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Introduction

The conditions that exist today in the Greater Cairo Region (G.C.R.) will determine to a great extent the needs of the future and the main challenges which will have to be met in the coming years. An analysis of the present conditions is therefore essential if needs are to be satisfied and problems resolved. It is with this goal in mind that the Master Scheme for the G.C.R. has been proposed.

In studying a given situation, it is not enough to merely describe the living conditions of a population, the available facilities or the infrastructure. This results in a static picture; it is rather the dynamic elements which explain how these conditions have occurred that are important to the urban planner. With an understanding of the urban dynamics, development patterns can be efficiently altered by avoiding socially disruptive actions and expenditures beyond national resources capabilities.

The first Master Plan of the G.C.R. was prepared between 1965 and 1970, and approved by a Ministerial Decree in 1974. Subsequently this plan had to be updated to take into account the new National Urban Policy Study (1980, 1982) and the important socio-economic changes which occurred after 1974, drastically changing public and private investment patterns. A great deal of construction activity has already been taking place in civil works and housing.

The target date of the 1970 Master Plan was 1990, which now appears to be too close to the present time to allow for long-range planning. The G.C.R. Master Plan for the year 2000, based on the Strategy Plan adopted in June 1982, was issued in January 1983, after a selection of one of three possible development schemes. The G.C.R. Master Plan focused on the landscape and its physical aspects, with all its potentials and constraints, for urban development. A brief description of the study is given below.

Thus, the main questions facing decision-makers with regard to the G.C.R. today relate to population growth and its location.

Population Growth

The G.C.R. now represents about 22 per cent of the total population of Egypt, and 43 per cent of the urban population, totaling approximately 10 million inhabitants. There are three categories of populated areas in the G.C.R.:

- 1) The Greater Cairo agglomeration, a continuous urbanised area, which can be roughly identified as the cities of Cairo, Giza, and Shubra al-Khima, with a population of about 8.6 million (1982) of which 62 per cent are in the Cairo Governorate, 25 per cent in the Giza Governorate and 13 per cent in the Qalyubiya Governorate);
- 2) Six small rural towns with a total of 300,000 inhabitants (1982);
- 3) Villages in the agricultural area of the Nile Valley and the Delta with a population of nearly one million (1981).

The annual population increase of the G.C.R. has been approximately 4 per cent (5.8 per cent in the Qalyubiya Governorate, 4.5 per cent in the Giza Governorate and 3.3 per cent in the Cairo Governorate). If the present trend of growth continues, a large encroachment on agricultural land can be expected in Giza and Qalyubiya.

Migration was the main reason for the population growth in the G.C.R. between 1935 and 1965, accounting for 35 per cent of it. According to the 1976 census, migration into the Cairo and Giza governorates were 1.236 million and 0.234 million inhabitants respectively, whereas emigration was only about 20 per cent of these totals. Migration into Qalyubiya was 71,000 inhabitants and emigration about 60 per cent of the total, oriented chiefly toward the industrial areas on the Ismailiya road. Migration within the governorates of the G.C.R. has always

been an important factor and has been increasing. In 1980 the net migration into the Cairo Governorate represented 23 per cent of the population, 33 per cent into the Giza Governorate and 16 per cent into the Qalyubiya Governorate.

Land Use

Two factors needed to be considered with regard to land use are that

- half of the urban expansion takes place on agricultural land; and
- most of the growth occurs on the agglomeration fringes. Sporadic growth in the form of new communities is making only a very small contribution to the total.

For the future, it will probably be difficult to avoid a substantial increase in the urban population of the G.C.R. from the 8.5 million of 1982 to 16.5 million by the year 2000, and this is assuming that very favourable conditions will exist in the rural areas. But whatever the case may be, planners should take this figure as a target because any failure to meet the demand for urban space would mean resorting to agricultural land for further development.

Table 1

	ha	%
Built-up area	26,896	9
Cultivated areas	88,843	31
Desert	152,713	53
Nile River	3,067	1
Other (military camps, airports, urban vacant land, quarries, former cultivated land, etc.)	18,344	6
Total:	289,863	100

The total area of the G.C.R. amounted to nearly 290,000 ha in 1982. Table 1 provides an analysis of the type of land use. These data point to three notable factors:

- 1) The urbanised area made up only 9 per cent of the total area;
- 2) The cultivated areas constituted an important part of the region supporting some 600,000 inhabitants;
- 3) The desert made up more than 50 per cent of the area.

