

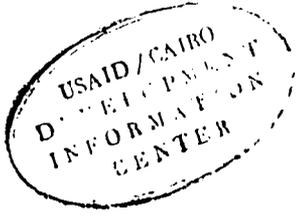
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دراسة السياسة القومية للتطوير
NATIONAL URBAN POLICY STUDY

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

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PADCO, INC.
WITH
ENGINEERING CONSULTANTS GROUP
AND
SHERIF EL-HAKIM AND ASSOCIATES

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تليفون

ص ٠ ب ١١٦٧ للقاهرة تلكس ٩٣٨٧٣

June 30th, 1981

Engineer Srliman Abdel Hai
Chairman,
Advisory Committee for Reconstruction
Ministry of Development
Cairo - A.R.E.

Dar Eng. Abdel Hai,

The National Urban Policy Study is pleased to submit our report on First Round Alternatives. Our Interim Action Report discussed alternative settlement patterns based upon urban policy strategies and settlement potentials. This report provides substantial new information about the possible alternatives to assist in the selection of a preferred strategy.

The report addresses both major cost and benefit issues in the choice of alternatives. In particular, we have developed detailed analyses of the direct investment costs for creating new industrial and service employment in different parts of the country; as well as the infrastructure costs for serving existing population and those attracted by newly created jobs. We have examined, also, the available legal and administrative instruments for implementing urban policy and inducing appropriate actions from private firms and public. Recommendations for additions or changes in these instruments are also provided. Finally, we have developed an initial concept plan for Cairo, which is intended

PADCO INC
In Association with
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و
شريف الحكيم ومشاركوه

to facilitate the implementation of a strategy of metropolitan deconcentration and reduce the adverse consequences of the size and growth of Cairo.

We would appreciate as always, comments and suggestions on the report and our major conclusions about the alternative strategies, their expected costs, and performance. Your review will facilitate our preparation of the Second Round Alternative Report and a more complete evaluation of the alternatives.

Sincerely,

A handwritten signature in cursive script that reads "Harvey A. Garn".

Harvey A. Garn
Team Leader

MG/1f

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INTRODUCTION

I. Overview

This report provides a substantial empirical and analytical basis for assessing the implications of choice among alternative settlement patterns. The alternative settlement patterns described in the Interim Action Report were derived from an analysis of urban policy principles and individual settlement potentials. In this report, the alternatives are further refined and partially costed.

The population distribution across settlements results from the spatial distribution of economic activity and, hence, from spatial patterns of investment in industry and services. Integration of investment in such productive activities and spatial policies is the major instrument of national urban policy. The population distribution consequences of allocating productive investment in different ways are the major focus of this report.

Investment in infrastructure, however, is both an additional instrument for achieving spatial objectives and a requirement for maintenance of the social well-being of the population -- wherever the people reside. It is, therefore, another major instrument of national urban policy. Appropriate infrastructure packages and their associated costs to accompany the allocation of investment in production is the second major subject addressed in this report.

In order to achieve the integration of investment and spatial policies -- i.e. to create a national urban policy -- instruments other than direct investment in production and infrastructure are required. Consequently, needed legal and administrative instruments to implement urban policy are discussed. These instruments are important in helping to structure the policy environment and to complement the use of direct investment instruments -- through enforcement of laws consistent with policy directions and inducements for both government and private citizens to make choices consistent with these policy directions.

Finally, the special problems of Cairo are addressed. Everyone knows that Cairo will grow in population -- if only from natural increase in its current population. The issues are how it will grow and how its growth can best be managed -- both physically and administratively. In spatial terms, the government has adopted a policy of deconcentration of core Cairo as a major strategy choice. Unfortunately, neither sectoral plans nor sectoral investments currently conform to this policy choice. As a result the development of Cairo is being driven by the momentum of past trends rather than clear policy choices. What we address in this report is the concept of a plan for Cairo, within the

context of a national urban policy, that can help overcome this major problem. The spatial policy of deconcentration adopted by the government can be made to work -- if it is linked to near term efforts to redirect investment and population growth to support that policy and longer term efforts to widen the attractiveness of non-contiguous centers to a wider range of the population.

II. Major Conclusions

Chapter I addresses two key questions:

1. How much investment is likely to be required between now and the year 2000 in order to achieve a 7 percent rate of growth in GDP and provide employment opportunities for the rapidly expanding labor force? and
2. How likely is it that the required investment resources will be available from domestic and foreign savings?

With respect to the first question, it is estimated that a 6.8 percent rate of growth in investment will be required to sustain a growth of GDP of 7 percent a year. At this rate of growth in investment, the amount invested in 2000 would be L.E. 12.6 billion more than the entire GDP in 1979.

This rate of growth in investment would result in a total investment pool of L.E. 127 billion for the period 1984-2000. The total investment required to reach the 7 percent growth rate for each five year time period are shown below.

	<u>Period</u>		
	<u>1986-90</u>	<u>91-95</u>	<u>96-2000</u>
Total Investment (L.E.million)	30,400	40,900	55,700

For purposes of this report, we are particularly concerned with the total investment required by time period for job creation in manufacturing, mining, construction and services plus housing and infrastructure. Our estimates of these totals are shown below:

Period

(In L.E. Billions)

	<u>1986-90</u>	<u>1991-95</u>	<u>1996-2000</u>
ing	10.9	18.5	29.5
	<u>14.7</u>	<u>15.5</u>	<u>16.7</u>
	25.6	34.0	46.2

The second question -- will the required funds be -- is necessarily guarded. As shown in achievement of the high rates of saving required investment figures cited above will necessitate shifts from recent savings patterns. Although there is a substantial foreign component in saving, it is clear that domestic saving -- both public and private -- has fallen over rates recently achieved to reach these target levels. A significant shortfall in saving would not only result in a decline in national output, but would also impede the achievement of the other major objectives of policy.

The seriousness of this situation emphasizes the need for a choice of national urban policy strategies. Chapters III provide evaluative information on the consequences of alternative choices.

Investment in productive sector jobs between 1986 and 2000 is expected to range from about L.E. 8.4 billion in the major metropolitan alternative) to about L.E. 13.4 billion in Alternative C (the most decentralized alternative). This is a difference in the average investment of about L.E. 5,800 to L.E. 6,600. The estimated total costs range from L.E. 13 billion in Alternative A to L.E. 14 billion in Alternative C. This represents a total cost increase from about L.E. 590 to about L.E. 1000. Direct and intra-urban infrastructure costs for the period 1986-2000 as estimated in this report are high relative to the savings which would be forthcoming if ways are found to improve on recent saving performance. These findings underscore the need to insure that all specific projects for both additional productive sector jobs and infrastructure be evaluated carefully in terms of their benefits relative to their costs.

The material presented in Chapters II and III indicates considerable room for choice for the govern-

ment in structuring the combined investment packages for direct job investment, housing and infrastructure. Direct investment in jobs can be associated with a variety of infrastructure packages utilizing different standards for individual housing and infrastructure elements in different settlement zones. If spatial priorities are set by national policy, targets for infrastructure design and standards can be adjusted to conform to these spatial priorities and estimates of available investment resources. Administratively this requires that plans for industrial sector investment, housing, and infrastructure need to be considered together at the same time that national output and financial plans are made.

A major conclusion of Chapter IV is that many of the legal and administrative instruments for implementing a national urban policy are already available to the government of Egypt or are contained in such proposed new legislation as the new national planning law. It is emphasized there also, however, that the coordinated use of those instruments (as well as the direct investment instruments) requires a more structured planning framework, more attention to enforcement and implementation of instruments available, and clarification of the required roles and actions of individual national ministries as well as the relative roles of the national and local governments.

Chapter V discusses the special situation of Cairo. There it is emphasized that the government's explicit policy of deconcentration of Cairo is an appropriate response to the expected growth of the metropolitan region. It is also emphasized that the momentum of past trends, current direction of development, and the reinforcement of these trends and directions by individual sectoral plans make it difficult to achieve the purposes of the explicit policy. In particular, both industrial and infrastructure investment plans support a continuation of substantial growth along a north-south axis, rather than in an east-west direction where preservation of agricultural land is easier to achieve. Similarly, it seems clear that additional efforts will be required to prevent contiguous fringe and corridor development where such growth is likely to impede progress in implementing the government's policy of deconcentration. A policy of restricted land use is suggested to accomplish this, rather than the maintenance of an undeveloped strip between new nuclei and current built-up areas. Finally, it is argued that policies regarding the planned satellite towns and new cities need to be reviewed to determine ways of enhancing their ability to attract and provide jobs, housing and services for a broader segment of current residents of Cairo and potential migrants to the metropolitan region.

CHAPTER I

INVESTMENT AND ITS FINANCING

I. Estimates of Investment Requirements

The Government of Egypt has chosen a number of social goals toward which its development efforts are directed. These include: self-sufficiency in food, the development of industry, increased quantity and improved quality of social services, the exploitation of desert resources and the provision of productive employment opportunities. These goals are interrelated in a variety of ways. Of particular importance here is the fact that attainment of each of these goals requires the use of scarce resources; which if used for one purpose are not available for the other. Growth in the economy provides a way to increase the resources available to share among these partially competitive demands for resources. 1/

The relationship between investment and output growth in Egypt was examined in an earlier report. Using historical data and information from the 1980-84 Development Plan, it was hypothesized that a 6.8 percent annual growth rate in investment would lead to a 7 percent rate of growth in output. Sustained growth at this rate requires that the absolute level of investment double every ten years, reaching L.E. 12.6 billion by the year 2000. The focus of this chapter is the ability of the Egyptian economy to generate the resources necessary to finance this level of investment.

Investment in industrial and social infrastructure capital alone will not ensure growth. Rather, there are a number of necessary ingredients that must be brought together if sustained economic growth and development are to occur.

First, there must be a labor force with the right mix of skills. Since the required skill-mix changes during the course of development, the educational system must be flexible enough to anticipate these changes. Growth in the human capital embodied in the work force is repeatedly found to be a major factor in studies examining the causes of output growth. Thus, investment in training and education can complement investment in new capital and new technology.

Second, new technology, suited both to the evolving composition of output and to the price of inputs, can contribute to output growth. The expanding range of consumer and intermediate goods calls for more specialized production techniques, which can be either imported or developed locally.

Third, the capital stock must increase for two reasons. First, more capital stock is needed to provide the tools and machinery needed by new entrants to the labor force. Second, it is needed to provide all workers with more capital because this leads to higher labor productivity and higher real wages. A higher employment level is both a goal of and a necessary condition for economic growth. The growth rate of output and employment depends on the rate at which capital is accumulated.

The fourth necessary ingredient is entrepreneurship. The role of the entrepreneur is to identify investment opportunities and bring the labor, technology and capital together in a production process. One of the significant differences of economic systems is the location of the entrepreneurial function. It can range from an exclusively state function to an exclusively private sector function. Egypt has chosen an intermediate path with the state taking a leading role, while encouraging private entrepreneurship.

Finally, the development process requires public policies that establish an environment conducive to economic growth. That is, in order to achieve growth, public policies should encourage the creation of an appropriately skilled work force, facilitate the introduction of new technologies, encourage the accumulation of capital in the private sector and/or generate increases in the public capital stock and assist in identifying and developing talent.

As stated above, each of the five requirements is necessary for development. The emphasis in this chapter is on the accumulation of capital and policies that encourage it. This emphasis is the result of the relatively long time horizon (nineteen years) of the study. Determination of the correct skill mix and the correct types of technological changes requires a detailed specification of the kinds of goods to be produced. The same thing would be true if one wanted to describe the type of capital to accumulate. These issues are appropriate to annual and five year development plans within a framework of reasonable expectations of longer term prospects for capital accumulation.

Even though capital accumulation is discussed in this Chapter at the macroeconomic level, it is desirable to make some broad distinctions between types of capital. In particular, we distinguish between social overhead capital (the distribution sectors) and directly productive capital (commodity and service sectors). This distinction is important when analyzing alternative national urban policies because it is the distribution sector that links the spatially-distributed productive capital and the associated spatial distribution of the population. Put another way, the estimate of the amount of capital needed to generate a target rate of growth in the commodity producing sectors will depend on the locations specified for economic acti-

vity. This, in turn, depends on the characteristics of the national urban policy.

It is worthwhile to make a few general comments about the determination of the levels of required investment before presenting the figures. The amount of capital needed to generate a target level of output depends on the capital intensity of the production process, the productivity of capital and the time period over which the capital is productive. 2/ Because the future characteristics of each of these elements are not currently known but will be determined by the investment patterns that will evolve during the nineteen year period, the analysis, in this Report, is necessarily based on some general assumptions. 3/ Capital intensity will rise modestly over the period, but the character of much of the industrial sector investment will be labor intensive with a short payoff period. 4/ These characteristics are appropriate for an economy in which labor force growth is vigorous and the risk associated with long-lived projects undertaken during a transitional period is high.

The starting point for the investment projections is the 1980-84 Development Plan. The major points of the plan are:

- Fixed investment will rise from L.E. 3.3 billion in the initial year to L.E. 4.8 billion in the final year.
- The share of total investment financed by domestic saving will rise from .51 to .68 during the plan years.
- Foreign saving is not expected to rise, although it remains significant through the plan.

The total planned investment, during the five-year period, is L.E. 20,085 million and is allocated as follows:

	<u>L.E. MILLION</u>	<u>PERCENT</u>
Agriculture	2,611	13.0
Mining, Manufacturing and Construction	3,816	19.0
Petroleum	602	3.0
Housing and Infrastructure	10,245	51.0
Services	2,811	14.0

This allocation reflects the government's determination to reverse the past negligence of the nation's social and economic infrastructure. The projections for the period 1985-2000 assume that as these infrastructure deficits are eliminated the relative share of infrastructure will decline and the relative share of

the commodity producing sectors will rise. The projected investment levels are shown in Table I.1.

TABLE I.1
INVESTMENTS REQUIREMENTS 1985-1999
(L.E. million, 1979 prices)

<u>SECTOR</u>	<u>1985-1989</u>		<u>1990-1994</u>		<u>1995-1999</u>		<u>1985-1999</u>	
	<u>L.E.</u>	<u>Percent</u>	<u>L.E.</u>	<u>Percent</u>	<u>L.E.</u>	<u>Percent</u>	<u>L.E.</u>	<u>Percent</u>
Agriculture	3,723	13.0	5,779	15.0	7,850	15.0	17,352	14.5
Mining, Mfg., & Construction	5,728	20.0	11,172	29.0	20,410	39.0	37,310	31.2
Petroleum	573	2.0	771	2.0	1,047	2.0	2,391	2.0
Housing & Infrastructure	14,607	51.0	15,410	40.0	15,700	30.0	45,717	38.3
Services	4,010	14.0	5,394	14.0	7,327	14.0	16,731	14.0
	<u>28,641</u>	<u>100.0</u>	<u>38,526</u>	<u>100.0</u>	<u>52,334</u>	<u>100.0</u>	<u>119,501</u>	<u>100.0</u>

SOURCE: NUPF Projections

The sectoral allocation in Table 1 is suggestive of how the government and private sector may act during the period. The amount of investment required in the productive and distribution sectors depends on spatial policy. For example, it was stated above that the spatial distribution of economic activities and population generate demands for interregional infrastructure networks. A widely-dispersed population will need more interregional networks than a concentrated population. Consequently, these initial projections will be adjusted in the second chapter to reflect the differential costs and relative allocations of alternative national urban policies. The likelihood of generating resources sufficient to meet the investment requirements is the topic of Sections II, III, IV of this Chapter.

II. Financing Investment

Investment, in any year, is that portion of the available resources (outputs) that is not consumed. This is the macroeconomic identity -- saving equals investment. Investment was presented above as a requirement of economic growth. This requirement can be met only if sufficient saving occurs to direct resources into investment.

In this analysis of the saving/investment relationship the variables of interest are flows of goods and services rather than financial flows or stocks. Saving is by definition, output that is not consumed. It may be either domestically produced or imported. Thus, total resource availability is the sum of Gross Domestic Product (at market prices) and the excess of imports over exports. Gross National Saving is the difference between total resource availability and total consumption (private consumption plus public consumption). Gross National Saving is comprised of Domestic Saving (Gross Domestic Product minus consumption) and Foreign Saving (imports minus exports). Foreign Saving can be financed in a variety of ways: worker remittances, direct foreign investment, medium and long term official loans and grants, private loans and the drawdown of foreign balances.

When domestic saving is large enough to meet the required investment levels it is not necessary to draw on foreign savings; provided the imports needed for investment projects (or for consumption) can be paid for with export earnings. This is not the case in Egypt today, nor is it likely to be in the near future. Consequently, there are three gaps that could constrain investment below the desired level. The first is the overall saving/investment gap. If Gross National Saving is deficient, investment will be held below the target level. The other two gaps arise when there is a single source of supply for the investment inputs. If a required input is not available in the domestic market (as is often the case with capital goods) there must be a source of foreign exchange to purchase the input. This source can be either foreign savings or export earnings. If

these are less than required, a foreign exchange gap results which can keep investment below the target level. Likewise, when a required input cannot be imported, either because it is physically impossible to import or because the import cost is prohibitive, it must be financed by domestic savings. Foreign exchange provides Egypt with a claim on the resources of the rest of the world, it does not make available additional local resources.

The implication of the foregoing is that there must be a balance in the sources of saving. In particular, excessive reliance on foreign financing of investment can lead to a number of problems. Servicing a large foreign debt requires that the investments result either in a larger volume of exports or a smaller volume of imports. If delays are encountered in completing the investments, or if actual productivity is below expected productivity, there may be insufficient foreign exchange in future years to service the foreign debt. In turn, this would adversely affect credit-worthiness and lead to a reduction of foreign saving. Delays are likely if there are shortages of domestic inputs. In the next Section, Egyptian saving patterns will be analyzed using the framework developed in this Section.

III. Recent Saving Trends and the Development Plan

A. Saving Trends

Table I.2 displays the relationship between resource availability and saving for the period 1975-1979.

TABLE I.2

NATIONAL SAVING

(L.E. million, current prices)

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
GDP Factor Cost	5061			9008	11936
+ Net Indirect Taxes	186			774	539
= GDP at Market Prices	5247	6705	8210	9782	12475
+ Net Factor Income	-16	133	433	983	761
= GNP Market Prices	5231	6838	8643	10765	13236
GDP at Market Prices	5247	6705	8210	9782	12475
- Private Consumption	3101	3965	4917	6278	8623
- Public Consumption	134	1572	1697	1841	2059
= Domestic Saving	802	1168	1596	1663	1793
Investment (Fixed)	1265	1450	1838	2618	3345
+ Change in Stock	459	439	561	416	450
- Domestic Saving	802	1168	1596	1663	1793
= Import Surplus	922	721	803	1371	2002

SOURCE: Ministry of Economy & USAID/Cairo

Domestic production at market prices in 1979 was L.E. 12,475 million, of which L.E. 10,682 million was consumed. Domestic production available for investment was L.E. 1,793 million while investment in 1979 was L.E. 3,796 million. This means L.E. 2002 million of total investment (53%) came from outside the country, as an excess of imports over exports.

The domestic saving effort (shown in Table I.3, row 1) is both below international standards and declining. Although there have been significant gains in production in recent years, only a small portion of the gains have been directed to investment. Table I.3 shows in row 3 the consequent increased reliance on foreign sources to finance the country's investment program, (i.e., the ratio of import surplus to gross investment is increasing).

TABLE I.3

SAVINGS RATIOS

	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Domestic Saving/ Gross Domestic Product	.15	.17	.19	.17	.14
Domestic Saving/ Gross Investment	.45	.62	.67	.55	.47
Import Surplus/ Gross Investment	.53	.38	.33	.45	.53

SOURCE: TABLE I.2

These data suggest the following characterization of the Egyptian economy. The country has begun an enormous investment program, partly to rehabilitate the capital stock that was neglected in the late sixties and early seventies and also to bring about a higher level of output and employment. This desire to increase investment has not been accompanied by much increase in domestic resources for investment. In this situation, either the investment effort must be scaled down or foreign financing must close the gap. Foreign resources can (and did) close the gap in the short run.

Excessive reliance on foreign financing exposes the nation's investment plan to the vagaries of foreign economic and political events. This is especially true when a substantial portion of the foreign saving takes the form of government to government concessionary loans and transfers. An

investment program financed largely with domestic resources will have a more sturdy foundation than one relying on foreign sources. An indication of the magnitude of the required change in Egyptian saving patterns can be gotten from a comparison of recent data and the 1980-84 Development Plan. The marginal propensity to save (MPS) for the years 1976-1979 and the MPS used in the Development Plan are shown in Table I.4. The marginal propensity to save is the fraction of output growth that is saved. As indicated, the fraction of output growth which was saved in 1978 and 1979 fell far short of that anticipated in the Development Plan.

TABLE I.4

	<u>MARGINAL PROPENSITY TO SAVE</u>				
	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	
Historical Data	.37	.35	.04	.05	
	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Plan Data	.33	.36	.29	.33	.30

SOURCE: Ministry of Planning and IMF.

In words, an increase in national income of one pound led to an increase in saving of only four to five piasters in 1978 and 1979. If this pattern were to persist the investment targets would become hopelessly out of reach. Investment projects would have to be abandoned, employment growth would slow down and self-sustained economic growth would not occur.

B. Development Plan

The importance of an improved saving effort is clear to Egyptian economic planners and is made explicit in a Ministry of Planning document regarding the Five Year Plan.

"The domestic savings target will require special efforts, because it calls for a significant change in the existing pattern of saving. Government current expenditure will clearly have to be rationalized and the public sector enterprises and organizations will have to eliminate their deficits and generate sizeable profits. The need to increase domestic resource generation cannot be exaggerated because it is becoming clear that at the present time it is the

shortage of domestic resources that is slowing down the implementation of projects and inhibiting the utilization of the project aid that has already been committed by donor countries and organizations". 5/

Table I.5 presents the saving/investment relationship derived from the Five Year Plan. The reduction in the foreign share of investment financing from one-half to one-third in a period of five years is quite remarkable. The plan envisions that a relatively slower growth rate of private consumption will release resources for investment. The annual growth rate of private consumption is 8.5%, compared to an output growth rate of 10.8%. The Plan document referred to above is not explicit, however, about policy changes that could lead to the increases in the saving rate. Before turning to the policy issues in the final section, we present projections of domestic savings through the year 2000 in which it is assumed that the relationships between output and consumption in the plan are both achieved and maintained after the plan period.

C. Saving Projections

The output and investment components of Table 6 are from the economic projections presented in the Interim Action Report. If the high marginal saving rates of the plan are achieved and maintained along with output growth, then domestic resources should be sufficient to finance investment by the turn of the century. To get an indication of the magnitude of the economic transformation involved, note that domestic saving in 2000 exceeds total output in 1979. After nineteen years of high economic growth the Egyptian economy would be investing, from its own resources, an amount which exceeds total current production.

D. Financing Foreign Saving

Since the mid seventies, there has been a large inflow of foreign low-interest loans and grants into Egypt from other countries and institutions. Direct private investment has grown rapidly but is still concentrated in the petroleum sector. When the loans come due and the foreign investment projects come on-line, foreign exchange will be needed for debt repayment and profit repatriation. The foreign saving estimates in Table 6 are net of these capital movements. If Egypt is to continue to attract foreign savings throughout the period it must earn (or save through import substitution) enough foreign exchange to meet the repayment schedule. At the present time Egypt's foreign exchange earnings come from four principal sources: workers' remittance, petroleum, Suez Canal and tourism. As foreign loans come due these revenues will have to be shifted from paying

NATIONAL SAVINGS 1980-84 DEVELOPMENT PLAN

(L.E. million, 1979 prices)

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
GDP at Factor Cost	11257	12479	13677	15007	16475
+ Indirect Taxes	2290	2525	2780	3050	3335
= GOP at Market Prices *	13547	15004	16457	18057	19810
+ Net Factor Income	685	661	640	683	687
= GNP at Market Prices *	14232	15665	17097	18740	20497
GDP at Market Prices *	13547	15004	16457	18057	19810
- Private Consumption *	9407	10110	10925	11805	12805
- Public Consumption	2390	2700	2985	3270	3580
= Domestic Saving	1750	2194	2547	2982	3425
Investment (Fixed)	3350	3600	3920	4385	4830
+ Change in Stocks	100	110	120	140	200
- Domestic Saving	1750	2194	2547	2982	3425
= Import Surplus	1700	1516	1493	1543	1605
Ratio DS/Total I	.51	.59	.63	.66	.68

SOURCE: Ministry of Planning

* Includes consumer subsidies? Therefore these are not technically market prices? This accounting procedure does not affect the saving section.

TABLE 1.6NATIONAL SAVINGS 1985-2000

(L.E. million, 1979 prices)

	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
GDP at Factor Cost	17487	23425	31694	43427
+ Net Indirect Taxes	1439	1928	2608	3573
= GDP at Market Prices	18926	25353	34302	47000
= Net Factor Income				
= GNP at Market Prices				
GDP at Market Prices	18926	25353	34302	47000
- Private Consumption	11592	14544	18395	23502
- Public Consumption	3824	5252	7291	10260
= Domestic Saving	3510	5557	8616	13238
Investment (Fixed)	5071	6793	9191	12594
+ Change in Stocks	184	246	333	456
- Domestic Saving	3510	5557	8616	13238
= Import Surplus (M-X)	1745	1482	908	-188

for imports to repaying debt. Unless these revenues continue to grow rapidly or new revenue sources are found imports will be curtailed.

Estimating future receipts from these four sources is problematic. The Development Plan forecasts that by 1984 workers' remittances will level off and Suez Canal revenues will rise at a modest 6 percent over 1983. Oil exports (not including the oil companies' share) will rise 10 percent and tourism revenue 14 percent.

A logical source of new foreign exchange earnings is the non-oil commodity sectors. Foreign markets for manufactured and agricultural goods should be identified and developed. A more diversified mix of exports would protect the economy from adverse changes in one of the four principle sources. It would disperse the development process throughout the economy and, as domestic firms become competitive in world markets, import substitution will be economical. In summary, over the next nineteen years, Egypt must both amortize its existing foreign debt and finance future import surpluses. Current foreign exchange sources may not be buoyant enough to provide funds for both. If this happens a shortage of foreign exchange would disrupt the investment program. A diversified program of export promotion and import substitution in manufacturing and agriculture can both provide foreign exchange and spread the development process throughout the economy.

At the same time foreign exchange sources are being developed, economic planners must identify policies to bring the domestic saving effort into accord with the Development Plan.

IV. Policy Change to Increase Saving

It was pointed out in Section III that there is an incompatibility between Egypt's desire to mount a large investment effort and its current saving's performance. The investment effort will be jeopardized unless the domestic saving effort improves. This fact is well known to policy makers and is the topic of a number of recent studies 6/

The reasons for a low domestic saving rate can usually be identified by analyzing the economic environment in which savings decisions are determined. These savings decisions are made in both the public and private sectors 7/. For public saving to take place, government revenue must exceed government current expenditure. In 1979, government revenue was L.E. 3,684 million; government current expenditure (including public authority deficits and subsidies) was L.E. 3,774 million so that public saving was a negative L.E. 90 million. During the same period government investment was L.E. 2,547 million; producing a public deficit of L.E. 2,637 million. Comparable data for previous years are shown in Table I-7.

TABLE I-7

PUBLIC SAVING (L.E. MILLION, CURRENT PRICES)

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
TOTAL REVENUE	2015	2755	3306	3684
- Current Expenditure	2300	2476	3072	3774
= Public Saving	(285)	279	234	(90)
PUBLIC INVESTMENT	980	1549	2311	2547
- Public Saving	(285)	279	234	(90)
= Government Deficit	1265	1270	2077	2637

SOURCE: IMF

A closer look at the fiscal operations in 1979 shows some of the more important reasons behind this poor saving performance. Transfers from the Public Enterprises to the central government amounted to L.E. 501 million. However, L.E. 401 million came

from petroleum and the Suez Canal. The other authorities and companies, in spite of their dominant role in the economy, did little more than cover their production costs.^{8/} The domestic saving effort would be substantially improved if these companies were operated more efficiently. If efficiency increases, they would be better able to compete with foreign firms in both domestic and international markets. While it is true that the motivation behind some of the current regulation of the public sector is the important social equity objective, there are better ways to enhance social equity than operating the industrial sector inefficiently.

A second reason for the weak public saving effort is the level of subsidies, L.E. 1,230 million in 1979, of which L.E. 880 million was for the General Authority for Supply Commodities. Here again there appears to be a conflict between economic development objectives and social equity objectives.

However, the right question regarding consumer subsidies is how extensive they should be and not whether there should be subsidies. Both the food subsidy and the implicit fuel subsidy are open-ended; they are available to and used by all income classes, although the intent of the subsidies is to protect the poor. A reduction in the number of items subsidized and in the number of people eligible for the subsidy would release funds for investment and move market prices toward levels that reflect relative scarcities.

Decisions in the private sector are also important in determining the overall saving effort. Households can invest their savings directly in family-owned enterprises, or they can use the commercial banking system to channel savings into investment projects. The real return on private savings held in the banking system depends on the bank interest rate and the rate of inflation. With rates of inflation above bank interest rates the real return to savings is negative, this tends to discourage saving. This situation has developed in Egypt over the past several years primarily as a result of government borrowing to finance the deficit (Table I-7 shows the magnitude of the deficit). This borrowing has contributed to money supply growth that exceeds the growth of output.

During the mid 1970's the private sector was willing to hold these money balances and this reduced upward pressure on prices. By the late 1970's the inflation rate had risen to the point that real rates of return were, and continue to be, negative. Additional deficit financing can be expected to generate higher prices more quickly than was the case in the past. The government has announced that the 1981/1982 Budget does not require deficit financing. This should go a long way toward reducing inflationary pressures; but it should be combined with higher bank interest rates to encourage a larger flow of funds into the banking system.

Inflation is probably the predominant short-run factor affecting private savings rates. Reducing the inflation rate should be an important government policy goal. Other policy changes that could contribute to higher savings rates are expenditure taxes, especially on luxury goods, and a floating unified exchange rate. The latter policy change would affect saving both by making luxury imports more expensive and by increasing the profitability of Egyptian firms selling in domestic and foreign markets.

Egypt needs to build up its industrial capital stock. The government policy is to encourage the private sector to contribute to this effort. In addition to the specific policy changes discussed above, the government must also establish a legal, administrative and economic environment in which citizens have enough confidence in the stability of public policies to make long-term investments in industry.

In this discussion we have touched briefly on some of the various ways by which saving can be fostered. The purpose of this section is to indicate the types of changes that will be necessary to generate sufficient domestic savings to finance the investment program. Recent evidence suggests that without these types of changes the investment program will fall short of its needed levels because of real resource constraints.

CHAPTER I

FOOTNOTES

- 1/ The demands are described as 'partially competitive' because increasing the resources devoted to any one of the goals can have positive effects on the others. Consequently, the effects are sometimes complementary, even though they compete for funds in the short run.
- 2/ For equally productive capital, the annual increment of output is lower the longer the life of the capital.
- 3/ The parameter values which were used are presented in the Interim Action Report.
- 4/ This characterisation, of course, refers to averages; there will simultaneously be investments in large scale industrial complexes and traditional handicraft production activities.
- 5/ Ministry of Planning, Egypt's Development Strategy, Economic Management and Growth Objectives, 1980-1984, p. 13.
- 6/ For example; World Bank, Arab Republic of Egypt. Domestic Resource Mobilization and Growth Prospects for the 1980's, Report No. 3123-EGT, December 1980, and A.R.E., Ministry of Economy, Economic Studies Unit, Recent Development in the Egyptian Economy, January 1981. The latter study is a very lucid presentation of recent economic developments, presented in more detail than can be done in this section.
- 7/ The Study Team has been unable to obtain data on the distribution of domestic saving between the public and private sectors from the Ministry of Planning. If the information is made available in time for the next report, a more complete discussion of the sources of domestic saving will be presented.
- 8/ There was also L.E. 374 million in investment self-financing but its source is not explicit.

CHAPTER II

SPATIAL ALLOCATION OF INVESTMENT

I. Introduction

The maintenance of any spatial population distribution depends on the underlying economic base. If the economic base changes its location, so will the population. When people perceive that economic conditions and opportunities are better in regions other than their own there is an incentive to migrate.

An analysis of Egyptian demographic data indicates a willingness of both rural and urban residents to migrate, both within the country and to other countries, in search of better economic opportunities. This sense of mobility can be an asset in the implementation of a strategy to create a new more desirable settlement pattern. The set of incentives needed to induce migration differs from place to place, but two elements common to all incentive sets are employment opportunities and reasonable living conditions. This chapter deals with the employment and the physical and social infrastructure elements of the settlement policy.

Employment follows investment. The location of investment determines the location of new employment opportunities. Areas specially favored with new industrial investments will experience high growth rates of employment. As knowledge of this rapid growth spreads beyond the local area, job seekers in those parts of the country that are not growing rapidly will migrate in search of employment. If the area has adequate housing and adequate urban infrastructure service levels, newly-arrived workers are more likely to establish their families in the areas and become permanent residents rather than transitory workers. The new residents will increase the demand for local goods and services and this will generate second-round investments.

Through this chain of causality, investment location decisions are a dominant factor in the evolving settlement policy. The explicit objectives of investment policy, unfortunately, rarely include alteration of the settlement pattern. Rather they stress national income growth, export expansion, satisfaction of local (national) demand, etc ... In this chapter, we trace out the cost implications of including alteration of the settlement pattern as a serious objective of investment policy, both to achieve the purposes normally associated with investment policy and other social goals associated with the performance of the settlement system.

The costs considered include direct investment costs for job creation and investments in housing and infrastructure systems

at standards compatible with the settlement policy. The analysis was done at the settlement level and it includes the same group of cities that were analyzed in the Interim Action Report. 1/

Investment allocation rules have been developed for this analysis that incorporate efficiency and regional equity criteria in different proportions. These rules are used to generate alternative settlement patterns (with the same strategic principles as those that were used to generate patterns presented in the Interim Action Report). The two cost components of the alternative patterns, direct investment costs and infrastructure costs, are evaluated against the projected investment pool.

A central aspect of this approach that deserves more explanation before proceeding to the analysis, is the role of the manufacturing sector as the leading sector in the integration of investment policy and settlement policy. Of course, all investments have an impact on the settlement pattern; manufacturing investment, however, provides the core of the economic base underlying the system of cities. The amount of investment in agriculture will affect the level of rural/urban migration but not the specific destination of the migrants. The choice of destination depends on investment levels and living standards in different urban areas. Housing and infrastructure investments clearly are needed to implement a settlement policy but they are complements to and not substitutes for industrial investments. Finally, sufficient land resources suitable for agriculture are not available to enable Egypt's economy to grow at 7 percent annually and remain predominately agricultural. Sustained economic growth is possible only with a vigorous urban-based manufacturing investment plan.

II. Description of the Alternative Strategies

A range of settlement alternatives was presented in the Interim Action Report. These alternatives, derived from different settlement concepts, illustrate how the spatial distribution of the urban population might be altered by a National Urban Policy. The settlement concepts dealt with two important social goals; economic efficiency and interregional equity. Public policies to implement a particular strategy should recognize that any particular strategy will reflect the relative importance that is given to efficiency and equity whether or not this was the basis for choice. Because of the central role of industrial and service investments in the implementation of a National Urban Policy, the chosen spatial allocations of investment associated with a settlement strategy should be based upon an awareness of the implications of using allocation rules based on either an economic efficiency criterion or an equity criterion, or a combination of the two.

In this report we present six different investment allocations, each allocation is based on an investment rule that can be characterized by the relative importance put on efficiency and equity. Before discussing the six specific investment rules, a brief general description of efficiency and equity rules is useful. Egypt's investment program has among its objectives increasing the production of goods and services and generating employment opportunities. The notion of economic efficiency in the investment allocation rules refers to the latter objective. Specifically, an investment allocation is considered efficient when a target employment increase is reached and the total direct costs of job creation (investment) are minimized. 2/

A pure regional equity rule would distribute industrial and service employment equally, on a per capita basis, to all regions in the country. The time period required to generate an equal per capita distribution of the industrial capital stock depends on the initial (unequal) distribution of the stock and the rate of capital accumulation. The selection of a time period over which to achieve equality is somewhat arbitrary. Nevertheless, because the initial distributions are unequal changes in relative population distributions, while using the equity rule, can be encouraged by imposing constraints on particular regions. Such constraints could attempt to keep the population below a specified level or attempt to bring the population to a target level by shifting investments away from or to a region. Constraints on already industrialized regions reduce the time needed to bring about an equitable distribution of the industrial capital stock by accelerating the flow into lagging regions. The six settlement alternatives presented below are the outcomes of investment rules based on the efficiency criterion and/or the modified equity criterion using such constraints.

Alternative A is derived from applying the efficiency criterion. It is an estimate of the least cost of distribution of employment in which no prior constraints on regional allocations are imposed. For Alternative B₁, the countermagnet strategy, three regional constraints are imposed:

1. Cairo's 2000 population should not exceed 15 million;
2. the Delta Region's 2000 population should not exceed 7 million; and
3. the Canal Region's 2000 population should reach 4 million.

Satisfying these conditions requires allocating enough investment in these three regions to create 1 million of 1.4 million new jobs needed in the 1986-90 period. The remaining 400 thousand jobs are allocated in Alternative B₁ to Alexandria, North and South Upper Egypt and the Remote Areas in two ways. First, the efficiency rule is applied to get a least cost allocation for the four regions, this is Alternative B₁ (Efficiency). Second, the same 400 thousand jobs are distributed among the zones on an equal per capita basis. This is Alternative B₁ (Equity).

Alternative B₂ represents a more dispersed distribution of employment. It is equivalent to the growth center strategy in the Interim Action Report. In addition to constraining Cairo and the Delta (to 15.2 million and 7.3 million by 2000 respectively), Alexandria is constrained to 4.4 million by 2000. In this alternative the Canal Region, North and South Upper Egypt and the Remote Areas receive 455,000 jobs after applying the above constraints. As with Alternative B₁, these jobs are allocated in two ways; once using the efficiency rule, B₂ (Efficiency), and then using the equity rule, B₂ (Equity).

Four population constraints are imposed in Alternative C in order to achieve major decentralization of investment; Cairo at 15 million, Alexandria at 4.4 million, the Delta at 7 million, and the Remote Areas to 1.3 million. The Canal Region and the North and South Upper Egypt Regions receive equal per capita job allocations in this alternative.

The constraints, expressed as year 2000 population targets, are summarized in Table II-1, below:

TABLE II-1
POPULATION CONSTRAINTS IN MILLIONS

REGION	A	<u>ALTERNATIVE</u>		
		B ₁	B ₂	C
Cairo	No Regional Constraints	15.0	15.2	15.0
Alexandria		Not constrained	4.4	4.4
Delta		7.0	7.3	7.0
Canal		4.0	Not constrained	Not constrained
North Upper Egypt		Not constrained	Not constrained	Not constrained
South Upper Egypt		Not constrained	Not constrained	Not constrained
Remote		Not constrained	Not constrained	1.3

TABLE II-2

POPULATION

	POPULATION (IN THOUSANDS)						GROWTH RATE						
	1990						1985 - 1990						
	A	B1 EFFICIENCY	B1 EQUITY	B2 EFFICIENCY	B2 EQUITY	C	A	B1 EFFICIENCY	B1 EQUITY	B2 EFFICIENCY	B2 EQUITY	C	
Cairo	11457	11066	11066	11115	11115	11029	3.8	3.1	3.1	3.2	3.2	3.0	
Alexandria	3809	3867	3637	3440	3440	3440	4.6	4.9	3.6	2.5	2.5	2.5	
Delta	3857	3728	3739	3771	3767	3767	2.9	2.2	2.2	2.4	2.4	2.4	
Canal	1187	1624	1624	1483	1412	1382	2.7	9.3	9.3	7.3	6.3	5.8	
North Upper Egypt	716	727	799	879	902	412	1.4	1.7	3.7	5.6	6.2	6.4	
South Upper Egypt	1322	1342	1460	1613	1657	1668	1.6	1.9	3.7	5.7	6.3	6.4	
Remote	238	239	271	291	308	405	1.0	1.0	3.6	5.1	6.3	12.3	
Total	22586	22593	22596	22592	22601	22603							
		<u>1995</u>						<u>1990 - 1995</u>					
Cairo	13750	12899	12899	12998	12998	12862	3.7	3.1	3.1	3.2	3.2	3.1	
Alexandria	4727	4640	4190	3890	3890	3914	4.4	3.7	2.9	2.5	2.5	2.6	
Delta	4466	4250	4253	4355	4347	4283	3.0	2.7	2.6	2.9	2.9	2.5	
Canal	1368	2550	2550	2002	1850	1761	2.9	9.4	9.4	6.2	5.6	5.0	
North Upper Egypt	780	767	913	1113	1167	1149	1.7	1.1	2.7	4.8	5.3	4.7	
South Upper Egypt	1440	1426	1662	2043	2127	2089	1.7	1.2	2.6	4.8	5.1	4.6	
Remote	254	249	311	361	402	724	1.3	.8	2.8	4.4	5.5	12.3	
Total	26785	26781	26778	26762	26781	26782							

The urban populations by zone and annual growth rates for the largest cities for the years 1980 and 1995, are shown in Table II-2. Because the Cairo Region is so large relative to the others, a small change in its growth rate generated proportionately larger changes in the other regions. This explains the relative stability of Cairo's growth rates across alternatives compared to the other regions.

The least cost solution, Alternative A, produces high growth rates in Cairo and Alexandria, as one would expect since they already have a large industrial base and are attractive to investors relative to other places. The Upper Egypt Regions and the Remote Areas have growth rates below the rate of natural increase implying outmigration to Lower Egypt. The countermagnet Strategy B₁ has, again as one would expect, very high growth rates in the Canal Region. The constraints imposed on Cairo and the Delta allow Upper Egypt to grow faster than in Alternative A. The addition of a constraint on Alexandria and the reduced emphasis on the Canal Region in B₂ would encourage even higher growth rates for Upper Egypt. Growth in the Remote Areas is also significant in this alternative. Reaching the target population of 1.3 million in the remote areas in Alternative C requires annual population growth rates of 12 percent. Although this is nearly double its growth rate in B₂, the population impact on other regions is not dramatic since the absolute population of the remote areas is small. These variations in population distribution across alternatives have effects on the direct costs of job creation, which are considered in the next section.

III. Direct Costs of Employment Creation

The ambitious investment program being implemented in Egypt is a major source of new employment opportunities. For urban areas, most employment growth will occur as a result of investments in industry and the service sector. In this section estimates of the effect of the spatial distribution of industry and service investments on the total direct cost of the investment plan are provided. The total direct investment costs associated with each settlement strategy are variations from the initial economic projections presented in the Interim Action Report. Those projections are based on parameter values derived from the 1980-84 Development Plan, which result from a particular spatial allocation of investment. If the government were to choose a different spatial allocation of investment, the total cost of the investment plan would change because costs are not uniform throughout the country. The Interim Action Report projections of investment requirements through 2000 can be thought of as a trend projection that assumes no change in the spatial allocation of investment.

In practice, regional cost variations can lead to differences in total investment cost (for a given level of employment growth)

and differences in employment growth (for a given level of investment spending). In the analysis presented in this section, the direct investment cost of achieving the employment growth projections of the Interim Action Report is estimated for each settlement strategy.

A. Regional Cost Variation

The unit cost of generating new employment is not uniform throughout the country. Regions, and places within regions, have different characteristics, natural and man-made, that affect job costs. Some characteristics are relevant to particular industries while other characteristics have general applicability. The latter characteristics are of interest in this study since the focus is on industry sectors rather than any particular industrial group. These characteristics include:

1. a local labor force exposed to, if not trained in, industrial skills;
2. supporting physical infrastructure systems-transport, power, water, etc.; and
3. services that are ancillary to construction and production processes - such as repair facilities, banking facilities and wholesale trade facilities.

These are the agglomeration economies which cause both capital and operating costs to be lower than they are in areas where an industrial base has not been established.

Industry can be located away from the zones of agglomeration economies, but there are a number of cost-increasing consequences of doing so. The firm will experience transport delays leading to both higher transport and higher inventory costs, shortages of locally produced materials (especially construction materials), difficulty in locating and recruiting skilled workers, and work slow-down when critical machinery needs repair and local servicing is not available. The combined effect of these consequences is to increase the cost of building and operating a factory where agglomeration economies are limited.

The current zones of agglomeration economies are a result of the spatial allocation of investment in prior years. The Cairo Region, Alexandria, Suez and some of the Delta governorates have extensive industrial bases. Upper Egypt is less industrialized than lower Egypt, although some industrial areas are located there, notably at Aswan and Qena/Naga Hamadi. Industry is virtually non-existent in the Remote areas. The statistic used by the Study Team to esti-

mate the presence and extent of agglomeration economies in mining, manufacturing and construction employment as a percentage of total area employment. Using Cairo as a reference point, its investment cost per typical job, is considered to be the national average, the lower the percentage of employment in mining, manufacturing and construction in another settlement the higher the investment cost per job relative to the national average. Areas with a higher percentage than Cairo have typical job costs below the national average; those with a lower percentage than Cairo have unit costs above the national average. 3/

B. Growth Management Cost Variation

The government can use such regional cost variations to its advantage by directing investments into low cost areas. However, because of the magnitude of the investments over the nineteen year period, it would be incorrect to expect that all these investments could go into the few areas which currently have agglomeration economies without affecting their cost per job. There are offsetting diseconomies associated with rapid growth.

These diseconomies arise as the number of individual projects attempting to take advantage of the local agglomeration economies approaches the capacities of the supporting industrial infrastructure. Areas with high rates of growth will begin to take on the characteristics of high cost areas. The labor market will tighten, the transport system will become strained, local material shortages will develop, and municipal services will have difficulty keeping pace with demand; all of which lead to higher investment costs. In making the most efficient use of investment resources a balance must be found between agglomeration economies and rapid growth diseconomies. The general rule for an efficient spatial allocation of investment is to direct investments into the low cost areas until the growth induced by these investments creates diseconomies which raise the costs sufficiently to eliminate their cost advantages over other areas. 4/

The total direct cost of a settlement strategy, as estimated in this report, reflects both the regional cost variation and the costs of growth management. A strategy that emphasizes growth in areas with a small industrial base entails higher costs; likewise, a strategy that emphasizes rapid growth in a concentrated area entails higher costs. The direct cost estimates of the alternative strategies for the year 1986-1990 incorporate both effects and indicate the differential costs of the strategies. Since the local industrial base is the source of the regional cost variation, estimates of direct costs for the following five

year period, 1991-1995, and any subsequent period, must reflect changes in the industrial base brought about by the implementation of the first phase.

C. Intertemporal Regional Cost Variation

Agglomeration economies are not static conditions confined to particular locations. They evolve from the interplay of individual investment decisions, individual locational decisions and public policies. Each of the settlement alternatives we have analyzed is based upon a different spatial allocation of investment. As a strategy is implemented the industrial base of some areas broadens and agglomeration economies should emerge in the areas favored in that particular strategy. For this reason a different regional cost variation index is calculated prior to estimating the direct costs for each succeeding period. Estimates are shown for 1986-90 and 1990-95. For every strategy the dispersion of the index is reduced between 1985 and 1990 and the more deconcentrated the strategy the greater the reduction in the dispersion (which is an indication of more equity).

D. Cost and Employment Estimates

The investment figures shown in Table II-3 are our estimates of the direct investment costs of generating 1.4 million urban jobs between 1985 and 1990 and 2.1 million urban jobs between 1990 and 1995 for each of the six strategies. Investment costs are minimized with Alternative A (L.E. 8.4 billion in the first period) and increase with the degree of decentralization, that is, as investments are pushed into the higher cost areas. Alternative C requires an investment budget 13 percent larger than Alternative A for the same increase in employment.

Differences in zonal allocations highlight the thrust of each alternative. For example, the share of the Canal Zone ranges between 4 percent in Alternative A and 22 percent in the B Alternatives, in which a countermagnet city is located in that zone. The share of Upper Egypt is about 25 percent in Alternative C, a share well above both what it is expected to receive in the 1980-84 period and what it would receive in Alternative A.

The second period for which direct costs were estimated, 1991-1995, displays some dissimilarity from the pattern of the first period. The cost variation between Alternative A and Alternative C is 6 percent in this period showing the effects of some industrial investment in each zone in Alternative A and substantial investment in high cost areas in Alternative C.

