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دراسة السياسة القومية للتنمية الحضرية  
NATIONAL URBAN POLICY STUDY

FINAL REPORT—VOLUME ONE



ADVISORY COMMITTEE FOR RECONSTRUCTION  
MINISTRY OF DEVELOPMENT  
ARAB REPUBLIC OF EGYPT  
U.S.A.I.D. GRANT NO. 753-50042

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دراسة السياسة القومية للتنمية الحضرية

**NATIONAL URBAN POLICY STUDY**

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FINAL REPORT

THE NATIONAL URBAN POLICY STUDY  
USAID Grant No. 263 -0042

Prepared for the  
ADVISORY COMMITTEE FOR RECONSTRUCTION  
MINISTRY OF DEVELOPMENT  
ARAB REPUBLIC OF EGYPT

PADCO INC.  
with  
ENGINEERING CONSULTANTS GROUP  
and  
SHERIF EL-HAKIM AND ASSOCIATES

JULY 31, 1982

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PADCO INC  
In Association with  
ECG ENGINEERING CONSULTANTS GROUP  
&  
SHERIF EL-HAKIM & ASSOCIATES

بادكو انك  
بالاشتراك مع  
جماعة المهندسين الاستشاريين  
و  
شريف الحكيم ومشاركوه

# دراسة السياسة القومية للتنمية الحضرية

## NATIONAL URBAN POLICY STUDY

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July 31, 1982

Engineer Soliman Abdel Hai  
Chairman  
Advisory Committee for Reconstruction  
Arab Republic of Egypt

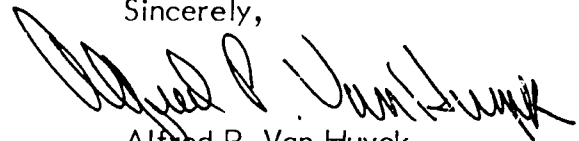
Dear Engineer Abdel Hai:

The National Urban Policy Study is pleased to submit its Final Report. This report provides a set of recommendations for urban policy which the Study Team believes could result in improvement of the quality of life of the population and increase the contribution of urban settlements to the major development goals of Egypt. The recommendations relate to spatial priorities, associated sectoral requirements and actions, and national and local administration of urban policy.

The National Urban Policy Study Final Report is complemented by three other major reports which illustrate various aspects of the study: The Urban Growth and Urban Data Report is a compilation of major urban information affecting urban policy choices, the Illustrative Development Project Reports in Tanta and Gena/Naga Hamadi show how urban policy can be implemented in two different regions of Egypt, and the Urban Management Handbook attempts to illustrate how programs and projects can flow from urban policy. The Study Team has also produced numerous working papers and occasional papers on different sectoral and spatial aspects of Egypt.

The NUPS Team has benefitted enormously from the opportunity the study provided to obtain first-hand information about the many different urban areas throughout the country and to discuss urban problems and policy issues with a very broad range of public officials at national and local levels, as well as interested private citizens and other consultants. We wish to acknowledge our indebtedness to all the people throughout Egypt who have contributed to our work. Our special thanks to you, the Chairman, and Members of our Steering Committee, USAID, and ACR's in-house advisors, TAMS and CADSAC.

Sincerely,



Alfred P. Van Huyck  
Principal in Charge

PADCO INC  
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ECG ENGINEERING CONSULTANTS GROUP  
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بانكرو انك  
بالاشتراك مع  
جماعة المهندسين الاستشاريين  
&  
شريف الحكيم وشركوه

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## PREFACE

This Final Report of the National Urban Policy Study (NUPS) presents the recommended strategy for urban development in Egypt up to the year 2000. These results, a set of integrated and comprehensive urban development policy recommendations, are derived from NUPS work since July 1980, undertaken for the Advisory Committee for Reconstruction, Ministry of Development with financial assistance from the United States Agency for International Development (USAID).

This report is one of six final reports produced by NUPS. The other final reports are:

### 1. Egypt: Urban Growth and Urban Data Report

This report is a compilation of data which was collected during the course of the work with brief descriptive narratives.

