy away.

The guard cells round stomata could be closed by certain alkenylsuccinic acids and abscisic acid.

Film-forming materials include silicones, wax, latex, and plastics. One should select materials which are non-toxic to plants and animals, more permeable to carbon dioxide and oxygen than to water vapor, not too slow metabolism, flexible enough to allow for leaf motion and expansion, resistant to degradation by sunlight and economically attractive. (Fig. 14) shows that pre-harvest anti-transpiration spray reduces olive fruit shrivel, especially in drying winds where untreated olive trees yielded only 15% compared to 90% from anti-transpirant treated trees.

Within the plant itself is the most efficient place to save water, more than earlier points because of losses in storage, conveyance, distribution, and field application in the irrigation system.

It should be noted that a chemical barrier against water loss from stomata may reduce plant growth if it also interferes with the passage of carbon dioxide.

Anti-transpirants restrict carbon dioxide, thus they are most useful where water conservation is so important that maximum plant growth can be sacrificed, as in cases of plants for landscaping, lawns, and highway borders.

10. CROP SELECTION

Some plants may need over 2000 kg of water to produce just 1 kg of usable dry matter.⁽⁹⁾ So wise selection of cultural practices can do much to use water more efficiently as to select plants that survive in desert conditions to use them as food or cash crops, or to select water-efficient crops as barley, cornflower, melons, sorghum, pearl millet and beans.

Certain kinds of plant offer promise like those grown in cool seasons such as lettuce, or rapid growing plants without greatly increasing water requirements to shorten the time of transpiration and evaporation. Also high yielding plants without requiring much water, like short strawed wheat varieties, evolved in Mexico that give double or triple water use efficiency, or plants with low

transpiration losses like agave, pineapple which close their stomata during the hot day, or plants with stomata position that transpire less water as plants with compact leaf structure. Priority should be to crops of high-protein range and forage that use less water.

II. CONTROLLED-ENVIRONMENT AGRICULTURE

Encapsulated crops (Fig. 15) can yield high agricultural productivity with limited amounts of water. By this way, lost water in evaporation and transpiration is retained and reused within the enclosure itself where light, heat, water, humidity, carbon dioxide, nutrients and pests are manipulated and balanced to produce yields often ten times larger than those of conventional outdoor agriculture. Enclosures may be transparent fibreglass structures, air-inflated bubbles, or low tunnels over the row of growing plants. The University of Arizona Environmental Research Laboratory and the University of Sonora, Mexico, inflated plastic greenhouses where plants are grown. Inside the air is continuously cycled through a stream of water which humidifies and cools it. Brackish, silty or sea water can be used. In Abu Dhabi (Fig. 16) the plants are irrigated with a small amount of water because the high humidity suppresses transpiration and evaporation. Carbon dioxide must be added because in the enclosed environment the plants quickly use it up. Burning natural gas could be used for this purpose.

Low plastic tunnels placed over the plants are used to reduce evaporation and transpiration losses (Fig. 17). According to one report (Kloner, U, 1967, p 11), carbon dioxide added to the tunnels caused cucumbers to develop more quickly, fruit earlier, and yield up to 45% more than in standard agriculture. Other crops as lettuce and sweet peppers were increased by this method which made it possible to produce vegetables very early in the season when prices are high. Plastic tunnels can also protect the plants against frost, storms or heavy rain.

Encapsulated crops offer considerable water savings in terms of the size of crop produced. If lower capital costs could be achieved, whole villages, even in remote areas, could feed themselves with controlled-environment farms.

The University of Arizona estimated in the early 1970s the cost of such a system at about US \$ 250 - 370 /ha including the experience, equipment packing etc. Cooling water in the enclosure limits such methods to coastal areas.

Disease control in a hot and extremely humid environment is essential within the enclosures.

12. WATER ATTRACTING CHEMICALS

Hydrophylic (water-attracting) chemicals can absorb water and hold it safe from evaporation or further dissipation. Thus water is available to plant roots which grow into and around the water-swollen hydrophylic material and extract water and nutrients from it. Adding about 5% of crushed brown coal into the surface layer which can double the available moisture, promote uniform soil temperatures and mature crops earlier.⁽¹⁰⁾ (Fig. 18) Hydrophylic starch copolymers absorb water up to 1500 times their own weight.⁽¹¹⁾

APPENDIX (4)NOTES AND REFERENCES

1. Fink, Cooley and Frasier, 1973, wax treated soils for harvesting water. Journal of Range Management.
2. More water for Arid Lands, National Academy of Sciences (NAS), Washington, D.C., U.S.A., 1974, p. 38).
3. Ibid, p. 39.
4. Ibid. pp. 39-40.
5. Ibid. p. 65.
6. Ibid. p. 73.
7. Ibid. p. 1.
8. Ibid. p. 102.
9. Ibid. p. 123.
10. Prof. A.K. Turner, Department of Civil Eng., University of Melbourne, Australia.
11. Dr. W.M. Doane, Department of Agriculture, Illinois, U.S.A.

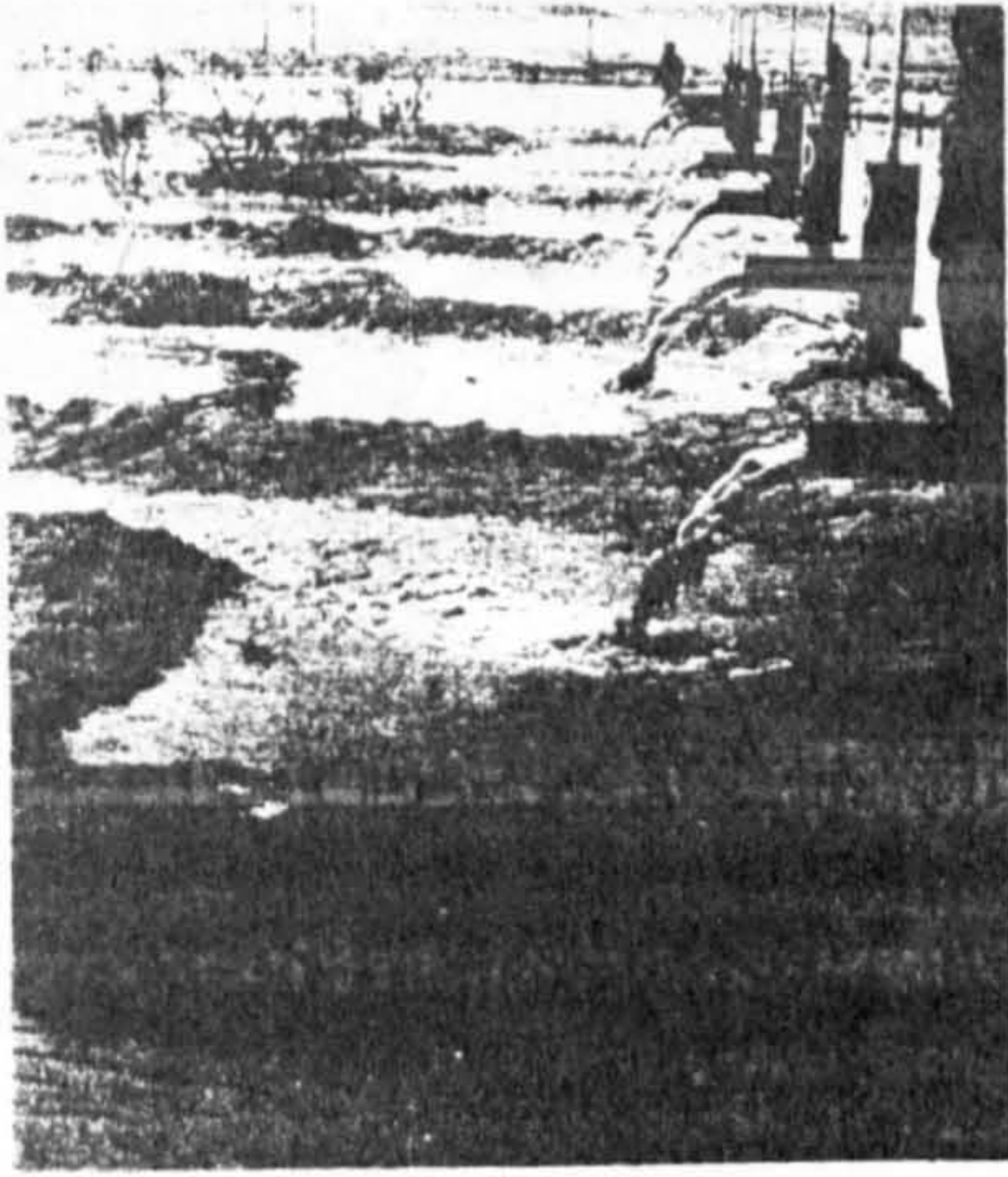


Fig. (1)

The yield from rainwater harvesting can be surprising. Here, in the Negev Desert, runoff is collected from the background hills and channeled to separate fields (N. Tadmor).



Fig. (2)

Using wax to suppress evaporation in Arizona. Sun's heat melts the wax to form a continuous film which suppressed over 85% of the normal evaporation (K.C. Cooley).

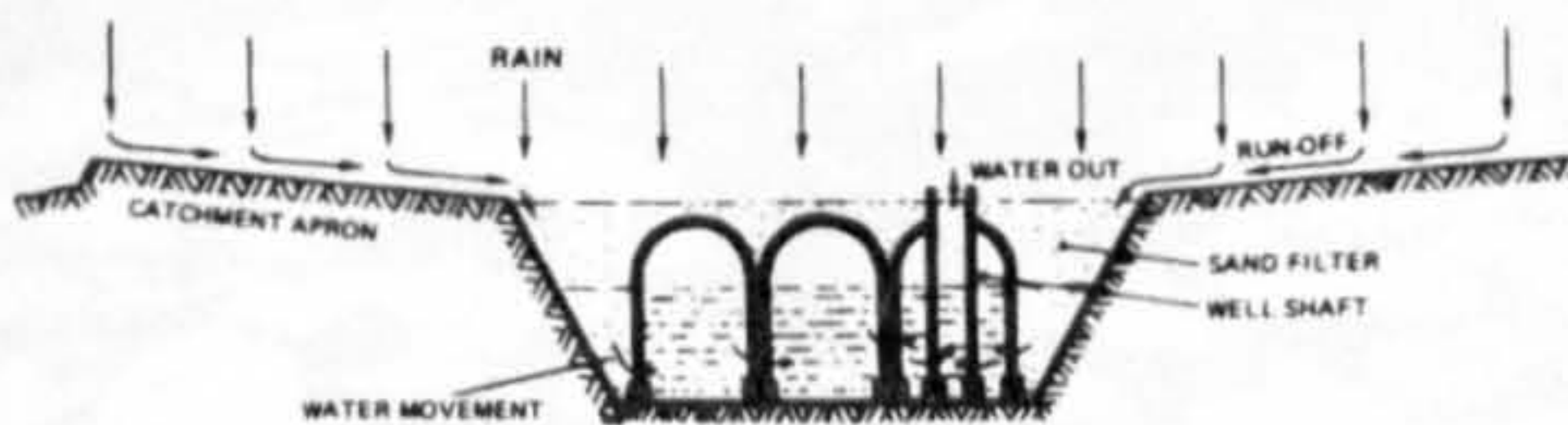


Fig. (3)

Rainwater catchment with sand filled water-storage tank. The sand reduces evaporation and filters the water as it enters and is withdrawn.



Fig. (4)

Irrigating cotton with brackish water (2,500 ppm dissolved salts). The cotton yield was 59% higher than with freshwater irrigation. Spraying plants with the transpiration - suppressing plant hormone abscisic acid further increased cotton yield (M. Twersky).