TABLE II-3

INVESTMENT1986 - 1990

	<u>AMOUNT OF INVESTMENT</u>						<u>PERCENT OF INVESTMENT</u>					
	A	B1 EFFICIENCY	B1 EQUITY	B2 EFFICIENCY	B2 EQUITY	C	A	B1 EFFICIENCY	B1 EQUITY	B2 EFFICIENCY	B2 EQUITY	C
Cairo	4644	3583	3583	3713	3713	3486	55.1	40.3	39.7	40.7	40.2	36.6
Alexandria	1767	1931	1308	825	825	925	21.0	21.7	14.5	9.0	8.9	8.7
Delta	1227	883	941	994	1020	1022	14.6	9.9	10.4	10.9	11.0	10.7
Canal	358	1976	1976	1373	1114	1004	4.3	22.2	21.9	15.0	12.1	10.5
North Upper Egypt	127	158	376	695	789	832	1.5	1.8	4.2	7.6	8.5	8.7
South Upper Egypt	271	327	708	1321	1489	1533	3.2	3.7	7.8	14.5	16.1	16.1
Remote	29	33	138	213	289	829	.3	.4	1.5	2.3	3.1	8.7
Total	8423	8891	9030	9134	9239	9531	100	100	100	100	100	100

1991 - 1995

Cairo	7042	5456	5454	5630	5630	5454	54.7	40.4	40.2	42.5	42.1	40.0
Alexandria	2735	2214	1529	1225	1225	1296	21.3	16.4	11.3	9.2	9.2	9.5
Delta	1878	1586	1597	1766	1842	1589	14.6	11.8	11.8	13.3	13.8	11.7
Canal	567	3809	3809	1863	1560	1312	4.4	28.2	28.1	14.1	11.7	9.6
North Upper Egypt	207	128	387	873	1006	874	1.6	.9	2.9	6.6	7.5	6.4
South Upper Egypt	386	267	679	1629	1753	1525	3.0	2.0	5.0	12.3	13.1	11.2
Remote	53	33	141	262	363	1584	.4	.2	1.0	2.0	2.7	11.6
Total	12868	13493	13578	13248	13379	13636	100	100	100	100	100	100

The reduction in cost variation between the two periods is a result of reducing the share of Cairo by more in the first period (to 37 percent) than the second period (to 40 percent).

The reduction in Cairo's share raises the total cost in that period, but at the same time, leads to a larger expansion of the industrial base in Upper Egypt and the remote areas and subsequently a reduction in the regional cost variation in the second period. For similar reasons, the B₂ Alternatives are less costly than the B₁ Alternatives in the second period (the reverse is the case in the first period). By 1996, under either B₂ Alternative a more dispersed industrial base will be in place, compared to the B₁ Alternatives, with their heavy emphasis on the Canal Zone. Therefore, there will be more low-cost areas to absorb the 1991-95 investments and growth management costs will be lower. Finally, for both B₁ and B₂, the relative difference between the efficiency and equity alternatives is smaller in the second period. This reduction is one more result of the expanding industrial base.

The conclusion that emerges from this analysis is that imposing a decentralized investment pattern in an economic setting characterized by spatially concentrated industrial areas is more costly than perpetuating the concentrated pattern. The direct costs of decentralization are significant, amounting to 1.3 billion pounds in the ten-year period. However, these costs are transitional provided the spatially-dispersed industrial investments successfully develop into expanded industrial bases.

IV. Infrastructure Costs of Settlement Alternatives

A. Introduction

Both alternative settlement strategy priorities and the choice of infrastructure standards have major impacts on the costs of providing infrastructure. In this section we illustrate the magnitude of the intra-urban infrastructure costs resulting from the settlement alternatives as well as the impact which the choice of standards has on increasing or reducing total costs. This is done by estimating the intra-urban infrastructure costs of the alternatives for the 1986-1990 period for the 39 major urban settlements which had 1976 census populations greater than 50,000. The costs shown here do not include inter-regional infrastructure requirements nor do they estimate the infrastructure costs of smaller urban settlements or rural areas. These cost projections also exclude the current costs of operating

these infrastructure systems. However the impact of current costs is further discussed in Chapter III.

Inter-regional infrastructure requirements and costs can be expected to vary substantially across settlement strategies. Although the costs for this infrastructure are not estimated in this report, the direction of their effect on total costs is clear. The more decentralized the strategy is, the higher the inter-regional infrastructure costs will be. This will be the case because the average distance over which industry inputs and outputs will be shipped and power transmitted will tend to increase with decentralization of industrial investment. It will be likely, also, that greater within country accessibility to transportation modes, power and communication will be needed as an inducement to labor force migration and retention in a more decentralized strategy. Therefore, the general pattern of greater total infrastructure costs with more decentralization estimated here for intra-urban infrastructure only will tend to persist when other infrastructure elements are added.

The impact of the choice of infrastructure standards on total costs is shown by progressively increasing standards in decentralized sites for alternatives in which greater inter-regional equity is sought. It is also shown by comparing the two extreme solutions, i.e., "A" the most concentrated alternative and "C" the most decentralized alternative, at similar standards. In this latter case, the only reason for cost variation is the choice of standards. These standards are summarized in Table II.4.

Since the choice of infrastructure standards need not (and probably should not) be uniform for all types of settlements in a given alternative due to different settlement functions, the major settlements were divided into five categories reflecting different roles within the alternatives. These categories are:

1. Metropolitan areas -- Greater Cairo and Alexandria
2. Growth Centers in the Canal Zone and Upper Egypt.
3. Regional Service Centers within the Delta.
4. Other Settlements, and
5. Remote area settlements.

Settlement issues relating to Greater Cairo are discussed in Chapter V, while the nine growth centers and regional service centers are further discussed in Appendix II.

TABLE II-4

STANDARDS OF INTRA-URBAN INFRASTRUCTURE COST ESTIMATES OF MAJOR URBAN SETTLEMENTS

(1986 - 1990)

SETTLEMENT TYPE AND STANDARDS	ALTERNATIVE A	ALTERNATIVE B1 EFFICIENCY	ALTERNATIVE B1 EQUITY	ALTERNATIVE B2 EFFICIENCY	ALTERNATIVE B2 EQUITY	ALTERNATIVE C
I. Metropolitan Areas	Medium/High	Medium	Medium	Medium/High	Medium/High	Medium/High
- Water and Sanitary	Master Plan1/	Master Plan	Master Plan	Master Plan	Master Plan	Master Plan
- Other Infrastructure	"280" Package2/	"280" Package	"280" Package	"280" Package	"280" Package	"280" Package
- Housing	125 % NHP	NHP	NHP	125 % NHP	125 % NHP	125 % NHP
- Social Infrastructure	"280" Package	"280" Package	"280" Package	"280" Package	"280" Package	"280" Package
II. Growth Centers	Medium	Medium/High	Medium/High	High	High	High
1. Canal Cities	Medium	Target	Target	Target	Target	Target
- Water and Sewerage	Existing (improved)3/	Master Plan	Master Plan	Master Plan	Master Plan	Master Plan
- Other Infrastructure	"280" Package	Target5/	Target	Target	Target	Target
- Housing	NHP	Target	Target	Target	Target	Target
- Social Infrastructure	"280" Package	Target	Target	Target	Target	Target
2. Other Growth Centers	Medium	Medium	Medium	Medium/High	Medium/High	High
- Water and Sewerage	PWSP	PWSP	PWSP	Medium/High	Medium/High	High
- Other Infrastructure	"280" Package	"280" Package	"280" Package	"280" Package	"280" Package	"280" Package
- Housing	NHP	NHP	NHP	125 % NHP	125 % NHP	150 % of NHP
- Social Infrastructure	"280" Package	"280" Package	"280" Package	"280" Package	"280" Package	"280" Package
III. Regional Service Centers	Medium	Special	Special	Special	Special	Special
- Water and sewerage	Existing (improved)	Existing (improved)	Existing (improved)	Existing (improved)	Existing (improved)	Existing (improved)
- Other Infrastructure	"280" Package	"280" Package	"280" Package	"280" Package	"280" Package	"280" Package
- Housing	NHP	Urban Development6/	Urban Development	Urban Redevelopment	Urban Redevelopment	Urban Redevelopment
- Social Infrastructure	"280" Package	"280" Package	"280" Package	"280" Package	"280" Package	"280" Package
IV. Other Settlements	Improved Maintenance	Improved Maintenance	Medium	Improved Maintenance	Medium	Medium/High
- Water and Sewerage	Urban Average4/	Urban Average	PWSP	Urban Average	PWSP	Medium/High
- Other Infrastructure	"280" Package	"280" Modified7/	"280" Package	"280" Modified	"280" Package	"280" Package
- Housing	Urban Average	Urban Average	NHP	Urban Average	NHP	125 % of NHP
- Social Infrastructure	Urban Average	"280" Modified8/	"280" Package	"280" Modified	"280" Package	"280" Package
V. Remote Areas	Improved Maintenance	Improved Maintenance	Medium	Improved Maintenance	Medium	Medium/High
- Water and Sewerage	Urban Average	Urban Average	PWSP	Urban Average	PWSP	Medium/High
- Other Infrastructure	"280" Package	"280" Package	"280" Package	"280" Modified	"280" Package	"280" Package
- Housing	Urban Average	Urban Average	NHP	Urban Average	NHP	125 % of NHP
- Social Infrastructure	Urban Average	"280" Modified	"280" Package	"280" Modified	"280" Package	"280" Package

TABLE II-4

ABBREVIATIONS

- NHP - Minimum housing provision of the 1979 National Housing Plan.
- PWSP - Target standard for water supplies in provincial cities of Proposed by the Provincial Water Supplies Project for the General Organization for Potable Water.

Notes:

1. "Master Plan" refers to the standards of the water supply and sewerage masterplans which have been prepared for the Canal Cities, Alexandria and Greater Cairo.
2. "280" Package refers to the intra-urban standards shown in the Intra-Urban Cost Package in Chapter III which was costed at gross densities of 280 persons/hectare.
3. "Existing (Improved)" refers to improvements water and sewerage systems to ensure that present standards of services are provided for groups and that where sewerage systems do not exist, they are installed.
4. "Urban Average" refers to the average urban standards found in major settlements. (See the "Average Urban Intra-Urban Cost Package" in Chapter III for details).
5. "Target" refers to the target standards of intra-urban development as is exemplified by the "Target Intra-Urban Cost Package" in Chapter III.
6. "Urban Redevelopment" refers to an estimate of the costs of renewing existing built areas. The derivation of these costs is presented in the Housing section of Chapter III.
7. "280" Modified Other Infrastructure refers to the 280 Gross Density Intra-Urban Package in Chapter III, but the costs of public transport have been subtracted and telecommunications costs have been reduced 50 percent.
8. "280" Modified Social Infrastructure refers to the 280 Gross Density Intra-Urban Package in Chapter III except that other social infrastructure has been costed at levels presented in the Average Urban Intra-Urban Cost Package.

The magnitude of the intra-urban infrastructure costs of the major settlements is shown in both absolute and per capita costs for the different alternatives in summary form in Table II-5. The more detailed estimates by settlement and the individual standards used to project these costs for the periods 1980-1985 and 1986-1990 are also shown in the appendices to this Chapter.

In preparing these estimates, the following assumptions were made:

- i. The focus of infrastructure investment during the period 1980-1985 would be to provide improved maintenance of existing infrastructure and install sewerage systems in settlements where they do not exist.
- ii. Settlements would grow within their boundaries during the 1980-1985 period rather than expand horizontally.
- iii. After 1985 in all alternatives except "A", settlements which have horizontal expansion potential onto non-arable land would do so when they reach gross densities of 300 persons per hectare so that they would reach a high level of land-use efficiency within their existing boundaries.
- iv. All other settlements which do not have horizontal expansion possibilities onto non-arable land would expand vertically within their 1980 boundaries. 5/

Since capital investment is needed on an ongoing basis to expand the services of existing infrastructure and to maintain or improve the service levels for existing populations, the infrastructure costs projections shown in Table II-4 include provisions for the capital required to maintain service levels for existing populations at the standards proposed for new populations. Since the process of preparing detailed feasibility studies of settlement level infrastructure is just beginning for some components of infrastructure, e.g. water and sewerage systems, capital requirements for existing populations were estimated as a percentage of per capita costs required for new populations. The constants used for these estimates are shown in the appendices to this chapter.

B. Intrastructure Costs of the Alternatives.

The six alternatives have total intra-urban infrastructure costs which vary widely. These range from L.E. 13,000 million for Alternative A or a per capita cost of L.E. 590 to Alternative C which has the highest estimated cost of L.E. 18,417 million and a per capita cost of L.E. 830.

Table II-5

PROJECTED INTRA-URBAN INFRASTRUCTURE COSTS OF MAJOR URBAN SETTLEMENTS (1986-1990)

ALTERNATIVE	METROPOLITAN AREAS		GROWTH CENTERS		REGIONAL CENTERS		OTHER SETTLEMENTS		REMOTE AREAS		ALTERNATIVE TOTALS	
	TOTAL (L.E.-MILLION)	PER CAPITA (L.E.)										
A	7,634.3	513.5	1,875.5	715.0	819.5	1,341.8	2,294.6	635.0	376.9	1,583.6	13,000.9	590.0
B ₁ Efficiency	6,396.3	440.1	5,116.2	1,659.4	892.8	1,134.4	2,463.4	726.9	399.5	1,671.5	15,262.2	692.7
B ₁ Equity	5,803.4	405.8	5,519.4	1,716.9	911.9	1,173.6	5,207.0	1,501.2	903.4	3,328.7	16,296.0	739.6
B ₂ Efficiency	5,725.5	404.1	4,791.1	1,473.1	921.8	1,161.0	4,120.3	1,163.5	812.3	2,791.4	14,824.9	672.8
B ₂ Equity	5,725.7	404.5	5,493.2	1,689.5	940.5	1,202.7	3,458.2	1,199.1	1,262.9	4,100.3	16,880.5	766.1
C	5,581.2	396.7	5,391.4	1,683.2	939.3	1,200.5	3,989.6	1,981.0	2,515.1	6,211.7	18,416.6	8,290.5
A at "C" Standards	5,560.8	395.3	2,906.6	1,108.1	1,024.5	1,677.3	4,157.3	1,150.5	691.5	2,905.4	16,176.5	734.2
C at "A" Standards	5,560.8	395.3	3,747.6	1,170.0	840.3	1,074.0	3,463.5	851.6	1,547.8	3,822.7	15,159.9	688.0

These variations result from the degree of decentralization in each alternative and the standards illustrated. For example, B₁ (Equity) has somewhat lower per capita costs than B₂ (Equity) due to its greater concentration of population in the Canal Zone and Metropolitan Zones even though the two alternatives have similar standards. Both the B Alternatives have higher Equity than Efficiency infrastructure costs because the standards are higher in the settlement categories "Other Settlements" and "Remote Area Settlements" in the Equity solutions reflecting the objective of more equal service provision. In all of the alternatives the standards of the Metropolitan Areas were kept fairly constant. In the B₁ Alternatives the standards of the metropolitan areas were somewhat reduced to provide more compatibility with standards for Canal cities. Overall, the per capita costs of infrastructure of the metropolitan areas tends to be lower than other settlements even with similar standards since large existing population in the metropolitan areas tend to reduce total per capita costs.

Since the settlements in the Canal Zone are likely to play an important role in all of the alternatives, the standards of the Canal Zone settlements were kept relatively high in all of the Alternatives except A. The Canal standards are those proposed by the water supply and sewerage master plans for the Canal Cities or those of the "Target Intra-Urban Cost Package" which is discussed in further detail in Chapter III. Since the B₂ alternatives have a major emphasis on decentralization through growth centers, the standards of the other seven potential growth centers were raised as an indication of service levels needed to help induce more rapid growth in them.

The Interim Action Report discussed the need to provide improved hierarchical structuring of urban services in Delta settlements. Therefore, to transform Tanta and Mansoura into settlements which could serve broader regional functions special standards for housing were developed which would encourage vertical redevelopment of depressed central built areas.^{6/} However, since the Tanta water standard is already high in comparison to other settlements, (315 l/c/d as compared to the national average of 167 l/c/d), it was used as a standard to cost water supply requirements for these cities under all of the alternatives. Sewerage standards were however improved in all cases.

The settlement category "Other Settlements" was generally costed at standards which are higher than the standards presently found in these settlements, but lower than the growth centers and metropolitan areas. These standards range from the present national urban average standards to the higher standards proposed by the Provincial Water Supply Project

and the National Housing Plan of 1979. In all categories of settlements, where the settlement already enjoys standards which are higher than those proposed for the settlement category in which it is located, the higher existing standards were maintained for that settlement.

Although they are shown separately on Tables II-5 and II-6, the "Remote Area Settlements" were provided with standards similar to the "Other Settlements" category. The very high per capita costs ranging from L.E. 1,584 in Alternative A to L.E. 6,212 to Alternative C, result from regional cost variations reflecting higher construction costs in those areas and higher proportions of new populations to existing populations due to assumed high population growth rates in the more decentralized alternatives. The latter factor increases per capita costs since the costs of constructing new infrastructure for new populations are a higher proportion of total costs than the costs of maintenance.

Both Alternative A and C were costed at "A" and "C" standards to illustrate a pure standards effect on policy choice. In the first case Alternative A was costed at "C" standards. This shows the cost consequences of attempting to achieve greater inter-regional equity through adopting a settlement strategy which concentrates population in the metropolitan areas and provides a high level of urban services in other places. However this would increase infrastructure costs by almost 60 percent. Conversely, a decentralization strategy might be employed which emphasizes lower costs in growth centers and other settlements. This is illustrated by costing Alternative C at "A" standards, which reduces the cost of C from L.E. 18,416 to L.E. 15,150 million. Nevertheless, this would still result in infrastructure costs which are about L.E. 2,159 million higher than in Alternative A.

Clearly, the choice of standards has a major impact on infrastructure costs in any settlement strategy adopted and thus on the ability to implement that strategy. The total intra-urban infrastructure costs of all of the alternatives, with the exception of Alternative A, exceed the total amount which is likely to be available for infrastructure during the 1986-1990 period under even the most favorable GOP projections and as pointed out earlier, these infrastructure cost projections are only for major urban settlements. Thus a resource gap between the costs of infrastructure and the capacity to finance those costs is likely under all of the alternatives, even Alternative A. This gap could however be lessened through more selective choice of settlement priorities and accepting lower standards in other places, focussing investment on priority components of infrastructure and providing maintenance standards for other com-

TABLE 11-6
PROJECTED INTRA-URBAN INFRASTRUCTURE COSTS FOR MAJOR SETTLEMENTS
 (1985 - 1990)

Zone	ALTERNATIVE A		B ₁ EFFICIENCY		B ₁ EQUITY		B ₂ EFFICIENCY		B ₂ EQUITY		ALTERNATIVE C		A at 40'		C at 44"	
	Total Cost (L.E. Millions)	Per Capita Cost (L.E.)														
Greater Cairo	4,544.6	407.4	3,608.8	335.3	3,508.8	335.3	3,974.0	367.2	3,969.9	367.2	3,825.9	343.0	4,557.5	424.9	3,807.9	355.0
Alexandria	3,089.7	832.3	2,781.5	737.8	2,194.0	620.2	1,755.5	525.1	1,755.8	525.2	1,755.3	472.9	2,839.1	849.3	1,752.8	524.4
Canal	967.6	815.0	4,136.3	2,547.3	4,119.2	2,536.0	2,746.4	4,131.0	3,107.7	2,201.0	2,899.0	2,097.8	1,679.9	1,413.1	1,636.7	1,184.4
Delta	2,794.6	803.3	2,991.2	824.7	3,393.6	932.7	2,771.3	755.1	3,403.6	929.0	3,733.9	1,018.8	3,975.4	1,055.5	3,538.7	965.0
North Upper Egypt	668.7	964.1	725.1	1,029.5	1,076.7	1,387.1	1,449.1	1,690.0	1,819.0	1,803.5	2,007.3	1,050.8	1,072.5	1,487.1	1,570.6	1,765.1
South Upper Egypt	558.8	434.9	619.6	475.2	999.7	703.2	1,320.3	837.2	1,561.6	1,027.2	1,857.8	1,139.6	1,360.6	964.6	1,305.4	800.7
Nearby Areas	376.9	1,583.6	399.3	1,671.6	903.4	3,329.7	812.3	2,791.4	1,262.9	4,102.0	2,515.1	6,211.6	691.5	2,905.4	1,347.8	3,822.6
Total	13,000.9	590.0	15,262.2	652.7	16,296.0	739.6	14,824.9	672.8	16,680.5	766.1	18,416.6	829.5	16,176.5	734.2	15,159.9	648.0

ponents and by emphasizing growth in settlements where it is possible to "add onto" existing infrastructure. In the latter case, the need for completely new infrastructure for all infrastructural components would be minimized.

V. Summary

The material in this chapter provides order of magnitude estimates of the relative costs of pursuing alternative settlement strategies. Although it was not possible to estimate all relevant costs for each alternative in this First Round Analysis, the addition of non-estimated costs would tend to result in similar rankings of the alternatives. Thus the material presented provides a substantial basis for an assessment of the costs and consequences of different alternatives.

The costs of each alternative reported in this Chapter are based upon the direct investment needed to create, 1.4 million new jobs and the intra-urban infrastructure to support a total population of 22.6 million in large urban settlements in 1990, of which 3.6 million is the new 1986-90 population.

One significant way to compare alternatives is to consider the difference in financial costs to support this amount of employment and population. Alternative A (at A standards) is chosen as the base for these calculations because it has the lowest costs. Table II-7 shows these comparisons.

Several features of the data in Table II-7 deserve special mention. First the total costs of the alternatives at the standards used are close to the total amount available for non-agricultural job creation and housing and infrastructure for the entire country (L.E. 24.61 billion). Alternatives B₁ (Equity), B₂ (Equity), and C all exceed this investment total. This means that there may be a total resource gap, unless savings are increased nationally. It also means that an attempt to achieve substantial levels of decentralization coupled with major improvements in residential services in areas away from the major metropolitan areas might face even more severe financial constraints, require diversion of resources away from direct job creating investment (thus reducing achievable employment levels), or require a progressive reduction in service levels in major metropolitan areas.

Second, the comparison of B₁ and B₂ (Efficiency) shows that a consequence of achieving relatively high rates of growth in the Canal Zone is to push up the infrastructure costs in B₁ relative to B₂, even though B₁ outperforms B₂ in the direct costs of creating jobs.

TABLE 11-7

FINANCIAL COSTS OF ALTERNATIVE

ALTERNATIVE	DIRECT INVESTMENT COST (L.E. BILLIONS)	COST OF ALTERNATIVE AS PERCENT OF COST OF A	INFRASTRUCTURE INVESTMENT COST (L.E. BILLIONS)	COST OF ALTERNATIVE AS PERCENT OF COST OF A	TOTAL INVESTMENT COST (L.E. BILLIONS)	COST OF ALTERNATIVE AS PERCENT OF COST OF A
A	8.42	100	13.00	100	21.42	100
B ₁ Efficiency	8.89	105.6	15.27	117.5	24.16	112.8
B ₁ Equity	9.03	107.2	16.30	125.4	25.33	118.3
B ₂ Efficiency	9.13	108.4	14.82	114.0	23.95	111.8
B ₂ Equity	9.24	109.7	16.88	129.8	26.12	121.9
C	9.53	113.2	18.42	141.7	27.95	130.5
A (at C Standards)	8.42	100	16.18	124.5	24.60	114.8
C (at A Standards)	9.53	113.2	15.16	116.6	24.69	115.3

Third, comparisons between Alternatives A and C with A at C standards (which substantially improve infrastructure in areas away from major metropolitan areas) and C at A standards, (which provide only maintenance standards in non-growth center cities) are intended to show how critical the choice of standards is. Even with the direct cost advantage of A, a simultaneous effort to upgrade standards substantially away from Cairo and Alexandria raises the cost of A by about 25 percent. Or put the other way, a decentralization strategy such as C can be made less costly by a lowering of standards in secondary cities. The problem with this, of course, is that such cities would become less attractive locations for jobs and population than they would be in Alternative C with higher standards.

Another way to make comparisons among alternatives is to see how much less employment can be obtained for the expenditure of a given amount of direct job investment funds as a result of choosing to allocate investment in some way other than the least cost alternative - Alternative A.

Table II-9 shows an estimate of the output that would be generated by the additional employees and, in the last column the average annual output which would be lost by choosing an alternative other than the least cost alternative - Alternative A. Over this period, each employee is estimated to produce an annual output of L.E. 1,335.

Tables II-8 and II-9 show, by comparing Alternative A with the other alternatives, the efficiency cost of pursuing a more decentralized strategy than the least cost option. The relative loss in jobs and output in going from A to C is about 12 percent of the jobs and output estimated for A. A comparison of B_1 (Efficiency) and B_2 (Efficiency) with their respective equity versions shows the relative employment and output costs of decentralizing with and without an attempt to allocate within a strategy on a least cost basis. This is a relative loss of about 28 percent in the case of B_1 and of 14 percent in the case of B_2 .

These foregoing cost and output comparisons are, of course, not the sole basis for choosing among alternatives. Another objective is to provide improved urban services in urban areas outside of Cairo and Alexandria; both to improve the quality of life of their residents and to reduce the incentive to migrate. Using the relative portion of housing and infrastructure investment that would be allocated to other settlements as an indicator of performance on this objective, demonstrates that Alternative C accomplishes this better than any other alternative, even though the total costs are higher than in other alternatives.

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TABLE II-8 shows the relevant data.

TABLE II-8

COMPARISON OF ALTERNATIVES IN EMPLOYMENT TERMS

(1986 - 1990)

ALTERNATIVE	AVERAGE COST PER JOB	JOB'S CREATED FOR DIRECT INVESTMENT OF L.E. 8.42 B	RELATIVE JOB LOSS 1/
	(L.E.)	(THOUSANDS)	(THOUSANDS)
A	5855	1438	-0-
B1 (Efficiency)	6182	1362	(76)
B1 (Equity)	6280	1340	(98)
B2 (Efficiency)	6349	1326	(112)
B2 (Equity)	6426	1310	(128)
C	6627	1271	(167)

1/ This column is the difference between jobs in alternative A (the least cost alternative) and other alternatives for an equal amount of direct investment in job creation.

TABLE II-9

COMPARISON OF ALTERNATIVES IN OUTPUT TERMS

(1984 - 1990)

ALTERNATIVE	ANNUAL OUTPUT DIRECT INVESTMENT OF	AVERAGE OUTPUT LOSS OVER THE
	L.E. 8.42 B	1986 - 1990 PERIOD 1/
	(BILLIONS)	(MILLIONS)
A	1.920	-0-
B1 (Efficiency)	1.818	510
B1 (Equity)	1.789	655
B2 (Efficiency)	1.770	750
B2 (Equity)	1.749	855
C	1.697	1.115

1/ This column is the difference between output in Alternative A (the least cost alternatives) and the other alternatives, for an equal amount of direct investment in job creation.

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Another desirable objective is to provide a wider regional distribution of employment in industrial jobs than would be possible if current trends persist or if strict efficiency criteria for creating jobs are applied. Using a regional industry mix index as an indicator of performance on this criterion shows that Alternative B₂ (Equity) has the best performance following closely by C.

A third desirable objective is to prevent excessive population growth in the Delta Zone to prevent spillover into arable land. On this criterion, Alternative B₁ is likely to be the best performer.

Reducing population growth and reducing the social costs of concentration in Cairo is a major objective of the government. Chapter V discusses a preliminary concept plan for achieving a reduction in social costs of Cairo and retaining advantages of agglomeration through a rigorous policy of regional Cairo growth with core deconcentration. Such a policy is desirable regardless of the expected size of the metropolitan region and should be followed under any alternative. Nevertheless, any of the decentralizing alternatives are likely to reduce the population size of Cairo relative to its size under Alternative A and may be preferred on these grounds. The Cairo and Alexandria Regions will grow more substantially in alternatives based upon cost efficiency in generating jobs and income than in other alternatives because of their economic attraction and thus pose more severe strains on the internal management of the region.

Table II-10 below summarizes all these considerations by presenting a tentative ranking of alternatives on all of these criteria. A rank of one is best.

TABLE II-10

PERFORMANCE CRITERIA ALTERNATIVE

<u>Criteria</u>	<u>A</u>	<u>B₁</u>	<u>B₁</u>	<u>B₂</u>	<u>B₂</u>	<u>C</u>
		(Efficiency)	(Equity)	(Efficiency)	(Equity)	
1. Least Direct Cost Per Job	1	2	3	4	5	6
2. Least Total Cost (including Infrastructure)	1	3	4	2	5	6
3. More Equitable Provision Of Urban Services	6	5	4	3	2	1
4. More Regional Equality In The Share of Industrial Employment	6	5	4	3	1	2
5. Reducing Population Growth In The Delta	6	1-2	1-2	3-4-5	3-4-5	3-4-5
6. Reducing Population Growth In Cairo	6	2-3	2-3	4-5	4-5	1

CHAPTER II

FOOTNOTES

- 1/ The city data has normally been aggregated into zones for presentation in this report to emphasize the interregional differences in the alternatives; however the analysis was conducted at the settlement level. In subsequent reports inter-city analysis will receive more attention, particularly as it relates to inter-urban infrastructure.
- 2/ The efficiency relationship between investment and the production of goods and services is discussed elsewhere in this report.
- 3/ A more detailed discussion appears in the Appendix to this Chapter.
- 4/ The technical equivalent of this efficiency rule is that the marginal cost of job creation should be the same for all areas receiving an investment allocation. The appendix contains a discussion of our application of this rule.
- 5/ It should be noted that if the growth of Delta settlements occurs within their existing boundaries, very high gross densities in some of these settlements would result. For example, by 1990 both Damanhour and Kafr El Dawar are likely to have gross densities which will exceed 500 persons per hectare due to their existing high densities and their potential growth.
- 6/ Tanta and Mansoura were chosen as candidates for becoming regional service centers because they both can absorb large net populations in excess of 500,000; they are located on major transport networks; they already have regional service functions such as universities and major health facilities and they already have strong economic bases from which they could provide future employment. These are further discussed in Appendix ____.

CHAPTER III

INDICATIVE COSTS OF INFRASTRUCTURE PACKAGES FOR URBAN POLICY

I. Introduction

Chapter II showed a range of costs for creating industrial jobs and supporting infrastructure for six strategy options. This chapter provides a description of the basis for the infrastructure component of those costs.

Costing of intra and inter-urban infrastructure is complex due to the number of component services provided to support urban settlements and the variety of standards at which the services may be provided. Furthermore, costs for infrastructure vary significantly by region. For example, water supply costs for a region depend on the availability and quality of ground water, the distance over which bulk water supplies must be transported and regional differences in construction costs reflecting relative access to construction industry inputs -- labor and materials. The costs of other types of infrastructure also vary regionally for similar reasons.

Detailed costing of infrastructure requires exact technical specification of components beyond the scope of this study. Here, we present order of magnitude costs for major infrastructure groups -- intra and inter-urban infrastructure -- at various standards to provide a sense of overall differences in the costs of alternative strategies. They should not be treated as precise estimates for an individual settlement.

Intra-urban costs are estimated for physical infrastructure (such as water and sanitation systems), social infrastructure (such as health and education), housing and land. Inter-urban costs are estimated for power, fixed transportation facilities and networks, and bulk water supplies.

Intra-urban infrastructure costs are presented as a set of four representative packages of urban services at different standards. Costs are shown on a per capita basis to permit comparisons. The first package shows per capita costs at urban average service level standards. The second per capita costs at the "target standards" of various ministries as represented in projects being implemented or suggested by sectoral master plans. The other two show per capita costs for (1) standards suggested for settlements receiving special emphasis and (2) settlements designated as having secondary city status.

II. Intra-Urban Infrastructure Costs

A. Settlement Gross Densities

The Interim Action Report demonstrated the potential impact of increased gross densities on population absorption capacity. If the Delta settlements grew at densities in the range of Damanhour -- 400 persons/hectare, for example -- they could accommodate an additional 14 million population or 67 per cent of the expected urban population increase without further incursion on arable land outside present settlement boundaries. Increased densities also have a significant impact on reducing the per capita costs of infrastructure and the requirement for urban land. If settlement gross densities are increased from the 104 persons/hectare represented by the new town standards to 400 persons/hectare, the per capita costs of water supply systems in new areas are reduced by almost 2.5 times at constant consumption standards.

Four representative gross densities have been used to project per capita costs of infrastructure. These gross densities range from 104 persons/hectare (the gross density proposed by the Sadat City master plan), to 400 persons/hectare, the highest gross density measured by the 1976 census. This latter density could become a target density for vertical expansion of settlements which are expected to increase in population but whose horizontal growth is constrained by surrounding arable land.

Two intermediate gross densities were used to illustrate a greater range of development options. The first shows per capita costs if future urban growth continues at the current national average gross densities and the second shows costs for a density of 280 persons per hectare (a density somewhat higher than Cairo's current gross density).

While it is not expected that all future settlement will have uniform gross densities by the year 2000; the four representative gross densities illustrate the order of magnitude costs, both financially and of physical resources, of adopting different policies towards physical growth. A horizontal growth policy as represented by both the current average density patterns and the "Urban Target Standards" would result in a land requirement which is two times greater in area than that of a 280 persons/hectare gross target. It would also reduce the net population absorption capacity of existing urban settlements by roughly 13.8 million persons. This reduction in population absorption capacity of existing settlements would increase the requirement for new settlements and the likelihood of increased urban sprawl outside the boundaries of existing settlements.

I. GROSS URBAN DENSITY: 400 PERSONS/HECTARE

II. LAND REQUIREMENTS AND PER CAPITA COSTS

ITEM	PHYSICAL STANDARD	INDICATIVE PER CAPITA COST
PRIVATE	16.25 m ² /capita (65%)	812.50
--RESIDENTIAL	(14.30 m ² /capita)	715.00
--NON-RESIDENTIAL	(1.95 m ² /capita)	97.50
PUBLIC	8.75 m ² /capita (35%)	437.50
TOTAL: LAND	25.00 m ² /capita (100%)	L.E. 1250.00

III. HOUSING

AVERAGE AREA (M ²)	AVERAGE UNIT COSTS (L.E.)	INDICATIVE PER CAPITA COST
45 m ² Flats	70/m ²	L.E. 552.00

IV. PHYSICAL INFRASTRUCTURE

ITEM	PHYSICAL STANDARD	INDICATIVE PER CAPITA COST
WATER	237 l/c/d	25.79
SAHITATION	166 l/c/d	53.98
ELECTRICITY	500,000/30 w/capita	151.31
CIRCULATION	5 m ² /capita (20%)	54.41
TRANSPORTATION	0.3 Buses/1000	34.20
TELECOMMUNICATIONS	95.21 Lines/1000	251.02
SOLID WASTE	Provincial Estimate	10.00
OTHERS		
TOTAL: PHYSICAL INFRASTRUCTURE		L.E. 581.51

V. SOCIAL INFRASTRUCTURE

ITEM	PHYSICAL STANDARD	INDICATIVE PER CAPITA COST
EDUCATION	Modified Alexandria	40.59
HEALTH	Modified Urban Ave. (4.5 Deds/1000)	258.56
SOCIAL SERVICES		
ADMINISTRATION	30% of Target	128.61
OTHERS		
TOTAL: SOCIAL INFRASTRUCTURE		427.76

VI.

TOTAL: HOUSING AND INFRASTRUCTURE	L.E. 1561.27
GRAND TOTAL	L.E. 2811.27

INTRA-URBAN INDICATIVE COST PACKAGE AVERAGE URBAN STANDARDS

1.	GROSS URBAN DENSITY: 140 PERSONS/HECTARE
----	--

II. LAND REQUIREMENTS AND PER CAPITA COSTS

ITEM	PHYSICAL STANDARD	INDICATIVE PER CAPITA COST
PRIVATE	46.4 m ² /capita (65%)	2321.43
--RESIDENTIAL	(40.7 m ² /capita)	2035.00
--NON-RESIDENTIAL	(5.7 m ² /capita)	286.43
PUBLIC	25.00 m ² /capita (35%)	1250.00
TOTAL: LAND	71.43 m ² /capita (100%)	L.E. 3571.43

III. HOUSING

AVERAGE AREA (M ²)	AVERAGE UNIT COSTS (L.E.)	INDICATIVE PER CAPITA COST
-	-	L.E. 391.30

IV. PHYSICAL INFRASTRUCTURE

ITEM	PHYSICAL STANDARD	INDICATIVE PER CAPITA COST
WATER	167 l/c/d	26.72
SANITATION	89 l/c/d *	55.62
ELECTRICITY	136,000 @ 300v/capita	151.54
CIRCULATION	6 m ² /capita (Fayoum)	74.66
TRANSPORTATION	0.12 Buses/1000 (Alexandria Standard)	13.39
TELECOMMUNICATIONS	17.95 Lines/1000	11.98
SOLID WASTE	Tanta Standard	0.09
OTHERS	}	
TOTAL: PHYSICAL INFRASTRUCTURE		L.E. 334.00

V. SOCIAL INFRASTRUCTURE

ITEM	PHYSICAL STANDARD	INDICATIVE PER CAPITA COST
EDUCATION	1 School/1821 Urban Population	59.25
HEALTH	4.14 Beds/1000 Urban Population	28.76
SOCIAL SERVICES	Estimates of Urban Governorates	0.34
ADMINISTRATION	"	45.93
OTHERS	"	44.73
TOTAL: SOCIAL INFRASTRUCTURE		L.E. 179.01

VI.	TOTAL: HOUSING AND INFRASTRUCTURE	L.E. 917.99
	GRAND TOTAL	L.E. 4489.42

* MOST URBAN SETTLEMENTS DO NOT HAVE SEWERAGE SYSTEMS. THIS STANDARD WOULD APPLY IF THEY DID HAVE SEWERAGE SYSTEMS WITH CAPACITIES DESIGNED AT 80% OF WATER SUPPLY NET OF LOSSES AND STANDPIPE CONSUMPTION.

FIGURE: III - 3

INTRA-URBAN INDICATIVE COST PACKAGE TARGET STANDARDS

I. GROSS URBAN DENSITY: 104 PERSONS/HECTARE

II. LAND REQUIREMENTS AND PER CAPITA COSTS

ITEM	PHYSICAL STANDARD	INDICATIVE PER CAPITA COST
PRIVATE	44.7 m ² /capita (46%)	2235.00
--RESIDENTIAL	(24.4 m ² /capita)	1220.00
--NON-RESIDENTIAL	(20.3 m ² /capita)	1015.00
PUBLIC	52.1 m ² /capita (54%)	2605.00
TOTAL: LAND	96.8 m ² /capita (100%)	L.E. 4,840.00

III. HOUSING

AVERAGE AREA (M ²)	AVERAGE UNIT COSTS (L.E.)	INDICATIVE PER CAPITA COST
74 m ²	70/m ²	L.E. 1042.00

IV. PHYSICAL INFRASTRUCTURE

ITEM	PHYSICAL STANDARD	INDICATIVE PER CAPITA COST
WATER	460 l/c/d (Sadat City)	160.75
SANITATION	247 l/c/d (Sadat City)	89.80
ELECTRICITY	500,000 Population/300w/capita	151.31
CIRCULATION	14 m ² /capita (33%)	117.15
TRANSPORTATION	192 Buses/1000 (Sadat City)	59.31
TELECOMMUNICATIONS	124.25 Lines/1000	328.65
SOLID WASTE	}	47.83
OTHERS		
TOTAL: PHYSICAL INFRASTRUCTURE		L.E. 1,003.97

V. SOCIAL INFRASTRUCTURE

ITEM	PHYSICAL STANDARD	INDICATIVE PER CAPITA COST
EDUCATION	1 School/3200 (Sadat City)	152.75
HEALTH	5.36 Beds/1000 (G.O.P.P)	346.44
SOCIAL SERVICES	Sadat City Master Plan }	428.70
ADMINISTRATION		
OTHERS		
TOTAL: SOCIAL INFRASTRUCTURE		927.89

VI.

TOTAL: HOUSING AND INFRASTRUCTURE	L.E. 2,973.86
GRAND TOTAL	L.E. 7,813.86

INTRA-URBAN INDICATIVE COST PACKAGE MEDIUM HIGH DENSITY

I. GROSS URBAN DENSITY: 280 PERSONS/HECTARE

II. LAND REQUIREMENTS AND PER CAPITA COSTS

ITEM	PHYSICAL STANDARD	INDICATIVE PER CAPITA COST
PRIVATE	23.2 m ² /capita (65%)	1160.71
--RESIDENTIAL	(20.4 m ² /capita)	1020.00
--NON-RESIDENTIAL	(2.8 m ² /capita)	140.71
PUBLIC	(2.5 m ² /capita) (35%)	625.00
TOTAL: LAND	35.71 m ² /capita (100%)	L.E. 1785.71

III. HOUSING

AVERAGE AREA (M ²)	AVERAGE UNIT COSTS (L.E.)	INDICATIVE PER CAPITA COST
45 m ² Flats	70/m ²	L.E. 552.00

IV. PHYSICAL INFRASTRUCTURE

ITEM	PHYSICAL STANDARD	INDICATIVE PER CAPITA COST
WATER	237 l/c/d (Provincial City Standard)	40.51
SANITATION	166 l/c/d (Provincial City Standard)	61.01
ELECTRICITY	500,000/300 w/c	151.31
CIRCULATION	7.14 m ² /capita (20%)	72.23
TRANSPORTATION	0.3 Buses/1000	34.20
TELECOMMUNICATIONS	95.2 Lines/1000	251.82
SOLID WASTE	Provisional Estimate }	10.00
OTHERS		
TOTAL: PHYSICAL INFRASTRUCTURE		621.00

V. SOCIAL INFRASTRUCTURE

ITEM	PHYSICAL STANDARD	INDICATIVE PER CAPITA COST
EDUCATION	Modified Alexandria	40.59
HEALTH	Urban Average 4.5 Beds/1000	258.56
SOCIAL SERVICES	30% of Target Standards }	128.61
ADMINISTRATION		
OTHERS		
TOTAL: SOCIAL INFRASTRUCTURE		L.E. 427.76

VI.

TOTAL: HOUSING AND INFRASTRUCTURE	L.E. 1600.76
GRAND TOTAL	L.E. 3386.47

TABLE III-1

COMPARISON OF URBAN LAND PRICES (L.E./m²)

SETTLEMENT	CENTRAL BUSINESS DISTRICT	CENTRAL RESIDENTIAL AREAS	PERIPHERAL RESIDENTIAL AREAS	AGRICULTURAL LAND CLOSE TO BUILT AREAS	DESERT LAND CLOSE TO URBAN AREAS
Greater Cairo	400-1000	250-750	30-250	3 -50	1.0-10.0
Tanta	200+	50-200	50	10	-
El Fayoum	110-140	50-110	50-65	35-50	-
Qena	100+	50-100	50	N.A.	N.A.

B. Land Costs

Informal studies of prices in several settlements indicate that there are wide variations in the cost of urban land. These prices can range from about L.E.1,000 per square meter in prime central business district locations to around L.E. 10 per square meter for undeveloped urban fringe land outside settlement boundaries. However, as shown in Table , undeveloped land within settlement boundaries tends to be priced in the range of L.E. 50.00 per square meter. Therefore, this latter price was adopted to show the impact of land prices on total development costs.

Since most urban settlements do not have recent master plans showing current land uses, the current land use patterns of El Fayoum were used as an indicator of private and public land requirements. ^{1/} This consists of a public land requirement of 35% of total land uses and a private land requirement of 65%. This private land requirement is further subdivided into a residential requirement of 57% of total land requirements with the remainder (8%) devoted to other private non-residential uses. These land use standards were used for all the Urban Cost Packages except the Target Cost Package in which land uses are those in projects being implemented or suggested by sectoral master plans.

C. Housing Costs

The Government of Egypt has recently devoted considerable effort to studying and seeking solutions to housing problems. This has resulted in preparation of a National Housing Policy statement and experiments in several different types of settlement projects in which housing has played a major role. Since the "Urban Growth and Data Report" discusses in detail household composition, housing needs, the provisions of recent settlement projects, the National Housing Policy and institutions involved in developing, constructing and financing housing, only representative standards and per capita costs for housing are presented in the Standards Packages discussed here. It should be noted however, that while the Standards Packages show average areas and per capita costs, they are intended to represent a range of housing solutions, since the bulk of housing is built by the private sector at a wide range of standards and a single standard is not appropriate for all housing requirements.

The highest housing standard shown is the average standard of the housing provisions of the 10th of Ramadan First Stage (74 square meter flats having an average per capita cost of L.E. 1,004). These housing provisions range from core houses having areas of 15 square meter to luxury villas and town houses having built areas of 135 square meters.

Since the National Housing Census does not indicate the average area of dwelling units, a national average physical standard could not be shown. However, Appendix I of the Draft Final Report of the Construction Industry Study indicates that the average per capita cost of rehabilitating existing housing is roughly L.E. 391 per capita or 59 percent of the value of new housing. In the absence of other data, this value was selected to represent the current average investment in housing.

The other two housing options show per capita costs if the minimum flat size of 45 square meters recommended by the National Housing Policy were adopted as an average target standard. To allow for more flexibility in construction, the per capita cost was derived using a higher construction cost per square meter than proposed by the National Housing Policy, i.e., L.E. 70.00 per square meter rather than L.E. 58.00.

The final section of the discussion of intra-urban infrastructure further considers these possible housing solutions in terms of the capital required for them and mechanisms to recover development costs.

D. Physical Infrastructure Costs

The costs of providing physical infrastructure (such as water, sewerage, road networks and other network systems) vary with changes in gross densities, population size and the consumption standard used to design the systems. Reductions in settlement gross densities require longer networks, and thus higher costs, to serve a similar population size than if the settlement had a more compact form and higher densities. It is fairly evident, also, that higher consumption standards result in higher per capita costs than lower standards because networks must utilize large sized units and treatment plants must similarly be scaled to handle larger capacities.

Figures III-5, III-6, and III-7 show how per installation costs for water, sewerage and circulation systems change with different consumption standards and densities. The data used to generate those curves was derived from estimates of settlement requirements for new water systems presented in the Provincial Water Supplies Project. Sewerage system and circulation data was developed from standards and costs found in settlement projects which were presented in the NUPS "Working Paper on Urban Development Standards and Costs".

The costs of electrical systems was found to vary more significantly with population size than density due to

requirements for investments in transformers, substations and high voltage transmission networks. Overall, since the A.R.E. relies on the Unified Power Grid for distribution of much of its electrical power, settlement system costs and consumption standards are more a function of national electrical power standards and requirements than are other intra-urban infrastructure which function entirely at the settlement level. Thus Figure III-8 shows settlement electrical demand at a standard of 300 Watts per capita (an indicative standard derived from the standards presented in the "Working Paper on Urban Development Standards and Costs"). Data on existing settlement level electrical power loading has proven difficult to obtain due to the complexity of the power network and the lack of a nationwide settlement level study of power requirements. Therefore, Figure III-8 shows only order of magnitude per capita costs varying with changes in population.

The telecommunications data shown in the cost packages was obtained from various volumes of the "Telecommunications Sector Study" prepared for the Ministry of Transport, Communications and Marine Transport of the Arab Republic of Egypt by the Continental Telephone Holding Corporation. As with power systems, since the telecommunications network is interlinked; major changes in projected telephone densities, i.e., the number of telephones in a settlement, would require overall changes in the national system. Therefore telecommunications per capita costs presented are those of the telecommunications sector study. If National Urban Policy necessitates major changes in the telecommunications system not envisaged by the sector study, detailed feasibility studies beyond the scope of our work would be required to determine per capita costs resulting from those changes.

The standards packages show costs of water and sewerage systems at standards which range from the current national average consumption capacity of major settlements (but excluding the Canal Cities, Greater Cairo and Alexandria) to the capacities proposed for Sadat City. Intermediate standards show the estimated per capita costs of building at the capacities proposed by the Provincial Water Supply Project targets and at the current capacity of Port Said, a Canal City having standards almost twice as high as the national average standard consumption. Sewerage standards were based on 80 percent of water consumption standards after allowances for losses and for standpipe consumption had been deducted.

Circulation costs are based on the costs of constructing road networks at different densities and per capita land requirements shown in the "Urban Development Standards and Costs" working paper. These costs exclude, however, the

costs of purchasing land which are shown separately. The illustrative circulation standards shown in the standards packages were derived from the standards of the General Organization for Physical Planning, the present land use standards shown in El Fayoum Master Plan, Volume II, and the land requirements necessary at different gross densities if 20 percent of a settlement's area is devoted to circulation.