The coverage is broad since the Report is intended to provide professionals, both Egyptian and foreign, with basic information about urban Egypt and the national setting. Major sections are devoted to:

- National level data on natural features and resources, population, macro-economic features, economic sector profiles and national infrastructure networks.
- Urban settlement data on rank ordering, spatial pattern, urban typology, recent expansion (LANDSAT maps), governorate and settlement profiles, and settlement project characteristics.
- Household and housing data including household characteristics, income and expenditure estimates, income taxes, 1976 Housing Census Data, land value in urban areas, housing production and finance, and the 1979 National Housing Plan.
- Development, management and administration including the constitutional framework, national government structure, public economic units, the Suez Canal Authority, decentralization to local government, and an administrative profile of the Cairo Government.
- Legal framework for development including subdivision regulation, building regulation, the proposed Planning Law, New Urban Communities, other laws affecting land use, preservation of arable land, urban land rights and real property taxation.

### 2. Illustrative Development Project: Tanta

This report is intended to illustrate for a Delta Urban settlement, Tanta, the application of the National Urban Policy recommendations for Delta growth management and consolidation of regional service functions. Issues relating to economic and physical development of Delta cities and control of urban intrusion in arable land are emphasized.

### 3. Illustrative Development Project: Qena/Naga Hamadi

This report is intended to illustrate for an Upper Egypt urban region, Qena/Naga Hamadi, the application of the National Urban Policy recommendations for growth inducement in Upper Egypt in order to develop a number of decentralized centers to slow migration to Cairo, develop an economic base for future self-sustaining growth, and contribute to income and urban service improvements in Upper Egypt. Recommendations for future economic, physical, and administrative development are made to overcome the current constraints on the self-sustaining growth of a regional economy in Upper Egypt. The two Illustrative Development Project studies have been combined into one final report.

### 4. The Urban Management Handbook

This report is intended primarily for uses at local levels. Its major purposes are to familiarize local officials with the overall NUPS recommendations, provide summaries of special policy and program directions for each regional zone, and present guidelines for improved local involvement in planning, programming and implementation of the National Urban Policy.

### 5. The National Urban Policy Information System

This report is a guide to the library, maps, and data collection developed during the Study and turned over to the Ministry of Development. Recommendations are made about insuring future use of the materials collected, fitting the information into a broader urban planning information system, and improving on the overall information base.

The above Final Reports were preceded by a series of occasional working papers on special subjects by project staff and consultants and six formal reports to the ACR. The formal reports were:

#### 1. Status Report on NUPS, October 1980.

This report provided a progress statement on work to date and established the analytic framework for completing the study.

#### 2. Working Paper on Standards and Costs, October 1980.

This report reviewed existing urban development programs in Egypt (such as New Towns, 15th of May, etc.) and their associated housing and infrastructure standards and actual or projected costs. This study demonstrated considerable variation in standards, cost recovery mechanisms, and per capital costs among development programs. Issues were raised, therefore, related to household affordability for housing and services and public affordability of the implied subsidy levels.

#### 3. Working Paper on Characteristics of Alternative Strategies, December 1980.

This Report reviewed key criteria for establishing the major dimensions of alternative spatial strategies and expectations of their performance on important national development objectives.

4. The Interim Action Report, January 1981.

This report reviewed the basic settlement concepts employed in the choice of alternative spatial packages, examined the growth potential and absorption capacity of urban areas in Egypt, and provided an initial comparison of four alternative settlement patterns to the trend pattern (derived from 1960-1976 growth rates) and with each other in terms of major outcomes relative to national objectives.

5. The First Round Alternatives Report, May 1981.

This report provided additional information about the four basic alternatives and overall resource feasibility and risks. The report discussed investment and its financing, spatial allocation of investment under the four alternatives for the period 1986-1990, costs of infrastructure to support the alternative distributions of job-generating investment and population, and legislative and administrative requirements for regulative urban development.

6. The Second Round Alternatives Report: Recommendations For the Preferred Strategy, September 1981.

This report examined the overall context for urban policy choice emphasizing demographic and economic constraints and opportunities, reviewed the First Round Alternatives Report, completed the costing of the alternatives (1986-2000), evaluated the alternatives, assessed their legal and administrative implications and presented the Recommended Settlement Strategy that NUPS analysis had indicated would provide a feasible and beneficial performance in achieving the government's development objectives. The Final Report, in this volume, completes the analysis of the Preferred Strategy -- an integrated spatial and sectoral strategy -- for government consideration and possible adoption.