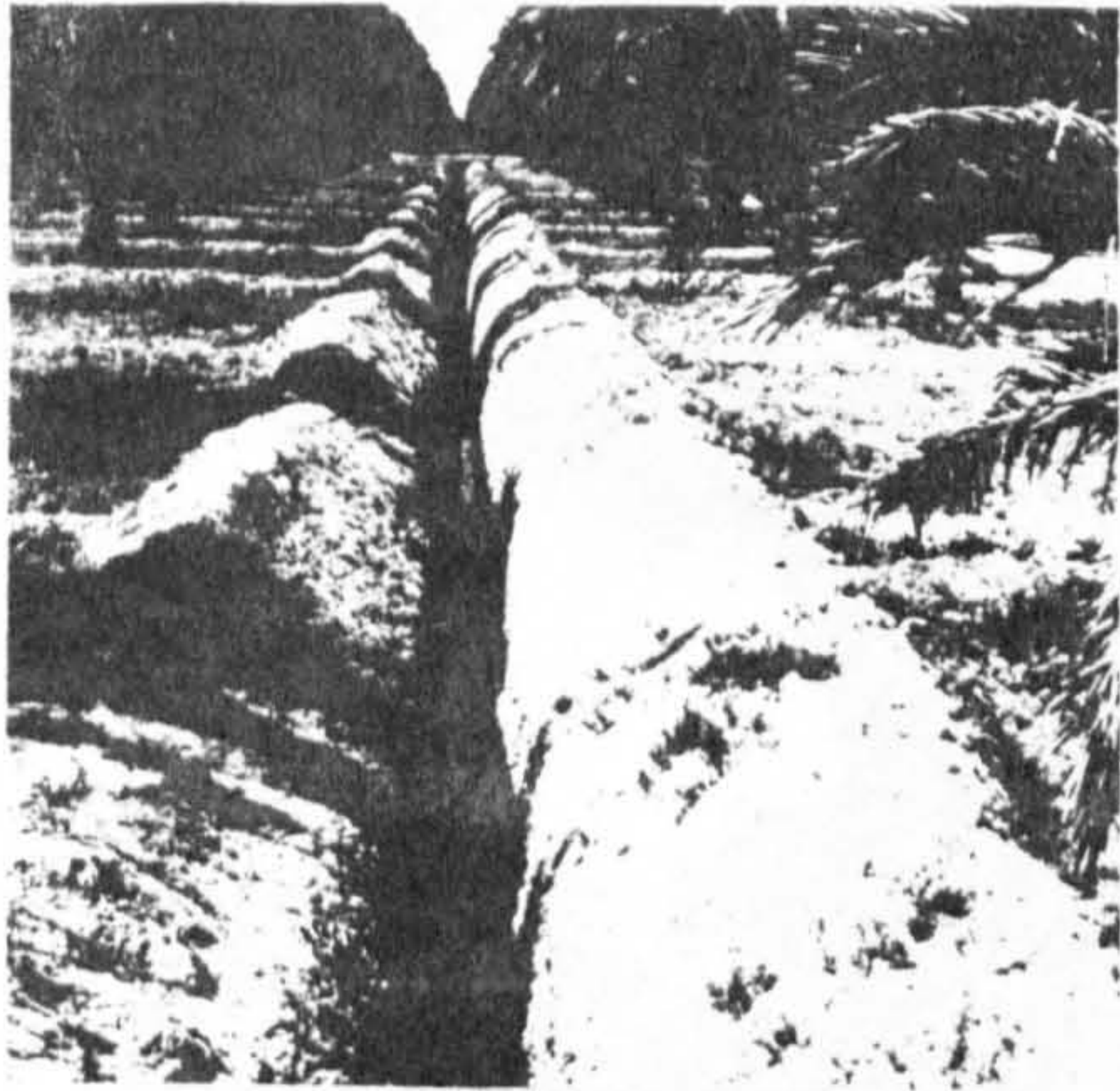


Fig. (4a)
Date palms in southern Tunisia that have been irrigated for 4 years with water containing 2,000 mg/l salts. The extensive drainage system is required to facilitate leaching (J.W. van Hoorn).



Fig. (5)
Tall maize was given a particularly heavy pre-irrigation with treated sewage, while stunted maize at right was irrigated almost entirely by rainfall. No fertilizer was added to either crop (Rhodesia Agricultural Journal).



Fig. (6)
Paraffin wax is shredded and spread for rainwater harvesting in Arizona. Melted by the sun, the wax flows into and seals soil pores (U.S. Dept. of Agriculture).



Fig. (7)
Protective covering of lightweight slabs of polystyrene, sand and concrete, cut evaporation by about 80%. Exposed surface of each slab is painted white to reflect the intense sun rays. Submerged portion is coated with bitumen for durability and to avoid affecting the taste of the water. (National Institute for Water Research, South Africa).



Fig. (8)
Cracked soil structure indicates high calcium content in a dry pond bed in Coconino National Forest, Arizona. Water seeps away through the cracks. Rocks & weeds were cleared, and 1 ton of sodium carbonate applied by hand to 1000m². This was mixed with the soil to a depth of about 8cm with a small tractor which caused the clay aggregate to break down into fine particles which sealed the pond bed (U.S. Dept. of Agriculture).

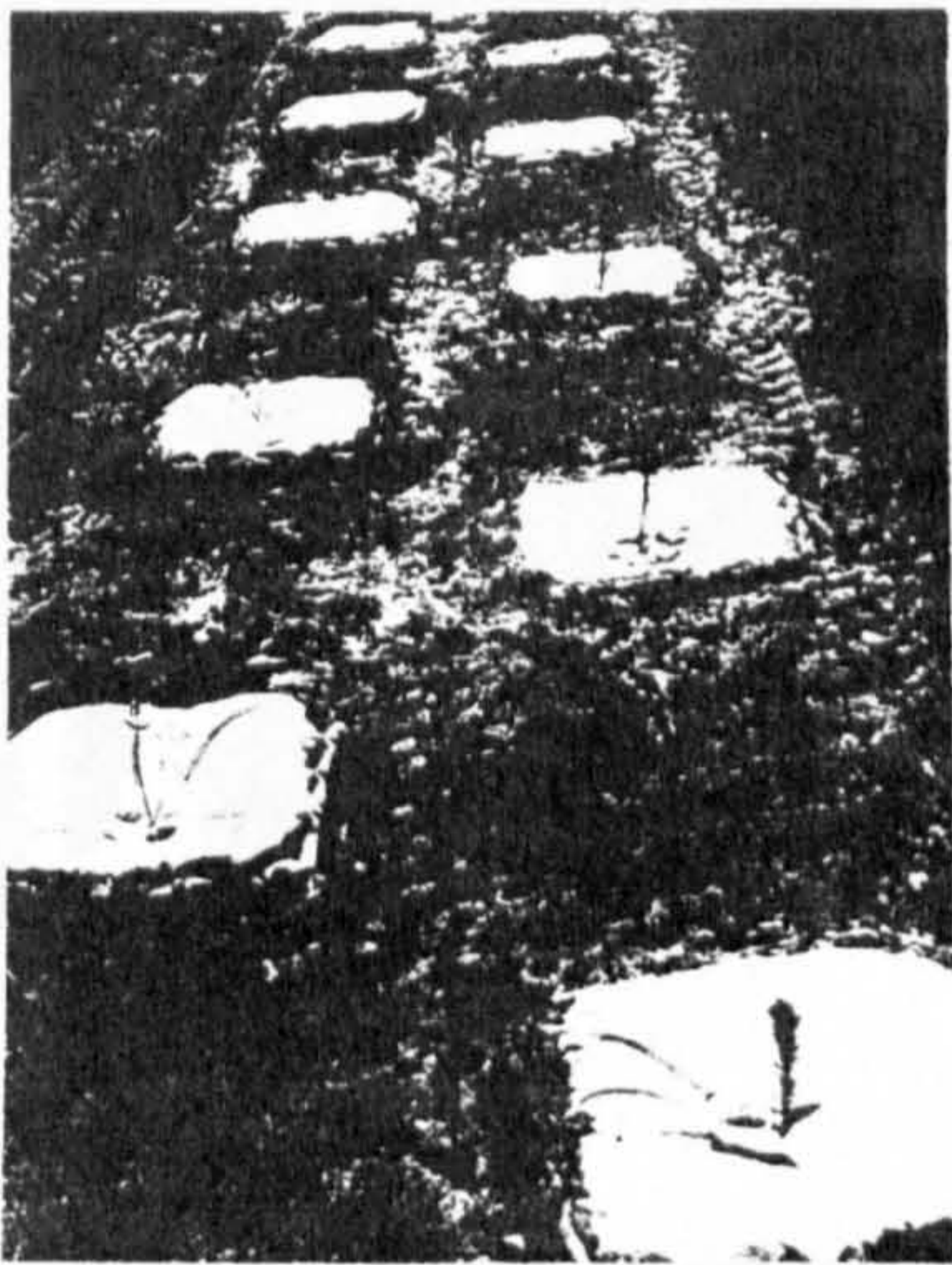


Fig. (9)
Plastic 'aprons' to catch rainfall, reduce evaporation, suppress weeds, and promote the growth of tree seedlings in arid areas (FAO).



Fig. (10)
Stabilizing dunes with a heavy oil mulch in the Rajasthan Desert, India. Unstabilized sand would either bury the young plants or blow away, exposing their roots (Exxon).

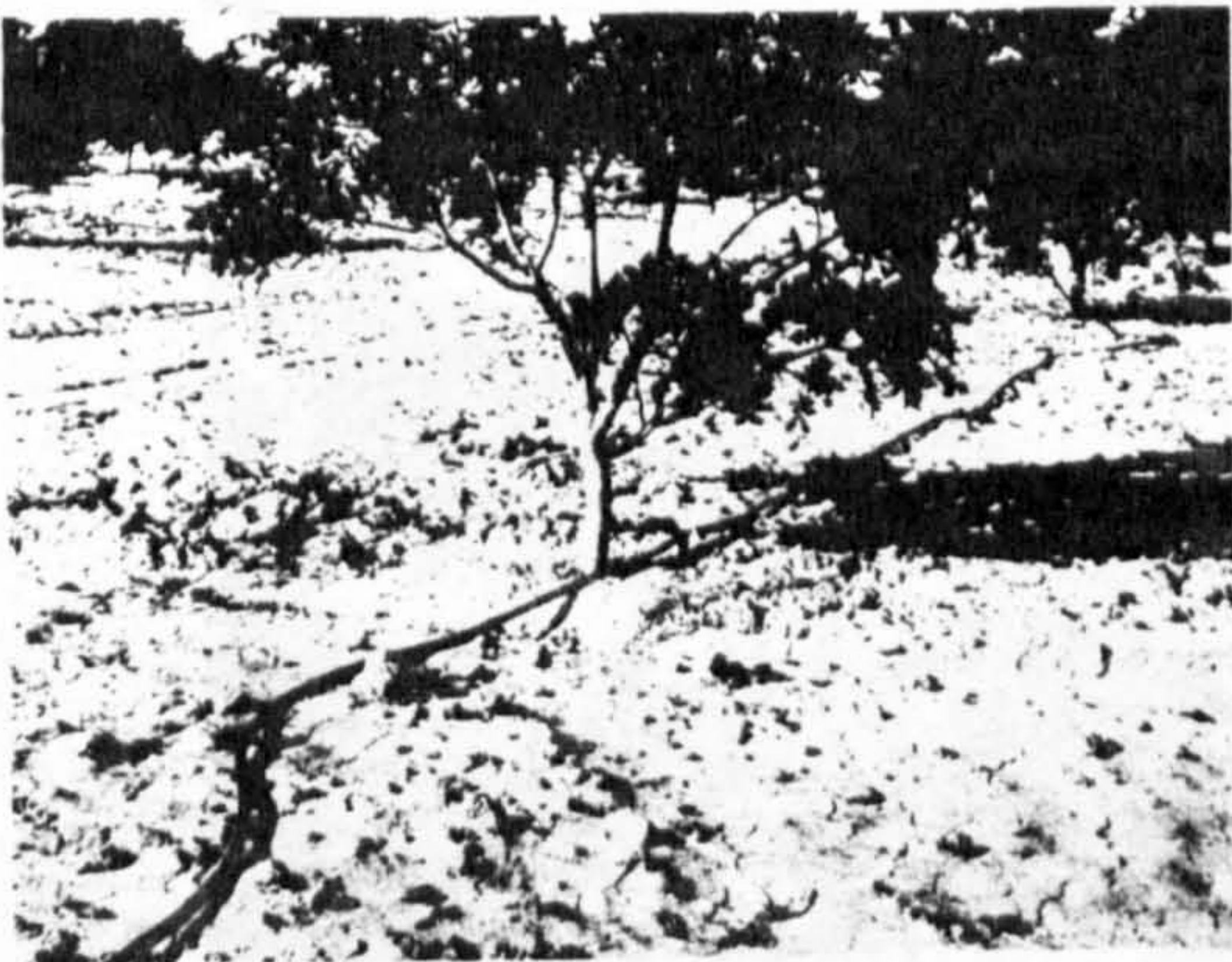


Fig. (11)
Trickle irrigation system in California where pipes lead water to emitters beside the trees (F.K. Aljibury).