Table 2 shows the distribution of total urbanised land use (amounting to about 32,500 ha in 1982) broken-down according to governorates.

Table 2

	Cairo %	Giza %	Qalyu- biya %	For the G C R %
Residential	64	74	63	67
Economic activities	17	13	27	17
Infrastructure	19	13	10	16

However, the analysis of existing land use is essentially based on maps made from aerial photographs taken in 1977. Table 3 indicates the extent of the G.C.R. in 1977 by governorate.

Table 3

Governorate	Area (ha)	%
Cairo	119,567	41
Giza	91,968	34
Qalyubiya	72,328	25
Total:	283,863	100

Table 4 provides an overview of urbanised land use by function in the three governorates. These data underscore the following points:

- 1) Giza appears as an important residential area, with 80 per cent of the land allocated to residential use and only 8 per cent to economic activities.

Table 4

Type of use	Cairo		Giza		Qalyubiya		Total	
	ha	%	ha	%	ha	%	ha	%
Residential	9,945	61	5,510	80	2,521	57	17,526	65
Economic activities	2,720	18	540	8	1,341	30	4,601	17
Service facilities and utilities	3,303	21	843	12	539	13	4,685	18
Total	15,518	100	6,893	100	4,401	100	26,812	100

Table 5

	1945	1968	1977	Average annual growth rates	
				45/68	68/77
Total built-up area (ha)	7,985	16,143	20,605	3.10	2.75
Population (000)	2,166	5,436	6,699	4.08	2.35

Built-up area by Governorate (ha)

	1945	1968	1977	45/68	68/77
Cairo	6,817	12,187	15,516	2.60	2.7
Giza City	983	2,856	3,620	4.70	2.7
Qalyubiya	185	1,100	1,469	8.00	3.3

- 2) The imbalance in the distribution of economic activities between Cairo and Qalyubiya is also noticeable here, the latter being an employment area for Cairo residents.

Table 5 represents the growth of built-up areas between 1945 and 1977. It indicates a decrease in the rate of expansion of built-up areas and an increase in land use per inhabitant. The average annual growth rate of the built-up area decreased from 3.10 per cent to 2.75 per cent between the periods 1945/68 and 1968/77. However, the use of urban space which was nearly 37 sq. m. per inhabitants in 1945, declined between 1945 and 1968 to 25 sq. m. per inhabitants. But as indicated in Table 6, it grew to 35.5 sq. m. per inhabitant between 1968 and 1977.

Urban encroachment on agricultural land in the five years from 1977 to 1982 repre-

Table 6

	Total	Increment	
		1945/68	1968/77
Built-up area (ha)	7,985	8,158	4,478
Population in 1,000 sq. m per inhabitant	2,166	3,270	1,263
Average	36.9	29.7	30.8
Marginal	—	24.9	35.5

sented about 3,000 hectares or 7,500 feddans, i.e., 1,500 feddans per year in the G.C.R. Since the rate of urban expansion of the G.C.R. is 900 hectares per year, it means that one third of this urban expansion takes place on agricultural lands.

Planning Objectives and Population Forecasts

Planning objectives are based on the two main social goals of development:

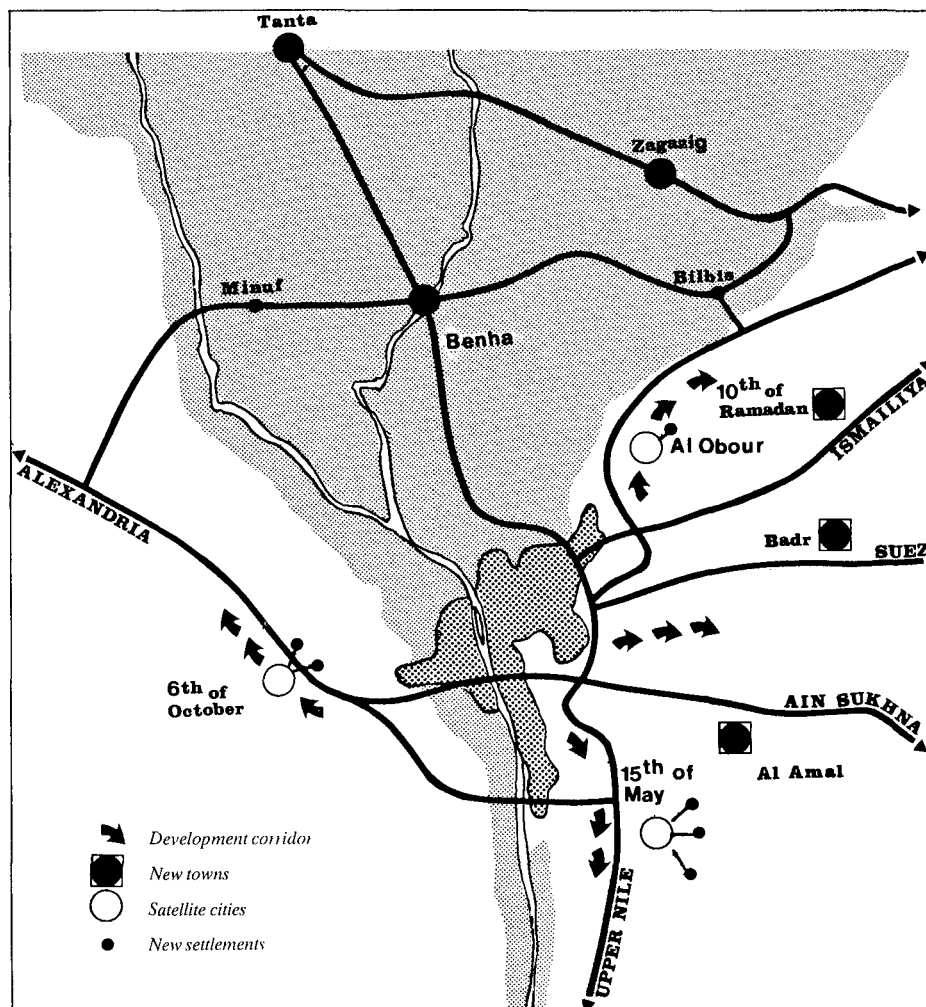
- 1) To increase the production capacity of the economy by:
 - protecting agricultural lands,
 - improving industrial location policy,
 - organising the urban fabric to reduce transport requirements,
 - maximising the use of existing infrastructure,
 - protecting the archaeological and historical heritage.
- 2) To improve the living environment by:
 - deconcentration, by limiting the contiguous expansion of the Greater Cairo agglomeration,
 - supplying serviced land for low-and medium-income households as an alternative to informal housing in agricultural areas,
 - organising the urban fabric to improve access to public services,
 - rehabilitating old neighbourhoods,
 - protecting water resources,
 - controlling air pollution.

The proposed strategy for land use provides for the accommodation of an urban population of 16.5 million in the G.C.R., out of a total of 37 million by the year 2000. It could very well be, however, that the total population of Egypt will approach 70 million by that year. The expected population increment of 7.4 million between 1982 and year 2000 would be distributed as follows:

The absorption capacity of existing agglomeration by the year 2000, 1.070 m; committed projects, 1 m; agglomeration fringes, 2.53 m; new settlements, 1.9 m; new towns (6th of October, Al-Obour, 15th of May), 0.9 m inhabitants.

Development Concepts

Various planning concepts have been used in the past. The two main concepts gov-



Source: Greater Cairo Master Scheme GOPP/OTUI-IAURIF

erning the 1970 Master Plan were that of 1) self-sufficient new towns acting as relief poles to accommodate new migrants to the G.C.R., and that of 2) controlling the existing agglomeration in order to end urban encroachment on arable land and keeping the agglomeration within a manageable size.

Difficulties related to the high costs involved in constructing new communities at some distance from existing economic bases, and the absence of external econo-

mies have led to a modification in the concept of self-sufficiency, and more emphasis has been given to satellite cities, such as 6th of October and Al-Obour

Apart from transportation, the reason for planning the ring road around the Greater Cairo agglomeration in the 1970 Master Plan was to restrain urban expansion and limit encroachment on agricultural land through the creation of a physical barrier. Recent experience has shown that an agglomeration with high economic poten-

tial, such as the Greater Cairo agglomeration, cannot be restrained without offering alternative development opportunities at a competitive cost. The idea of creating physical barriers should not be altogether discarded, however, and can appear in the concept of buffer zones and restricted access roads. This need to limit the size of the contiguous agglomeration is felt by all planners.