## ACKNOWLEDGEMENT

With a study of this magnitude it is not possible to acknowledge all of the hundreds of individuals who contributed to the work we have done in preparing this Final Report and the earlier reports described above. We have been fortunate to be able to talk with national and local officials throughout Egypt, Egyptian and foreign professionals in many disciplines, and to have been provided access to data and reports relating to their own work. We thank all of these people and wish to acknowledge the value to us of their contribution to the future development of Egypt and the well-being of the Egyptian people, that those who contributed their time and help will feel amply rewarded.

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## INTRODUCTION

The Ministry of Development commissioned this work to prepare a National Urban Policy for Egypt in July 1980, with financial assistance from the U.S. Agency for International Development. The Government of Egypt desired a means of integrating spatial and sectoral plans and programs so that national development objectives would have the best chance of being realized.

Such an integrative effort utilizing recent development experience and information and analysis contained in the large number of sectoral and spatial plans already prepared would permit a review of their overall compatibility with each other, their collective costs measured against available resources and their joint impact on achievement of government objectives.

The Government of Egypt has already established its broad national development objectives:

- Sustaining a high rate of economic growth.
- Improving the standard of living of all Egyptians, with emphasis on low income groups, through:
  - Creating productive employment opportunities for the rapidly growing population.
  - Generating sustained increases in real per capita income.
  - Ensuring that public service and facility gains are equitably shared by the Egyptian people.
- Achieving certain special objectives:
  - Encouragement of the deconcentration of Cairo.
  - Protection of arable land from urbanization.
  - Demonstration of an expression of modernization and progress.

The NUPS work fully supports these objectives and has used them to guide the assessment of spatial and sectoral options open to the Government. The Preferred Strategy presented in this report represents, in the judgment of the NUPS team, the best combination of performance levels on these objectives within the estimate of available resources, the 20 year time frame to the end of the century, the expected urban population of at least 37 million to be served and at acceptable levels of risk to the government and private investors (both firms and households).

Specifically, the adoption by the Government of Egypt of the strategy recommended in this report can be expected to provide the following major benefits at supportable costs:

- Economic growth and increases in real per capita income at nearly maximum achievable rates.
- Creation of the possibility of greater social equity through targeted assistance at affordable levels and greater availability of resources to utilize in providing assistance to lower income people now and in the future.
- Protection of arable land by providing migration options for Delta population growth and encouragement of growth within metropolitan regions (in satellites, new towns and areas outside the existing core areas) and "Special Emphasis Cities" on non-arable land. This will lead to deconcentration of Cairo and Alexandria core areas and site most growth on desert lands or in present low-density locations.
- An implementable and feasible level of national decentralization of urban growth away from Cairo to provide a better base for reduction of polarization of the settlement system (reversing current trends) and provide a basis for further decentralization in the future.<sup>1</sup>

The recommended strategy is based upon the review of virtually all current major spatial and sectoral plans, as well as a very substantial number of documents relating to urban development in Egypt, hundreds of interviews with government and private officials and extensive field work concentrated on the 40 largest urban settlements.<sup>2</sup> The study has developed more than 25 Working Papers, as well as 4 major interim reports leading to the development and testing of 4 spatial alternatives prior to selection of the recommended strategy.

The alternatives and the recommended strategy were tested for their likely impacts on urban development and aggregate costs based upon a consistent methodology that permitted settlement and regional variations in economic potential, functions, densities, existing and required infrastructure (both local and national systems), and standards to be taken into account and then aggregated to assess national implications. The methodology used helped ensure that the recommendations were solidly based on more than subjective judgments of where it is "desirable" for people to settle within the national settlement system. Thus, the analysis provides a basis for testing future options as well as the framework for an integrated development policy. In this sense, it is an action management tool.

When applied to the current urban agenda in Egypt (the sum of of plans and projects for cities and regions in the nations), the analysis leads to several important conclusions which now need to be addressed by government decision-makers:

- Even under the optimistic forecast of 7 percent annual real growth in the economy and a substantial increase in domestic saving, there will not be a sufficient capital resource pool to implement all of the urban projects and plans already drawn up or contemplated at their present targets and standards.<sup>3</sup>
- The more rapid decentralization of the population across the national space attempted, the higher will be the investment costs per capita and the higher the risk of a slowdown in the rate of economic growth.

