

WORKING PAPER  
ON  
FIRST ROUND ALTERNATIVES  
FOR  
**THE NATIONAL URBAN POLICY STUDY**

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VOLUME II  
CHAPTER V : CAIRO CONCEPT PLAN

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CHAPTER V

FIRST ROUND ALTERNATIVES RELATED TO CAIRO

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## CHAPTER V

### FIRST ROUND ALTERNATIVES RELATED TO CAIRO

#### I. Introduction :

Cairo and Alexandria are certain to have major roles in future Egyptian urbanization regardless of the ultimate choice of a "Preferred Strategy" for the National Urban Policy. Table V.1 presents the six alternatives discussed in the early chapters as they pertain to Cairo and Alexandria.

The 1976 population of the Cairo Zone (as established in the Interim Action Report) 1/ was 6.8 million persons. The estimated 1990 populations based on the First Round Alternatives range from a low of 11 million (Alternative C) to a high of 11.46 million (Alternative A). The total net increase being between 4.2 million and 4.66 million. By the year 2000 this difference in total population widens to between 15 million and 16.4 million. The four other Alternatives considered result in population estimates quite close to Alternative C.

The population estimates for Alexandria show a more diverse pattern because the range of the alternatives impacts the city development patterns more widely. The difference is .36 million by 1990 growing to a difference of 1.4 million by the year 2000. While the total net difference is similar to Cairo the percentage difference is much greater because of the smaller population base in 1976.

The important point is that regardless of the alternative selected Cairo and Alexandria are going to experience high levels of total population growth during the period to the year 2000. The fundamental decision for Government, therefore, is not whether growth should occur -- because it will -- but how this growth should be planned, managed, and controlled. The appropriate response should be the development of a plan which implements the concept of "Intra-Regional Deconcentration."

Intra-Regional Deconcentration was described in the Interim Action Report as having the following characteristics. It is concerned with overcoming the diseconomies of urban form not urban scale. This means changing the present "radial-concentric" form of the city to a "polynucleated" system of satellite new towns and neighborhoods. The purpose is to relieve congestion in the core area and to rationalize the pattern of peripheral development. In fact the satellite cities around Cairo (15th of May, 6th of October, El Obur, and 10th of Ramadan) and Alexandria (New Ameriya) already recognize this concept of Intra-Regional Deconcentration.

TABLE V.1

CAIRO AND ALEXANDRIA POPULATION AND INVESTMENT URBAN NUPS FIRST ROUND ALTERNATIVES

ALTERNATIVE	1990 Estimate Population 000	1986 - 90 Industrial Investment L.E. 000's	1986 - 90 Infrastructure Investment	1986 - 90 Per Capita Total Investment	Percent Rate of Population Growth	Percent Total Industrial Investment	Tentative Year 2000 Population
<b>CAIRO</b>							
Alter A	11457	4644	4545	802	3.81	55.1	16433
Alter B1 Efficiency	11066	3583	3608	649	3.09	40.3	15026
B2 Equity	11066	3583	3608	649	3.09	39.7	15026
Alter B2 Efficiency	11115	3713	3970	691	3.18	40.7	15200
B2 Equity	11115	3713	3970	691	3.18	40.2	15200
Alter C	11029	3486	6748	928	3.02	36.6	15070
<b>ALEXANDRIA</b>							
Alter A	3809	1767	3090	1275	4.60	21.0	5812
Alter B1 Efficiency	3867	1231	2781	1218	4.91	21.7	5252
B2 Equity	3637	1308	2194	963	3.64	14.5	4649
Alter B2 Efficiency	3440	825	1755	750	2.49	9.0	4399
B2 Equity	3440	825	1755	750	2.49	8.9	4399
Alter C	3440	825	2826	1061	2.49	8.7	4478

Unfortunately, other plans and policies currently being implemented are having the directly opposite effect of the new towns policy by reinforcing the "radial-concentric" patterns of Cairo and to some extent Alexandria. These issues are discussed in this chapter as they relate to Cairo. A full working paper will be prepared for both Cairo and Alexandria to ultimately contribute to the NUPS Final Report on the Preferred Strategy. Just the highlights related to the First Round Alternatives are presented here.

As government seeks to rationalize the growth of Cairo it will have available three fundamental instruments:

- i. Public investment in job creation through industrial development.
- ii. Public investment in infrastructure upgrading and extension.
- iii. Public controls through legislation and administration over what private investors and the public may do.

In using these instruments government must be concerned with the fundamental choice facing all great cities of the world between satisfying the demands of the existing population in place (and therefore reinforcing the very trends it wishes to change) versus investing in new growth directions (and therefore failing at least in part to satisfy the demands of the existing population). The balance ultimately to be struck needs much further study than is possible in NUPS, but a first cut at an appropriate concept plan can be developed.

Fundamentally, the government should seek to implement a series of positive and negative actions to obtain control of the growth of Cairo.

The negative actions include:

- i. limiting further commercial and industrial growth in the center of the city;
- ii. restricting further growth on arable land.

The positive actions include:

- i. recognizing and harnessing the potential contribution of the informal sector in housing through provision of adequately serviced sites in appropriate locations on non-arable land;
- ii. reorientation of growth from the predominate north/south axis to a northeast/southwest axis;
- iii. accelerating a modified new communities program;

- iv. providing priority investment in the road transportation system to open up appropriate areas for development outside the built up area; and
- v. establishing effective planning and urban management systems which relate to the scale and form of the future city.

These steps will require a total concentration of "political will" to achieve the desired results; less will inevitably lead to the further deterioration of the city and extensive social and economic diseconomies.

## II. Cairo Population and Density

Natural growth of the Cairo population between 1971-1977 has accounted for twice as much of the increase as migration. Even if migration totally stopped to Cairo, the year 2000 population would be 12.8 million through natural increase alone. The Cairo Governorate population in 1976 was 5.1 million, the city of Giza 1.2 million and Shoubra El Kheima .4 million.

Within Cairo Governorate the population densities and rates of growth vary significantly according to kism. Table V.2 lists the population in 1960 and 1976 and presents their corresponding change. In general, the central kisms actually declined in population while the peripheral kisms stabilized, and large increases occurred to the extreme north, northeast and south. Much of this growth took place on arable land.

The kisms with the highest densities are generally those in the older central areas while the least dense are either established upper income neighborhoods or outlying new areas starting the process of urbanization. In Table V.3 the kisms have been grouped according to density pattern. In addition, to illustrate the pattern of 1976 Metropolitan densities, they have been presented in isometric form in Figure V.1

TABLE V.2

## POPULATION INCREASE 1960 CENSUS TO 1976 CENSUS ( BY KISM)

(POPULATION IN THOUSANDS)

KISM	1960 CENSUS	1976 CENSUS	DIFFERENCE	PERCENT CHANGE
El Ahram	12	30	118	938
Dokki, Agouza, Boulak El Dakroul <sup>a</sup>	105	571	466	444
Tebbin	7	34	27	386
Shoubra El Kheima <sup>b</sup>	101	394	293	290
Mataria	161	535	374	232
Maadi	83	267	184	222
Helwan	94	283	189	201
Zeitoun	100	268	167	167
Sharabia <sup>c</sup>	171	444	273	160
Imbaba	136	323	187	138
Kobba Gardens	144	315	171	119
Nouzha	48	102	54	113
Heliopolis	77	127	50	65
Mouski	36	58	22	61
Sahel	304	439	135	44
Giza	145	209	64	44
Misr El Kadima	212	274	62	29
El Gamalia	142	167	25	18
El Khalifa	162	189	27	17
El Zaher	100	104	4	4
Shoubra	125	129	4	3
Rod El Farag	265	272	7	3
Sayeda Zeinab	254	252	-2	-(0.8)
Darb El Ahmar	149	146	-3	-(2.0)
Abdeen	95	88	-7	-(7.4)
Kasr El Nil	43	39	-4	-(9.3)
Ezbekia	64	60	-4	-(6.3)
Boulak	202	178	-24	-(11.9)
Wayli	163	142	-21	-(12.9)
Bab El Shaaria	153	110	-43	-(28.1)
Nasr City	d	65	-	--

a Three 1976 kisms were basically one in 1960.

b Includes the area that in 1976 was the city of Shoubra El Kheima.

c Change in kism borders has occurred. This includes Nozha, Wayli, Kobba Gardens, Shoubra and Sharabia. The increase in Sharabia is not a true reflection of population growth, as it received a large increase through alteration of its borders with Wayli.

d Nasr City did not exist in 1960.

SOURCE: Greater Cairo Waterworks Master Plan

GREATER CAIRO POPULATION DENSITY BY KISM 2000 \*  
 NATIONAL URBAN POLICY STUDY

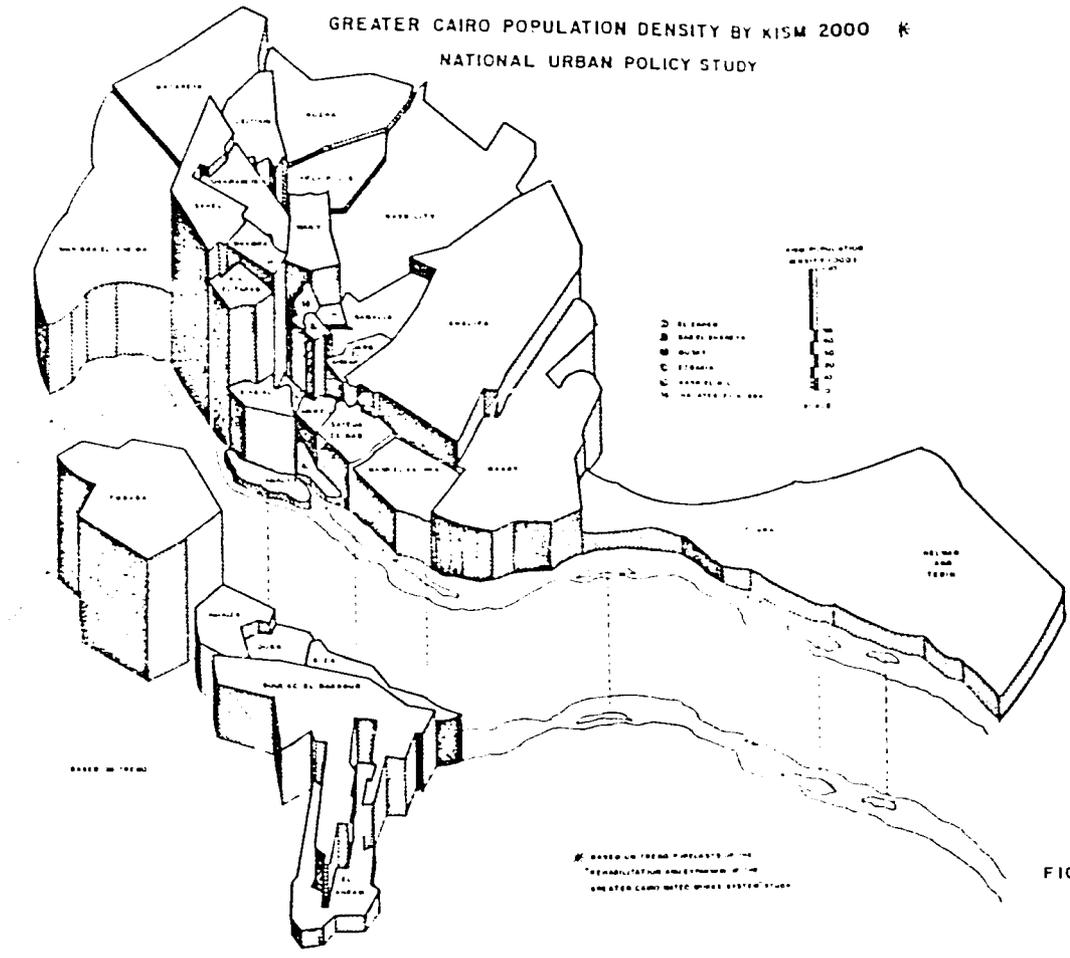


FIGURE 5.4

TABLE V.3

GREATER CAIRO KISM DENSITIES (1976)

<u>DENSITY (PERSONS/KM2)</u>	<u>KISMS</u>
72,100 to 100,225	Sayeda Zeinab, Mouski, Bab El Shaaria, Rod El Farag, Shoubra
49,405 to 65,900	Darb El Ahmar, Zeitoun, Sahel, Zaher, Boulak, Abdin, Tebbin-Helwan.
18,970 to 38,280	Ezbekia, Khalifa, Wayli, El Kobba Gardens, Gamalia, Misr El Kadima, Imbaba, Boulak El Dakrour, Giza, Agouza
4,525 to 13,725	Maadi, Kasr El Nil, Nasr City, Heliopolis, Shoubra El Kheima, Mataria, Dokki, Ahram.

In order to gain better understanding of population "pressure" corridors within Greater Cairo, a directional population growth diagram was prepared and illustrated in Figure V.2. The diagram simply sums up census year populations of each kism from 1937 to 1976 according to the appropriate directional axis using the kisms of Ezbekia, Mouski and Bab El Shaaria as the centroid. Because of the nature of past urban growth, most kisms fall along the northeastern, northern, and southern axis. Only one kism, Nasr City, is on the eastern axis because the bulk of intervening kisms lie principally to the northeast or southeast. The diagram does not make a distinction between growth on arable land and non-arable land, however, in general, all growth with the exception of the east and southeast is on arable land while that to the northeast is mixed.

On the basis of Figure V.2, it is noteworthy that the three principal axes of past growth lie in the north, northeast and south. The northeast and south have been increasing more rapidly with respect to the other axes since 1937, while the north showed the greatest relative increase during the period 1947-1960. Relatively, the west has registered much more growth, particularly in the northwest, than the east and southeast. Most of the growth in the southwest, furthermore, has occurred since 1960. The low rate of growth in the southeast and east may be attributed to the location of the El Khalifa Cemeteries, the Mokattam Hills and the undeveloped desert areas of Nasr City which had previously been occupied by the military. This area is presently undergoing rapid development which is confirmed by Landsat photographs during the period 1972-78. It is clear from the diagram, that had large absorption areas in the east been opened up for development earlier on much of the growth to the northeast and west might have been reduced.

GREATER CAIRO DIRECTIONAL POPULATION GROWTH TRENDS  
 (1937 - 1970 BY KISM)  
 NATIONAL URBAN POLICY STUDY

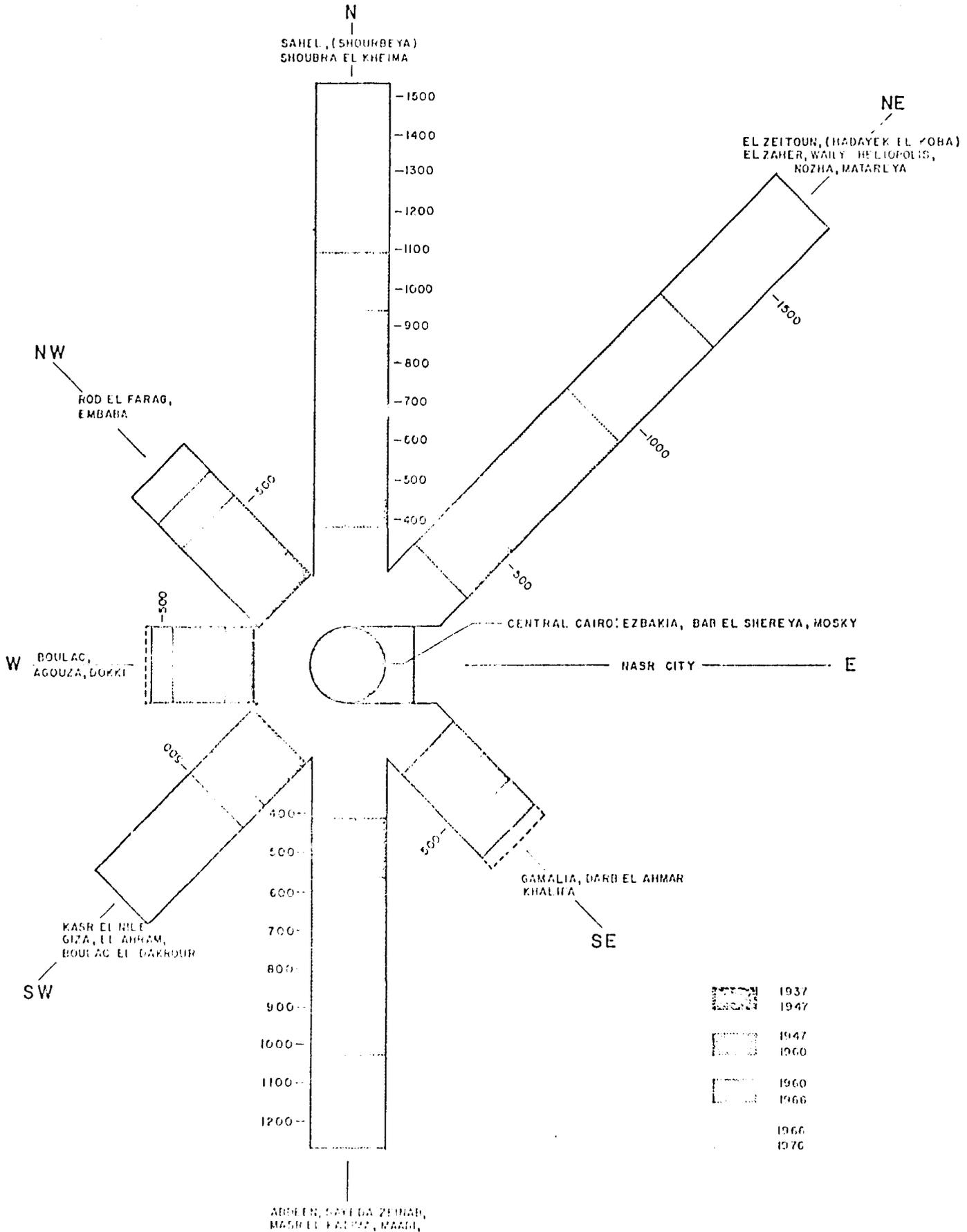


TABLE V.4  
 VARIOUS GREATER CAIRO POPULATION FORECASTS  
 (POPULATION IN THOUSANDS)

AREA	1976 CAPMAS ESTIMATE	1980			1985			1990			2000			% 1976-2000
		A	B	C	A	B	C	A	B	C	A	B	C	
<u>CENTRAL CAIRO</u>														
EZBAKIA	60	59	59	59	55	55	55	54	54	54	51	51	51	15
SAYEDA ZEINAB	252	245	245	245	200	200	200	180	180	180	180	140	140	44
ZAHER	104	103	103	103	100	100	100	98	98	98	95	95	95	86
MOUSKY	58	56	56	56	54	54	54	51	51	51	46	46	46	21
BAB EL SHAREYA	110	105	105	105	100	100	100	97	97	97	90	90	90	10
BOULAC	178	170	170	170	155	155	155	141	141	141	115	115	115	35
SHOUBRA	129	126	126	126	124	124	124	116	116	116	102	102	102	21
ABDEEN	88	85	85	85	75	75	75	68	68	68	55	55	55	38
KASR EL NIL	39	38	38	38	36	36	36	35	35	35	32	32	32	18
WEST SUB TOTAL	1018	987	987	987	899	899	899	840	840	840	726	726	726	30
GAMALIA	167	170	170	170	175	175	175	185	185	185	200	200	200	20
DARB EL AHMAR	146	148	148	148	149	149	149	150	150	150	151	151	151	3
WAILY	142	149	149	149	155	155	155	165	165	165	183	183	183	29
EAST SUB TOTAL	455	467	467	467	479	479	479	500	500	500	534	534	534	17
TOTAL CENTRAL	1473	1454	1454	1454	1378	1378	1378	1340	1340	1340	1260	1260	1260	14
KHALIFA	187	220	220	220	275	275	275	342	345	350	542	470	500	167
MAADI	267	263	314	314	321	370	470	394	430	530	580	570	470	263
MASR EL KADIMA	274	285	285	285	300	300	300	316	318	317	360	350	355	30
TOTAL SOUTH	728	768	819	819	896	945	995	1060	1090	1192	1482	1390	1875	151
<u>NORTHEAST CAIRO</u>														
HELIOPLIS	127	140	140	140	150	150	150	170	170	170	210	210	210	65
NASR CITY	65	100	100	100	170	170	170	305	295	310	920	670	725	1015
NOZAH	102	120	120	120	150	150	150	189	175	182	294	262	778	173
TOTAL NORTHEAST	294	360	360	360	470	470	470	664	640	662	1424	1142	1213	313
<u>NORTH</u>														
ZEITOUN	268	330	320	320	420	400	400	552	515	515	943	760	760	184
SAHEL	439	520	514	517	660	630	645	845	755	800	1180	1030	105	152
MATAREYA	535	670	670	670	910	860	910	1200	998	1200	1594	1304	1449	171
HADAYEF EL KOBBA	315	336	337	336	365	367	366	396	394	395	545	460	503	60
ROD EL FARAG	272	275	275	275	277	277	277	280	277	278	285	285	705	5
SHOURABEYA	444	485	475	480	590	530	560	665	591	628	855	730	793	79
TOTAL NORTH	2273	2616	2591	2598	3772	3664	3158	5338	3530	3816	5402	4569	4395	115
CAIRO SUB-TOTAL	4768	5198	5224		5966	5857		7002	6600		9568	8361		

- A. GREATER CAIRO WASTEWATER MASTER PLAN ESTIMATE  
 B. GREATER CAIRO WATERWORKS MASTER PLAN ESTIMATE  
 C. REHABILITATION AND EXPANSION OF THE GREATER CAIRO WASTEWATER SYSTEM ESTIMATE

TABLE V.4  
VARIOUS GREATER CAIRO POPULATION FORECASTS  
(POPULATION IN THOUSAND)

AREA	1976 CAPMAS ESTIMATE	1980			1985			1990			2000			% 1976-2000
		A	B	C	A	B	C	A	B	C	A	B	C	
<u>HELWAN</u>														
HELWAN AND TAJRA	283	)	441	441	)	683	683	)	783	783	)	1025	1025	262
TEBBIN	33	)	44	44	)	67	67	)	77	77	)	100	100	203
TOTAL HELWAN	<u>316</u>	<u>542</u>	<u>485</u>	<u>485</u>	<u>804</u>	<u>750</u>	<u>750</u>	<u>946</u>	<u>860</u>	<u>860</u>	<u>1125</u>	<u>1125</u>	<u>1125</u>	<u>256</u>
CAIRO TOTAL	<u>5084</u>	<u>5740</u>	<u>5709</u>	<u>5716</u>	<u>6770</u>	<u>6607</u>	<u>6751</u>	<u>7948</u>	<u>7460</u>	<u>7890</u>	<u>10693</u>	<u>9486</u>	<u>10318</u>	103
<u>GIZA</u>														
GIZA	209	220	220	220	235	245	740	255	255	255	295	295	295	41
DOKKI	102	110	110	110	120	120	120	135	129	132	158	158	158	55
AGOUZA	147	160	175	175	190	220	190	210	250	210	230	330	235	60
EL AHRAM	130	140	157	157	160	200	200	190	247	247	300	360	360	177
EMBABA	336	422	384	392	504	475	477	608	581	564	920	840	752	174
BOUJAC EL DAKROUR	322	370	390	380	420	490	455	495	608	495	830	890	330	158
TOTAL GIZA	<u>1246</u>	<u>1422</u>	<u>1436</u>	<u>1432</u>	<u>1629</u>	<u>1750</u>	<u>1682</u>	<u>1893</u>	<u>2070</u>	<u>1903</u>	<u>2733</u>	<u>2800</u>	<u>2630</u>	<u>111</u>
<u>SHOUBRA EL KHEIMA</u>	394	475	481	506	580	626	626	762	810	810	1424	1370	1397	255
<u>EL ABOURE</u>	---	---	---	---	50	50	---	75	75	---	150	150	150	-
TOTAL URBAN	<u>6724</u>	<u>7637</u>	<u>7626</u>	<u>7686</u>	<u>9029</u>	<u>9033</u>	<u>9109</u>	<u>10678</u>	<u>10415</u>	<u>10658</u>	<u>15000</u>	<u>13879</u>	<u>14495</u>	<u>116</u>
TOTAL RURAL	<u>1276</u>	<u>1313</u>	<u>1421</u>	<u>1388</u>	<u>1471</u>	<u>1532</u>	<u>1528</u>	<u>1632</u>	<u>1700</u>	<u>1679</u>	<u>2000</u>	<u>2030</u>	<u>1974</u>	55
<u>TOTAL GREATER CAIRO</u>	<u>8000</u>	<u>8950</u>	<u>9047</u>	<u>9074</u>	<u>10500</u>	<u>10565</u>	<u>10637</u>	<u>12310</u>	<u>12115</u>	<u>12337</u>	<u>17000</u>	<u>15959</u>	<u>16469</u>	<u>106</u>

1/ CAPMAS estimate.