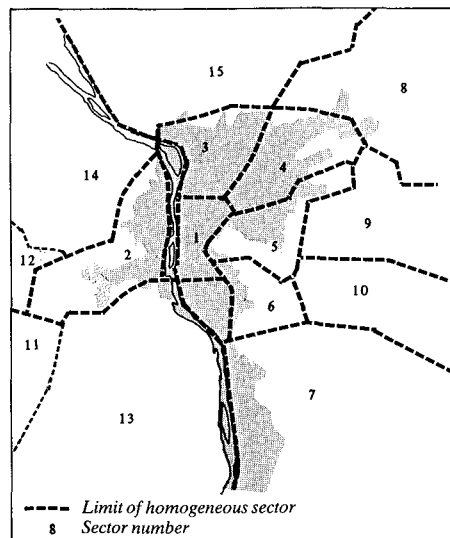
The new concepts proposed are the result of the planning objectives stated previously, which should permit the creation of a dynamic urban area with a high quality environment by making the best use of past experience and investment. Four spatial concepts have been proposed:

- 1) *Homogeneous sectors*, as a way of restructuring the existing agglomeration and integrating it with outlying communities;
- 2) *New settlements*, i.e., communities located between the satellite cities and suburban developments, which would provide an alternative to informal housing in agricultural areas;
- 3) *Development corridors*, as a way of fostering development dynamics between the existing agglomeration and the more remote new towns; and
- 4) *Urban region*, the appropriate level for development planning.

Homogeneous Sectors

The existing agglomeration, in which the number of inhabitants will soon pass the ten million mark, is plagued by congestion, owing to a poor balance between work and residential locations and a poor distribution of public services. It is proposed to subdivide the agglomeration into sectors with populations of one to two million, and to increase self-sufficiency in these sectors in order to reduce the need for dependency on one another.

These sectors would be homogeneous as far as living opportunities are concerned, i.e., the availability of public services and



Limits of Homogeneous sectors.

Source: Greater Cairo Region
GOPPIOTUI-IAURIF.

access to employment. However, they should be increasingly contrasted in the types of activities fostered by each one, with the purpose of striving toward individualisation. This geographic diversity would strengthen the originality of each sector and improve productivity through concentration without reducing the advantages derived from the large labour market of the G.C.R.

The agglomeration has been divided into five zones:

The Cairo C.B.D.

The Cairo Central Business District (C.B.D.) extends from the Abdin Palace and the Ezbekiya Gardens to the banks of the Nile. It is bordered in the north by Ramses Street and in the south by the Old City.

The Cairo C.B.D., as a whole, is witnessing a reduction in its residential function and a loss of population; instead, business activities are replacing the need for hous-

ing. The convergence of public transport in the Cairo centre increases concentration.

Further growth of business and commerce cannot be supported by the infrastructure at a competitive cost compared with that of the proposed new centres. Therefore, a quantitative increase of activities and services should be avoided. A qualitative transformation of business activities in the Cairo C.B.D. is nevertheless desirable: trade in luxury goods, entertainment and tourism activities could replace other business activities which would be better located in the new centres.

The existing urban fabric should be preserved (street patterns, densities, building heights), as well as the historical heritage.

A large intermediary zone surrounding the centre is affected by new developments in the centre. The old city comprising the districts of Bulaq, Khan al-Khalili and Misr al-Qadima, has significantly depreciated because of a lack of maintenance. Traditional activities which maintained the equilibrium of such districts are in a decline.

The absence of a supporting road infrastructure leads to uneven development which will create a strain on the local infrastructure. Restructuring is required for these districts on the basis of the guidelines provided in the master plans.

The North

Shubra — Sharabiah — Rod al-Farag — the Sahel:

Urbanisation has developed from Ezbekiya along the access roads to Cairo, overflowing into agricultural areas beyond the old Ismailiya Canal (Ramses Street).

Popular districts of Shubra with high densities are adjacent to the middle-class districts of the Sahel. Large spaces, presently used by the railroad and industry, could be partially recovered for other uses. The creation of a local service centre in the Sahel area has been proposed.