- The higher the physical standards adopted in new development or upgrading older settlements or neighborhoods, the more likely it becomes that substantial segments of the population will receive little or no benefit from the investment available in their life time and the less likely it becomes that the government can recover enough of its investment to replenish the investment pool in later years.

These three conclusions underline the need to carefully evaluate the risks involved in different ways of programming urban investment in achievement of Government objectives. Following the present sectoral and spatial plans without integration or modification raises four major risks which could adversely effect the achievement of the Government's fundamental objectives:

- Because of the overall high cost, there is a risk that sufficient capital investment will not be mobilized to sustain the work over time and, therefore, the full benefits will not be realized.
- Even if the total capital investment was realized, there is a substantial risk that because the standards are so high the population could not afford to utilize the services and facilities and the Government could not afford the massive subsidies to operate them.
- Even if the full investments in spatial deconcentration to the free standing new cities and remote areas at currently planned levels were realized, there is a risk that the population could not be induced to migrate in the massive numbers implied, targets which have no precedent in world experience and, therefore, the capital assets created will not be productively utilized.
- The combined effect of the above risks would be a substantial shortfall in the rate of future national economic growth which, in turn, would make future capital investment resource pools smaller than it could be.

In our judgment, the recommended strategy makes a very substantial contribution to each of Government's objectives at an acceptable level of risk. Furthermore, the achievement of the recommended strategy within the 20 year time frame would provide a strong base for sustained economic development and further accelerated decentralization in the years beyond.

Thus, the conclusions of NUPS work are a recognition of the government's strong desire for the continuation of a major development effort in Egypt and a strategy for doing so. Recommendations for making modifications in some existing plans and projects (with regard to location priorities, scale, timing, standards, and cost recovery) are made where necessary to ensure the feasibility and enhance the probability of achieving the fundamental objectives already well established by the government.

That an integrative effort such as this intensive and comprehensive study of National Urban Policy should lead to positive recommendations for change, should come as no surprise. Indeed, it was the likelihood that NUPS work could contribute to improvement and integration of current development activities, plans and programs that occasioned the Government of Egypt to commission the work in the first place. In fact, were it not for the substantial experience in development and all of the

spatial and sector plans already undertaken at the Government's initiative, it would not have been possible for this study to carry out the rigorous analysis that has been done and offer well-supported suggestions designed to achieve a high level of performance in achieving Government's objectives.

What is needed now is government assessment of the plans and projects in light of the findings of this study and, hopefully, the adoption of the Preferred Strategy by Government, in order to take a mid-point correction in the implementation program to bring it in line with available resources to ensure the highest potential achievement of Government's objectives within the time period.

Such a review of national ministry and governorate implementation plans and programs should utilize as criteria for choice, the guidelines which have been employed in developing the NUPS recommended strategy:

- Locational efficiency criteria should guide economic investments in order to achieve high rates of economic growth and job creation.
- Public investment resources should be conserved and inter-personal equity enhanced by selecting physical standards for housing, infrastructure and provision of social facilities so that all segments of the population receive benefits from the investments made and the available resources at costs which are more affordable to the people and at subsidy levels affordable to the Government.
- Investment choices should generally favor projects and project scales which achieve early payoff in benefits to users, thus, reducing the amount of unused or underutilized assets.
- The private sector should be utilized as fully as possible to generate investment in jobs and housing to reduce the demand on public resources and thereby allow the public sector to contribute more effectively to those things which the private sector cannot effectively provide.
- Priority should be given in deconcentration efforts in the metropolitan regions of Cairo and Alexandria to relatively close-in satellite settlement areas on non-arable land selected to take advantage of economies associated with the size and diversified base of the existing settlement area.
- Priority settlements for decentralization away from the Cairo Region should be few in number and have relatively high economic growth potential in order to ensure that enough investment can be amassed to realize their potential.

These guidelines were utilized in the detailed recommendations for the NUPS Preferred Strategy. NUPS believes that, if accepted, the Preferred Strategy will provide the major means to achieve substantial gains toward the ends implied by the Government's very desirable overall national development objectives.