2/ Typographical error indicated 385,000. Corrected estimate should read 285,000.

3/ Including urban area of Embaba Markaz.



GREATER CAIRO POPULATION DENSITY BY KISM 1976  
 NATIONAL URBAN POLICY STUDY

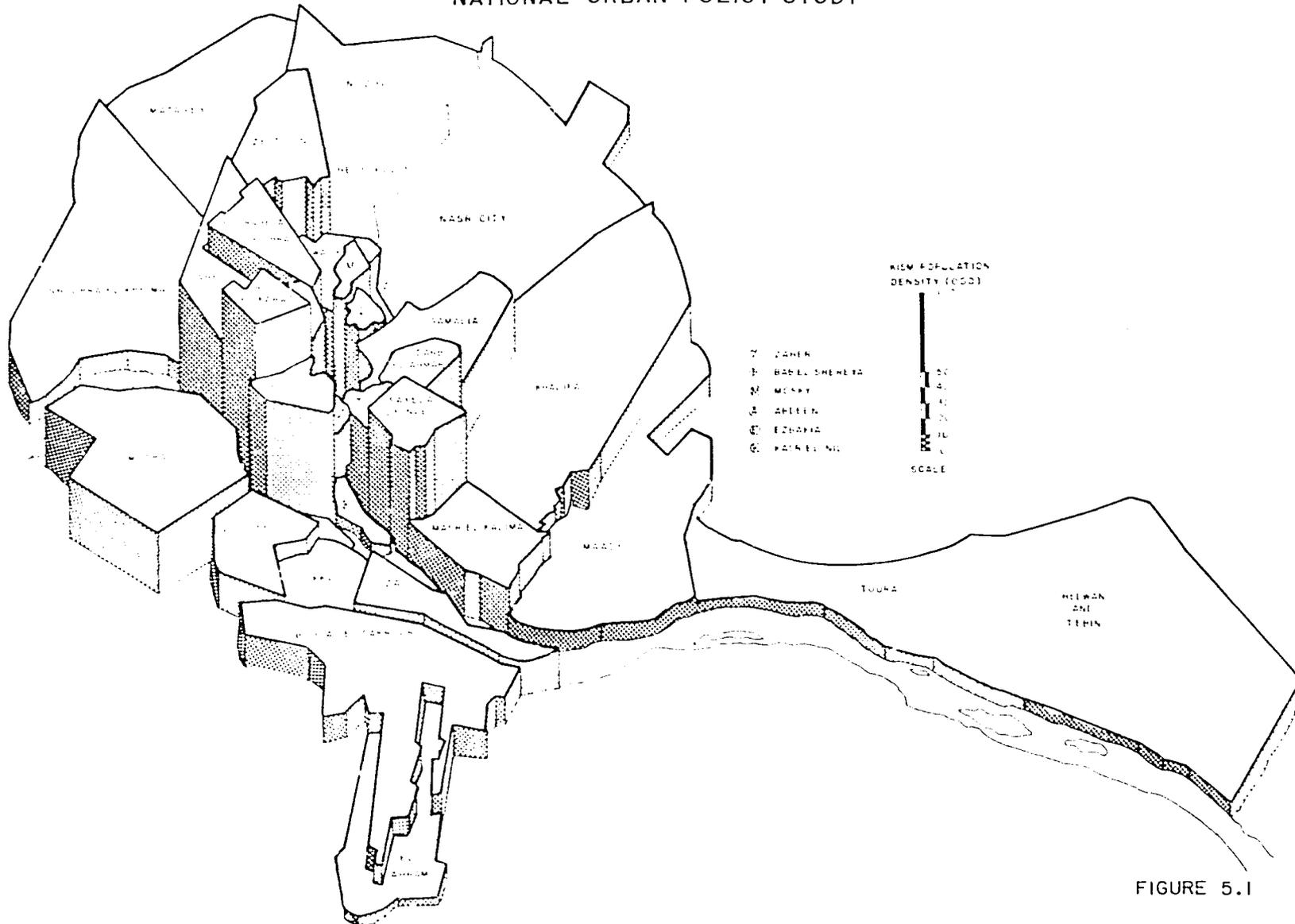


FIGURE 5.1

### III. Future Trend Directions of Population Growth

Figure V.3 is based upon population growth forecasts, by kism, based on current trends. It is evident from the diagram that the urban population growth expected by the year 2000, is more than all the growth, up to 1976. Furthermore, the northern, northeastern, and southern axes are expected to remain the most dominant axes while the eastern and southwestern axes gain in importance. Growth to the west is expected to be minimal, but in the northwest, the population is expected to double. Particularly alarming is the fact that growth to the north (in only three kisms) is expected to equal the combined growth in the northeast (seven kisms) and exceed that to the south (six kisms). Furthermore, when the four populous kisms of the northeast are combined with those to the north, northwest, west, southwest and south, it is obvious that a great majority of the growth will occur on arable land if current trends persist.

The trend population forecasts undertaken by the "Wastewater" and "Waterworks" studies were made on a kism by kism basis taking into account past trends, absorption capacity or likely maximum densities, the preliminary master plan constraints and the likely impact of proposed transportation, housing and industrial schemes.

Each of the studies attempted to confine the urban growth to the year 2000 within the proposed ring road as the preliminary master plan recommended. Irrespective of the study, however, some spill over was planned since by 1976 the ring road boundary had already been breached in some areas.

Population projections by the studies for the year 2000 in Greater Cairo varied from 16 to 17 million. In each case, the growth was "planned" in fringe areas or through densification. It should be noted that these population forecasts exceed what the preliminary master plan called for.

Population forecasts by kism for the "landmark" years of 1980, 1985, 1990 and 2000 for the Wastewater Master Plan, "Waterworks Master Plan, and "Wastewater Rehabilitation and Expansion" study are shown in Table V.4. Except in a few cases they do not vary by more than 10 percent. The latest of the studies, "Rehabilitation and Expansion of the Cairo Wastewater System" conducted a thorough analysis of the other forecasts based on current data. The impact of these forecasts on density in the year 2000 is illustrated in Figure V.4

### IV. Land Use

Study of land use of the Cairo Planning Zone is fundamentally a function of transportation and urban growth corridors in their

relation to the current built up areas and proposed and on-going New Towns and Satellite Cities. Each of these corridors has different characteristics which require further study. (Table V.5):

TABLE V.5

CAIRO ENTRANCEWAYS AND NEW TOWN LOCATIONS

ROAD	NEW TOWN OR SATELLITE CITY	DISTANCE TO TAHRIR SQUARE
- North: El Menoufia Road Alexandria Agricultural Road		
- North east: Ismailia Agricultural Road El Mary Road Belbeis Desert Road	El Obour	35 km
- East: Ismailia Desert Road Suez Desert Road	10th Ramadan	50 km
- South east: Ein El Sukhna Road Helwan - Red Sea Road	El Amal	55 km
- South: Upper Egypt Road Sakkara Road El Fayoum Desert Road El Corniche Road	6th of October	32 km
- North- east: Agricultural Road (Alex) Warrak Road Barrage Road	Sadat City	90 km

7  
Land use into the north of Cairo proper is predominantly agricultural with scattered villages and towns. However, along the major transportation corridors and outskirts of Cairo there are numerous factories, warehouses, and substantial informal residential development. Urbanization along the Alexandria Agricultural corridor is particularly acute.

In the northeast, along the Ismailia agricultural road and canal and along the El Marj road the same pattern of development occurs, whole villages have been incorporated into Cairo and further urbanization is likely there. The settlements of El Marj, Qalag, El Khanka and Abu Zaabal are likely to form one contiguous urban corridor.

In the northeast desert area, beyond the Delta fringe, a substantial industrial area has developed mostly upon reclaimed desert land; a mix of military and private factories has occurred there in a haphazard fashion. The northeast is also the site of airports at Almaza, Cairo International Airport, Inshaas and Belbeis as well as the proposed El Obour satellite city. Large land reclamation projects for agricultural purposes are planned or underway along the Delta fringe, in the vicinity of Belbeis and between Belbeis and th 10th of Ramadan. The northeast desert is traversed to Belbeis by the Belbeis desert road which serves large military installations along this corridor.

Beyond the Cairo fringe development in the vicinity of Nouzha, a large land reclamation project is situated to the north of the Ismailia desert road beyond the El Khanka dunes. A second smaller land reclamation project is also found between the Ismailia and Suez roads in the same general vicinity. Also along the Suez road several large military installations are located. This corridor is defined by the eastern plateau to the south.

The El Amal new town is situated along the El Sukhna road from Maadi to the southeast. Activities in this corridor are restricted to military installations and training camps, a few stone crushing plants and sand quarries, a proposed cement factory and the national observatory. Residential development is limited to the Maadi fringe.

To the South, along the Corniche road, development is characterized by a concentration of industry in the Helwan area and residential infill between it and Maadi. In proximity to Helwan on the Nile Valley/desert fringe is situated the 15th of May satellite city, the Helwan New Community project and the proposed site of the 2nd Residential City.

Also in the south, but on the Western Bank, the area is largely agricultural with scattered but expanding rural settlements particularly, across the river from Helwan and along the Upper Egypt road and Sakkara road. From the Pyramids area to Dahshur this

whole area is an important archeological site. Beyond Dahshur are located several defense installations.

The dominant features of land use in the west include agricultural land and rural settlement which is penetrated by the Giza-Pyramids urban corridor, the expansion of the Boulak El Dakroul-Imbaba urban fringe into arable lands, corridor development including warehouses and factories along the Fayoum and Alexandria desert roads, the 6th of October satellite city, and the military airport and installations. Development along the Warrak road has been primarily restricted to the expansion of Imbaba. Sadat City is located 90 km from Cairo, along the Alexandria road beyond the Cairo zone.

The Pyramids district is a particularly strong catalyst for touristic and residential land uses. Several major residential and tourism proposals have been proposed in this vicinity.

Along most of the entrance ways or transportation corridors to Cairo, land associations and cooperatives as well as private individuals are vigorously acquiring land. This is true in the Delta as well as the desert areas. Much of this appears to be due to speculation, but it implies a strong tendency for future corridor development in these areas.

#### V. Agriculture and the Preservation of Arable Land

The preservation of agricultural land is a fundamental objective of government and a well established policy. Yet, on the doorstep to government, loss of arable land to urbanization is relatively unchecked. This is particularly alarming since the soil lost is some of the most fertile in all of Egypt. According to the Ministry of Agriculture's soil classification data, 69.7% of the soil within the region falls into categories I and II, and 99.5% in categories I, II and III. No other zone in the entire country has such high ranking of soil quality and productivity.

The landsat images of the growth of the Cairo Governorate between 1972 and 1978 are presented in Figures V.5 a and V.5 b. The directions of growth are evident. The Interim Action Report presented the data on the urbanization on arable land in Qalyubia Governorate. Data is now available on the principle cities of the Governorate as shown below along with the data on the Cairo Governorate.

It is clear from the data that urbanization is proceeding rapidly and that 900 hectares of arable land have been lost during the five year period directly due to the growth of Cairo, not including Giza area for which landsat data is not yet available.

Unfortunately, urban sprawl is only one of the factors contributing to the loss of arable land: other factors (or causes)

include the loss of top soil for brick making; fragmentation of land holdings due to inheritance practices; and soil salinity.

The use of top soil for brick making is very profitable and consequently difficult to stop. At current prices bricks can be sold at L.E. 50 per thousand. Top soil for making the bricks is sold at between L.E. 20,000 to 30,000 per feddan after which the land can still be sold for L.E. 10,000 to 20,000 per feddan. On the other hand, the annual return per feddan in agricultural usage is only about L.E. 200-400. Under the least profitable terms, profits for the sale of top soil and land is equivalent to the return of 75 years of labor to farm the land. Few farmers on the urban periphery would not acquiesce to this temptation to sell.

Land holdings in Greater Cairo range between 1 and 70 feddans most of which are less than 10 feddans. When they are inherited, the heirs often put the land up for sale in order to simplify partition of the land values. For those with no interest in farming, the land's yield rental value is only equivalent to about L.E. 35 per feddan. On the other hand, in Shoubra El Kheima a feddan of land may be sold for between L.E. 42,000 and L.E. 63,500. Loss of arable land would probably be much greater if not for the fact that it is impossible to evict tenant farmers.

The great disparity in possible income from land used for agricultural or urban uses renders the efforts to preserve the land much more difficult in spite of existing legal instruments. The loss of arable land due to urban expansion, brick making, and fragmentation due to inheritance laws are primarily related to increased demand for housing. The fact, however, that most of the increase in housing supply occurs on arable land, implies that urban growth is out of control and/or no real alternative sites are being provided.

Adequate enforcement of the laws regarding the preservation of arable land is probably impossible unless suitable alternative sites on non-arable land are made available for housing. This would do much to relieve the pressure on arable fringe areas and assist in the reduction of exorbitant land prices.

A recent study conducted jointly by the GOPP and USAID was responsible for identifying vacant land within the Cairo Metropolitan Area which would be suitable for this purpose. Though substantial areas within the area were found to exist, (see Figure V.6) they found that it is much easier for low and middle income households to acquire agricultural land from private owners than desert land which is primarily in public ownership.

Furthermore, as the public and formal sectors have not provided sufficient housing to meet the requirements of these groups a

TABLE V.6

LANDSAT DERIVED LAND USE STATISTICS IN HECTARES

CAIRO GOVERNORATE

Class	1972	1978	Change
Urban	14,929	17,905	+2,976
Water	996	996	--
Agriculture	5,953	5,308	- 645
Bare	33,322	30,991	-2,331
Total	55,199	55,200	

\* Year to year totals may not match due to rounding of numbers.

TABLE V.7

LANDSAT DERIVED LAND USE STATISTICS IN HECTARES

SHOUBRA EL KHAYMA

Class	1972	1978	Change
Urban	845	1,123	+ 278
Water	9	14	+ 5
Agriculture	2,556	2,299	- 257
Bare	62	35	- 27
*Total	3,472	3,471	

CAIRO GOVERNORATE URBAN EXPANSION

1972 - 1978

NATIONAL URBAN POLICY STUDY

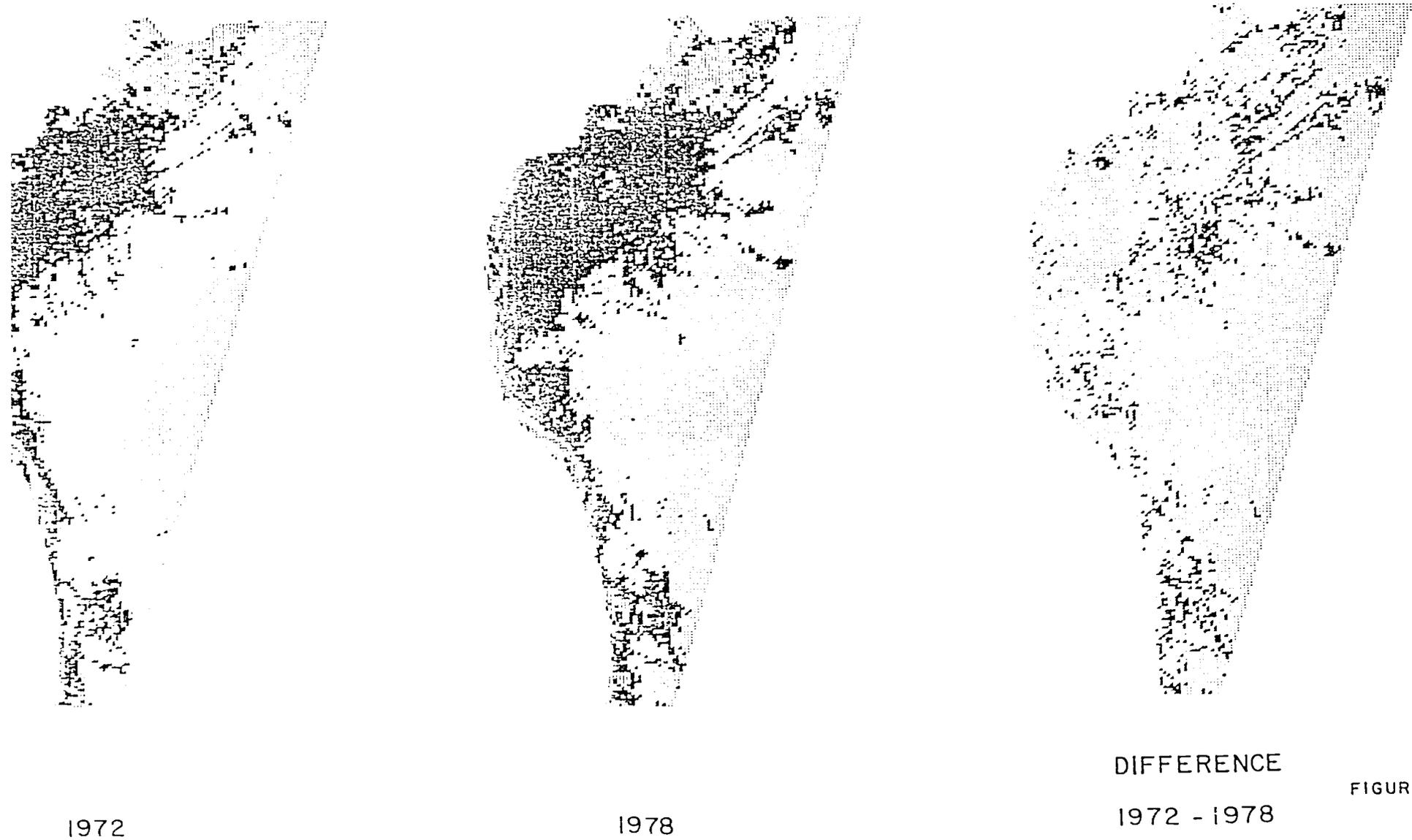
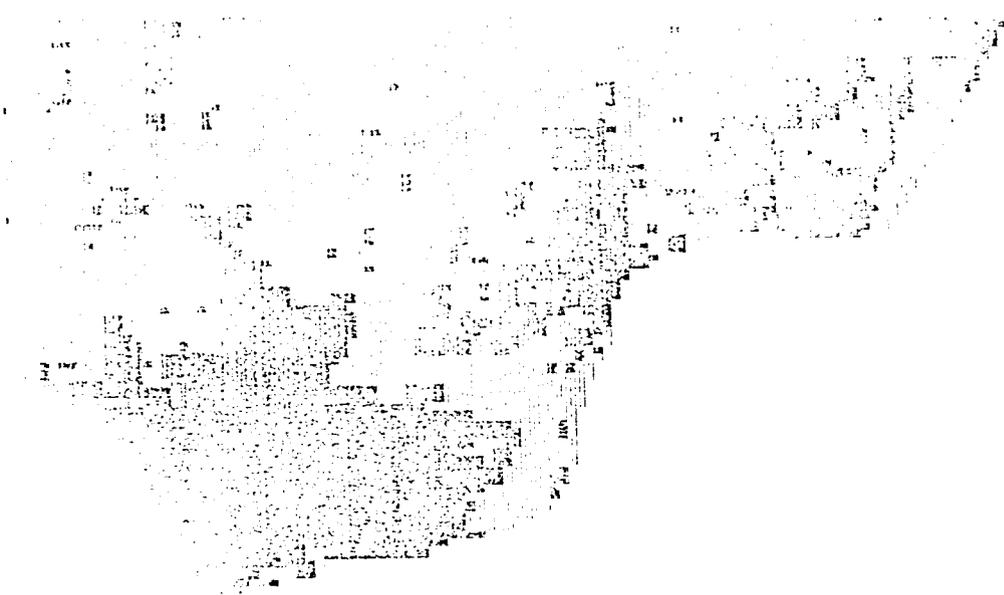