Shubra al-Khima:

Separated from the Greater Cairo agglomeration by the Ismailiya Canal and possessing a large industrial area, Shubra al-Khima is developing quite independently. In the future, expansion will be limited by the proposed ring-road. Since this area was developed completely on agricultural land, all means should be used to slow down its rapid growth.

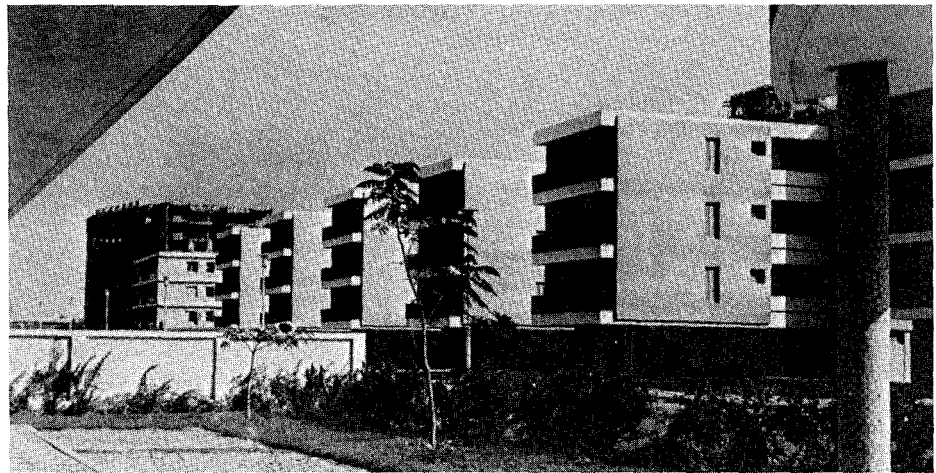
The North-East

Hadik al-Koba and Zaitoun:

These two *qisms*, ending in Mataria to the north, converge towards the C.B.D. They are trapped between a strip of industries to the west and the Suez Railway line, making east-west crossings difficult. They offer fairly good housing conditions to the middle class, close to important industrial areas which should be opened to the east in order to encourage industrialisation in the direction of the Suez Road and discourage any further build-up of the Cairo C.B.D.

Heliopolis and Nasr City:

In contrast to the above urban complexes, both Heliopolis and Nasr City offer well-structured patterns, typical of urban developments by "concession" which are granted to development and housing companies. They are effectively linked with the Cairo C.B.D. but poorly to each other,



Middle-income housing, Nasr City.

Photo: Courtesy of Abou-Zeid Rageh.

separated as they are by a long strip of military zone.

Mataria:

This *qism*, which has undergone rapid growth in recent years, had already more than 500,000 inhabitants in 1976. Mataria, with its informal development on agricultural land, offers the only opportunity for low-and medium-income mass housing for those working in east Cairo. The establishment of new settlements on the Suez Road, integrating the various socio-economic groups, offers an alternative to the expansion in Mataria.

should be progressively reduced by the opening of new land for economic activities and urbanisation in the Western Desert.

The South

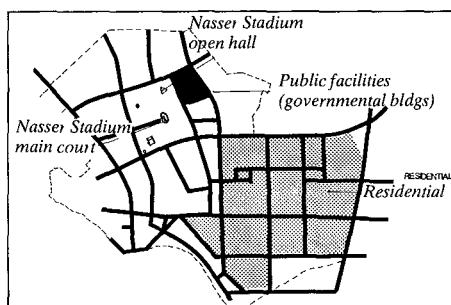
Maadi — Mokattam — Helwan:

The recent rapid expansion in the areas of Maadi and Helwan is due to the establishment of heavy industry in Helwan. The Mokattam plateau has been supplied with an infrastructure; however, little housing construction has taken place. It will be a privileged residential area in the future, enjoying a mild climate and the proximity of the Cairo C.B.D., Nasr City and Maadi. The southern zone is proposed for continuous expansion, utilising the space available.

The West

Giza:

Giza city is divided into two by the zoo and the university campuses: to the south, the old city of Giza and its extensions along the Pyramids Road; to the north, Dokki and Imbaba. The master plan is designed to stop the growth of the Giza agglomeration on agricultural land, and to re-organise existing areas. The strong dependence of Giza on Cairo for employment and services



Master Plan, Nasr City.