It should be emphasized at the conclusion of this Introduction that while the specific recommendations made in this report apply to urban development strategy, the background analysis was not restricted to narrowly defined urban issues. Furthermore, the criteria for policy choice suggested above are

relevant to broader development policies. Rather, the analysis indicates the necessity for serious consideration of these criteria in the choices which need to be made for rural development policy and the structuring of a complete national development plan.

The demands on resources which might be made, for example, in a rural development strategy to restructure Egypt's villages, reclaim anew agricultural land, and provide housing and infrastructure in agro-villages in desert development regions could be sufficiently large, unless NUPS criteria of locational efficiency in the choice of investment projects and conservation of public investments are applied to frustrate the achievement of objectives relating to urban areas specifically or national development objectives generally.

The point is that a shift of focus to a rural analogue to NUPS or the integration of urban and rural development strategies into a national development plan does not eliminate the necessity for the kind of choices which NUPS has illustrated. On the contrary, it makes the need for such choices even more apparent. The reality of this set of observations is illustrated by the analysis in Chapter IV of the current development plans for the Sinai, Red Sea Governorate, and Northwest Coast compared to NUPS recommendations for these areas; where it is shown that their implementation at currently planned levels would jeopardize achievement of needed job and infrastructure levels elsewhere in the settlement system.

A major point of the NUPS framework and analysis presented in this and previous reports is that it is necessary in contemplating investment for achieving a given settlement or sectoral objective to consider the consequences of such choices in terms of what must be given up elsewhere in order to accomplish that objective (this is the "opportunity cost" of a particular investment choice). NUPS analysis does not demonstrate that any particular investment (spatial or sectoral) must not be made. What it does show is the importance of considering the total cost consequences for the combined set of spatial and sectoral plans, the risks involved in attempting to implement all existing spatial and sectoral plans without modification, and that the opportunity costs associated with non-integrated spatial and sectoral strategies are likely to be large in terms of reduced chances to reach high performance levels on the Government's national development objectives.

As NUPS reports and presentations have frequently emphasized, it is not possible to develop a spatial or sectoral strategy that will simultaneously achieve the highest possible level of accomplishment of all of the Government's national development objectives. The necessity to make difficult choices is inherent in the enunciation of multiple objectives. What a particular spatial or sectoral strategy is likely to achieve is a mixed level of accomplishment on the set of objectives. This report provides our best estimate of a feasible and highly beneficial policy set, taking such benefits on partially competing objectives and the costs and risks of various alternatives into account.

## NOTES

### INTRODUCTION

1 "Polarization" is used to indicate the degree of primacy which exists in the Egyptian settlement system. This polarization of settlements has led to the rapid growth of the primate settlements of Greater Cairo, and to a lesser extent, Alexandria to the point where by 1976 (the last census) they were the only settlements with populations greater than one million. The next largest settlements had populations which were less than 500,000.

2 There are about 300 settlements which are classified administratively as "urban." The NUPS Team focused its attention on the 40 largest settlements which had 1976 census populations greater than 50,000 or were of special interest such as the industrial settlement of Naga Hamadi and certain settlement areas in the Remote Area (also called Frontier) governorates.

3 The NUPS Team projected a 7 percent growth rate in the economy which is consistent with official expectations as an optimistic means of forecasting the total resources which might be available to the economy for investment in urban settlements. NUPS also prepared a less favorable 5.5 percent growth rate. In the analysis which follows the potential urban "total resource pool" includes all required investment to achieve a 7 percent growth rate except agricultural and petroleum investment. Investment requirements for agro-industry and other agriculturally related industry are included in the "total resource pool."

# CHAPTER I

## OVERVIEW OF THE RECOMMENDED STRATEGY FOR THE NATIONAL URBAN POLICY

### I. MAJOR ELEMENTS IN THE RECOMMENDED STRATEGY

NUPS recommends that the Government of Egypt adopt a national urban policy which integrates spatial and sectoral policies, builds on the strengths of the Egyptian economy, is tailored to Egyptian circumstances and has a reasonably high chance of leading to improvements in income and the quality of life for Egyptian citizens.