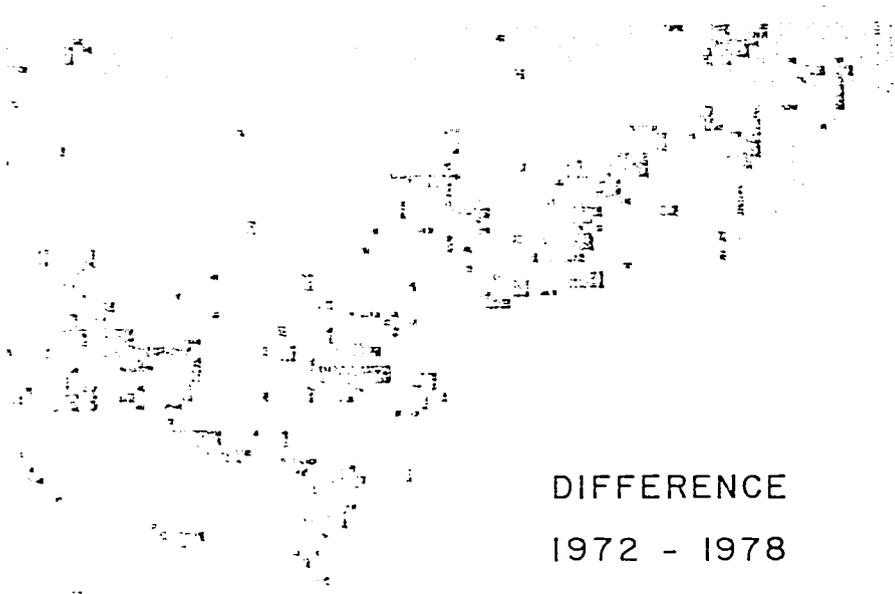
FIGURE 5.5 a



1972



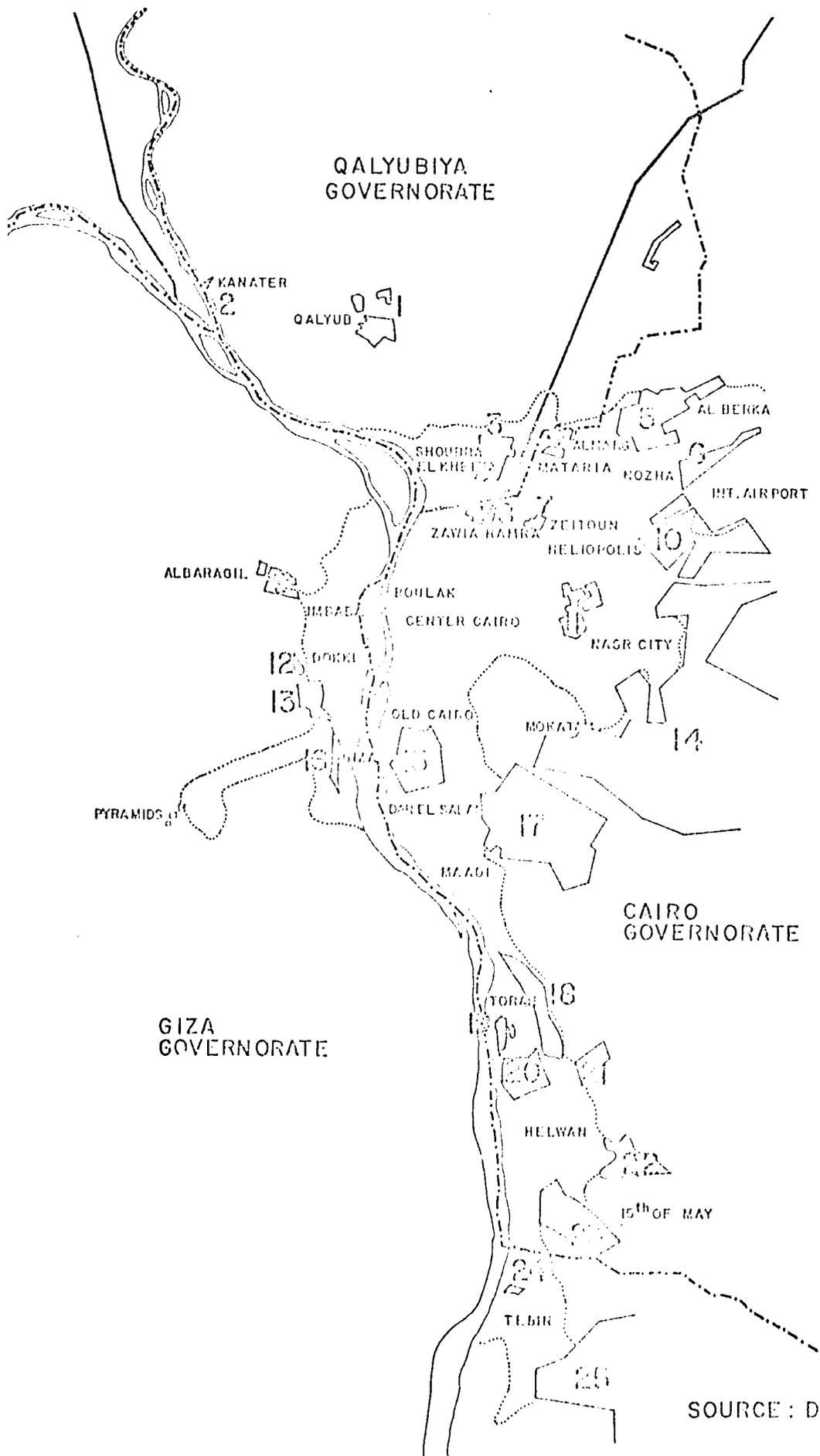
1978



DIFFERENCE  
1972 - 1978

SHOUBRA EL KHEIMA URBAN EXPANSION  
1972 - 1978  
NATIONAL URBAN POLICY STUDY

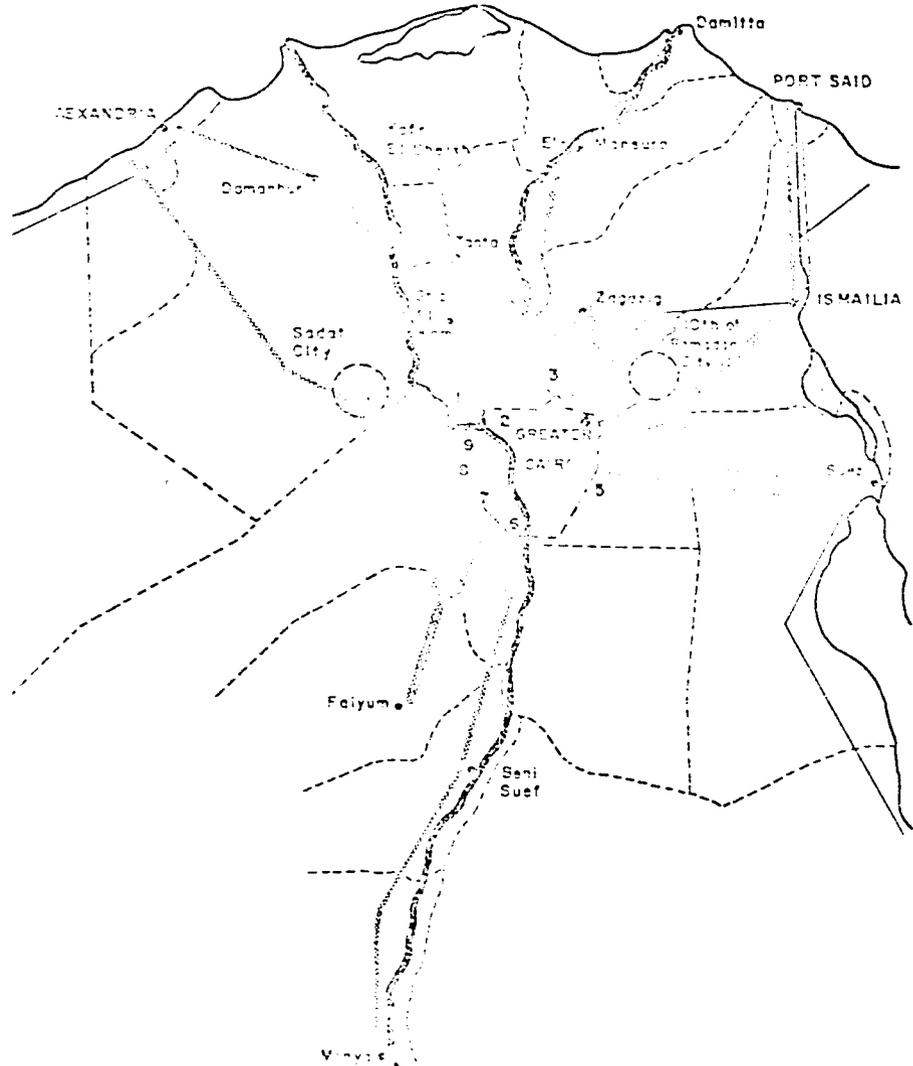
# VACANT NON ARABLE LAND



SOURCE : DAMES and MOORE

FIGURE 5.6

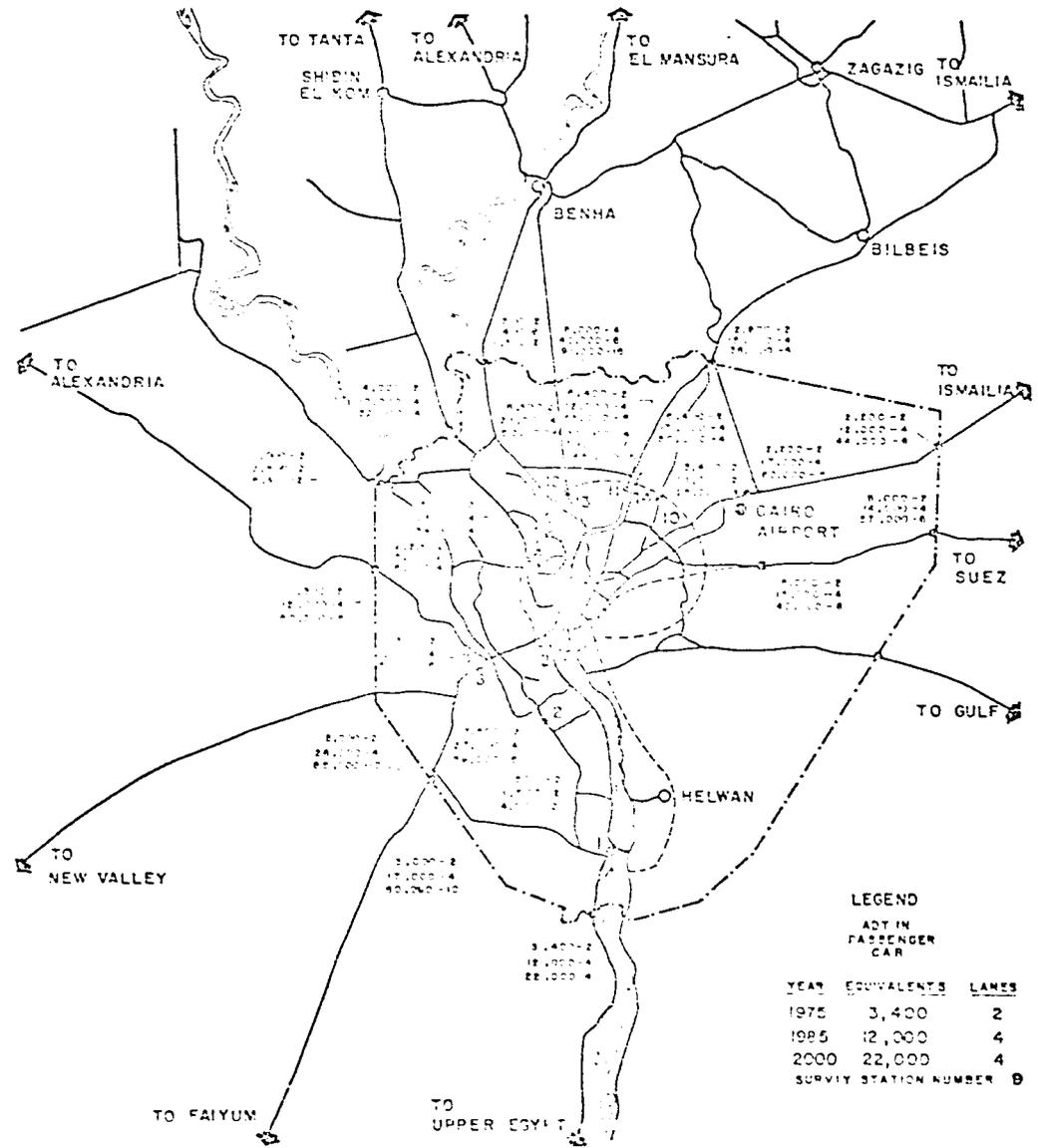
MEDITERRANEAN SEA



PASSENGER CAR TOLL VALUES (ADT)

1	2	3	4	5	6	7	8	9
1000	2000	3000	4000	5000	6000	7000	8000	9000

GREATER CAIRO HIGHWAY TRAFFIC



LEGEND

YEAR	EQUIVALENTS	LANES
1975	3,400	2
1985	12,000	4
2000	22,000	4

SURVIVY STATION NUMBER B

ENTRANCE HIGHWAY VOLUMES

FIGURE 5.7

large informal "illegal" housing sector has evolved. Because of its nature, the informal housing, moreover, is not equipped with public services. Thus, a preference has been established for agricultural areas where water is readily accessible.

Other factors (such as the creation of employment opportunities and transportation) also do much to stimulate urbanization on arable land also. It is evident, therefore, that an integrated approach of better means of enforcement, suitable housing supply in desired areas, improved agricultural gains and selective locations for industry and transportation networks is required in order to maximize arable land preservation.

## VI. Transportation

### A. Regional Networks

Transportation networks within the Greater Cairo Zone and Region will inevitably affect the future distribution of population in the zone and help to determine where future urban growth can be expected to occur and how it might most easily be accommodated. Numerous transportation studies including the Cairo Transportation Study of 1979, the Planning of the Entranceways to Greater Cairo, 1976, etc. have dealt with the technical characteristics of the network and its future requirements.

The location of these highways and their respective 1976 traffic volumes are indicated in Figures V.7. The predominance of both traffic volume and highways in the northern and northeastern sectors of the urban area reflects the strong and vital links which Cairo maintains with Alexandria, the Delta and the Canal cities. These highways have also stimulated urban development along those corridors in rough proportion to the magnitude of the volume of traffic they carry.

A principal planning concern regarding the regional highway network (the same is true for rail traffic) is the necessity for most traffic to traverse the Cairo urban area which results in greater congestion of the urban network.

The intra-regional rail lines all converge into central Cairo at Ramses Station. They include:

- The Alexandria/Port Said/Ismailia lines
- The Upper Egypt "Kom Hamada" line
- The Suez line

From Ramses station to the Sharabia rail yard the Alexandria rail bed carries passengers and freight destined for Alexandria, Port Said and Ismailia. The line has been instrumental in promotion of industrial activity tied to the line in Sharabia, Sahel and Shoubra El Kheima, while near the rail yards, including Boulak, warehousing and distribution functions have flourished.

The Suez line proceeds from Ramses station to the Wayli rail yard along Teret El Ismailia street in Mataria and the Ismailia desert road before it branches off towards Suez. Along its route, it has been instrumental in stimulating the installation of industry and warehousing; the most recent of which are in proximity to the airport.

As all of these lines, as well as the principal urban lines, converge on Ramses station, which evolved as the economic heart of Greater Cairo. It is the advent of motorized traffic that the "center" has drifted west to the Kasr El Nil district.

The major waterways in the region include the Nile, the Ismailia Canal and the Maryoutiah, El Zommar and El Mansouriah Canals. Most of the national traffic on these waterways, 50 percent of which is between Cairo and Alexandria, is restricted to the Nile. In general, the waterways are considered to be underexploited both for freight and passenger service.

From a regional planning point of view, however, the presence of the Nile and canals is most important as a source of water for industrial and residential purposes. Thus, along the Ismailia canal for example, in Shoubra El Kheima and Matareya, a string of industrial activities has developed, which has been reinforced by rail and highway networks.

#### B. Urban Networks

The principal sources of data for this section include the Cairo Transportation Study, the "Entrance ways" Study and the quarterly reports of the National Transportation Investment Plan, which is yet to be published in final form.

Cairo's transportation network largely reflects the patterns of urban growth, the land uses and lifestyles, which were current at the time they were introduced.

Regardless of their time of origin, however, it is fair to say that many of the streets, particularly in the core area, suffer from congestion. The congestion problem is principally due to the fact that the land area devoted to circulation space is only 12 percent of the urban area when at least 20 percent is a practical necessity.

Yet congestion is the result of other factors too, such as the mixtures of inter and intra regional traffic, pedestrians and motorized traffic, fast and slow moving vehicles. For example, about 80,000 animal-drawn and similarly slow-moving vehicles such as hand carts, mobile restaurants etc. reduce traffic capacity and increase congestion. Recently measures have been taken to restrict these vehicles in the center. They are still required, however, since as of 1973 they have collected 5,000 to 6,000 tons of daily household garbage and the transport of fruits and vegetables, building materials and other goods. 3/

As there are limited parking facilities, the cars join newspaper and vendor stalls, garbage depots, workshops and other activities upon the narrow sidewalks. In the unplanned areas the situation is graver; sewage holding tanks often rise above street level and mounds of debris impede normal circulation.

Pedestrians are thus obliged to use the congested streets to make headway to their destinations. The Cairo Transportation Study showed that walking is by far the most common form of transportation. Of all trips taken in 1973, 50 percent were on foot, 43 percent by motorized means (bus or metro), and only 7 percent by car or taxi. For distances of up to 2 kilometers, 67 percent of all trips were made on foot and 35 percent of those up to 4 kilometers. 4/

As in the case of the regional networks, there are many instances where the proposed urban networks will encourage north/south development and/or loss of arable land. The proposed extension from Tahrir Street to the Alexandria road, for example, which will cross the agricultural land on the west bank, will create a strong pressure for development in these areas unless controlled.

There is also the concern that grand scale improvements to increase network capacities, which are accompanied by a rapid rise in private vehicle ownership, will encourage concentration in the core area and lead to a cycle of unending demand, further major investments etc. Thus, the problem of congestion in the central area is directly related to the policy of intra-regional deconcentration.

A number of consulting studies have suggested that greater capacity is not really required in Cairo, better traffic

management should first be achieved. On the other hand, it is quite possible that the highly congested central city areas and restricted urban corridors contribute to an ongoing process of deconcentration. It may be argued for example, that the high income residential communities of Heliopolis, Nasr City, Pyramids Avenue, Maadi and so on evolved partially because of the crowded conditions of more central areas. Even the proliferation of informal housing in fringe areas is partially due to a desire to leave the central areas. New industry has also shown a clear preference for location outside the central area. In addition, governmental functions are gradually building up in Nasr City and more commercial, financial and administrative offices are locating offices in Giza and Heliopolis as opposed to the crowded core area.

C. Public Transport

The Cairo Transportation Authority operated 1,700 vehicles, buses, trams and trolley buses in 1973, which served approximately 3.5 million daily passengers. About 25 percent of the fleet was estimated to be out of service on any given day due to problems of maintenance, overloading, spare parts and poor road conditions. At that time the operative fleet covered about 400,000 kilometers daily or 100 million miles a year. The system is heavily overburdened. The most heavily used line is from Shoubra to the central core which carried nearly 45,000 passengers an hour. 5/

The number of passenger trips within the urban area is largely due to the fact that about 50 percent of people are employed outside the kism in which they reside. Rent control and the general lack of housing encourages households to "stay put" rather than seek shelter closer to work.

Furthermore, as the public transport system is heavily subsidised and since it only recovers about 40 percent of its costs through fares (fixed since 1953) it must compete with other sectors for scarce government resources. 6/

D. Private Vehicle Transport

In 1980, the public system was complemented by an estimated 21,200 taxis. Due to the relatively low fares which can be derived because of the gasoline subsidies, taxis have become popular as a reliable means of transport.

The subsidised price of gasoline, however, which is equal to one half of world prices before taxes, also contributes to the congestion problem and leads to a serious question of equity. It facilitates the use of private cars.

The ownership of private vehicles has been increasing at the rapid rate of approximately 14 percent per year and if trends continue it will rise to 15 percent or 20 percent. 7/ Of the 132,000 passenger cars in circulation in 1976, 21,200 were taxis, 40,000 government vehicles and the remainder private. This suggests that only 3 percent of the population had vehicles yet these households benefit disproportionately not only from the gasoline subsidy but also by the improvements of highways, bridges, flyovers and other required improvements to meet rising vehicle demands. 8/

E. Underground:

The idea of a subway was first introduced in 1954 and has been debated ever since. Until very recently, no concrete action was taken, but it now appears that the first section between Ramses Station and Bab El Louk will be implemented. This 8 kilometer stretch will join the southern railway system (to Helwan) with the northern El Marj line thus bypassing the central core area.