Intra-Urban Transport costs and standards were more difficult to estimate as inventories of current stock are generally not available and most transport planning has focussed on inter-urban not intra-urban requirements. However, to illustrate the range of policy choices which might be made regarding non-primate city intra-urban transport, the following standards based on available investment data were made:

- i. The National Average Standard Package shows the per capita investment required if they provided transport systems represented by the L.E. 0.51 per capita investment level of Tanta, i.e., 0.77 buses 1000 population, although most settlements would have to establish public systems to reach this level.
- ii. The Target Standard package shows standards at the level proposed by the Sadat City Master Plan: 1.92 buses/1000 population.
- iii. The other two standards shown are based on standards derived from the Alexandria Transport Company and on an increase in these standards by 150 percent. 2/

Telecommunications standards were based on those proposed by the Telecommunications Sector Study. The per capita costs shown illustrate the order of magnitude costs of providing telecommunications services at the current national average standard, the standards proposed by the sector study and at standards which are 50 percent less than the sector study.

Provisions for solid waste and other physical infrastructure were derived from costs shown in the Urban Development Standards and Costs Report, the Tanta standard and modifications of those standards.

E. Intra-Urban Social Infrastructure

The standards of social infrastructure, particularly health and education, are important elements in developing settlement strategies due to the emphasis which Egyptian families place on them. Many senior and managerial level personnel have refused to move their families from Cairo and

Alexandria to even the Canal Cities because of the lack of desired educational and health facilities. Although Cairo and Alexandria predominate, urban Egypt already has a relatively high standard of social facilities. For example, its upper level educational facilities attract students from other countries.

Nevertheless, policy decisions in these categories of infrastructure are needed to determine levels of investment required to expand these services to meet the needs of new populations and also to rehabilitate existing facilities so that they can continue to provide adequate levels of service.

Estimating the requirements for expansion and rehabilitation of social infrastructure is more difficult than physical infrastructure because comprehensive settlement level studies of the conditions of social infrastructure are not available (as they are of many components of physical infrastructure) and because the ministries responsible for provision of social infrastructure do not use cost accounting methodology to reflect the remaining useful life of their facilities. Therefore, cost estimates provided here are approximations.

1. Education Provision

Settlement level provision of secondary, trade and commerce, technical and agricultural facilities and rates of utilization are available from the Ministry of Education and are shown in Appendix _____. However, the ministry is currently computerizing its data banks and cannot make data on lower level education available due to software problems. This latter data is available, however, at the governorate level. Therefore, in order to approximate the settlement costs, we have assumed that the provision of primary and preparatory facilities generally follows the urban/rural population distribution and that general secondary schools are all located in urban areas.

Since secondary level schools are located in urban settlements, they tend to serve rural populations as well as the population of the urban settlement. The regional service functions of these facilities are shown in Appendix _____ and were assumed to continue to be important factors in estimating the requirements for new educational facilities.

The standard packages show estimates of the levels of per capita investment required to provide new populations with educational facilities at standards: (1)

equal to those proposed by the Sadat City Master Plan, (2) an estimate of the national urban average investment in school facilities, (3) at standards presently found in Alexandria, and finally, (4) the costs of a modified Alexandria standard. The national urban average per capita investment level was derived by comparing 1980 information about the distribution of schools by governorate and the average investment made by the Ministry of Education in different types of schools with a 1977 study of the conditions of school buildings. Details of these calculations are shown in the Appendices of this Chapter.

The Alexandria standard was used for intermediate estimates of costs because its standards are relatively high, and based on data shown in Appendix III, its educational facilities only serve its own population. Therefore, regional multipliers could be used without double counting.

A further estimate of investment requirements of the educational sector (primary through secondary) as a whole indicates that it is unlikely that current investment levels can maintain current standards and still provide for increments of new population expected by the year 2000. The ministry currently has a stock of about 10,270 school buildings of which about 42 percent are rated as being in "bad condition" or requiring massive rehabilitation. In addition, based on population projections presented in the "Interim Action Report" an additional 6,360 facilities will be required to educate the expected new urban population by the year 2000. This requirement for new construction and rehabilitation and expansion of existing facilities is expected to require an annual investment of L.E. 8.00 per capita over the period. However current ministry investment is only about L.E. 0.51 per capita, a shortfall of about 94 percent. 3/

While developing detailed manpower studies is outside the scope of our work, a number of policy choices affecting educational services which need to be considered were indicated by the Human Resources Study of the Canal Region. These choices include:

- Redirecting education policy towards providing a greater emphasis on basic literacy skills, particularly among females.
- Further emphasis on providing technical level education needed for future industrialization, and

- Refocussing higher level education towards providing managerial, administrative and technical skills likely to be needed by future industrial and commercial enterprises.

2. Health Provision

Developing profiles on the health sector is even more difficult than for education because 11 different ministries and semi-autonomous organizations as well as the private sector are involved in providing health services. The most comprehensive study of the sector was done at a national level by the Ministry of Health. 4/ While it discusses health provisions and financing, it does not provide much disaggregated data at the settlement level. 5/

Urban Egypt presently has a relatively high standard of health care facilities as is represented by its current standard of 4.4 hospital beds per 1,000 population. However, at the national level, the overall provision is about 2 beds per 1,000 population. These statistics in themselves are not an indication of urban-rural disparities as, except for remote regions, most rural areas have access to urban facilities. Furthermore, due to the lack of associated infrastructure and sufficient catchment populations it would be difficult to provide secondary health care facilities in rural areas. As a result it was assumed that future secondary health care facilities will continue to be provided in urban areas at the current urban standards, but that these facilities will continue to serve both urban and rural populations. However urban primary health care facilities are assumed to serve only urban areas as rural primary health care infrastructure is fairly complete.

The standards packages show estimates of the levels of per capita investment required for new urban populations at: (1) standards proposed by the General Organization for Physical Planning (G.O.P.P.), 6/ i.e. one 300 bed hospital per 56,000 population or 5.6 beds/1,000 population; (2) an estimate of the investment represented by the facilities in the urban governorates 7/ and (3) an intermediate standard which maintains the current urban bed to population ratio but costs new facilities at levels proposed by the Sadat City Master Plan. These per capita costs range from L.E. 346 at the G.O.P.P. standard to L.E. 29 at the estimated urban governorate standard. The intermediate standard, which approximates the investment required to maintain the current urban standard of 4.4 beds per 1,000 population is L.E. 258.

As with the education sector, a review of current budgetary allocations for new investment in the health sector suggests that investment is inadequate to maintain current levels of health provision. As reported in the "Health Profile of Egypt", the 1980 investment by all health sector organizations in new urban facilities is approximately L.E. 2.80 per capita. However, to maintain Egypt's current stock of health care facilities at their 1979 replacement value, provide for innovations in new technology and expand those facilities to accommodate new urban populations, an estimated annual investment of L.E. 13.51 per capita will be required. Details of these calculations are shown in Appendix III.

Although these calculations lack refinement due to insufficient information about the current condition of health care facilities they do suggest some policy options to reduce per capita costs:

- i. As is suggested by the Ministry of Health, a greater emphasis on primary health care might lessen the need to maintain secondary health care standards at their current level.
- ii. A greater movement towards regionalization of secondary health care facilities might allow retirement of some underutilized facilities, particularly since improvements in transport and communications networks could provide greater accessibility to regional facilities.
- iii. Changes in health care requirements suggests that some types of facilities such as fever hospitals are no longer necessary and could be refitted into general hospitals.
- iv. A greater share of the burden of financing health care investment needs could be shifted towards beneficiaries through insurance schemes and private contributions.^{9/}

3. Social Services

Social services encompass a wide range of services and thus result in a wide range of standards of provision of those services. As a result, only general investment levels are shown in the standards packages. These range from the levels projected in the urban governorates, shown in Appendix III, to those projected in the new town master plans. Since the new town master plan projections indicate an investment

level which is 14 times that of projected investments by the urban governorates, the intermediate packages show investments at 30 percent of the master plans.

III. Regional Cost Modifiers

The Intra-Urban Cost Packages so far have focussed on urban standards and costs irrespective of regional location. However, distance from sources of construction inputs and the difficulty in providing infrastructure due to local conditions, such as the lack of non-saline water, influence costs. Therefore, three indices have been developed to modify these average costs to account for such regional differences.

The first regional cost modifier is a regional construction cost index developed from unpublished 1980 regional and sectoral construction output data from the Ministry of Planning. The index was generated from this output data by determining the proportion of that output by governorate which results from cement value, since for a given sector, the volume of cement used to construct an unit of construction output is constant. Therefore, an index of the proportion of cement output value could be used as a proxy for regional construction cost variations.

The constants used to determine sectoral value were derived from sectoral constants shown in the main volume of the "Draft Final Report" of the Construction/Contracting Industry Study, CIS 1980, prepared by the General Organization for Housing, Building and Planning Research, October 1980. The proportion of construction output due to cement value for each sector was added together for each governorate and then compared with the value of cement in fixed prices allocated to each governorate in 1980 by the Cement Sales Office.

The regional construction cost index which resulted shows the relative efficiency of the construction sector in each of the governorates. A governorate with a high index number (the inverse of ratio of output due to cement value to the value of cement supplied to governorate in fixed prices) indicates that the costs of constructing a given volume of construction are likely to be higher than in a governorate which has a lower index number. Since the remote regions present special construction problems, and as in the case of the Red Sea Governorate, are engaged in single large construction projects (such as a railroad which utilizes relatively little cement and therefore distort output calculated from the sectoral constants, but comprise a very large proportion of their construction output) only the output due to housing, public buildings and private sector construction was used in the index.

The second index shows the relative access which different governorates have to non-saline ground water. This index was

TABLE III-2

REGIONAL COST MODIFIERS

GOVERNORATE	REGIONAL CONSTRUCTION COST INDEX	REGIONAL POTABLE WATER INDEX
Greater Cairo	1.00	1.00
Giza (outside Greater Cairo)	2.20	2.02
Alexandria	1.31	1.35
Port Said	1.92	2.44
Ismailia	2.20	2.44
Suez	1.18	2.44
Beheira	2.14	1.35
Kafr El Sheikh	3.21	1.95
Dakahlia	3.22	1.88
Damietta	2.25	2.40
Sharkia	1.78	1.93
Gharbia	1.58	1.40
Menoufia	3.52	1.44
Qalyubia	1.17	1.00
Beni Suef	2.58	1.53
El Fayoum	2.98	2.21
Minia	3.07	2.07
Assiut	1.23	1.72
Sohag	2.86	3.28
Qena	1.03	2.23
Aswan	1.01	2.47
Red Sea	4.51	7.56
New Valley *	4.51	2.77
Sinai, North *	4.51	7.51
Sinai, South *	4.51	1.88
Matruh *	4.51	5.14

* Construction data is insufficient, therefore the Red Sea index was used as a proxy for all remote areas.

developed from data supplied in the Provincial Water Supplies Project and is used to regionally adjust the cost of water supply only. It is the result of surveys conducted by the water supply project throughout Egypt. Governorates having access to non-saline ground water generally have lower water supply costs than those which do not, because less investment in treatment plants and overall networks is required. For example, Damietta which has only saline ground water must draw all of its water supplies from the Nile, which by the time it reaches Damietta requires treatment. However, Minia, which has a relatively low index number, has access to both ground water and Nile water, thus, Minia's water supply costs are lower than those of Damietta.

IV. Cost Recovery On Intra-Urban Infrastructure

The net amount of capital the government requires to finance infrastructure depends on the amount of capital investment which can be recovered from beneficiaries. Higher levels of cost recovery reduce future capital requirements as returns on investments from earlier periods can be used to finance development in later periods.

Generally, three major types of cost recovery are potentially available to development authorities' to recover costs of capital investment:

- i. Direct cost recovery through sales or rents of physical assets to beneficiaries.
- ii. Indirect cost recovery through charges to users of urban services.
- iii. Taxes and transfers from other sectors not directly related to the provision of urban infrastructure.

In this Chapter, the amount of infrastructure costs which could be recovered under the current policies of agencies responsible for provision of infrastructure is discussed by reviewing first, direct recovery from beneficiaries through rent or sale; second, the indirect recovery through user charges. Amounts not recovered either directly or indirectly are treated as residuals which must be financed through transfers from other sectors.

A. Direct Cost Recovery

Part of the investment cost of housing and residential land is customarily recovered through sales; paid for by a down payment plus a loan repayment. Down payments vary considerably but usually cover the cost of land plus a percentage of housing costs. Loans are provided to housing beneficiaries at an annual interest rate of about 3 percent

over a thirty year repayment period. Development agencies have recently financed their operations by borrowing funds from the Central Bank at 10 percent interest annually over thirty years. The difference between their borrowing and lending rates has been financed through direct transfers from the Treasury. 9/

A hypothetical cash flow has been developed to compare initial capital costs with subsidies required for each of the Urban Cost Packages to examine possibilities for direct cost recovery of housing, residential land and physical infrastructure. The cash flow is calculated on the assumption that all costs of intra-urban physical infrastructure could be recovered through direct sales to future urban populations, but that social infrastructure costs would not be assessed to users.

The amount which the median 1979 per capita urban annual household income (L.E. 200) could amortize under current recovery policies (90 percent financing of total costs at 3 percent annual interest over 30 years) is used to illustrate affordability in the example. This results in a loan amount net of down payments of L.E. 785. The capital subsidy required is the difference between the residential portion of the intra-urban cost packages net of 10 percent down payments and the affordable amount. The additional capital required to finance interest on capital subsidies and interest rate subsidies, i.e., the difference between lending and borrowing rates, is shown individually for the first four periods of the cash flow and totalled for the remaining periods. Finally, the total subsidy requirements over the life of the beneficiary loans are shown as percentages in the final column of the Table.

Based on the hypothetical cash flow, current cost recovery policies result in large subsidy requirements. Thus direct cost recovery is likely to have little impact in reducing the requirements for capital to finance infrastructure for future urban populations. However, the total amount of subsidies required is considerably smaller for the higher density intra-urban cost packages than for the Urban Target Standards Package.

Greater amounts could be recovered by requiring greater initial deposits from beneficiaries for development costs as is the current practice for sale of land and through financing physical infrastructure through user charges. Therefore, user charges as a mechanism for cost recovery are next reviewed.

TABLE III-3

DIRECT COST RECOVERY OF PHYSICAL INFRASTRUCTURE, HOUSING AND RESIDENTIAL LAND COSTS

COST PACKAGE	INTRA-URBAN PER CAPITA COST OF LAND, HOUSING, AND PHYSICAL INFRASTRUCTURE (L.E.)	PERCENT CAPITAL SUBSIDY REQUIRED TO MEET AFFORDABILITY (\$)	PERIOD	(CASH FLOW IMPLICATIONS (MILLIONS OF L.E.))				
				INCREASE IN URBAN POPULATION (MILLIONS)	DEVELOPMENT CAPITAL REQUIRED (NET OF DOWN- PAYMENTS)	CAPITAL SUBSIDIES	ADDITIONAL CAPITAL REQUIRED TO FINANCE INTEREST ON CAPITAL SUBSIDIES & INTEREST RATE SUBSIDIES	TOTAL PROGRAM SUBSIDY REQUIRED
Urban Target Standards	3,265	73	1980-1985	3.1	9,109	6,650	-	
			1985-1990	4.1	12,049	8,796	901	
			1990-1995	4.8	14,105	10,297	2,093	
			1995-2000	5.6	16,456	12,013	3,489	
			2000-2030				23,812	
TOTALS					51,719	37,755	30,294	86
Average Urban Standards	2,761	68	1980-1985	3.1	7,703	5,238	-	
			1985-1990	4.1	10,188	6,928	750	
			1990-1995	4.8	11,928	8,111	1,743	
			1995-2000	5.6	13,915	9,463	2,905	
			2000-2005				19,824	
TOTALS					43,734	29,740	25,221	83
Medium High Densities	2,193	60	1980-1985	3.1	6,118	3,671	-	
			1985-1990	4.1	8,092	4,855	583	
			1990-1995	4.8	9,474	5,684	1,355	
			1995-2000	5.6	11,053	6,632	2,259	
			2000-2005				15,417	
TOTALS					34,737	20,842	19,614	79
High Density (Delta) Standard	1,849	47	1980-1985	3.1	5,153	2,422	-	
			1985-1990	4.1	6,815	3,203	481	
			1990-1995	4.8	7,979	3,750	1,117	
			1995-2000	5.6	9,309	4,375	1,862	
			2000-2005				12,705	
TOTALS					29,256	13,750	16,168	75

B. Indirect Cost Recovery

The second form of cost recovery frequently used is indirect cost recovery where beneficiaries pay for the costs of installation of infrastructure through periodic charges based on consumption of urban services, such as water supply. These user charges normally are used to finance the costs of operations and maintenance of infrastructure systems prior to establishing any reserve which can be used to finance expansion of present systems. If such a reserve is established expansion of existing systems is possible. If user charges are to finance completely new infrastructure, debt servicing must be deferred until the system is in use before any cost recovery can occur.

The present capacity of per capita revenues from water supply, sewerage, telecommunication, electrical and transport authorities of the urban governorates to finance expansion of infrastructure is shown in Table III-4. It compares per capita revenues from users with the costs of operations, maintenance, depreciation and debt servicing.

The information shown in Table III-4 comes from 1980 national budgets and tariff studies conducted on water supply and sewerage utilities in these settlements. As indicated the capacity to finance new infrastructure through user charges is severely limited. All systems except the telecommunications authority show negative net incomes and require transfers from the Treasury to finance their current operations as well as expansion of their services.

Although Table III-4 shows some regional variations in the amount of increase which would be necessary for user charges to provide sufficient revenue to fully recover the costs of operating and expanding urban infrastructure, overall tariffs would have to increase in the order of 130 percent or more before they could finance the current levels of service of these utilities. This increase would not provide for improved maintenance and service levels nor would it finance major expansion of these systems suggested by master plans for the different utilities. As indicated by the Tariff Study of the Greater Cairo Water Utility per capita revenues would have to increase 5.4 times by 1986 and almost 11 times by the year 2000 to finance major increases of service capacity for populations and improvements in existing service levels. ^{10/} During the same period, total operating expense including depreciation would have to be increased almost two times by 1986 and about 4.4 times by 2000 to improve existing service levels and provide larger depreciation reserves. ^{11/}

Although the per capita revenue requirements shown in Table III-5 can not be related directly to per capita house-

TABLE III-4

INDIRECT COST RECOVERY UNDER CURRENT POLICIES

SETTLEMENT	1980 PER CAPITA REVENUES AND COSTS						REVENUE REQUIREMENT FOR FULL COST RECOVERY	PERCENT REVENUE INCREASE REQUIRED FOR FULL COST RECOVERY AT CURRENT SERVICE LEVELS
	REVENUES	TOTAL OPERATIONS & MAINTENANCE	DEPRECIATION	NET OPERATING INCOME PER CAPITA	DEBT SERVICE	NET INCOME PER CAPITA		
GREATER CAIRO								
Water	1.92	2.15	1.12	(1.34)	1.50	(2.84)	4.77	248
Sewerage	1.60	1.20	1.10	(0.67)	0.41	(1.08)	2.71	159
Telecommunications	4.35	4.01	0.25	0.08	0.08	-	-	-
Electricity	9.76	10.52	0.359	(1.12)	0.15	(1.28)	11.04	113
Transport	6.84	4.05	3.54	(0.75)	2.12	(2.86)	9.72	142
TOTAL	24.47	21.95	6.38	(3.80)	4.27	(8.08)	32.55	133
ALEXANDRIA								
Water	2.82	2.31	0.98	(0.47)	1.41	(1.61)	4.43	157
Sewerage	1.1	0.76	0.92	(0.59)	0.37	(0.96)	2.67	240
Telecommunications	4.35	4.01	0.25	0.08	0.08	-	-	-
Electricity	8.69	9.45	0.45	(1.22)	0.09	(1.31)	10.00	115
Transport	7.13	7.13	1.34	(1.34)	0.32	(1.66)	8.79	123
TOTAL	24.09	23.65	3.95	(3.54)	2.00	(5.54)	29.53	123
SUEZ								
Water	3.71	3.29	1.51	(1.2)	4.02	(5.22)	8.92	240
Sewerage	3.24	1.09	1.58	(0.57)	1.44	(0.87)	4.11	127
Telecommunications	4.35	4.01	0.25	0.08	0.08	-	-	-
Electricity	2.91	3.67	0.08	(0.84)	0.08	(0.92)	3.83	132
TOTAL	14.21	12.06	3.53	(1.39)	5.62	(7.01)	21.22	149
ISMAILIA								
Water	3.51	3.83	0.69	(1.0)	1.56	(2.56)	6.08	173
Sewerage	2.0	0.87	1.89	(0.75)	1.22	(1.97)	3.97	199
Telecommunications	4.35	4.01	0.25	0.08	0.08	-	-	-
Electricity	2.91	3.67	0.08	(0.84)	0.08	(0.92)	3.83	132
TOTAL	12.77	12.38	2.91	(2.51)	2.94	(5.45)	(18.22)	143
PORT SAID								
Water	3.47	3.11	0.53	(0.17)	0.76	(0.93)	4.40	127
Sewerage	1.57	1.49	0.92	(0.84)	0.58	(1.42)	2.99	150
Telecommunications	4.35	4.01	0.25	0.08	0.08	-	-	-
Electricity	2.91	3.67	0.08	(0.84)	0.08	(0.92)	3.83	132
TOTAL	12.30	12.28	1.79	(1.77)	1.50	(3.27)	15.57	127

hold income as they include revenues from non-domestic consumers, the Table indicates that major capital development programs could not be financed by existing user charges without either increasing tariff structures or increasing subsidies to these utilities.

Sector plans and tariff studies for water, sewerage and telecommunications utilities have proposed tariff structures which develop cross subsidies from revenues from non-domestic consumers to reduce revenue requirements from domestic consumers. Nevertheless, total revenue requirements from domestic consumers, due to the total demand they represent, range from between 36 percent of total revenue requirements of Kafr el Sheikh Water Utilities to 77 percent of Ismailia sewerage utilities (see Table).

Thus, even with substantial cross subsidies from non-domestic consumers, tariff increases would be necessary before the infrastructure program suggested in the Intra-Urban Costs Packages could be financed by user charges. As projected by the Tariff studies, this increase of user charges could result in up to 3 to 4 percent of median household income being spent for water and sewerage and potentially another 6 percent of income being spent for transport, telecommunications and electricity. 12/

C. Cost Recovery Implications

This brief assessment of current cost recovery policies indicates that fairly large transfers from other sectors may be required to finance all of the Intra-Urban Cost Packages. These development capital requirements range from 69 percent of the High Density Package to 89 percent of the Urban Target Cost Package. In addition, substantial current capital amounts will be required to finance interest rate subsidies and deficits not covered by user charges. It would also appear that rapid increases in user charges to finance the expansion of physical infrastructure may be difficult due to the substantial load which these tariffs would place on household incomes.

This situation could be improved through increasing the amount of development capital recovered directly from households through deposits for land costs and increasing the amounts recovered through user charges. Regarding the latter, a gradual increase in tariff schedules is suggested by the Provincial Water Supplies Project aiming at an interim goal of financing, say, 50 percent of investment costs through surpluses of current revenues over current expenses (including increased provisions for operations and maintenance to improve existing services levels as well as increased provisions for depreciation to allow more rapid replacement of existing plant than is currently allowed).

TABLE III-5

TOTAL REVENUE REQUIREMENTS PROJECTED BY MASTER PLANS
AND FOR WATER AND SEWERAGE UTILITIES

<u>UTILITY</u>	<u>REVENUES BY CONSUMER CLASS (L.E. MILLIONS)</u>			<u>DOMESTIC REVENUES AS A PROPORTION OF TOTAL REVENUES</u>
	<u>DOMESTIC</u>	<u>NON-DOMESTIC</u>	<u>TOTAL</u>	
<u>GREATER CAIRO 1/</u>				
Water	44.8	17.1	61.9	72 %
Sewerage	38.6	15.2	53.8	72 %
<u>ALEXANDRIA 1/</u>				
Water	14.8	13.2	28.0	53 %
Sewerage	11.9	8.4	20.3	59 %
<u>SUEZ 1/</u>				
Water	2.3	2.8	5.1	45 %
Sewerage	1.4	0.4	1.8	78 %
<u>ISMAILIA 1/</u>				
Water	2.2	1.3	3.5	63 %
Sewerage	2.3	0.7	3.0	77 %
<u>PORT SAID 1/</u>				
Water	1.2	1.9	3.1	39 %
Sewerage	2.4	1.0	3.4	71 %
<u>GENERAL ORGANIZATION FOR POTABLE WATER 2/</u>				
Behcira Water	4.0	4.6	8.6	47 %
Kafr El Sheikh Water	2.0	3.5	5.5	36 %

1/ 1984 test year in which revenues are to be sufficient to allow self-financing.

2/ 1990 test year in which revenues are to be sufficient to finance 50 % of capital development program.

Government participation could be treated as equity investment rather than long-term loans or grants. This would allow infrastructure authorities to move towards more financial independence. Both procedures would have the effect of reducing long-term subsidy requirements. 13/

Interest rate subsidies could be reduced possibly in two ways:

- i. A movement towards market interest rates where the beneficiary would be charged the actual financial cost of debt servicing. If affordability criteria restricts lower income access to financial markets, as well may be the case, greater initial deposits may be required or that portion of the recoverable cost of infrastructure which is not affordable may be subsidized as a one-time capital subsidy. If the latter course is chosen, physical standards of development should also be modified to reduce the subsidy requirement. Both of these possibilities would allow financial organizations greater opportunities for growth than is currently the case as they could rely more on their own savings deposits for financing their loan portfolios. Savings deposits now attract higher interest rates than current housing lending rates of 3 percent.
- ii. A second, less drastic way, to reduce interest rate subsidies would be to minimize capital subsidies through either requiring initial deposits to cover the portion of development costs which are not affordable and to modify standards to reduce subsidy requirements. This is a less desirable option as it would require larger long-term subsidies to finance deficits which financial agencies would incur and would reduce their ability to expand their services to groups not presently served. It would however reduce overall subsidy requirements and could be coupled with a program of gradually increasing interest rates to reduce long-term subsidy requirements.

These suggestions for reduction of subsidy requirements in new urban infrastructure are shown in Tables III-6 and III-7. The tables incorporate increased initial deposits to cover land costs by assuming that household savings are large enough to allow larger one-time payments for urban services than was shown in Table III-4. They also show increased recovery of physical infrastructure costs as follows:

ITEM	PERCENT RECOVERED THROUGH USER CHARGES
Water	50%
Sewerage	50%
Electricity *	100%
Circulation	50%
Transportation	100%
Telecommunications *	100%
Others	50%

* These components of infrastructure already recover the bulk of their costs through user charges.

The amounts shown as not recovered in the table are the subsidies required to meet median household per capita income affordability criteria. Affordability in this case was based on the amount which the 1979 median per capita income of L.E. 200 per annum could amortize at 10 percent annual interest over thirty years if 20 percent of income is devoted to repayment of loans for urban infrastructure. This resultant amount is L.E. 377.

The Tables show large reductions in the capital and long-term subsidies. For example, the Medium High Density Cost Package has a capital subsidy requirement which reduces from 74 percent of investment costs (Table III-3) to 43 percent. This subsidy requirement is largely the result of social infrastructure costs and the portion of physical infrastructure costs not recovered. The total program or life of the debt servicing subsidy requirements reduce from 79 percent to 41 percent.

TABLE III-6

IMPLICATIONS OF DEVELOPMENT CAPITAL COST RECOVERY ON INTRA-URBAN COST PACKAGES

I. DIRECT RECOVERY OF LAND, HOUSING, AND PORTIONS OF PHYSICAL INFRASTRUCTURE UNDER CURRENT POLICIES

<u>COST PACKAGE</u>	<u>TOTAL PER CAPITA COST</u>	<u>AMOUNT WHICH CAN BE DIRECTLY RECOVERED</u>	<u>AMOUNT NOT RECOVERED</u>	<u>AMOUNT NOT RECOVERED AS A PROPORTION OF TOTAL</u>
Urban Target	7,814	972	6,840	88 %
Urban Average	4,489	972	3,517	78 %
Medium High Density	3,387	972	2,415	71 %
High Density	2,811	972	1,839	65 %

II. COST RECOVERY IF HOUSING AND LAND ARE RECOVERED DIRECTLY AND PORTIONS OF INFRASTRUCTURE RECOVERED INDIRECTLY

<u>COST PACKAGE</u>	<u>TOTAL PER CAPITA COST</u>	<u>AMOUNT TO BE RECOVERED DIRECTLY</u>	<u>AMOUNT RECOVERED THROUGH USER CHARGES</u>	<u>AMOUNT NOT RECOVERED</u>	<u>AMOUNT NOT RECOVERED AS A PROPORTION OF TOTAL</u>
Urban Target	7,819	1,597	688	5,507	71 %
Average Urban	4,489	2,113	255	1,821	41 %
Medium High Density	3,387	1,402	529	1,456	43 %
High Density	1,849	715	509	625	34 %

DIRECT COST RECOVERY OF HOUSING, PORTIONS OF PHYSICAL INFRASTRUCTURE AND RESIDENTIAL LAND

INTRA-URBAN	PER CAPITA COST TO BE RECOVERED <u>1/</u>	DEPOSIT FOR LAND	AMOUNT RECOVERED THROUGH USERS CHARGES	AMOUNT NOT RECOVERED TO MEET AFFORDABILITY	PERIOD	INCREASE IN URBAN POP. (MILLIONS)	CASH FLOW IMPLICATIONS (L.A.E. MILLIONS)			TOTAL PROGRAM SUBSIDY
							DEVELOPMENT CAPITAL NEEDED <u>2/</u>	CAPITAL SUBSIDIES	ADDITIONAL CAPITAL REQUI- RED FOR INTEREST SUBSIDIES <u>3/</u>	
Urban Target Standards	3,265	1,220	688	980	1980-1985	3.1	4,207	3,039	-	
					1985-1990	4.1	5,564	4,018	321	
					1990-1995	4.8	6,514	4,704	746	
					1995-2000	5.6	7,599	5,488	1,243	
					2000-2030				10,945	
					TOTAL		23,884	17,249	13,255	
Average Urban	2,761	2,036	255	93	1980-1985	3.1	1,457	288	-	
					1985-1990	4.1	1,927	381	31	
					1990-1995	4.8	2,256	446	72	
					1995-2000	5.6	2,632	520	120	
					2000-2030				1,053	
					TOTAL		8,272	1,535	1,276	
Medium High Density	2,193	1,025	529	259	1980-1985	3.1	1,980	803	-	
					1985-1990	4.1	2,620	1,061	86	
					1990-1995	4.8	3,067	1,243	200	
					1995-2000	5.6	3,578	1,450	334	
					2000-2030				2,934	
					TOTAL		11,245	4,557	3,554	
High Density	1,849	715	509	248	1980-1985	3.1	1,937	769	-	
					1985-1990	4.1	2,563	1,016	82	
					1990-1995	4.8	3,000	1,190	191	
					1995-2000	5.6	3,500	1,388	318	
					2000-2030				2,800	
					TOTAL		11,000	4,363	3,361	

1/ Includes residential land costs, housing and all of physical infrastructure costs.
2/ Net of land deposits and amounts recovered through user charges.
3/ Based on lending and borrowing rates of 10 percent over thirty years.

V. Inter-Regional Infrastructure

A. Introduction

Complex systems of inter-regional infrastructure serve the existing settlements of the Delta, the Nile Valley and the Canal Zone. This inter-regional infrastructure is comprised of three major sectors: transportation (consisting of road, rail, water and air networks), power and telecommunications. A fourth sector, potable water networks, serves smaller regions, usually within a single governorate, and has already been discussed as part of intra-regional infrastructure.

B. Transportation

Cost data on inter-regional transportation infrastructure has been derived from the National Transportation Investment Program of the Transport Planning Authority of the Ministry of Transportation. This program covers all major modes of transportation and provides information on projected capital investment, operating and maintenance costs.

Although the final investment program has not been formally released, preliminary versions of the program have not proposed development of major new transport corridors. Rather, they have focussed on improvement and upgrading of existing corridors as traffic forecasts to the year 2000 have not indicated the need for major new investments along existing corridors. Major investments have been recommended for development of a new port facility at Damietta and major expansions of the ports of Alexandria, Port Said, Suez and Safaga. Since port development represents an investment which is location specific, port development costs are not presented here as inter-regional infrastructure. Similarly, as external air routes are established, they have not been considered here in inter-regional costing. Finally, estimates about internal air traffic routes have been excluded until more details about the transportation investment plan have been released.

The capital costs of highways (including new roads, conversion of existing roads, ringroads and bridges) are shown in Table III-8. The data shows financial costs and uses a factor of 1.35 to convert financial costs to economic costs. This conversion factor is based on estimates of subsidies on fuel and building materials. The economic capital costs of constructing new railways are shown below:

TABLE III-8

HIGHWAY CAPITAL COSTS *
(Financial to Economic = 1.35 Factor)
(In Thousand L.E. Per Kilometer)

HIGHWAY TYPE OR CONST. CATEGORY	A R E A				LAND REQUIRED IN METERS		
	DESERT		NON-DESERT				
		FINANCIAL	ECONOMIC	FINANCIAL	ECONOMIC		
A. NEW ROADS							
	NO. OF CARRIAGE WAYS	NO. OF LANES					
	1	2(1x2)	275	371	360	486	25 m
	2	2(2x2)	500	675	610	824	40 m
	2	3(2x3)	625	844	760	1,026	50 m
	2	4(2x4)	750	1,012	910	1,228	60 m
B. CONVERSIONS OF EXISTING ROADS							
	2 Lane to 2x2		250	338	275	371	
	2x2 to 2x3		125	169	150	202	
	2x2 to 3x4		375	506	450	608	
C. RINGROADS							
	2	2	-		1,500	2,025	
	2	3	-		2,000	2,700	
	2	4	-		2,500	3,375	
D. GRADE-SEPARATED INTERSECTIONS							
	Major		-		30,000	40,500	
	Minor		-		7,500	10,125	
E. MODERNIZE 2-LANE HIGHWAY (TYPE 2.1.2) (TO 2.1.1)							
			70	95	100	135	10 m
F. BRIDGES (BRIDGES x SECTION WIDTH)							
	LANES	WIDTH (INCL. 1 or 4 cm SERVICE ROADS)					
	2 Lanes	16 m (1 service rd) (8,000 sq m)				10,000	
	4 Lanes	30 m (1 service rd) (15,000 sq m)				18,500	
	6 Lanes	41 m (2 service rd) (20,500 sq m)				25,000	
	8 Lanes	48 m (2 service rd) (24,000 sq m)				30,000	

NOTE: Average Length of Nile Bridge = 500 m Unit Const. Cost = L.E. 1,250/sq m.

SOURCE: National Transportation Investment Program. Phase II. Various Unpublished Reports.

* Land acquisition costs assumed to be L.E. 1.4 per square meter.

TABLE III-9

LONG RUN MARGINAL COSTS - 1980

A. Intercity Passenger Transport (Long-Run Marginal Costs) 1/

<u>Mode</u>	<u>Cost Per km (Millions)</u>
1. Rail (Non Air)	5
2. Bus	8
3. Taxi	14
4. Car	22

B. Intercity Freight Transport-Rail & Road Cost Per Ton km in Millioemes
Long-Run Marginal Costs 1/

<u>Mode</u>	<u>Distance Class</u>							
	0- 100	100- 200	200- 300	300- 400	400- 500	500- 600	600- 700	700- 800

A. Rail

1. Mixed Freight	45-50	<u>a/</u>	43-45	<u>a/</u>	40.8	39.5	38.6	38.0	37.8	37.6
2. Unit Trains	50	<u>a/</u>	33		26.5	23.8	22.0	21.0	20.0	19.4
3. Bagged Cargo	25	<u>a/</u>	19.6		17.0	15.2	14.2	13.4	13.0	12.7
4. Bulk Minerals	21	<u>a/</u>	17.6		15.6	14.4	13.6	13.0	12.8	12.6

B. Road

1. Single Truck	60	<u>a/</u>	57	<u>a/</u>	56	<u>a/</u>	57	<u>a/</u>	60	<u>a/</u>	61	<u>a/</u>	62	<u>a/</u>	65	<u>a/</u>
2. Truck Combina-	45	<u>a/</u>	37	<u>a/</u>	36	<u>a/</u>	36	<u>a/</u>	35	<u>a/</u>	35	<u>a/</u>	35	<u>a/</u>	35	<u>a/</u>

SOURCE: National Transportation Investment Program.

1/ Economic long-run marginal costs, include capital plus the variable maintenance costs.

a/ Estimated by interpolation from the transportation program data. Typically unit trains does not operate over short distances although volumes will affect economic viability.

ITEM	COSTS PER KILOMETER (L.E.'000s)
------	------------------------------------

Doubling Track	160
Mechanical Equipment	20
Electrical Equipment	200

Since no new canals are recommended by the investment program, only operations and maintenance costs are shown. Capital investment in major transport facilities clearly represents large resource requirements.

The long-run marginal costs (including capital and variable maintenance costs) are shown in Table III-9. These costs are a significant factor in assessing future transport costs since they have a direct impact on the costs of moving a settlement's non-local inputs and outputs and changing the level or type of economic activity in different locations. Table III-9 shows that there are significant differences in ton/kilometer and passenger/kilometer costs between the various modes. Freight transport costs by truck tend to be higher over short distances, reduce over intermediate distances and then increase over very long distances, while rail transport costs reduce as distance increases.

C. Inter-Regional Power Networks

The Egyptian Electricity Authority has prepared a nationwide investment program over the period 1980-1987 which envisions expansion of new generating capacity from 3,915 megawatts (MW) in 1980 to 8,128 MW by 1987. This program is estimated to require an expenditure of L.E. 1.11 million per new installed MW (1980 prices) including increased transmission and distribution networks. As this program aims at expansion of the existing Unified Power Grid, it results in a uniform nationwide per capita investment over the period of L.E. 8.84 per annum. 14/

Since details about regional variations in this program, this per capita investment should be added to intra-regional costs to reflect total electrical power sector electrical requirements.

There are significant variations in the marginal costs of electrical power supply which depend on location with respect to the Unified Power Grid and with respect to sources of hydroelectric power. For example, settlements which are not located on the power grid must generate electrical power through either thermal or nuclear power plants 15/ which result in more expensive units of power than those generated by hydroelectric plants. Furthermore, within the network itself, variations in the costs of producing power result from the distance from major sources of electrical power generation such as the Aswan High Dam. These variations result from transmission losses which increase with distance.

D. Inter-Regional Telecommunications Costs

The Intra-Urban Cost Packages include the capital costs of inter-regional telecommunications costs. However, within those average costs there are significant variations in the capital costs of installing new telecommunications networks. These variations in total telecommunications capital costs are represented by telephone lines in the following Table.

TABLE III-10

PROJECTED CAPITAL INVESTMENT AND
YEAR 2000 DISTRIBUTION OF TELEPHONE LINES *

COMMUNICATIONS ZONE	PROJECTED TOTAL NUMBER OF LINES	COST PER NEW LINE (L.E)	COST PER CAPITA ** (L.E.)	REGIONAL INDEX
Cairo	2,209,168	2,583	516.49	100.0
Alexandria	691,256	2,822	564.43	109.3
Canal	481,790	2,764	553.42	107.2
Delta	778,330	2,729	545.83	105.7
Upper Egypt	346,790	3,019	603.74	116.9
Totals ***	4,597,150	2,645	529.03	-
Total 2000 Urban Per Capita Cost			328.65	-

* Arab Republic of Egypt. "Telecommunications Sector Study. Volume 4, Telecommunications System Planning Strategy". Continental Telephone Internacional. April 30, 1978.

** Per capita costs were estimated by multiplying the projected number of lines by five persons per line and dividing that amount into the projected capital investment by zone.

*** Totals are those of the Telecommunications Sector Study.

CHAPTER III

FOOTNOTES

- 1/ "Development & Planification Project of El Fayoum City". Volume II. The Development & Technical Planning Research Center, Cairo University, 1980.
- 2/ The following methodology was used to calculate the standards of Tanta and Alexandria. The Tanta standard was based on data supplied by the Local Council, while the Alexandria Standards are based on a valuation of its current inventory resulting from depreciation allowances shown in the 1980/81 budget. The Alexandria standard was then determined by dividing the estimated value of its inventory by the current replacement value of urban buses.
- 3/ Budgetary estimates are based on 1977 figures applied by the Ministry of Education.
- 4/ Arab Republic of Egypt. Ministry of Health. "Health Profile of Egypt". Study on Health Financing and Expenditure in Egypt". Publication No. 10, April 1980.
- 5/ The Planning Department of the Ministry of Health has agreed to provide more disaggregated level information, but this can not be made available for inclusion in the First Round Alternatives.
- 6/ General Organization for Physical Planning. Department of Development and Planning and Research Studies. "Directory I. Planning of Neighborhoods".
- 7/ These investment levels were projected based on information supplied by Ministry budgets for investments in maintenance and spare parts. It was found from studies of other infrastructure where the net value of existing plant is known that these investments range from 0.003 to 0.025 percent of the net value of the plant. Therefore assuming that the minimum relationship is also true for other types of infrastructure indicative per capita investments were projected from urban governorate budgetary data. It is recognized that these are only order of magnitude projections. These projections are presented in Appendix III.

- 8/ Discussions are currently underway between USAID and the Government of Egypt which could lead to a health sector study which would study the sector in detail and provide greater insight into sector needs.
- 9/ This is discussed in greater detail in the Urban Growth and Data Report.
- 10/ The overall aim of these revenue increases is to provide sufficient income for the utility to enable it to finance all of its current operating and maintenance expenses including depreciation expense and be able to finance interest expense through surpluses from its gross income after total operating expenses are deducted. This would provide the utility with a return on its investment in plant of 5.5 percent by 1986, the year in which it would not require major subsidies for interest expense and almost 8 percent by the year 2000.
- 11/ More modest tariff structure increases were projected for the Beheira water systems by the Provincial Water Supplies Project in which only 5 percent of the capital investment program would be financed by long-term loans. The remainder would be financed equity participation by the central government.
- 12/ Page 68 of the NUPs "Working Paper on Urban Development Standards and Costs" shows these calculations for water and sewerage systems, while it was assumed that all of transport costs are domestic and that at the median income 20 percent of telecommunications revenue requirements result from households as the telecommunications authority has substantial revenues from other sources. Under the new electricity tariffs issued in January 1980, minimum consumption charges for household uses are estimated at L.E. 1.60 per month for 80 kWh which is equivalent to 1 percent of median per capita household income of L.E. 200 per annum.
- 13/ These suggestions are implemented by the water systems of Beheira Governorate under procedures outlined by the Provincial Water Supplies Project. There, the General Organization for Potable Water is converting the system into a "private" largely self-financing company.
- 14/ This per capita expenditure is net of price escalations shown in the EEA program and distribution and general plant costs as these are included in intra-urban costs.

15/ Although there have been several proposals for construction of nuclear power plants, the EEC does not include nuclear generated power in its projected investment program, nor has it included power from special projects such as the Qattara Depression due to uncertain implementation schedules of these projects.

16/ A portion of primary health care facility requirements are met through investments in secondary health care facilities represents investment required in free-standing facilities.

CHAPTER IV

LEGISLATIVE AND ADMINISTRATIVE INSTRUMENTS FOR REGULATING URBAN DEVELOPMENT

Two of the major instruments for achieving the aims of National Urban Policy -- (1) Direct investment in industry and services and (2) Investment in industrial and residential infrastructure -- have been discussed in previous chapters. While control of the allocation of these investment funds is imperative for successful integration of spatial and sectoral development policies, such control needs to be accompanied by a set of legal and administrative instruments for regulating development and inducing complementary decisions by private firms and individuals. Such instruments are the subject of this chapter. Existing instruments are reviewed and recommendations are made to improve their chances of working effectively.

The study team has not estimated the costs associated with the use of these instruments; although it should be noted that they do require direct outlays in some cases and foregone revenues or subsidies in others.

There are many types of legal instruments that are used throughout the world, with varying degrees of success, to regulate urban development. They range from direct controls to indirect controls, from prohibition of development on specific types of land to planning, subdivision and building permission requirements to inducements to promote certain preferred behavior, such as differential property taxation, tax concessions and subsidies, and the establishment of special districts and agencies to facilitate land development, housing or industrial development. The success of many of these instruments is dependent upon a sophisticated bureaucracy and legal system for enforcement. Others, such as a successful property taxation, are also dependent upon the ethos of the society itself, the self-regulatory behavior of its citizens. No government can effectively implement any type of taxation system without the support of its citizens, regardless of the level of efficiency of its bureaucracy. A similar situation applies in most cases with regard to the preservation of arable land and other types of designation or prohibition of land for particular uses.

The successful use of legal instruments to support development is dependent not only upon their efficacy in and of themselves but upon their fitness within the particular society in which they are to operate and upon their relation to a national strategy or set of goals or dream of the future. The ordinary citizen must see how any prohibition or inducement fits with the country's dream for the future. Otherwise, such policies cannot be successful in the long run. The need for scrutiny is particularly acute with regard to issues of rights to land, uses of land and water, and rules of inheritance. The

resolution found for these issues is the foundation of the society itself and should not be tampered with without a thorough understanding of their raison d'être. Thus cross-cultural comparisons of legal instruments must always be approached with caution. Such instruments must always be moulded and shaped to fit the legal system of the country in which they are intended to be used. Consequently, we have devoted considerable attention to the operation of such instruments in the current legal and administrative context.

Planning in Egypt for most types of activities is presently done on an ad hoc basis. 1/ No economic plan has been carried out without significant modification since the comprehensive plan of 1960-1964. The lack of set planning procedures is reflected in the laws regarding the preparation of the state budget (Law No. 53 of 1973) and the economic planning process (Law No. 70 of 1973). These laws have not generated detailed executive regulations regarding the budget process. Rather a new *mansura* (order/instruction) is issued each year with a new set of guidelines. Further, the planning process reflects the centralization of government in the national ministries despite the policy of decentralization to the governorates and the establishment of eight economic regions under the Local Government Law (Law No. 43 of 1979) and its predecessor (Law No. 52 of 1975). At the level of the governorate, planning officials are often unaware of the contents of the plan for their own governorate. 2/ Thus their annual budget requests are generally merely a laundry list of projects endorsed by the elected officials which then must be reduced to a manageable level at the central level by the Ministry of Finance or the Ministry of Planning.

In addition, the civil service suffers from a number of general problems; including low pay, insufficient training and a surplus of personnel, the latter as a result of the requirement of finding a job for every university graduate. The problem of supervision and control is made more difficult because of the lack of authority to dismiss incompetent or insubordinate personnel and the fact that promotion is not necessarily related to merit. At the same time, there is a steady attrition of the best civil servants to private enterprise and to jobs in the oil rich Arab countries.

These general conditions of lack of efficient planning and enforcement, centralization of authority at the national level, inadequate integration of the efforts of national ministries and insufficient motivation and recognition of civil servants form the background of a discussion of legal instruments to regulate urban development. Any proposals for change must recognize the constraints set by them. One must also recognize the state of flux with regard to the role of local government in Egypt. There have been two new local government laws since 1975 and a new local government law is presently being considered by the Parliament.

Within this framework, this chapter will review the current legislative means of regulating urban development in Egypt based upon the following categories:

1. Restrictive legislation - provisions for restricting or prohibiting development in arable land, wet-lands, flood plains and other special categories.
2. Master plans - provisions governing the preparation of local and regional master plans requirements for conformance and procedures for enforcement.
3. Building requirements - legislative controls governing the issuance of building permits relative to the permit process, criteria for review and the authority for approvals. In addition, avoidance of permits and controls leading to informal sector building construction will be examined.
4. Authorization for special development districts - legislative authorization for such special development districts as new towns, port districts, free trade zones and industrial districts will be reviewed.
5. Urban renewal process - the legislative mandate for the urban renewal process will be reviewed pertaining to the delineation of such areas, the acquisition of property, relocation of people and business activities, the demolition of buildings, preparation of plans, improvement of infrastructure and disposition and development of the land.
6. Inducement assistance - provisions for special inducements to assist in the development of housing, industry and other land uses will be examined, including authorization for development corporations, direct subsidies, tax concessions and related types of assistance.

In each section, some recommendations will be made for changes that would facilitate the goals of national urban policy and efficient urban development. In addition, mention will be made of techniques used in countries with conditions similar to those found in Egypt. However, such comparisons will be made with great caution reflecting the philosophy set forth above.

I. RESTRICTIVE LEGISLATION

Egypt presently has a number of types of restrictive legislation, the most important of which restrict the use of arable land and require permission for specific industrial locations.