New Settlements

New settlements with a maximum population of 250,000 should be established close to the existing agglomeration in order to:

- stop the continuous growth of the agglomeration and suburban sprawl;
- provide a true alternative to informal housing on agricultural land;
- be economical with public resources and channel private financing into the supply of utilities. New settlements should be structured around satellite cities which would supply upper-level services.

In order to give individual character to each new settlement, the topography of each site has to be studied (contour lines, hills, valleys, watersheds), and its physical features, constraints and potential for urban landscape must be identified. A natural urban grid will thereby be formed, giving special characteristics to each new settlement. This method saves about 60 per cent of the cost for utilities and road networks.

Development Corridors

On a regional level, natural obstacles (hills, dunes, etc.) limit the development of corridors leading from the Greater Cairo agglomeration to the other regions of Egypt. In most cases, a new town project is located at the centre of these corridors, and having therefore the possibility of commercial contact with other regions of Egypt, it provides good economic potential for the development of new settlements in these corridors. Initially, these corridors could benefit from the utilities and transport infrastructure established for the new towns until they are provided with their own.

The population increase in the five development corridors could be approximately distributed as follows:

Western Corridor (Alexandria Desert Road) 750,000 inhabitants, Northern-Eastern Corridor (Cairo-Bilbeis Road) 365,000; Eastern Corridor (Cairo-Suez Road) 1,000,000; Ain Sukhna Corridor 250,000; Southern Corridor (Maadi — Helwan) 450,000

Urban Region

As the autonomy of independent communities improves with regard to basic services and employment, so will the need grow for integrating and structuring the higher levels of service and logistics needed on a regional basis, i.e. input-output relationships between industries, supply of consumer goods, regional utility systems, etc.

Deconcentration of the core area of the existing agglomeration will provide suitable results only if it is accompanied by regional structuring which would allow for homogeneity in living conditions throughout the Greater Cairo Region.

Population Distribution and Space Requirements

How and where can the 16.5 million inhabitants of the year 2000 be distributed in the G.C.R. is a question highly dependent upon the financial resources available in the future. Space requirements have been determined based on past experience and reasonable expectations for the future.

High population targets have been assigned to new communities located outside the main agglomeration, a policy which endeavours to break away from past trends, but which will require a very special commitment. In spite of these efforts, the existing agglomeration will none the less reach a minimum of thirteen million inhabitants by the year 2000.

To further the goal of decentralisation, a major effort should be made to create new communities for 2.8 million inhabitants (40 per cent of the added population). These could be distributed as follows:

- 0.90 million in new towns and satellite cities; and
- 1.90 million in proposed new settlements.

Space requirements have been determined on the assumption that relatively high residential densities should be retained as

they correspond to efficient urban organisation. To compensate, the emphasis would be placed on proper planning of communities and the supply of public facilities and utilities. Even so, the total built-up area will roughly double because of a continuing trend toward lower densities.

Requirements for industrial complexes have been determined assuming that 50 per cent of the new jobs would be provided within these complexes, the remainder being dispersed in mixed residential and business districts (small crafts). Emphasis is clearly placed upon new communities which would supply 60 per cent of all new industrial space and only 40 per cent of the population increment