Other lines which are to be implemented in the future include the Shoubra/Ramses/Tahrir/Boulak El Dakroul line and the Salah Salem/26th of July (Zamalek)/Imbaba line. According to the Ministry of Transport, the initial line is expected to carry about 60,000 passengers an hour compared to 8,000 passengers per hour on a bus line. The sister proposals to the underground's first phase are the electrification of the El Marj line and improvement of the Bab El Louk/Helwan metro lines.

Part of the reasoning for the underground and El Marj proposals is to serve the residents of the populous and poor northern and western districts who often travel as far as Helwan to their places of work. However, these are the same areas in which the government is trying to suppress informal development on arable land. If implemented in its entirety, the underground will enhance the north/south axis and possibly irrevocably set the pattern of urban development, limiting the impact of future urban development strategies.

These concerns do not mean that the projects should be abandoned but that they should be reconsidered in the light of possible alternatives which better reinforce the east/west axis on desert land. Transportation investment should be aimed not only at meeting demand but also at the creation of uses to orient future desired development patterns.

VII. Industrial Characteristics

In Cairo, the manufacturing dominates all other sectors. Consequently employment in this sector has a larger share than in

other Egyptian cities where non-farm employment in trade and services is respectively more important.

The manufacturing sector in Egypt as a whole, is broken down into three categories: public, private and artisan.

Public firms tend to be the largest in Egypt, covering nationalized steel, textile, petroleum ... etc. with an average size of 400-800 employees. The private sector on the other hand has an average firm size of only 35-40 employees. The artisan sector is part of the private sector employing less than 10 employees.

Compared to the national total, Cairo accommodates 38 percent of the nation's total manufacturing employment, 50 percent of the private manufacturing employment and about 61 percent of the nation's artisans. By contrast, it has only 20 percent of public sector manufacturing -- roughly equal to its share of population. More than 70 percent of the manufacturing employment in Cairo is in private hands, three quarters of which is artisan employment. Thus, small private manufacturing is not only centered in Cairo, but within the city it is the largest source of industrial employment. In 1977, Greater Cairo accommodated 1,291 manufacturing establishments, constituting 54.4 percent of the total national establishments, 45.2 percent of total industrial employment, producing 47.2 percent of the gross output and receiving 46.2 percent of the total manufacturing wages.

A variety of industries are situated in Cairo mainly due to the city's advantageous location, close to both Lower and northern Upper Egypt Governorates, the existence of a relatively well built infrastructure and the concentration of diverse skilled and semi-skilled labor. These industries can be divided into the following categories:

- i. Basic consumer industries such as clothes, leather and shoes and wood and furniture. These industries are mostly situated within Cairo.
- ii. Basic intermediate industries, such as printing and publishing, basic iron and steel products in Helwan and Massara: construction material such as glass in Cairo, cement and gypsum in Helwan, Tura and Tebbin and red brick in Nasr City. Metallic industries also exist.
- iii. Basic capital goods industries: such as electric and non-electric machinery, transport equipment such as vehicles, wagons and car assembly in Wadi Halfa.
- iv. Consumer-oriented industries mainly situated in the center of Cairo.

In Qalyubia, substantial industrial activities can also be found: mainly concentrated in Shoubra El Kheima, Abu Zaabal and

Mousterod. The main industries that are located there are textile industries in Shoubra El Kheima, rubber and plastic and construction material in Mousterod and electric machinery industries in Benha.

Giza Governorate, on the other hand, has access to many industries which are relatively capital intensive. Basic consumer industries such as food processing and beverages, wood and furniture and tobacco can be found. On the other hand, basic intermediate industries such as chemicals, construction material and metallic industries located in Sakiet Mekky are also located there.

A. Industrial Investment Plans - Spatial Allocation

The trend of industrial investments since 1975 favors Greater Cairo followed by Alexandria. According to the 1975 investment plan, Greater Cairo was expected to receive L.E. 85.7 million or 50.7 percent of the total industrial investment. By 1980, Greater Cairo was expected to receive L.E. 313.2 million or 45.4 percent of the total industrial investment.

The 1980-84 Industrial Investment Plan, however, attempts to cut down the share of Greater Cairo to just 28 percent of the total planned public industrial investment. It should be noticed, however, that a great part of the investment is going to the new communities of 10th of Ramadan and Sadat City, rather than increasing the share of the other governorates of the industrial investment. According to the Plan, 10.4 percent of the industrial investment allocated to Cairo shall be in transport equipment. 72.7 percent of investment allocated to Giza shall be in tobacco, and 60 percent of investment allocated to Qalyubia for textiles. Transportation, tobacco and textiles receive the highest shares of investments in all three governorates constituting Greater Cairo.

According to the Industrial Plan for 1980/84, most of the allocated investments in Cairo Zone were provided in order to complete projects in which actual investments were made before 1980.

Out of a total of 115 projects constituting the industrial investment Plan, 77 projects were actually underway, and 38 projects are entirely new. Out of those 38 entirely new projects, 29 are expected to take place on agricultural land. Relocating these projects may need to be considered in order to preserve as much arable land as possible.

Total actual investment through 1979 (and previous years) amounted to L.E. 645.5 million which the allocated invest-

TABLE V.8

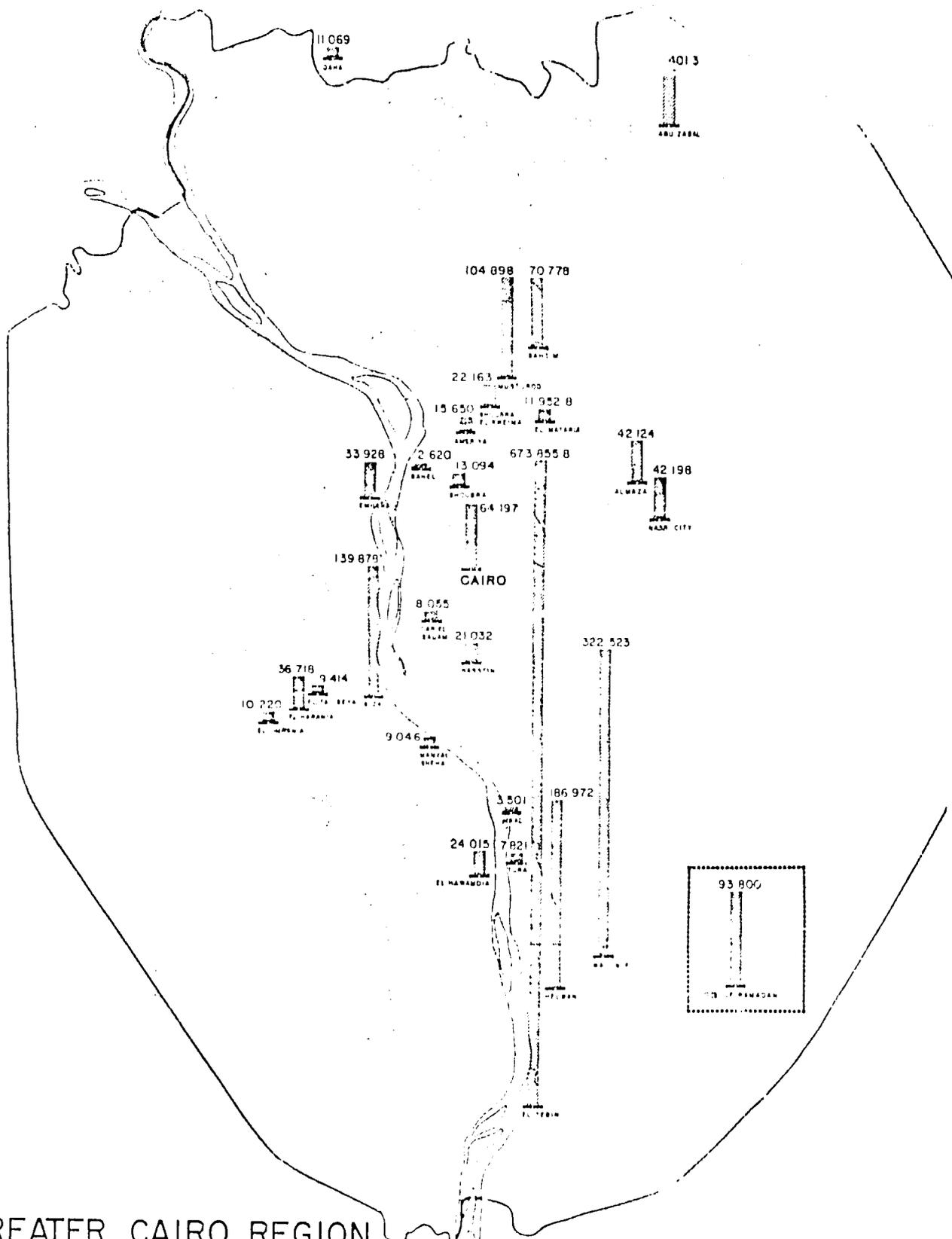
GREATER CAIRO DISTRIBUTION OF INDUSTRIAL INVESTMENT

1980-1984 INDUSTRIAL INVESTMENT PLAN

(In L.E. 000's)

GOVERNORATE	TOTAL INVESTMENT COST	TOTAL ACTUAL INVESTMENT THROUGH 31/12/79	TOTAL ALLOCATED INVESTMENT 1980/1984	PRODUCTION AT FULL CAPACITY
1. Greater Cairo (GC)	189,0187.8 100%	645,541 34.15%	1,244,648.8 65.85%	2,155,030 114.01%
2. Qalyubia	253,099.4	40,033	213,066.4	132,305
Share of Total Invest.	100%	15.82	84.18%	52.27%
Qalyubia share of GC	13.39%	6.2%	17.12%	6.14%
3. Giza	263,155.7	28,484	234,671.7	354,980
Share of Total Invest. Cost	100%	10.82	89.18	134.9
Giza share of GC	13.92%	4.4%	18.85%	16.47%
4. Cairo	1,373,932.7	577,024	796,908.7	1,667,745
Share of Total Invest. Cost	100%	42%	58%	121.38%
Cairo share of GC	72.69	89.4	64.03	77.39
5. Invest in Agriculture areas	1,403,431.7	592,658	810,733.7	1,309,462
Share of Total Invest. in Agriculture areas	100%	42.23%	57.77%	93.30%
Agriculture share of GC	74.25%	91.81%	65.14%	60.76%

Figure V.8 illustrates the 1980-1984 planned industrial investment by district in the Cairo region; the predominance of investment in the south (Helwan) is noteworthy as is the location of investment on arable land.



GREATER CAIRO REGION  
 DISTRIBUTION OF INDUSTRIAL INVESTMENT  
 1980-1984 INVESTMENT PLAN  
 NATIONAL URBAN POLICY STUDY

FIGURE 5 B

ment for 1980-84 was about L.E. 1.24 billion; total investment costs thus amounted to approximately L.E. 1.89 billion. As a result of such investment, production at full capacity was estimated to be approximately L.E. 2.15 billion annually.

## VIII. Housing

### A. Existing Housing

The purpose of this section is to provide a brief description of existing housing and service characteristics by residential type and kism. The data, on a kism basis, is useful in the sense that it identifies those districts which require immediate attention (regarding deficits in urban services). However, the data can be misleading due to the following factors:

- Mixes of residential types with extreme differences in socio-economic and physical characteristics: i.e. the kisms of El Ahram, Maadi, Boulak El Dakrour and Giza.
- Mixes of different land uses which influence density data: i.e. agricultural and industrial land uses in Mataria, Imbaba, Helwan, Tebbin and Shoubra El Kheima. Commercial and government land uses in Ezbekia, Kasr El Nil, Nasr City and Giza.

#### 1. Residential Types

In 1977, the Joint Land Use Team prepared a residential typology for Metropolitan Cairo which has been included in Table V.9. As the material gives a good description of specific housing types including density, layout and building types and household income characteristics, as well as useful recommendations for improvement, it has been reused in simplified form.<sup>6/</sup> Unfortunately the material did not provide population by type, but an estimate was made for the latter on the basis of densities and land use areas.

It is clear from Table V.9 that a large disparity exists in residential land usage between the different residential types and corresponding populations. The three least dense housing types, for example, occupy 60 percent of the residential land area yet house less than 17 percent of the urban population. On the other hand, the low middle income/high density residential type occupies only 15 percent of residential land yet houses about 37 percent of the population. This dis-

TABLE V.9

## TYPOLOGY OF RESIDENTIAL AREAS

## IN METROPOLITAN CAIRO

Settlement Form (Example)	People/Square Kilometer (1973) 1/	Mean Annual Income Bands		Percent Population (est)	Proportion of Developed Land (1977)	Policy Implications and Approaches
		L.E.1975)	L.E.1979 (est)			
Rural settlements overtaken by urban growth (North Cairo villages)	117,630	below 250	below 700	11	3.0	Upgrade and legalize or adapt some land adjust- ment and partial redevelopment.
Urban settlements of rural character (Aln Shams, Warraq El Arab)	77,000	below 250 250 - 400	below 700 700 - 1000	7	3.0	Legalize, establish standards for upgrading, make some land adjustments and limited removal for road widening, or move population to new housing elsewhere.
Illegal, unplanned urban subdivisions Materla	60,000	150 - 1000 400 - 600	550 - 1000 1000 - 1200	9	5.0	Legalize, establish standards for upgrading, make some land adjustments, establish sites for community buildings, and prepare access roads.
Planned urban subdivi- sions under progres- sive development (Boulaq el Dakrur)	10,000	400 - 600 600 - 1000	1000 - 1200 1200 - 1300	1	3.0	Revise high layout standards for later subdivisions, review for waste of urban land, and improve means of obtaining materials and licences.
Medieval conservation and redevelopment areas (Old Cairo, El Khalifa)	70,000	250 - 400 400 - 600 600 - 1000	700 - 1000 1000 - 1200 1200 - 1300	11	5.0	Establish and upgrade conser- vation standards, provide building repair grants-in-kind, some limited slum clearance.
Establish urban districts (Inner city: Kasr el Nil Inner suburbs: Garden City, Zamalek)	7,000	1000 - 1400 above 1400	1300 - 1900 above 1900	6	28.0	Provide some slum clearance and upgrading in inner city areas, and provide some build- ing repair and slum clearance in adjacent areas.
Formally planned high and middle-income districts (The companies Heliopolis, Maadi, Nasr city)	5,000- 6,000	1000 - 1400 above 1400	1300 - 1900 above 1900	10	31.0	Review layout standards and lot sizes, widen scope of projects to include other income groups, improve building material supply, review impact of rent control on rate completions of building.
Comprehensive development areas (Maadi, The Osman Company, Merryland)	7,000	above 1400 1000 - 1400	above 1900 1300 - 1900	0.2	1.0	Set maximum permitted size of rooms and apartments, insist on a propor- tion of lower-middle-income groups in each project and a wider range of lot sizes.
Low/middle-income high- density residential districts (Shoubra, Boulaq, Babel Shaarla)	80,000	250 - 400 400 - 600 600 - 1000	700 - 1000 1000 - 1200 1200 - 1300	37	15.0	Install public utilities, improve refuse removal, and upgrade generally.
Public housing projects (economic housing, Zeitoun, Zeitun, Indus- trial workers housing: Helwan)	40,000	150 - 400 400 - 600 600 - 1000	550 - 1000 1000 - 1200 1200 - 1300	6	5.0	Examine whole subsidy policy and selection procedures, revise so those who could pay more rent do so, eval- uate and revise architecture and layout standards.
Occupation of graveyards		below 250 150 - 400	below 700 550 - 1000	1.5	0.5	Some removal of population to other sites, some clearance and land adjustment.
Roof squatters		below 250	below 900	0.5	0.5	Resettlement and siting and services schemes.

Note: 1/ Taken from Central Agency for Public Mobilization and Statistics, Cairo 1974. Document 1269/74, p. 137

2/ Revised Urban Income and Expenditure Distribution / USAID

Source: PADDO estimates and analysis. / Joint land use team study 1977

equilibrium is corroborated by the kism data in Table V.10 which shows that the five kisms with lowest density and highest number of utility connections occupy 32 percent of the total kism area yet house only 6.4 percent of the population.

2. Kism Data: Density and Levels of Service (Utility Connections)

In Table V.10 and Figure V.9, data regarding density ( $m^2$  of kism area/person; persons per room) and building utility connections for water, sewer and electricity (used as a proxy for levels of service) are shown. In each of the above, the kisms are roughly ranked from a low density/"high utility" standard to a high density/"low utility" standard, though these were found to fluctuate greatly. The "utility standards" are obviously only indicative as they do not genuinely reflect likely per capita consumption. Some parallels, however, may be drawn between the JLUT residential types and the kism data as it is presented.

Those areas with low density and "high utility" standards roughly correspond to the established urban districts and formally planned high and middle income districts. High density and medium high service kisms, on the other hand, correspond closely to the "low middle income/high density residential type, while low kism density/low service kisms correspond roughly with illegal unplanned urban subdivisions and planned urban subdivisions under progressive development. These parallels are more obvious in the matrix presented in Figure V.10 which relates density and "service levels" based upon utility connections. As was pointed out in the Introduction, anomalies do occur due to mixes in residential types and land uses. Mataria, for example, would probably best fit with Shoubra El Kheima or Imbaba but due to the large area of agricultural land within its boundaries it registers a medium low density.

The kism data indicates that both density and "levels of service" are a function of location vis-a-vis the central area. Both decline towards the urban periphery (as do building floor heights). The exceptions to these are the northeastern suburban kisms of Heliopolis, Nasr City and Nouzha which though decreasing in density have been able to maintain high levels of building connections. Furthermore, as they are quite distant from the central area and at low density, one must assume that their development

GREATER CAIRO HOUSING KISM DATA

	% 1980 1966-76	POP. 1976	% POP.	DENSITY/ha <sup>2</sup> 1976	m <sup>2</sup> / PERSON	NO. OF D.U/ BUILDING	NO OF FLOORS BUILDING	PERSONS/ D.U.	PERSONS/ ROOM	WATER % BLDGS CONNECTED	ELECTRICITY % BLDGS CONNECTED	SEWERAGE % BLDGS CONNECTED
MAGR EL NIL	-(9.3)	39342	0.6	6557	152.5	12.2	5.1	2.77	0.95	93.40	96.28	92.6
NDIHA	113	101625	1.5	9135.3	109.8*	1.5	3.3	3.53	1.01	95.50	95.45	95.48
HELIOPLIS	65	127131	1.9	9135.3	109.8*	6.6	3.4	3.97	1.14	97.25	97.40	97.23
MAGR CITY	-	65347	1.0	9135.3	109.8*	6.4	3.4	3.9	1.12	84.72	87.27	83.18
DO-KI	444	101564	1.5	13774.9	72.8	4.06	3.05	4.25	1.25	87.54	91.95	87.33
ADDIA	-(4.7)	88292	1.3	55176.2	18.1	7.8	4.5	4.14	1.45	93.59	95.42	94.52
ASOUZA	444	146686	2.2	22919.7	43.6	4.51	2.85	4.4	1.38	71.32	85.76	70.49
EABANIA	-(6.3)	59667	1.0	35998.2	28.5	7.76	4.4	5.1	1.67	93.43	96.71	91.47
ZAHER	4	164153	1.6	52076.5	19.2	9.5	4.5	5.1	1.5	97.18	98.23	97.02
• BELLAG EL DAKROUR	444	822480	4.9	18989.4	52.7	2.46	1.97	4.97	1.73	51.01	77.92	41.34
EL AHRAM	938	129860	2.0	4824.7	221	1.52	1.31	5.29	1.75	20.07	67.38	1.21
• MAADI	222	287856	4.0	10639.7	94	1.9	1.7	5.49	1.74	38.89	68.89	13.70
• MATAREYA	232	534512	8.0	7885.1	126.8*	1.9	1.6	5.8	1.86	45.62	60.60	39.99
MALANEK EL KOBA	119	214785	3.3	27691.7	36.1	4.9	2.9	6.6	2.05	86.27	85.13	88.42
SHUBRA	3	128782	2.0	73517.1	126	4.4	3.4	6.82	1.78	85.46	88.68	88.45
HAJLY	-(28.1)	142208	2.2	27691.7	36.1	3.8	3.0	7.11	1.84	74.97	80.08	75.52
EMBARA	138	323443	4.9	38277.3	26.1	2.79	2.35	5.58	1.93	41.67	77.46	42.50
• GIZA	44	209621	3.2	23979.4	41.7	2.79	2.49	6.32	1.96	53.23	72.45	47.33
ZEITOUN	167	267862	4.0	63729.0	15.7	3.5	2.2	5.65	1.97	68.84	79.72	68.60
SAIDA ZEINAB	-(0.8)	252000	3.8	72074.3	13.9	4.1	3.1	6.49	1.87	81.55	91.32	80.28
MOSKY	61	58402	1.0	97336.7	10.2	4.5	3.9	6.13	2.04	57.07	94.77	87.57
MAGR GADIHA	29	273670	4.1	27696.8	36.1	3.3	2.6	7.05	1.89	65.21	74.87	59.31
SAHEL	44	438753	6.6	67500.4	14.8	4.5	3.1	6.29	1.83	82.15	88.93	85.49
SHUBRA EL KHEIMA I	290	233745	3.5	13300.7	75.1	2.43	1.97	6.13	2.65	22.85	77.01	27.71
AMALIFA	17	184353	2.8	21739.9	46.0*	2.2	2.2	7.5	2.19	70.92	75.12	61.53
TEBEN	386	33593	0.5	49424.7	20.2*	2.8	1.8	4.44	1.98	26.32	41.49	16.40
ROD EL FARAG	3	272448	4.1	100926.7	9.9	3.3	3.4	8.9	1.94	87.21	90.87	87.62
HELWAN	201	282597	4.3	49404.7	20.2	1.8	1.7	6.77	1.97	53.49	68.17	26.27
DARB EL AHMAR	-(2.0)	146589	2.2	52353.2	19.0	3.3	2.7	7.56	1.94	81.12	74.44	60.69
SHUBRA EL KHEIMA II	290	160435	2.4	13300.7	75.1	1.61	1.54	6.45	3.65	9.81	65.01	12.12
SAB EL SHEREYA	-(28.1)	110247	9.9	100224.5	1.7	4.5	3.4	6.87	2.13	84.48	90.03	85.74
SAWALIA	18	166699	28.7*	34728.9	2.5	2.1	2.3	9.4	2.31	51.58	71.56	47.59
BOULAC	-(11.9)	177929	15.2	65899.6	2.7	2.6	2.9	9.1	2.51	58.11	77.88	61.11
SHOURABEYA	160	443741	12.5	79517.1	6.7	3.4	2.6	6.86	2.91	54.84	78.80	73.74