After careful review of the alternatives, the major strategic elements of such a new urban policy are clear. NUPS recommends the adoption of a phased, selective decentralization to the Suez Canal Zone (with a major emphasis on Suez) and to Upper Egypt (with a priority emphasis on Qena/Naga Hamadi, Aswan and Assiut).<sup>1</sup> It is recommended, also, that these priorities be coupled with metropolitan deconcentration plans to accommodate substantial growth in the Cairo and Alexandria metropolitan regions, a growth management approach to the Delta and find innovative methods to overcome development constraints and an approach to increase the habitability of the remote areas.

It is both beneficial to Egypt and necessary for feasibility for the government to adopt a spatial (or settlement) strategy that emphasizes efficiency by placing primary emphasis on urban locations which will contribute substantially to national economic growth, and an additional emphasis on a selective effort to achieve wider geographic distribution of economic activity and population than has been true in the past.

In order to ensure the feasibility of the recommended settlement strategy, sectoral policies should be adopted which have the primary purpose of reducing requirements for unrecovered public investment and the additional purpose of spreading the benefits of public investment more quickly to a larger segment of the low income population.

The Ministry of Development can play a major role in seeking approval of the selected urban policy throughout the government, as well as a crucial role in its implementation through its planning, research and development operations.

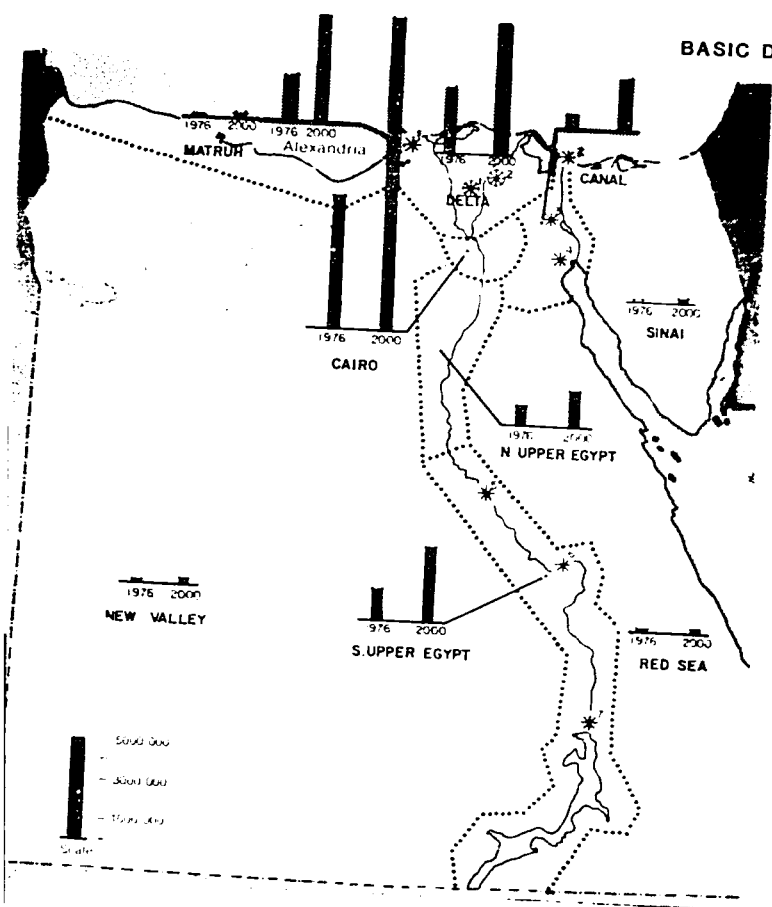
#### A. Basic Dimensions (See Figures I-1 through I-3)

The basic dimensions of the recommended strategy are these:

- I. The exploitation of strong economic advantages of the Cairo and Alexandria metropolitan regions to absorb a major portion of the expected growth in urban population while deconcentrating the core areas of these cities through development of fringe areas, close-in satellites and New Towns on desert or low productivity land. (Plans for Cairo Region year 2000 population of 16 to 16.5 million including 10th of Ramadan, 6th of October, 15th of May, and Sadat City and for Alexandria Region year 2000 population of 5 to 5.5 million including New Ameriyah.)