1. Use of Arable Land 3/

Over the last decade several steps have been taken to discourage conversion of agriculturally productive land. Law No. 59 of 1973, amending Basic Agricultural Law No. 53

of 1966, prohibits the erection or construction of any buildings or establishments on agricultural land without the express permission of the Ministry of Agriculture. This prohibition applies to all agricultural lands outside of the boundaries of towns. Within towns, the use of such lands may be changed as long as the land is used for the benefit of the town itself or for buildings which will serve as homes for its owner, within guidelines set by the Cabinet. Further, it is prohibited to issue permits for the subdivision of such agricultural lands except with the approval of the Ministry of Agriculture. Violators of these provisions are subject to imprisonment or to a fine of from L.E. 200 to L.E. 500. This sentence shall include an order for the demolition of whatever buildings have been erected at the expense of the violator. This penalty is not to be suspended for any reason.

In addition, Law No. 59 of 1973 contains a specific provision prohibiting the digging up of agricultural land and the transfer of agricultural soil to be used for the making of bricks or for other purposes except with the permission of the Ministry of Agriculture. A decree is to be issued by the Minister of Agriculture listing the conditions for the granting of such licenses to dig, what type of digging may be done, and the areas where such digging is permitted. The penalty for the violation of this provision is either imprisonment or a fine of from L.E. 200 to L.E. 500 per feddan, or part of a feddan. As with the above prohibition, this penalty is also not to be suspended for any reason.

Further, Law No. 59 of 1978 amended the Basic Agricultural Law to specifically prohibit large-scale development on agricultural land with the exception of land acquired by the government for public uses and for agro-industry projects. This prohibition has already resulted in the cancellation of several proposed projects being planned in Giza Governorate.

Finally, a number of strong provisions regarding the use of agricultural land are contained in the New Urban Communities Law (Law No. 59 of 1979). That law not only prohibits the establishment of new towns on agricultural land, but also prohibits all government bodies, private agencies and individuals from subdividing any agricultural land for building purposes which is located outside of the boundaries of existing towns, except with the express approval of the New Urban Communities Authority. In effect, this latter provision extends the prohibitions of Law No. 59 of 1973 to land under the control of this authority.

In practice, these provisions have not been enforced to date. Partly this is due to the lack of budget and staff of the Ministry of Agriculture at the local level and to the uncertain

position of local offices of ministries following the passage of the new local government law (Law No. 43 of 1979) with its emphasis upon decentralization of authority. Articles 25 and 26 of Law No. 43 of 1979 state that a governor shall be treated as a Minister and as the representative of the President in the governorate, responsible for the execution of the general policy of the state and specifically responsible for maintaining food security and augmenting agricultural production efficiency in the governorate. Officials of the Ministry of Agriculture thus consider that the governor is now responsible for seeing that these laws are enforced in his jurisdiction as he has control over promotion of Ministry of Agriculture employees in his area. However, the officials of the governorate do not consider that they have such authority as it has not been specifically delegated to them by Presidential Decree, for agricultural land which is located outside of town boundaries and thus not under the control of a local council. The officials of the Ministry of Agriculture at the governorate, district, town and village levels appear to be uncertain as to their specific role and unwilling to actively enforce such prohibitions without the support of the Governor. Some governors have given their support to such actions and some have not, in the absence of a national directive. In February 1981, the People's Assembly refused to delegate authority for the enforcement of such measures to the Governor stating a fear of favoritism on the part of governors and the problems associated with non-uniform national enforcement.

Thus one is left with the enforcement capabilities of the Ministry of Agriculture. That Ministry has established a committee structure at both the national and governorate levels to enforce Law No. 59 of 1973. The Higher Committee at the national level is headed by the First Under Secretary of Agriculture and has representatives from the Ministries of Planning, Housing and Irrigation. The committee at the Governorate level is headed by a representative of the First Under Secretary of Agriculture as has representatives from the Ministries of Irrigation and Housing. Requests for building and subdivision approval are initially made at the Governorate level and then sent to the national level for final approval. At the national level, there is a section under the General Secretary of the Ministry which processes and records such permissions. However, very few permissions are granted with the exception of requests for the construction of agricultural buildings closely tied to agricultural production, such as chicken houses. Permissions for the use of agricultural soil for the making of bricks and other purposes are handled by the same committee structure.

Unfortunately, the Ministry of Agriculture has no real enforcement authority of its own. It files a complaint against the violator and sends it to the local police station to be enforced. However, judges at the local level will only set fines for such violations rather than imprisonment and, in many cases, even the

fine is not paid because the sentence is suspended. A part of the problem is that the complaint is issued by the Minister of Agriculture, rather than by the Local Popular Council. The local people resent the intrusion of this national government body into local affairs.

Finally, all agricultural land is treated as if it were the same. There is no priority set of areas in which enforcement will be attempted most vigorously. This setting of priorities is essential given the lack of budget and staff to carry out such a program and local opposition to the imposition of the prohibition. Given the above present situation and constraints, a number of recommendations regarding law and administration are required if Egypt is to be more successful in controlling the conversion of productive agricultural land to urban and industrial uses:

- A. Define priority agricultural zones by district (markaz) for enforcement of restrictions. Such agricultural areas could be defined on the basis of the type of soil, number of crops per year, crop yields, value of crops raised and costs of production. A simple classification by six soil types has already been completed. That classification would seem to be sufficient for regulatory purposes when combined with recognition of the areas in which land conversion is occurring most rapidly, especially in the Qalyubia and Giza Governorates in and near the Cairo Metropolitan Area. Such a classification should be oriented toward the markaz (district) level since adequate data appears to be often collected at that level of government and it is a level which appears to offer a sufficiently fine-grained distinction with regard to cropping patterns. In addition, enforcement officials operating from the governorate level would better be able to monitor a selected group of districts than a group of scattered villages.

- B. Strengthen enforcement procedures for Law No. 59 of 1973 and place enforcement responsibility at the governorate level. The governor acts as the representative of the President within his jurisdiction and has specific responsibility for food security and efficient agricultural production. The control of state-owned lands and the granting of subdivision permissions are handled at the governorate level. With the passage of the proposed physical planning law, the governor will be responsible for the drafting of development plans in conjunction with the General Organization for Physical Planning (GOPP) in the Ministry of Development and Reconstruction. Thus this is the proper level for enforcement of a system of

agricultural zones and restriction of use of agricultural lands, although policy guidelines should be set at the national level to achieve uniformity throughout the country. An effective enforcement procedure would require a number of specific actions:

1. Establishment of special land courts and a special administrative process to handle cases for the prohibition against conversion of arable land.

Many countries have special courts that handle land problems. There is precedent in Egypt for special courts. Municipal courts were established in Cairo about 25 years ago to render speedy justice in case of violations of municipal regulations, such as those regarding the cleaning of streets.

2. Amendment of Law No. 59 of 1973 to specifically define a "building" so as to include a foundation.

At present it is impossible to get an order to demolish an offending building until at least one storey of that building has been erected.

3. Emphasize demolition of the building and short jail sentences as penalties likely to have a greater deterrent effect than fines and provide bulldozers and other equipment at the town and district level for the enforcement of the present legal restrictions and the decisions of the special Land Court, if established.

2. Restrictions on Lands for Industrial Uses

The second major type of restrictive legislation to regulate urban development currently in force in Egypt is that controlling the location of industry. The permit system for industries is governed by the basic law granting authority to the Ministry of Industry (Law No. 21 of 1958, as amended), and by Law No. 28 of 1949 which set up a system for the establishment of industrial zones. Under the latter law, governorates are permitted to designate one or several zones within their jurisdiction for factories, manufacturing and workshops and for other unhealthy, inconvenient or dangerous establishments to the exclusion of all other uses. Such zones shall be established after consultation with the Ministers of Industry, Public Health, Interior and Social Affairs. In towns where such zones are designated it is prohibited to issue a permit for an industrial establishment or to set up such an establishment outside of such designated zones. (Article 3).

In addition, the present Local Government Law (Law No. 43 of 1979) gives authority to the governorate to determine the

boundaries of such industrial zones and to form industrial services committees to operate within these zones. (Articles 110-112). The governorate has the responsibility for selecting locations for new factories inside the governorate, provided that all required public utilities are already established in coordination with the Ministry of Industry. To date, industrial zones under the local Government Law have been designated in Helwan and Ameriya in the Cairo Governorate, in Shoubra El Kheima and El Hemke in Qalyubia Governorate, and in Mahalla El Kubra, Kafr El Dawar, West Alexandria and Gianaclis.

A second type of designated industrial location are the free zones and the new urban communities which were granted investment incentives under Law No. 43 of 1974 and Law No. 59 of 1979, respectively. These areas and their various special privileges will be discussed under the section dealing with inducements below.

Despite this restrictive legislation, it is apparent that many industrial permits are approved for other locations when the investment monies are available and ready to be spent. Thus one finds the industrial corridor in Qalyubia Governorate which starts long before one reaches the boundaries of the city of Shoubra El Kheima. The rather diffuse decisionmaking structure at the national level for the approval of industries, the need of the governorates to provide income and employment within their boundaries, and the lack of personnel and authority for enforcement at the governorate level and below all contribute to the present state of affairs. The passage of Law No. 53 of 1978 has similarly not been successfully enforced, although it has stopped some large-scale projects in Giza Governorate. Given this situation, the following recommendations might allow the government to more effectively control industrial location:

A. Designation of Portions of Metropolitan Areas and Cities as Industrial Areas and Priority Distinction of Industrial Zones Within Such Cities.

Specific cities that are deemed to have potential as regional growth centers and industrial areas should be designated as such. The investment incentives accorded to free zones and new communities should be limited to these towns. Within the industrial cities specific industrial zones would be designated. In other towns existing industrial zones would remain where industry is already located but without the above incentives. The General Authority for Foreign and Arab Investment would give priority to investment in such designated areas. The choice of priority

areas should depend upon the preferred urban strategy which is chosen.

B. Greater Enforcement Capability and Stronger Penalties for Violations of Controls

The enforcement of control of the location of industry suffers from the same problems as the enforcement of the prohibition against the conversion of agricultural land. It is now difficult for the governorate to deny permission to any industry that already has the approval of one of the ministries or of the General Authority for Foreign and Arab Investment and Free Zones. It is rare that the governorate would reject industrial development within its boundaries, in any case. What is required is the choice of a national strategy and a complementary industrial development plan which designates priority industrial areas and industrial zones within those areas. This designation should be made by the Ministry of Planning at the national level with assistance from the Ministry of Development, the Ministry of Industry and other concerned agencies in the particular case, in conjunction with the governorate where the industry will be located. The governorate would be responsible for enforcement of precise regulations issued by the Ministry. Such enforcement would concentrate upon the large scale industries with 50 or more employees (mainly public sector companies) and other industries that are a public nuisance or noxious to health. In addition, a large daily fine on the enterprise itself for each day of violation of these regulations would put pressure on the enterprise to remove the violation immediately. It is important to note that the establishment may be closed by administrative decision for the second violation within a six month period, although an earlier closing would need to be by court order. It should be specified also that the governorate can demolish any buildings and remove machinery for sale, if required, as part of the administrative procedure. One should take note that this is another instance in which the term "construction" of the building should be redefined so as to allow immediate demolition from the moment that the foundation is laid. This is a stumbling block in removing illegal dwellings on agricultural land.

II. MASTER PLANS

At present, Egypt has no planning framework within which urban development projects must be related to city master plans for

present and future development. There are laws regarding building construction 4/ and subdivision standards 5/ but no requirements that such construction be specifically related to a citywide plan. Master plans have been developed for Cairo and Alexandria and for several other cities, including the Canal cities, but they do not have official legal status. Thus, detailed land use plans often have not been developed to implement them. The advisory powers of the General Organization for Physical Planning (GOPP) in the Ministry of Development and Reconstruction and the Department of Housing and Reconstruction in the governorate often ensure that proposed subdivisions are consistent with the framework of such master plans. However, there is a lack of sanctions against offenders, who often include other ministries.

Besides the laws regarding subdivision regulation and standards for building construction, there are a myriad of regulations of specific types of activities including regulation of industrial areas (Law No. 28 of 1949, as discussed above) areas for tourism (Laws No. 1 and 2 of 1973), public roads (Law No. 84 of 1968 and Law No. 140 of 1956), cemeteries (Law No. 5 of 1966), ponds and swampy areas (Law No. 57 of 1978), public establishments (Laws No. 371 and 372 of 1956), sanitation (Law No. 93 of 1962), and billboards (Law No. 66 of 1956).

A. Existing Planning Law

The basic law regarding planning is Law No. 52 of 1940 which required that all subdivision of land for sale, rent or construction purposes, in which all plots are not directly located upon an existing road, must be approved by the governorate. It applies both to the making of new subdivisions and to the alteration of existing subdivisions. However, it does not apply to subdivision of land areas where no new roads are created and also does not apply to Heliopolis (an upper income planned area of Cairo) or to other sub-divisions which, because of their importance or the presence of total or partial government ownership, are provided with special regulations. (Examples include Nasr City, Maadi and New Helwan in the Cairo Governorate). Regulation is the responsibility of the Department of Housing and Reconstruction in the governorate under authority granted both by Law No. 52 of 1940 and by the Local Government Law (Law No. 43 of 1979).

Under the law, plans and drawings submitted by the applicant must be approved or disapproved within six months of submission or the subdivision will be considered to be approved. Reasons for the rejection of an application must be stated in writing. However, rejections are rare.

There are a number of specific provisions in Law No. 52 of 1940 that must be followed by subdividers, beside adherence

to the basic building regulations, hygiene, public security, and traffic circulation standards. These provisions include:

1. Minimum street widths are specified at 10 meters, unless there are detailed regulations of the city providing for a lower standard. Roads more than 1,000 meters long must be at least 20 meters wide (Article 4).
2. Public uses are required to include one-third of the total developed area allocated for roads, squares, parks and other public uses. (This allocation includes one-half of the street width of existing public roads around the subdivided lands). However, the governorate is allowed to establish regulations setting a higher or lower standard. When it sets such a standard, it must pay compensation for expropriation if more space is required for public uses (Article 5).
3. Lot coverage provisions restrict a landowner from building on more than 60 percent of the total coverage of each lot. In addition, unenclosed structures, such as terraces or stairs, are allowed to occupy up to 10 percent of the additional space (Article 6).

Minimum lot size provisions are not specified in Law No. 52 of 1940, but maximum lot coverages are specified for construction. The law does not extend in its jurisdiction to existing residential areas that are subdivided without new roads being created. However, using its general powers under Article 10 of that law which prohibits a subdivider from renting, selling or leasing plots before it has approved the subdivision, the Ministry of Housing and Reconstruction issued a regulation, dated August 28, 1971, setting minimum lot sizes and maximum building elevations for different sections of the city of Cairo, including establishing the 60 percent coverage rule for existing older residential areas.

These general provisions regarding subdivision standards have been superseded by more stringent standards for planned upper income areas in the Cairo Governorate, including Heliopolis, Maadi, Nasr City, and new residential developments planned for the industrial suburb of Helwan. As noted previously, Heliopolis was specifically exempted from the provisions of Law No. 52 of 1940.

Further, Law No. 52 of 1940 contains a number of provisions regarding the control of development and the enforcement of the above standards:

1. Sale of land and construction of buildings in subdivisions is prohibited, if the land is not registered and if a copy of the subdivision plan has not been submitted to the local office of land registration (a part of the Ministry of Justice). Contracts for the sale or leasing of such lands must mention, specifically by number, the approval decision from the governorate, or the contract will be null and void.

2. The Department of Housing and Reconstruction in the governorate may require the developer to provide a subdivision with drinking water, electricity and sewerage at its own cost (Article 12).

However, this latter provision is rarely enforced for large works that are not purely internal to the project itself. Also the decision must be issued directly by the Minister of Housing and Reconstruction.

If such a decision is issued, the developer may not build on the lots before completing the works mentioned and paying to the governorate his share of the cost of the mentioned works. When a third or less of the lots of the whole subdivision or of a specified part of the subdivision, are occupied by buildings which have been supplied with such utilities already, the developer must provide such municipal facilities for the entire subdivision, or that part under rules, within the time limit set by the governorate. If he does not do so, the governorate may complete the works and charge the developer.

3. The Department of Housing and Reconstruction should not approve a road for construction until completion of the water, sewerage and electricity works and until three-quarters of the lots directly on that road are occupied by buildings.

4. The engineer of the Department of Housing and Reconstruction responsible for the project has been granted police power to enter the subdivision at any time to see that the regulations are being followed (Article 19).

These provisions give sufficient legal authority to control development. However, their implementation leaves much to be desired, because of the lack of a budget and adequate staff. For example, in recent years, there has been no line item in the budget for the Cairo Governorate to cover the costs of contracting to complete municipal works, such

as water and sewerage, before securing reimbursement from property owners.

In addition, the penalties for violations of the law seem not to have been changed since 1940. Fines are limited to a range of L.E. 1.0 to 10.0 (Article 20).

B. Illegal Subdivisions

Given the high standards of the present subdivision regulations, the lack of enforcement capacity at the governorate level, and the pressures of rapid population increase in Cairo, only about 50 to 60 percent of the development in the Cairo metropolitan area each year occurs on legal subdivisions. A substantial proportion of this development is completed by public sector housing and development companies. Substantial illegal development is also in other high growth areas such as Alexandria.

In recognition of these realities, Law No. 29 of 1966 essentially legalized all existing subdivisions by eliminating the possibility that the Minister of Development and Reconstruction could seek a court order to remove such violations or demolish buildings in violation, except in three cases:

1. On land which is owned by a government organization or public sector company
2. Where buildings exceed building lines
3. Where physical planning standards require improvement (Article 1)

It further stated that the Department of Housing and Reconstruction take over existing roads and services in such areas, after approval by the governor and the Ministry of Housing and Reconstruction, without providing compensation. It can also give public services to such areas, as under Article 12 of Law No. 52 of 1940, and collect the costs of administration of such services from the owners.

A similar law had been adopted in 1956 (Law No. 259 of 1956) to cover buildings constructed between 1940 and 1955 which were in contravention to building construction and subdivision standards. Another such law is now being considered by the Peoples Assembly to cover areas inhabited since 1966. However, neither the prior law nor the existing law have been effectively used, although they do provide a legal basis for the provision of public services to many low and middle income subdivisions.

C. The Draft Planning Law

A comprehensive physical planning law was first submitted to the Peoples Assembly in 1973. That law would establish a framework for planning, including the mandatory preparation of urban and rural master plans to guide further development. This framework would apply to all new subdivisions in urban areas and to such subdivisions in other areas as determined by the Minister of Development and Reconstruction after consultation with the Minister for Local Administration. It would also regulate changes in existing subdivisions, including Heliopolis, developments on government-owned land, and others of special importance now governed by special regulations under Articles 23 and 24 of Law No. 52 of 1940. In addition, subdivisions are not thereby made legitimate.

The basic procedure for development of such master plans and their relationship to specific subdivision and land use regulations is as follows:

1. The local council, in cooperation with the General Organization for Physical Planning (GOPP) in the Ministry of Housing and Reconstruction, shall prepare master plans taking into account its surrounding region and proposed expansion of urban boundaries. The priority for such projects shall be set by the Minister of Development and Reconstruction, after consultation with the Minister of Local Administration. After public discussion and approval by the local council, it shall be approved by the governorate council and then by the Minister of Development and Reconstruction.
2. The local council, in cooperation with the GOPP, shall review such master plans at a maximum interval of five years. The results of this review shall be presented to the Minister of Development and Reconstruction.
3. The local council, in cooperation with the GOPP, shall prepare physical planning projects, specify land uses, and set development controls for areas governed by the master plan. Applications for subdivisions and building construction must conform to these planning requirements. Thus, there is created an interlocking system between planning and subdivision and building construction approvals.
4. The proposed planning law would also set forth a new set of subdivision standards to replace Law No. 52 of 1940. It is more comprehensive in scope than the present law, as it defines a subdivision as any division

of a plot into two or more plots or the construction of a second building, whether connected or not, on a given plot (Article 7). Thus, the distinction between subdivisions where no new road is created and those where roads are created is eliminated. In addition, the special exemption for areas such as Heliopolis is eliminated, and the new law can be applied to such areas where they do not meet these standards. However, in the meantime, such special provisions remain in force.

The proposed law would make several changes in the present regulation of subdivisions:

5. Subdivisions can only be approved if they are consistent with general planning conditions. They must be approved by both the local council and the governor. 6/ The local council may request the governor to issue a decree halting all subdivision requests for a period of two years, with the possibility of extension for another two-year period, while such plans are being developed and approved. In addition, the local council may define stages of development for a given development area. Thus, the local municipality is provided with a flexible set of powers that should be sufficient to coordinate approval of subdivisions with master planning. The law further provides a series of specifications regarding the establishment of industrial zones.
6. The procedures for approval of subdivisions are somewhat more complicated than the present ones. All drawings would have to be approved by a certified architect (not presently required). After the application is received by the local municipality, there is a staff technical review by the Department of Housing and Reconstruction. That staff review must be completed within four months of the date of submission of the application. The local council must submit its decision within two months of receiving the staff technical review. It is considered to have approved the application if no decision has been made within three months. Thus, in most cases, a decision must be made within six months of application submission. The governor then has one month to approve or disapprove the proposal.

If the application is for a purpose other than building and if no new road is required, then only the approval of the local Department of Housing and Reconstruction is required. a decision must be made by that Department within 30 days of submission of the application.

1. Specific Standards

The specific standards found in Law No. 52 of 1940 have been eliminated in this proposal, with the exception of setting a maximum percentage of land for public uses. Such a standard may be set by the local authority, as long as it does not exceed 50 percent of the total area of the subdivision (Article 10). (The present maximum area is one third). This standard is a flexible one that does not appear to create problems, but might actually assist in the construction of more low income housing.

Thus, the proposed law would allow the opportunity to set standards for different areas of a city. This would be clarified further if Article 10 of the proposed law was amended to specifically allow for such standards, as follows:

Article 10. Detailed regulations of this law shall set regulations and standards for subdivisions. These standards may differ for different cities and for different areas of the same city based upon character of the population, present and proposed land use, public welfare and socioeconomic conditions. However, all such standards must meet minimum requirements for health and safety.

However, such a specific change might not be necessary to achieve this end. Article 41 of the proposed law allows for exemptions from its provisions for the furtherance of the public interest or in consideration of local circumstances.

2. Control Provisions

The proposed law also provides for an even broader ranging group of control measures and a tightening of already existing measures.

- a. Subdivision approval must be included in all contracts of sale or rent, or they are void. As an addition to existing law, it would state specifically that it must be included in the conditions stated upon transfer of property by inheritance.
- b. The developer may not advertise his subdivision or otherwise deal with it until a copy of the approval has been submitted to the Department of Land Registration, until he has complied with the provisions regarding public utilities, and until he has

made a financial guarantee that he can complete such work. (The latter provision is a new one in this legislation).

- c. The developer shall provide utilities or the money needed to provide such utilities, according to regulations set by the local council. If the developer does not conform with such a program, the local council has the right to provide such utilities and can charge the developer the cost of such work plus a 10 percent charge. No building permit shall be issued if he does not pay such charges within six months of their being incurred (Article 18).
- d. The Minister of Development and Reconstruction can alter subdivision regulations which were approved before the enactment of this law to comply with the needs of particular planning projects (Article 22).
- e. The council may also require a subdivision project to include some adjacent lands to those of the owner, requesting approval if such an inclusion will provide for more rational development of that particular area. If the owners of such properties do not voluntarily participate in the project, their lands can be expropriated (Article 16).

3. Enforcement Provisions

The most pressing problem regarding the present subdivision regulations is that of enforcement. The proposed planning law provides several methods for strengthening such enforcement:

- a. Penalties for dealing with property before subdivision approval is obtained are increased to imprisonment of up to six months or a fine between L.E. 100 and L.E. 2,000 or both (as compared to a maximum fine of L.E. 10 under Law No. 52 of 1940). Penalties for other violations, such as failing to provide adequate public utilities, would also be a maximum of six months imprisonment and/or a fine of L.E. 10 to L.E. 1,000 (Article 43). Thus, the penalties are now meaningful in present value terms. In addition, they can be doubled, if it is shown that these rules were purposefully evaded (Article 47).
- b. Perhaps more importantly, these fines may be collected through administrative procedures rather than requiring a court order. This also applies to

the fees required for subdivision approval (Article 33).

However, there remains the problem of a sufficient budget so the governorate can afford to provide public utilities to areas that would later be repaid by the developer.

4. Conclusion and Recommendations

Thus the proposed Planning Law is an adequate legal instrument and a necessary first step in developing a legal framework for planning in Egypt. It has good control and enforcement provisions, if they can be executed. However, there are several modifications which would make it an even stronger piece of legislation:

- a. A specific provision for different standards as applicable to different towns or different areas of the same city by amendment of Article 10 of the proposed law.
- b. Complete elimination of the exception by which a subdivision that does not include modernized roads does not come under the statute, (Article 14). This exception can lead to disorderly development.
- c. Elimination of the requirement that all drawings must be approved by a certified architect (Article 11). This provision will increase the costs of compliance with the building regulations, especially for low income housing, and will further encourage non-compliance. Such a review should be handled by the Tanzim Unit itself.
- d. Provide an escalator clause for fines so that the amount is still significant after a five or ten year period. It is recommended that the maximum fine increase by a fixed percentage annually rather than there being specified review after a certain period (say three or five years). The latter process has not proved successful in Egypt in the assessment of real properties for tax purposes or in the settings of construction costs for rent control purposes.
- e. Consider revoking subdivision approval if land is not built upon within a prescribed period, say three years, and combine this revocation with a large fine. If the land is state land that was sold to the developer, the land should be taken

private developer or a public sector company, a building permit must be obtained from the Department of Housing and Reconstruction in the governorate (Article 4). Exemptions from this requirement may be made for public welfare, historic, tourist, political, or security reasons when a request is made by a local council to a committee made up of representatives of the Ministry of Development and Reconstruction, and the reasons for approval or disapproval must be stated (Articles 26-27).

3. The department must review plans and drawings within 60 days or the project is considered as approved (Article 6). Rejection of applications will be reviewed by a committee composed of a judge appointed by the president of the local court, two members of the local council, and two government architects (Article 15).
4. If an applicant receives a permit, he must begin building within one year and can renew his permit for only one additional year (Article 9). Digging of foundations is not considered as a start in the execution of a construction project. All applicants must hire a certified architect to sign such drawings, and a certified engineer must supervise construction over L.E. 5,000 in value (a new provision under this law) (Articles 5 and 11).

Fees for granting such permits are limited to a maximum of L.E. 200 (Article 33). In Cairo, the fee is based on a formula related to the amount of floor area and the number of square meters of elevation, as well as a fee of L.E. .50 for filing an application. In Alexandria, the fee is 1.0 percent of the value of the construction.

5. A number of specific standards for buildings were set forth in Decree No. 169 of 1962. Law No. 106 of 1976 itself does not prescribe such standards, except to mention maximum height restrictions (Article 33) and to limit the approval of extra stories, except where the foundation is sound (Article 7). However, many of these standards were carried over the new building regulations.

Building heights are set at a maximum of 35 meters or one and a half times frontage. However, the height of the building can exceed the above standard, if the building's volume does not exceed 21 times the built area of the lot.

Ceiling heights are generally a minimum of 2.7 meters, except for w.c.'s and other such rooms.

Openings for ventilation and lighting are set at 8.0 percent of floor area for residences and offices and at 10.0 percent of floor area for kitchens and bathrooms.

Elevators must be supplied for every building that is above five stories with a basement.

Guards must be provided if a building has 20 or more residence rooms.

6. Law No. 106 of 1976 sets up stiffer procedures for violations of these regulations than were found in previous legislation. There are stronger penalties for violations, and additional powers have been granted to local public authorities to carry out demolition of buildings, to halt non-conforming uses, and to levy daily fines for non-compliance.
 - a. The Department of Housing and Reconstruction may now remove a building or a part of a building and clear it of its occupants without obtaining a court order. The cost of the removal can then be charged to the owner. Such removal can occur only if the building is found to violate public welfare and only if the owner does not bring the building up to standard in the time specified by the review committee mentioned above (Article 16). If the violations do not affect public health or the safety of residents, lesser penalties can be applied.
 - b. A violator can be punished by a fine of L.E. 1.0 to L.E. 10.0 daily for each day that he is in violation of this law, after he receives notice of such violation. The amount is based on his number of previous violations and cannot be suspended by a court (Article 24). Such penalties may be doubled if the violation is held to be willful.
 - c. Violators of the provision requiring approval of all construction with a cost of over L.E. 5,000 must pay a fine equal to the cost of the construction or of the building materials used. A contractor of such a building must pay a fine equal to one-half of the cost of the construction that he was responsible for executing. In addition, either of those parties may be imprisoned for a period of three months to one year (Article 21).

- d. Violators of the provisions regarding building permits and the correction of already existing violations may be fined from L.E. 10 to L.E. 1,000 or imprisoned for a period of six months or less, or both (Article 22). If the violator does not correct the violation, he may be charged for its correction up to 2.0 percent of the total cost of the construction, but not less than L.E. 25. This amount may be in addition to the daily fine for non-compliance mentioned above.
- e. If construction built without a building permit is not removed, the violator shall pay one-half of the costs of such removal (Article 22).

Thus, there is greater authority to provide for rehabilitation of existing dwellings, if it is used and if standards are adopted which make it possible, given government budgets, to make owners carry out such improvements.

B. Informal Sector

The above standards are quite high and costly to comply with. Thus a majority of housing in the Cairo Metropolitan Area and large amounts of housing in other urban areas are built without proper legal permission. A description of the situation in the Cairo Metropolitan Area will illustrate the difficulties connected with the problem.

A majority of the housing constructed annually in the Cairo Metropolitan Area is built either by private individuals or by small contractors. Most of the housing is constructed on agricultural land located on the fringes of present urban areas either just within or just outside present town boundaries, in areas such as Imbaba, Boulak El Dakrur, the Pyramid area of Giza, Shoubra El Kheima and Helwan. The growth rate of such areas is indicated by the annual growth rates for the city of Giza and for the suburban industrial city of Shoubra El Kheima. The population of the city of Giza grew at a rate of 10.5% annually over the period of 1960-1976, while Shoubra El Kheima grew at 12.5% annually over the same period. The Cairo Metropolitan Area, as a whole, grew at 3.7% annually.

Typically, the agricultural land holdings located at the fringes of the urban centers range in size from 1.0 feddan or less to as much as 60.0 to 70.0 feddans. Most holdings vary between 1.0 to 10.0 feddans. Many of the holdings came into possession of the present owners after the Agrarian

Reform of 1952. Some are farmed by the owner, while many are still farmed by tenant farmers. In the latter category, some of the owners are neighboring rural landlords, while others are middle and upper income persons living in the city of Cairo.

The decision to sell or subdivide agricultural land often occurs when the original land is inherited by the urbanized children of a rural landlord. These children are often trained professionals who have no desire to return to farming. For example, on a field trip to Boulak Al Dakrur a contractor was encountered who had recently bought a piece of land from such an heir. He was constructing on this land a six-storey building ^{7/} which he planned to sell as six individual units, to avoid the requirements of rent control.

In other cases, particularly in larger holdings, the landlord may continue to farm a part of his land, while selling off small parcels as he needs to for money or as such land is vacated by a tenant. In Shoubra El Kheima, an old man has been acquiring land in this way, in small pieces, to be able to construct homes for his sons.

Near the Pyramids in Giza, landowners are parcelling out their land for the construction of houses. Often, they would like to sell more land but cannot because they are unable to remove the tenants who have been farming the land for many years. Smaller owner-farmed parcels are often sold in their entirety to a wholesaler or subdivider.

In Shoubra El Kheima, land wholesalers are engaged in buying parcels from farmers and then reselling them to individuals wishing to build houses. Land that can rent for agricultural purposes at L.E. 35 per feddan per year is worth L.E. 10 to 15 per square meter as building land. In Giza, the difference is even more pronounced. Much land is rented to long-term tenants at L.E. 12 per feddan per year. However, land that sold for L.E. 3.5 per square meter in 1970 is now selling for more than L.E. 15.0 per square meter. If it were not so difficult to get tenants to leave the land, the process would be operating even more quickly than it presently is.

The process of land purchase is facilitated by the normal practices of financing. In low-income areas, a down payment of 10 to 20 percent of the cost of the land is commonly required. The landowner is then paid a small monthly amount until the land is fully paid off. The total amount paid is dependent upon the terms of the agreement. Payment over a long period of time will result in a larger total payment, as if interests were being charged. A typical arrangement for a 60 square meter lot in Shoubra El Kheima consists of

a down payment of L.E. 100 and a monthly payment of L.E. 3 for eight years. This arrangement yields an effective purchase price of approximately L.E. 6.5 per square meter. The down payment is often obtained from personal savings or loans from relatives or friends. Much of the capital accumulation comes from savings of Egyptians working abroad.

The house is built gradually over a period of years as money and/or building materials are accumulated. It is usually built by a contractor instead of by the household itself. The house is often constructed in two to four stages. This method corresponds with the smaller city tradition of adding a second storey to an existing dwelling. Such expansion of existing housing is the second typical method of land and housing development found in Cairo. Often a second storey is added for a son or daughter when he or she marries. More recently, a second storey has been added as a source of revenue. Unless furnished, such apartments are technically under the rent control law. However, in practice, they are usually rented to relatives or friends who pay a reasonable rent but at a level that may not conform to the rent control restrictions.

This process thus supplies housing to many in the Cairo Metropolitan Area, although such developments do not receive the basic utilities of water, sewerage, drainage and paved roads as they are illegal, for the construction is completed without the required building permit and is often located on land to which the occupant does not have clear title. As noted previously, laws have been passed at intervals legalizing illegal subdivisions and thus the buildings constructed within them. This is a short run solution but not a satisfactory one with regard to orderly planning of urban areas. What is required are packages of planning and building standards for different types of areas based upon social and economic conditions. 8/ Thus most housing can be given permits and be made to conform to planning standards.

IV. Authorization For Special Development Districts

Egypt presently has authorization for a number of types of special development districts, including:

1. new urban communities
2. free trade zones
3. industrial districts
4. tourism districts
5. historical areas

A. New Urban Communities (Law No. 59 of 1979)

Law No. 59 of 1979 established a government agency, the New Urban Communities Authority, which is the sole governmental body responsible for the creation and management of new urban communities established outside of the boundaries of existing towns and villages. Thus it is responsible for all of the new cities now being considered by the Government.

As such, the Authority was given a number of local government powers, as well as several types of authority not possessed by units of local government. Its basic function is responsibility for the planning and development of the basic infrastructure and utilities for such new communities until the community is transferred to the jurisdiction of a local government body by cabinet decree (Article 13, 50). It selects sites for such communities, prepares and approves general and detailed plans, and may purchase property (Article 5). It may expropriate lands under a cabinet decree (Articles 5, 6) and state-owned lands may be set aside for the community under a Decree of the Prime Minister (Article 9). In addition, an area of a maximum of 5 kilometers around the new community may be set aside by the Authority as a restricted area which cannot be disposed of or exploited or have any building constructed upon it without the prior approval of the Authority (Article 8). Similarly, an area of 100 meters on either side of all public roads leading to the new community shall be reserved for use under the direction of the Authority and may be subject to the same restrictions as the 5 kilometer perimeter.

The Authority approves all projects within the area of the new community, with appeal possible to the Prime Minister (Article 12). Projects under the jurisdiction of the agency are given a specific exemption from Law No. 29 of 1947 regarding public utility concessions and from Law No. 61 of 1958 regarding the granting of privileges concerning investment in natural resources and of public utilities. Thus a concessionaire for a public utility may receive the more liberal terms of a period of 40 years (not 30 years) and an annual share in the net profits of the enterprise of a maximum of 20 percent of invested and authorized capital (not 10 percent).

Further, persons and businesses dealing with the Authority receive a number of tax and investment incentives:

1. Exemption from customs duties and other import duties, as if they came under the provisions of Law No. 62 of 1974 (Article 18).
2. Exemption from all taxes and duties for interest due on loans and credit facilities granted to the Authority for the financing of projects (Article 19).

3. Repatriation of capital invested in Authority projects and in works done by contractors in execution of such projects receives the same special privileges as for capital invested in works that come under the foreign investment and free zones law (Articles 20, 21).
4. The occupants of real estate in the new community are exempt from the property taxes on built properties during a 10 year grace period (Article 22).
5. Lands reclaimed within the boundaries of the new community are exempted from the land tax and all additional taxes for a 10 year grace period (Article 23).
6. The profits from projects in a new community area are exempted from the commercial and industrial profits tax and from the income tax on movable assets and related changes, also for a grace period of 10 years (Article 24).
7. Such projects are exempt from the general tax on revenues (Article 25).

The Authority itself is a public organization with the authority to:

1. outline policy and draw up plans and programs for the creation of new urban communities;
2. carry out studies to select suitable sites for such communities;
3. organize and coordinate all ministries and public bodies in the fields of construction and utilities in order to carry out such plans and programs;
4. to execute necessary projects and to evaluate them;
5. to obtain loans and grants to be used for such projects, in addition to the credits allocated it by the Government;
6. to promote the sale, lease or use of lands in the new communities;
7. to divide up such new urban communities into towns, villages, zones and quarters and to establish for each of these units appropriate planning conditions and building types. The Authority would then issue building permits in accordance with such conditions (Article 28).

The capital of the Authority comes from assets allotted to it by the State and from the lands set aside by the State for its purposes (Article 31). Its resources shall include state appropriations and allocations, loans, grants, gifts and the proceeds from the sale, rent and use of its real property and from its own activities and from counterpart operations or services provided to others (Article 32).

The Authority is prohibited from establishing a new urban community on agricultural land (Article 3). In addition, government departments, local governments, general authorities and public sector companies may not dispose of desert or barren lands or of agricultural lands located outside of the boundaries of existing towns for the purpose of subdivision into building lots without the approval of the Authority (Article 46). A similar prohibition is placed on private persons who have full ownership of such lands.

Conclusion

Law No. 59 of 1979 provides a broad set of powers for the control of urban development in new communities and in other areas outside of the boundaries of existing towns. However, it has not yet been effectively used in the two years since its enactment. The New Urban Communities Authority has not been adequately staffed and has not yet taken control of the already planned new cities of Sadat City and Tenth of Ramadan. It is not clear what the relationship will be between the new communities and the governorates. This was indicated previously in the discussion of the draft Physical Planning Law. The governorates have primary responsibility, along with the COPP in the Ministry of Development and Reconstruction, for the approval of regional and local master plans. However, it is unclear if the new urban communities will come under their specific authority.

B. Public and Private Free Trade Zones

Law No. 43 of 1974, as amended by Law No. 32 of 1977, grants specific incentives to investments in designated free zones and establishes the General Authority for Investment and Free Zones (Articles 30-57). The Board of Directors of the General Authority, upon the approval of the Council of Ministers, is authorized to establish public free zones while private free zones may be established by the Board of Directors alone.

1. Public Free Zones

Each public free zone is run by a Board of Directors appointed by the Board of Directors of the Authority. The Free Zone Board of Directors authorizes occupation

or rental of lands located in the free zone, provides municipal services for a fee for projects created in the zone, establishes and operates ship-unloading and warehousing activities, approves or rejects submitted projects to be located in the zone and provides equipment necessary to facilitate operations and projects created within the zone (Article 33). Licences to operate in free zones may be granted for:

- a. storage of goods;
- b. sorting, repacking and warehousing; and
- c. manufacturing, assembling and processing goods.

Goods exported from or imported into free zones are not subject to customs and other duties except as they are withdrawn from the zone for local consumption, except that goods containing local materials shall be exempted from such taxes and duties in proportion to the local material used in their manufacture and to one-half of the duties due if the local component is 40% or greater (Articles 36, 37). Projects created in the free zone shall be exempt from the provisions of existing tax laws but shall pay an annual duty of 1 percent (1%) of the value of the goods entering or leaving the free zone on account of the project or of 3 percent (3%) of the value-added realized by the enterprise (Article 46). Payments made to expatriate employees working on such projects shall be exempted from the general tax on income (Article 47). Commercial transactions carried out in the free zone or between the free zone and other countries shall not be subject to the exchange control laws (Article 49). Further, employment of Egyptians by foreign organizations located in a free zone shall not require a permit from any government authority except the Free Zone Board, but shall follow the general conditions set down in the Executive Regulation for this Law (Articles 51-56 and Decision of the Minister of Economy No. 375 of 1977).

2. Private Free Zones

Private free zones are created by the Board of Directors of the Authority exclusively for a single project and the location and boundaries of the zone are clearly delineated (Article 30). Such zones shall be supervised by the Board of the Authority until they are affiliated with a public free zone (Article 31). Otherwise, such zones shall have the same privileges as the public free zones.

C. Industrial Districts

The present system regarding the establishment of industrial zones in Egypt was described in the previous section entitled "Restrictive Legislation". As noted there, Law No. 28 of 1949 permits governorates to designate one or more zones within their jurisdiction for factories, manufacturing and workshops and for other unhealthy, inconvenient or dangerous establishments, to the exclusion of all other uses. In towns where such zones are designated, it is forbidden to issue a permit for an industrial establishment or to establish any such establishment outside of such designated zones. In addition, the present Local Government Law (Law No. 43 of 1979) gives authority to the governorate to determine the boundaries of such industrial zones and to select locations for new factories inside of the governorate, provided that all required public utilities are already established in coordination with the Ministry of Industry.

To be effective, such a system requires greater designation of specific priority areas where enforcement will be emphasized, as discussed previously.

D. Tourism Zones

Law No. 2 of 1973 gives the Minister of Tourism the authority to establish tourism districts after the approval of the Council of Ministers. That authority includes the power to comprehensively plan such zones and to set specifications, conditions and limitations regarding building in the zone. The Ministry of Tourism is responsible for the issuance of permits to operate in such zones.

In addition, Law No. 1 of 1973 gives the Minister of Tourism the authority to set conditions for the construction of hotels and other establishments for tourists. Such constructions shall be exempted from the taxes on commercial and industrial profits and the tax on movable assets for a 5 year grace period and also be exempt from certain customs duties and taxes on imported materials. Local councils are not permitted to impose any taxes or duties on hotels or other tourist establishments, except with the approval of the Minister of Tourism.

E. Historic Areas

A 1965 ordinance sets architectural controls for the Fatimid City of Cairo which govern construction of new buildings in the area and the structural alteration of existing buildings. That ordinance limits the height of all buildings in that area to 4 stories, including the ground

floor; specifies that all facades of buildings in the district be in the simplified Islamic style; and limits balconies and similar projections of buildings to protect public roads from encroachments. The ordinance is enforced by a committee consisting of representatives from the Ministries of Tourism, Awqaf and Development and Reconstruction and of planners and archaeologists who review designs and plans prior to the granting of building permits.

V. Urban Renewal Process

Egypt does not presently have specific legislation regarding an urban renewal process. However, government agencies have sufficient authority to develop publicly-owned lands in urban areas and to take privately-owned lands for public purposes in order to accomplish orderly land development. The expropriation laws have provisions regarding compensation for property, relocation of people and business activities and the demolition of buildings.

A. Expropriation

There are two laws regulating the expropriation of land: Law No. 577 of 1954 (the general law of expropriation) and Law No. 27 of 1956 (expropriation of properties in urban areas for specific planning purposes). Under each of these laws, the general welfare purpose for which land can be taken is broadly construed. Thus, there is not the problem often found under Anglo-American law by which lands taken by expropriation cannot then be used to benefit private commercial purposes. However, adequate compensation must be paid to the property owner, as prescribed by Article 34 of the Egyptian Constitution.

1. Law No. 577 of 1954

Under Law No. 577 of 1954 the public purpose for which the land will be taken must be stated in a decree issued by the governor. 9/ This decree must also contain a general plan for the project (Article 2). The Department of Planning and Reconstruction establishes a committee, consisting of a representative of that department, a member or representative of the local council and the tax collector. That committee is responsible for executing the expropriation procedures and for setting the amount of compensation to be paid.

Objections regarding the amount of compensation to be paid will be settled by a committee, consisting of a judge (appointed by the chief judge of the district court) as chairman, a member of the Survey Department

and a member of the Department of Planning and Reconstruction (which is responsible for carrying out the expropriation). The decision of that committee can be appealed to the district court (Articles 13-15).

In addition, there are provisions establishing a procedure for temporary expropriation, if necessary because of flooding, epidemics, or other emergency (Article 17). Such temporary occupation can last for a period of up to three years. Any longer period requires a permanent taking (Article 18). Compensation must be paid for that use.

Sections regarding setting the amount of compensation and the period for payment of that compensation are favorable to the government. Compensation for increased value because of development is not paid if the expropriation occurs within 5 years of the beginning of project execution (Article 20). In addition, the government can delay payment for up to 5 years, suffering only a penalty of paying 4 percent interest on that principal (Article 23).

Finally, the government is allowed to over-expropriate when required, in its opinion, to realize the project or to eliminate incompatible uses (Article 22).

2. Law No. 27 of 1956

Law No. 27 of 1956 is the only law that specifically establishes procedures for the urban renewal process. It establishes a procedure similar to that found in Law No. 577 of 1954 for expropriation of particular areas for urban renewal purposes. The expropriation procedure is carried out by the same committee as that which executes the provisions of Law No. 577 of 1954. The committee must proceed within a 2-year period of the declaration stating the need for the land and its public purpose (Article 6). Payment may be made in terms of developed land as well as of money, so that the owner can receive some of the increase in land value resulting from development (Article 13). Thus, a land adjustment procedure could be instituted in existing residential areas without requiring changes to existing law regarding the public taking of land. The developed land must be sold by public auction, and that sales price will set the amount of land that the former owner will receive as compensation (Articles 19-21). Such owners will be given priority to buy at the base price if they are owed compensation equal to at least one-third of the base value of the property that they wish to buy (Article 20).

B. Powers to Use State-Owned Land

The government has broad powers to use state-owned land under Law No. 99 of 1992, as amended. It may develop such lands itself or rent or sell them to private developers under certain specified conditions.^{10/} The control of urban lands is under the Department of State Lands in the Ministry of Housing and Reconstruction. However, much of the actual control of such lands has been delegated to the governorates. This role of the governorates was strengthened by the specific enumeration of control over the use of land within its boundaries by the new local government law, Law No. 52 of 1975.^{11/} The governorates also are empowered to buy land, although in practice their budgets most often exclude that option.

In addition, Law No. 549 of 1976 permits governors to sell state domain land within their jurisdictions.^{12/} Such sale can be made to public sector companies, newspapers, or other entities serving public purposes, as long as there is approval by the minister concerned. Thus, industrial projects must have the approval of the Minister of Industry. Arab foreign investment projects must have the approval of the General Authority for Foreign Investment. Other projects with public welfare purposes must have the approval of both the minister concerned and the Minister of Finance. In addition, the governor may sell land to owners of buildings built illegally on publicly-owned land after November 12, 1952, as long as the sales price is equal to the present market value of the land. Thus, the governorates have great flexibility to influence land development by selling land to public companies, or even to private entities, in order to accomplish public development purposes.

A strong area of power is the use of desert lands and lands under the authority of the Ministry of Awqaf or the military for urban development purposes. It is not difficult to get desert land transferred to the authority of the Ministry of Housing and Reconstruction for use as urban land. This authority has already been used in planning the new cities of Sadat City and 10th of Ramadan City.

Also, the Ministry of Awqaf is not as autonomous as it has been in the past (as related above). There is now a joint committee, with representatives from the governorate, the Ministry of Housing and Reconstruction and other interested parties to supervise the use of wagf lands. Law No. 180 of 1952 required the Ministry of Awqaf to invest income from the lands it administered in projects with socially desirable purposes.^{13/} Finally, a Decree in 1963 called upon the Ministry of Awqaf to turn over all real estate properties under its jurisdiction to the governorates in which

they were located. If lands were to be used for public purposes, the governorate was to recompense the Ministry of Awqaf up to 50 percent of the value of the property. If such waqf Khairi properties were not required for public purposes, then the governorates were to recompense the ministry for 90 percent of the value and keep 10 percent for administrative expenses. 14/ This order does not appear to have been strictly implemented, but it has led to greater cooperation between these bodies.

A more difficult situation is found with regard to urban lands controlled by the military. At present, 30,000 feddans in Cairo are occupied by mostly obsolete military installations, including 1,000 feddans at the Almaza Air Base (which is presently planned for development). A more effective formal means for the transfer of such land is required. Such a plan was worked out in the early 1960s for development of Nasr City where the Ministries of Housing and Defense were jointly involved in the planning.

Thus, the Ministry of Housing and Reconstruction has great authority to control state-owned land and to sell it at a nominal price or to free it for the purpose of encouraging development. In most cases, such transfers have been either a delegation of authority over certain state-owned lands to the governorate or a sale of land to specific public-sector development companies.