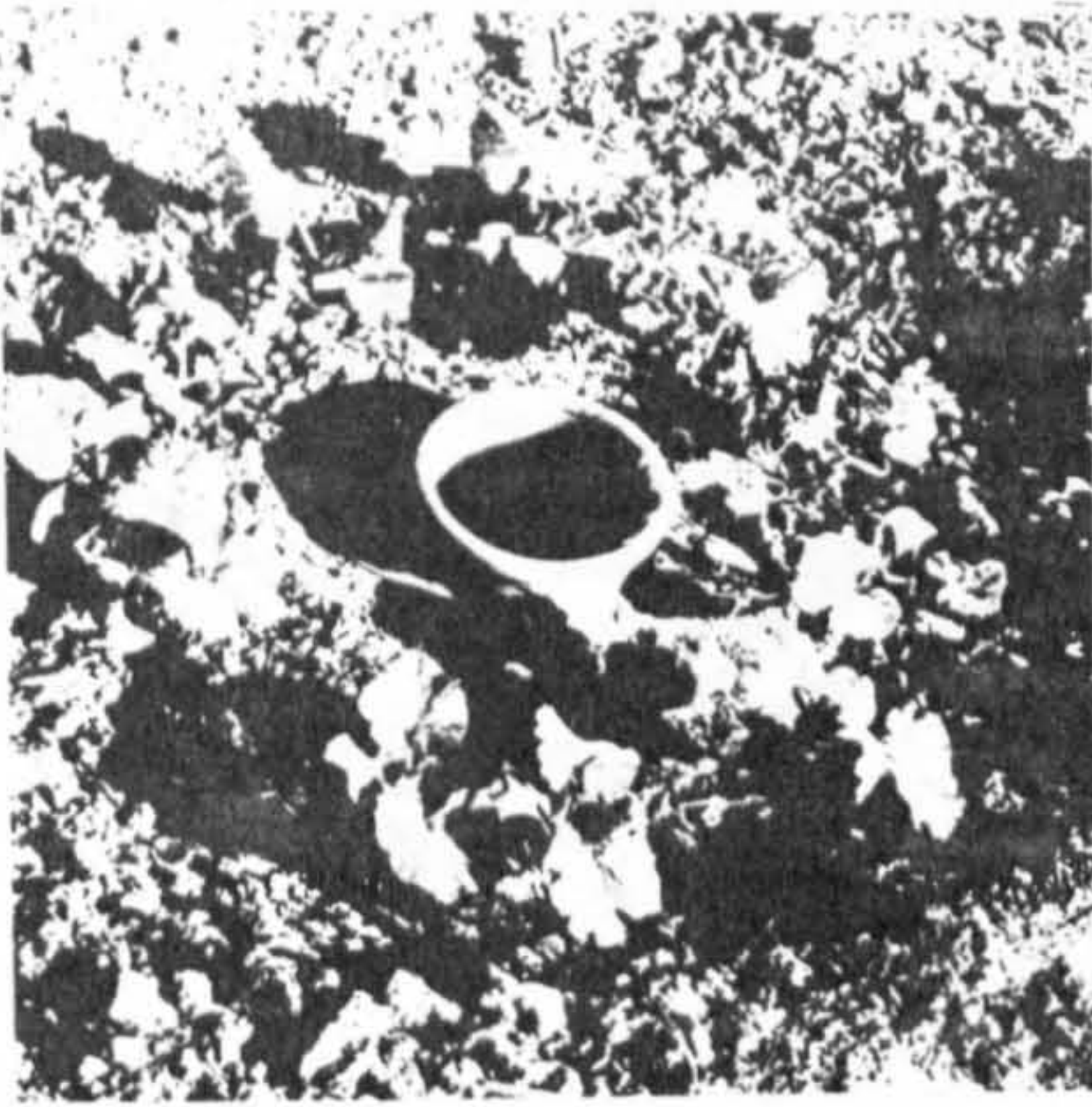


Fig. (12)
Pitcher irrigation in India where melons and pumpkins are grown with very little water (R.C. Mondal, Central Soil Salinity Research Institute, Karnal, Punjab, India).

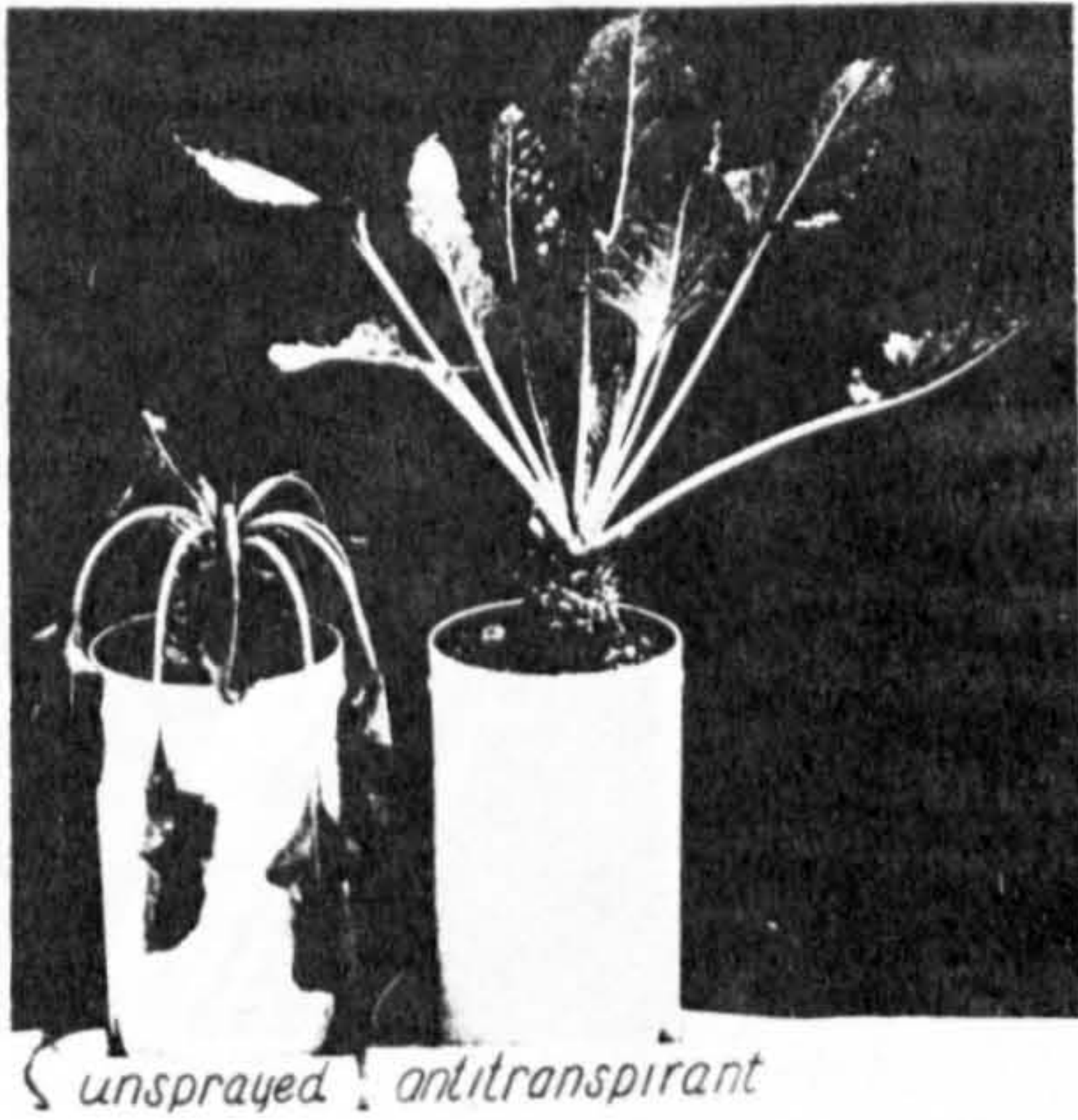


Fig. (13)
Sugarbeet plants, one was treated with an antitranspirant. Three days later it still retains its moisture and turgor, while the other has wilted (R.M. Hagan).

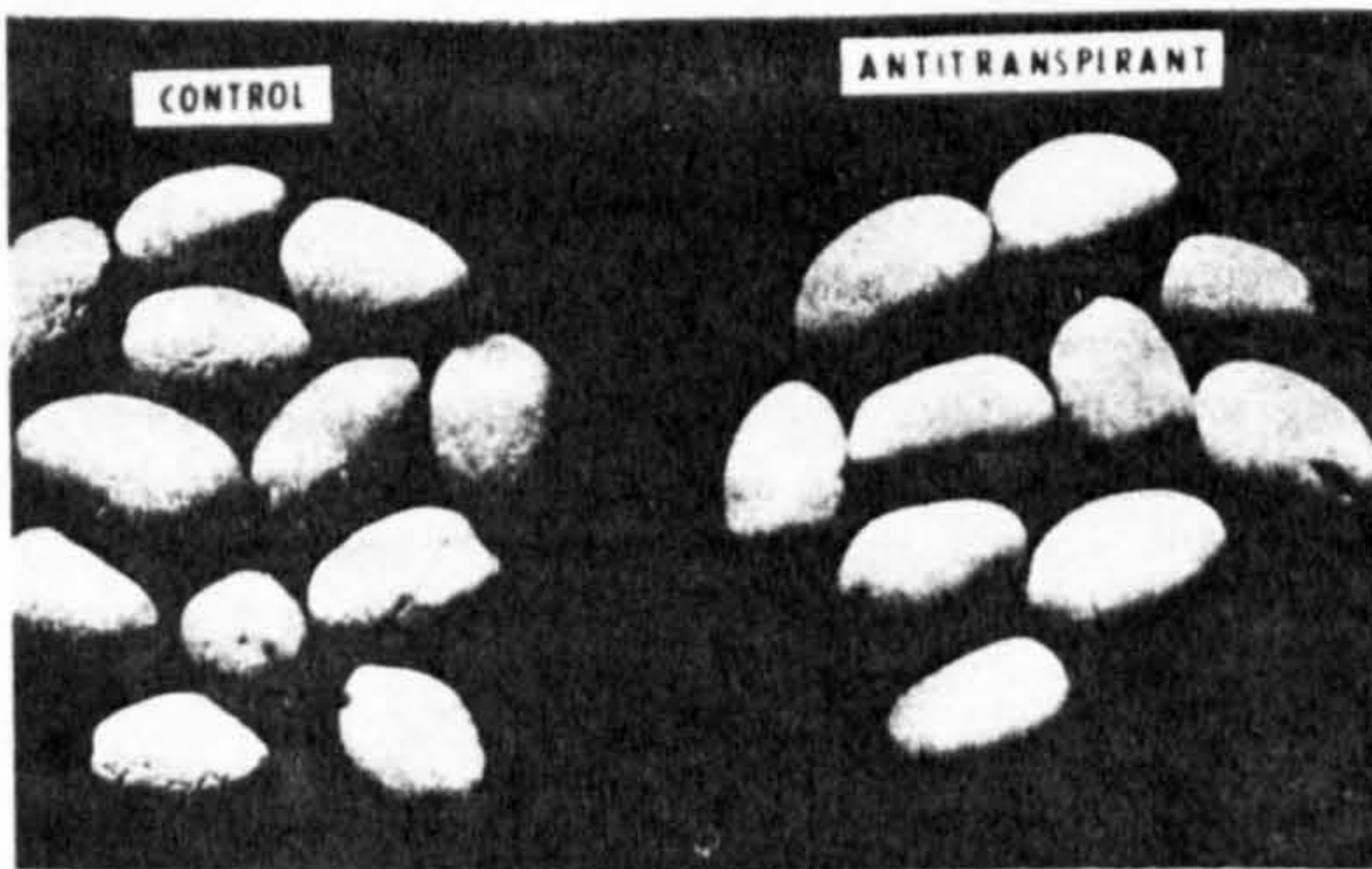


Fig. (14)
During an experiment in Oct. 1971, California's severe drying winds shrivelled most of the fruit on untreated olive trees and only 15% were marketable, compared to 90% from antitranspirant-treated trees (R.M. Hagan).