# CENSITEN CENSUS DENSITY & UTILITY SERVICE BY KISM

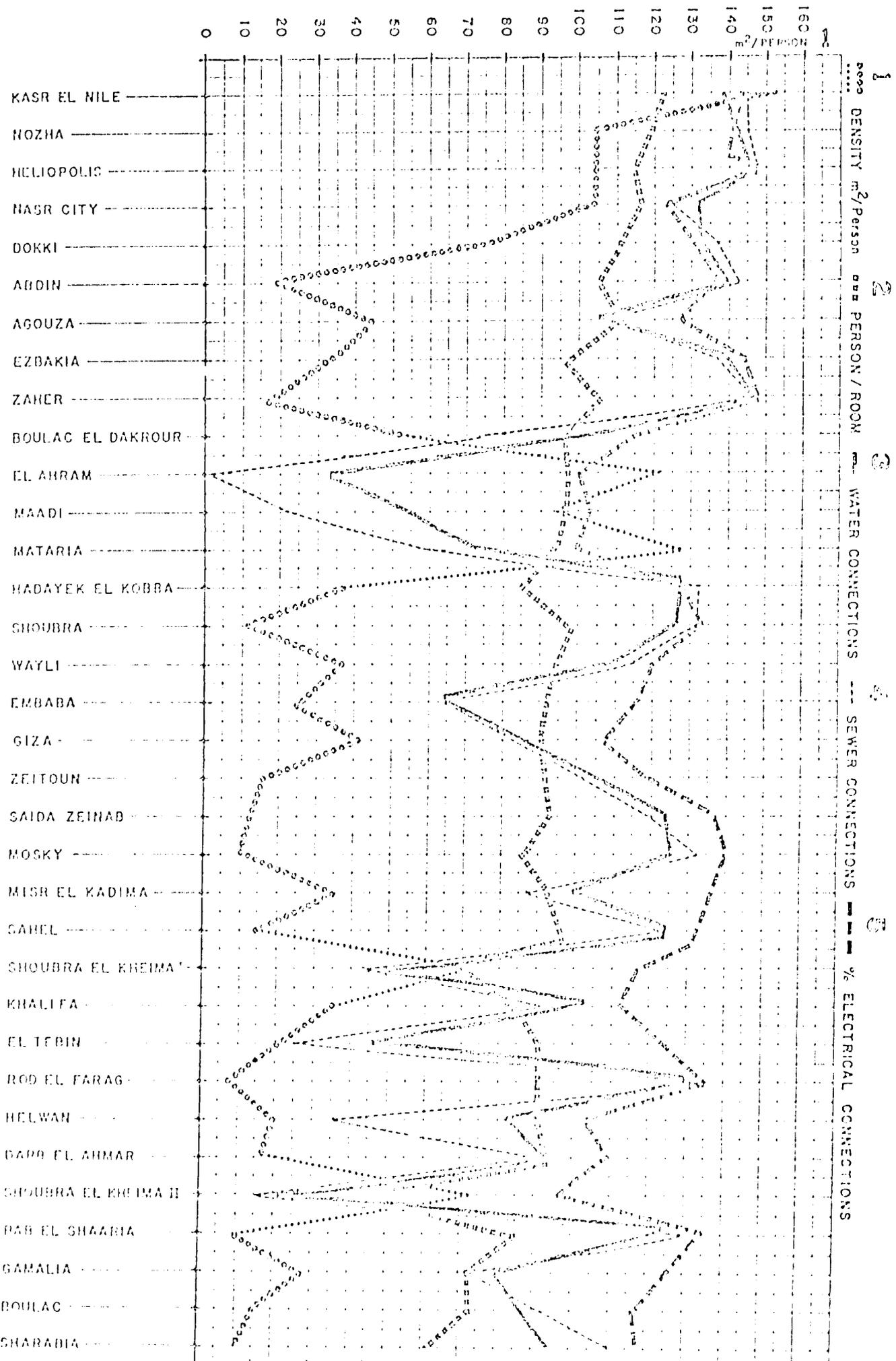


FIGURE 5.10

KISM DENSITY / SERVICES MATRIX  
RELATED TO RESIDENTIAL TYPE

DENSITY \ SERVICES	LOW	MEDIUM LOW	MEDIUM	MEDIUM HIGH	HIGH
HIGH	3 KASR EL NIL 2 NOZHA 1,2,9 HELIOPOLIS			3 ELZAKARIA	3 ZAHER 8 MOSKY
MEDIUM HIGH	2, NASR CITY	3 DOKKI	7,4 BOULAC EL DARROUR	3 AGOUZA 5 HADAYEK EL KOBBA 5 WALLY	6 ABDIN 6 SHOUBRA 7,3 ELITON 8 S. ZEINAB 6 SAHEL 9,10 FOD EL FAHAG 6 BAB EL KHAYYA
MEDIUM		7,1,5 MONTARIA		7,10 ELBARA 4,2 GIZA 8 MAQR EL GADIMA 8 YHALIFA 5 GAMALIA	6 SHOUBRA 6,5 BARR EL NEMAR 6 BOULAC
MEDIUM LOW			7,10 SHOUBRA EL KHEIMA I		
LOW	4 EL AHDAM	2,7,1 MAADI	7,5, SHOUBRA EL KHEIMA II		5,4 HELWAN 7,10 THERIN

RESIDENTIAL TYPES

- |   |                                   |
|---|-----------------------------------|
| 1. COMPREHENSIVE DEVELOPMENT                      | 6. LOW-MIDDLE INCOME HIGH DENSITY |
| 2. FORMALLY PLANNED HIGH AND UPPER MIDDLE INCOME  | 7. ILLICIT UNPLANNED              |
| 3. FORMALLY PLANNED UPPER MIDDLE INCOME           | 8. MEDIEVAL CONSERVATION          |
| 4. PLANNED, ILLEGAL UPPER PROGRESSIVE DEVELOPMENT | 9. FEDERAL GEMSCHEER              |
| 5. PUBLIC HOUSING                                 | 10. OVERBUILT RURAL SETTLEMENTS   |

occurred at a relatively higher per capita cost. A redeeming feature of these developments, however, is the fact that they are on desert land.

The recommendations in Table V.9 regarding the specific residential measures for improvement by residential type is generally applicable to the appropriate kisms. (However in some cases more than one specific nature of intervention may be required). In the low density "high service" areas, for example, standards should be revised to maximize land use efficiency and reduce inequity. In high density/medium high service areas generally the housing stock and service levels should be upgraded. While, in the medium high density/medium service (medieval conservation) areas upgrading and renewal is recommended at current density standards. Outlying low density/low service areas are recommended for legalization and improved services (i.e. Helwan, Shoubra El Kheima, Imbaba etc.) when alternative development sites to reduce loss of arable land (and to absorb population from central renewal and upgrading schemes) are established.

#### B Formal Sector Housing

Based upon official data regarding housing production, issue of building permits, etc., the 1979 National Housing Plan estimated that there was a severe housing shortage of 550,000 units in 1976, which was expected to increase to 831,000 units by 1980. However, census data regarding the number of dwelling units, room increases and room density during the period 1960-1976 do not corroborate this hypothesis.

On the basis of Table V.11 for example, the total "official" production of urban dwelling units during the period 1960-1976 only increased by 28 percent (14.6 percent if losses due to demolition are included), while the census data indicates that the number of "urban dwelling units increased by 114 percent and the number of households at only 74 percent". Furthermore, in Cairo and Giza, the number of dwelling units increased by 95 and 243 percent respectively. The notion that the added dwelling units were the result of overcrowding and subdivision of dwelling units is dispelled by data on the number of rooms which indicate an 86 percent increase in urban areas and 53 and 51 percent in Cairo and Giza. Furthermore the persons/per room indicator actually dropped for all urban areas as well as for the three cities of Cairo. Data for Shoubra El Kheima was not available.

Thus, in terms of overall dwelling unit production, it appears that the number of dwelling units has been keeping

TABLE V.11

CAIRO, GIZA

DWELLING UNIT STATUS DATA

1960 - 1976

	<u>1960</u>	<u>1976</u>	<u>INCREASE PERCENT</u>
"Urban " D.U.			
<u>(From Official Production</u>	1675	2146 (1921) <sup>1</sup>	20 (14.6) <sup>1</sup>
<u>"Urban" Families (Census)</u>	1908	3329	74.4%
<u>"Urban" D.U. (Census)</u>	1675	3586	114
- Cairo	585	1140	94.9
- Giza	98	337	243.9
<u>Total Rooms (Census)</u>	13473	20364	86
- Cairo	1439	2676 (2200) <sup>2</sup>	86
- Giza			
<u>Total Population (Census)</u>	25984	36658	41.1
- Cairo	3349	5084	51.8
- Giza	1330	2419	81.9
<u>Person/Room</u>	1.9	1.8	- 5.3
- Cairo	2.3	1.9 (2.3) <sup>2</sup>	- 17.4 (0) <sup>2</sup>
- Giza	1.9	1.8	- 5.3

<sup>1</sup> Includes net additions considering 225 thousand estimated demolitions.

<sup>2</sup> Assumes 50% of multi-room units have "halls" which were not counted as a room in 1960 census.

SOURCE: Table 23 Development and Infrastructure in the Greater Cairo Region, W.C. Wheaton MIF 1980.

pace with the number of households both on a national and local basis in Cairo. The difference, is due to the large contribution which has been made by the illegal or informal sector.

1. The Formal Housing Delivery System

Most of the land used for formal sector housing development is in desert areas under the jurisdiction of the governorates, while the remainder belongs to private groups which are active in both desert and arable land areas. Government-owned land also includes that under military and Ministry of Awqaf authority, which in the former case has been developed for residential purposes (i.e. Nasr City). The primary beneficiaries of governorate land in the Cairo Zone, are the building companies (Heliopolis, Maadi, Nasr City, etc.) and cooperatives.

Housing development funds come principally from the Central Bank via the Ministry of Housing. The Central Bank lends to mortgage banks at subsidized rates. Commercial banks have a minor role. The primary beneficiaries of Central Bank funds are Credit Foncier and the General Authority for Building and Housing Cooperatives (GABHC) both of which are public institutions. Credit Foncier is the largest source of mortgage funds for the private sector. Its principal beneficiaries are upper middle and upper income groups. The GABHC provides easy terms (loans at 3 percent over 30 years) to cooperatives as well as subsidized building materials to members. Its funds are principally derived from the Central Bank, the Housing Loan Fund, as well as member savings programs. It also primarily serves middle and upper income groups.

The building companies of Nasr City, Maadi and Heliopolis, are responsible for most formal construction within the Cairo Metropolitan Area. Both public sector and private sector contractors carry out cooperative housing programs. Excluding public formal housing, about 17,000 units of formal private housing has been produced annually during the period 1960-76. 9/ In Cairo about 55,000 dwelling units were added to the 1960 stock by 1976. If, as was the case at the national level, that about 20 percent of this stock was contributed due to the formal sector then approximately 6,000 units per year were added by the formal private sector and about 3,500 units annually for public sector housing.

Public housing programs are carried out by governorates with assistance from the Ministry of Housing.

There are two basic types of public housing: economic and industrial workers housing.

## 2 Upgrading

Several upgrading projects are currently being planned or are underway in the Cairo Zone. These which include government joint efforts with the IBRD and USID. The IBRD financed upgrading project at Manshiet Nasr is targetted to benefit households between the 12th and 57th percentiles of household incomes. The project will provide secure tenure, improved water supply, cesspool improvement and small material loans and will benefit about 70,000 persons. USAID Projects at Ain Shams and Helwan are currently being planned in similar programs.

### C. Informal Housing

Nationally, 1.5 million dwelling units were constructed between 1960 and 1976 which were not built by the public or registered private sector. As these "unofficial" units were constructed without permits and often in unplanned areas they are illegal. Yet, the contribution of this informal sector to the new housing stock is very substantial; equal to about three out of every four units built nationally and in Cairo itself.

The subject of informal housing in Greater Cairo, due to its scale of development is a fundamental issue which must be addressed in the concept plan for future urban growth. Presently, as little is known about its dynamics, it is the subject of a joint GOPP/USAID study which is due to be completed in September 1981.

Informal housing in the Metropolitan Area is concentrated in the west (Boulak El Dakrou and Imbaba), north (Shoubra El Kheima), northwest (Mataria, Zeitoun, Kobba Gardens) with some pockets in the southeast and south along the Maadi/Helwan corridor. It is generally located on agricultural land due to the availability of ground water. However, it seeks other locational advantages such as proximity to employment opportunities and transportation networks and infrastructure. For these reasons, it has developed primarily in proximity to industrial zones (Shoubra El Kheima and Helwan) and "planned" middle and upper residential developments (Agoouza, Giza and Heliopolis).

Informal housing development has evolved as a response to otherwise unsatisfied housing demand by low and lower middle income groups which represent a vast majority of the urban population.

In spite of problems associated with it, informal housing serves a vital function by providing shelter for large numbers of households which would otherwise increase densities and congestion in the central areas and overburden existing public services there. On the other hand, uncontrolled and unplanned informal housing encroaches on valuable agricultural land. It often does not meet required building standards, lacks adequate sanitation and infrastructure and is consequently a threat to public health safety. Furthermore, when and if a decision is made to provide services they are usually more difficult and costly to implement than in planned settlements.

Nevertheless, the demand for informal housing will remain substantial unless alternative sites in more desirable locations are found. The government needs to find ways to channel the dynamism of this sector in a coherent and planned fashion. In order to do this, large areas of vacant desert land must be found which offers equivalent or better locational advantages than the rural fringe areas.

#### IX. Planned Metropolitan Development to the Year 2000

Within the past few years, several sectoral studies were undertaken in the fields of transportation, water supply and wastewater treatment which, necessarily, had to deal with the future size and form of Metropolitan Cairo in order to assess the needs and capacities of their respective systems and networks. They include:- 9/

- "Planning of the Entrances to the Cairo Urban Area"  
April 1976
- "Greater Cairo Wastewater Project", 1978
- "Greater Cairo Waterworks Master Plan", 1979
- "Helwan Wastewater Master Plan", 1977.78
- "Rehabilitation and Expansion of the Cairo Wastewater System" 1980/81

In each case, the 1970 master plan for the year 1990, prepared by the now defunct Greater Cairo Planning Commission was used as a framework for analysis.

The "preliminary" master plan for Greater Cairo for the year 1990 was published in 1970. Its recommendations were approved by a special consultative committee in 1971 and by the Council of Ministers in 1977 making it binding on all ministries and governorates. The plan, at this time, needs substantial revision and reconsideration, however, it has been and continues to be extremely influential in guiding planning decisions.

The recommendations of the plan have been included here to provide a context for analysis of the sectoral studies mentioned above and for the concept plan recommendations.

At the time the preliminary master plan was prepared, Greater Cairo was expected to have 1990 population of 16.6 million inhabitants assuming the natural and migration rates of growth remained constant.

The commission reckoned, however, that Cairo's public systems could not absorb this much population. They, therefore, recommended:

- i. Migration to Cairo should be reduced by 50 percent in order to achieve a maximum 1990 population of 14.8 million inhabitants.
- ii. The 14.8 million inhabitants should be accommodated as follows: 9.5 million in the continuous built-up area; 1.2 million in peripheral urban and rural settlements; and 4.2 million into new areas of expansion.
- iii. The new areas of expansion should be in the form of independent desert new towns each with an economic base sufficient for its development and growth. (Two sites were suggested on the east bank near the Cairo/Suez road and in the El Khanka district, and two were proposed on the west bank on the Fayoum road and in the Abu Rawash district).
- iv. Helwan and Shoubra El Kheima will remain the main industrial zones in the region. Existing industries should be allowed to expand to achieve their most "economic" size and only supporting industries should be allowed to start up. Needed residential areas and service facilities should be established. New industries should be located in the new towns.
- v. Commercial and financial subcenters should be established to relieve the CBD and wholesale markets should be distributed to serve the subcenters.
- vi. Agricultural land must be preserved and 50,000 feddans (20,800 hectares) should be converted to vegetable crops adjacent to the built-up area.
- vii. Space should be allocated for 1.8 million housing units with required public services within the plan.
- viii. Open space standards should be increased from  $1.6 \text{ m}^2$  to  $8.5 \text{ m}^2$ . El Dahab Island and Warrak Island should be used as regional parks.
- ix. The existing built-up area should be separated from the proposed extensions by a green belt.
- x. Traffic movement should be reorganized, regulations enforced, the tramway removed from the CBD and different

types of traffic segregated. Parking facilities should be improved, particularly in the CBD and a system of micro-buses for mass transit should be established.

- xi. Limited access expressways should be established on the main roads leading from the region to other parts of Egypt.
- xii. An outer, intermediate and inner ring road should be created. The entranceways to different localities in the region would be connected by the outer ring road which will also serve as a limit for urban development.
- xiii. To complete the proposed ring roads, bridges should be constructed at the following locations: Warrak El Hadar; Rod El Farag; Ramses; Geziret Dar El Salaam; Helwan (two bridges to the West Bank).
- xiv. An underground should be implemented with supporting surface transportation along the following routes: Circular; El Marj-Helwan; Shoubra/El Malek/ El Salah Bridge; El Malek/El Salah Bridge/ Giza 10/

## X. Intra-Regional Deconcentration Concept Plan for the Cairo Zone

### A. Introduction

The development of a feasible and appropriate strategy set for Cairo is the centerpiece of the eventual National Urban Strategy. This will require careful consideration of many development issues and the application of a strong "political will" to implement the preferred strategy.

The purpose of the concept plan is to provide an overview of the kind of development strategy which would be appropriate for the Cairo Zone. A concept plan is only a starting point for the more in-depth and detailed analysis and planning which is required. Thus, the Cairo Concept Plan is designed to show that the enormous growth forecast by all observers for Cairo need not be the disaster many fear. Indeed, through an aggressively planned, managed, and implemented strategy the tremendous potential contribution of Cairo to national economic growth, with efficiency and equity, can be harnessed.

The present directions of development in the "contiguous" area of Cairo is north and south predominantly on some of the most highly productive arable land in the nation. The reasons for this growth direction have been discussed previously. To summarize briefly they include:

- i. The major transport links to Alexandria and Upper Egypt create development attraction. The various

inter-regional transportation proposals which are under consideration or development reinforce this axis of development, and increase the pressure on arable land.

- ii. The water and sewer network expansion has generally lagged behind urban growth. Nonetheless, the present plans give priority to service where the people live and therefore will reinforce the attractiveness of the north/south axis.
- iii. The industrial development program is also heavily concentrated on the north/south axis with 75 percent of the planned investment and 90 percent of the realized investment falling on arable land.
- iv. Informal housing has been extensive on the urban fringe and at least a significant proportion has been on arable land on the north/south axis. As mentioned, the lack of alternative serviced desert land sites has been a major contributor to this problem.

The thrust of the Concept Plan is to suggest a means to halt these trends and reorient urban growth to the northeast/southwest axis.

Among the most crucial objectives which should be addressed with the ultimate aim to prepare an integrated set of spatial, economic, social, financial and administrative plans, programs and legal instruments are the following:

- i. The east/west spatial organization of the Intra-Regional Deconcentration Concept through the acceleration of the satellite and new city development process.
- ii. The achievement of appropriately high densities in new development areas and the preservation of arable land.
- iii. The decentralisation and decongestion of the center of Cairo.
- iv. The improvement of the "quality of life" of the people through environmental upgrading of physical and social infrastructure, the provision of land for informal and private/public sector housing in appropriate locations.
- v. The creation of appropriate instruments of governance to guide and control development and implement policy.

B. The Spatial Organization

Figure V.11 presents a schematic diagram of the long term alternative metropolitan growth framework. The schematic map illustrates two predominant directions of growth: the Alexandria/Cairo desert corridor and the Canal cities/Cairo corridor. These corridors should be planned in coordination with a program of "constrained" and tightly controlled development in the Delta Zone.

The Cairo Zone, under any alternative strategy, is the crucial nodal point of urban Egypt. The Cairo Zone Concept Plan stresses Intra-Regional Deconcentration until the year 2000 in an northeast/southwest direction. The 10th of Ramadan and El Obur anchor the northeast direction and 6th of October the southwest. Also receiving continuing priority are 15th of May and Helwan in the South. It is important to note that the new cities within the concept plan are considered the centers of growth areas and not just "independent" or "free standing" projects. Regional development in settlement form should be planned and encouraged within the long-term development corridors while restricted areas are used to control contiguous development.

The concept of "Restricted Areas" is critical to the achievement of Intra-Regional Deconcentration. There are three types of "Restricted Areas" contemplated in the concept.