C. The Role of the Public Sector Companies

There are 10 public sector housing and development companies under the general jurisdiction and authority of the Ministry of Housing and Reconstruction. They are responsible for the planned communities of Nasr City, Haudi, and Heliopolis as well as for the public housing program. These authorities can buy and sell land. Thus, they can control land development both before and after construction is completed. However, they are restricted in the use that can be made of revenues obtained from the sale or rental of developed properties. When most Egyptian companies were nationalized during the 1961 to 1963 period, it was specified that their profits must be returned to the general treasury instead of being retained for future development, with some allowance for required current expenses. 15/ Because any change in this requirement for public sector housing and development companies would probably also require a change for other companies in other economic sectors, it has been recommended here that a Land Development Agency be operated as a General Organization.

D. Demolition of Existing Buildings

One of the major difficulties with regard to the upgrading of existing housing areas is that of getting permission to demolish old buildings. Under the present Landlord-Tenant Law (Law No. 49 of 1977), it is almost impossible to remove a tenant unless the building is actually falling down. If the building is falling down, then the landlord can seek a demolition order. The tenant must be given notification and can object to the granting of that order. Even if a court order for demolition is granted, it is rarely enforced. In addition, tenants retain their rights (including the fixed level of rent) through any restoration process or renovation needed to correct building code violations. They are compensated and have priority to occupy a unit in the new building. A fine of from L.E. 50 to L.E. 300 is set for interfering with the rights of a tenant. In addition, Law No. 49 of 1977 adds to the requirements of previous laws by making the landlord acquire both a permit of demolition and a building permit before being able to demolish a building (Article 49). Demolition must be completed within three months of the vacating of the building or a tenant may obtain a court order to reoccupy his unit. Construction must be begun within three months of the date of completing demolition (Article 52). If construction is not begun within the time period required, then the governor concerned may entrust the job of construction to a public agency, at the landlord's expense (Article 53).

Such protection of tenants' rights is laudable but accentuates the problem of encouraging renewal of existing residential areas. A further problem is that of encouraging repair and maintenance. Law No. 49 of 1977 does provide an increased incentive to repair by the landlord by permitting him to increase the rent by 20 percent (20%) of the cost of any repairs and maintenance (Article 61). However, in practice, tenants still believe that rents cannot be increased beyond a certain percentage of the old rent, as under previous law. In addition, the law authorizes the Minister of Housing and the Minister of Finance to issue a decision setting up a program of grants and loans to landlords and lessees for repairs. However, that program is not yet in operation. The 1979 National Housing Policy Report suggested that tenants be required to pay a certain amount of monies into a fund which would be used for repairs. Any unused funds would be returned to the tenants at the end of that 5 year period. This type of program would be very difficult to administer in practice. However, if combined with a loan program for improvements it might be a short term solution to the problems created by rent control with regard to not only repair and maintenance but with regard to encouragement of investment in land and buildings in center city areas.

E. A Program to Control Land Speculation, Including a Land Transactions Tax, a Penal Tax on the Holding of Vacant Land and Stronger Enforcement of the Tax and Real Property

An additional element required in an urban renewal process is a system of taxes that controls land speculation and encourages urban development and the efficient use of urban land. In Egypt there is presently no tax on the holding of vacant land although a transaction tax covering the sale of land was enacted in 1979. In addition, the present system of urban land taxation in Egypt is based upon a rental value tax. It is levied upon the annual rental value of all occupied buildings, whether they are actually rented or not. Unfortunately, under rent control the rental value is only a small proportion of the estimated market rental value. There is no tax on land, only on buildings. There is no penal tax on the holding of vacant land. However, there is a new transactions tax on immovable property levied at the time of the transfer. The tax is based upon a percentage of the sales price, not upon a percentage of the gain in value of the property.

What is required to control land speculation is a penal tax that would discourage the holding of vacant land and thus encourage urban development projects, combined with a stronger system of real property taxation. Assessment would have to be carried out more frequently. Law No. 56 of 1954 specifies that tax assessments are to be adjusted at eight year intervals (Article 3). However, since tenants generally pay such taxes (although they are collected from the landlord) and since an increase in assessment would lead to an increase in rent, there is a strong incentive not to increase such assessments. As long as rent control prices are below market value, the tax yield will also be low in comparison to what is possible. The low taxes are not only a deterrent to new urban development but also is deterrent to improvement of existing dwellings. The neglect is already beginning to take its toll in the older parts of Cairo.

In addition, the present administrative structure for the collection of property taxes appears to suffer from lack of staff capability to assess values. Such capacity to do more frequent assessment would be difficult to achieve but could be paid for by increased revenues in the long run, especially assuming gradual decontrol of rents.

F. Betterment Taxes as a Means of Financing Urban Development

Law No. 222 of 1955 permits municipal councils to levy betterment charges to help pay for enlargement of public roads,

drainage projects, bridge construction or renovation projects and other projects as set by the Council of Ministers (Article 2). In practice, this law has been almost exclusively applied to road widening projects in which land must be expropriated. Thus, the betterment charge is considered a means of raising the revenue necessary to pay compensation to displaced landlords. This charge is not paid at the time of the improvement but only at the time of transfer of property ownership. The new owner must get a certificate from the Department of Planning and Reconstruction in the governorate that no improvement tax is required to be paid before his right of ownership will be registered. This method alleviated the financial burden to the home owner, until such time as he will have the money to pay the charge, but eliminates any ability to make such improvement projects self-financing.

If this law is to be effectively used to assist urban development it will have to be used for all types of public infrastructure projects, including especially water and sewerage works, in addition to public roads. It will also be necessary for at least a part of the charge to be levied at the time that the improvement is made.

G. The Institutional Structure for an Urban Renewal Process

Perhaps even more critical than the general powers to establish an urban renewal process would be the establishment of a precise institutional structure to execute large-scale projects. This section assumes the passage of the Physical Planning Law as discussed previously in Section II, Master Plans.

As noted previously, there is no real coordination presently of the use of public land in Egypt as it is under the control of a number of ministries as well as of the governorates and there is no national program of urban development. What is required is an institutional structure that will provide for the efficient allocation of land and for its efficient use consistent with public planning purposes.

One possibility is the establishment of a Land Development Agency specifically for the carrying out of a government program to ensure an adequate supply of serviced urban land. That national agency would be responsible for the coordination of the land development process which is currently carried out on an ad hoc basis by the governorates, the public sector development companies, private individuals and the national government ministries, particularly the Ministry of Development and Reconstruction, the Ministry of Awqaf, and the military.

Such a Land Development Agency would have three major functions:

1. to acquire land by purchase, gift, exchange, expropriation or by allocation from the government;
2. to control the development of such lands or to develop such lands by itself;
3. to sell or lease developed plots. (If plots are leased, the agency would be responsible for their administration and for enforcing building and other restrictions placed upon the plots).

The agency could function either as a general organization under the Ministry of Development and Reconstruction, a parallel unit to the General Organization for Physical Planning, or as a semi-autonomous public corporation controlled by the government. The choice of a semi-autonomous body has been favored in other countries for their land development agencies because semi-autonomy allows greater emphasis on self-financing and financial independence after an initial contribution of capital from the government. A semi-autonomous land agency in Egypt would be independent enough to be secretive in its land purchase activities. Its legislation could probably be structured so as to avoid the restrictions on public sector employment and scale of wages (see Law No. 60 of 1971). Further, semi-autonomy would make it easier to include representatives from interested parties outside of the Ministry of Development and Reconstruction on its Board of Directors. Such parties would include the Ministries of Planning, Local Administration and Awqaf. Jordan has just established an Amman Development Corporation to operate in the Amman Metropolitan Area in which one-third of the stock is owned by the Amman Municipality, one-third of the stock by the Housing Bank and one-third by the Pension Fund. Such agencies also operate in Sweden and Pakistan. 16/

However, there are a number of major difficulties involved in the operation of a semi-autonomous land agency in Egypt at this time which would probably make a General Organization more feasible for the present. Present law and regulations greatly restrict the use of profits by public sector companies (see Regulation No. 49 of 1969), although there is discussion in government circles of changes in these rules. Companies are not allowed to keep such profits even if they are to be used to make capital improvements in the business. Almost all such profits must be returned to the national treasury annually. 17/ Thus the self-financing and independence that makes a semi-autonomous agency so attractive would be severely restricted.

Such a General Organization for Land Development could be organized in a number of ways. It must be recognized that

the present local Government Law (Law No. 43 of 1979) gives the governorate primary responsibility over land, expropriation of land, urban planning and public utilities projects.^{18/} Thus any land development project must receive the approval of the Governor and the Governorate Local People's Council and must be coordinated with local projects financed by the governorate itself. Preferably such projects should be initiated at the governorate level and executed at that level or below.

At the national level, there would be a General Organization for Land Development which would be generally responsible for the use of public land and for the coordination of plans for the use of such land throughout Egypt. The policy regarding its operations would be set by the Ministry of Development and Reconstruction and coordinated with the policy of the General Organization for Physical Planning. Such a General Organization should absorb the present functions of the Department of State Land. For efficient operation, the Organization would have three or more branches, coinciding with, or at least congruent with, the economic development regions. There should be one branch each for the Cairo and Alexandria Metropolitan Areas and then one or more branches for the rest of the country. (This is the present organizational framework for the Water Supply Authority).

These branches would be responsible to the governor of the governorate where the land development project is located, as well as to the Minister of Development and Reconstruction. They would carry out or administer land development within their jurisdictions. The branches would have the authority to execute land development projects themselves but would also be able to delegate such authority to either private companies or to public sector companies, such as the Nasr City, Madi and Helipolis companies. Public sector companies, however, would face the same restrictions on self-financing at this level as would the semi-autonomous agency discussed above.

A second alternative would be a more decentralized model, giving greater power at the governorate level or at the level of the economic region. Thus there would still be a General Organization at the national level. However, the operating units would be at the Governorate or economic region level and would not be branches of the General Organization. The General Organization would serve as a coordinating body and would provide technical advisory services to the local units. It could also serve as an information clearinghouse and would have an approval authority with regard to national budget funds used for land development projects. Land development projects would be

generated at the governorate level or at the regional level. It is at that level that the program for land development would be formulated. Land acquisition and sale would remain under the authority of the governorate. Execution of projects would be done by these units themselves or by private sector or public sector companies.

The second approach would perhaps be more consistent with the emphasis upon decentralization to the governorate level found in Local Government Law No. 43 of 1979. However, it increases the difficulties of nation-wide coordination. Such coordination is one of the major problems of administration in Egypt at present. The case of the General Organization for Physical Planning illustrates this problem. That organization has no present authority to enforce master planning in cities. Thus it can only provide technical assistance when so requested by the governor. Often this help is not requested and thus plans may not be coordinated with each other. Further, the planning for such special projects as the new cities may not be coordinated with the planning for other urban areas located within the same region. It is critical that a General Organization for Land Development have much stronger authority to coordinate land development programs, including an approval authority over funding of such projects at the national level. Such funding might especially be provided for infrastructure components, such as connections to main roads and to primary waterworks, which would not be included within the project cost.

In addition, both approaches face the problem of a shortage of trained personnel to effectively carry out a land development program. However, that problem would be magnified under the decentralized approach which would require a large-scale beefing up of staffing at the local government level. A large percentage of skilled staff are presently found at the national government level and are located physically in the Cairo Metropolitan Area. It is difficult to get those persons to locate outside of that metropolitan area. It is easier to get them to accept a temporary assignment of technical assistance. In addition, the status of governorate officials is generally less than that of national ministry officials. Both the number of available skilled staff and the prestige of certain types of positions will have to be carefully considered in fashioning a land development program. The brain drain of technical talent to the rest of the Middle East makes this problem even more critical.

The problem of lack of technical personnel must also be considered when evaluating the potentiality for developing private sector and public sector companies to execute the

implementation of specific urban renewal projects. At present, that capacity is limited to the ten public sector companies and a small number of private sector firms. These companies are presently carrying out almost all of the development projects of Egypt. It would be difficult to assign them further duties with regard to new land development projects. Even more difficult would be the establishment of new firms to carry out such projects. Urban renewal and low income housing projects do not generate income immediately. The initial capital required for such firms and projects would be great and the cash flow slow in being generated. A great deal of that capital would have to initially come from the government and whether capital is available in the amounts that will be necessary is a major problem. Also new firms will not have the management experience to operate large projects.

These considerations indicate that any program of land development will have to expect a shortage of technically trained personnel and, probably, a shortage of capital as well. It is important to reduce the number of agencies involved in the process as much as possible to conserve and best use the technical staff. It is also important that the agencies involved be given sufficient authority, clearly delineated, to operate in an efficient manner. It will also be necessary to change the rules regarding public sector companies to allow them to use monies received from one project to construct other projects. The effectiveness of such self-financing would also be aided by reducing the number of units responsible for the execution of such projects so that enough funds are accumulated to carry out further projects. The Housing Development Fund, as decentralized to the governorate level, suffers from the lack of sufficient concentration to carry out low income housing projects, especially outside of the Cairo and Alexandria metropolitan areas and the Canal cities.

VI. Inducement Assistance

Egypt has a number of legal provisions to assist in the development of housing, industry and other land uses, including direct subsidies, tax concessions and such special authorities as the Free Zone Authority and the Urban New Communities Authority. Most of these inducements have been thoroughly discussed in the previous sections of this paper. Thus the tax incentives and subsidies for investments in free trade zones and in urban new communities have been discussed in detail above, along with the powers of the special authorities mentioned. They will be summarized again here for convenience.

A. Tax Incentives

1. Industrial Zones

Under Law No. 43 of 1974, certain tax incentives are given to Arab and foreign investments and to investments in designated free zones. Such investments must be in designated fields and must be made in the form of participation with public or private Egyptian capital, except where the General Authority for Investment and Free Zones decides otherwise (Article 4). These incentives are as follows:

- a. The profits of projects coming under the provisions of this law are exempt from the tax on commercial and industrial profits and the tax on revenues from movable capital. These exemptions are generally for a 5 year period with 8 years for projects of public interest and 10 years for enterprises located in new towns and for land reclamation projects. The President may extend the exemption in the latter two categories to 15 years. The 5 year period may be further extended for 3 years by the Council of Ministers.
- b. Distributed profits are exempt from the general tax on income up to 5% of each shareholder's percentage of invested capital after the exemption period (Article 17).
- c. Interest due on foreign loans is exempt from all taxes and duties (Article 18).
- d. Stock of such companies is exempt from the startup duty for a 5 year period and machinery and equipment required for the project may be exempted from all taxes and customs duties (Article 16).

Investments in designated free zones are also given the following incentives:

- a. Projects created in a free zone are exempt from all provisions of existing tax laws but shall pay an annual duty of 1 percent (1%) of the value of the goods entering or leaving the free zone or pay 3 percent (3%) of the value-added realized by the enterprise (Article 46).
- b. Goods exported or imported into free zones are not subject to customs and other duties except as they are withdrawn from the zone for local consumption, except that goods containing local material shall

be exempted from such taxes and duties in proportion to the local material used in their manufacture, and to one-half of the duty due if the local component is 40 percent or greater (Articles 36, 37).

c. Payments made to expatriate employees working on such projects shall be exempted from the general tax on income (Article 47).

2. New Urban Communities

Law No. 59 of 1979 provides a similar set of incentives for projects constructed within designated new urban communities. These incentives are:

a. Exemption from customs duties and other import duties, as under Law No. 62 of 1974 (Article 18).

b. Exemption from all taxes and duties on interest due on loans and credit facilities granted to the Authority for the financing of projects (Article 19).

c. Profits from projects in a new community area are exempted from the commercial and industrial profits tax and from the income tax on movable assets and related changes for a grace period of 10 years (Article 24).

d. Projects are exempt from the general tax on revenues (Article 25).

e) Occupants of real estate in new communities are exempt from the taxes on built properties during a 10 year grace period (Article 22).

f) Lands reclaimed within the boundaries of the new community are exempted from the land tax and all additional taxes for a 10 year grace period (Article 23).

Further, both the investment legislation and the new urban communities legislation provide additional inducements, including re-export of profits and invested capital, exemption from present company and labor laws requiring labor representatives on the Board of Directors and from the distribution of annual profits to workers under the formula of the Basic Companies Law (Law No. 26 of 1954), ability to set up foreign exchange accounts and facility in obtaining necessary licences and permits.

The major problem with these incentives programs is that they apply to too many areas. They are not targetted to specific industrial or urban development locations and thus their impact is diluted. In addition, there is a question whether new urban communities should receive subsidies beyond those for other designated industrial or free zone areas or rather be considered as a part of that general framework of incentives. Specifically, should new urban communities also receive subsidies for 10 years when free zones and other designated investments may receive the same subsidy for only 5 years?

B. Housing Subsidies

Housing is a major sector of importance to urban development where subsidies play a distorting role. The General Authority for Housing and Building Cooperatives grants loans to cooperatives for housing construction with terms of 3% interest per year for 30 years or way below the market rate. Since most cooperatives are made up of middle income and upper income persons, this housing is not low income housing and does not help relieve the worst crowding. Further, these subsidies have encouraged cooperatives to buy up large plots of land in urban and urbanizing areas and thus they are in direct conflict with any organized program of land development that would concentrate upon a mix of uses and income groups. The new Housing Cooperatives legislation has helped limit some of the worst abuses of the cooperatives in sitting on land for speculation purposes and in allowing members to sell to third parties. However, the whole question of this subsidy will have to be examined in the light of the construction of a rational land development program.

Law No. 107 of 1976 established a National Housing Fund which was to sell bonds and receive a fee from developers in addition to initial capital from the government to provide loans for economic housing. That Fund was decentralized to the governorates in 1979, in conjunction with the new Local Government Law, and has yet to begin operations. However, its loans also would have been at a subsidized interest rate of 3% for 30 years.

Also to be mentioned in this connection is the government allocation system for the distribution of building materials. While not strictly a subsidy, it has the effect of discriminating against small business at the expense of the larger contractors and thus of being another impediment to small-scale housing construction and the execution of smaller urban renewal and infill housing projects. The question of the allocation of building materials is only a

part of the general underlying question of the managed system of price controls and supply of goods in Egypt. This question must be faced in considering the successful implementation of a National Urban Policy.

C. Special Authorities

The role, function and authority of the Free Zones Authority and the New Urban Communities Authority were discussed previously at pages 106 and 109 respectively. In addition, the Suez Canal Authority plays an important role in urban development in Egypt through its construction of housing for its employees and the necessary accompanying infrastructure. This construction is done using its own funds. The underlying questions regarding these special authorities are whether they distort investment in urban development and whether they defeat the purpose of integrated urban development. As noted previously in the discussion of the proposed Physical Planning Law, it is still an open question whether planning for the new urban communities will follow the dictates of the organizations at the national and governorate level established to set up planning guidelines.

VII Conclusion

In the preceding sections, we have reviewed the present legislative means of regulating urban development in Egypt and have made recommendations for changes in laws and regulations as well as comparisons with the experience of other countries. In summary, there are several major points that should be considered in fashioning a national urban policy for Egypt:

1. The lack of an integrated legal foundation for regulating urban development. Egypt has parts of a legislative framework for urban development but not the whole. A major missing piece is a comprehensive Physical Planning Law to serve as a coordinating mechanism, but also required is a stronger property tax system and more efficient means of encouraging urban renewal or new development in areas of existing cities. Rent control, a complicated system of granting building permits, high required planning and building standards, and lack of sufficient housing finance are other deterrents.
2. Lack of a well-defined relationship between Local Government and National Government. The present immediate predecessor (Law No. 43 of 1979) and its immediate predecessor (Law No. 52 of 1976) stress decentralization of power to the governorate level, but do not establish a procedure for seeing that necessary staff and financial resources are also placed at that level. Thus Egypt is in a position where gover-

norates are apparently supposed to take responsibility in areas such as control of arable land and land development from central ministries but are without the ability to do so. Consideration of the role of a land development agency to handle urban renewal or of the need to set up an agency or apparatus to meet metropolitan problems (water, sewer, land regulation) could be a means of more precisely defining the roles of the different levels of government. This is a necessary first step, along with adequate staffing and financing, to the creation of a good urban management system. The question of classes of cities with different resources and functions should also be examined in this regard. Finally, one must consider the related issue of the overlapping jurisdiction of national government agencies, which is related to the role of local government.

3. Lack of a Restricted System of Targetted Incentives For Industrial Location, Housing Location and New Community Location, and Control of Arable Land. At present, incentives for development and restrictions against development are not based upon an overall and partial strategy and are not area specific but cover too many locations to be effective. Thus the value of the incentives are negated and the ability to enforce the restrictions is diluted. Steps must be taken to set priority areas for enforcement of both incentives and restrictions. This effort should be tied to coordination of the system of inducements and restrictions with the allocation of job-creating, investment and to the provision of critical infrastructure, especially to water, sewerage and public roads.

CHAPTER IV

FOOTNOTES

- 1/ See Sobhi Moharram, Albert Gorvine and F. El Khatib, Organization of the Government of Egypt: Administrative Framework in a National Urban Policy (National Urban Policy Study: February 1981), pp. 16-25
- 2/ USAID, Basic Infrastructure for Provincial Cities: Draft Final Report (Cairo: January 1981) p. A - 10.
- 3/ The legislation above is discussed in greater detail in Samuel A. Sherer, The Protection of Agricultural Land: A Legal and Administrative Discussion (National Urban Policy Study: March 1981)
- 4/ Law No. 106 of 1976. See section below on building requirements.
- 5/ Law No. 52 of 1940.
- 6/ Approval by the governor is not required if the subdivision does not include modernized roads or is for purposes other than building and development. Thus, a part of the earlier distinction between types of subdivisions (where new roads are built and where new roads are not required) would be carried over in this law.
- 7/ Six stories is the maximum that can be built under existing building regulations without providing an elevator.
- 8/ See Urban Development Standards And Costs (Cairo: National Urban Policy Study, October 1980).
- 9/ This authority was delegated to the governor by the Minister of Housing and Reconstruction.
- 10/ Law No. 29 of 1958 specifies that state-owned properties can be sold or rented at a low price or rent to realize a public purpose. Such action requires a Presidential Decree if the property has a value of L.E. 1,000 or more. Such nominal rentals cannot exceed a period of 30 years. Law No. 100 of 1964, as amended, states the conditions for sale of desert and agricultural lands. Regulation No. 471 of 1967, by the Minister of Housing, establishes a procedure for the sale of reclaimed land, unoccupied inheritances, land owned or administered by insurance companies public buildings, or sequestered estates when the value is not over L.E. 20,000.
- 11/ Law No. 57 of 1975, Articles 12, 13.

- 12/ The local council of a governorate was previously permitted to dispose gratuitously of, or to rent at a nominal value, lands under its control, as long as the value of such lands disposed of in one fiscal year was L.E. 25,000 or less. Disposal of lands with a greater value to private parties requires approval of the Ministerial Committee for Local Administration (Law No. 52 of 1975, Article 15).
- 13/ Between 1952 and 1962, the Ministry of Awqaf is stated to have constructed 1,097 low-cost rental housing units and 104 units of upper-middle-income housing. United Arab Republic Annual Yearbook, 1962. Later figures were not available to us.
- 14/ See Janet Abu-Lughod, Cairo: 1001 Years of the City Victorious, p. 223.
- 15/ In general, 20 percent of revenues can be kept for new development.
- 16/ In Sweden, land banking is undertaken by semiautonomous municipal land banking companies (Strada). In Pakistan there is Karachi Development Authority. The most conspicuous example of such a body in the United States is the New York State Urban Development Corporation.
- 17/ Under Regulation No. 49 of 1969 an unspecified amount of monies must be used to purchase government stocks. Then 5% of the remainder must be set aside for a legal reserve and an additional 5% for a special reserve to meet the rise in prices of fixed assets. Then 10% of the net distributable profits must be set aside for a consolidation reserve in case of decrease of circulating funds of the company below its short term liabilities. 10 percent (10%) of the remainder may be reserved for administrative expenses and control and the rest must be distributed to shareholders and workers. Thus approximately a maximum of 20% is available for further development purposes.
- 18/ Law No. 43 of 1979, Articles 26-28. Article 26 gives the governor the authority to take all procedures necessary to protect public and private property and to remove infringements on that property by administrative procedures. Article 27 gives the governor all executive authority with regard to local public utilities. Article 28 delegates to the governor the authority to set rules for the disposal of lands for building owned by the state and local government units. It further gives him the right to set regulations for the disposal of agricultural lands within the governorate boundaries and for the distribution of reclaimed land after it is provided with public utilities. Such regulations may also define cases in which such land may be disposed of without payment to encourage reconstruction and housing activities and for land reclamation purposes.

APPENDIX II-A

DIRECT INVESTMENT COST ESTIMATION PROCEDURE

The direct investment cost procedure has two integrated components; regional cost variation and growth management costs. The rationale for these components is presented in section 3 of the Chapter II the method of applying the concepts is presented in this Appendix.

In the estimation of the regional cost variation, it was assumed that the established pattern of the spatial distribution of investment (emphasis on Cairo and Alexandria Regions) would continue through 1985. Using 1976 data and the trend assumption, we estimated the proportion of total employment in mining, manufacturing and construction in 1985 for each of the forty cities. These ratios were normalized by dividing each city ratio by the Cairo ratio to generate an index with these properties: (1) Cairo is equal to one, and (2) cities with a larger (smaller) proportion of employment in mining, manufacturing and construction than Cairo have index values greater (less than) one. This regional cost variation of direct job creation for a city, relative to the national average, is one-half the deviation from unity of the city index value. (An index value of .9 means the regional cost variation is 5 percent above the national average).

Growth management cost is a function of the employment growth rate. In the specification we used, the average cost per job increases by approximately L.E. 200 for each 1 percent increase in the growth rate. The combination of regional cost variation and growth management costs are shown in Fig. 11-A-1.

The regional cost variation is among cities, the growth management cost refers to a single city at various growth rates.

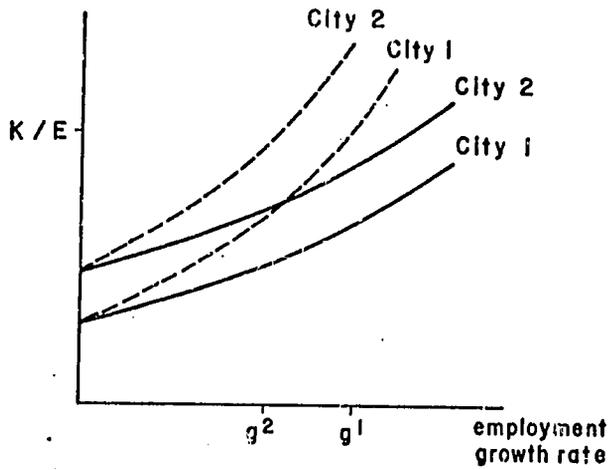
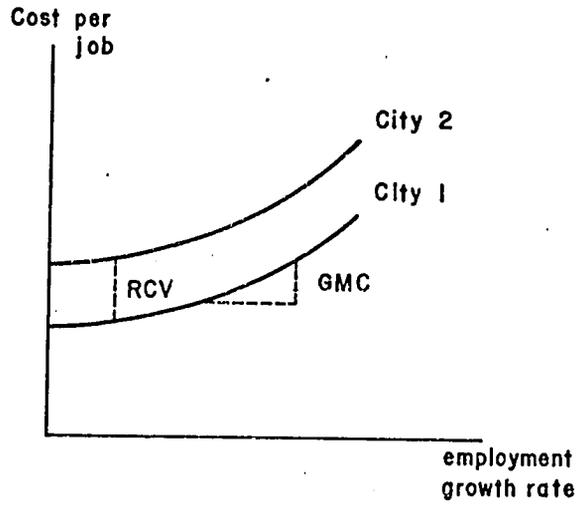
The second panel of Fig. 11-A-1 illustrates the least cost solution; keep the marginal job cost (the broken lines) each city equal and solve for the marginal job cost (K/E) that generates the target increase in employment. The total cost of the least-cost solution is the product of the average cost per job and the change in labor, summed over the forty cities.

The population change for each city is a constant multiple of the employment change, 2.47 in the 1986-1990 period. The constant is derived from the urban population and urban employment projections in the Interim Action Report.

The approach used in this Report to calculate the direct investment costs of settlement alternatives is based on variations in input costs. The existence of productive investment opportunities in a particular place sufficient to absorb an investment allocation has not been established by the Study Team. This topic will be discussed in the Second Round Alternatives Report.

Figure II-A-1

Least-Cost Settlement Growth Rates



APPENDIX II-B

GROWTH CENTERS AND REGIONAL SERVICE CENTERS

1. INTRODUCTION

The Interim Action Report indicated that several secondary cities due to their recent economic performance and potential population absorption capacity could play a more important role the settlement hierarchy than they do now if their received higher investment priority. It also indicated that there was a need to rationalize service functions in the Delta through transforming some Delta settlements into regional service centers. In this appendix, we discuss in more detail the recent economic growth of seven settlements which were identified in the Interim Action Report as having the potential to become growth centers and the capacity of two Delta settlements to serve broader regional functions.

As shown in Chapter II, these nine settlements due to their strategic location and previous growth could have important roles under any of the alternatives. Thus they received special treatment in terms of higher infrastructure standards, and where appropriate, employment growth.

Since comprehensive, consistent settlement level economic and infrastructure data is not available at the settlement level for all of these settlements, the analysis presented here relies heavily on the data which Governorate Planning Officers have supplied to the project. Since their resources are often limited, particularly in terms of collecting economic data, the data from some settlements is more recent and complete than from others.

In this appendix, two sets of data are analyzed: the existing industrial structure of these settlements along with potential investment and employment resulting from the 1980-84 Industrial Investment Plan, and their existing social and physical infrastructure. Since most of these settlements serve broader regional populations, the extent of their regional service function was determined by comparing the actual student population of their technical secondary schools and universities with their school age populations that would actually be going to school.

Calculations of water and sewerage capacities and deficits were made using standards which were developed by the Provincial Water Supplies Project. These are shown in a table at the end of the appendix.

The industrial development over the 1980-84 plan period was projected using investment figures from the investment plan and

capital/labor ratios published by the Ministry of Industry for selected industries. Regional master plans and development plans were also used to indicate future industrial development potential along with data supplied by governorate planning departments.

2. Growth Centers in the Urban Strategy Context.

A national urban strategy which aims to distribute future population in a desired pattern over the national space could do so through promotion of some secondary cities into regional growth centers. However, the resources required to develop secondary cities into growth centers depends on their current economic base, industrial mix, possibilities for future diversification and support infrastructure. In this section, seven urban settlements are examined to determine their current industrial mix and potential for diversification. These settlements can be classified according to their current industrial mix and potential as follows:

- i. settlements with strong potential for diversification around their existing propulsive industries;
- ii. settlements with a traditional agro-industrial base and limited potentials for diversification; and
- iii. settlements with an industrial base that could be expanded if treated within the context of a broader regional development plan.

A. Settlements with Strong Potential for Diversification

Two urban settlements, Suez and Naga Hamadi, possess strong industrial bases with "propulsive industry" that could attract new industries due to backward and forward linkages. These industries are aluminum in Naga Hamadi and petroleum in Suez.

1. Naga Hamadi

The newly established aluminum plant is the key industrial activity in Naga Hamadi. Its current output and employment amounts to 100,000 tons of aluminum and 8,000 jobs. This capacity is being expanded by an additional 66,000 tons which will add 2,000 jobs. The location of this plant, although not based on a comparative regional advantage, has diversified the region's industrial base away from its traditional agro-based industries.

The existence of the aluminum plant, a port outlet at Safaga, a railway under construction between Safaga

and Qena and the potential market in South Upper Egypt, are all factors that highlight the advantages of Naga Hamadi to host a number of aluminum derivative industries. These could include die-casting (valves, taps, window catches, locks, finger plates and hinges), wires and aluminum extrusion (windows and door sectors, solar panel sections).

Due to the location of Egypt's largest sugar factory in Naga Hamadi and the construction of a cement factory there (completion is expected in 1983), its industrial base could be further diversified around complementary industries such as paper pulp, alcohol, pharmaceutical and perfume produce and a wide range of the concrete products. As shown in Table II-1, its existing planned investment industrial mix is expected to generate an additional 5,800 jobs by 1984. Naga Hamadi's centrality in South Upper Egypt is likely to enable these industries to grow at a faster rate than in many other parts of the country.

Infrastructure is likely to be a constraint to Naga Hamadi's future development. The present capacity of its water system, although higher than the national average capacity found in provincial cities, is still lower than that of the Canal Cities, Alexandria and Greater Cairo -- major industrial centers with which it would have to compete. It presently has no sewerage system. Housing is also likely to be inadequate as available data from the Governorate of Qena indicates that residential building starts have been fairly constant since 1976.

Naga Hamadi, since it is not a governorate capital, has a relatively low level of social infrastructure in comparison with the other eight settlements and the major metropolitan areas. Its level of hospital beds per 1,000 population is lower than both the national urban average and the other eight settlements. It is however close to Qena where a higher level of health care facilities exists, but even in Qena these are likely to be a constraint.

An additional 40,000 population could be absorbed within Naga Hamadi's existing boundaries at gross densities of 300 persons per hectare. However roughly 50 percent of this growth would have to occur on agricultural land within its boundaries. Naga Hamadi could however expand into non-arable land to the west. Thus its absorption capacity outside its boundaries would not be a constraint to its further growth.

EXISTING AND POTENTIAL INDUSTRIAL DEVELOPMENT:

SETTLEMENTS WITH STRONG POTENTIAL FOR DIVERSIFICATION

		1980 INDUSTRIAL MIX		SUGGESTED INDUSTRIAL DEVELOPMENT 1980-1984		INDUSTRIAL DEVELOPMENT POTENTIAL	
		INDUSTRY	EMPLOYMENT	INDUSTRY	INVESTMENT L.E. MILLIONS		EMPLOYMENT
<u>NAGA HAMADI</u>							
Employment Structure		Aluminum	8000	Sugar	42	1200	Metal Working Engineering
N.A.		Sugar	3000	Aluminum	43.7	2000	Die Casting
				Cement			Aluminum extrusion
				Pre Fabricated			Paper pulp
				Housing	87	2613	Alcohol, pharmaceutical and
				Total		5813	perfume products
							Concrete products
<u>SUEZ</u>							
Agricultural		Textiles	3000	Fish Canning	5.2	562	Petrochemical Industries
Fishing	9,000	Chemicals	3500	Sulphuric Acid			Plastics
Industry	19,000	Ship Building	1400	and Aluminum			Rubber
Petroleum	3,500	Pre Fabricated		Sulphate	14.29	160	Synthetic fibers
Construction	3,000	Housing	120	Nitric Acid	12.0		Fibre glass
Transportation	6,000	Flour Milling	200	Oil Refineries	N.A.	3500	Ready made clothes
Finance and		Free Zones	1996	Textiles	39.0	2000	Steel fabrications
Trade	12,250	Small Scale		Shipbuilding	10.0	600	
Public Utility		and Others	7525	Bricks	9.0	550	
and Services	25,750	Total	17741	Pharmaceutical			
Total	78,500			Glass	30.0	2000	
				Free Zones	N.A.	1080	
Employment 1/				Total		10452	

* Industries in Suez include those suggested by the industrial development plan (1980 - 1984) as well as Suez Master Plan, N.A. Not Available

1/ Source: Planning Department of the Suez Governorate

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ii. Suez

The current industrial mix of Suez is limited to oil refineries, chemicals and textiles. These three industries absorb 58.0 percent of the city's 21 thousand industrial employment. Due to committed investments, during 1980-84, oil refineries and chemicals industries are expected to create 4,000 new jobs. Beyond 1984, industrial potential of Suez City depends on the magnitude of investments that would be directed toward the utilization of the existing industries linkages. The Suez oil industry could support further industrial expansion in petrochemical, plastics, synthetic fibers and rubber. The expansion in the oil field services can give rise to a wide range of steel manufacturing industries that includes the fabrication of steel platforms, jackets for the offshore industry, tin containers, hard and edge tools, enamelled iron and shipbuilding. The large scale textile industry could support the location of a ready-made clothes industry with an orientation toward foreign markets, thus capitalizing on the location of Suez on a major international trade route. In addition, the efficient exploitation of the area identified as having white sand and limestone mining deposits could further strengthen its construction material and glass industry.

Infrastructure, particularly water and sewerage, has been a constraint to industrial growth in Suez. Its present water system is inadequate to serve future expansion of existing industries and although it has a sewerage system it is not functioning and untreated sewage is dumped into either the Red Sea or in lagoons to the north of the built area. However due to reconstruction efforts of the central government, detailed engineering design is underway to implement master-plans prepared to improve water and sewerage systems. When completed, these utilities should have service levels which are projected to be roughly equal to those of Alexandria and adequate to serve future industrial growth. These service levels are planned to provide for an expected population of one million with water consumption of 353 liters per capita per day and sewerage flows of 282 liters per capita per day.

Although a considerable amount of housing was built during reconstruction of the Canal Zone, the growth of residential buildings as indicated by building permits and violation data from the Governorate of Suez in 1980 was less than 1 percent of the 1980 housing stock. Furthermore, much of the existing housing in

the central area of Suez is in bad condition. Sample surveys of private housing areas conducted by the Suez Urban Development Programme indicate that roughly 31 percent of the existing buildings are either structurally unsafe or very high occupancy rates. Finally, the planning department of the Governorate indicates that if present construction trends persist, accumulative shortfall of over 13,000 housing units will exist by 1985 or 53 percent of expected housing demand.

Social infrastructure is also inadequate in Suez. At only 2.6 hospital beds per 1,000 population the provision of health facilities in Suez is well below the urban national average provision of 4.4 beds per 1,000.

Data from the Governorate of Suez indicates that it has a net population absorption capacity of about 80,000 at gross densities of 300 persons per hectare within its present boundaries. This however should not be a constraint to growth, as sufficient, buildable desert land exists to the north and west of Suez which will allow sufficient area for horizontal expansion of settlement boundaries. Due to the existence of fairly large portions of the central area which are in poor condition, vertical expansion possibilities exist within the central area. However, alternative low income housing areas would have to be provided to accommodate existing populations.

B. Urban Settlements with Limited Industrial Development Potential.

Ismailia and Port Said are typical of this category of settlements since their economic structure is service oriented. (Beni Suef, El Fayoum and Minia also fall into this category but less data is available about them and the Industrial Development Plan allocates no investments to them). The latest available data indicates that transport, storage, trade and services account for more than 65 percent of their employment, while industrial employment is less than 12 percent. (The average industrial employment for the other urban governorates is 23 percent of total employment).

Shipbuilding, textiles and food processing predominate in Port Said's large scale industries, while small scale industries are mostly privately owned leatherware, furniture and mechanical workshops. These account for about 19 percent of 74,600 jobs in 1980. The 1980-84 industrial investment is aimed at food processing and textiles and is expected to generate an additional 2,080 jobs. This

employment is in addition to master plan projections of 3,140 new jobs in three new industrial zones.

Due to the lack of land and the cost of reclaiming new land, land consumptive, large scale industries cannot be located in Port Said. Therefore, future industrial employment should be directed towards small scale industries which aim at assembly of products directed towards internal markets and at food processing. The latter could be based on fish farming and agricultural produce.

Large scale industries in Ismailia are limited to assembly of electrical equipment, food processing and clay tiles. Its small scale industries are predominately furniture making, wearing apparel and steel fabrication. Thus Ismailia's current industrial employment is only 12 percent of total employment.

This employment mix is not expected to be changed during the 1980-84 Industrial Plan period. The projected investment of L.E. 8 million is expected to yield only about 860 new jobs and thus have little impact on diversifying its industrial mix. However, given its central location in the Canal Zone and its proximity to potential sources of agricultural raw materials from the Delta and newly reclaimed areas, Ismailia could expand its agro-industrial based activities to provide additional employment.

Like Suez, both Port Said and Ismailia suffer from infrastructure deficits. However, like Suez, detailed planning is underway to expand both water and sewerage systems in both settlements. These master plans aim at increasing water supply capacities in Ismailia 60 percent to 353 liters per capita per day and 28 percent in Port Said to 381 liters per capita per day. Sewerage flows are aimed at about 70 percent of water consumption. However these master plans are designed to serve populations of 500,000 in Ismailia and 650,000 in Port Said. Thus if either exceeded those populations, deficits in service levels would likely occur.

Although data from the Governorate of Port Said indicates that it has a net population absorption capacity of 1.7 million at gross densities of 280 persons per hectare, this capacity is constrained by the availability of dry land. Thus the present expansion of residential areas is on land that is being reclaimed from Lake Manzalla. Due to its access to desert land, Ismailia's population absorption capacity is less constrained. However, the immediate growth of the built area of the city as projected by its master plan is constrained by military installations.

TABLE II-2

EXISTING AND POTENTIAL INDUSTRIAL DEVELOPMENT

SETTLEMENTS WITH LIMITED INDUSTRIAL DEVELOPMENT POTENTIAL

PORT SAID	CURRENT INDUSTRIAL MIX		SUGGESTED INDUSTRIAL DEVELOPMENT 1980-1984		INDUSTRIAL DEVELOPMENT POTENTIAL		
	INDUSTRY	EMPLOYMENT	INDUSTRY	INVESTMENT L.E. MILLION			
<u>Employment</u>			PUBLIC SECTOR INVESTMENT PLAN:				
		2,154					
Agricultural and Fishing Industry	2,400	Food processing and packing	639	Food Canning and Processing	5.0	1,018	Fish processing
Commerce	13,100	Port related Industries (ropes, Engineering work, Shipyard, etc ...)	5,319	Textiles	6.45	758	Agro-based Industries
Ins. Finance Service and Public Utilities	1,600	Small scale and other Industries	4,106	Salt	13.02	600	
Not classified	30,100	Free Zone	585	PORT SAID MASTER PLAN:			
	13,100			Industrial Estates		3,140	
Total	74,633	Total	14,333	Total		2,376	
<u>ISMAILIA</u>							
<u>Employment</u>							
Industry	4,670	Food processing	838	Dairy Products	2.19	274	Agro-based Industries
Public Utilities	1,056	Textiles	1,045	Food Canning	0.54	108	
Transport	10,090	Wood and Furniture	883	Metallics	5.20	476	
Finance	554			Total		858	
Commerce	6,248						
Services	16,713						
Total	39,341	Total	2,756				
<u>BENI SUEF</u>							
<u>Employment</u>							
Agriculture	2,134	Food processing	1,294				
Industry	4,727	Spinning and Weaving	3,206				Agro-based Industries
Commerce	597	Furniture	63				
Transportation	2,424	Other Industries	156				
Services	13,270						
Construction	1,792						
Total	26,952	Total	4,727				
Source: Governorate's planning division and C.I.P. CAMAS							
<u>MINIA</u>							
<u>Employment mix</u>							
N.A.		Food processing	3,766				Agro-based Industries
		Beverages	147				
		Tobacco	43				
		Spinning and Weaving	5,161				
		Other Industries	145				
		Total	9,262				
<u>EL FAYOUM</u>							
		Food processing	1,088				Agro-based Industries
		Tobacco	198				
		Spinning and Weaving	2,790				
		Non Metallics	277				
		Others	74				
		Total	4,427				

C. Settlements with Potential Industrial Growth Resulting from Regional Development Potential.

A third category of settlements which through regional investment could be transformed in growth centers consists of Aswan, Assiut and Qera. However their potential industrial growth depends on necessary industrial investment in surrounding regions, as their existing industry diversification potential is limited to either a single industry or to largely agro-based industries and small scale workshops.

The industrial base of Aswan typifies the first group as it is limited to a large fertilizer plant. Although it is the second largest industrial user of hydro electric power, the local impact of the fertilizer plant has been limited, as it employs only about 3,000 workers and has not resulted in much diversification other than housing and training facilities related to the plant.

Aswan's industrial base could however be diversified when viewed in the broader context of its surrounding region. More intensive utilization of the High Dam Lake could result in fish processing and animal feed industries in Aswan. The expansion of the paper pulp industry at Edfu and the fibre-board industry at Komombo could support furniture, construction products and other paper and paper board industries. Fibreglass/boat building industries could be introduced through using plastic resins manufactured in petrochemical industries in Suez. The mining of quartz and silica deposits could support the establishment of glass products, while Kaolinic clays could support a whiteware ceramic industry. Limestone marble, and granite deposits could be exploited to produce a wide range of products for the construction and transportation sectors which could be aimed at both internal and external markets. Other mining industries in the Red Sea Governorate and the Komombo Area could also support development of other industries in Aswan where abundant power and water resources are necessary.

Qena, like Aswan, has its main source of industrial employment limited to a single industry, a spinning mill employing 3,500 workers. The absence of a cotton ginning industry to supply the spinning mill with ginned cotton or a weaving mill that could use its intermediate output minimizes the economic impacts which the industry has on Qena. Furthermore, the lack of significant allocation of investment in the 1980 - 1984 plan to Qena seems to indicate that there are very limited possibilities of expanding its existing industrial mix. Local planners indicate that most industrial investment presently occurring is related to food sufficiency programmes such as dairy products and animal feed stuff industries.

TABLE 11-3

EXISTING AND POTENTIAL INDUSTRIAL DEVELOPMENT:

SETTLEMENTS WITH INDUSTRIAL POTENTIAL DUE TO REGIONAL DEVELOPMENT POTENTIAL

CURRENT INDUSTRIAL MIX			SUGGESTED INDUSTRIAL DEVELOPMENT 1980-1984			INDUSTRIAL DEVELOPMENT POTENTIAL	
INDUSTRY	EMPLOYMENT		INDUSTRY	INVESTMENT (L.E. MILLION)	EMPLOYMENT		
<u>ASWAN</u>	Fertilizers	3,000	Fish Processing	2.0	215	Fish canning, Animal food stuff. Boat building, furniture, Paper manufac- turing, Printing, Ceramics, Sheet Glass.	
Employment	Beverages and Ice	195	Shale Bricks	6.25	937		
N.A.	Shale Bricks	45	Mining	28.8	8,000		
	Total	3,240	Total		9,152		
<u>QENA</u>	Spinning Mill	3,500	Shale Bricks	7.58	1,136	Animal Food Stuff, Dairy Products Textiles.	
Employment							
N.A.			Total	7.58	1,136		
<u>ASSIUT</u>							
Employment ^{1/}							
Industry	7292	Textiles	3,279	Spinning & Weaving	1.69	199	Fruit & Vegetable canning, Ginning of Cotton, Oil Soap, Organic fertilizers, Glass.
Construction	2828	Fertilizer	990				
Transportation	4430	Pharmaceutical	433				
Finance	6812	Beverages	176				
Services	24374	Small Scale & All Other	2,414				
Others	6452						
Total	52108	Total	7,292				

1/ Source: Planning Department of the Assiut Governorate

However, due to its location between Naga Hamadi and the Safaga port in the Red Sea Governorate, the potential of expanding Qena's industrial base exists when viewed in the broader context of corridor development between Naga Hamadi and Qena. This expansion could be based on inputs produced by the aluminum and cement industries in Naga Hamadi and mining industries in the Red Sea Governorate.

The third settlement in this group, Assiut, has an industrial employment structure in which 45 percent of employment is in a single industry, textiles, and another 33 percent is in small scale, informal industrial activities. Recently, its industrial base has been expanded away from traditional agro-based industries through development of fertilizer and pharmaceutical industries. These now account for about 20 percent of Assiut's 1980 industrial employment.

The 1980-84 Industrial Development Plan will have very little impact on diversifying Assiut's industrial base as it only allocates L.E. 1.7 million to the development of textile industries and is expected to increase employment by only 200 workers. However, if more investment emphasis were placed on development of the agricultural sector in Assiut's immediate region, its agro-based industries could be expanded to include, ginning of cotton, edible oils, animal feed stuffs, soaps and detergents, ready made clothes and canning industries. Upgrading regional infrastructure and exploitation of mineral resources in the New Valley could result in further expansion of the fertilizer industry.

Although all three settlements in this group have deficits in their infrastructure, generally infrastructure in Assiut is in better condition than in Qena and Aswan. Presently neither Aswan nor Qena have sewerage systems and they have inadequate water supply capacities. However, in all three settlements investment is being made in both water supply and sewerage.

Building permit data from Qena and Assiut indicates that formal sector construction in both has been increasing at annual growth rates which are lower than population growth rates. However, in Assiut at least, formal sector residential permits have been increasing since 1977 at an annual rate of 6 percent which would seem to indicate housing shortages might be less severe than in Qena.