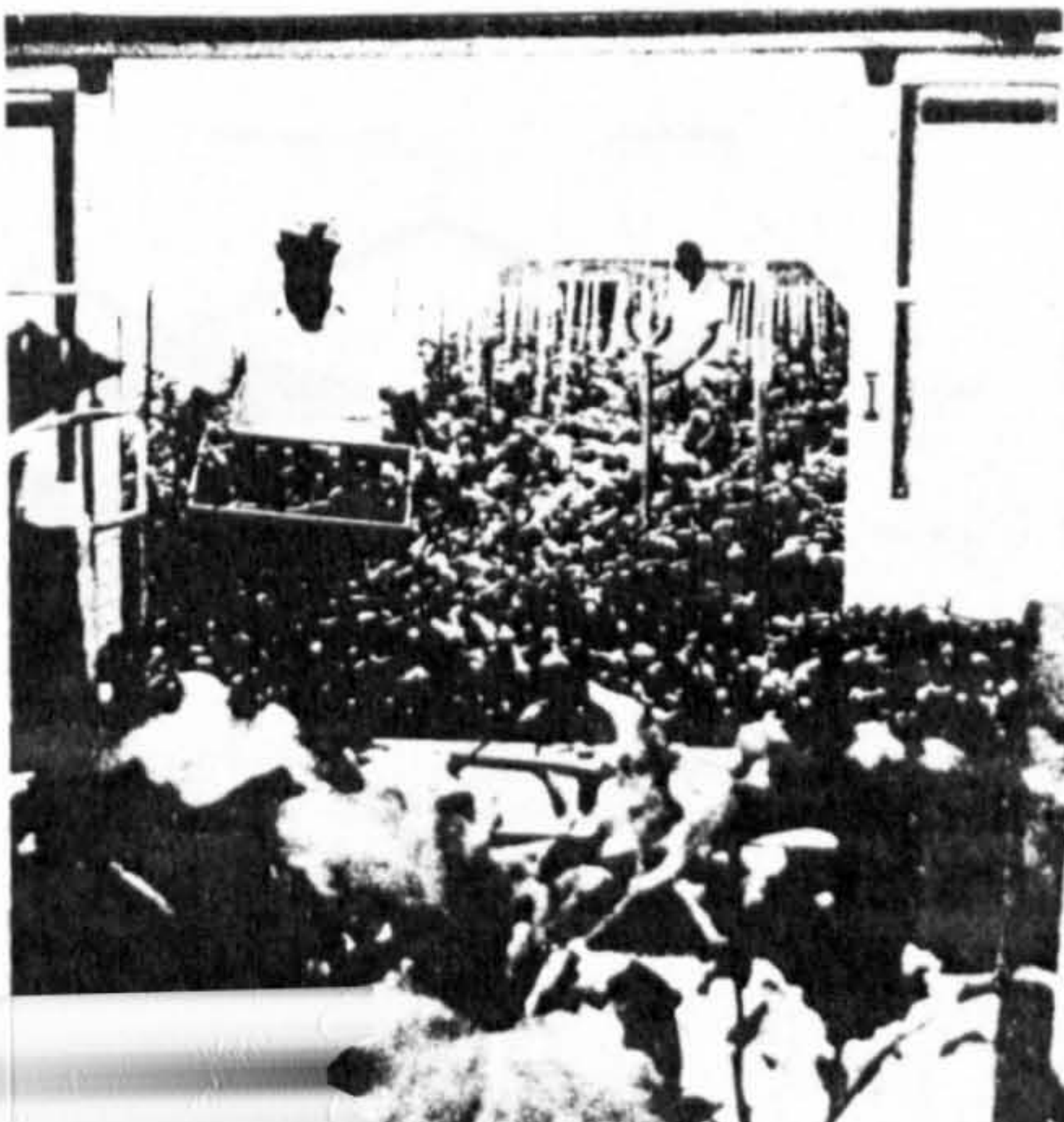


Fig. (15)
Quality tomatoes grow profusely in a controlled environment greenhouse at Abu Dhabi (Arid Lands Research Centre, Abu Dhabi).

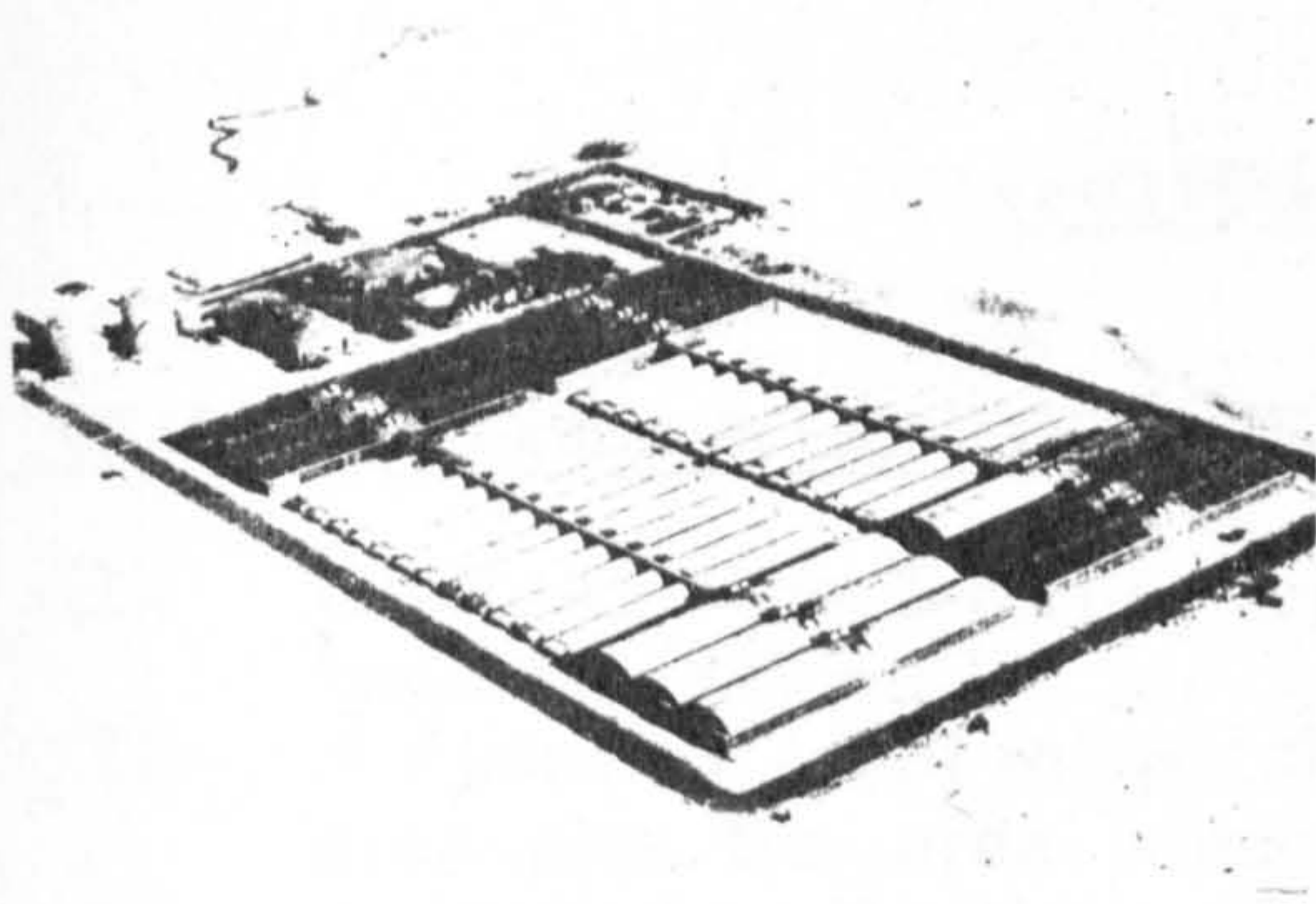


Fig. (16)
Controlled environment complex in Abu-Dhabi. Even in such inhospitable terrain, very large quantities of crops can be produced (Arid Lands Research Centre, Abu Dhabi).



Fig. (17)
Tunnel enclosure for strawberries grown in Israel (Ministry of Agriculture).



Fig. (18)
Lettuce growing in porous sandy soil amended with crushed brown coal, which has a large moisture-holding capacity. Yield from treated plots increased dramatically (A.K. Turner)

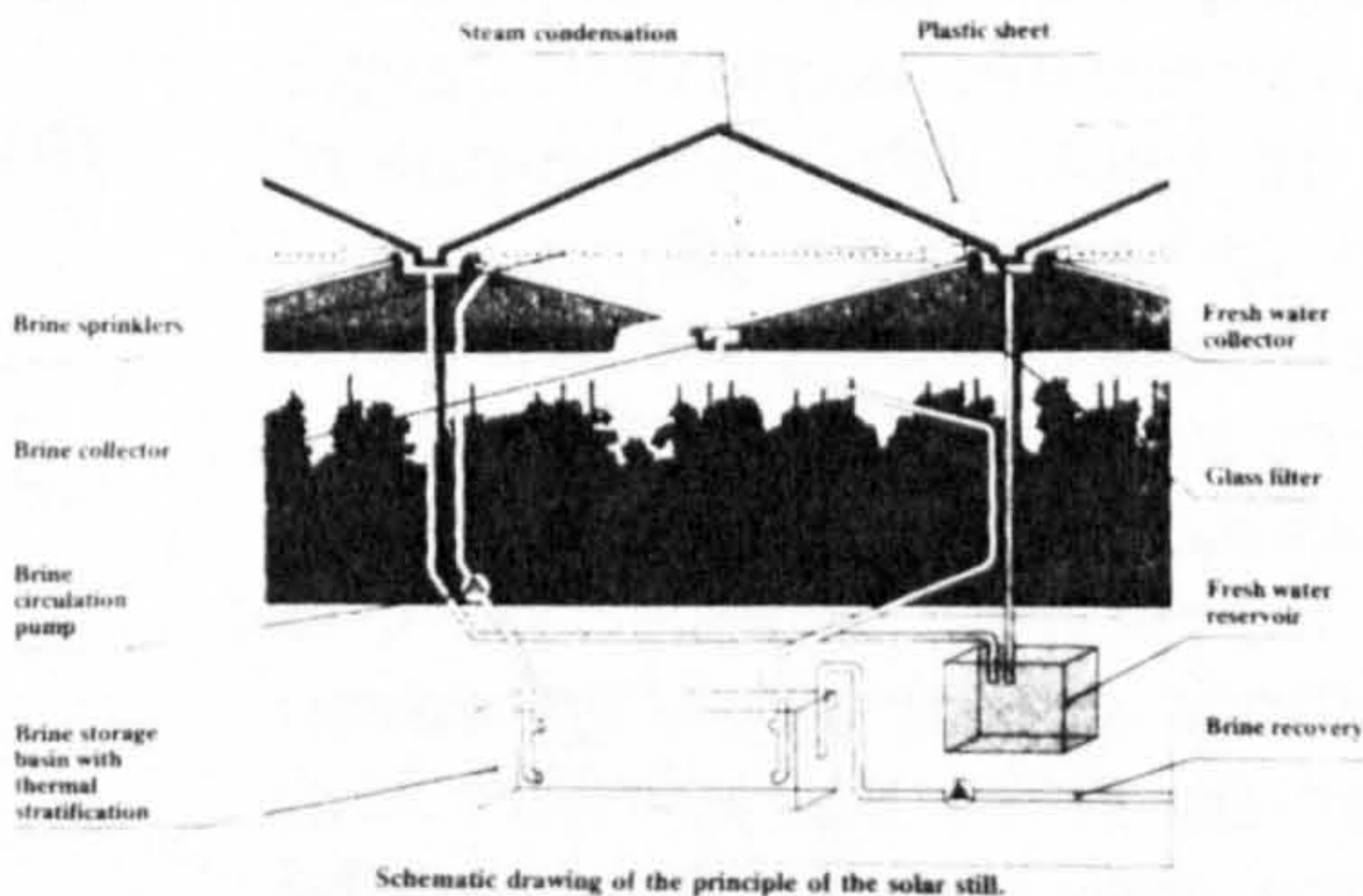


Fig. (19)
Schematic drawing of solar distillation system. Plants tolerant to saline water can be used to transpire more water.