The Master Plan

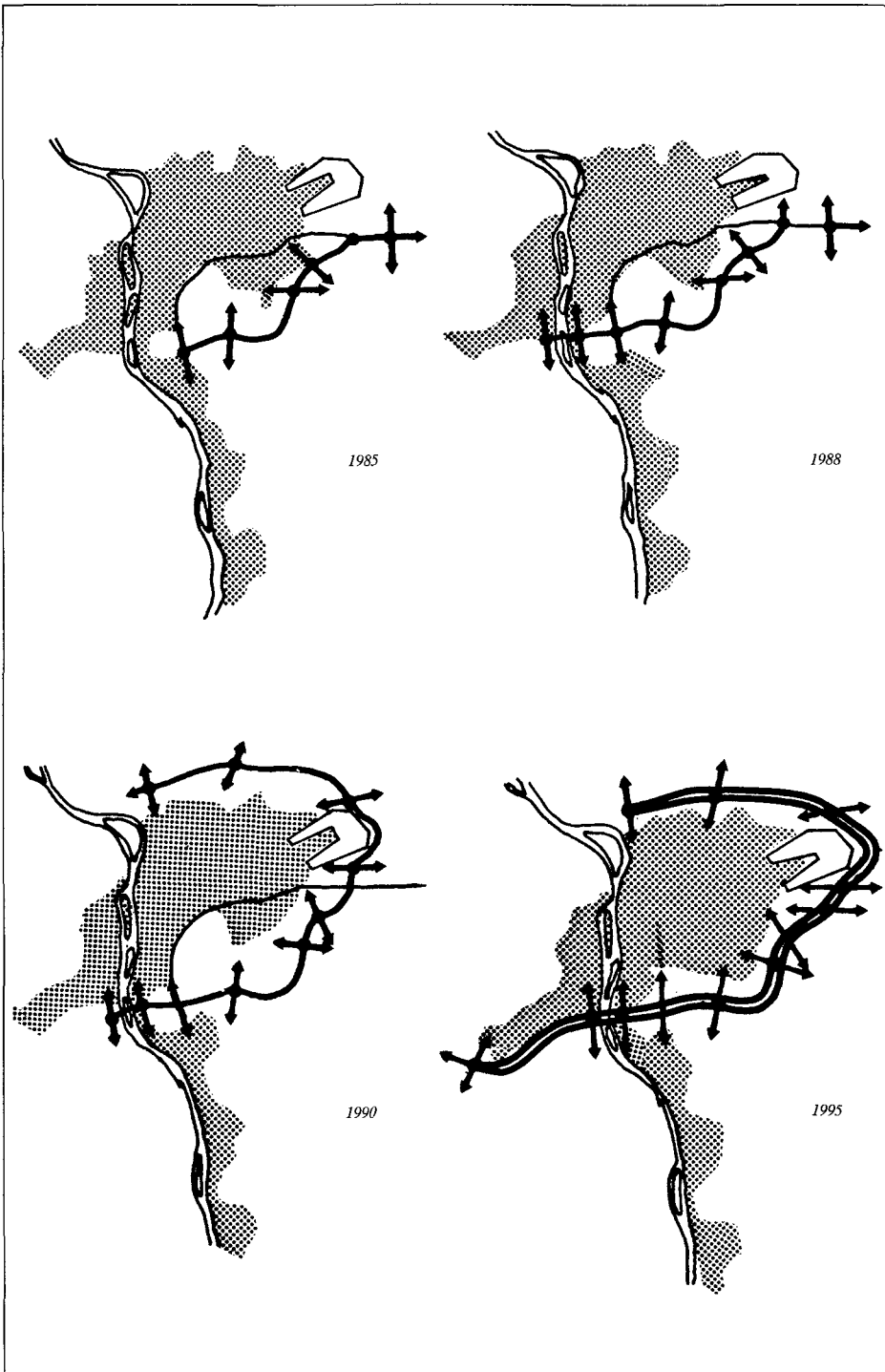
The development concepts described above have been integrated into the Master Plan scheme under several options calling for deconcentration and articulation, protection of the living environment, and efficiency through staged decentralisation. These options are summarised in J.E. Cornu's contribution in this volume.

The Master Plan implies important changes in the growth rates of population in the four main directions of development. As a result of the commitment to reduce growth on agricultural land, the proposed population distribution is against any further expansion in the north and west of the agglomeration, but is in favour of the regions east and south of the agglomeration.

Transportation

Action taken on the transport system will aim at two goals:

- 1) To support the deconcentration of the agglomeration towards external new communities, which mainly concerns the regional road network;



Implementation of Ring Road.

Source: Greater Cairo Master Scheme GOPP/OTUI-IAURIF

2) To improve the functioning of the existing agglomeration; four types of coordinated action are required:

- reduce transport demand by restructuring the agglomeration;
- increase the capacity and attractiveness of public transport (particularly the light rail system);
- redistribute traffic flows through a hierarchical development of the road network; and
- establish private traffic restraints in the Cairo C.B.D.

Master Plan Implementation

Given the need to concentrate and optimise the use of public resources, implementation of the Master Plan will rely on the execution of certain key projects to bring about a change in present trends. Key projects have been identified concerning

- transportation, including the ring road;
- implementation of the Master Plan for water supply;
- housing and new settlement;
- arable land; and
- service centres at appropriate intervals.