The service levels of social infrastructure in Assiut are likely to be higher than in either Qena or Aswan due to the location of the university with a medical faculty in Assiut. However, standards of health service in Aswan are equally high due to construction of major health facilities during construction of the High Dam. In Qena, however, health standards as indicated by

hospital beds per 1,000 population, are lower than national urban average standards

Both Aswan and Assiut have population absorption capacities within their boundaries which would enable them to absorb

All three settlements have population absorption capacities within their boundaries which would allow them to absorb populations in excess of 400,000 at gross densities of 300 persons per hectare. However, roughly 64 percent of this growth would be on agricultural land within the boundaries of Assiut, while only 9 percent of the new growth would occur on arable land in Qena. In all three settlements, expansion onto desert land is possible. In Assiut, however, a strip of arable land is between the existing built area and the desert.

3. Regional Service Centers in the Delta

A special set of settlement issues needs to be addressed when dealing with Delta urban settlements such as accommodating the predicted urban population growth at higher densities within existing settlement boundaries to prevent further encroachments onto arable land, diversification and expansion of the Delta's already strong economic base without encouraging further urban sprawl and improving and strengthening the regional service functions.

The main Delta settlements are characterized by three somewhat overlapping groups:

1. industrial settlements (primarily located along the Cairo-Alexandria corridor),
2. governorate capitals providing some degree of regional services, and
3. other secondary cities.

While all of the governorate capitals provide some regional services at least within their administrative boundaries, only Benha, Tanta, Mansoura and Zagazig provide broader regional functions such as higher level education and specialized health care. These settlements are located on major transportation networks within the Delta and have access to the primate cities and the Canal Cities. However, only Tanta and Mansoura have population absorption capacities within their settlement boundaries which would allow them to reach year 2000 populations of 600,000 to 900,000. Thus they have greater potential for further growth of their service functions.

As mentioned, both Tanta and Mansoura already have strong regional service functions. As indicated by Table II-5, the

universities in both have regional service factors which are greater than those of Greater Cairo and Alexandria. Recent data about Mansoura's health care facilities are not available, however, Tanta has a provision which is greater than the urban national average provision of hospital beds. While this provision of hospital beds in Tanta indicates that service levels are high, it also shows that Tanta's health care facilities have the capacity to serve broader regional populations.

While Tanta has an absorption capacity of roughly 600,000 additional population at high gross densities, only about 13,000 could be accommodated on vacant or undeveloped plots. The remaining new population would have to be accommodated on land which is now agricultural, but is still within the settlement's boundaries (approximately 165,000) or through vertical redevelopment of deteriorated low density areas within the built area of the city. Some of this deteriorated area is owned by the Waqf Ministry and is rented to tenants at very low rents fixed since the 1930's. One such area encompasses two square kilometers within the core area and is composed of deteriorated one and two storey structures. While some of this land is valued at L.E. 100 to L.E. 200 per square meter, return on it is frequently less than L.E. 10.00 per year. Thus many structures are vacant or used for functions such as stables which are inappropriate for central business districts.

One measure which releases under-utilized core land would be to encourage the small workshops and craft industries located there to relocate in small industrial estates along the city's fringe where they could be provided with adequate infrastructure. This land could then be released for new higher density residential and service functions more appropriate to the central business districts. The costs of converting low density core area structure into higher density are very roughly estimated at L.E 981 per capita. These costs would include construction of multi-storey flats, payment of compensation to existing tenants to enable them to move and provisions for improvement of infrastructure to enable it to serve higher densities.

TABLE 11-4

EXISTING AND POTENTIAL INDUSTRIAL DEVELOPMENT IN PROPOSED REGIONAL SERVICE CENTERS

		CURRENT INDUSTRIAL MIX		SUGGESTED INDUSTRIAL DEVELOPMENT 1980-1984			INDUSTRIAL DEVELOPMENT POTENTIAL
		INDUSTRY	EMPLOYMENT	INDUSTRY	INVESTMENT (L.E. MILLION)	EMPLOYMENT	
<u>TANTA</u>							
Employment		Food Processing	37,914				
		Spinning & Weaving	6,202				
		Leather Products	3,428	Textiles	25.7	3,023	Fertilizers, Animal food stuff,
industry	62617	Assembly of Agri-					
Construction	21163	cultural Machinery	2,998	Ready Made			bottling of liquid gas, metal
Transportation	19533	Ready Made Clothes	1,327	Clothes	2.07	1,241	
Finance & Commerce	26615	Metallic Fabrication	1,254				fabrication, electric and electro-
Housing	12546	Paper	811				
Services	15470	All Others	8,683	Rubber	41.6	1,698	nic Industries, cottage Industries
Others	21605						
							In the rural areas.
Total	180649	Total	52,617	Total	69.4	5,962	
<u>MANSOURA</u>							
Employment		Textiles	7,358	Textiles	14.8	1,740	Fertilizers, Animal food stuff,
							bottling of liquid gas, metal
N.A.		Rice & Flour					fabrication, electrical and electro-
		Milling	969				
		Wood	768	Fertilizers			nic Industries, cottage Industries
		Food Processing	298	(Talkha)	19.0	1,450	
		Oil & Soap	626				In the rural areas.
		Total	10,019	Total	33.8	3,190	

TAX

1/5

TABLE

INFRASTRUCTURE OF GROWTH CENTERS AND REGIONAL SERVICE CENTERS

SETTLEMENT	WATER CAPACITY 1/c/d	WATER SYSTEM SURPLUS OR (DEFICIT)	SURPLUS (DEFICIT) IN (200'0) POPULATION NOT SERVED	SEWERAGE CAPACITY 1/c/d 1/	SEWERAGE SYSTEM SURPLUS OR (DEFICIT) 1/c/d	SECONDARY TECHNICAL LEVEL EDUCATION 2/			
						TOTAL NUMBER OF SCHOOLS	PERCENT OF SCHOOLS NOT IN GOOD CONDITION	STUDENT/CLASSROOM COMMERCE INDUSTRIAL A	
National Urban Average	169	-	-	-	-	351	24.0		
Cairo	338	(122)	(2,048.0)	N.A.	(138)	61	17.0		
Alexandria	288	(172)	(964.133)	271	(67)	31	9.7	39.0 39.5	
<u>Urban Centers</u>									
- Port Said	299	70	81.97	137		6			
- Ismailia	219	14	13.52	141	(161)	5	4.4	31.2 29.3	
- Suez	219	(8)	13.52	141	(78)	5	3.0	35.0 35.0	
- Bahig el-Madinet	128.5	(42.5)	(10.26)	N.B.	(32.8)	15	-	24.2 24.2	
- Fayyum	91.5	(112.5)	(30.7)	105.7	(70.36)	8	1.0	33.5 35.0	
- Matruh	126.8	(78.2)	(62.3)	36.46	(224.4)	20	2.1	34.8 33.4	
- Arish	250.8	45.4	54.6	74.8		17	5.3	35.5 36.2	
- Qena	173.1	(67.9)	(39.0)	N.B.		15	9.5	36.8 39.7	
- Siga Masafi	174.3	24.2	10.2	N.B.		3	3.0	24.0 22.0	
- Assiut	158.2	(46.8)	43.8	N.B.		12			
<u>Regional Centers</u>									
- Tanta	315.2	87.8	122.2	72.6	(242.6)	16			
- Mansoura	224.2	(1.8)	(2.2)	57.14	(169.06)	-			

ABBREVIATIONS

N.B. No System

SOURCE

- Greater Cairo, Alexandria and Canal Cities water and Sewerage; Appendices to Water Utility and Sewerage Utility Volumes. Other Settlement Provincial Water Supplies Project Volume III.
- Unpublished data from the Ministry of Education.
- Statistical Yearbook Arab Republic of Egypt 1973. Central Agency for Public Mobilization and Statistics.
- 1976 Census Central Agency for Public Mobilization and Statistics.
- Data supplied by Governorate Planning Offices.
- Study on Health and Expenditure in Egypt. Publication No. 18, April 1980, Ministry of Health.
- Interim Reports National Transportation Investment Program Phase II. Prepared by MEDICO for the Transport Planning Authority of the Ministry of Transport.
- Telecommunication Sector, Study. Telecommunication System Master Plan Volume 3. Prepared by Continental Telephone International.

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CH. RAT. NO. AD-17/18/19/20/21	SECONDARY TECHNICAL REGIONAL FACTORS				UNIVERSITY 3/		TOTAL NO. OF 1000 Urban Population 4/	HEALTH FACILITIES				TRANSPORT NO. OF PUBLIC BUSES TOTAL PER 1000 2/	TELECOMMUNICATIONS	
	COMMERCE	INDUSTRIAL	AGRICULTURAL	TOTAL	NO. OF STUDENTS	LEVEL EDUCATION REGIONAL PER 1000 3/		TOTAL NO. OF PATIENTS (500's) 5/	TOTAL NO. OF BEDS/ 1000 Urban Population 5/	NO. OF HOSPITAL BEDS/1000 POPULATION 6/	NO. OF TELEPHONE LINES 8/		NO. OF TELEPHONE LINES 1000 9/	
-	2.0	3.8	5.4	-	256.793	4.72	4.19	4.4	-	0.93	7.0	196.629	39.1	
45.5	1.0	0.76	-	0.82	71.424	2.67	4.4	2.794	M.A.	1.2	2.3	58.573	25.2	
-	2.0	3.0	-	2.08	-	-	3.55	M.A.	-	-	-	-	-	
35.4	1.5	1.7	-	1.73	-	-	3.25	94	M.A.	-	0.2	4.625	17.6	
-	1.5	1.0	-	1.4	7.192	1.82	1.98	158	M.A.	-	0.2	575	3.94	
34.4	1.8	8.4	12.4	4.78	-	-	1.98	149	M.A.	-	0.17	1.819	9.37	
33.4	2.2	2.5	7.1	3.08	-	-	7.07	177	5.25 1/	-	-	1.576	12.35	
32.4	1.4	4.3	6.1	2.74	15.386	0.47	3.17	156	M.A.	-	-	1.985	11.81	
31.4	0.75	4.7	5.9	2.37	30.455	1.65	4.73	233	4.06 1/	-	-	2.405	16.47	
30.4	1.4	7.8	9.8	4.24	-	-	4.5	112	M.A.	0.27	0.048	3.943	18.47	
28.6	1.7	16.0	37.7	6.82	-	-	-	-	3.3 1/	-	-	390	8.41	
38.0	-	4.1	-	1.13	-	-	6.7	163	M.A.	-	-	390	20.11	
-	2.0	4.0	5.0	2.84	21.832	7.17	-	-	-	-	-	1.724	7.22	
-	2.0	3.1	2.3	2.33	31.398	11.4	-	-	5.79 1/	1.76	0.24	5.980	20.9	
-	-	-	-	-	-	-	-	-	M.A.	2.99	-	5.967	23.13	

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APPENDIX II-C
DETAILED INFRASTRUCTURE ESTIMATES

TRENTO POPULATION PERIOD 1980-1985 PARAMETERS

SETTLEMENT	1980 GROSS DENSITY (P/HA)	1980 POPULATION (000'S)	CHANGE IN POPULATION (000'S)	1985 POPULATION (000'S)	1985 GROSS DENSITY (P/HA)	WATER STANDARD (L/c/d)	SEWERAGE STANDARD (L/c/d)	PER CAPITA HOUSING (L.E.)	OTHER INFRA- STRUCTURE (L.E.)	EDUCATION (L.E.)	HEALTH (L.E.)	OTHER SOCIAL INFRA- STRUCTURE (L.E.)	NOTES
METROPOLITAN AREAS													
GREATER CAIRO	236.3	7,721.8	1,480.2	9,202.0	261.6	367	217	552	296	41	258	126	
ALEXANDRIA	133.7	2,578.5	366.5	2,945.0	152.7	307	243	552	296	41	258	128	
GROWTH CENTERS													
PORT SAID	37.1	267.1	169.9	437.0	60.7	341	153	552	296	41	258	128	
ISHMILIA	138.3	192.1	93.9	292.0	203.9	265	137	552	296	41	258	128	
SUEZ	230.1	250.0	52.0	312.0	276.1	231	139	552	296	61	258	128	
ELVI SUEF	130.7	130.7	77.3	277.3	245.4	231	142	552	296	41	258	128	
FAYOUM	147.8	109.0	31.0	220.0	172.0	237	144	552	296	41	258	128	
MIYA	149.0	163.3	24.0	187.3	170.9	237	142	558	296	41	258	128	
ASSIUT	254.3	243.6	42.4	286.0	293.6	253	150	552	296	81	258	128	
HADRAH HAWADI	180.3	63.1	28.9	92.0	262.9	237	142	552	296	41	258	128	
CAIRO	56.1	106.1	17.9	124.0	65.6	236	142	552	296	41	258	128	
ASHMUN	125.9	189.6	76.4	266.0	176.6	237	142	552	296	41	258	128	
TOTAL GROWTH CENTERS													
REGIONAL SERVICE CENTERS													
TAHNA	124.0	286.0	78.0	364.0	157.8	315	189	552	296	81	258	128	
MANSOURA	115.7	297.3	41.7	329.0	132.5	315	189	552	296	81	258	128	
DELTA													
MAHALLA	172.4	331.6	55.4	387.0	201.2	167*	100	391	26	59	29	91	
ZAGAZIG	290.1	222.9	38.1	267.0	330.4	170*	100	391	26	59	29	91	
BHAYSAHOUR	468.1	218.9	44.1	263.0	552.0	250	100	391	26	59	29	91	
KAFR EL DAWAR	400.4	223.0	114.1	337.1	605.3	275	100	391	26	59	29	91	
SHEBIN EL KHAYMA	182.5	120.3	26.7	147.0	223.2	259	179	391	26	59	29	91	
DEMETTIA	90.6	99.6	8.3	103.0	98.1	157	100	391	26	59	29	91	
BEHRA	91.0	101.5	18.5	120.0	107.6	256	154	391	26	59	29	91	
KAFR EL SHEIKH	104.4	92.3	22.7	115.0	120.1	455	100	391	26	59	29	91	
MATRUH	167.4	83.7	16.3	100.0	196.4	167	100	391	26	59	29	91	
BELBEIS	165.2	80.6	16.4	97.0	200.0	167	100	391	26	59	29	91	
BAHIG	103.8	68.7	9.2	77.9	117.7	167	100	391	27	59	29	91	
EDHO	3.1	74.5	18.4	93.0	3.9	167	100	391	26	59	29	91	
BAHARIYA	238.6	70.2	12.8	83.0	282.3	167	100	391	26	59	29	91	
DESSOUK	119.8	64.8	5.2	74.0	136.6	167	100	391	26	59	29	91	
MENOUF	143.7	66.1	16.9	83.0	79.7	211	126	391	26	59	29	91	
ABU MABIR	344.9	60.7	8.3	69.0	392.1	200	100	391	26	59	29	91	
ZEFTA	72.7	56.7	8.3	65.0	83.3	167	100	391	26	59	29	91	
BELKAS	154.2	55.9	10.1	67.0	181.6	237	100	391	26	59	29	91	
TOTAL													
NORTH UPPER EGYPT													
FALLAH	209.0	80.9	9.1	90.0	232.5	260	156	391	26	59	29	91	
TOTAL													
SOUTH UPPER EGYPT													
SCHAG	295.4	115.3	19.7	135.0	346.1	203	125	391	26	59	29	91	
LUXOR	160.0	118.2	42.8	161.0	217.9	227	166	391	26	59	29	91	
ASWAN	183.6	56.6	4.4	61.0	198.1	230	138	391	26	59	29	91	
GIRGA	136.6	53.7	4.3	58.0	147.5	168	100	391	26	59	29	91	
TOTAL													
REMOTE AREAS													
MATRUH	N.A.	58.4	5.6	6.4	30 1/2	167	100	391	26	59	29	91	
NEW VALLEY	N.A.	60.6	25.4	86.0	30 7/8	167	100	391	26	59	29	91	
RED SEA	N.A.	56.0	19.0	77.0	15 7/8	167	100	391	26	59	29	91	
SINAI													

1/ Assumed gross densities based on field trials

TREND POPULATION PERIOD 1980-85 TOTAL INFRASTRUCTURE COSTS (L.E. MILLIONS)

SETTLEMENT	WATER	SEWERAGE	CIRCULATION	POWER	OTHER INFRA-STRUCTURE	TOTAL PHYSICAL INFRA-STRUCTURE	HOUSING	SOCIAL INFRA-STRUCTURE	TOTAL BASE COSTS	TOTAL BASE COSTS/CAPITA	TOTAL COSTS 1/
GREATER CAIRO	370.8	259.4	105.3	41.3	440.4	1,218.2	1,030.2	727.3	2,975.7	323.4	2,975.7
ALEXANDRIA	99.9	91.6	40.4	36.9	109.2	377.3	273.5	183.2	824.9	283.2	1,137.8
GROWTH CENTERS									3,609.6		4,113.5
PORT SAID	41.5	25.0	37.2	24.6	58.2	187.4	101.2	84.3	372.9	853.0	830.7
ISMAILIA	15.0	14.3	8.6	15.6	33.7	87.1	57.3	55.6	99.9	664.7	457.3
SUEZ	9.4	13.5	4.0	11.2	23.1	61.2	35.9	33.6	130.7	418.9	251.9
BENT SUEF	9.4	16.0	1.6	6.5	12.8	45.3	16.7	18.8	81.8	295.0	223.9
FAYOUM	9.2	13.7	3.3	7.3	14.8	48.3	22.3	21.5	92.1	418.8	307.6
MENYA	7.8	11.7	2.6	6.0	11.9	40.0	17.7	17.4	75.1	401.2	256.2
ASSIUT	9.8	12.5	3.1	9.7	19.8	54.8	30.1	34.2	119.1	415.6	155.2
MADINET NASR	3.2	5.2	2.2	5.2	10.4	25.3	17.7	15.1	59.1	642.0	64.9
GENA	6.4	8.5	3.8	4.2	8.4	31.4	12.8	12.3	56.6	456.1	65.4
ESNA	11.5	15.5	7.8	13.3	23.2	77.3	47.4	41.0	165.6	622.6	184.3
TOTAL GROWTH CENTERS									1,352.9		2,828.4
REGIONAL CENTERS											
TANTA	26.0	20.6	8.7	14.9	31.5	101.6	51.0	53.3	205.9	565.6	341.8
MINYA	23.6	18.4	5.4	10.2	20.9	76.5	31.0	36.5	145.9	443.5	536.7
TOTAL									351.8		878.5
DELTA											
MARSA MATRUH	5.8	16.2	5.3	12.7	2.3	42.1	28.1	18.9	89.1	230.2	144.4
ZAGAZIG	0.9	9.3	2.5	8.9	1.6	23.2	19.4	13.0	55.5	208.2	100.5
BAHIG	2.6	6.5	1.7	9.5	1.7	22.1	21.5	13.8	57.4	218.4	124.8
KAH EL DAKAR	5.1	9.8	3.8	18.2	3.5	40.5	49.0	25.5	115.0	344.0	252.1
SHEBIN EL KHAYMA	8.6	7.0	2.4	5.7	1.0	25.3	12.8	8.0	46.1	313.9	175.6
BAHIG	2.6	4.9	1.4	2.8	0.5	12.1	5.2	4.2	21.5	199.0	89.0
BAHIG	6.5	6.4	2.7	4.3	0.7	20.7	9.2	6.1	35.9	299.5	42.0
KHAYMA EL SHEIKH	14.1	7.9	2.9	4.7	0.8	30.4	10.7	5.6	47.7	414.7	195.1
MATRUH	1.6	5.4	1.6	3.7	0.6	12.8	8.0	5.2	26.0	260.0	88.3
BAHIG	1.5	5.2	1.6	3.7	0.6	12.5	0.8	5.1	25.6	264.2	48.1
BILBEIS	1.8	4.5	1.3	2.4	0.4	10.4	4.9	3.5	18.9	242.5	22.1
QALUBA	3.2	6.1	51.0	3.9	0.7	64.9	8.7	5.3	78.8	847.7	171.0
ESNA	0.6	4.0	1.0	3.0	0.5	9.1	6.4	4.2	19.7	237.0	65.1
MATRUH	1.5	4.2	1.2	2.4	0.4	9.7	4.9	3.4	18.0	243.0	65.6
BAHIG	2.7	3.3	1.7	3.5	0.6	12.4	7.3	4.8	25.2	303.2	92.9
ADU KABIR	0.6	2.9	0.5	2.2	0.4	6.5	4.4	3.1	14.1	203.8	26.1
ZEFTA	1.7	3.9	1.5	2.1	0.4	9.6	4.4	3.0	17.0	260.8	27.9
BELBAYS	5.3	3.6	1.0	2.4	0.4	12.7	5.1	3.4	21.2	315.8	83.3
TOTAL									708.2		1,814.9
NORTH UPPER EGYPT											
MALLAWI	3.9	4.2	0.8	2.6	0.4	12.0	5.1	3.8	20.9	232.4	77.0
TOTAL									20.9		77.0
SOUTH UPPER EGYPT											
SORH	2.1	6.6	1.3	4.7	0.8	15.4	10.0	6.7	32.0	237.3	105.2
LUXOR	6.3	10.2	3.8	7.9	1.4	29.6	19.1	10.9	59.5	359.7	69.3
ASHMUN	2.2	3.7	0.5	1.5	0.3	8.1	2.8	2.3	13.2	217.1	52.1
GIZA	1.2	3.3	0.5	1.5	0.3	6.7	2.7	2.2	11.7	200.9	41.3
TOTAL									116.4		267.9
REMOTE AREAS											
MATRUH	1.9	4.1	2.4	1.7	0.3	10.4	3.3	2.6	16.4	255.6	109.4
NEW VALLEY	2.8	5.5	10.1	4.7	0.8	23.8	11.1	6.2	41.2	478.2	203.2
RED SEA	2.9	5.5	18.9	4.7	0.8	32.8	11.1	6.2	50.1	582.6	311.7
TOTAL REMOTE AREAS									107.1		629.3
SUBTOTAL NET OF CAIRO/SALEX									2,657.3		6,496.0
GRAND TOTAL									6,466.9		10,503.5

1/ Weighted by regional cost index

** Indicates horizontal expansion beyond settlement boundaries
 Additional provisions for universities.

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ALTERNATIVE A

1985-90

PARAMETERS

SETTLEMENT	1985 GROSS DENSITY (P/HA)	1985 POPULATION (000'S)	CHANGE IN POPULATION (000'S)	1990 POPULATION (000'S)	1990 GROSS DENSITY (P/HA)	WATER STANDARD (l/c/d)	SEWERAGE STANDARD (l/c/d)	PER CAPITA HOUSING (L.E.)	OTHER INFRA-STRUCTURE (L.E.)	EDUCATION (L.E.)	HEALTH (L.E.)	OTHER SOCIAL INFRA-STRUCTURE (L.E.)	NOTES	
METROPOLITAN AREAS														
GREATER CAIRO	281.6	9,202.0	1,952.3	11,154.3	341.3	584	452	690	296	81	256	128	<u>STANDARDS</u> METROPOLITAN AREAS: MEDIUM/HIGH (WATER SUPPLY - AT MASTER PLAN OTHER INFRASTRUCTURE: MEDIUM) HOUSING: MEDIUM/HIGH SOCIAL INFRASTRUCTURE: MEDIUM/ <u>GROWTH CENTERS</u> MEDIUM <u>OTHER SETTLEMENTS</u> MAINTENANCE	
ALEXANDRIA	152.7	2,945.0	765.7	3,711.7	192.5	373	322	690	296	81	258	128		
GROWTH CENTERS														
FORT SAID	60.7	437	35.3	472.3	65.6	341								
ISHMILIA	203.9	292	35.8	327.8	225.9	265	153	552	296	41	258	128		
SUEZ	276.1	312	75.1	387.1	342.5	231	139	552	296	41	258	128		
FAYOUM	149.0	148	8.6	155.6	155.6	237	142	552	296	41	258	128		
MIYA	172.0	220	20.0	240.0	197.6	237	142	552	296	41	258	128		
ASSIUT	170.9	187.3	13.3	200.6	193.0	237	142	552	296	41	258	128		
NAGAH HAWADI	296.6	205.0	15.6	201.6	314.9	250	150	552	296	81	258	128		
GENA	252.9	92.0	7.4	99.4	284.0	237	142	552	296	41	258	128		
ASHMUN	65.6	124.0	9.9	133.9	70.8	237	142	552	296	41	258	128		
TOTAL GROWTH CENTERS														
REGIONAL SERVICE CENTERS														
TANTA	157.8	354.0	85.0	450	195.1	315	195	552	256	81	258	128		
MANIOUTA	144.6	329.0	56.8	365.8	160.8	315	189	552	296	81	258	128		
DELTA														
MAHALLA	201.2	387.0	91.6	478.6	248.8	167								
ZAGAZIG	338.4	257.0	22.2	289.2	155.5	170	100	391	296	59	29	91		
BAHIG	563.1	263.0	35.6	298.6	639.3	167	100	391	296	59	29	91		
KAFR EL DAWAR	605.1	337.0	45.2	382.2	605.3	237	100	391	296	59	29	91		
SHEBHY EL KOM	223.1	147.0	13.1	160.1	243.0	299	179	391	296	59	29	91		
BANHETTA	98.1	102.0	34.1	142.1	129.1	167	100	391	296	59	29	91		
GENA	107.6	120.0	35.1	155.1	140.0	256	154	391	296	59	29	91		
KAFR EL SHEIKH	130.1	115.0	9.1	124.1	140.4	455	273	391	296	59	29	91		
MET EL KHAYMA	195.0	100.0	10.9	110.9	217.4	167	100	391	296	59	29	91		
BILBEIS	200.0	92.0	5.4	102.4	211.1	167	100	391	296	59	29	91		
GALUB	117.7	78.0	22.3	100.3	151.4	167	100	391	296	59	29	91		
EDKO	3.9	93.0	12.6	105.6	4.4	167	100	391	296	59	29	91		
MATARIA	282.3	83.0	9.1	92.1	313.3	167	100	391	296	59	29	91		
DESSOUK	136.8		5.7	79.7	147.3	211	126	391	296	59	29	91		
MENOUF	180.4	83.0	6.9	89.9	135.4	167	100	391	296	59	29	91		
ABU KABIR	392.1	69.0	5.7	74.7	424.5	167	100	391	296	59	29	91		
ZEKTA	83.3	65.0	36.1	101.1	129.6	167	100	391	296	59	29	91		
BEHNAS	181.6	67	6.9	73.9	200.3	347	100	391	296	59	29	91		
NORTH UPPER EGYPT														
MALLAWI	232.5	90.0	6.4	96.4	249.0	260	156	391	296	59	29	91		
SOUTH UPPER EGYPT														
SORHAG	346.1	135.0	9.9	144.9	371.5	203	125	391	296					
LUYOR	218.0	161.0	13.1	174.1	235.7	237	155	391	296	59	29	91		
ARMINIM	198.1	61.0	4.2	65.2	211.7	230	128	391	296	59	29	91		
GIRSA	147.5	58.0	4.0	62.0	157.7	163	100	391	256	59	29	91		
REMOTE AREAS														
MATRUH	30	64	4.0	68.0	31.9	167	100	391	296	59	29	91		
NEW VALLEY	30	86	4.5	90.5	31.5	167	100	391	296	59	29	91		
RED SEA	17	77	2.5	79.5	17.6	167	100	391	296	59	29	91		

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ALTERNATIVE A - 1986-1990 TOTAL INFRASTRUCTURE COSTS

SETTLEMENT	WATER	SEWERAGE	CIRCULATION	POWER	OTHER INFRA- STRUCTURE	TOTAL PHYSICAL INFRA- STRUCTURE	HOUSING	SOCIAL INFRA- STRUCTURE	TOTAL BASE COSTS	TOTAL BASE COSTS/ CAPITA	TOTAL COSTS 1/
GREATER CAIRO	259.6	244.2	126.1	46.4	850.3	1,536.6	1,664.6	1,343.4	4,544.6	407.4	4,544.6
ALEXANDRIA	65.9	461.6	74.4	67.0	314.1	1,004.0	630.6	496.2	2,130.8	574	3,069.7
GROWTH CENTERS											7,634.3
PORT SAID	40.2	25.3	8.0	11.6	23.4	103.5	31.6	31.6	171.6	363.3	440.6
ISHMILIA	14.9	14.6	3.2	9.5	19.2	61.4	27.8	30.4	119.7	365.1	210.5
SUEZ	9.3	15.7	4.8	14.9	31.5	76.2	50.1	43.9	170.1	439.5	216.5
BENI SUEF	6.6	7.5	1.1	3.5	6.9	25.6	8.8	9.3	43.7	278.7	131.8
FAYOUM	9.5	11.2	2.1	6.3	12.4	41.5	12.1	16.9	75.4	314.2	253.9
MENYA	7.9	9.3	1.5	4.8	9.5	33.1	12.5	12.8	58.3	250.7	204.9
ASSIUT	5.6	12.5	1.2	6.6	13.1	43.0	16.5	20.7	80.2	265.9	107.1
MADINET NASR	3.0	4.2	0.6	2.5	4.9	15.2	6.6	6.6	28.4	255.7	33.1
GENA	6.7	14.0	2.1	3.4	1.6	27.6	4.8	8.9	41.4	339.6	51.1
ASWAN	11.8	14.2	3.7	9.4	19.1	58.0	28.2	25.2	112.4	370.1	131.0
TOTAL GROWTH CENTERS											1,675.5
REGIONAL CENTERS											
TANTA	8.3	6.8	41.7	16.9	35.2	105.9	57.5	57.2	224.6	499.2	360.1
MANSSOURA	4.2	3.3	38.7	10.2	20.6	77.0	29.4	32.5	139.0	380.0	459.5
TOTAL											819.6
DELTA											
MAHALLA	5.2	19.1	7.5	17.9	38.6	88.1	43.4	23.1	154.6	323.0	257.6
ZAGAZIG	0.2	9.5	1.4	7.3	14.5	32.9	13.9	3.6	55.4	191.6	118.7
DOKKI	0.8	6.2	1.1	9.1	18.3	35.5	19.1	11.0	65.6	219.7	141.0
MADINET NASR	2.6	7.1	1.3	11.4	23.4	45.7	24.3	14.0	64.0	219.8	151.7
SHEBIN EL KHAYMA	8.8	7.8	1.2	4.2	8.2	30.2	8.0	4.9	43.1	265.2	155.3
BAHIGY	3.2	6.6	4.3	6.5	13.3	34.0	15.4	8.0	57.4	403.9	151.3
BENHA	8.2	6.3	4.3	7.0	14.2	42.1	15.5	8.6	67.2	430.5	111.4
KAFR EL SHEIKH	14.5	8.1	1.2	3.1	6.1	33.0	1.4	3.6	39.0	295.2	162.9
MIT GHAMR	1.5	4.4	1.0	3.1	6.2	16.3	6.2	3.7	26.2	236.2	83.6
BILDEIS	1.4	4.1	0.6	2.3	4.5	12.8	4.0	2.6	19.4	189.5	35.3
QALIUB	2.0	4.5	2.5	4.5	8.9	22.5	10.3	5.4	38.2	353.9	44.7
EDKO	3.5	5.3	31.6	3.3	6.4	50.1	1.6	3.9	55.6	526.5	121.6
MATARIA	0.4	3.3	0.7	2.6	5.2	12.1	5.2	3.1	20.4	221.5	66.8
LESSOF	2.7	3.7	0.7	2.0	3.9	13.0	3.7	2.3	19.0	238.4	68.8
NELOUF	1.4	3.7	0.7	2.3	4.5	12.5	4.3	2.7	19.5	216.9	70.8
ABU KABIR	0.4	2.3	0.3	1.9	3.7	6.5	3.6	2.2	14.4	992.8	26.3
ZEFTA	0.0	4.8	0.7	5.2	12.6	37.2	15.4	7.6	60.8	565.5	101.8
BELLAAS	1.1	3.0	4.7	2.1	4.0	10.9	4.0	2.4	17.3	234.0	58.8
TOTAL											1,974.9
NORTH UPPER EGYPT											
MALLAWI	4.0	4.4	0.6	2.3	4.6	15.8	4.3	2.7	22.8	235.5	81.1
TOTAL											
SOUTH UPPER EGYPT											
SOUHAG	1.9	5.2	0.6	3.5	6.9	18.2	6.5	4.1	28.8	158.8	94.8
LUXOR	6.1	8.3	1.2	4.4	8.6	28.7	8.3	5.2	42.2	242.4	51.2
AKHMIM	2.3	2.9	0.4	1.6	3.0	10.2	0.7	1.8	12.7	194.8	51.3
GIRGA	1.2	2.6	0.5	1.5	2.9	8.7	0.6	1.7	11.0	177.4	39.3
TOTAL											236.6
REMOTE AREAS											
MATRUH	2.0	3.3	1.7	1.6	3.1	11.7	2.8	1.8	16.3	239.8	110.9
SIWA	2.7	4.3	2.0	2.0	3.9	14.9	3.4	2.3	20.6	227.9	114.5
RED SEA	2.5	3.8	2.1	1.5	3.0	12.9	2.5	1.8	17.2	216.1	151.5
TOTAL REMOTE AREAS											
SUBTOTAL NET OF CAIRO/ALEX.									3,292.6		
GRAND TOTAL									8,568.0		13,030.9

1/ Weighted by regional cost index

* Indicates horizontal expansion beyond settlement boundaries
 ** Additional provisions for universities.

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ALTERNATIVE B1 EFFICIENCY PERIOD 1936-50 PARAMETERS

SETTLEMENT	1985 GROSS DENSITY (P/H/A)	1985 POPULATION (000'S)	CHANGE IN POPULATION (000'S)	1950 POPULATION (000'S)	1990 GROSS DENSITY (P/H/A)	WATER STANDARD (l/c/d)	SEWERAGE STANDARD (l/c/d)	PER CAPITA HOUSING (L.E.)	OTHER INFRA-STRUCTURE (L.E.)	EDUCATION (L.E.)	HEALTH (L.E.)	OTHER SOCIAL INFRA-STRUCTURE (L.E.)	NOTES
METROPOLITAN AREAS													
GREATER CAIRO	281.6	9,242.0	156.1	10,762.0	328.4	584	462	552	295	81 **	258	128	
ALEXANDRIA	152.7	2,945.0	825	3,770	195.5	373	322	552	295	81 **	258	128	
GROWTH CENTERS													
PORT SAID	60.7	437.0	202.5	639.5	88.8	381	272	10:0	753	153	346	429	
ISMAILIA*	203.9	262.0	150.7	442.7	309.1	353	282	10:0	753	193**	346	429	
SUEZ	276.1	312.0	229.7	511.7	300.0	353	232	10:0	753	153	346	429	
BENI SUEF	148.0	148.0	10.0	158.0	158.0	237	142	552	295	41	258	128	
FAYOUM	177.0	220.0	25.0	245.0	191.5	237	142	552	295	41	258	128	
MIYA	174.9	187.3	17.0	204.3	165.4	257	142	552	295	41	258	128	
ASSIUT*	298.6	265.0	20.0	305.0	300.0	237	142	552	295	41	258	128	
MAGAH HAMADI	262.9	92.0	10.0	102.0	291.5	237	142	552	295	81**	258	128	
QENA	65.6	124.0	12.0	136.0	72.0	237	142	552	295	41	258	128	
ASWAN	176.6	266.0	42.0	308.0	204.5	237	142	552	295	41	258	128	
TOTAL GROWTH CENTERS													
REGIONAL SERVICE CENTERS													
TANTA	154.8	364.0	59.0	433.0	194.1	315	159	891	265	81**	258	123	
MANSOURA	144.6	329.0	25.0	354.0	155.6	315	189	891	296	81**	258	128	
TOTAL													
DELTA													
MAHALLA	201.2	397.0	74.0	451.0	239.7	167	100	391	179	41	258	91	
ZAGZIG	338.4	267.0	17.0	279.0	253.6	170	100	391	179	81**	258	91	
BAHIGOUR	553.1	263.0	27.0	290.0	620.9	250, 167	100	391	179	41	258	91	
KAFR EL DAWAR	695.1	337.0	35.0	372.0	667.9	275, 237	100	391	179	41	258	91	
SHEBIN EL KOM	223.1	147.0	7.0	154.0	233.7	239	100	391	179	41	258	91	
DAMIETTA	93.1	108.0	27.0	135.0	122.6	157	100	391	179	41	258	91	
BENHA	107.6	120.0	50.0	150.0	134.5	256	154	391	179	41	258	91	
KAFR EL SHEIKH	130.1	115.0	5.0	120.0	135.8	455	273	391	179	41	258	91	
KIT BAHAR	195.0	103.0	7.0	107.0	209.7	167	100	391	179	41	258	91	
BILBEIS	205.0	97.0	2.0	99.0	204.1	157	100	391	179	41	258	91	
GALIUB	117.7	78.0	20.0	95.0	147.9	157	100	391	179	41	258	91	
ECHO	3.9	93.0	10.0	103.0	4.3	157	100	391	179	41	258	91	
HATARIA	282.3	83.0	5.0	89.0	299.3	167	100	391	179	41	258	91	
DESSOUK	136.9	74.0	2.0	76.0	140.5	167	100	391	179	41	258	91	
MENOUF	180.4	83.0	5.0	88.0	191.3	211	125	391	179	41	258	91	
ABU HABIR	352.1	69.0	2.0	71.0	403.5	167	100	391	179	41	258	91	
ZEFTA	81.3	65.0	72.0	77.0	95.7	167	100	391	179	41	258	91	
BELKAS	181.6	67.0	5.0	72.0	55.2	347	100	391	179	41	258	91	
TOTAL													
NORTH UPPER EGYPT													
MALLAWI	209.0	90.0	7.0	97.0	225.3	260	156	391	179	41	258	91	
TOTAL													
SOUTH UPPER EGYPT													
SCHAG	346.1	135.0	12.0	147.0	376.9	208	125	391	179	41	258	91	
LUXOR	218.0	161.0	15.0	176.0	238.3	237	156	391	179	41	258	91	
ARSIYUK	198.1	61.0	5.0	66.0	214.3	230	133	391	179	41	258	91	
GIRGA	147.5	58.0	5.0	63.0	160.2	167	100	391	179	41	258	91	
TOTAL													
REMOTE AREAS													
MATRUH	30.0	65.0	5.0	69.0	32.3	167	100	391	179	41	258	91	
NEA VALLEY	30.0	85.0	5.0	91.0	31.7	167	100	391	179	41	258	91	
RED SEA	15.0	77.0	2.0	79.0	15.4	167	100	391	179	41	258	91	
SINAI													
TOTAL REMOTE													

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ALTERNATIVE B, EFFICIENCY PERIOD 1985-90 INFRASTRUCTURE COSTS (L.E. MILLIONS)

SETTLEMENT	WATER	SEWERAGE	CIRCULATION	POWER	OTHER INFRA- STRUCTURE	TOTAL PHYSICAL INFRA- STRUCTURE	HOUSING	SOCIAL INFRA- STRUCTURE	TOTAL BASE COSTS	TOTAL BASE COSTS/ CAPITA	TOTAL COSTS 1/
GREATER CAIRO	225.7	204.4	104.9	62.8	734.4	1,332.5	1,115.6	1,160.7	3,608.8	336.8	3,608.8
ALEXANDRIA	92.4	449.2	79.0	66.1	331.4	1,069.1	536.7	573.4	2,121.3	553.2	2,781.5
<u>GROWTH CENTERS</u>									5,232.1		396.3
PORT SAID	66.9	46.9	33.3	29.7	105.4	352.1	232.3	221.0	816.4	1,276.6	1,752.0
ISMAILIA	37.4	28.5	10.2	23.1	135.5	229.6	171.9	170.6	552.2	1,792.5	1,361.3
SUEZ	41.1	32.1	15.9	15.9	30.5	136.5	255.1	236.8	608.1	1,491.8	1,023.2
BENI SUEF	6.6	7.5	1.2	3.7	7.3	26.5	9.6	9.9	45.9	253.6	127.1
FAYOUM	9.6	11.5	2.6	7.0	13.9	44.5	19.9	19.0	83.4	340.3	263.1
MINYA	8.1	9.5	1.2	5.3	10.6	35.3	14.6	14.3	64.2	314.4	273.4
ASSIUT	6.9	12.0	1.6	7.2	14.4	44.6	18.9	22.8	85.4	282.2	114.1
HAGAH HAWADI	3.1	4.3	0.8	2.9	5.7	15.7	8.1	7.7	32.5	318.7	37.3
GENA	6.8	7.1	2.5	3.7	7.2	27.3	10.1	9.8	47.1	375.5	57.0
ASHWAN	11.9	14.4	4.0	10.0	20.3	69.5	30.5	27.9	119.0	386.5	137.7
<u>TOTAL GROWTH CENTERS</u>											5,116.2
<u>REGIONAL CENTERS</u>											
TANTA	29.3	23.5	7.0	14.8	31.2	105.8	77.7	49.3	232.8	537.6	355.3
MAHSAURA	24.2	19.1	3.1	8.6	17.1	72.0	36.9	27.1	136.1	384.3	505.5
<u>TOTAL</u>									368.9		892.8
<u>DELTA</u>											
MAHALLA	5.3	18.4	6.3	15.8	20.2	65.9	36.5	43.3	145.7	316.1	233.5
ZAGAZIG	0.5	9.2	0.9	5.9	6.9	23.4	9.9	17.6	50.9	182.3	91.3
DOKKI	3.7	6.2	0.9	7.9	9.5	28.2	15.7	20.4	64.3	221.7	140.1
KAFR EL DAWAR	3.1	7.2	1.1	10.1	12.3	33.7	20.3	26.3	80.2	215.6	173.7
SHEBIN EL KOM	8.5	7.5	0.7	3.3	3.9	23.9	5.6	8.2	27.7	244.8	450.6
BAHIGYA	3.1	6.2	3.6	4.6	6.8	25.2	12.8	14.6	52.5	336.5	199.9
KAFR EL SHEIKH	7.9	7.9	3.7	6.2	7.5	33.2	14.1	15.2	63.5	423.3	83.6
MIT GHAMR	13.9	7.8	0.7	2.5	3.0	27.9	4.2	6.3	36.3	319.3	168.5
BILBEIS	1.5	4.3	0.7	2.6	3.0	12.1	4.7	6.5	23.2	217.2	79.5
QALUB	1.1	3.9	0.3	1.8	2.1	9.5	2.7	4.1	16.6	167.1	31.0
EDKO	2.0	4.4	2.3	4.1	5.0	17.8	9.3	10.7	37.9	366.7	44.3
MATARIA	3.4	5.1	26.1	2.9	3.5	41.0	5.7	7.4	54.1	525.4	118.1
DESSOUK	0.5	3.1	0.4	2.0	2.4	8.4	3.5	5.1	17.1	194.1	55.3
MENDOUH	2.7	3.2	0.3	1.4	1.7	6.2	2.2	3.6	13.9	162.9	48.9
ABU KABIR	0.5	2.2	0.1	1.4	1.6	11.5	3.6	5.1	20.2	229.5	75.3
ZEFTA	1.9	3.6	1.9	2.8	3.3	5.8	2.1	3.4	11.3	158.8	21.0
BELKAS	5.4	2.9	0.5	1.8	2.1	12.7	3.3	4.5	26.5	344.5	43.1
<u>TOTAL</u>									281.2		81.3
<u>NORTH UPPER EGYPT</u>											
MILLAWI	4.2	4.5	0.7	2.4	2.9	14.7	4.5	6.1	27.4		2,179.7
<u>TOTAL</u>									25.3		91.5
<u>SOUTH UPPER EGYPT</u>											
SOHAG	1.8	5.3	0.8	3.8	4.6	16.2	7.3	9.7	33.3	226.5	107.0
LUXOR	6.1	8.4	1.3	4.7	5.6	26.1	9.0	11.0	45.9	255.7	55.8
AKHMIN	2.3	3.0	0.5	1.7	2.0	9.4	3.1	4.2	16.8	254.1	62.9
GIRSA	1.2	2.7	0.6	1.6	1.9	8.0	3.1	4.1	15.2	241.3	47.8
<u>TOTAL</u>									112.2		273.5
<u>REMOTE AREAS</u>											
BAHIGYA	2.1	3.3	2.0	1.7	2.0	11.2	3.2	4.3	18.8	271.9	124.0
NEW VALLEY	2.7	4.4	2.2	2.1	2.4	13.7	3.6	5.2	22.5	247.7	123.1
RED SEA	2.5	3.8	2.0	1.5	1.7	11.4	2.3	3.7	17.4	219.9	152.4
<u>TOTAL</u>											399.5
<u>TOTAL REMOTE AREAS</u>											
<u>SUBTOTAL NET OF CAIRO & ALEXANDRIA</u>									58.7		399.5
<u>TOTAL</u>									4,014.7		8,947.2
									9,746.5		15,343.5

1/ Weighted by regional cost index

 * Indicates horizontal expansion beyond settlement boundaries
 ** Additional provisions for universities.