- i. Restrictions on the development of arable land. Ultimately, this issue is a fundamental test of Government's political will and true priorities. Development can be stopped if Government truly wishes it to be stopped.
- ii. Restricted Area Land Uses. Large low density and consuming uses which are required in the national interest should be located as a means of protecting arable land and furthering the development of open space and buffer areas between existing and new urban growth. Military installations, land reclamation areas, experimental farms, large institutional uses (with low employment requirements), and touristic areas such as the Pyramid Zone (see Fig. V.12) may be used in this regard to strengthen the Intra-Regional Deconcentration concept.
- iii. Restricted Transportation Corridors. The development of an efficient road transport system is critical to the plan concept, but, of course, historic experience has shown that available transportation corridors stimulate urbanization and develop-

ment if left unplanned and uncontrolled. Existing and proposed entranceways should thus be re-evaluated in light of their probable development impacts. Those that stimulate growth in undesired areas, such as the Cairo/Alexandria agricultural corridor; Ismailia; and Upper Egypt, should be restricted to present capacities or designed to carry only Cairo origin or destined traffic. To achieve this, alternative routes via the northeast and northwest should be envisaged to serve Delta traffic, while a possible alternative desert route to the Upper Egypt road should be considered on the southern west bank. (See Figs. V.12 and V.13). In the near future the emphasis should be on the Alexandria desert road and proposed new link from Helwan to El Obur. This link would ultimately divert traffic from the direct Benha/Cairo corridor to the east (El Obur, Nasr City). To the northwest the Alexandria/Cairo desert road and 6th of October should be served by a Delta connection. No further corridors should be established leading directly into the north of Cairo through Shoubra El Kheima or Matareya.

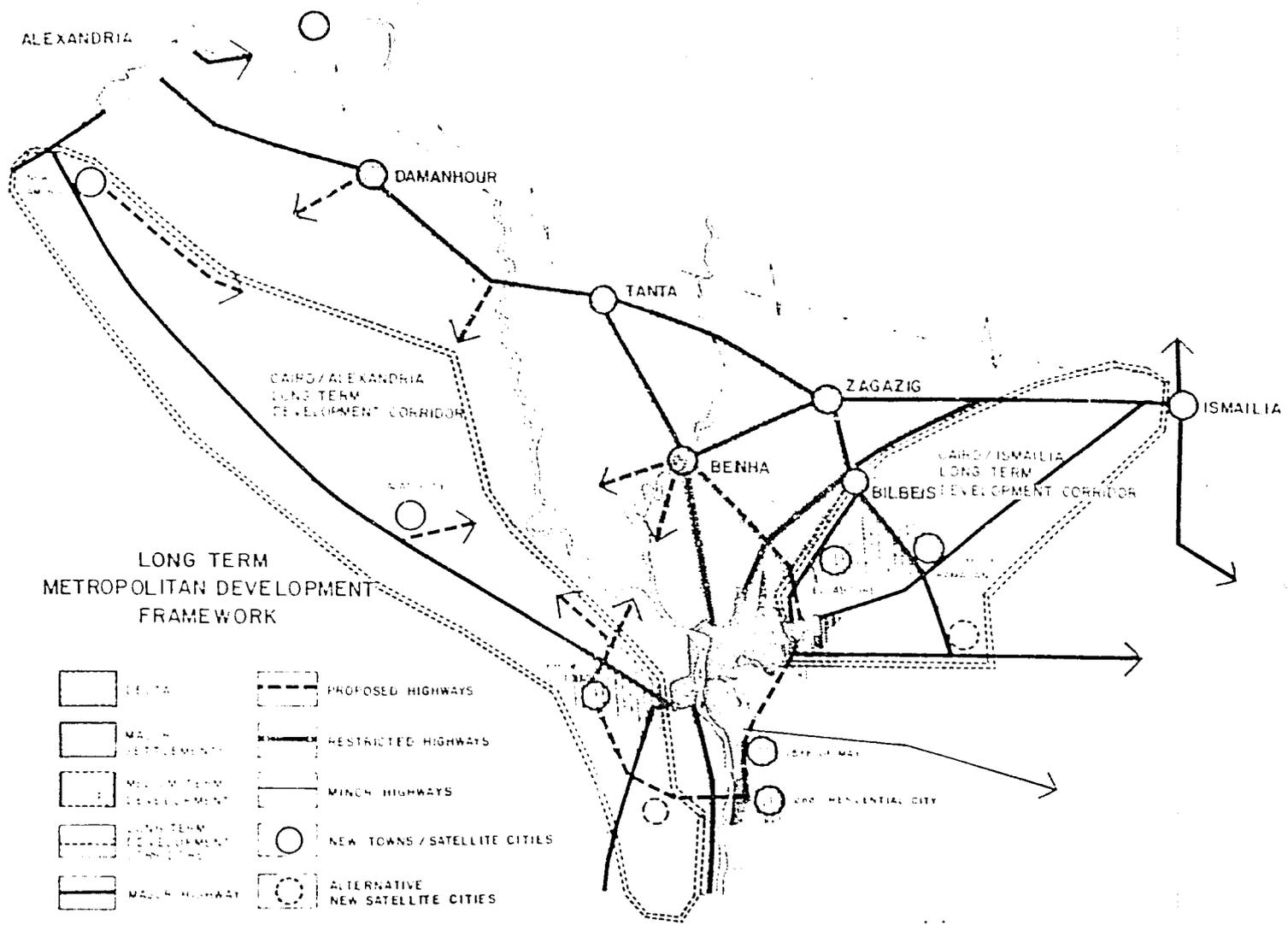
During the last part of the planning period an additional development area should be considered to the southwest between 6th of October and Helwan (in Giza Governorate). This would then require the development of a highway link between 6th of October and the southern outskirts of Helwan. The Al Amal new town (perhaps in a revised location) along the Cairo/Suez corridor should be considered only on a long term growth area. It should not be developed in the near term, however, as it would divert funding and management effort from the high priority development area targets.

#### C. The Greater Cairo Concept Plan

The Greater Cairo Concept Plan is presented in Fig. V.12 and V.13. which reflect the Intra-Regional Deconcentration concepts in more detail within proximity to the existing built-up area.

In Fig. V.12, the highway structure emphasizes the east/west axis via the Alexandria desert road and 6th of October to the previously proposed intermediate ring road. The outer ring road on the eastern fringe has been modified to serve the northeast El Obur area. The northern and western sections of the outer ring road should be held in abeyance pending further study of its likely impact and requirements. If possible, it would be best not to build these sections, but such a decision would depend on the ultimate commitment of Government to the east/west concept proposed here.

A potential new corridor can be contemplated which would link the Abu Zaabal industrial area and El Obur to the



LONG TERM METROPOLITAN DEVELOPMENT FRAMEWORK

- |   |                         |   |                                  |
|---|-------------------------|---|----------------------------------|
|  | DELTA                   |  | PROPOSED HIGHWAYS                |
|  | MEDIUM SETTLEMENT       |  | RESTRICTED HIGHWAYS              |
|  | MEDIUM TERM DEVELOPMENT |  | MINOR HIGHWAYS                   |
|  | LONG TERM DEVELOPMENT   |  | NEW TOWNS / SATELLITE CITIES     |
|  | MAJOR HIGHWAY           |  | ALTERNATIVE NEW SATELLITE CITIES |

FIGURE 5 II





Ismailia highway. This would be eventually the eastern corridor diversion from Benha referred to in the previous section. It would extend south to the Helwan Autostrade opening up both the northeastern and eastern desert for further expansion. It would also permit the Bilbeis desert road to replace the stretch of the Ismailia agricultural road between Bilbeis and Cairo.

Development in the northeastern, eastern and southwestern desert areas is considered crucial since the areas offer attractive locational advantages for both residential and industrial development which require close proximity to major concentrations of economic activities and employment, and to divert otherwise inevitable growth in the arable fringe areas.

1. The Deconcentration and Decongestion of the Core Area.

While there is widespread support in Government for the need to deconcentrate and decongest the center of Cairo, the specific actions taken will ultimately have the opposite effect. Among the most significant areas deserving rethinking are the following:

- i. Suggested "Entranceway" proposals, the commitment to flyovers, and the proposed Under-ground network will all reinforce the potential for concentration and congestion downtown. Many cities have attempted to deal with congestion through extensive access improvements only to discover that increased access creates its own demand. This is particularly significant for Cairo where the private vehicle fleet is growing rapidly and the basic street system is "incorrectably" inadequate (only 12 percent of the land area in streets). Cities such as Singapore, on the other hand, are restricting vehicles in the downtown (through congestion pricing mechanisms). Reduction of traffic congestion in Cairo's core area can probably best be achieved through better traffic management and control, priority bus routes, improvements in pedestrian right of ways, improved parking and restriction on the growth and use of private vehicles.
- ii. Deconcentration of unneeded core activities should be achieved by first conducting a study of public and private functions which serve no vital function to the core area. Special taxes could be imposed while alternative secondary, tertiary, and minor centers are encouraged to absorb these activities. Flexible land use controls and possible incentives could be used in this regard.

- iii. The lack of control over the urban renewal process is a major contributor to high core concentration congestion. The renewal process itself is desirable. However, the present inordinately high floor area ratios being developed in the downtown, will ultimately prove an enormous overload on transportation networks and other urban services. This may doom the center to inevitable and uncorrectable congestion, while at the same time delaying or even killing other government initiatives to deconcentrate urban growth within or outside the built up area. The imposition of appropriate building and land use controls should thus become a high priority.

2. The Improvement of the Quality of Life

The ultimate objective of the government is the sustained improvement in the quality of life of the people. Yet, as in the other issues discussed, there is a gap between the policy and the actions taken. Two critical issues are at the heart of the problems. Both ultimately deal with the desire of the government to take too much of the burden of provision and (therefore cost) upon itself.

- i. The deficits in water supply and sanitation, bus transportation, and other services due to insufficient funds to finance improved service levels is well established. Traditionally these services are supported by "user" charges, which in Egypt are extremely low. This needs to be corrected, and an approach devised to gain public support for the increased "user" charges (informing the public well in advance of increases and the relationship between higher charges and better services). Increases in small increments, could also be coordinated to the periodic wage increases provided for the public sector.
- ii. The provision of housing is a major problem both in terms of its quality and location (prohibition of development on arable land). In general housing production appears to be keeping pace with household formation. On the other hand, the role of government in this process is minor: it has not provided for the full range and magnitude of housing requirements. As yet, a housing policy which would facilitate the householder to meet their shelter needs in appropriate locations has not been established (hence the problem of

construction on arable land simply because it is the easiest place to build). The elements of such a policy would include the provision of serviced plots in desert areas, the establishment of minimum, flexible building regulations and procedures, and access to housing finance. Better cost recovery, particularly through reduced interest rate subsidies should be encouraged to ensure renewable funds. The prohibition of unauthorized construction in undesired areas once sufficient alternatives are available should also be severely enforced.

- iii. As a part of the overall housing policy, specific programming support is required for a much expanded "Upgrading" program of the neighborhood environments which are now seriously deficit. Early starts are underway at small project upgrading with World Bank and AID support, but little impact will be realized until the government takes over sponsorship and widescale implementation of the program on its own account. These should include conservation efforts in the older areas.

### 3. The Issue of Governornance

It is not possible within the confines of NUPS to develop a concept of "governornance" for the Cairo Zone though this issue needs in depth study. The issues to be addressed, however, are clear.

- i. The establishment of an appropriate structure to control zonal wide development including implementable procedures for prohibiting unauthorized development on arable land (see discussion on cover).
- ii. The creation of a revamped Zonal wide planning agency.
- iii. The establishment of procedures to integrate the levels of government and the individual agencies making investments and/or decisions effecting the Zone.
- iv. Enhancement of the financial resource base of Metropolitan Cairo for maintenance and service delivery.

The national government will have to take the leadership in the commitment to a greatly strengthened ability to govern the Cairo Zone.

#### 4. Population Absorption Guidelines

According to the alternative settlement strategies shown in chapter II , the Greater Cairo Zone will accommodate an additional 8.2 to 9.5 million inhabitants between 1976 and the year 2000 while the trend population indicates an increase of 9.5 million inhabitants. As the differences between the settlement strategy productions is not great, the actions required to accommodate the future population growth will, thus, not differ substantially.

##### A. Principal Options

The principal options for future population absorption in the Greater Cairo Zone include:

- Satellite cities and new towns
- Infill within existing boundaries
- Desert fringe development
- Irrremedial arable fringe development
- Desert entranceway corridor development
- Other urban absorption (i.e. Belbeis)

##### New Towns and Satellite Cities' Absorption

Given interregional deconcentration objectives, the most optimum distribution of future population would be to absorb as much growth as possible within the new towns and satellite cities. However, the total combined absorption of these areas at current target populations is only 2.2 million or only 23 to 27 percent of the expected population increase.

TABLE V.12

TARGET POPULATIONS OF NEW TOWNS AND SATELLITE CITIES

	<u>TARGET POPULATION</u>			Compound growth rate
	1985	1990	2000	
- Sadat City	61,000	122,000	500,000	15.06
- 10th of Ramadan	150,000	224,000	500,000	8.36
- 6th of October (Giza)	68,000	132,000	350,000	14.23
- 15th of May (Helwan)	50,000	72,000	150,000	7.6
- (2nd Residential City) (Helwan)	30,000	46,000	110,000	9.05
- El Obur	250,000	280,000	50,000	2.27
- El Amal	35,000	67,000	250,000	14.01
	<hr/>		<hr/>	
	644,000		2,210,000	

To improve their absorption capacity, the settlements with the most potential should be reassessed to enable them to absorb a greater proportion of the expected population increase or at least insure that they meet their target populations. Given current delays in construction and difficulties in attracting growth, these target goals may not be achieved unless significant revision in implementation and management procedures are undertaken. Furthermore, even if the target objectives were met, not all of the growth would necessarily be from the Cairo Zone. For example, Sadat City and the 10th of Ramadan should draw from the Delta cities and the former from Alexandria.

With respect to development potential, it has been concluded that El Amal and Sadat City have the least prospects of meeting growth expectations. El Amal is proposed in a location with very little economic potential and where development costs are likely to be high (i.e. water supply). Sadat City is far removed from both Cairo and Alexandria and suffers from poor linkages with the Delta. With respect to the former, two alternative sites are recommended for consideration: a satellite city similar to the 6th of October across from Helwan on the west desert bank or a location along the Suez road in proximity to the 10th of Ramadan. Of these, the first appears to have

the greatest potential and could capitalize on close proximity to existing urban systems and the growth of momentum of Helwan/Tebbin. The scale of the project should be comparative with that of El Obur and the 6th of October (350,000).

It has been assumed that Sadat City will absorb 250,000 of the required metropolitan growth. However, if this is to be achieved, it will require a major reassessment and growth stimulus. Development in the northwest including El Obur and Belbeis will improve the development potential of the 10th of Ramadan, hence, it is assumed to meet its target population of 500,000 by the year 2000.

In general, the satellite cities have a strong potential for development particularly the 15th of May, the 2nd Residential City and El Obur. The 6th of October requires further urban consolidation in the southwest in order to gain required momentum. On this basis, the satellite cities should be given first priority for development followed by the 10th of Ramadan and Sadat City. The 15th of May and 2nd Residential City should also be expanded (an increase of 100,000 has been suggested).

Options which might improve the development of the satellite cities and new towns will be discussed in the Second Round Alternatives. This will include both proposals for improved management as well as revised physical standards. In Appendix I to this Chapter a brief discussion of the impact of required investment for the settlements in the context of available resources is discussed (based on the different alternative national urban strategies).

B. Other Urban Expansion

Belbeis, 1976 population (70,000), is one of the faster growing southern Delta cities (3.84 percentage per annum). As its unique location permits desert expansion and linkages with the Delta, the Ismailia Canal and El Obur and the 10th of Ramadan, it could conceivably absorb a share of Metropolitan Cairo growth. In order to have an impact on overall metropolitan population distribution, however, it would have to absorb a population of at least 150,000. Whether this is feasible requires further assessment.

C. Infill, Expansion and Irremedial Arable Fringe Growth  
(of the built-up area)

Kism population forecasts for Greater Cairo conducted by the various wastewater and waterworks sectoral studies were previously discussed and provide the basis for likely infill and urban extensions (see Table V.4). The forecasts, which were based on current trends, however, assumed that the 2000 population would be absorbed entirely within the contiguous urban area. Furthermore, although population absorption was taken into account for the southern satellite cities and El Obur (150,000) the other new towns and satellite cities were not.

As the forecasts were based on the ring road constraint concept of the 1970 preliminary master plan, they resulted in excessive gross kism densities as high as 1,400 inhabitants per hectare and residential densities of 1,850 inhabitants per hectare in the northern kisms (see Table V.13). Densities of this nature cannot be easily achieved within the current residential structure types (i.e. 4-5 storey walkups). Before densities of this nature are reached, they tend to stabilize and then decrease in density. Bab el Shaareya for example had a gross kism density of 1,400 per hectare in 1960, however, it had declined to 1000 by 1976.

The expected residential densities as forecast by the latest wastewater study are presented in Table V.13. In general the projected populations and densities for kisms with densities lower than 800 inhabitants/hectare have been maintained. (an option for a higher density of 1000/hectare is also determined). Excess population due to high density and controlled arable fringe development have been deviated to other development areas. In low density kisms such as Nouzha, Heliopolis, Nasr City and Khalifa (Makattam Hills) the densities have been increased from an average of 370 to 470 persons/hectare in order to reflect a reduction in future development standards and permit more access to these areas by middle income households. If this were done, these kisms could absorb an additional 500,000 inhabitants (above the year 2000 forecasts).

Through reduction of high densities arable fringe growth, implementation of planned urban extensions, and increased densities in high standard kisms, the

TABLE V. 13

## GREATER CAIRO -2000

## EXCESS POPULATION RANGE DUE TO HIGH DENSITY FORECASTS

KJSM/ DIRECTION	FORECAST 2000 POPULATION (000)	RESIDENTIAL AREA HECTARES	DENSITY PERSONS/RES HECTARE (000)	EXCESS POPULATION 100.000 PERSONS/RES HECTARE (000)	EXCESS POPULATION 100.0 JO PERSONS/RES HECTARE (000)
<b>CENTRAL</b>					
Ezbekia	51	96	530	---	---
Bab el Shaaria	90	107	841	---	4.4
Mouski	46	58	793	---	---
Subtotal	187	261	AV.716		4.4
<b>NORTH</b>					
Sharabia	793	440	1802	353	441
Sahel	1105	657	1682	448	580
Shoubra	102	130	761	---	---
Shoubra El Kheima	1397	1761	793	---	---
Subtotal	3397	2992	AV.1135	871	1134
<b>NORTHEAST</b>					
Wayli	183	159	1151	24	56
El Kobba Gardens	503	410	1126	52	134
Zaher	95	125	760	---	---
Zeitoun	760	560	1357	200	312
Mataria	1449	2034	71	---	---
Heliopolis	210	690	304	---	---
Nouzha	278	750	371	---	---
El Obur	150	768	195	---	---
Subtotal	3628	5496	AV.660	276	502
<b>EAST</b>					
Nasr City Subtotal	725	1625	AV.446	---	---
<b>SOUTHEAST</b>					
Darb El Ahmar	151	250	604	---	---
El Gamaliya	200	170	1175	28	64
Khalifa	500	1549	323	---	---
Subtotal	851	1969	AV.432	28	64
<b>SOUTH</b>					
Abdeen	55	80	688	---	---
Sayeda Zeinab	140	250	560	---	---
Misr El Kadima	355	705	504	---	---
Maadi	970	2250	431	---	---
Helwan/Toura/Tebbin	1125	2000	562	---	---
Subtotal	2645	6080	435	---	---
<b>SOUTHWEST</b>					
Kasr El Nil	32	157	203	---	---
Dokki	158	375	421	---	---
Boulak El Dakrou	830	1823	455	---	---
Giza	245	264	1117	31	84
El Ahram	360	720	500	---	---
Subtotal	1675	3339	AV.502	31	84
<b>WEST</b>					
Boulak	115	153	752	---	---
Agouza	235	494	668	---	---
Subtotal	350	647	AV.541	---	---
<b>NORTHEAST</b>					
Rod El Farag	285	215	1326	70	113
Imbaba	752	1700	442	---	---
Subtotal	1037	1915	AV.542	70	113
<b>Total</b>	<b>14495</b>	<b>24324</b>	<b>AV.596</b>	<b>1276</b>	<b>1901</b>