NOTES AND REFERENCESCHAPTER ONE: A GENERAL VIEW OF EGYPT

- (1) CAPMAS, The Interim Report of 1976 census p. 5 (In Arabic) and Halloda, 1980 p.17
- (2) A Feddan = $4,200 \text{ m}^2 = 1,038 \text{ acres}$. The crop area is the cultivated area plus the area which is cultivated more than once a year multiplied by the times of cultivation of this area to produce several crops. It is said that every 53 feddans of arable land are equivalent to 100 feddans as crop area cultivated with different crops one after the other. For example, in Aswan, south Egypt, some vegetables can be harvested after 40 days only from first cultivation, because of sufficient sunlight and temperature.
- (3) CAPMAS, 1976 census, The Interim Report p.31 (In Arabic)
- (4) Because of the vast area covered by the lake, it decreases the temperature and increases the humidity around its shores, especially where the water fills the "Akhwar" or the low and narrow gorges close to the lake shores adding considerably to its area and elongating its shoreline. It is argued that the High Dam Lake has deprived the Nile water of most of its fertile clay which used to add annually to the fertility of the agricultural land of Egypt. That is because when the water arrives to the southern part of the lake, which is now far south of the Egyptian frontiers, the water current slows down and most of the suspended matter is deposited. It is also said that lack of clay and other suspended matters such as plankton, the tiny creatures and plants, has resulted in an acute decrease in some kinds of fish such as sardines which used to be caught in the Mediterranean near the Delta shores. Studies are underway to determine the true position and to find out how to avoid the side-effects from the High dam construction. More recently some doubts were raised about earthquakes in the area and their relation to the formation of the lake.
- (5) There are 72 towns, and 2,369 villages surrounding them in the Delta, while the valley in upper Egypt contains 56 towns and 1664 villages. Each of those 4,033 villages have smaller settlements around them called Kafrs, Nagás, or Izbas whose number totals about 29,000. H. Ayad, Towards A Housing Policy For Egypt, Ph.D. Thesis, University of Liverpool, July 1980, p.18.
- (6) That can be clearly noticed round the different levels of the sides of Fayum dish-like depression, south west of Cairo, where were found several kinds of human primitive stone tools representing the life of the early man on the shores of Qaroon Lake.
- (7) Al Ahram semi-official newspaper. Cairo, 23 and 24 September 1980.
- (8) Al Sharkul Awsat newspaper, London, 1 August 1980, a statement by Egypt Petroleum Authority.
- (9) In some cases the flood of such wadis have destructive effects on the towns on its way as what happens to Kena city where a large valley with the same name supplied by numerous tributaries spread on a vast area north to the city conveys big quantities of water almost every other five years and pours it through its mouth where the city lies and destroys a number of buildings and infrastructure. That area needs to be carefully studied with the aim of controlling such floods and making use of it to be stored somewhere in the eastern desert where lack of suitable water represents a problem for any kind of development.

- (10) The river was used for travel to such an extent that the regular words in the hieroglyphic script for "go north" and "go south" were determined by boats, i.e. a boat with no sail or a boat with a sail respectively. Egyptians thought of travel in terms of movement on the Nile and they had difficulty in describing properly directions outside Egypt. For example, they called the river Euphrates which flows from north to south, "that reversed water that goes down stream!". T. C. H. James, *An Introduction to Ancient Egypt*, British Museum Publications Ltd., London, 1979, pp. 21-22.
- (11) The author in his research, "The Regional Development Strategy of the Suez Canal Region", for the Postgraduate Certificate in Town and Regional Planning, The Technical University in Szczecin, Poland, July 1977.
- (12) The tunnel saves hours instead of crossing the Verdun bridge near Ismailia. H. T. and telephone cables are fitted in the tunnel. Internal aeration and lighting were implemented. Some housing units were established for those who work the tunnel, *Al Akhbar* newspaper, Cairo, 3.3.1982, pp. 1 and 10.
- (13) CAPMAS, *The Preliminary Results of the 1976 census* p.21 (Arabic)
- (14) Ministry of Housing and Reconstruction, "Human Settlements In Egypt", Cairo 1975, p.32.
- (15) The General Organisation for Physical Planning, Cairo, special information.
- (16) This system is diminishing now after it proved a big failure.
- (17) Khalifa, *The Population of Egypt*, pp. 82-83
- (18) "The annual rate of population growth in Cairo increased from 1.72% to 3.50% between 1917 and 1927, and from 2.20% to 5.90% between 1937 and 1947. The migration current to Cairo did not stop after the World Wars, neither was it limited by the border of Cairo. It extended across the Nile to Giza city. The population of Giza increased from 66,156 in 1947 to 250,534 in 1960 and to 341,482 in 1966, growing at more than 20% per annum in some years of the last period! The migration rate to the Suez Canal cities exceeded that of Cairo because of their strategic and important location resulting in an immense quantity of jobs and services".
The Higher Commission for Greater Cairo Planning, *A Report on Migration to Cairo*, 27 November 1967 pp.4-7 (In Arabic).
- (19) Ministry of Housing and Reconstruction, "Human Settlements in Egypt", A National Report, Cairo, 1975.
- (20) The six goals of the 1952 Revolution were:
1. The conversion to Republican Rule
 2. The liberation of the Suez Canal Zone
 3. The achievement of Democracy
 4. The establishment of strong armed forces
 5. The elimination of feudalism and monopolies
 6. The establishment of social justice free from oppression, exploitation and poverty.
- (21) H. Ayad, Ph.D. Thesis, The University of Liverpool, 1980 p.51
- (22) These may be some of the factors which led to the assassination of the late President Sadat at 6th October 1981 military parade in the memorial of the 1973 war.
- (23) Professor Jerzy Glowezewski of the School of Architecture and Planning, Pratt Institute, New York, N.Y. U.S.A., worked in the Environmental Planning Centre of the Aswan Regional Planning

Office 1964-1967, and as a U.N. consultant for the city Planning and Housing at Abu Tartoor in The Western Desert in 1977. This paper "Development of Egypt's Western Desert For Human Settlements" was presented at the International Conference for Housing Science (IAHS) Conference in Dhahran, Saudi Arabia, 1978, on Housing Development in Developing Countries, Vol. 1, pp.168-177.

- (24) It is reported that Alexander the Great visited Siwa Oasis in the western desert after he founded Alexandria in 332 B.C.
- (25) Coal sludge is carried from Wyoming to Louisiana in U.S.A. by pipelines, and limestone goes by pipelines in England.
- (26) The author had a helicopter trip to the area in February 1979 when the canal was being dug. Akhwar means deep conic bays at the sides of the Nile.
- (27) It is said "Egypt will be one of the world's greatest phosphate producers. Abu Tartoor mines contain about 1,000 million tons which is sufficient for the following 100 years. The phosphate project will result in six other consequential projects:
1. A new settlement for the workers to accommodate 2,500 people at a distance of 5 km from the project site.
 2. The first latitudinal railway line from west to east in Egypt to transport the raw phosphate from Abu Tartoor to Port Safaga on the Red Sea.
 3. The digging of 27 new wells at a depth of 500 m (approx.) and the installation of an underground reservoir to collect the water.
 4. Electricity supply for the area from Nage Hammadi in the Nile valley.
 5. The installation of warehouses and platforms for loading phosphate.
 6. The establishment of a vegetable and fruit farm."
- Al Ahram semi-official newspaper Cairo, 13.10.1980.
- (28) A statement by Engineer Maher Abaza, The Ministry of Energy, October semi-official Magazine, Cairo, 12.10.1980.
- (29) The Solar Energy Unit in the National Centre for Research, Dokki, Giza, is carrying out interesting researches. Also Dr. Salah Ismail, of the American University in Cairo, has applied the usage of Solar Cells in his origin village El Basaisa in the Governorate of Menofia for lighting, electronics and motive energy. An Institute for Solar Energy is established in Sadat new City north west of Cairo, sponsored by the American University in Cairo.
- (30) The International New Towns Association Conference, Cairo, October, 1980, "Community Planning and Development Challenges Water, Energy and Environment" (In Egypt) - Ministry of Development and State of Housing and Land Reclamation, pp.22-30.

CHAPTER TWO: POPULATION AND THE SOCIO-ECONOMIC DEVELOPMENT IN EGYPT

- (1) Halloda, CAPMAS, The Present Situation of the Population in Egypt and the Possibilities of its Development, Symposium on Population and Development Issues, Cairo, 20-22 April 1981, p.7.
- (2) CAPMAS official statement, on 13.10.82, Population Studies, January/March 1983, p.39.
- (3) Rodel Farag, which had 100,907 people per sq.km = 404 per acre. CAPMAS, The Interim Report of the 1976 census, Table 14-B (In

- Arabic)
- (4) The population of Warragel Arab village, in Giza governorate amounted to 31,263 in 1966 census - GOPP, Population Studies in Greater Cairo, November 1974, Appendix A, p.3. (In Arabic)
 - (5) CAPMAS, Population and Development, Cairo, Sep. 1978, p.175.
 - (6) Dr. A.M. Khalifa, Director of the Population Studies Unit, Institute of Statistical Studies and Research, Cairo University, "The Population of Egypt", a U.N. publication, Cairo 1973, p.1.
 - (7) C.V. Keiser, "The Demographic Position in Egypt", N.Y., Milbank Mem. Fund, 1944.
 - (8) CAPMAS, "Population Growth", a report by the Demographic Studies Dept., 1974.
 - (9) C.H. Essawi, "Population and Wealth in Egypt", The Free Press, Cairo, 1957.
 - (10) Institute of National Planning, Problems of Unemployment in Rural Egypt", Report A., Cairo, 1966, p.6.
 - (11) Dr. M.S. Albdel Hakim, Professor of Human Geography, Cairo Univ., the Bulletin of the Faculty of Arts, "The Population of Egypt, A Demographic Study", 1972, p.40.
 - (12) CAPMAS, Population and Dev., op-cit, p.183. *See, also note (2) Chapter One.*
 - (12a) Britain 1982 and 1979, Official Handbooks, H.M.S.O.
 - (13) CAPMAS, Statistical Abstract of ARE, Cairo, June 1973. That was realized in the early 1980's when the natural increase exceeded 30 per thousand, Fig. (2-1).
 - (14) A statement on the Population of Egypt, Dr. A.M. Halloda, CAPMAS, Cairo, 3rd April 1980, p.1. The paper was presented in the Symposium on Population and Development Issues, Cairo, April 20-22, 1981.
 - (15) Akher Saa Weekly Magazine, Cairo, 3 March 1983, p.5.
 - (16) Population Studies and Research, Cairo Demographic Centre, Vol. 1, No. 1, 1971.
 - (17) K.C. Zacharia, "Geographic Variations of Fertility Rates in Arab Countries", CDC, Cairo, 1971.
 - (18) The Supreme Council for Population and Family Planning, Memo., National Strategy Framework of Population, Human Resource Development and the Family Planning Programme, Dec. 1980, p.1.
 - (19) CAPMAS, Population and Development, Sept. 1978, p.5.
 - (20) Britain 1982, op cit, p.19.
 - (21) CAPMAS, Population and Development, June 1973.
 - (22) CAPMAS, Estimations for Urban/Rural percentages for 1980 are 46/54, for 1985 are 48/52, for 1990 are 50/50, for 1995 are 51/49, for 2000 are 52/48.
 - (23) Khalifa, op-cit, p.36.
 - (24) The Higher Commission for Greater Cairo Planning, a Report on Migration to Cairo, 27.11.67, P.7 (Arabic).
 - (25) Khalifa, op-cit, p.44.
 - (26) J. Abu Lughod, "Migration Adjustment to City Life, The Egyptian Case", Amer. Journal of Soc., Vol. XVII, No. 1, July 1961, pp. 22-23.
 - (27) Private information from the Tenth Ramadan New Town, D.C., June 1981.
 - (28) There is no evidence that the rural migration to urban areas will decrease in the near future. A report about human settlements in Egypt prepared by the "Building Research Centre, Cairo, 1975", stated that in view of the large numbers of rural households, more than 4 million, it is difficult at the present time to remedy the rural housing conditions.

This opinion is too pessimistic. Planners must clearly persevere with rural improvement which can be achieved by decreasing population density and introducing modern technology in rural areas, especially for agro-industrial field.