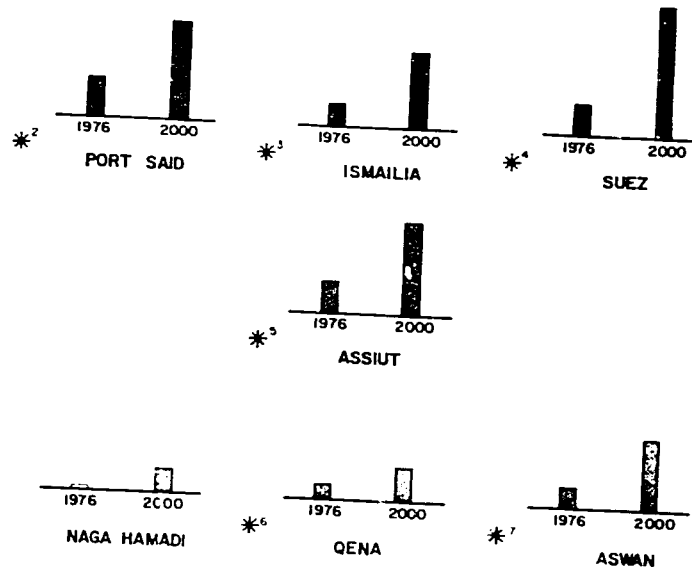


BASIC DIMENSIONS OF SPATIAL RECOMMENDATIONS

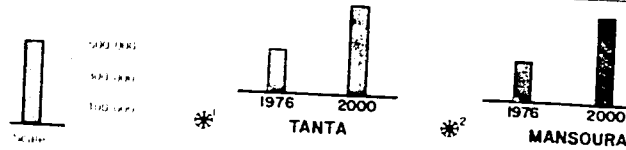


SETTLEMENT ZONE	TOTAL URBAN 1976	TOTAL URBAN 2000	URBAN CHANGE 1976 - 2000
CAIRO	6,843,000	16,500,000	9,657,000
ALEXANDRIA	2,319,000	5,500,000	3,181,000
CANAL	630,000	2,089,000	1,459,000
DELTA	3,668,000	6,952,000	3,284,000
N UPPER EGYPT	983,000	1,821,000	838,000
S UPPER EGYPT	1,488,000	3,748,000	2,260,000
REMOTE AREAS			
RED SEA	56,400	110,000	53,600
NEW VALLEY	34,400	100,000	65,600
SINAI	10,000	100,000	90,000
MATRUH	51,000	90,000	39,000
REMOTE AREAS TOTAL	151,800	400,000	248,200
TOTAL URBAN	16,082,800	37,010,000	20,927,200

\* SPECIAL EMPHASIS CITIES FOR GROWTH EMPHASIS



\* SPECIAL EMPHASIS CITIES FOR GROWTH MANAGEMENT



SPECIAL EMPHASIS CITIES (POPULATION 1976 - 2000)

SETTLEMENT ZONE	URBAN POP. 1976	URBAN POP. 2000	CHANGE 1976 - 2000
<b>SPECIAL EMPHASIS FOR GROWTH ENCOURAGEMENT (EXCLUDING ALEX.)</b>			
*2 PORT SAID	262,600	650,000	387,000
*3 ISMAILIA	147,000	500,000	353,000
*4 SUEZ	190,200	850,000	659,800
*5 ASSIUT	213,900	600,000	386,100
*6 NAGA HAMADI	19,800	175,000	155,200
*7 QENA	93,800	223,000	131,200
ASWAN	144,400	450,000	305,600
<b>SPECIAL EMPHASIS FOR GROWTH MANAGEMENT</b>			
*1 TANTA	285,000	575,000	290,000
*2 MANSOURA	258,000	550,000	292,000