TABLE V.14

ARABLE FRINGE GROWTH BASED ON ASSUMPTION OF 50 PERCENT REDUCTION AFTER 1985

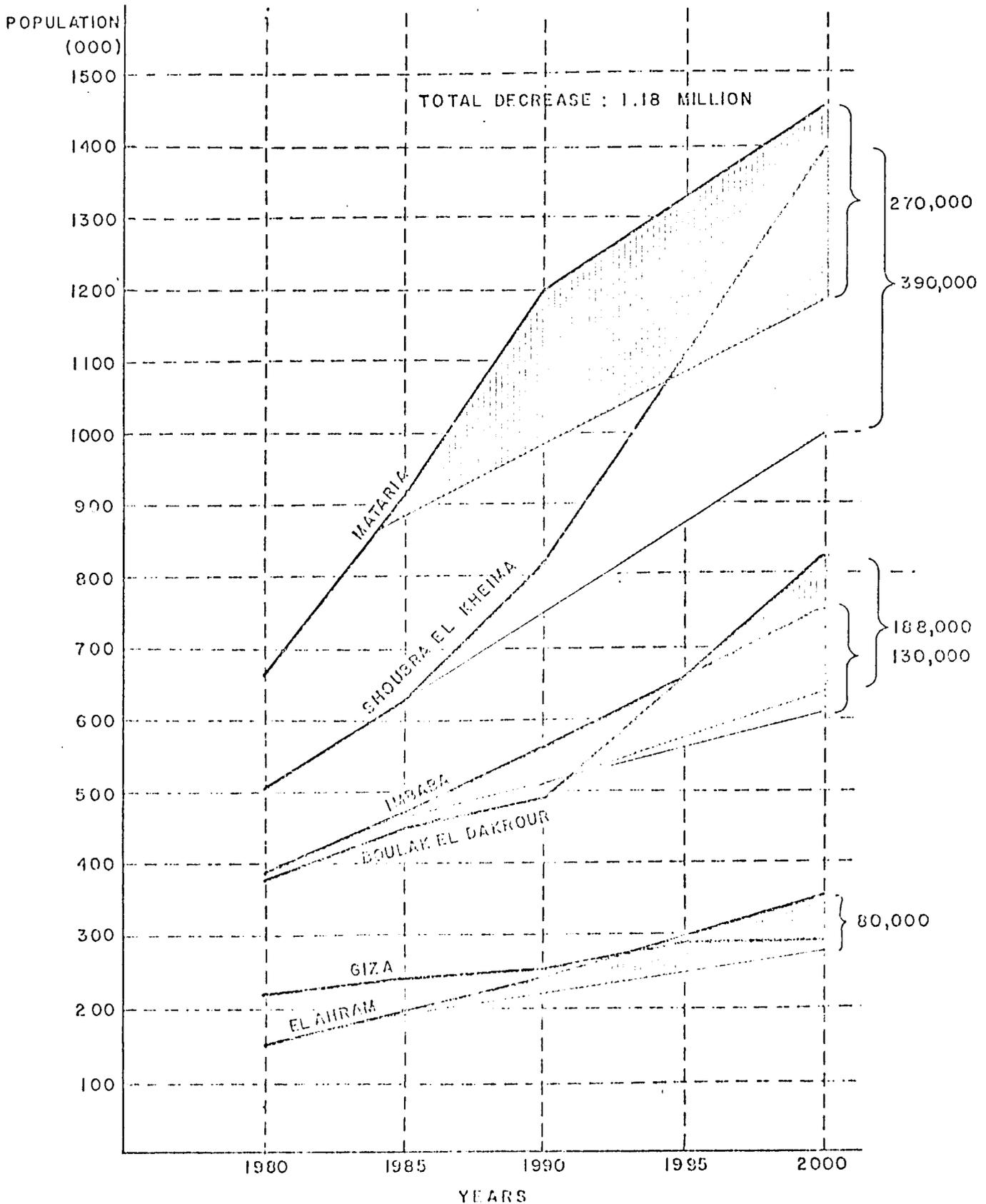
	1980 (000)	1985 (000)	1990 (000)	2000 (000)	A 1980-2000 (000)	B 1980-1985 (000)	C 1985-2000	50% C 1985-2000
<u>NORTH</u>								
Shoubra El Kheima	506	626	810	1397	891	126	771	386
<u>NORTHEAST</u>								
Mataria	670	910	1200	1450	780	240	540	270
<u>SOUTHWEST</u>								
Boulak El Dakrur	380	455	495	830	450	75	375	188
Giza	220	240	255	295	75	20	55	28
Ahram	<u>157</u>	<u>200</u>	<u>247</u>	<u>360</u>	<u>203</u>	<u>43</u>	<u>160</u>	<u>80</u>
	757	895	992	1485	728		590	296
<u>NORTHWEST</u>								
Imbaba	392	477	564	752	360	85	775	138
	2325	2908	3571	5084	2759	589	2176	1090

TABLE V.15

SUMMARY EXCESS GROWTH TABLE

	EXCESS DENSITY	EXCESS FRINGE GROWN	TOTAL	% TOTAL
Center	0.44	---	4.4	
North	871-1134	326	1257-1520	53-51
Northeast	276-1134	270	546-772	23-26
Southeast	28-64	---	28-64	1-2
Southwest	31-84	296	327-380	14-13
Northwest	70-113	132	208-251	9-8
	<hr/>	<hr/>	<hr/>	<hr/>
	1276-1901	1090	2370-2991	

## POSSIBLE ARABLE FRINGE GROWTH REDUCTION (50 PERCENT AFTER 1985)



built up area could absorb 5.2 million of the future metropolitan growth requirements.

D. Excess Population Due to High Densities and Reduction of Arable Fringe Growth.

In order to determine "excess population" due to high densities, gross residential densities were first determined using year 2000 "Wastewater" and "Waterworks" forecasts. The "excess" population was derived from subtracting expected densities from more moderate residential densities ranging between 800 and 1000 persons/hectare as indicated in Table V.13. This produced a range of between 1.28 and 1.9 million inhabitants.

Fringe "excess" population was determined after 1980 assuming that the then government interventions in arable land preservation will begin to take effect. On this basis it was assumed that 50 percent of the growth (1.09 million) could be channelled to other, more desirable areas. As Table V.14 and Fig. V.14 indicate, these appear to be reasonable assumptions based on the strong growth trends of these areas between 1985-2000. Fringe growth between 1980-1985 estimated at 589,000 was not included in these estimates.

Table V.15 combines both excess density and fringe population (2.37 to 2.99 million). It also indicates that 76 percent of this growth is expected in the northern and northeastern sectors. Thus, government intervention in the northeast (El Obur) should have the greatest impact in accommodating excess population growth.

The other dominant excess growth area is the southwest and west which accounts for about 22 percent of the total excess population. The 6th of October could benefit from this growth. However, since the excess growth areas are close to the Nile and tied to CBD and southern employment (Helwan), other alternative sites on the east bank could also prove useful (i.e. Nasr City and Maadi extension).

E. Short Term Low Income Housing

Most of the excess population due to high densities and arable fringe areas growth are low income households in the northern and western kismas which are tied to employment opportunities in the inner city areas or industrial zones (both north and south). In order to avoid excessive arable fringe growth and densities in

these risks, it is recommended that several alternative low income housing areas be established within the next few years to accommodate part of this growth and to reinforce the east/west development axis.

On the basis of the excess population estimates and considering that the 1980-1985 fringe growth of 589,000 was not included in the long term estimates, it appears feasible to create a short term or immediate action land development program to house 600,000 inhabitants. This will require the development of serviced sites in desert areas where small scale housing developers will function. Government's role should be to provide the serviced land and develop a mechanism to assist and channel development in these areas to benefit low income households.

The suggested locations of these projects are indicated in Figs. V.12 and V.13. A suggested population distribution includes:

TABLE V.16

PROPOSED SHORT TERM HOUSING DISTRIBUTION

	<u>Population</u>	<u>Hectares*</u>
Northeast:		
El Obur/Abu Zaabal	250,000	625
East:		
Nasr City	125,000	13
South:		
Maadi Extension	100,000	250
Southwest:		
near 6th of October	75,000	189
	<hr/>	<hr/>
	600,000	1,377

\* Assumes overall 400 gross density

The importance of these short term developments is stressed as it is not likely that any of the other settlement options will provide a real alternative to these short term growth requirements.

F. Southwest Consolidation

At the present time, there are several industrial and cooperative residential projects planned or under consideration in the southwest along the Alexandria and El. Fayoum desert roads. Given the overall urban growth needs, this area could be developed without causing any threat to the development of the 6th of October. On the contrary, permission of private development in this area will most likely provide the growth momentum that the 6th of October requires, provide a labor pool for nearby industrial zones and set the trend for the northeast/southwest development axis. A population of about 600,000 could be accommodated in this area.

G. Summary of Population Distribution Proposals

Table V.17 provides an indication of where an expected population increase of (8.45 million) between 1976 and 2000 might be distributed within the Greater Cairo Zone. The greatest proportion of growth accommodated through infill and expansion of the contiguously developed area due to the current high growth trends and expansion opportunities. Where these growth trends are particularly negative (arable land development and excessive northern kism densities), alternative short term sites have been suggested which reinforce either the northeast/southwest or eastern axes in desert locations. Interregional deconcentration is stressed through development proposals in the northeast, southwest, and northwest. Ultimately the long term growth should be structured as suggested in Fig. V.11. The ability to achieve these ends, however, will depend on the priorities established between now and the year 2000. The suggested distribution is a first attempt at locating the massive growth expected. Obviously, these proposals require in depth study and may be modified in the Preferred Alternative Report.

TABLE V.17

METROPOLITAN CAIRO CONCEPT PLAN  
DISTRIBUTION OF FUTURE POPULATION 2000

EXPECTED POPULATION GROWTH 1976 - 2000: 8.2 - 9.5 MILLION (8.45 MILLION) <sup>1/</sup>

<u>ABSORPTION AREAS:</u>	<u>POPULATION INCREASE:</u>	<u>COMMENT</u>
- Infill, Expansion, and Irremedial Arable Fringe Growth	5.2 Million <sup>2/</sup>	Based on 2000 Forecasts Minus excessive density and remedial arable fringe growth
- Short Term Low Income Housing	0.6	See Figure 5.13 and Table V.16
- Southwest Consolidation	0.6	See Figure 5.13
- Satellite Cities		
6th of October	0.35	Target population
El Obur	0.35	Target population
Alternative to El Amal	0.35 <sup>3/</sup>	Location: Suez road or southwest
Expansion of 15th of May and 2nd Residential city	0.1 <sup>4/</sup>	Proposed Increase
- New Towns		
10th of Ramadan	0.5	Target population
Sadat City	0.25	One-half target population
- Bilbeis Desert Expansion	0.15	Proposed new development
	-----	
	8.45	

<sup>1/</sup> 8.45 Million approximately equivalent to alternatives B1 + B2

<sup>2/</sup> Includes 15th of May 2nd residential city target growth and increased density of high standard development areas ( Nozha, New City, Maqattam )

<sup>3/</sup> El Amal was found to have low development potential therefore alternative sites were suggested

<sup>4/</sup> 15th of May and the 2nd residential city are recommended for increased populations

CHAPTER V

FOOTNOTES

1/

There are multiple definitions of the Cairo planning area in use. The most frequently cited are:

	<u>1976 Population of Egypt</u>	<u>% Total Res. Population of Egypt</u>	<u>% Urban Popula- tion of Egypt</u>
1. Cairo Governorate	5,074	13.9	31.6
2. Urban Metropolitan Cairo Cairo Governorate & Cities of Giza & Shoubra El Kheima	6,700	18.3	41.8
3. Greater Cairo (CAPMAS): Metropolitan Cairo <sup>1</sup> plus rural population of Giza District	6,794	18.6	42.4
4. Greater Cairo Region (CAPMAS) greater Cairo <sup>2</sup> plus districts of El Khanka, Qalyub, El Kanater El Khayriah; cities of Shebin El Kanater, Badrashin and Hawadiah; some villages of districts of El Saf Shebin El Kanater, Badrashin, Imbaba	8,063	22.0	50.3
5. Urban Cairo Planning Region Cairo Governorate plus urban popu- lation of governorates of Giza and Qalyubia	7,137	19.5	44.5
6. Cairo Planning Region Urban Cairo Planning Region <sup>3</sup> plus rural population of governorates of Giza and Qalyubia	9,172	25.0	57.2

SOURCE: 1 Estimates for populations of Cairo governorates and rural urban populations of governorates of Giza, Qalyubia are based on 1976 census data final reports.

2 Estimates of all other cities and villages are from 1976 preliminary census data from CAPMAS, Statistical Indicators.

- 2/ Exceptions to this rule, however, include the Nasr City area and the Helwan/Masr Gadida Corridor where massive improvements are either planned or underway and where substantial areas can still be developed.
- 3/ Waterbury, Cairo Third World Metropolis, Part II, Transportation p.12 from "An End to Light Transportation in Cairo", S. Ashawi, 1972.
- 4/ Cairo Development and Infrastructure, Wheaton, MIT, 1980.
- 5/ IBRD, Economic Management in a period of Transition Vol. II, Human Resources, May 1978.
- 6/ Wheaton, op. cit.
- 7/ Nedeco Quarterly Report National Transportation Investment Plan
- 8/ Wheaton, op. cit.
- 9/ During the period 1977-1979 the formal contribution to the urban housing stock is estimated to have increased to 66,000 units annually of which 40 percent is public housing. MOH October 1980.
- 10/ The underground was expected to solve 40 percent of Cairo's surface transportation problems.

## CHAPTER V.

### APPENDIX I

#### INFRASTRUCTURE INVESTMENT IN THE GREATER CAIRO ZONE UNDER VARIOUS SETTLEMENT ALTERNATIVES

All of the alternatives except A have standards in the Greater Cairo Zone which are lower than other higher priority settlement zones such as the Canal Zone to induce migration away from the Greater Cairo Zone. Nevertheless, due to its very large existing population and expected increases, the total infrastructure requirements for the zone result in a large resource demand for the zone. Although the populations are much greater, the existing standards already achieved and the large capital resources which are targeted for the zone allow a much greater degree of flexibility in determining target groups within the zone and financing new infrastructure. The following assessment of the likely costs of Greater Cairo zone new towns and satellite cities illustrates the impact which different standards and target groups sizes can have on the standards provided for the population of the rest of the zone.

The first case shown on Table (I.a) estimates the costs of the new towns using the per capita costs resulting from current tender costs and masterplans and the likely increase in population between 1985 and 1990 if they have uniform compound population growth rates between 1985 and 2000. <sup>1/</sup> Case II shows sensitivity of the likely costs of the new towns and satellite cities to total zone infrastructure costs if the 1986-1990 population increase is 50 percent higher than Case I.

The first case shows that roughly 2.8 percent of the expected increase of the zone's population which would be targeted for the new towns would require roughly 18 to 23 percent of the total infrastructure investment allocated to the zone under the different alternatives. Expenditures of these magnitudes would reduce the per capita investment available for infrastructure for the remaining population from L.E. 335 to 259 in alternative B1 (Efficiency). This reduction in infrastructure investment targeted for the population in the contiguous area could be made without seriously reducing standards either through modifying all infrastructure standards or through reducing standards of some components of infrastructure. For example, the standards of water supply and sewerage which are projected to have service levels which are very high in comparison to those proposed for other urban settlements could be reduced. Reductions in average unit sizes, greater investment on upgrading existing stock and careful targeting of housing investment to different income groups are procedures which could be used to reduce housing costs.

While case I indicates that it would probably be possible develop priority settlement areas within the zone at much higher standards

CHAPTER V.

APPENDIX I: TABLE I-a

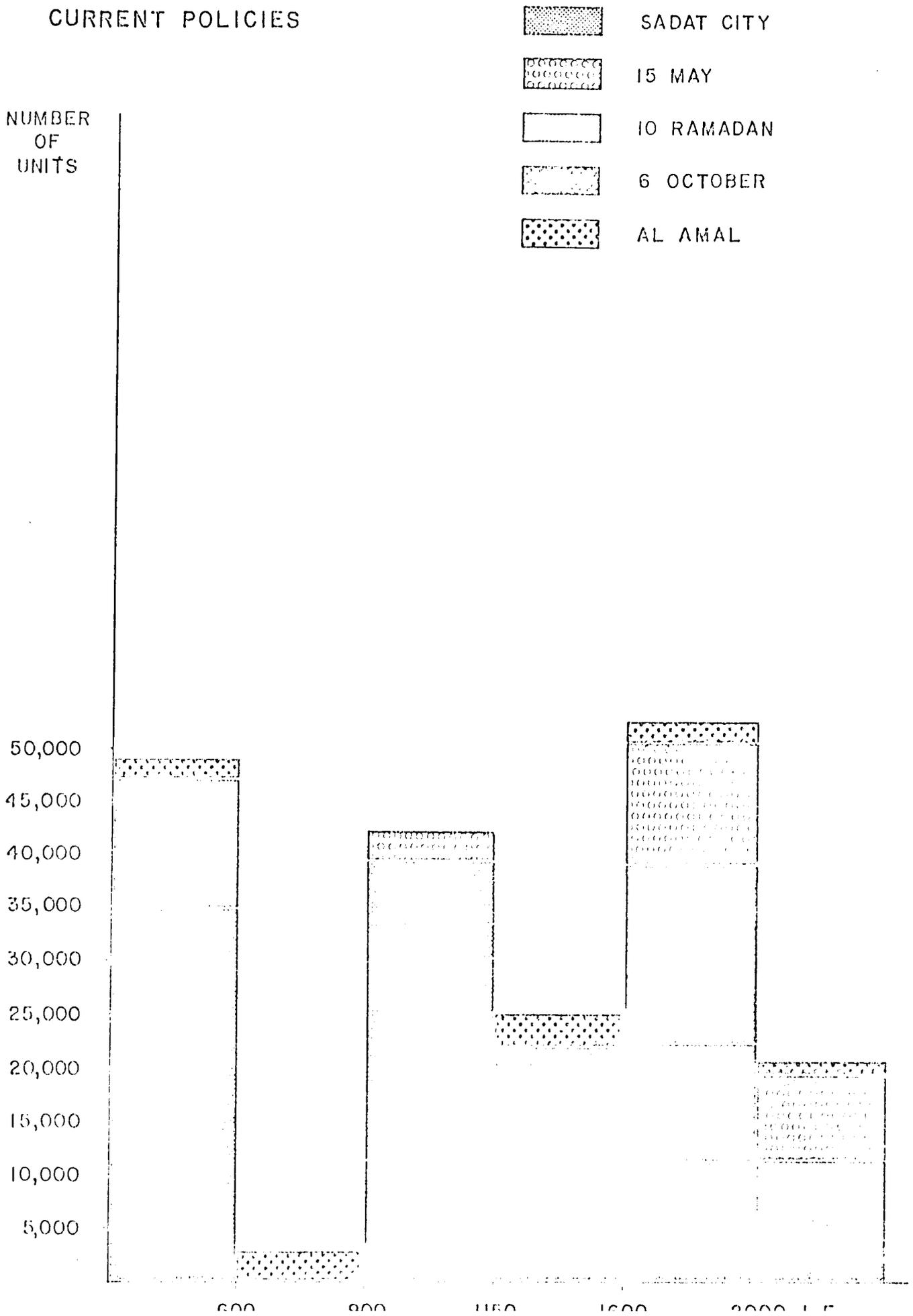
COMPARISON OF INFRASTRUCTURE INVESTMENT IN NEW TOWNS WITH TOTAL INFRASTRUCTURE

INVESTMENT AVAILABLE FOR GREATER CAIRO ZONE UNDER DIFFERENT ALTERNATIVES

ALTERNATIVE	TOTAL INFRASTRUCTURE INVESTMENT		CASE I. NEW TOWNS AT TARGET GROWTH RATES				CASE II. NEW TOWNS AT 150% OF TARGET GROWTH RATES			
	(L.E. MILLIONS)	PER CAPITA (L.E.)	PROPORTION OF POPULATION IN NEW TOWNS (1986-1990)	INFRASTRUCTURE INVESTMENT NET OF NEW TOWNS (L.E. MILLIONS)	PER CAPITA (L.E.)	PERCENT OF TOTAL	PROPORTION OF POPULATION IN NEW TOWNS (1986-1990)	INFRASTRUCTURE INVESTMENT NET OF NEW TOWNS (L.E. MILLIONS)	PER CAPITA (L.E.)	PERCENT OF TOTAL
A	4,554.6	407.4	2.7	3,653.5	335.9	82.4	4.1	3,192.7	298.3	73.2
B1 Efficiency	3,608.8	335.3	2.8	2,707.7	258.8	77.2	4.2	2,256.9	218.9	65.3
B1 Equity	3,608.8	335.3	2.8	2,707.7	251.6	75.0	4.2	2,256.9	218.9	65.3
B2 Efficiency	3,970.0	367.2	2.8	3,068.9	292.0	79.5	4.2	2,618.1	252.7	68.8
B2 Equity	3,969.9	367.2	2.8	3,068.9	292.0	79.5	4.2	2,618.0	252.7	68.8
C	3,825.9	343.0	2.7	2,924.8	269.5	78.6	4.1	2,474.0	231.2	67.4
A at "C" Standards	4,557.5	429.9	2.8	3,656.4	350.8	82.6	4.2	3,205.6	312.0	73.4
C at "A" Standards	3,807.9	355.0	2.8	2,906.8	278.8	78.5	4.2	2,456.0	239.0	67.3

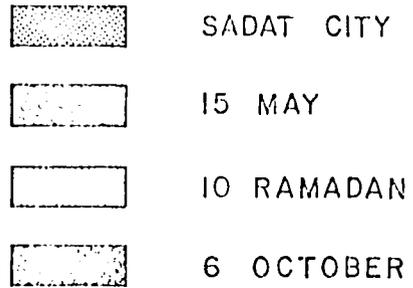
# NEW TOWN AND SATELLITE CITY AFFORDABILITY