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ALTERNATIVE B 1 EQUITY PERIOD 85-90 PARAMETERS

SETTLEMENT	1985 GROSS DENSITY (P/HA)	1985 POPULATION (000'S)	CHANGE IN POPULATION (000'S)	1990 POPULATION (000'S)	1990 GROSS DENSITY (P/HA)	WATER STANDARD (l/c/d)	SEWERAGE STANDARD (l/c/d)	PER CAPITA HOUSING (L.E.)	OTHER INFRA-STRUCTURE (L.E.)	EDUCATION (L.E.)	HEALTH (L.E.)	OTHER SOCIAL INFRA-STRUCTURE (L.E.)	NOTES	
METROPOLITAN AREAS														
GREATER CAIRO	281.6	9,202.0	1561.0	10,763.0	329.4	534	462	552	296	81	258	128	EMPHASIS ON CANAL CANAL CITIES WATER & SEWERAGE - MASTER PLAN HOUSING - 1.5 X MEDIUM SOCIAL - SAQAT CITY ALL OTHERS MEDIUM METROPOLITAN AREAS WATER AND SEWERAGE AT MASTER PLAN OTHERS AT MEDIUM	
ALEXANDRIA	152.7	2,945.0	593.3	3,538.3	183.5	373	322	552	296	81	258	128		
GROWTH CENTERS														
PORT SAID	60.7	437	232.5	639.5	88.8	331	272	1040	753	153	346	429		
ISMAILIA *	203.9	292	150.7	442.7	300	353	282	1040	753	193**	346	429		
SUEZ *	276.1	312	229.7	541.7	300	353	232	1040	753	153	346	429		
BENI SUEF	142.0	148	29.9	177.9	177.9	237	142	552	296	41	258	128		
FAYOUM	172.0	220	44.7	254.7	206.9	237	142	552	296	41	258	128		
MINYA	120.9	187.3	33.0	225.3	225.6	237	142	552	296	41	258	128		
ASSIUT *	258.7	286.0	57.8	343.0	300.0	250	150	552	296	41	258	128		
NAGAH HAWADI *	262.9	92	18.5	110.5	300.0	237	142	552	296	81**	258	128		
QENA	65.6	124.0	24.9	148.9	78.8	237	142	552	296	41	258	128		
ASHMUN	176.7	266.0	53.3	319.8	212.3	237	142	552	296	41	258	128		
TOTAL GROWTH CENTERS				3,214.8										
REGIONAL SERVICE CENTERS														
TANTA	154.8	364	44.5	408.5	173.7	315	189	691	296	81**	258	128		
MANSOURA	144.6	329	39.5	368.5	162.0	315	189	691	296	81**	258	128		
TOTAL			777											
DELTA														
MAHALLA	201.2	387	46.9	433.9	225.6	237	142	552	296	41	258	128		
ZAGAZIG	318.4	267.0	32.1	299.1	379.1	237	142	552	296	41	258	128		
DAKHOUH	533.1	263	32.1	295.1	631.8	250	142	552	296	81**	258	128		
KAN? EL DAWAR	605.1	337	39.5	376.5	676.0	275	132	552	296	41	258	128		
SHUBIN EL KHAYMA	223.1	147	17.3	164.3	243.4	259	179	552	296	41	258	128		
BAHIGETTA	98.1	108	12.3	120.3	109.3	237	142	552	296	41	258	128		
BENHA	107.6	120	14.8	134.8	120.9	255	154	552	296	41	258	128		
JAFR EL SHEIKH	130.1	115	14.8	129.8	145.6	455	273	552	296	41	258	128		
MIT GHAMR	195.0	100	12.3	112.3	220.1	237	142	552	296	41	258	128		
BILDEIS	200.0	97	12.3	109.3	225.4	237	142	552	296	41	258	128		
CALIUS	117.7	26	9.9	87.9	132.6	237	142	552	296	41	258	128		
ELHO	3.9	93	12.3	105.3	4.4	237	142	552	296	41	258	128		
BATARIA	282.3	83	9.9	92.9	316.0	237	142	552	296	41	258	128		
DESSOUK	136.8	74	9.9	83.9	155.1	237	142	552	296	41	258	128		
MENOUF	180.4	83	9.9	92.9	201.9	237	142	552	296	41	258	128		
ADU KASIN	392.1	69	7.4	75.4	434.2	237	142	552	296	41	258	128		
ZEFTA	53.3	65	7.4	72.4	92.5	237	142	552	296	41	258	128		
BEKAS	181.6	67	7.4	74.4	201.7	237	142	552	296	41	258	128		
TOTAL				2,861.5										
NORTH UPPER EGYPT														
HALLAWI	209.0	90	18.3	108.3	251.5	260	155	552	296	41	258	128		
TOTAL														
SOUTH UPPER EGYPT														
SOHAG *	346.1	135	27.2	162.2	300.0	237	142	552	296	41	258	128		
LUAGR	218.0	161	32.6	193.6	262.1	237	142	552	296	41	258	128		
ARSHIN	198.1	61	12.3	73.3	238.0	237	142	552	296	41	258	128		
GIRGA	147.5	58	11.6	69.6	177.0	237	142	552	296	41	258	128		
TOTAL				458.7										
REMOTE AREAS														
MATRUH	30	64	13.3	77.3	36.2	237	142	552	296	41	258	128		
NEW VALLEY	30	86	14.6	100.7	35.1	237	142	552	296	41	258	128		
RED SEA	15	77	16.5	93.5	18.2	237	142	552	296	41	258	128		
SINAI														

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ALTERNATIVE B₁ (EQUITY) PERIOD 1986-1990 TOTAL INFRASTRUCTURE COSTS (L.E. MILLIONS)

SETTLEMENT	WATER	SEWERAGE	CIRCULATION	POWER	OTHER INFRA- STRUCTURE	TOTAL PHYSICAL INFRA- STRUCTURE	HOUSING	SOCIAL INFRA- STRUCTURE	TOTAL BASE COSTS	TOTAL BASE COSTS/ CAPITA	TOTAL COSTS 1/
GREATER CAIRO	225.7	204.7	104.9	62.8	734.4	1,332.5	1,115.6	1,160.7	3,608.8	335.3	3,608.8
ALEXANDRIA	70.4	364.9	60.2	63.4	262.0	626.7	408.8	415.2	1,650.7	466.5	2,194.6
GROWTH CENTERS									5,259.5		5,259.5
PORT SAID	66.8	46.9	32.3	29.7	185.4	362.1	233.3	221.0	805.4	1,261.0	1,732.8
ISMAILIA	32.4	28.5	10.2	23.1	135.5	230.1	171.9	170.6	573.0	1,295.0	1,363.1
SUEZ	41.1	32.1	15.9	30.5	196.5	316.2	255.1	236.3	630.1	1,492.0	1,073.3
BERSI SUEF	7.4	8.6	3.1	6.6	13.2	39.9	20.6	18.4	77.9	437.6	211.0
FAYOUM	10.3	12.5	4.2	9.7	19.7	56.3	30.8	27.4	114.4	437.3	377.9
MENYA	8.8	10.6	3.6	8.3	16.8	48.0	26.2	23.3	97.5	432.5	326.2
ASSIUT	11.9	15.0	4.1	12.3	25.6	68.9	39.0	40.4	149.2	433.8	154.0
MATRUH HAMADI	3.3	4.7	1.3	4.1	8.2	21.7	12.8	11.4	45.6	414.6	51.3
GENA	7.6	7.9	4.6	5.5	11.0	36.6	17.2	15.3	69.1	464.2	60.8
ASWAN	12.2	15.3	4.9	11.5	23.3	67.5	37.0	33.0	137.5	430.0	157.0
TOTAL GROWTH CENTERS									2,878.9		5,419.4
REGIONAL CENTERS											
TANTA	27.6	22.0	4.8	11.7	24.0	90.0	55.9	37.9	193.8	449.9	307.8
MANSSOURA	25.2	20.2	4.5	10.5	21.4	81.7	50.0	33.9	165.5	449.0	604.1
TOTAL									349.3		911.9
DELTA											
MAHALLA	15.7	19.7	4.3	12.4	25.3	77.3	26.6	34.6	148.6	342.4	244.5
ZAGAZIG	6.5	11.4	2.0	8.6	17.4	46.0	25.1	23.8	94.9	317.4	175.8
BAHIG	1.0	7.8	1.1	8.6	17.3	35.7	25.0	23.6	84.3	265.8	121.0
KAFR EL DAWAR	2.9	9.2	1.2	10.7	21.7	45.6	31.1	29.6	106.3	292.2	223.6
SHEDIN EL KON	9.0	8.0	1.5	4.8	9.5	32.8	13.6	12.9	59.3	351.2	222.5
BAHIG	5.6	6.1	1.9	3.5	6.8	23.9	9.8	9.3	43.0	357.3	135.9
BAHIG	7.1	7.0	2.1	4.0	7.9	26.0	11.5	10.9	50.4	373.7	59.0
KAFR EL SHEIKH	15.3	8.9	1.8	3.9	7.8	37.4	11.3	10.7	59.4	457.3	237.2
MATRUH	4.1	5.1	1.1	3.4	6.6	20.3	9.5	9.0	38.9	346.5	136.9
BILBEIS	34.0	5.0	1.1	3.3	6.5	15.9	9.5	5.9	38.2	319.9	124.2
QALUB	3.9	4.4	1.3	2.7	5.2	17.5	7.5	7.2	32.3	307.4	37.9
EKO	6.0	5.9	30.9	3.2	6.4	52.4	9.4	8.5	70.6	670.0	155.8
BAHIG	2.6	3.8	1.1	2.7	5.4	15.2	7.8	7.4	30.4	325.8	105.0
BAHIG	3.5	4.1	1.2	2.6	5.1	16.6	7.5	7.0	31.1	370.6	110.7
BAHIG	3.6	4.3	0.9	2.7	5.4	17.0	7.8	7.4	32.1	345.5	130.9
BAHIG	1.3	2.7	0.4	2.2	4.2	10.8	6.0	5.6	22.6	245.3	42.4
ZEFTA	3.5	3.7	1.3	2.1	4.1	14.7	5.9	5.6	25.2	351.5	43.6
BAHIG	5.6	3.4	0.7	2.1	4.2	16.1	5.9	5.7	27.7	372.5	105.0
TOTAL									596.3		2,481.7
NORTH UPPER EGYPT											
MALLAWI	4.6	5.1	1.5	4.1	6.1	23.3	12.6	11.2	47.1	435.1	155.6
TOTAL									47.1		
SOUTH UPPER EGYPT											
SOHAG	4.9	6.9	1.5	6.0	12.0	31.8	18.7	16.7	67.3	414.6	227.7
LUXOR	6.5	8.6	2.6	7.1	14.4	39.3	22.4	20.0	81.7	422.0	62.3
ASSIUT	2.6	3.3	1.0	2.8	5.4	15.2	8.5	7.6	31.3	426.4	106.4
GISSA	2.9	3.4	1.2	2.6	5.2	15.2	8.0	7.1	30.4	436.6	95.2
TOTAL									210.7		516.6
REMOTE AREAS											
MATRUH	4.2	4.3	4.6	3.0	5.8	21.9	9.1	8.1	39.1	505.7	254.4
RED VALLEY	5.5	5.5	5.2	3.5	6.9	26.6	10.4	9.5	46.5	462.0	233.6
RED SEA	5.3	5.2	10.5	3.6	7.2	31.8	11.2	10.0	53.0	566.6	395.5
TOTAL REMOTE AREAS									138.6		903.4
SURTOTAL NET OF CATEGORICAL									4,620.9		10,492.6
GRAND TOTAL									9,880.4		16,296.0

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1/ Weighted by regional cost index

 * Indicates horizontal expansion beyond settlement boundaries
 ** Additional provisions for universities.

ALTERNATIVE B2 EFFICIENCY

PERIOD 1986-90

PARAMETERS

SETTLEMENT	1985 GROSS DENSITY (P/HA)	1985 POPULATION (000'S)	CHANGE IN POPULATION (000'S)	1975 POPULATION (000'S)	1975 GROSS DENSITY (P/HA)	WATER STANDARD (L/C/D)	SEWERAGE STANDARD (L/C/D)	PER CAPITA HOUSING (L.E.)	OTHER INFRA- STRUCTURE (L.E.)	EDUCATION (L.E.)	HEALTH (L.E.)	OTHER SOCIAL INFRA- STRUCTURE (L.E.)	NOTES
METROPOLITAN AREAS													
GREATER CAIRO	261.6	9,202.0	1610	10,812.0	330.9	354	462	690	295	81 **	258	128	
ALEXANDRIA	152.7	2,345.0	358	3,343.0	173.3	373	322	690	295	81 **	258	128	
GROWTH CENTERS													
PORT SAID	60.7	437	148	585.0	81.3	381	275	828	255	153	345	429	STANDARDS GROWTH CENTERS - MEDIUM/HIGH HOUSING EMPHASIS 1250 650 HORIZONTAL EXPANSION OF SETTLEMENTS WHEN DENSITIES EXCEED 300 P/HA.
ISMAILIA	203.9	272	114	406.0	263.5	353	282	828	295	153 **	345	429	
SUEZ	275.1	312	186	492.0	371.0	353	232	828	255	153	345	429	
BENI SUEF	143.0	148	44	192.0	132.0	300	180	690	255	41	258	128	
FAYOUM	172.0	220	82	302.0	256.1	300	180	690	255	41	258	128	
MIYA	170.9	187.3	59	246.3	134.7	300	180	690	255	41	258	128	
ASSIUT	258.6	265.0	82	358.0	300	300	180	690	255	41 **	258	128	
NAGAH HAWADI	262.9	92.0	30	122.0	300	300	180	690	255	41 **	258	128	
GENA	65.6	124.0	40	184.0	65.7	300	180	690	255	41	258	128	
ASHEN	175.6	265.0	109	375.0	249.0	300	180	690	295	41	258	128	
TOTAL GROWTH CENTERS													
REGIONAL SERVICE CENTERS													
TANTA	157.8	364.0	74	438.0	189.4	315	189	691 *	295	81	258	128	
MANSOURA	144.6	329.0	27	356.0	155.5	315	169	691 *	295	81	258	128	
TOTAL													
DELTA													
MARHULLA	201.2	387.0	79	465.0	242.3	167	100	391	179	41	258	91	
ZAGAZIG	338.4	267.0	15	332.0	357.4	179	100	391	179	81 **	158	91	
BANAHOUR	563.1	263.0	27	292.0	625.9	250	100	391	179	41	258	91	
KAFR EL DAWAR	505.1	337.0	37	374.0	671.5	275	100	391	179	41	258	91	
SHEBIN EL KH	223.1	147.0	10	157.0	238.3	179	100	391	179	41	258	91	
DAKHKHA	58.1	108.0	30	138.0	125.4	167	100	391	179	41	258	91	
BENHA	107.6	120.0	32	152.0	135.3	164	100	391	179	41	258	91	
KAFR EL SHEIKH	130.1	115.0	7	122.0	135.0	167	100	391	179	41	258	91	
MIT GHARA	156.0	100.0	7	107.0	210.3	167	100	391	179	41	258	91	
BILDEIS	200.0	97.0	5	102.0	209.7	167	100	391	179	41	258	91	
GALIUS	117.7	78.0	20	98.0	210.3	167	100	391	179	41	258	91	
EDFO	3.5	53.0	10	59.0	147.9	167	100	391	179	41	258	91	
MATARIA	252.3	83.0	10	103.0	4.3	167	100	391	179	41	258	91	
DESSOUK	126.6	74.0	5	79.0	325.1	167	100	391	179	41	258	91	
MENDUF	180.4	63.0	7	50.0	145.0	167	100	391	179	41	258	91	
ADU KABIA	392.1	69.0	5	74.0	155.6	167	100	391	179	41	258	91	
ZIFTA	83.3	65.0	15	80.0	420.6	167	100	391	179	41	258	91	
BELHAS	181.6	67.0	5	72.0	162.5	167	100	391	179	41	258	91	
TOTAL													
NORTH UPPER EGYPT													
MALLAWI	209.0	90.0	27	117.0	271.7	260	155	391	179	41	258	91	
TOTAL													
SOUTH UPPER EGYPT													
SUHAG	345.1	135.0	44	179.0	300.0	208	125	391	179	41	258	91	
LUXOR	218.0	161.0	52	213.0	288.4	237	156	391	179	41	258	91	
ASWAN	193.1	61.0	20	61.0	263.1	230	138	391	179	41	258	91	
GIRFA	147.5	58.0	17	75.0	190.7	167	100	391	179	41	258	91	
TOTAL													
REMOTE AREAS													
KATROUH	30	64	20	84.0	39.4	167	100	391	179	41	258	91	
NEW VALLEY	30	85	22	108	37.7	167	100	391	179	41	258	91	
RED SEA	15	77	22	59.0	19.3	167	100	391	179	41	258	91	
SINAI	15	-	22	-	-	167	100	391	179	41	258	91	

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TOTAL INFRASTRUCTURE COSTS (L.E. MILLIONS)

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SETTLEMENT	WATER	SEWERAGE	CIRCULATION	POWER	OTHER INFRA- STRUCTURE	TOTAL PHYSICAL INFRA- STRUCTURE	HOUSING	SOCIAL INFRA- STRUCTURE	TOTAL BASE COSTS	TOTAL BASE COSTS/ CAPITA	TOTAL COSTS 1/
GREATER CAIRO	231.2	209.7	107.5	60.6	748.9	1,358.0	1,428.4	1,183.6	3,970.0	247.2	3,970.0
ALEXANDRIA	51.8	255.5	42.9	66.8	265.0	622.0	376.2	324.0	1,322.0	395.5	1,755.5
GROWTH CENTERS											
PORT SAID	60.3	42.3	26.2	24.5	55.7	210.2	143.6	170.4	521.2	290.9	1,167.4
ISMAILIA	30.1	25.2	8.3	19.1	42.4	125.2	105.5	135.1	367.7	905.8	804.2
SUEZ	35.7	28.7	12.5	26.2	168.5	167.0	190.6	165.5	591.1	1,055.2	674.8
BENTI SUEF	12.1	10.4	4.3	8.5	12.4	52.7	35.5	24.4	112.5	565.9	139.3
FAYOUM	16.0	15.9	6.8	14.4	30.6	65.9	64.2	43.3	193.4	641.5	641.3
MINYA	14.8	12.9	5.1	11.1	23.0	57.0	47.2	32.3	146.5	594.8	489.3
ASSIUT	19.4	17.9	5.8	15.4	32.7	91.1	66.5	51.7	209.3	568.8	274.7
BAGAH HAWADI	5.5	5.0	2.1	5.8	11.0	21.9	23.9	16.3	72.1	590.9	52.5
GENA	12.1	9.7	6.8	7.6	15.5	51.7	31.9	21.8	103.3	642.2	123.3
ASWAN	22.1	19.6	8.7	18.2	40.1	108.7	64.4	56.6	249.7	665.9	285.0
TOTAL GROWTH CENTERS											
REGIONAL CENTERS											
TANTA	29.5	25.7	7.3	15.5	32.7	109.7	82.2	51.6	242.5	553.6	401.8
MANSOURA	24.3	19.2	3.3	8.8	17.7	73.4	38.7	28.0	140.1	343.6	520.0
TOTAL											
DELTA											
MENHALLA	5.3	18.6	5.6	16.4	21.1	67.9	38.5	45.3	151.6	325.4	242.8
ZAGAZIG	0.4	9.3	7.0	6.2	7.5	25.5	11.1	15.9	54.5	193.1	97.7
DOKKI	1.2	6.2	0.9	7.9	9.5	25.8	15.7	20.4	61.9	213.3	133.3
KAFR EL DAKAR	3.0	7.2	1.1	10.3	12.7	34.2	21.1	27.0	82.3	220.1	178.5
SHEBHI EL KH	8.7	7.7	0.9	3.7	9.7	30.6	1.7	9.4	41.8	265.0	161.5
BAHIGYA	3.1	6.4	3.9	6.0	7.3	26.7	13.8	15.7	55.3	407.8	135.4
BAHHA	8.0	8.0	3.0	6.5	7.9	34.3	14.9	17.0	65.1	435.0	77.3
KAFR EL SHEIKH	14.2	8.0	0.9	2.8	3.3	29.1	25.0	7.0	41.2	337.7	175.6
MIT GHAMR	1.5	4.3	0.7	2.5	3.0	12.1	4.7	5.5	23.2	217.2	78.9
GILBEIS	1.4	4.0	0.5	4.2	2.6	10.8	3.9	5.6	20.3	159.7	38.4
QALIUB	2.0	4.4	2.3	2.9	5.0	17.8	9.3	10.7	37.9	386.7	44.3
EDKO	3.4	5.1	25.1	2.2	2.7	41.0	5.7	7.4	54.1	525.4	118.3
METRIA	0.5	3.2	0.5	2.3	1.9	9.3	4.4	5.8	19.5	215.1	64.1
HESSOUK	1.5	3.4	0.6	1.9	2.2	8.7	3.4	4.7	17.8	225.3	52.0
MEHROUF	2.7	4.0	0.7	2.3	2.7	12.4	4.4	5.8	22.6	251.5	33.8
ABU KABIR	0.4	2.0	0.3	1.8	2.1	6.9	4.2	4.7	15.8	169.1	26.8
ZEFTA	2.0	3.7	2.3	3.2	3.6	15.6	7.1	8.3	30.9	380.7	49.5
BELHAS	5.4	2.9	0.5	1.8	2.1	12.7	3.3	4.5	20.5	264.2	81.3
TOTAL											
NORTH UPPER EGYPT											
MALLAWI	4.8	5.5	2.0	5.3	6.4	24.1	12.3	13.0	50.4	430.4	170.4
TOTAL											
SOUTH UPPER EGYPT											
SOHAG	3.7	7.4	3.1	8.3	10.3	32.8	19.8	22.2	74.9	418.3	238.2
LUXOR	6.8	10.1	3.8	9.6	12.2	42.7	23.5	26.3	92.5	435.0	103.9
ASWAN	2.6	3.6	1.9	3.9	4.7	16.3	9.0	15.1	39.2	327.9	106.1
GENA	1.2	3.2	1.7	3.4	4.1	13.6	7.8	6.6	32.2	402.3	54.1
TOTAL											
REMOTE AREAS											
MATRUH	3.6	4.2	6.3	3.9	4.7	21.8	9.1	10.2	41.1	469.4	235.1
NEW VALLEY	3.3	5.4	7.3	4.3	5.5	29.0	10.3	11.8	49.1	243.4	243.4
RED SEA	3.3	5.1	15.1	4.4	5.3	31.2	10.1	11.5	52.7	532.5	335.1
TOTAL REMOTE AREAS											
SUBTOTAL NET OF CAIRO/ALEX.											
GRAND TOTAL											
									3,752.8		

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1/ Weighted by regional cost index

* Indicates horizontal expansion beyond settlement boundaries
 ** Additional provisions for universities.

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ALTERNATIVE B 2 EQUITY PERIOD 1985-90 PARAMETERS

SETTLEMENT	198 GROSS DENSITY (P/HA)	198 POPULATION (000'S)	CHANGE IN POPULATION (000'S)	19 POPULATION (000'S)	19 GROSS DENSITY (P/HA)	WATER STANDARD (l/c/d)	SEWERAGE STANDARD (l/c/d)	PEP CAPITA HOUSING (L.E.)	OTHER INFRA-STRUCTURE (L.E.)	EDUCATION (L.E.)	HEALTH (L.E.)	OTHER SOCIAL INFRA-STRUCTURE (L.E.)	NOTES
METROPOLITAN AREAS													
GREATER CAIRO	281.6	9202.0	1610	10,812.0	330.9	584	452	690	296				
ALEXANDRIA	152.7	2945.0	398	3,343.0	173.3	373	322	690	296	81**	285	128	
GROWTH CENTERS													
PORT SAID	60.7	437.0	156	593.0	82.4	301	272	1040	753				
ISMAILIA	203.9	292.0	104	396.0	276.5	353	282	1040	753	153	346	429	
SUEZ	276.1	312.0	111	473.0	300.0	353	232	1040	753	193**	345	425	
BENI SUEF	245.4	277.3	54	331.3	293.2	300	180	690	296	153	346	429	
FAYOUM	172.0	220.0	79	299.0	233.8	300	180	690	296	41	258	128	
MINYA	170.9	187.3	69	256.3	233.9	300	180	690	296	41	258	128	
ASSIUT	259.6	286.0	106	293.3	300.0	300	180	690	296	81**	258	128	
MAGAH HAMADI	262.9	92.0	35	127.0	300.0	300	180	690	296	81**	258	128	
QENA	65.6	124.0	44	168.0	88.9	300	150	690	296	41	258	128	
ASHWAN	176.6	266.0	99	365.0	242.3	300	180	690	296	41	258	128	
TOTAL GROWTH CENTERS													
TOTAL										41	258	128	
REGIONAL SERVICE CENTERS													
TANTA	157.8	364.0	47	411.0	178.2	315	199	891***	296	81***	258	128	
MANSSOURA	132.5	329.0	42	371.0	149.4	315	159	891***	296	81***	258	128	
DELTA													
MAHALLA	201.2	387.0	49	436.0	225.7	237	142	552	296	41	258	128	
ZAGAZIG	339.4	267.0	35	302.0	382.8	237	142	552	296	81**	258	128	
DAMANHOUR	562.0	253.0	35	298.0	635.8	300	142	552	296	41	258	128	
KAFR EL DAWAR	605.3	337.1	44	381.1	684.3	370	142	552	296	41	258	128	
SHEBIN EL KHAYMA	223.2	147.0	20	167.0	253.6	259	179	552	296	41	258	128	
DAMIETTA	98.1	108.0	15	123.0	111.7	237	142	552	296	41	258	128	
BEHRA	107.6	120.0	15	135.0	121.1	256	154	552	296	41	258	128	
KAFR EL SHEIKH	130.1	115.0	15	130.0	147.1	458	154	552	296	41	258	128	
MIT GHAMR	186.4	100.0	12	112.0	220.0	237	142	552	296	41	258	128	
BILBEIS	200.0	97.0	12	109.0	224.7	237	142	552	296	41	258	128	
QALUBA	117.7	77.9	10	87.9	132.8	237	142	552	296	41	258	128	
EDKO	31.9	93.0	12	105.0	4.4	237	142	552	296	41	258	128	
MATARIA	282.3	83.0	10	93.0	316.3	237	142	552	296	41	258	128	
DESSOUK	135.8	74.9	10	84.0	155.3	237	142	552	296	41	258	128	
MENOUF	180.4	83.0	10	93.0	202.1	257	142	552	296	41	258	128	
ASU KABIR	392.1	69.0	10	79.0	448.9	237	142	552	296	41	258	128	
ZEFTA	83.2	65.0	7	72.0	92.3	237	142	552	296	41	258	128	
BELKAS	181.6	67.0	10	77.0	208.7	347	142	552	296	41	258	128	
TOTAL													
NORTH UPPER EGYPT													
MALLAWI	232.5	90.0	32	122.0	315.0	260	156	552	296	41	258	128	
TOTAL													
SOUTH UPPER EGYPT													
SOHAG	346.1	135.0	45	184.0	300.0	237	142	552	296	41	258	128	
LUXOR	218.0	161.0	59	220.0	297.9	237	142	552	296	41	258	128	
AKHMIN	198.1	61.0	22	83.0	259.5	237	142	552	296	41	258	128	
GIRGA	147.5	58.0	22	80.0	203.4	237	142	552	296	41	258	128	
TOTAL													
REMOTE AREAS													
MATRUH	30	64	25	69.0	41.7	237	142	552	296	41	258	128	
NEW VALLEY	30	86	27	113.0	39.4	237	142	552	296	41	258	128	
RED SEA	15	77	29	105.0	20.6	237	142	552	296	41	258	128	
SINAI													

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ALTERNATIVE B 2 EQUITY PERIOD 1985 - 1890

SETTLEMENT	WATER	SEWERAGE	CIRCULATION	POWER	OTHER INFRA- STRUCTURE	TOTAL PHYSICAL INFRA- STRUCTURE	HOUSING	SOCIAL INFRA- STRUCTURE	TOTAL BASE COSTS	TOTAL BASE COSTS/ CAPITA	TOTAL COSTS 1/
GREATER CAIRO	231.4	209.5	107.5	50.5	748.9	1,357.9	1,428.4	3,963.9	367.2	-	3,969.9
ALEXANDRIA	51.8	255.5	42.9	56.8	205.0	622.0	376.2	1,322.2	395.5	18.1	1,755.8
GROWTH CENTERS											
FORT SAID	61.2	43.0	27.3	25.4	150.4	307.3	185.0	777.8	670.1	1,130.0	1,455.6
ISMAILIA	29.5	25.5	7.8	13.0	103.3	181.1	123.3	125.4	429.8	1,025.4	1,037.3
SUEZ	30.5	23.9	7.8	19.1	107.7	107.7	123.3	125.4	429.8	1,025.4	1,037.3
SENI SUEF	17.3	15.9	3.9	11.7	24.2	169.3	131.7	125.6	435.6	1,059.8	214.3
FAYOUM	17.9	15.7	6.6	14.1	29.9	73.1	46.8	33.5	153.4	463.1	419.5
MINYA	15.4	13.5	5.8	12.4	25.0	84.2	62.1	42.0	188.3	629.6	625.8
ASSIUT *	16.8	17.3	5.7	18.2	39.8	72.9	54.1	36.5	163.5	538.1	551.1
HIGH HAWADI *	6.8	6.3	2.5	6.5	13.1	37.8	83.0	62.9	243.7	621.8	314.6
QENA	17.4	10.0	7.3	8.2	15.7	54.5	27.3	18.4	80.8	636.2	91.9
ASWAN	21.6	19.1	8.1	17.1	37.2	103.0	34.6	23.5	112.6	670.5	131.7
TOTAL GROWTH CENTERS							77.5	52.3	232.8	637.8	250.8
REGIONAL CENTERS											
TANTA	27.6	22.1	5.0	12.0	24.7	91.4	58.1	39.0	188.5	458.7	5,493.2
MANSOURA	25.8	20.4	5.0	10.9	22.2	84.4	52.1	35.1	171.5	462.3	35.2
DELTA											445.3
MAHALLA	15.8	19.8	4.4	12.6	25.0	70.6	37.7	35.5	152.8	345.2	940.5
ZAGAZIG	6.6	11.5	2.1	9.0	18.3	47.5	26.6	28.7	102.9	344.0	251.4
DAMANHOUR	5.8	7.9	1.1	9.0	18.1	42.0	26.6	24.9	92.5	313.6	193.8
KAFR EL DAWAR	5.3	9.2	1.2	11.3	23.0	50.6	25.5	31.6	115.7	303.5	204.4
SHEHIN EL KHM	5.8	6.2	1.7	5.2	10.3	34.4	15.1	31.5	115.7	303.5	251.9
DAMIETTA	5.8	6.2	2.2	3.9	7.6	25.7	15.1	14.1	63.6	381.0	238.0
BEHRA	7.1	7.0	2.1	4.0	8.0	29.2	11.3	10.5	47.5	365.9	125.1
KAFR EL SHEIKH	15.3	8.6	1.8	24.0	7.8	37.5	11.6	10.9	50.7	375.6	59.3
MIT GHAMR	4.1	5.1	1.1	3.3	6.5	20.1	11.5	10.7	59.7	459.3	239.2
BILBEIS	4.0	4.9	1.1	3.3	6.2	19.7	9.4	8.9	55.4	343.1	135.9
KALIB	3.9	4.4	1.3	2.7	5.3	17.6	7.7	8.8	37.8	246.5	73.9
EL KO	6.0	5.8	30.3	3.2	6.3	51.6	9.2	7.2	32.4	369.1	37.9
MATARIA	2.6	3.8	0.7	2.8	5.4	15.3	9.2	8.5	69.5	661.6	153.2
LESSONK	3.6	4.1	1.2	2.6	5.2	16.6	7.8	7.4	30.5	528.1	55.8
SHIBIN	3.8	4.3	1.0	4.8	5.2	17.0	7.8	7.1	31.3	372.1	111.1
KAFR EL BAYT	1.2	2.8	0.5	1.5	5.0	12.1	7.4	6.9	25.2	346.8	179.3
ZEFTA	3.5	3.7	1.2	2.0	4.0	14.4	5.7	5.4	25.5	354.3	45.9
BELYAS	5.8	3.6	0.9	2.5	4.9	17.8	7.4	6.8	32.0	415.1	42.5
TOTAL											119.5
NORTH UPPER EGYPT											
MALLAWI	4.6	5.5	2.2	6.0	12.1	30.4	20.2	17.1	67.6	654.4	2,483.1
TOTAL											
SOUTH UPPER EGYPT											
SOHAG	5.7	8.1	3.4	9.0	18.5	44.8	30.8	26.0	101.6	551.9	222.6
LUXOR	6.9	9.7	4.2	10.7	22.2	53.7	37.0	31.3	122.0	554.4	339.5
ASWAN	2.8	3.8	1.7	4.2	8.1	20.0	13.5	11.7	45.3	557.7	140.7
GIRGA	3.2	5.0	2.0	4.1	8.2	22.7	13.7	11.6	47.9	599.0	137.9
TOTAL											
REMOTE AREAS											
MATRUH	5.0	7.1	7.5	4.6	9.3	31.5	15.5	13.1	60.2	576.1	772.5
RED VALLEY	6.9	6.4	8.5	5.3	10.5	37.0	17.3	12.0	69.1	611.1	364.9
RED SEA	6.2	6.1	16.1	5.4	10.9	44.7	18.1	15.3	75.1	735.7	322.2
SINAI											535.8
TOTAL REMOTE AREAS											1,252.9
SUBTOTAL NET C. CAIROALEX.											1,252.9
GRAND TOTAL											15,890.5

1/ Weighted by regional cost index

 * Indicates horizontal expansion beyond settlement boundaries
 ** Additional provisions for universities.

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ALTERNATIVE C PERIOD 86-90 PARAMETERS

SETTLEMENT	1985 GROSS DENSITY (P/HA)	1985 POPULATION (000'S)	CHANGE IN POPULATION (000'S)	1990 POPULATION (000'S)	1990 GROSS DENSITY (P/HA)	WATER STANDARD (l/c/d)	SEWERAGE STANDARD (l/c/d)	PER CAPITA HOUSING (L.E.)	OTHER INFRA-STRUCTURE (L.E.)	EDUCATION (L.E.)	HEALTH (L.E.)	OTHER SOCIAL INFRA-STRUCTURE (L.E.)	NOTES
METROPOLITAN AREAS													
GREATER CAIRO	281.6	9,202.0	152.4	10,725.0	328.2	584	462	1690	296	81 **	256	128	GROWTH CENTERS
ALEXANDRIA	152.7	2,945.0	397.7	3,342.7	173.3	373	322	690	296	81 **	258	128	
GROWTH CENTERS													
PORT SAID	60.7	437	143.4	580.4	80.6	381	272	1040	753	153	346	429	CANAL CITIES AT MASTER PLAN STANDARDS
ISMAILIA	203.9	292	95.3	387.3	270.4	353	232	1040	753	193 **	346	429	
SUEZ	276.1	312	102.2	414.2	300.0	353	232	1040	753	153	346	429	OTHER GROWTH CENTERS AT HIGH MEDIUM HIGH
BENI SUEF	148.0	148	56.0	201.0	261.0	350	210	828	296	41	258	128	
FAYOUM	172.0	220	83.5	303.5	237.3	350	210	828	296	41	258	128	
MINYA	170.9	187.3	71.0	250.3	235.7	350	210	828	296	41	258	128	
ASSIUT	289.6	286.0	108.0	394.0	500.0	350	210	828	296	41	258	128	
RAGAH HAMADI	262.9	92	34.8	126.8	300.0	350	210	828	296	481	258	128	
QENA	65.6	124.0	46.9	170.9	90.4	350	210	828	296	41 **	258	128	
ASWAN	176.6	266.0	100.7	366.7	243.5	350	210	828	296	41	258	128	
TOTAL GROWTH CENTERS													
REGIONAL SERVICE CENTERS													
TANTA	154.8	354	47.0	411.0	174.0	315	189	891 ***	296	81	258	128	OTHER SETTLEMENTS AT MEDIUM HIGH
MAVSOURA	144.6	329	42.4	371.4	153.2	315	189	891	296	81	258	128	
DELTA													
MAHALLA	201.2	387	50.1	437.1	227.2	300	180	690	296	41	258	128	OTHER SETTLEMENTS AT MEDIUM HIGH
ZAGAZIG	338.4	267	34.4	301.4	383.0	300	180	690	296	81	258	128	
DAKHKHA	563.1	253	34.0	297.0	635.9	300	180	690	296	41	258	128	
KAFR EL DAKAR	605.1	337	43.7	380.7	603.6	300	180	690	296	41	258	128	
SHEDIN EL MONI	223.1	147	18.9	165.9	251.8	300	180	690	296	41	258	128	
DAHLETIA	98.1	108	13.9	121.9	110.7	300	180	690	296	41	258	128	
BENHA	107.6	120	15.5	135.5	121.5	300	180	690	296	41	258	128	
KAFR EL SHEIKH	130.1	115	15.1	130.1	147.2	455	273	690	296	41	258	128	
MET GHANR	196.0	100	13.0	113.0	221.5	300	180	690	296	41	258	128	
BILBEIS	200.0	97	12.6	109.5	225.0	300	180	690	296	41	258	128	
QALUB	117.7	78	10.1	88.1	132.9	300	180	690	296	41	258	128	
EDKO	3.9	93	12.2	105.2	4.4	300	180	690	296	41	258	128	
MATRIA	287.3	83	10.9	93.9	319.4	300	180	690	296	41	258	128	
DESSOUK	136.8	74	9.7	83.7	154.7	300	180	690	296	41	258	128	
MENOUF	180.4	83	10.9	93.9	204.1	300	180	690	296	41	258	128	
FEU KABIR	392.1	69	9.2	78.2	444.4	300	180	690	296	41	258	128	
ZEFTA	83.3	65	8.4	73.4	94.1	300	180	690	296	41	258	128	
BELKAS	181.6	67	8.8	75.8	205.5	347	160	690	296	41	258	128	
TOTAL													
NORTH UPPER EGYPT													
MALLAH	209.0	90	34.0	124.0	288.0	300	180	690	296	41	258	128	OTHER SETTLEMENTS AT MEDIUM HIGH
TOTAL													
SOUTH UPPER EGYPT													
SOHAG	346.1	135	50.9	185.9	300	300	690	296	296	41	258	128	OTHER SETTLEMENTS AT MEDIUM HIGH
LUXOR	218.0	161	60.3	221.8	300.3	300	690	296	296	41	258	128	
AKHMIN	198.1	61	23.1	84.1	273.1	300	180	690	296	41	258	128	
GIRGA	147.5	58	22.0	80.0	203.4	300	160	690	296	41	258	128	
TOTAL													
RENDIE AREAS													
MATROUH	30	64	53.3	117.3	55.0	300	160	690	296	41	258	128	OTHER SETTLEMENTS AT MEDIUM HIGH
NEW VALLEY	30	66	58.8	144.8	50.5	300	180	690	296	41	258	128	
RED SEA	15	77	65.8	142.8	27.8	300	160	690	296	41	258	128	
SINAI													

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ALTERNATIVE C PERIOD 1985-1990 TOTAL INFRASTRUCTURE COSTS

SETTLEMENT	WATER	SEWERAGE	CIRCULATION	POWER	OTHER INFRA- STRUCTURE	TOTAL PHYSICAL INFRA- STRUCTURE	HOUSING	SOCIAL INFRA- STRUCTURE	TOTAL BASE COSTS	TOTAL BASE COSTS/ CAPITA	TOTAL COSTS 1/
GREATER CAIRO	221.6	201.0	102.5	64.6	723.5	1,313.5					
ALEXANDRIA	51.8	255.5	42.9	66.8	204.9	621.9	1,359.0	1,143.4	3,625.9	355.7	3,825.9
<u>GROWTH CENTERS</u>							376.0	323.9	1,321.8	395.4	1,755.3
PORT SAID									5,147.7		5,581.2
ISMAILIA	59.7	41.2	25.6	24.2	140.9	262.3	171.9	165.1	630.2	1,095.9	1,374.9
SUEZ	26.9	24.9	7.2	17.0	93.8	171.8	114.3	117.0	431.3	1,052.9	978.3
BENT SUEF	29.8	23.2	7.2	18.1	109.5	176.7	122.5	138.4	419.7	1,013.2	545.8
FAYOUM	16.2	11.7	4.9	9.7	20.1	62.7	50.0	28.2	143.9	701.0	365.4
MINYA	23.5	17.2	6.9	14.6	31.2	93.5	78.2	44.0	215.7	710.7	227.4
ASSIUT	20.1	14.7	5.9	12.6	25.6	79.8	65.5	37.4	183.7	711.3	639.9
MADAH HAYADI	28.1	21.1	7.6	16.4	40.4	115.6	101.3	63.9	280.7	712.5	370.1
GENA	9.1	6.8	2.4	6.4	13.0	37.8	32.6	18.3	89.7	699.6	192.7
ASHMUN	15.7	10.9	7.6	8.6	17.6	60.4	44.0	24.7	129.0	755.0	152.7
TOTAL GROWTH CENTERS	28.2	20.7	8.2	17.3	37.7	112.0	94.4	53.1	259.5	707.6	393.9
<u>REGIONAL CENTERS</u>									2,751.2		5,391.4
TAHNA											
MANSOURA	27.7	22.1	5.1	12.0	24.7	91.7	58.1	39.0	188.6	459.3	315.6
TOTAL	25.5	20.2	4.8	10.9	22.3	83.7	52.4	35.2	171.3	461.3	623.7
<u>DELTA</u>									360.1		939.3
MAHALLA											
ZAGAZIG	25.2	22.0	4.5	12.8	26.3	90.7	47.9	36.0	174.6	399.5	251.6
BAHIG	13.0	13.0	2.1	9.0	18.1	55.1	33.0	28.6	115.7	287.1	229.0
BAHIG HOUR	5.9	9.3	1.1	8.9	17.9	43.0	32.5	24.5	103.0	336.6	218.2
KAFR EL DAWAR	5.9	11.1	1.2	11.2	22.9	52.3	41.8	31.4	125.5	329.8	272.6
SHEDIN EL KOM	9.2	5.5	1.6	5.0	9.9	31.3	19.1	13.6	63.0	275.7	235.8
BAHIGETTA	8.3	6.8	2.1	3.7	7.3	28.2	13.3	10.0	51.5	122.6	141.9
BAHIG	9.1	7.5	2.1	4.1	8.1	31.0	14.8	11.2	657.0	420.5	65.6
KAFR EL SHEIKH	15.3	8.6	1.8	4.0	7.9	37.9	14.4	10.8	62.8	422.4	249.1
MIT GHAMR	6.6	5.7	1.2	3.5	6.8	23.7	12.4	9.3	45.5	422.4	165.1
SILSIBIS	6.3	5.5	1.1	3.3	6.6	22.9	12.0	9.0	44.0	401.5	83.6
QALIUB	5.8	4.8	1.3	2.7	5.3	20.0	9.7	7.3	35.7	415.6	42.9
EDHO	8.2	6.4	30.8	3.2	6.4	54.9	11.6	8.7	75.3	715.7	167.1
MATARIA	4.6	4.3	0.8	2.9	5.7	18.3	10.4	7.8	36.4	363.1	139.0
BESSOUK	5.4	4.5	1.1	2.6	5.1	13.6	9.2	5.9	34.8	416.1	127.1
MENOUF	5.6	4.8	1.1	2.9	5.7	20.1	10.4	7.8	38.2	407.1	142.9
SOH FABIR	2.9	3.2	0.5	2.4	5.7	13.8	6.7	6.5	29.0	371.1	56.2
ZEFTA	5.1	4.1	1.4	2.2	4.4	17.3	8.0	6.0	31.4	427.8	52.7
BELMAS	5.7	3.9	0.9	2.3	4.6	17.4	8.4	6.2	32.1	422.9	119.4
TOTAL									1,154.5		2,795.6
<u>NORTH UPPER EGYPT</u>									79.0		264.6
MALLAWI									79.0		264.6
TOTAL	6.8	6.2	2.5	6.3	12.7	34.5	26.6	17.9			
<u>SOUTH UPPER EGYPT</u>											
SOHAG											
LUXOR	10.0	9.2	3.6	9.3	19.1	51.0	39.8	26.8	117.6	632.8	401.5
ASWAN	11.9	11.0	4.3	10.9	22.8	60.8	47.5	32.0	140.2	532.7	159.5
GIZA	4.7	4.3	1.7	4.3	8.6	23.7	18.0	12.2	53.9	641.1	184.7
TOTAL	5.0	4.3	2.0	4.1	8.2	23.8	17.2	11.6	52.5	656.6	182.7
<u>REMOTE AREAS</u>									3,354.3		923.4
MATRUH											
NEW VALLEY	9.6	7.6	12.6	8.6	17.7	56.0	35.0	25.2	120.2	1,024.5	721.1
RED SEA	11.7	9.3	14.9	9.6	20.0	65.5	43.5	28.4	137.4	948.7	713.0
SINAI	12.1	9.5	27.0	10.4	21.8	81.3	48.1	31.0	160.4	1,123.0	1,081.0
TOTAL REMOTE AREAS									418.0		2,515.1
SUBTOTAL NET OF CAIROALEX.									5,127.1		12,835.4
GRAND TOTAL									10,274.8		18,416.6

1/ Weighted by regional cost index

* Indicates horizontal expansion beyond settlement boundaries
 ** Additional provisions for universities.

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ALTERNATIVE A AT C STANDARDS - PERIOD 1985-1990 PARAMETERS

SETTLEMENT	1985 GROSS DENSITY (P/HA)	1995 POPULATION (000'S)	CHANGE IN POPULATION (000'S)	1990 POPULATION (000'S)	1990 GROSS DENSITY (P/HA)	WATER STANDARD (l/c/d)	SEWERAGE STANDARD (l/c/d)	PER CAPITA HOUSING (L.E.)	OTHER INFRA-STRUCTURE (L.E.)	EDUCATION (L.E.)	HEALTH (L.E.)	OTHER SOCIAL INFRA-STRUCTURE (L.E.)	NOTES	
METROPOLITAN AREAS														
GREATER CAIRO	291.6	9202.0	1952.3	11,154.3	300	757	462	690	295	81**	258	128	CAIRO & ALEXANDRIA AT MASTER PLAN STANDARDS	
ALEXANDRIA	152.7	2945.0	766.7	3,711.7	192.5	373	322	690	296	81**	250	128		
GROWTH CENTERS														
PORT SAID	60.7	437	35.2	472.2	65.6	381	272	1040	753	153	346	429		
ISMAILIA	203.7	292	35.8	327.8	228.7	353	282	1040	753	193**	346	429		
SUEZ	276.1	312	75.1	337.1	300	353	232	1040	753	153	346	429		
BENI SUEF	143.0	148	9.6	155.6	155.6	350	210	828	295	41	258	128		
FAYOUM	172.0	220	20.0	240.0	197.6	350	210	828	295	41	258	128		
MINYA	170.9	187.3	13.3	200.0	183.0	350	210	828	295	41	258	128		
ASSIUT	289.6	286.0	15.6	301.6	300	350	210	828	295	41	258	128		
NISSAH NAWADI	262.9	92.0	7.4	99.4	284.0	350	210	828	295	41	258	128		
QENA	65.6	124.0	9.9	133.9	70.9	350	210	828	295	41	258	128		
ASHMUN	176.6	266.0	37.8	303.8	201.7	350	210	828	296	41	258	128		
TOTAL GROWTH CENTERS														
				2,623.0										
REGIONAL SERVICE CENTERS														
TANTA	154.8	354.0	85.0	450.0	191.4	315	189	691	295	81**	258	128		
MANSSOURA	144.6	329.0	36.8	365.8	160.8	315	189	691	296	81**	258	128		
TOTAL														
				825.8										
DELTA														
MARSA MATRUH	201.2	387	91.6	478.6	248.8	300	180	690	295	41	258	128		
ZAGAZIG	338.4	267	22.2	292.2	265.5	300	180	690	295	81**	258	128		
DAMANHOUR	553.1	263	35.6	298.6	639.3	300	180	690	295	41	258	128		
KAFR EL DAWAR	605.1	337	45.2	382.2	626.3	300	180	690	295	41	258	128		
SHEBIN EL KHAYMA	223.1	147	13.1	160.1	243.0	300	180	690	295	41	258	128		
DAMIETTA	96.1	108	34.1	142.1	125.1	300	180	690	295	41	258	128		
BAHIG	167.6	120	36.1	156.1	140.0	300	180	690	295	41	258	128		
KAFR EL SHEIKH	130.1	115	9.1	124.1	140.4	300	180	690	295	41	258	128		
MIT GHAZAL	195.0	100	10.9	110.9	217.4	300	180	690	295	41	258	128		
BILBEIS	200.0	97	5.4	102.4	211.1	300	180	690	295	41	258	128		
GALIUS	117.7	78	22.2	100.2	151.2	300	180	690	295	41	258	128		
EDKO	3.9	93	12.6	105.6	4.4	300	180	690	295	41	258	128		
MATARIA	282.3	83	9.1	92.1	313.3	300	180	690	295	41	258	128		
DESSOUK	136.8	74	5.7	79.7	147.3	300	180	690	295	41	258	128		
MENOUF	180.4	83	6.9	69.9	165.4	300	180	690	296	41	258	128		
ASH MANSARA	392.1	69	5.7	74.7	424.5	300	180	690	295	41	258	128		
ZEFTA	83.3	65	15.1	80.1	102.7	300	180	690	295	41	258	128		
BELKAS	181.6	67	6.9	73.9	200.3	347	180	690	296	41	258	128		
TOTAL														
				2,940.5										
NORTH UPPER EGYPT														
MALLAWI	209.0	90	34.0	124.0	288.0	300	180	690	295	41	258	128		
TOTAL														
SOUTH UPPER EGYPT														
SOKHARI	346.1	135	50.9	185.9	300.0	300	180	690	296	41	258	128		
LUXOR	218.0	161	60.8	221.8	300.3	300	180	690	295	41	258	128		
ASWAN	198.1	61	23.1	84.1	273.1	300	180	690	296	41	258	128		
GIZA	147.5	58	22.0	60.0	203.4	300	180	690	296	41	258	128		
TOTAL														
				571.8										
REMOTE AREAS														
MATRUH	30	64	4.0	68.0	31.8	300	180	690	296	41	258	128		
NEW VALLEY	30	86	4.5	90.5	31.6	300	180	690	296	41	258	128		
RED SEA	15	77	2.5	79.5	15.5	300	180	690	296	41	258	128		
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ALTERNATIVE A AT C STANDARD - PERIOD 1985-90 TOTAL INFRASTRUCTURE COSTS (L.E. MILLIONS)

SETTLEMENT	WATER	SEWERAGE	CIRCULATION	POWER	OTHER INFRA- STRUCTURE	TOTAL PHYSICAL INFRA- STRUCTURE	HOUSING	SOCIAL INFRA- STRUCTURE	TOTAL BASE COSTS	TOTAL BASE COSTS/ CAPITA	TOTAL COSTS 1/
GREATER CAIRO	269.4	244.4	139.0	46.4	650.3	1,549.5	1,664.6	1,343.4	4,557.5	408.6	4,557.5
ALEXANDRIA	86.9	467.6	74.4	67.0	314.1	1,010.0	633.6	496.2	2,136.8	575.7	2,939.1
GROWTH CENTERS									6,694.3		7,395.6
PORT SAID	46.5	32.5	8.0	11.6	59.4	159.0	59.3	65.7	283.1	599.4	672.2
ISHMAILIA	24.7	20.8	3.2	9.5	50.9	109.1	52.4	59.4	220.9	673.8	554.3
SUEZ	27.3	21.4	5.3	14.9	82.0	148.9	94.3	93.3	335.5	805.3	443.4
BENI SUEF	12.4	8.0	1.1	3.5	8.9	32.8	13.3	9.3	55.3	353.1	159.7
FAYOUM	18.6	13.3	2.1	6.3	12.4	52.7	25.7	16.9	95.2	393.6	340.7
MIENYA	15.5	11.1	1.5	4.5	9.5	42.4	18.8	15.0	76.1	379.5	284.3
ASSIUT	19.8	14.9	1.2	6.6	13.1	55.7	24.8	17.5	93.0	324.8	130.1
HAZAH HAWADI	6.8	5.1	0.6	2.5	4.9	19.9	9.9	6.6	36.4	366.5	46.1
GENA	11.7	8.1	2.1	3.4	6.6	31.9	13.3	8.9	54.2	464.7	70.7
PSHAW	23.4	16.9	3.7	9.4	19.1	72.4	42.3	26.2	140.9	463.9	177.1
TOTAL GROWTH CENTERS									1,386.6		2,906.6
REGIONAL CENTERS											
TANTA	30.4	24.5	8.4	16.9	36.2	116.5	92.8	57.2	265.6	592.0	440.5
MANSSOURA	25.0	19.9	4.2	10.2	20.6	79.9	47.5	32.6	160.0	437.4	566.0
TOTAL									426.6		1,024.5
DELTA											
MARSA MATRUH	27.3	24.2	7.5	17.9	39.6	115.4	76.6	53.7	245.7	513.3	404.3
ZAGAZIG	12.8	12.5	1.4	7.3	14.5	48.5	24.5	22.9	95.9	331.5	191.9
BANHA	5.8	9.3	1.1	5.1	18.3	43.7	33.6	25.1	102.5	343.1	336.5
KAFR EL DAWAR	5.8	11.1	1.3	11.4	23.4	53.0	42.8	32.0	127.6	334.4	277.8
SAYEDIN EL KOM	3.9	7.6	1.2	4.2	8.2	30.3	14.1	11.2	55.5	345.9	269.1
BANHA	9.9	8.1	4.3	6.6	13.0	42.2	27.5	18.5	89.1	619.2	229.5
DEHRA	10.6	8.8	7.0	14.2	45.1	29.1	20.0	94.1	602.6		110.1
KAFR EL SHEIKH	8.0	6.6	1.2	3.1	6.1	25.1	10.3	8.2	43.5	350.8	164.0
MIT GHAMR	6.4	5.6	1.0	3.1	6.2	22.4	11.0	8.4	41.8	375.9	152.6
BILBEIS	5.9	5.1	0.6	2.3	4.5	18.4	7.1	6.0	31.4	306.6	55.7
CALLIUS	6.7	5.6	2.5	4.5	8.9	29.2	13.0	12.4	53.6	584.8	68.6
EOKO	8.3	6.4	31.6	3.3	6.5	55.0	11.9	8.9	76.8	727.3	170.6
MATARIA	4.5	4.2	0.7	2.6	5.2	17.2	9.1	7.0	33.4	352.4	120.4
MESSOUK	5.1	4.2	0.7	2.0	3.9	15.9	6.5	5.2	27.6	345.6	104.3
MENSA	5.4	4.6	0.7	2.3	4.5	17.5	7.6	6.1	31.2	345.8	115.3
EL BABIR	2.9	3.0	0.4	1.9	3.7	11.9	6.3	5.0	23.3	311.3	46.3
DELTA	5.7	4.5	2.3	3.2	6.4	22.2	12.7	8.9	43.7	545.1	72.7
ELKAS	5.6	3.8	0.7	2.1	4.0	16.1	7.1	5.5	28.7	368.0	103.2
TOTAL									1,249.6		2,550.9
NORTH UPPER EGYPT											
MALLAWI	8.9	6.2	2.5	6.3	12.7	35.6	26.6	17.9	81.0	653.5	277.8
TOTAL									61.0		277.8
SOUTH UPPER EGYPT											
SOHAG	10.0	9.2	3.6	9.3	19.1	51.1	39.8	25.6	117.6	632.8	431.5
LUXOR	11.9	11.0	4.3	10.9	22.8	60.8	-47.5	32.0	140.3	632.7	159.5
ASWAN	4.7	4.3	1.7	4.3	8.6	22.7	13.0	12.2	53.9	441.1	164.8
TOTAL									116.6		525.6
REMOTE AREAS									345.3		925.6
MATRUH	5.0	4.0	1.7	1.6	3.1	15.4	5.0	4.1	24.5	359.6	203.9
NEW VALLEY	6.7	5.3	2.0	2.0	3.9	19.8	6.1	5.2	31.0	342.9	193.5
RED SEA	6.0	4.6	2.3	1.6	3.0	17.5	4.4	4.0	25.8	324.9	254.1
TOTAL REMOTE AREAS									81.3		631.5
SUBTOTAL NET OF CAIRO/ALEX.									3,583.4		8,779.9
GRAND TOTAL									10,283.7		16,176.5

1/ Weighted by regional cost index

 * Indicates horizontal expansion beyond settlement boundaries
 ** Additional provisions for universities.