- (29) CAPMAS, The Preliminary Results of the November 1976 Census Tables (10), (14-B), & (14-D) in Arabic.
- (30) Al Ahram, semi-official newspaper, 12 April 1977, after CAMPAS, Cairo.
- (31) "Around 40% of the population in Egypt is estimated to be under 15 years, and for every 100 adults aged 15-64 there are approximately 75 children to be supported" - National Strategy Framework of Population.
- (32) CSO Annual Abstract of Statistics, 1979 Edition, Table 2-3 pp.9-35.
- (33) CAPMAS, The 1976 Census, The Preliminary Results, pp.9-10 and Table 16, (Arabic).
- (34) CAPMAS, Population and Development, Sept. 1978, p.35.
- (35) CAPMAS, the 1960 census data.
- (36) CAPMAS, Population and Development 1978, op-cit, p.78.
- (37) Ibid, p.77.
- (38) Ibid, p.79.
- (39) CAPMAS, the 1976 census, the Preliminary Results, p.12 (Arabic).
- (40) Khalifa op-cit, p.34 CAPMAS, and Detailed Results of the 1976 census, Sept. 1978, p.30 (Arabic) and CAPMAS, 1976 census Preliminary Report, p.12 (Arabic).
- (41) CAPMAS, Population and Development, Sept. 1978, p.235.
- (42) Khalifa, op-cit, p.51.
- (43) Khalifa, op-cit, p.55.
- (44) CAPMAS, Population and Development, op-cit, p.177.
- (45) Khalifa, op-cit, p.77.
- (46) Population and Development, op-cit, p.182.
- (47) Ibid, p.184.
- (48) Khalifa, op-cit, p.79.
- (49) CAPMAS, Population and Development, p.189.
- (50) Al Shabebel Arabi Newspaper, Cairo, 7.12.81, p.3.
- (51) 8 Days Magazine, London, 18.4.81, p.42.
- (52) Population and Development, op-cit, 1978, p. 262.
- (53) Ibid, pp.277-278.
- (54) Ibid, p.332.
- (55) Ibid, p.284.

CHAPTER THREE: THE BRITISH EXPERIENCE FOR NEW TOWN'S ESTABLISHMENT IN EGYPT

- (1) P. Self and Others, New Towns; The British Experience, London 1972, p.11.
- (2) F. Schaffer, The New Town Story, London 1972, p.21.
- (3) P. Self and Others, op-cit., p.11.
- (4) Ibid, p.11.
- (5) Ibid, p.11.
- (6) It became: Garden Cities and Town Planning Association, later Town and Country Planning Association, TCPA.
- (7) In 1919, E. Howard started to buy land for Welwyn Garden City and in 1920 construction started - M. Aldridge, The British New Towns, A Programme without a Policy, p.205.

- (8) This is almost similar to the situation in Greater Cairo in the 1960's when a concentration of development took place and attracted rural/urban migration mainly to Cairo. That caused a big restraint on housing and services which resulted in shortages both in the 1970's and 1980's.
- (9) Housing programmes in Egypt almost took the same attitude in the 1950's and 1960's. "Alf Maskan" or 1,000 housing project north east Cairo, and "Amiriya" housing project, north Cairo are two of many examples of building big numbers of 'popular houses', mainly on the agricultural lands close to the urban built-up areas, and without enough services or jobs, which created complications in transport, day-to-day needs and so on.
- (10) F. Schaffer, *The New Town Story*, London, 1972, p.87. "The final report of the Uthwatt Committee contained a closely-reasoned analysis of the problems of land-values and the philosophy of compensation. It explained with almost brutal clarity the reasons the compensation to land-owners as a class, was always in excess of the true loss of value, and why 'betterment' could rarely be collected. Development value, said the Committee, is a floating value spread over many more acres than are even likely to be developed, so that the compensation to each member of a group of individual owners, separately assessed, greatly exceeds the real loss of the group as a whole. If development is not allowed in one area the value shifts to land elsewhere, but it is impossible to say with certainty whether and to what extent a given land-value is attributable to a given cause" - Uthwatt (F), paras. 18-28.
- (11) Interim Report of the New Towns Committee, Cmd., 6759, HMSO, 1946.
- (12) Second Interim Report, Cmd., 6794, HMSO, 1946.
- (13) Final Report, Cmd., HMSO, 1946.
- (14) F. Osborn and A. Whittick, *New Towns, Their Origins Achievements and Progress*, London, 1977 p.55.
- (15) By the 1959 Act the Commission for the New Towns was set up, and in 1965 a further New Towns Act consolidated the acts of 1946 and 1959. Separate Acts apply in Scotland and Northern Ireland - F. Schaffer, *The New Town Movement*, op-cit. pp.17-21.
- (16) See Appendix 1.
- (17) P. Self and others, op-cit. p.18.
- (18) Ibid, p.20.
- (19) Sir F. Osborn and A. Whittick, *New Towns: Their Origin, Achievements and Progress*, (Formerly named: *The New Towns, The Answer to Megalopolis*), London 1977, p.112. Sir Fredric Osborn is internationally known for his central role in the planning and new towns movement. His first involvement with Sir Ebenezer Howard was at Letchworth, the first Garden City, 1903, where he gained practical experience of housing and estate management. Later he joined Howard in creating Welwyn Garden City, where he has made his home. Being the President of the Town and Country Planning Association, he played a leading part in the successful campaign for a British new town policy. He joined several committees of planning, and has been a prolific writer, lecturer and broadcaster, advisor to 30 countries. He was knighted in 1956 for services to planning.
- (20) Hall, *The Containment of Urban England*, 1973, Vol. 1, p.91.
- (21) M. Aldridge, *The British New Towns, A programme without a policy*, London, 1979, p.21.

- (22) The Committee was appointed in Oct. 1945 with the following terms of reference: "Two consider the general questions of the establishment, development, organization and administration that will arise in the promotion of New Towns in furtherance of a policy of planned decentralisation from congested urban areas, and in accordance therewith to suggest guiding principles on which such Towns should be established and developed as self-contained and balanced communities for work and living".
- (23) First Interim Report of the New Towns Committee, March 1946, 3, (2) p.5.
- (24) M. Aldridge, op-cit. p.37.
- (25) Ibid. p.66.
- (26) Government Policy in Leaschold Property in England & Wales, HMSO, Jan, 1953, p.3.
- (27) Astragal, The Architects' Journal, 7 Feb. 1968: A 'tame quantity surveyor' had given the following breakdown of new town costs:- Housing 48%, industry 12%, education 4%, shopping 2%, administrative and commercial 2%, hospital and health 3%, social and recreation 1%, services 20%, roads 7%, miscellaneous 1%.
The cost of services can vary enormously from town to town, according to local conditions, actual needs and priorities. In 1946 it was thought that a new town of 50,000 people may cost £19m. By 1948 it was increased by £25m, and increased to £250m, in 1972. Private finance is expected to increase considerably.
The amount of public money spent by development corporations is subject to a very thorough control by Parliament.
- (28) Sir Henry Wells: Town and Country Planning, Jan. 1968, pp.42-44.
- (29) B. Mullan, Stevenage Ltd., 1945-1978, London 1980, p.22.
- (30) F. Osborn and A. Whittick, New Towns, op-cit. p.453.
- (31) F. Schaffer, The New Town Story, op-cit, p.40.
- (32) Ibid, p.41.
- (33) Ibid, p.42. (adapted)
- (34) New Town Act, 1965, Schedule 2(1), p.53.
- (35) Principles of Estate Management, Michael Thorncroft, p.365, Estate Gazette Ltd., 1965.
- (36) Warrington Development Corporation, How A New Town Works, (with adaptation), undated.
- (37) R. Phelps, The Management of New Towns, INTA, Tehen 1977.
- (37a) Completing The New Towns, Town and Country Planning, Nov. 1982, pp. 265-266 (adapted).
- (38) F. Schaffer, op-cit. p.62 (adapted)
- (39) N.T.R. (1), para 11, N.T.R. (F) paras. 283-293.
- (40) F. Schaffer, The New Town Story, op-cit, pp.229-230.
- (41) M. Aldridge, op-cit, p.87.
- (42) N.T.C. report, 1971, pp.4-5.
- (43) There are vast quarters within the mosaic of Cairo where, physically and socially, the way of life and the characteristics of residents resemble rural Egypt. J. Abu-Lughod, The American Journal of Sociology, Vol. LXVII, July 1961, pp.22-23.
- (44) F. Schaffer, op-cit, p.71.
- (45) New Towns Final Report, paras 43-44.
- (46) F. Schaffer, op-cit, p.75.
- (47) Milton Keynes, Interim Report, D.C., 1969.
- (48) Osborn, op-cit. p.236 (with modification).
- (49) M. Aldridge, op-cit, p.61.
- (50) Ibid, p.63.
- (51) Town and Country Planning, Feb. 1977, pp.94-95. Figures do not include Ballymena & Craigavon.

- (52) Ibid, pp.96-97.
- (53) Ibid, pp.98-99.
- (54) Osborn, op-cit, p.458.
- (55) M. Aldridge, op-cit, p.174.
- (56) F. Schaffer, op-cit, p.116.
- (56a) Aldridge, op-cit, p.102 (adapted).
- (56b) Britain 1979, An official handbook, HMSO, p.173.
- (57) Shaffer, op-cit, p.103.
- (58) Osborn and Whittick, op-cit, p.453.
- (58a) Patrick Abercrombie, Greater London Plan, 1944, p.466.
- (59) Osborn & Whittick, op-cit, p.454.
- (60) 'Newer' new towns took in consideration the rapid increase in car ownership and the need for more private garages and public parking places. In the latest housing units many towns now allow for an average of one car a family. Ibid, p.455.
- (61) Ibid, p.455.
- (62) Ibid, p.266.
- (63) Ibid, p.131.
- (64) Ibid, p.132.
- (65) Ibid, p.456.
- (66) Ibid, p.455.
- (67) Schaffer, op-cit, p.164.
- (68) Ibid, p.169.
- (69) Family and Kinship in East London, Michael Young and Peter Willmott, Penguin Books, 1962.
- (70) Ibid, p.195.
- (71) Osborn, op-cit, p.457.
- (72) Ibid, p.457 (adapted).
- (73) The Advisory Committee which was appointed in Oct. 1945 by Lewis Silkin, The Minister of Town and Country Planning, together with Joseph Westwood, The Secretary of State for Scotland.
- (74) Schaffer, op-cit, p.120.
- (75) Ibid, p.121 (after a Report of the Royal Commission on the Distribution of the Industrial Population, 1940).
- (76) A main purpose of new towns, however, is to accommodate population living in sub-standard and overcrowded conditions. In spite of the slower population growth, the number of households continues to increase and the outward movement of population from the large old cities in the United Kingdom continues not lessened. Greater London, for example, has been losing population at the rate of 40-70,000 people per annum since the late 1960's. Thus, new towns continue to have a purpose and not until environmental and social conditions are sufficiently comparable in the old urban areas to the conditions prevailing outside them will people and firms stop moving out. Osborn and Whittick, p.457.
- (77) F. Schaffer, op-cit, p.124.
- (78) Ibid, p.127.
- (79) Ibid, p.141.
- (80) Ibid, p.150.
- (81) Ibid, p.154, (adapted).
- (82) Ibid, p.257, (adapted).
- (83) Britain 1979, op-cit, p.173.
- (84) House of Commons, 20th Nov. 1967, Vol. 257.
- (85) Britain 1979, op-cit, p.173, (adapted).
- (86) Gordon Cameron, Commonwealth New Towns Conference, East Kilbride, 20th Sept. 1979, p.1 (adapted).
- (87) Dennis Kerby, Director European Investment Bank, Ibid, p.5.

- (88) Fact sheets on Britain, British Information Services, March, 1978, p.2-3.
- (89) Osborn, op. cit., p.94.
- (90) B. Beckett, "High Density Housing in Western Europe with particular reference to the U.K." A paper presented at Pretoria, National Building Research Institute, The CSIR, Johannesburg, 26-28 Sept. 1972.
- (91) Harlow information leaflet No. 18, Nov. 1978, p.3.
- (92) Osborn, op-cit, p.165.