## CURRENT POLICIES



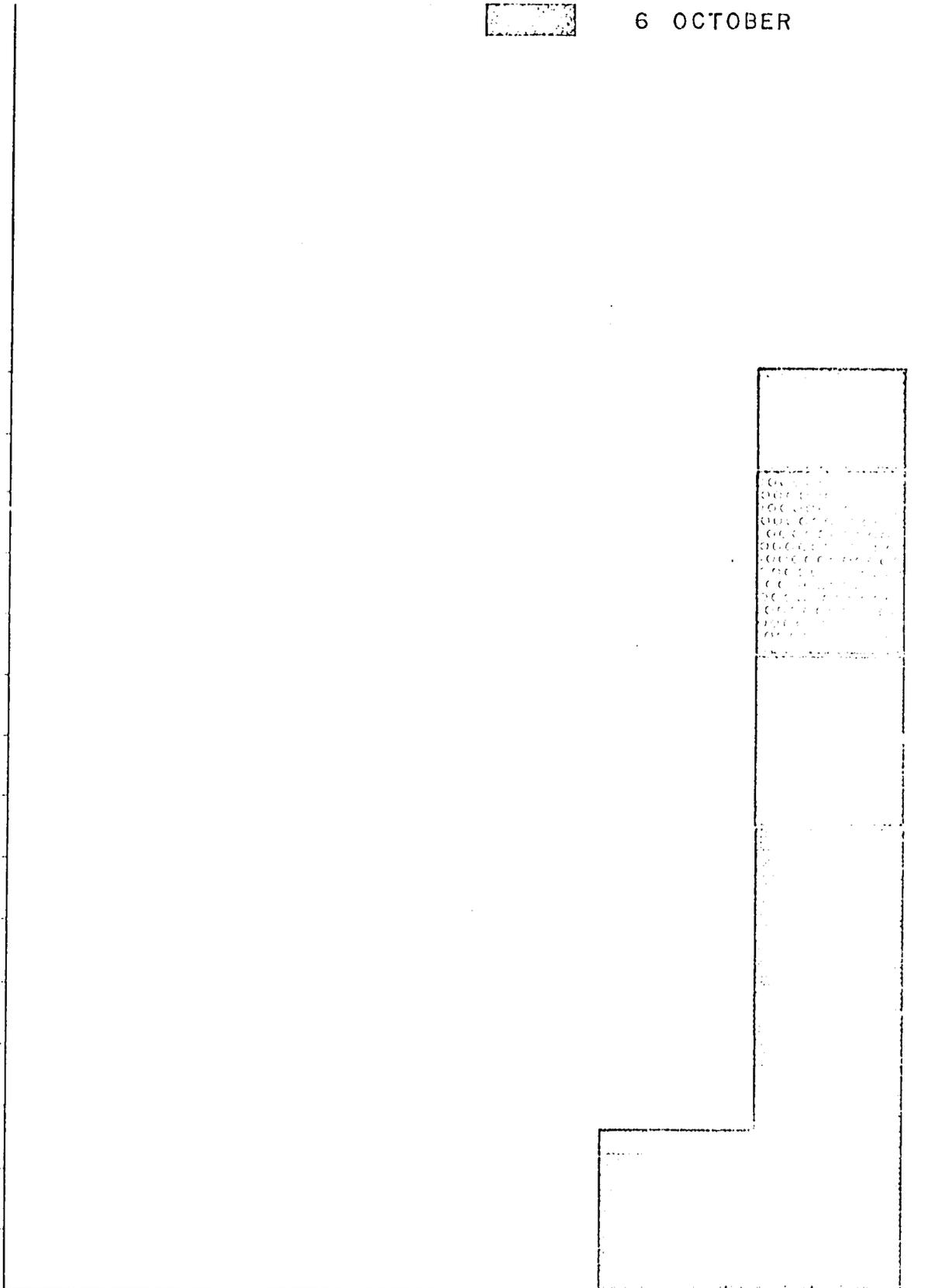
# NEW TOWN AND SATELLITE CITY AFFORDABILITY

FULL COST RECOVERY  
AL AMAL NOT INCLUDED



NUMBER  
OF  
UNITS

150,000  
140,000  
130,000  
120,000  
110,000  
100,000  
90,000  
80,000  
70,000  
60,000  
50,000  
40,000  
30,000  
20,000  
10,000



600

900

1150

1600

2000 1 F

than the rest of the zone to induce population to migrate to these priority areas, case II indicates the sensitivity of the total investment allocated to infrastructure in the zone to investment in priority areas. In the second case, 4.2 percent of the expected increase in the zone's population would be accommodated in new towns or satellite cities by increasing their 1986-1990 growth by 50 percent, but maintaining standards and thereby per capita investment requirements at the same levels as in the first case. As the table indicates, between 28 and 35 percent of the total infrastructure investment allocated to the zone would be required for the new towns. This would result in a reduction in per capita investment for the rest of the zone from L.E. 335 to 219 in alternative B1, the most extreme case. As in the first case, this level of expenditure in the new towns and satellite cities could be accommodated, but it would require much more drastic reductions in standards in other areas, such as all physical infrastructure costs would have to be reduced 50 percent, housing cost 75 percent and other social infrastructure costs by 50 percent. Increases in gross densities, modifications in infrastructure standards and increased populations in the new towns could reduce their costs to levels where their standards are still higher than the rest of the zone to encourage the growth of the new towns, but would not require such drastic reductions in standards in other areas.

#### AFFORDABILITY OF NEW TOWNS AND SATELLITE CITY DWELLING UNITS

In figures, 5.15 and 5.16, the number of planned dwelling units at current prices are related to income group affordability at current subsidized prices and full cost recovery respectively. It is obvious from these illustrations that the standards of the proposal dwelling units do not reflect household affordability unless they are significantly subsidized. Also, as was pointed in the previous section, at current costs and recovery policies they represent a significant burden on available resources and will ultimately affect distribution of infrastructure investment to other required areas.

## CHAPTER V.

### APPENDIX II

#### POPULATION ABSORPTION ZONES AND SUB-ZONES

In order to structure the proposals of the concept plan and development strategy special zones and subzones have been proposed. The zones themselves are directional in nature however subzones require attention of a special nature: some are designated for population absorption, for example while in others development is recommended to be restricted.

In this section, a brief description of the development potential of each zone is described followed by a discussion of the specific nature of actions which are required in each zone.

<u>ZONES</u>	<u>DESCRIPTION AND DEVELOPMENT POTENTIAL</u>
NORTH:	The northern zone has the heaviest concentration of infrastructure in the region and has a strong industrial base. It is generally flat and can be easily developed. However, as it is a rich agricultural zone efforts there should be aimed primarily at restricting growth.
NORTHEAST: EL OSUR/ 10TH OF RAMADAN/ BILBELS	Of all potential the desert expansion areas this zone has the highest concentration of infrastructure and includes an established industrial base at Abu Zabal, reclamation sites on the Ismailia desert road and near Bilbeis. There are no major physical constraints for development with the exception of the El Franka sand dunes. However, there are several military establishments in the area and some problems related to civil defense and the international airport. Considered as a whole, the zone has the most potential of the desert areas for development in both the short, medium and long term. The area can capitalize on growth trends in the northern fringe areas (Matareya), the Ismailia desert road corridor and the south-east Delta to insure population absorption.
EAST: HELIOPOLIS/ NOUZHA/NASR CITY/ ISMAILIA - SUEZ DESERT ROAD CORRIDORS	To date, this zone has been a principle growth area for upper middle and upper income groups. Development, in this area, is characterized by high standard low density housing which is still undergoing densification. It has a strong infrastructure base + urban transportation net-

work for residential development and is the site of several government institutions and a commercial center (at Heliopolis). Military installations still occupy a significant part of land in this area including the Almaza airport though negotiations are currently underway to obtain some of this land for residential development by the Nasr City company. Some light industry has been planned and implemented in the area. The area has high potential for population absorption including households from the overly dense central city districts which might be displaced by renewal and upgrading programs there.

SOUTHEAST: MUQATTAM  
HILLS/EASTERN  
PLATEAU EL AMAL

This zone has a very low level of activity and very little infrastructure, though roads from Heliopolis to Maadi and Maadi to the Red sea exist. A principal problem of the zone is the lack of water. It does offer some climatic advantages over other desert areas because of its elevation. Accessibility to the zone is also restricted because of the Muqattam ridge. The immediate south eastern area is the site of upper income residential development and a large military installation. Because of a lack of infrastructure and economic activities in the zone it probably has at best long term development potential in general and short term potential for upper income residential growth in the Muqattam hills for which accessibility is not a major problem.

SOUTH: MISR EL  
KADIMA/HELWAN EAST  
BANK/GIZA UPPER  
EGYPT ROAD/  
WEST BANK

The south is divided into two basic subzones: the east and west banks. The eastern bank of the Misr El Kadima/Helwan corridor has the strongest industrial base in all of Egypt in the area of Helwan and a high ratio of jobs vis a vis resident population. It is flat and conducive to development and strong trends already exist for development in this area. It has a good infrastructure base and expanding urban transport network. The area has such a high development potential that loss of all arable land in the zone is inevitable. According to population forecasts and trends alternative desert sites to the east of Maadi and east of Helwan will notably need to be developed in order to avoid excessive long term densification, and discourage development on the western bank.

The western bank is still primarily agricultural, though it is the site of some industry and residential development particularly south of Giza

and across the bridge from Helwan. Given the presence of the Upper Egypt road and rail, the zone offers high locational opportunities vis a vis Helwan and the central area and consequently has very high development potential. Because there is still a chance that the southern west bank can be preserved for agricultural purposes, however, growth in this area should be restricted. Expected development should be diverted to the East Bank and other appropriate sites.

**SOUTHWEST:** The southwest includes the pyramids avenue corridor the southwest desert areas including parts  
**PYRAMIDS AVENUE** of the Alexandria desert road, and El Faiyum  
**CORRIDOR/ALEXANDRIA** desert roads as well as the 6th of October  
**AND EL FAIYUM DESERT** satellite city and the pyramids district from  
**ROADS/6TH OF OCTOBER** Giza to Dahshur. This zone includes arable land  
**SATELLITE CITY AND** along the pyramids avenue corridor and desert  
**GIZA/DAHSHUR** land on the western Giza plateau. Along the  
**PYRAMIDS DISTRICT** pyramids corridor to the 6th of October  
satellite city on El Faiyum road urban services  
are already in place. There is a major housing  
complex and reclamation project planned by the  
Pyramids Residential Cooperative along the  
Alexandria desert road near the Abu Rawash  
district sewerage treatment plant. Some light  
industrial developments are also planned at the  
6th of October, and in the Abu Rawash district  
sewerage treatment plant.

Some light industrial developments are also planned at the 6th of October, and in the Abu Rawash district.

Most of the residential development in the southwest is geared towards middle and upper income households which are employed outside the zone (I.E. CBD).

Lower income groups cling to more central locations such as Boulac El Dakrou and are most probably tied to employment options in the central and southern areas. Plans are being made for an extension of Tahrir street to the Alexandria desert road which when coupled with a major sewer trunk line to Abu Rawash will create a strong tendency for growth between it and the pyramids avenue this will have to be strictly controlled. When an industrial base is established in the south west however, whether at Abu Rawash or the 6th of October the southwestern desert area will gain more potential for absorbing low income populations.

The pyramids district between the Giza Plateau and Dahshur has so far been relatively protected by from development (partially because of military installations). This area should be preserved for archeological and recreational purposes.

WEST/GIZA/IMBABA  
AGRICULTURAL ZONE

The western zone is primarily agricultural but it has been a natural urban expansion area for the central urban zone. With the exception of informal development in Imbaba (and Boulac El Dakrou) recent measures to control urbanization have been effective (i.e. some planned industrial programs have been cancelled). The western arable area may be able to be preserved for agricultural purposes and hence requires development restrictions.

NORTHWEST:ALEXANDRIA  
DESERT ROAD/SADAT  
CITY

This area is basically deficient in infrastructure and is not well connected to the western Delta. There are virtually no economic activities in the zone with the exception of that in proximity to Cairo. Because of this, the area probably at best has only long term development potential unless measures are immediately taken to improve the infrastructure base linkages with the western Delta, and create strong job generating activities.

ZONE CAIRO CORE AREA SUBZONES

- OBJECTIVE: Improve current living conditions; provide only needed upgrading of core motor vehicle access; improve surface public transportation encourage deconcentration of core economic and administrative functions. Avoid excess densities in residential districts
- RECEPTION AREAS: Possible "transitory" reception of rural small urban migrants
- RECOMMENDED MEASURES:
- CONTROLS:
- Limit major investments in highway and subway system
  - Restrict industrial investment
  - Impose taxes on central business activities and residential areas
  - Increase tariffs for public transportation, and services in zone

- Discourage use of private vehicle: high customs duties licensing and parking costs; elimination of gasoline subsidy
- Require and enforce parking facilities in new construction
- Revise building regulation height to reflect floor area ratios and urban transport network carrying capacity
- Provide framework for CBD expansion (i.e. land use zoning)

ALTERNATIVES:

- Improve traffic management, parking facilities, enforcement and generally upgrade existing mass transport system as alternative to subway and major new highway access improvements
- Investigate possibilities for greater use of waterway for north/south traffic and east/west linkages with surface transportation
- In medieval conservation areas (southeast) upgrade Islamic and coptic monuments; provide building repair grants in aid and credit for renovation; some limited urban renewal; upgrading of public services, alternative residential locations for displaced households
- Provide alternative desert sites for northern excessive population growth (short term absorption areas)
- Gradually deregulate rent control or alternative system to permit "free market" pressure for deconcentration of some economic and residential activities
- Provide alternative sites for inner city industrial investment
- Use "entranceway" recommendations to deconcentrate rail, transportation, and warehousing facilities in desert locations

REQUIREMENTS:

- Master Plan of inner city area (coordinated with other Zonal studies)
- Structure to coordinate planning, administration, and implementation
- Study of inner city households to determine which absorption zone is most appropriate for

excessive population growth and sufficiently economically mobile households ... study of appropriate standards and socio-cultural requirements

- Study to determine which central economic activities can best be relocated in appropriate population absorption zones
- Study to deconcentrate rail freight, transportation sub center, and warehousing and markets
- Study of expansion requirements of Central Business district requirements possible secondary centers in Heliopolis and southern east bank corridor to assist core deconcentration
- Study of appropriate physical standards and target group for urban renewal and upgrading
- Study of appropriate tax structure (property, services, private vehical use) etc... to assist deconcentration
- Study of alternative surface and waterway transportation systems

#### ZONE II NORTHERN CAIRO/THE SOUTHERN DELTA

OBJECTIVE: Restrict corridor development; deviate development into desert locations in the Northeast.

RECOMMENDED MEASURES:

CONTROLS:

- Limit industrial investment
- Limit highway entranceway capacities to Cairo destination and origin requirements
- Introduce restrictive land uses (on entrance ways + urban fringe)
- Prohibit water, sewer, and electrical connections for economic activities
- Enforce arable land preservation laws

ALTERNATIVES:

- Provide alternative locations for industrial and residential development

- Provide administrative, technical, and financial support to those household and economic activities opting for desert location
- Assist small farmers to increase earnings (i.e. credits + insurance to switch to higher gain crops)
- Provide alternative route(s) for intra regional traffic to replace agricultural corridors in northeast (see fig.V.12) and (eventually) the northwest

REQUIREMENTS:

- Up to date survey of building activities
- Periodic aerial photographs of areas for control purposes (when alternative sites have been identified)
- Identification of high priority agricultural areas which should be preserved "at all costs" and those areas which can be urbanized
- Identification of target groups for displacement to desert areas
- Identification of industries types and other economic activities which can be displaced to desert sites
- When alternative sites have been developed upgrade existing fringe development and coordinate irremedial infill
- Improve enforcement capacity of law 59

ZONE II NORTHEAST

OBJECTIVE:

Insure the coordinated development of the zone to achieve maximum development potential

PRINCIPAL RECEPTION AREAS:

Southern and southeastern Delta; Central Cairo

RECOMMENDED MEASURES:

CONTROLS:

- Insure orderly development and maximum efficiency of industrial zones in El Khanka and the 10th of Ramadan (and Bilbeis)

- Control residential development in absorption areas to achieve ultimate goals (i.e. if absorption of 10th of Ramadan is slow increase capacity of El Obur)
- Institute mechanism to deviate industrial and residential development from reception areas

**ALTERNATIVES:**

- Create alternative transportation corridors to northern entranceways within zone to serve industrial and residential areas, improve linkages with Delta and carry north/south and northwest/southeast traffic
- Improve desert mass transit or highway linkages with Cairo to El Obur and possibly the 10th of Ramadan to stimulate development
- Strengthen infrastructure in industrial zones of El Khanka and the 10th of Ramadan and possible Bilbeis as possible alternatives to southern Delta
- Create an immediate industrial and residential absorption zone in proximity to the Abu Zaabal industrial zone until El Obur and 10th of Ramadan gain development momentum
- Investigate development potential of Bilbeis desert expansion

**REQUIREMENTS:**

- Regional plan
- Assessment of target groups for appropriate subzones
- Delegation of development authority to appropriate agency(ies)
- Assessment of appropriate industries for each subzone
- Assessment of infrastructure and transport requirements
- Cost and investment coordination

**ZONE IV: EAST**

**OBJECTIVE:**

Improve development potential of zone; increase access to area for central city low income

households; control corridor development in desert roads

PRINCIPAL RECEPTION

AREA(S): Central City

RECOMMENDED MEASURES:

- CONTROLS:
- Impose vacant land taxes in areas presently served by urban services (exception: desert road corridor)
  - Require building companies to reduce standards and increase low + middle income beneficiaries
  - Restrict development on desert road corridors

ALTERNATIVES:

- Provide immediate absorption area in Nasr City for low income central cities households (to avoid northern fringe expansion) and as housing alternative for displaced households from center city due to renewal and upgrading
- Strengthen secondary urban center potential of Heliopolis/Nasr City
- Provide some alternative sites for light industry in Nasr City
- Seek to induce momentum of desert corridors to take place in 10th of Ramadan

REQUIREMENTS:

- Master plan for entire zone
- Nasr City subdivision guidelines to permit low income low standard development
- Create structure to permit low income "informal"- type development in immediate absorption subzone including "appropriate technology" in waste disposal
- Identification of target groups in zone that might be induced to relocate to 10th of Ramadan
- Assess required linkages with 10th of Ramadan
- Define potential role of secondary center at Heliopolis/Nasr City including types of economic activities which are most appropriate

ZONE V: SOUTHEAST

OBJECTIVE: Improve development potential in Muqattem hills district; hold Maadi/Heliopolis by pass corridor as reserve

PRINCIPAL RECEPTION AREAS: Central Cairo, northeast suburbs, Misr El Kadima Helwan corridor

RECOMMENDED MEASURES:

CONTROLS:

- Hold Maadi/Heliopolis desert area as reserve
- Maximize development potential of Muqattem hills (i.e. reassess subdivision standards)
- Control Maadi/El Aaal corridor development (with exception of Maadi immediate absorption area)

ALTERNATIVES:

- Reassess El Aaal new town; study and recommended alternative on Suez road or southwest
- Investigate feasibility of local resource base industries
- More in-depth study of economic potential of zone and relationship of El Aaal to Maadi/and Red Sea
- Resolve accessibility problem of potable and bulk water
- Study intra regional and inter regional highway and infrastructure requirements

ZONE VI: SOUTH

OBJECTIVE: Improve land use efficiency in zone and development potential but avoid excess densities

PRINCIPAL RECEPTION AREAS: Central Cairo, northern high density and west informal development areas, Upper Egypt

RECOMMENDED MEASURES:

East bank Controls:

- Land use

- Industrial investment and types
- Reduction of pollution
- Low income "informal" type development packages and implementation mechanism
- Fringe desert land availability

West bank Controls:

- Limit Upper Egypt highway capacity to local traffic
- Limit industrial investment
- Enforce law 59 and increase penalties
- Introduce restrictive land uses
- Restrict number of bridges to west bank
- Increase earnings of small farmers

ALTERNATIVES:

- Provide immediate absorption area in Maadi desert fringe area to absorb excess population from corridor and lower overall density (also possibly to east of Helwan/Tebbin)
- Investigate Helwan auto strade potential to serve local traffic as well as north/south and east/south by pass traffic
- Investigate possible alternative for by pass on eastern plateau
- Provide mechanism to provide alternative sites on east bank for would-be developers of west bank arable land
- Use available vacant land on east bank for low income households (using informal housing type techniques)
- Improve absorption capacity of 15th of May and the 2nd residential city by reducing standards and improving affordability of future expansions
- Maximize development potential of Fustat
- Upgrade poorly serviced existing low income communities and provide legal tenure

- Creation of urban tertiary commercial center in district

REQUIREMENTS:

- Master plan of zone
- Target group analysis and appropriate standards structure informal housing-type development
- Mechanism to provide appropriate housing type
- Improved enforcement techniques of law 59 on west bank
- Study possible restrictive land use proposals for west bank
- Study possible alternative for Upper Egypt road intra regional traffic in southwest desert area
- Study impact of proposed bridges on west bank undesired development
- Study expansion characteristics of small towns and villages on west bank

ZONE VII: WEST

OBJECTIVE: Contain urban fringe expansion, preserve arable land in west

RECOMMENDED MEASURES:

CONTROLS:

- Exercise and enforce law 59
- Channel informal development into alternative sites
- Limit industrial expansion, channel into alternative locations
- Introduce restrictive land uses (experimental agricultural farms in west)

ALTERNATIVES:

- Provide (possible) alternative short term housing in 6th of October and east bank
- Provide alternative industrial sites at 6th of October or Abu Rawash, Zaabal or Sadat City
- Upgrade and improve services in existing settlement when alternative location mechanism is in place

- Provide alternative to suggested transportation options and proposed ring road (i.e. surface transportation to waterway service, by pass corridor in desert areas)
- Increase earnings and assistance for small farmers

**REQUIREMENTS:**

Sub regional master plan (relate to current Giza master plan) target group and standards identification for short term absorption areas

- Study alternative means of transportation (to subway system) and western ring road (i.e. upgrading of western corniche only)
- Study commuting patterns and establish whether relocation (residential opportunities in the south or east) will reduce commuting by providing closer housing to employment
- Identify types of possible assistance to small farmers

ZONE VIII: NORTHWEST

**OBJECTIVE:**

Reinforce infrastructure support and linkages to Cairo and western Delta for medium and long term development

**RECEPTION AREAS:**

Western Delta, Cairo, and Alexandria

**RECOMMENDED MEASURES:**

**CONTROLS:**

- Institute development controls on Alexandria desert road
- Favor 6th of October industrial expansion over industrial development at Abu Rawash district
- If possible require Pyramids Residential cooperative to include low income housing to meet needs of reclamation area and industrial area at Abu Rawash

**ALTERNATIVES:**

- Provide alternative sites for desert corridor development (industrial and residential) in 6th of October, and Sadat City if possible

- If appropriate, introduce major employment generating industry and government services in time
- Increase infrastructure and linkages with Delta to zone particularly Sadat City (to include possible western cuter by pass/of Cairo central area and Upper Egypt road)

REQUIREMENTS :

- Regional master plan (including reassessment of optimum settlement areas)
- Study of development potential of zone and linkages with Cairo and Delta and Alexandria
- Study of alternative transport network to alleviate Cairo Alexandria Agricultural road for western Delta/Alexandria Upper Egypt traffic
- Identification of target group households for Sadat City
- Reassess possible economic, governmental, functions to stimulate Sadat City development