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ALTERNATIVE C AT A STANDARDS PERIOD 1985-90 PARAMETERS

SETTLEMENT	1985 GROSS DENSITY (P/HA)	1985 POPULATION (000'S)	CHANGE IN POPULATION (000'S)	1990 POPULATION (000'S)	1990 GROSS DENSITY (P/HA)	WATER STANDARD (l/c/d)	SEWERAGE STANDARD (l/c/d)	PER CAPITA HOUSING (L.E.)	OTHER INFRA-STRUCTURE (L.E.)	EDUCATION (L.E.)	HEALTH (L.E.)	OTHER SOCIAL INFRA-STRUCTURE (L.E.)	NOTES	
METROPOLITAN AREAS														
GREATER CAIRO	281.6	9,202.0	1,524.0	10,726.0	238.2	554	462	690	255	81**	258	128	<u>METROPOLITAN AREAS</u>	
ALEXANDRIA	152.7	2,945.0	397.7	3,342.7	173.3	373	322	660	296	81**	258	128		
GROWTH CENTERS														
FORT SAID	60.7	437	142.4	580.4	80.6	241	153	552	295	41	258	128	<u>METROPOLITAN AREAS</u> MEDIUM/HIGH -WATER AND SEWERAGE AT -MASTER PLAN -HOUSING AT MEDIUM/HIGH -SOCIAL AT MEDIUM	
ISMAILIA	232.9	792	95.3	337.3	270.4	265	137	562	296	81**	258	128		
SUEZ	276.1	312	102.2	414.2	300.0	231	159	552	295	41	258	128		
BENI SUEF	148.0	148	56.0	204.0	204.0	237	142	552	295	41	258	128		
FAYOUM	172.0	220	83.5	303.5	237.3	237	142	552	295	41	258	128		
MINYA	170.9	187.3	71.0	250.3	235.7	237	142	552	295	81**	258	128		
ASSIUT *	298.6	286	108.0	394.0	300.0	250	150	552	295	81**	258	128		
NAGAH HAYADI *	262.9	97	34.8	126.8	300.0	237	142	552	295	41	258	128		
QENA	65.6	124	46.9	170.9	50.4	237	142	552	295	41	258	128		
ASHWAN	176.6	266	100.7	366.7	243.5	237	142	552	295	41	258	128		
REGIONAL SERVICE CENTERS														
TANTA	157.8	364.0	47.0	411.0	174.8	315	155	552	295	81**	258	128	<u>METROPOLITAN AREAS</u> MAINTENANCE IMPROVED	
MANSOURA	144.6	129.0	42.4	371.4	163.2	315	189	552	295	81**	258	128		
DELTA														
MARSA MATRUH	201.2	387.0	50.1	437.1	227.2	167	100	391	295	59	29	91	<u>METROPOLITAN AREAS</u> MEDIUM -WATER AND SEWERAGE AT -MASTER PLAN -HOUSING AT MEDIUM/HIGH -SOCIAL AT MEDIUM	
ZAGAZIG	338.4	267.0	34.1	301.4	382.0	170	100	391	295	59**	29	91		
DAMANHOUR	553.1	253.0	34.0	297.0	635.9	157	100	391	295	59	29	91		
KAFR EL DAWAR	505.1	337.0	43.7	380.7	663.6	237	100	391	295	59	29	91		
SHEIKH EL KHAYMA	223.1	147.0	18.9	165.9	251.8	299	179	391	295	59	29	91		
DAMIETTA	98.1	108	13.9	121.9	110.7	157	100	391	295	59	29	91		
BAHIG	107.6	120	15.5	135.5	121.5	255	154	391	295	59	29	91		
KAFR EL SHEIKH	130.1	115	15.1	130.1	147.2	455	273	391	295	59	29	91		
HIT GHAZR	196.0	100	13.0	113.0	221.5	167	100	391	295	59	29	91		
BILBEIS	200.0	97	12.6	109.5	225.0	157	100	391	295	59	29	91		
QALUB	117.7	78	10.1	88.1	132.9	167	100	391	295	59	29	91		
EDKO	117.7	78	10.1	88.1	132.9	167	100	391	295	59	29	91		
MATARIA	232.3	83	12.2	105.4	4.4	167	100	391	295	59	29	91		
DESSOUK	135.8	74	10.9	93.9	319.4	167	100	391	295	59	29	91		
MENOUF	180.4	83	10.9	93.9	204.1	167	100	391	295	59	29	91		
ABU YABIR	392.1	59	9.2	78.2	444.4	167	100	391	295	59	29	91		
ZEFTA	83.3	65	5.4	73.4	94.1	167	100	391	295	59	29	91		
BELKAS	181.6	67	8.8	75.6	205.5	247	100	391	295	59	29	91		
NORTH UPPER EGYPT														
MALUTI	209.0	90	34.0	124.0	288.0	260	156	391	296	59	29	91		
SOUTH UPPER EGYPT														
SOHAG *	346.1	135	50.9	185.9	350.0	208	125	391	296	59	29	91		
LUXOR	218.0	161	60.8	221.8	300.3	237	166	391	295	59	29	91		
ASWAN	198.1	61	23.1	84.1	273.1	230	138	391	295	59	29	91		
GIRFA	147.5	58	22.0	80.0	203.4	168	100	391	295	59	29	91		
REMOTE AREAS														
MATRUH	30	64	53.3	117.3	55.0	167	100	391	295	59	29	91	<u>METROPOLITAN AREAS</u> MEDIUM -WATER AND SEWERAGE AT -MASTER PLAN -HOUSING AT MEDIUM/HIGH -SOCIAL AT MEDIUM	
REDA VALLEY	30	86	58.8	144.8	50.5	167	100	391	295	59	29	91		
RED SEA	15	77	65.8	142.8	27.8	167	100	391	295	59	29	91		

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ALTERNATIVE C AT A STANDARDS PERIOD 1986-90 TOTAL INFRASTRUCTURE COSTS (I.E. MILLIONS)

SETTLEMENT	WATER	SEWERAGE	CIRCULATION	POWER	OTHER INFRA- STRUCTURE	TOTAL PHYSICAL INFRA- STRUCTURE	HOUSING	SOCIAL INFRA- STRUCTURE	TOTAL BASE COSTS	TOTAL BASE COSTS/ CAPITA	TOTAL COSTS 1/
GREATER CAIRO	203.8	200.8	102.8	64.6	723.5	1,295.5	1,360.0	1,143.4	3,807.9	355.0	3,807.9
ALEXANDRIA	51.0	255.2	42.9	66.8	204.8	620.7	375.8	323.7	1,320.2	395.0	1,752.8
<u>GROWTH CENTERS</u>									5,128.1		5,560.8
PORT SAID	51.5	32.5	25.6	24.2	55.4	169.1	91.2	77.7	355.1	616.9	809.9
ISMAILIA	16.9	17.3	7.2	17.0	35.9	55.2	60.7	58.2	214.1	552.7	524.5
SUEZ	11.9	18.8	7.2	18.1	39.5	91.6	55.0	62.4	222.0	535.3	282.2
BENI SUEF	8.2	10.0	5.2	10.1	21.0	54.5	37.0	29.5	119.0	583.1	318.2
FAYOUM	11.3	14.4	6.9	14.6	31.2	78.4	32.2	44.0	174.5	575.0	560.9
MINYA	5.6	12.2	5.9	12.6	25.6	57.0	44.4	41.9	153.3	593.3	566.3
ASSIUT	14.1	17.9	7.5	13.4	40.4	98.3	67.5	63.9	229.7	592.9	295.0
MADAH HAMADI	3.9	5.6	2.4	6.4	13.0	31.5	21.8	18.3	71.5	554.1	78.6
QENA	8.8	9.3	7.6	8.6	17.6	51.9	29.3	25.7	105.9	419.5	160.2
ASWAN	13.4	17.2	9.2	17.3	37.7	93.8	62.9	53.1	209.8	572.1	231.8
<u>TOTAL GROWTH CENTERS</u>									1,657.9		3,747.6
<u>REGIONAL CENTERS</u>											
TANTA	27.6	22.4	5.0	12.0	25.7	91.7	36.0	35.0	165.7	405.7	280.8
MANSAURA	25.4	20.2	4.8	10.9	22.3	63.7	32.5	35.2	151.4	407.6	559.5
<u>DELTA</u>									318.1		640.3
MAHALLA	5.5	17.4	4.5	12.8	26.3	65.4	27.2	15.7	109.3	250.1	176.2
ZAGAZIG	7.9	9.8	2.1	8.9	16.1	46.9	19.7	10.8	76.4	253.5	149.1
DAMANHOUR	0.8	6.2	1.1	8.8	17.8	24.9	19.4	10.7	64.0	215.4	137.6
KAFR EL DAWAR	2.6	7.1	1.2	11.2	22.9	45.1	23.7	13.7	82.5	216.7	178.5
SHEEIH EL KHM	9.1	8.1	1.6	5.0	9.9	33.8	10.3	5.9	50.0	301.3	150.1
DAMIETTA	2.8	5.5	2.1	3.7	7.3	21.4	7.5	4.4	33.3	273.4	63.7
DEHHA	7.2	7.1	2.3	4.1	8.1	28.9	8.4	4.9	42.1	312.9	49.3
KAFR EL SHEIKH	15.3	8.6	1.8	4.0	7.9	37.6	8.1	4.7	50.4	378.4	203.4
MIT GHAHR	1.5	4.5	1.2	3.5	6.3	17.4	7.3	4.1	28.6	252.7	45.1
BILBEIS	1.4	4.4	1.2	3.3	6.5	16.9	6.8	3.9	27.7	252.7	51.6
QALIUB	1.9	3.9	1.3	2.7	5.3	15.1	5.5	3.2	23.7	269.1	65.4
EDKO	3.5	3.3	30.7	3.2	6.4	49.1	5.5	3.5	59.1	552.2	125.1
MINTARIA	0.4	5.3	0.8	2.9	5.7	13.0	5.2	3.4	22.3	237.8	72.9
BESSOUK	2.9	3.3	1.1	2.6	5.1	15.9	5.2	3.0	23.8	254.2	64.9
MEROUT	1.6	3.6	1.1	2.6	5.1	14.0	5.2	3.0	22.3	255.9	81.0
ASU KABIR	1.5	2.3	0.5	2.4	4.8	11.6	4.9	3.0	19.2	244.9	35.8
ZEFTA	1.8	3.4	1.4	2.2	4.4	13.2	4.6	2.6	25.4	275.7	33.4
BEHNAS	5.7	3.1	0.8	2.3	4.6	16.6	4.8	2.7	24.1	317.7	103.3
<u>TOTAL</u>									779.2		2,658.2
<u>NORTH UPPER EGYPT</u>											
MALLAH	5.0	5.8	2.5	6.3	12.7	32.3	15.1	7.7	55.0	443.6	165.3
<u>TOTAL</u>									55.0		165.3
<u>SOUTH UPPER EGYPT</u>											
ESNA	3.8	7.8	3.7	9.3	19.1	43.5	22.5	11.5	77.5	415.9	246.4
LUXOR	6.9	10.5	4.3	10.9	22.8	55.4	27.9	13.7	95.0	432.7	107.6
ARMINH	2.6	3.8	1.7	4.3	8.6	21.1	10.2	5.2	36.5	434.5	121.3
GIRGA	1.2	3.4	2.0	4.1	8.2	19.1	9.7	4.9	33.8	422.1	104.5
<u>TOTAL</u>									243.8		599.8
<u>REMOTE AREAS</u>											
MATRUH	3.7	6.2	12.6	8.6	17.7	48.8	22.1	10.7	81.5	654.8	436.6
NEW VALLEY	4.6	7.6	14.9	9.6	20.0	55.6	24.7	12.0	93.3	644.6	487.5
RED SEA	4.9	7.8	27.6	10.4	21.8	72.4	27.2	13.1	112.8	789.9	253.7
SINAI											
<u>TOTAL REMOTE AREAS</u>											
<u>SUBTOTAL NET OF MATRUH</u>									267.6		1,527.8
<u>GRAND TOTAL</u>									8,669.7		14,156.6

1/ Weighted by regional cost index

 * Indicates horizontal expansion beyond settlement boundaries
 ** Additional provisions for universities.

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APPENDIX II-D

CONSTANTS USED TO PROJECT INFRASTRUCTURE COSTS OF EXISTING POPULATIONS

INFRASTRUCTURE COMPONENT	PER CAPITA COSTS OF INFRASTRUCTURE COSTS OF EXISTING POPULATIONS AS A PROPORTION OF PER CAPITA INFRASTRUCTURE COSTS FOR NEW POPULATIONS		REMARKS
	1980-1985 %	1986-1990 %	
Water and Sewerage	74	3	Based on unpublished estimates of the costs of strengthening existing systems from provincial water supplies project and depreciation allowance for major metropolitan areas. Preliminary estimates from National Transportation Plan. Early period has provisions mainly to expand services while the later period assumes an average life of 10 years.
Circulation	1	0.5	
Electricity	20	10	
Other Physical Infrastructure	20	10	
Housing	50	5	
Social Infrastructure			The first period estimate is based on data presented in the Appendices to the Draft Final Report of the Construction Industry Study (Appendix 1). The later period estimate is based on an assumed reduced need for renewal due to 1980-85 renewal efforts.
Education	38	23	
Health	10	11	
Other Social Infrastructure	2	1	Assumed relationships.

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APPENDIX II-F

EVALUATION CRITERIA FOR ASSESSING ALTERNATIVES 1/

Information about elements of the expected performance of alternative settlement strategies is provided in the main body of the report. This appendix discusses performance criteria for assessing strategies more completely. Appropriate performance criteria for evaluating strategies are much easier to name than to measure and apply. The major types of criteria are:

- 1) The results (benefits or effects) of the strategy: types, magnitudes and incidence overtime and on target groups;
- 2) The costs: types (opportunity costs, financial real resource), magnitude and incidence, and
- 3) Comparison of benefits to costs;
- 4) Comparison of total, spatial and sectoral costs (resource demands) with expected resource supplies -- i.e. feasibility tests; and
- 5) Level and types of risk associated with alternatives.

Combinations of these criteria permit the three major types of assessment of strategies which we recommend: 1) feasibility assessment, 2) benefit cost assessment and 3) risk assessment.

A. Results or Benefits Criteria

The objectives of settlement strategies are largely congruent with national policy objectives. The pursuit of a particular settlement pattern is not an end in itself. Rather, the results of pursuing a particular settlement strategy should be judged by the degree to which they are beneficial or harmful to the achievement of national policy objectives.

As indicated in earlier reports, the national development objectives which are most relevant to urban policy choice are:

- 1) Increasing national and per capita GDP;
- 2) Increasing employment to provide work opportunities for an expanding work force;
- 3) Reducing inequality of income across regions and income groups;

- 4) Increasing quality of life in all regions and for all income groups by providing improved public services;
- 5) Preserving arable land for agricultural uses;
- 6) Increasing the utilization of non-arable desert land for urban industrial and residential purposes; and
- 7) Reducing the adverse effects of a high degree of population concentration in Cairo.

It is not possible to combine the positive and negative results of a given strategy on each of these objectives into a single measure of benefit. Consequently, there is no technical method for deciding unambiguously which combination of results is best.

A strategy which is expected to produce the greatest gains in per capita income, for example, may tend to increase rather than reduce inequality of income and lead to more rather than less concentration of population in Cairo Region. On the other hand, a different strategy which attempts to insure that per capita incomes in all regions of Egypt are more equal and at the same time increase the utilization of desert land for industry and residential purposes may tend to inhibit the growth of per capita income. Which of these solutions is best, depends upon the weight which is attached to the respective results -- appropriate weights reflect social or political judgements rather than technical calculations.

The foregoing discussion implies that, after social objectives (such as those listed on pp. 1 and 2) are enunciated, strategies are selected. It will often be the case that a strategy is selected with a primary purpose in mind -- e.g. providing the maximum gains in per capita income -- but when implemented will produce positive or negative benefits relative to other objectives.^{2/}

The expected benefits of each alternative on each objective are difficult to estimate precisely. The alternatives discussed in the text of this report, however, can be roughly ranked in terms of their contributions to such objectives as those cited above. Their relative rankings (which are subject to change as further refinements are made) are shown in Table II-10.

The rankings on expected benefits for per capita income growth, per capita employment growth and reduced regional inequality are reasonably well established in this report. The rankings on the other objectives are more subject to change as the analysis proceeds. This is partly due to the fact that, for example, the degree of preservation of arable land, utilization of desert land and reductions in adverse effects of concentration in the Cairo Region depends not only upon where investment is allocated

regionally, but also upon the intra-regional organization of the investment.

In particular, a continuation of expansion of Cairo in a predominantly north-south direction such as is described in Chapter V as the likely trend if current plans are followed, will threaten more arable land and utilize less desert land than expansion in an east-west direction. The degree to which adverse effects of concentration are reduced depends on the form of future expansion (i.e. polynucleation vs. sprawl or fringe development along corridors) as well as the population growth to be accommodated.

Similarly, vertical expansion and infill in Delta Cities may successfully preserve arable land while accommodating population growth even when there are no options for horizontal expansion on non-arable land. It is conceivable, also, that horizontal expansion of Delta or Upper Valley cities, even if it is on arable land may (as a result of higher urban than village densities) contribute enough to rural-urban migration from the surrounding villages and agricultural hinterland to use less arable land per person than a failure to expand these cities would use. Chapters II and III of this report provide some information relevant to the rankings shown in Table II.14; but they are not yet definitely established.

Benefits can be either positive or negative. Negative benefits can be considered to be a social cost of pursuing a particular course of action. The detailed identification of such costs under different future scenarios is extremely difficult; as is the identification of the social costs associated with the failure to adopt a particular strategy.

A sense that there are highly significant social costs associated with a continuation of past trends (in population growth, conversion of arable land to non-agricultural uses, concentration of even larger portions of the population in Greater Cairo and the multiplication of social problems related to concentration) provided a basis for this study and the search for better alternatives by the GOE.

The reality of the social costs of continuing past trends is amply demonstrated in the main body of this report and other reports of the National Urban Policy Study. Although it is true that the population of Egypt is a major national resource, it is also true that the rapid expansion of the population is a major cause of spill-over of housing onto arable land, increased utilization of arable land for bricks, excess demand for available social service facilities and congestion.

Population expansion in most of Egypt's cities has created increased urban densities (with the social problems created by high densities) and/or spill-over onto arable land. Greater

Cairo has continued to have an increasing share of the growing urban population; concentrating many of these social costs in the Cairo Region.

It is to be expected that any chosen strategy that tries to alter existing trends will also produce some negative benefits or social costs. To the extent possible, these social costs should be compared to those which would be incurred if existing trends were to continue.

B. Cost Criteria

1. Opportunity Cost

Just as negative benefits can be considered to be social costs of pursuing an alternative, benefits that are not possible to achieve as a result of pursuing a given strategy can be considered as costs of the alternative. These are the opportunity costs. Technically, the opportunity cost of a course of action is the difference between the benefit actually received and the benefit which would be received if the accomplishment of a given objective were maximized for the expenditure of a given amount of resources. For our purposes in evaluating alternatives, we shall consider the opportunity cost of an alternative to be the difference between the performance of the alternative and the performance of the best of the other alternatives on each individual objective. For example, Alternative A, as described in the text, is estimated to provide the largest increase in employment for each pound of development investment. The opportunity cost in terms of employment for Alternative B₁, B₂, and C, therefore, are the differences between their employment per pound and that of Alternative A as shown in Table II.8.

Similar calculations of opportunity costs for other objectives can be made for these benefits which can be both quantified and rank ordered (e.g. foddans preserved, reductions in the deviation of regional income from the mean, etc.).

For benefits which cannot be quantified reasonably accurately, rank ordering based upon judgements about which alternatives are better and worse (rather than how much better or worse) will have to be used. In these cases opportunity costs cannot be assigned on a magnitude.

2. Financial Costs

This report contains estimates of most of the financial costs associated with alternative strategies. Financial costs discussed in the text include:

- a) direct investment cost of a "typical" job in each settlement;
- b) costs associated with growth management;
- c) intra-urban infrastructure costs to support economic activity and population; and
- d) inter-urban infrastructure requirements.

As indicated in the text, these costs vary across the alternatives because of differences in the sectoral composition of employment, the rate of employment and population growth, transportation costs (reflecting both sectoral composition of output the distance from inputs and output markets), the size of population requiring infrastructure services and regional variations in construction costs.

There are some important financial costs associated with each alternative which we have not yet estimated. These are the costs of employing special instruments to control or induce the location of industry and population within the settlement system. Instruments which might be used include direct subsidies or differential development taxes (to business or potential migrants) for locating in particular areas; indirect subsidies through price (wage) differentials for operating in particular areas or undertaking particular activities; enforcement of direct controls -- e.g. on location on arable land, control of land uses, and restrictions on location of industry. These costs may show up either as direct outlays or as losses of revenue which the Government would otherwise receive. Such costs can be substantial both absolutely and relative to the direct investment costs discussed earlier.

These costs while not estimated in this report will tend to be higher for settlement strategies which call for substantial changes in past trends in industry location patterns and migration patterns of the population.

3. Real Resource Costs

In addition to the financial costs, each strategy implies the use of various combinations of real resources -- e.g. administrative talent, labor of various types, construction material, water, and developable land. Although it is possible in many cases to acquire additional real resources needed at some financial costs, shortages or non-availability of needed resources can be a major constraint in the implementation of a settlement strategy. Consequently, strategies which imply the need for larger quantities of real resources than are likely to be available within Egypt

are likely to be either more expensive, more risky or both than other strategies for which this is less true.

The availability of needed real resources and proper locations has a strong effect on the time it is likely to take to implement a strategy as well as its likely cost. Evidence from many countries which have attempted to counteract the increased concentration within the major metropolitan region by adopting decentralization strategies, for example, indicates that the probability of their effective implementation is strongly influenced by the level of administrative and analytic skill of local government officials. The training of additional skilled staff takes time as well as money. In terms of more general labor skills, the same would apply to strategies which require the introduction of non-traditional methods in areas which lack skilled manpower. There is, for example, concern that continuing migration of skilled construction workers to other countries may inhibit achieving needed domestic construction. The availability of sufficient water to support substantial urban growth in remote areas is an example of a potentially serious real resource constraint to development there, if the needed water system takes a long time to be installed and is very costly to install.

This report does not contain a systematic assessment of real resource constraints, although Chapters ... and ... provide some information about real resource availability and problems in various areas of Egypt. Further elaboration of these requirements and a determination of their seriousness as constraints is scheduled for subsequent reports.

C. Comparison of Benefits & Costs

Both benefit and cost estimates are more meaningful when treated together rather than separately. An alternative which has very high benefits on some criteria but also very high costs would clearly be a less desirable choice than another alternative with equally high benefits but lower costs. In those cases where two alternatives have differences in both their benefits and costs, the alternative which has the highest ratios of benefits to costs is generally preferable.

The application of benefit/cost criteria to choice situations is clearest when two conditions exist: 1) when all benefits can be converted to a common measure and 2) when costs are measured in the same units. In such cases, alternatives with a ratio of benefits to cost of less than one can be ruled out as desirable alternatives -- i.e. they cost more than they are worth. Furthermore, the alternative with the highest benefit/cost ratio is preferred.

In our analysis (and in most policy analysis where the satisfaction of many objectives are to be sought) it is not possible to achieve the two conditions cited above, even with respect to those benefits which can be quantified. Consequently, each alternative will have several benefit/cost ratios and the benefits and costs will be defined in different units (e.g. benefits in terms of employment and costs in terms of L.E.).

In our judgement it is better to display for GOE review the array of benefit/cost (or effectiveness/cost) ratios rather than attempt to force a definition of each benefit in common units. While the resulting array of benefit/cost ratios is not likely to show that one alternative has a higher benefit/cost ratio on all types of benefits than all other alternatives, display of the full array permits GOE reviewers to assign weights reflecting their judgement of the priority outputs.

D. Comparison of Resource Demands with Resource Supplies

As suggested earlier, the availability and price of financial and real resources may constrain the choice of alternatives. An alternative -- even if highly beneficial -- which has total cost, exceeding the expected available financial resources, is not feasible or at least very risky to undertake. If such an alternative is undertaken and there is a short-fall between the resources required and those available, major adjustments may be necessary in what is attempted or in generating additional resources. Such forced adjustments may result in substantial changes in the benefits to be expected from pursuing the alternative. To the extent possible, therefore, the initial choice of a preferred strategy should be restricted to those alternatives with a reasonable probability of being feasible.

In assessing feasibility of an alternative over a fairly long period of time, there is a considerable amount of uncertainty. This is so not only because the future may contain both helpful and harmful surprises, but also because resource availability and the price of resources are so strongly influenced by policy choices of the Government.

As indicated in Chapter I of the main report, the total amount of savings available to be invested (both domestic saving -- from public and private sources -- and saving from external sources) can be influenced by domestic price policy, tax and subsidy policy, banking and interest rate policy, international prices and trade, external demand for Egyptian labor, and foreign grant and loan policies, as well as sectoral and spatial investment. Consequently, point estimates of future saving (supply of financial resources) are likely to be very unreliable.

Nevertheless, a comparison of a range of expected future investment requirements with a range estimate of future savings is

likely to help prevent the adoption of options with a low probability of being feasible.

As indicated in the discussion about costs earlier in this appendix, real resource may also be short in supply relative to their required levels in some alternatives. The administrative requirements of implementing a national urban policy deserve special mention in this regard. Undertaking the planning, update, revision and conduct of an integrated sectoral and spatial approach to development policy -- a core requirement for an effective urban policy -- poses heavy demands for consistency and coordination among virtually all national ministries and between national and local administrative units. Consequently, the need for public officials with considerable skill in planning, programming, and operating programs is likely to increase substantially. Anticipating these requirements and insuring a supply of such personnel throughout Government is an important part of testing the feasibility of alternative strategies. Another area of concern is skilled manpower for construction and productively utilizing new industrial facilities.

E. Risk Assessment of Alternatives

There are obviously political and social risks associated with the adoption of a particular settlement strategy just as there are such risks associated with a failure to do so. Moreover, there are likely to be different degrees and types of risk associated with each strategy option.

The National Urban Policy Study Team cannot decide on technical grounds how much or what kinds of risks the Government of Egypt may wish to take. We can, however, indicate some of the elements of alternatives that make them more or less risky.

One of the reasons we have emphasized costs in the main report is that the risk of being unable to achieve stated objectives of public policy (including urban policy) increases as the expected costs of implementing the policy approach or exceed anticipated resources. At the same time, the possibility of achieving higher levels of benefits from the policy tends to increase as the level of investment in the policy increases -- if the investment itself is prudently managed.

Prudent management of investment entails the selection of general programs and particular projects with a reasonable chance of producing positive net benefits for each program or project included in the development investment portfolio -- regardless of the total resources allocated to development over any given time period. The risk of failure to achieve policy objectives can, therefore, be somewhat reduced by linking program and project choices closely to policy objectives and the overall strategy for achieving them.

Many development investments (e.g. for major changes in inter-regional infrastructure, such as transportation networks) require large commitments of funds over a relatively short period of time, that is they are "lumpy" investments in which it is difficult to retain flexibility if circumstances (changed priorities, unforeseen requirements for resources, etc...) necessitate changes. Consequently, alternative strategies which contain a high proportion of such "lumpy" investments in order to achieve their policy objectives are more risky than those which do not.

The level of risk in an investment plan is lower the greater the diversification of projects within the plan. This is one reason for avoiding lumpy investments that absorb a large part of the resources and have a long gestation period; unless the individual investments are of unusually low risk.

Similarly, there are development investments (regardless of size) which do not begin to yield benefits before they are completed. In the case of such investments (particularly if the time period between investment and yield is long) changed circumstances may require that they be abandoned before they have made any positive contribution. Consequently, alternatives necessitating the choice of a significant portion of such investments are more risky than those which do not.

Three additional comments are necessary to complete this brief discussion of risk assessment. First, this discussion is trying to make a different point than that the benefits and costs of pursuing any given alternative are spread out over time. In analyzing benefits and costs it is customary to calculate the present value of both the benefit and cost stream over time by using some social discount rate to take account of these differences. The point being made in this section is that it is possible for two alternatives with identical present value of benefits and costs to carry difference degrees of risk.

Second, calling attention to degrees of risk associated with strategies does not imply that a strategy with less risk should necessarily be adopted over a riskier strategy. The choice of how much risk the Government should accept in its choice of strategies is clearly a political and not a technical choice.

Third, this discussion may seem to imply that the degree of risk associated with the adoption of a particular policy or no policy can be definitively established. That is not so. What can be done is to provide indicators of what kind of choices are apt to be riskier than others, not a guarantee of the level of risk.

SUMMARY

In this Appendix, three related sets of evaluation criteria are proposed:

1. Criteria for feasibility assesment
2. Criteria for benefit/cost assessment and
3. Criteria for risk assessment.

The first set is used to evaluate the degree to which each alternative may be implemented without being seriously constrained by financial resources and shortfalls in other needed resources. The second set is used to evaluate positive and negative features (benefits and dis-benefits or social costs, respectively) of the alternatives. That is, what the expenditure of financial and other resources will produce as contributions to national development objectives and the well-being of the Egyptian people. The third set is intended to identify major sources of risk associated with pursuing each alternative.

Each of these sets of evaluation criteria contains elements which are difficult to measure precisely and whose future values are subject to uncertainty. Consequently, they are meant to be used to assist the GOE in exercising judgement in the choice of a preferred strategy and not as an alternative to judgement. We have assumed that the Government will generally prefer to pursue strategies which have a good chance of being implemented and, if implemented, will produce results that will further development objectives and social welfare at a level of risk acceptable to the Government.

APPENDIX II-E

FOOTNOTES

- 1/ This appendix constitutes Working Paper 2.2.1 as stated in the Scope of Work.

- 2/ Benefits are here defined as results which effect, either positively or negatively, the accomplishment of any one of the social objectives.

APPENDIX III-A

INDICATIVE PER CAPITA INVESTMENT IN URBAN SERVICES

Estimating the current provisions of social services and other administrative services is difficult due to the large number of services provided, the variations in standards of provision from one settlement to another and the lack of consistent data about the condition of current provisions. Therefore, only very approximate order of magnitude indications of the investments in social services can be provided to compare with the provisions suggested by new town master plans.

These order of magnitude investment levels were prepared based on information supplied by the budgets of the urban governorates for investments in maintenance and spare parts. It was found from studies of other infrastructure, notably water and sewerage systems, where the net value of existing plant is known, that investments in maintenance and spare parts range from 0.3 to 2.5 percent of the net value of the plant. Since complete master plans of these systems have been prepared, it was assumed that these relationships could be used as a proxy for estimating other types of infrastructure investment in plant. The minimum relationship between annual investment in maintenance and spare parts was used to project the level of investment in other social infrastructures because it would yield the highest net value of plant. These projections are shown in Table a-1.

TABLE a-1

INDICATIVE INVESTMENT IN SOCIAL INFRASTRUCTURE

IN URBAN GOVERNORATES

GOVERNORATE	ITEM	TOTAL 1980/81 PROVISION FOR MAINTENANCE AND SPARE PARTS (L.E. '000's)	ESTIMATED CAPITAL STOCK (L.E. '000's)	CAPITAL STOCK PER CAPITA (L.E.)	CAPITAL STOCK PER CAPITA (1979 L.E)
CAIRO	Administration	615	204,837	35.80	
	Social Affairs	8	2,646	0.46	
	Others	795	264,862	46.24	
	Total		472,346	82.46	71.70
ALEXANDRIA	Administration	434	144,650	55.40	
	Social Affairs	1	397	0.15	
	Others	620	206,427	79.00	
	Total		351,456	134.50	116.96
SUEZ	Administration	74	24,780	68.50	
	Social Affairs	0.5	153	0.42	
	Others	19	4,807	13.28	
	Total		29,740	82.15	71.44
PORT SAID	Administration	333	109,835	318.40	
	Social Affairs	0.4	120	0.35	
	Others	27	8,953	25.96	
	Total		118,908	344.66	299.71
AVERAGE URBAN GOVERNORATES	Administration		484,102	53.50	46.53
	Social Affairs		3,316	0.37	0.32
	Others		488,365	53.97	46.93
	Total		975,783	107.85	93.78

APPENDIX III-B

URBAN HEALTH CARE ESTIMATES

The following is an order of magnitude estimate of the new health care facilities which will be required by new population growth if the present national urban health care standards are to be maintained at their 1980 level. These estimates are only indicative of future requirements as disaggregated data about the location and condition of existing health care facilities is not available.

The estimates assume that rural populations will continue to utilize secondary health facilities. Therefore, the urban standard of 4.42 hospital beds per 1,000 urban population was used to project future requirements. This standard results from dividing the total number of hospital beds in Egypt by the 1980 urban population. The replacement value of the existing secondary health care stock was found by multiplying the number of beds times an average cost per bed of constructing a 300-bed hospital (L.E. 56.5 thousand in 1979 prices).

Secondary health care rehabilitation costs are expressed at 10 percent of the estimated replacement value since hospitals represent a large investment in buildings with a relatively long life. However, due to rapid changes in technology and the requirements to replace equipment over much shorter periods (usually less than 10 years), a much higher percentage for rehabilitation costs was allowed than most other infrastructure with similarly large investments in buildings.

Again, since disaggregated data about the location and condition of primary health care facilities could not be made available to the study by the Ministry of Health for inclusion in this Report, the requirements for urban health clinics was used as a proxy to project total urban primary health care facility needs. These future requirements were projected at a standard proposed by the Ministry of 1 unit per 40,000 urban population. Investment requirements were based on unit costs provided in the Sadat City Master Plan and are expressed in 1979 prices.

Since a much greater proportion of the investment in primary health care facilities is in equipment and service population per unit are much greater than secondary health care facilities, rehabilitation costs were estimated at 50 percent of replacement costs.

TABLE B-1

HEALTH INVESTMENT REQUIRED TO KEEP 1980 STANDARDS
OVER THE PERIOD 1980-2000

PERIOD	ITEM	TOTAL INVEST. REQUIRED (L.E. MILLIONS)	TOTAL INVESTMENT/ CAPITA
A. <u>1980-1985: NEW URBAN POPULATION: 3.8 MILLION</u>			
I. Secondary Health Care			
	1) Rehabilitation of existing stock 80,400 beds (4.42 beds/1000 pop.). Replacement value L.E. 4,540 million. Rehabilitation at 10%	454	
	ii) New additions required 3.8 million new population at 4.42 beds/1000 equals 16,796 beds	949	
	iii) Total Secondary Health Care	1,103	
II. Primary Health Care			
	1) Rehabilitation of existing stock 455 units (1 unit/40,000) Replacement value L.E.104 million. Rehabilitation at 50%	10	
	ii) New additions required 3.8 million new population at 1 unit/40,000 equals 95 units	22	
	iii) Total primary health care	32	
	III. Total Urban Health Care	1,435	
	Total urban health care per capita (mid period population)		69.67
	Average annual per capita investment		13.93

TABLE B-1 (CONT'D)

HEALTH INVESTMENT REQUIRED TO MAIN 1980 STANDARDS

OVER THE PERIOD 1980-2000

PERIOD	ITEM	TOTAL INVEST. REQUIRED (L.E. MILLIONS)	TOTAL INVESTMENT/ CAPITA
B. <u>1985-1990: NEW URBAN POPULATION: 4.1 MILLION</u>			
	I. Secondary Health Care		
	Rehabilitation of existing stock 97,196 beds Replacement Value L.E. 5,494 million Rehabilitation at 10 percent	549	
	ii) New additions required 4.1 million new population at 4.42 beds/1000 equals 18,122 beds	1,025	
	iii) Total secondary health care	1,574	
	II. Primary Health Care		
	i) Rehabilitation of existing stock 550 units (1 unit/40,000). Replacement value L.E. 125 million Rehabilitation at 50%	63	
	ii) New additions required 4.1 million new population at 1 unit/40,000 equals 102.5 units	23.3	
	iii) Total primary health care	96	
	III. Total Urban Health Care	1,670	
	Total urban health care per capita mid period population		68.02
	Average annual per capita investment		13.60

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TABLE b-1 (CONT'D)

HEALTH INVESTMENT REQUIRED TO MAIN 1980 STANDARDS OVER THE PERIOD 1980-2000

PERIOD	ITEM	TOTAL INVEST. REQUIRED (L.E. MILLIONS)	TOTAL INVESTMENT/ CAPITA
<u>C. 1990-1995: NEW URBAN POPULATION: 5.6 MILLION</u>			
I. Secondary Health Care			
	1) Rehabilitation of existing stock 115,318 beds Replacement value L.E. 6,518 million Rehabilitation at 10%	652	
	ii) New additions required 4.8 million new population at 4.42 beds/1000 equals 21,216 beds	1,199	
	iii) Total secondary health care	1,851	
II. Primary Health Care			
	1) Rehabilitation of existing stock 652.5 units Replacement value L.E. 149 million Rehabilitation at 50%	74	
	ii) New additions required 4.8 million new population 1 unit/40,000 equals 120 units	27	
	iii) Total Primary Health Care	101	
III. Total Urban Health Care		1,953	
	Total urban health care per capita (Mid period population)		67.11
	Average annual per capita investment		13.42

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TABLE b-1 (CONT'D)

HEALTH INVESTMENT REQUIRED TO MAIN 1980 STANDARDS OVER THE PERIOD 1980-2000

PERIOD	ITEM	TOTAL INVEST. REQUIRED (L.E. MILLIONS)	TOTAL INVESTMENT/ CAPITA
D. <u>1995-2000: NEW URBAN POPULATION: 5.6 MILLION</u>			
I. Secondary Health Care			
	i) Rehabilitation of existing stock 136,543 beds Replacement value L.E. 7,717 million Rehabilitation at 10 percent	717	
	ii) New additions required 5.6 million new population 4.42 beds/1000 equals 24,752	1,399	
	iii) Total Secondary Health Care	2,116	
II. Primary Health Care			
	i) Rehabilitation of existing stock 772.5 units Replacement value L.E. 176 million Rehabilitation at 50%	88	
	ii) New additions required 5.6 million new population 1 unit/40,000 equals 140 units	32	
	iii) Total Primary Health Care	120	
	III. Total Urban Health Care	2,236	
	Total urban health care per capita (mid period population)		65.38
	Average annual per capita investment		13.08

APPENDIX III-C

URBAN EDUCATION ESTIMATES

The following tables present estimates of the requirements at a national level for new urban education facilities and the requirements to rehabilitate existing facilities which are in poor condition.

The estimates of requirements for rehabilitation of existing facilities were prepared by comparing 1980 data supplied by the Ministry of Education on the location and number of schools in the governorates with a 1977 study of the condition of school buildings. In preparing these estimates, it was assumed that there have been no major changes in the condition of school buildings since 1977, therefore, 1977 data could be used as a proxy to estimate 1980 requirements.

The 1977 study on the condition of school buildings lists facilities in three categories: good, bad and needing massive rehabilitation. These relate to access to public utilities and the general condition of the structure of the school. Since the study does not assign values to these conditions, the following 1979 cost data was used to estimate rehabilitation requirements:

<u>TYPE OF FACILITY</u>	<u>VALUE OF FACILITIES ACCORDING TO CONDITIONS (L.E.1,000)</u>		
	<u>GOOD</u>	<u>BAD</u>	<u>NEEDS MASSIVE REHABILITATION</u>
Primary	54	21.6	10.8
Preparatory	75	30.0	40.0
General Secondary	200	80.0	40.0
Secondary Commercial	250	100.0	50.0
Secondary Industrial	500	200.0	100.0
Secondary Agricultural	750	300.0	150.0

The "Good" values or 1979 replacement values were modified from tender cost data, master plan estimates and Ministry of Education information about school construction costs. Thus the rehabilitation requirements are the investment required to bring the 'Bad' and 'Needs Massive Rehabilitation' categories of schools up to a condition represented by the value of schools in 'Good' condition.

The estimates for future school requirements were prepared using information on the provisions of schools per capita in Alexandria according to unpublished statistics of the Ministry of Education shown in Table 16 of the NUPS 'Urban Development Standards and Costs' working paper. These are:

<u>TYPE OF FACILITY</u>	<u>STANDARD</u>	<u>REGIONAL FACTOR</u>
Primary	1/4510	1.0
Preparatory	1/13,000	1.0
General Secondary	1/84,000	1.5
Secondary Commercial	1/62,000	2.0
Secondary Industrial	1/62,000	3.5
Secondary Agricultural	1/62,000	4.0

Since secondary schools are only built in urban areas, they must serve populations greater than the urban areas. Therefore, the regional factors indicate multipliers used to increase provisions of these facilities to accommodate regional populations. These factors were derived by comparing 1980 student populations for secondary schools with settlement demographic data about the number of school age persons in a settlement.

TABLE C-1

EDUCATION REQUIREMENTS TO MAINTAIN CURRENT STANDARDS TO THE YEAR 2000

<u>DESCRIPTION</u>	<u>TOTAL INVEST. REQUIRED (L.E. MILLIONS)</u>	<u>PER CAPITA INVESTMENT</u>
<u>1980-1985: URBAN POPULATION INCREASE: 3.8 MILLION</u>		
I. Rehabilitation of existing facilities	201	
II. New facilities	107	
III. Total investment	308	
Total investment per capita (mid period population 20.6 million)		14.95
Average annual investment		2.99
<u>1985-1990: URBAN POPULATION INCREASE: 4.1 MILLION</u>		
I. Rehabilitation of existing stock		
i) Replacement value of 1980 stock	LE.1,309 million	
ii) Value of new stock	<u>107 million</u>	
iii) Total replacement value	LE.1,416 million	
iv) Rehabilitation at 2%	28	
II. New facilities	114	
III. Total investment	142	
Total investment per capita (mid period population 24.6)		5.77
Average annual per capita investment		1.15

TABLE C-2

INDICATIVE PER CAPITA INVESTMENT IN URBAN SCHOOL BUILDINGS IN 1980

TYPE OF FACILITY	TOTAL NUMBER OF BUILDINGS	VALUE OF SCHOOL BUILDINGS ACCORDING TO CONDITION (L.E. MILLIONS)			TOTAL VALUE (L.E. MILLIONS)
		GOOD	BAD	REQUIRE MASSIVE REHABILITATION	
Primary	8,027	240	209	288	737
Preparatory	1,550	75	24	69	168
General Secondary	339	49	8	23	80
Secondary Trade and Commerce	179	33	1	2	36
Industrial Secondary	117	42	2	3	47
Agricultural Secondary	55	38	1	1	40
TOTAL	10,267	477	245	386	1,108
TOTAL PER CAPITA		(18.7 Million 1980 Urban Population)			59.25

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C. 1990-1995: URBAN POPULATION INCREASE: 4.8 MILLION

I. Rehabilitation of existing stock			
1)	Stock from previous period	LE.1,416 million	
ii)	New stock	<u>114 million</u>	
iii)	Total replacement value	1,530 million	
iv)	Rehabilitation at 2%		31
II. New facilities 133			
III. Total investment required 164			
	Total investment per capita (mid period population 29.0)		5.66
	Average annual investment		1.13

D. 1995-2000: URBAN POPULATION INCREASE: 5.6 MILLION

I. Rehabilitation of existing stock			
1)	Stock from previous period	LE.1,530 million	
ii)	New stock	<u>133 million</u>	
iii)	Total replacement value	1,663 million	
iv)	Rehabilitation at 2%		33
II. New facilities 156			
III. Total investment required 189			
	Total investment per capita (mid period population 34.2)		5.53
	Average annual per capita investment		1.11

TABLE C-3

PROJECTED REQUIREMENTS FOR NEW URBAN SCHOLS 1980 - 2000

(COSTS IN 1979 L.E. MILLIONS)

TYPE OF EDUCATION FACILITY	1980 - 1985		1985 - 1990		1990 - 1995		1995 - 2000	
	REQUIRED NEW SCHOOLS	TOTAL COST						
Primary Schools	925	49.9	997	53.9	1168	63.06	1362	73.5
Preparatory Schools	285	21.7	312	23.4	365	27.42	426	32
Secondary General	45	9.05	49	9.8	57	11.4	67	13.4
Secondary Commercial	32	8.0	33	8.25	38	9.5	45	11.3
Secondary Industrial	24	12.0	25	12.5	29	14.5	34	17
Secondary Agricultural	8	6.0	8.2	6.15	10	7.5	11	8.3
Total	1323	106.65	1424.2	114	1667	133.38	1945	155.5

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1981