CHAPTER FOUR: THE GREATER CAIRO REGION

- (1) In the 1976 census, 73% of the females and 43% of the males, over ten years, were illiterate. CAPMAS Dr. A. M. Halloda, The Present Population in Egypt, 3.4.1980, p.18 (Arabic).
- (2) GOPP, New Towns in the Greater Cairo Urban Region, First Report, August 1979, p.11.
- (3) GOPP and UNDP researches.
- (4) Oon, Hieroglyphic and Ein Shams (Arabic) means "Sun Centre".
- (5) The Planning Commission of Greater Cairo, The Preliminary Planning for the GCR, March 1970, pp.4-5 (Arabic).
- (5a) GOPP, Greater Cairo Region Interim Report No. 1, Vol. 1, December 1981, p.1173.
- (6) New Towns in The Greater Cairo Urban Region, op. cit., p.1.
- (6a) The Supreme Committee for GCR, The Preliminary Planning of GCR, 1970.
- (7) New Towns in GCR, op. cit., p.19.
- (8) Ibid, p.19.
- (9) "Migration from rural areas has been chiefly responsible for Egypt's soaring rate of urbanization, even though natural increase, still as high in cities as in rural areas, accounts for half the annual rate of urban growth". J. Abu Lughod, The American Journal of Sociology, Vol. LXVII, July 1961, p.22.
- (10) New Towns in The Greater Cairo Urban Region, op. cit., p.24.
- (10a) Ibid, p.27 (adapted).
- (11) The Central Agency for Public Mobilization and Statistics, CAPMAS, The Detailed Results of November 1976 Census, Cairo Governorate, (Arabic), September 1978, Part 1, pp.43-91.
- (11a) GCR Interim Report, 1981, op-cit., p.11. 72.
- (12) Al Azhar University has missionaries in the Muslim States all over the world. Thousands of Muslim scholars have graduated from its faculties over the centuries. The same can be said concerning the other specialized institutions and research centres in the region where many foreigners have been graduated.
- (13) New Towns in The Greater Cairo Urban Region, op. cit., p.35.
- (14) Banha city (The Capital) had a 1966 population of 63,851 (Ayad p.228) while Shoubra el-Kheima had 172,902 in the same year. The Planning Commission of Greater Cairo, The Preliminary Planning for the GCR, March, 1970, Appendix 2, (Arabic).
- (15) That is happening now in the new towns. For example, buildings for the Ministries of Housing, Reconstruction, Reclamation and Planning are being built in Sadat City, while the Solar Energy Institute has been completed there. Both Sadat and Tenth of Ramadan new cities will have Universities and several specialized institutions.
- (16) Cairo, and its suburbs, offer the visitor a cross-section of all Egyptian civilizations since the time of the ancient Kingdoms which

make it like a living museum, spanning a major epoch of the history of human civilization.

Giza, Dahshur, Saqqara, Memphis, Mit Reheina, badrashein, Abu Sir are some of the archaeological districts in the GCR. Also, Cairo was known as "the city of the thousand minarets" and it has attractive gardens and casinos along the Nile banks, although they are not very well kept in the last few decades.

- (17) New Towns in the Greater Cairo Urban Region, First Report, op. cit., p.40 (adapted).
- (18) It is argued that new towns are the 'gold mines of the future', see note (28) in Chapter Three.
- (18a) Ray Thomas, Stability for London, Town & Country Planning, April 1982, p.98 (adapted).
- (19) GOPP, 6th October New Town, First Report, October 1979, pp.18, 22 (Arabic) (adapted). One can get from the figures that the average growth of population will be 17,500 p.a. and if the average household is 5 persons, so 3,500 dwellings will be needed every year.
- (20) New Towns in Greater Cairo Urban Region, op. cit., p.49 (adapted).
- (21) GOPP, 6th October Second Report, May 1980, Tables (1-4) and (2-4) p.31.
- (22) Ibid, pp.93-101.
- (23) Ibid, p.109.
- (24) Ibid, p.115.
- (25) New Towns in GCR, op. cit., p.50, 5,000 buildings each consisting of ten units, each unit to accommodate 5 people = 250,000 people.
- (26) It was argued in early 1981, that the Sphinx was affected by the dampness resulting from the spread of tourist bungalows and development in the Pyramids district. The Government has taken prompt action and bulldozed such bungalows.
- (27) GOPP, Al Amal new town Report, May 1980, pp.76-77 (Arabic).

CHAPTER FIVE: TENTH OF RAMADAN, THE NEW INDUSTRIAL CITY

- (1) Ministry of Development, Tenth of Ramada, Draft Master Plan January 1976, Preface.
- (2) Special Information from the D.C., June 1981.
- (3) Ibid.
- (4) Al-Dawa Magazine, Cairo, May 1980.
 - (I) Hong Kong Housing, Far Eastern Economic Review, January 16, 1981, p.38 HK\$ are converted to US\$ at 0.2 each, and areas are converted from square feet to square metres.
 - (II) Hong Kong Year Book, 1982, Appendix 28, p.288.
 - (III) Some effects of H. K. land prices on Housing and Commercial Development, Professor R. Yin Wang Kwok, Director of Centre of Urban Studies and Urban Planning, University of H.K., Far Eastern Economic Review, March 1981, p.42.
 - (IV) Crack in the foundation, a 30% fall in values is forecast, Anthony Rowley, Far Eastern Economic Review, October 1981, p.93.
- (5) Primary Schools in Egypt deal with children between 6-12 years old who represent about 15% of the total population. The average capacity of such school is assumed to be about 630 pupils in about 18 classrooms. So, the average neighbourhood population is to be about 4000 people. Services at the school, playground, shopping centres, social and health centre, should be in 10-15 minutes walk from any house, or about 400 metres. In this way the maximum area of the neighbourhood is about 120 acres. (From, "Neighbour-Planning", GOPP, p.5 undated).

- (6) Draft Master Plan, op. cit., pp.13-15.
- (7) Ministry of Development, Community Planning And Development Challenge, (in Egypt), International New Towns Ass. Conference (INTA), Cairo, October 1980, p.32.
- (8) Draft Master Plan, op. cit., pp.18-2
- (9) Ibid.
- (10) According to experience in Egypt, each inhabitant in the new city would require about 20m² of green and open space including farmland and protection zones against sandination. That means that about 2500 feddans (acres) of parkland are required for the 500,000 people on the completion of the city. Figs. (5-12) and (5-13). Studies made in Nasr City, an urban extension on the desert north east Cairo, have shown that every faddan of parkland cultivated in sandy soil would need a daily water supply of about max. 50m³ per day. Irrigation using the pivot or dripping systems can reduce that amount by 50%. that was proved in Salhiya Project for land reclamation, eastern of Tenth of Ramadan, Figs. (5-15) and (5-23). The author visited Salhiya Project in July 1982 and examined the pivot system which is similar to that in Arizona Desert, North America.
- (11) Unofficially from the Ministry of Irrigation, Cairo.
- (12) Shotton (1946) mentioned that, "groundwater in the desert between Cairo and Ismailia is almost all of good quality". He also mentioned that there is a close resemblance between the characters of such groundwater and those of Wadel Natrun, west of the Delta, Fig. (1-5), being essentially similar in their lateral transmission from the gravels under the Delta. The variation in water quality with depth and eventually with duration is considerable. (See I. A. Ismail, Hydrological Studies of Tenth of Ramadan, The Geology Department, Zagazig University, Egypt, 1979, p.25).
- (13) The city region is characterized by typical and climate conditions, but it is relatively milder than that of the internal eastern desert. It has a short rainy season, from October to March. The mean annual rainfall is 24.5 mm. The mean maximum temperature is 27.9°C, and the mean minimum is 14.9°C. The annual mean relative humidity is 56%. Wind velocity varies between 17.2 Km. per hour in November, and 26.2 Km. per hour in June. The prevailing wind comes from the north and north-west, while the climatic condition is acid. Ibid, p.27.
- (14) A deep water well was drilled in 1960 immediately north of the Cairo-Suez desert road at a distance of 45 Km. from Cairo. The recorded water level in this well is 170 m below land surface. The measured salinity of its water is about 5.500 ppm. It is more saline than the wells of Heliopolis (north-east Cairo, about 50 m from the surface of the ground) where water has a salinity of about 2.000 ppm. The deeper the wells are - the more saline water exists. The depth of water from the ground surface is controlled by the ground elevation. Drilling in Umm Gidam slopes, south-west of Ismailia, indicates that the main aquifer exists in the Pliocene and early Pleistocene sands and gravels, Fig. (5-17). Water less than 1.000 ppm. salinity is suitable, while that more than 3.000 ppm salinity is undesirable for different kinds of use. Ibid, p.37.
- (15) Geohydrology study indicates that water reservoir in the district covers about 3,000 sq. km, with an average thickness of about 250 metres. If the mean porosity of the medium is taken as 25%, this will make the reservoir capacity in the order of 1.875×10^{11} cubic metres. But the potentialities of the reservoir is measured by the sustained yield which is defined by Meinzer (1923) as "the rate at

which water can be withdrawn from an aquifer for human use without depleting the supply to such an extent that withdrawal at this rate is harmful to the aquifer itself, or to the quality of the water, or that it is no longer economically favourable. Ibid, p.43.

- (16) U.N. Urban Rurl Projections from 1950-2000, World Bank Atlas, 1974.
- (17) Draft Master Plan, op. cit., p.7.
- (18) Ibid, p.7.
- (19) Ibid, p.8.
- (20) Productivity increases will be greatly facilitated by on-the-job training.
- (21) Draft Master Plan, op. cit., p.21-4.
- (22) See note (28) Chapter 3 about the British experience in new towns.
- (23) Special information from the D.C. June 1981.
The General Manager mentioned that numbers will be considerably changed, i.e. the settlers will increase and the commuters will decrease in December 1981. But that was not realised when the author visited the new town in June 1982 because the reasons mentioned in Section 5.5.1.
- (24) This section represents a field study in June 1982 when the author visited the new town for the fifth time.
- (25) Tenth of Ramadan, The Development Plan, SWECO, April 1982, p.22 (Arabic).
- (26) As stated by the D. C. officials.
- (27) The Development Plan, op. cit., p18.
- (28) Ibid, pp. 40, 41.
- (29) The Ministry of Development, Humanities, a report, March 1982. (Arabic).
- (30) Ibid, p.8.
- (31) The Development Plan, op. cit., pp.7-11.
- (31a) Ibid, p.13.
- (32) Ibid, Section 3-2.
- (33) See Note (24) Chapter 7.
- (34) See Section 7.2.1.
- (35) The U.N. Conference on Desertification was held in Nairobi, Kenya, 29th August - 9th September 1977, attended by 95 states and 50 U.N. officers and bodies. The U.N. Environment Programme (UNEP), publishes a bulletin called 'Desertification Control' every six months to spread information and knowledge on desertification problems.

CHAPTER SIX POTENTIAL DEVELOPMENT REGIONS IN EGYPT

- (1) Dr S. El Hanafy, then Deputy Minister of Planning, "The Characteristics of the Way to the Year 2000", July 1978, Cairo, (Arabic). Estimations are based on studies carried out by the departments of the Ministry of Planning.
- (2) Ministry of Housing and Reconstruction, Status Report No. 1, Suez Canal Zone, Vol. II, June 1975, p.9 (Population Trends).
- (3) ..."The jobs for this new population (two millions) in the (Sinai) desert are to come from new industry based on large reserves of coal, manganese, and offshore oil and gas".
James MacManus, The Guardian, London, 5th November 1982. At the end of the report the writer wonders, six months after the handover of Sinai, if it "Will remain as bleak and desolate as it always has been!?" The answer should be negative because of the implementation of the planned projects of development. Both the

public and private sectors have to participate in such comprehensive development of the peninsula.

- (4) Arab Contractors Magazine, the firm implementing the project, Arabic, April 1981, p.25.
- (5) Status Report No. 1, Suez Canal Zone, op. cit., p.5 (Water Resources).
- (6) The estimates did not include Sinai wells at the eastern coast of the Suez Gulf. Aida Beshara, Third World Planning Review, Vol. 3, No. 2, May 1981, p.243.
- (6a) Status Report No. 1, Ibid, p.7, (Industrial Sector).
- (6b) SUMED petroleum line starts from Einel Sokhna, 50 km south of Suez. It ends in Sidi Krare, about 30 km west of Alexandria with a total length of 320 km as a double line.
- (7) UNDP, Suez Canal Region Plan, 1976, p.57.
- (8) Ibid, pp.62, 63.
- (9) The author in his research, "The Regional Development Strategy of the Suez Canal Region", Technical University of SZCZECIN, Poland, June 1977, p.8.
- (10) The Ministry of Development, North-West Coast Dev., Terms of Reference, undated, p.2.
- (11) Dr. M. S. Diab, Desert Institute, Matariya, Cairo, "The Development of Water Resources in Desert Communities". The Conference on Comprehensive Development of Desert, 15-18 March 1975, Matruh, Arabic p.7.
- (12) Water has been re-cycled in Britain for a long time. If this is the case in a country with ample water resources, the dry areas should surely follow such advanced methods to make the utmost use of their limited water resources.
- (13) Ministry of Development, North West Coast Development, Terms of Reference, p.66 (undated).
- (14) Ibid, p.28.
- (15) Dr A. M. El Desouky, The Director of The Institute of Medical Plants, Cairo, for the development of Desert Communities", a paper presented in the Conference on Comprehensive Development For Desert Communities, 15-18 March 1975, Matruh, (Arabic) pl.
- (16) Ibid, p.3.
- (17) ILACO, The Consultant company, which started its studies in the North-West Coast Region in 1975.
- (18) Dr S. El Hanafy, op. cit., p.19.
- (18a) Satellite studies indicate that there are salt deposits at the bottom of the depression, including potasium, and magnisium, which will increase water salinity in the depression and reduce evaporation. Oil floating on the water of the Mediterranean which will be carried onto the surface of the lake, further decreasing evaporation and hence hindering the turbines' work.
- (19) El Hanafy, op. cit., p.42.
- (20) The author participated in the studies of the High Dam Lake Region in 1978 - 1979 as an official counterpart with a Japanese work team. A report was published in March 1979.
- (21) FAO, The U.N. specific fund, The Project of the Lands of The High Dam, UAR, 1964, p.16.
- (22) The Detailed Studies of South Egypt Region, The Institute of National Planning, April 1978, p.16 (Arabic).

- (23) Ministry of Agriculture, The Ground water of the New Valley, 1974, Vol. 1, p.13.
- (24) Geologist A. Salama, "The Development of Abu Tartur Phosphate And Its Impact On Desert Community In The New Valley, Matruh Conference, March 1975, p.5.
- (25) The Detailed Studies of South Egypt Region, op. cit., p.262.
- (26) Dr Farookel Baaze, The Egyptian American Scientific Advisor for the U.S.A. President in Space Affairs, in writing about natural resources in Egypt wondered why Egyptians still use gas and electric heaters while solar energy is available all the year round.
- (27) The licensed mining areas in Southern Egypt total 101,535 ha., The Detailed Studies of South Egypt Region, op. cit., p.162.
- (28) Ibid, p.309.
- (29) Ibid, pp.319-321.
- (30) Ibid, p.371.
- (31) Ibid, p.364.
- (32) The Prime Minister stated that "Every year Egypt imports agricultural products of about \$3,000 million", El Shababel Arabic newspaper, 15.11.1982, p.1.
- (33) The Detailed Studies of South Egypt region, op. cit., p.3.

CHAPTER SEVEN: GUIDELINES FOR THE DEVELOPMENT OF NEW SETTLEMENTS IN EGYPT

- (1) Aida Beshara, Professor of Geography, Ain Shams Univ., Cairo, Third World Planning Review, Vol. 3, No. 2, May 1981. pp.234-248.
- (1a) Ministry of Development, National Urban Policy Study, NUPS, January 1981, p.41. (Interim Action Report).
- (1b) Aida Beshara, op. cit.
- (2) "Petroleum revenues of 1982 - 1983 in Egypt are expected to reach \$6000 m", a statement by the Dep. Prime Minister of Petroleum, Al Shababel Arabic newspaper, Cairo, 12 July 1982, p.3.
- (3) One of the original inhabitants near Crawley, U.K. Commented, "The freshness of the area will be vitiated by 50,000 people, and the opportunity I have had of enjoying the sea breezes will cease". The Minister Lewis Silkin was faced by a vitriolic reaction from the original people in a meeting to explain Stevenage expansion.
- (4) NUPS, op. cit. p.43 (adapted).
- (4a) Ministry of Development, Tenth of Ramadan, April 1982, pp.1-4, Arabic.
- (4b) Ayad, Ph.D. Thesis, Liverpool University, 1980, p.93 (adapted).
- (5) Ibid pp.382-383.
- (5a) Ibid p.383 from HMSO Housing and Construction Statistics.
- (6) GOPP, New Towns in GCR, First Report, August 1979, p.14.
- (7) M. Hanna, Professor of Civil Engineering, Ein Shams Univ., Cairo, at the Conference on Desert Development, Matruh, March, 1975, p.4 (Arabic).
- (8) Every year a volume of 7 milliard cubic metres is still flowing to the Mediterranean, and another voluem of 12 milliard cubic metres of water is estimated to be lost through seepage, of which about one milliard is attributed only to the Ismailia Canal - Ministry of Housing and Reconstruction, Status Report No. 1, Regional Plan, Suez Canal Zone, Vol. II, June 1975, p.16.
- (9) Although Egypt faces shortage in water resources, the problem of over-irrigation is well-known in rural Egypt. For example, one sugar-cane Feddan needs only 10,000 cubic metres of water while it is

actually irrigated by 22,000 cubic metres. Also, the average consumption of Fayum region is 17 cubic metres per day per acre, while in the Delta region it is 40 cubic metres, although the first region is drier and its soil is lighter than the latter one. In addition to water losses, useful materials in the soil are lost, while useful bacteria for the plants are less active, and the roots are pressed which results in less productivity. Then the farmer thinks that his field needs more water, and the case is worsened by more irrigation. Hanna, op. cit., p.3.

- (10) M. Hanna, *ibid*, p.5.
- (11) The Minister of Irrigation, Al Ahram semi-official newspaper, Cairo. 29.9.1982, p.9.
- (12) Water loss in Sudd Region, southern Sudan, is immense, because of evaporation and transpiration. Jungly Canal is being dug between Bor and Malakal, 225 miles, to be completed by 1985 with total costs of £250 m. (if work runs as planned). The daily capacity of this canal will be 20 million cubic metres to carry water from the Nile Heights with a limited loss. Egypt's share from the Nile water will increase by about 9 milliard cubic metres annually on the completion of this project which resembles about 18% of the present share of Egypt from the Nile water (see Section 6.2.7). Al Sharkul Awsat newspaper, London, 15.10.1982, p.8 (Arabic).
- (13) It is estimated that electric energy which may be generated in Ataka and Sokhna, south of Suez City, will reach 2.4 million KWH (see Section 1.8.1). That will be more than energy generated from the High Dam which is two million KWH. The hydro-electric energy that could be obtained from the barrages across the Nile between Cairo and Aswan is estimated at 635 thousand KWH as a result of a difference of 70 metres between the levels of Aswan and Cairo. The same can be said about other sites which can be exploited by pumping Nile or sea water to the near plateaux and letting it fall down again to generate electricity.
- (14) Institutional and Household biogas plants are used in China, India, Korea, Taiwan and elsewhere with diluted animal faeces, with or without human excreta, and with or without vegetable refuse. The effluent slurry can be used in agriculture and fish ponds. The dung from one medium sized cow, or similar animal, can produce round 500 litres of gas per day. It contains 50 - 70% methane. In contrast human excreta yields only 30 litres of gas per person per day. The process is very sensitive to temperature and gas production is negligible below 15°C. In 1977, there were about 30 family-size biogas units in operation in one of the Taiwan communities. The methane generated was transported to the kitchen through a pressure hose. The digester was emptied twice a year and the sludge sold to neighbouring farmers. Gas was sufficient for cooking purposes all year for a family of five replacing the 20 kg cylinder of liquid petroleum gas formerly purchased each month at almost the same cost. The World Bank, Energy, Water and Telecommunication Department, "Appropriate Sanitation Alternatives: A Technical and Economic Appraisal" October 1978, pp.32 and 60.
- (15) Energy in Egypt and its future till the year 2000, The Specialized National Councils, Cairo, July 1978, p.60 (Arabic).

"In 1952, petroleum and natural gas searches only covered 1,490 square kilometres. In 1965 they increased to 20,500 square kilometres, and at the end of 1977 reached 569,200 square kilometres or more than one half of the total area of the country. They included 38 contracts with 29 companies from 13 different nationalities and obliged to spend \$833.6 million". Energy in Egypt, p.30.

"In 1973 petroleum production in Egypt was about 167 thousand barrels a day increased to 750 thousand barrels per day in 1982, and is expected to reach one million barrels per day in the next few years". The Minister of Petroleum, El Shababel Arabi, 29 November 1982. p.8.

Every site of petroleum or natural gas discoveries, will form a base for a new settlement. Some of them have to be developed to accommodate other activities such as mining, farming, industries or fishing, whichever the site allows and the water resources are sufficient.

- (16) Energy in Egypt, op. cit., p.60.
- (16a) The Ministry of Development, The Five Year Plan, 1979/1983, For The New Settlements, 10.10.1978 (Arabic), p.37.
- (17) Thermal comfort in Hot Climate, BRE News, Summer 1982, U.K. p.13.
- (17a) Urban Projects Manual, Liverpool University, 1983, p.33.
- (18) According to some estimation 40-60 thousand Feddans of prime arable land are lost each year to urban encroachment - The National Urban Policy Study, NUPS, Ministry of Development, January 31, 1981, p6.
- (19) Professor Weidman, W., Effect of Urbanization on the Agricultural Land Resources Base: Status and Future Expansions. National Urban Policy Study, Working Paper, Cairo, 1980.
- (20) NUPS, Ibid, p.11.
- (20a) M. Bayad and J. Andreason, Housing & Urban Development in Egypt, Copenhagen, 1983.
- (21) Dr. M. El Gabaly, the former Minister of Agriculture, El Shababel Arabi, 29.11.1982, p.11 (Arabic).
- (22) When the Rouse Brothers started to build Columbia, a private enterprise new town in Maryland, U.S.A., they built first of all the swimming pools, golf course, lakes, and community buildings and other amenities. Only then did they seriously start building houses to sell, and the new town became an immediate success. F. Schaffer, The New Town Story, 1978, p.226.
If this is the case of the well-off people who have their own facilities and transport, what about the low income classes who have much less facilities for recreation? They surely need adequate kinds of social and recreational facilities that match their standard and requirements as football and racket games.
- (23) The Ministry of Housing and Recreation, "Human Settlements in Egypt", A National Report, 1975, p.30.
- (24) The plantation of forests and the creation of lakes helped to reduce the oppressive heat by 4 - 5°C in Dushanbe, south west of USSR. Y. Gallantay, "New Towns: Antiquity to the Present", NY, 1975, p.39.
- (25) In the tropics the neem tree grows fast in poor soils with little water, while it actually improves the quality of soil. Cattle, sheep and goats leave it strictly alone and most insects would sooner starve than eat its leaves even the hungry locust. Also, neem wood is heavy and tougher than teak. It grows straight so it is ideal for construction and furniture-making. The seeds contain oil that can be used as a fuel or

a lubricant, while the remaining pulp can produce methane gas or be used as fertilizer. Chemical industries can benefit from parts of the tree to make soap, disinfectant, cosmetics, even insect repellent. If left, the neem will grow to a beautiful shade tree and serve as a sturdy windbreak for decades. Scientists see the amazing zone trees. Mazingira, The International Journal for environment and Development, Vol. 5 No. 4, 1981, pp.81-82.

(26) Very recently, more hope is in sight for desert cultivation.

1. Desert Sponge

"A revolutionary technique for the greening of the deserts has been successfully tested in Egypt. It consists of a polymer (molecule compound) that absorbs 30 times its weight in water. Plants draw their water from tiny granules, called Agrosoke, which are mixed with sand or soil.

The trials carried out at the agricultural research station in Ismailia, showed that a cubic metre of soil mixed with 3kg of the granules, required 65% less irrigation. Plants grown in this mix were stronger and healthier than those in similar soils under normal irrigation - so the technique may not only bring plant life to areas where none existed before, but will also assist plant growth. A grosoke, brain-child of British scientist Allan Cooke, could also provide the answer to another arid land problem - the loss of water by evaporation and seepage". The "South" magazine London, May 1983, p.58.

2. "A Devon firm, U.K., believes it has solved a problem that has been baffling scientists for years - how to make desert bloom and feed the world starving million. It has invented a revolutionary soil conditioner that can turn unproductive sand and clay into arable land, known as 'Landspeed'... A new 16,000 square foot factory went into operation this month... It took 10 years of painstaking research to discover the chemical formula for the soil conditioner. The formula is applied beneath the surface to break down unyielding clays. It works from the bottom up rather than the top down... The technique binds sand particles to provide growing medium plant roots can take hold of". The "Financial Guardian", London, Friday 24th June 1983.

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