FIGURE I-1

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2. A concentrated effort to support growth possibilities of the Suez Canal Zone with a focus on Suez City (year 2000 population targets of 750,000 to 850,000 in Suez, 400,000 to 500,000 in Ismailia and 550,000 to 650,000 in Port Said).
3. A strategy for managing the expected spontaneous growth in Delta cities which aims to hold growth substantially below trend rates to limit unnecessary intrusions on arable land while providing additional urban employment (special emphasis on Tanta and Mansoura with year 2000 population targets of 525,000 to 575,000 and 500,000 to 550,000, respectively).
4. An effort to induce additional growth in an initially limited number of Upper Egypt cities to develop both an economic basis and a knowledge base for more decentralization in later time periods than the planning horizon of this study (special emphasis on Assiut, Qena/Naga Hamadi and Aswan with year 2000 population targets of 550,000-600,000; 325,000-400,000; and 400,000-450,000, respectively).
5. An approach to the settlement problems of the remote areas to find innovative ways to utilize emerging technologies and establish implementing institutions to increase the attraction of these areas for human settlement (major urban population increases are not anticipated, the year 2000 population targets for the existing main settlements are 400 thousand, a slight increase over trend growth).
6. A program to maintain infrastructure and services in other urban places.
7. The choice of standards for housing and infrastructure service levels that are affordable by a wider range of the population and mechanisms that will increase the proportion of public cost recovery.
8. Increased emphasis on the industrial sector in economic planning, encouragement of private investment to conserve public funds support for small-scale industry, and integration of spatial and sectoral planning through selective use of direct investments, tax and non-tax location instruments.

Major elements of the reasoning behind these recommendations are reported in the NUPS Interim Action Report, the Working Paper on First Round Alternatives, and the series of "Occasional Working Papers" prepared by the Study Team. Chapters II, III, and IV, V and VI of this report provide information on the basis for the recommendations, spatial elements and sectoral elements of the strategy, respectively.

A schematic summary of major factors affecting urban policy choices, principles for policy choice and recommendations is provided in Figure 1-4.

The benefits of adopting the basic policy directions indicated above -- an efficiency-oriented settlement strategy with some decentralization and a strategy of conserving public investments -- derive from their probable positive effects on encouragement of economic growth (thus, an increase in the potential resource pool for future investment and efforts to improve the equity position of the worst-off elements of the population) and the reduction of pressure on public resources. These pressures currently limit Government flexibility, increase the risks of having

# ELEMENTS OF NATIONAL URBAN POLICY FOR EGYPT DEVELOPMENT CONSTRAINTS

## POPULATION :

- High Rate of Growth
- Decreasing External Demand for Labor

## ECONOMY :

- Difficulty in Sustaining High Growth Rate
- Insufficient Domestic Saving

## SETTLEMENT DISTRIBUTION :

- Rapid Urban Growth
- Increased Migration
  - Rural to Urban
  - Small to Larger City

## INDUSTRY :

- Weakness in Domestic Economy
- Low Productivity Public Sector
- Non-Selective Use of Incentives
  - Sectoral
  - Location

## INFRASTRUCTURE / SERVICES :

- Large Current Deficits
- Large Future Needs

## POTENTIAL RESOURCE SHORTFALLS :

- Domestic Investment Finance
- Agricultural Lands
- Water

## POLICY ADMINISTRATION :

- Overlapping and Dispersed Authority Nationally
- Uncertain Relationship National to Local

## EMPLOYMENT :

- Over-expansion of Service Employment relative to Industrial Employment
- Slow Growth in Farm Employment

## DEVELOPMENT PRINCIPLES

- Efficiency Orientation in Settlement System
- Conservation of Public Investment Funds

## MAJOR METROPOLITAN GROWTH :

- Cairo Region (Including, New Satellites and New Towns)
- Alexandria Region (Including, New Satellites and New Towns)
- Suez

## METROPOLITAN GROWTH MANAGEMENT :

- Core Deconcentration
- Increased Density-Peripheral Axis
- Fringe Sites and Close-in Satellites

## DELTA GROWTH MANAGEMENT :

- Migration inducement to non-arable land sites in Major Metropolitan Regions
- Sectoral/Location Control Industry
- Focus Expansion Service Centers

## INDUSTRY and REGIONAL INFRASTRUCTURE :

- Emphasize Industrial Sector in Investment
- Integrate Sectoral and Location Policies with Spatial Strategy
- Infrastructure Support for Spatial Strategy

## DECENTRALIZATION :

- No More than Three Upper Egypt Sites
- Finance only High Pay-off Projects in other Areas

## URBAN INFRASTRUCTURE and SERVICES :

- Affordable Service Standards
- Improved Cost Recovery
- Standards/Recovery Related to Spatial Targets

## DEVELOPMENT STRATEGY

FIGURE I-4

insufficient resources to complete desirable projects and lead to popular expectations about what the Government can do that are difficult to achieve in practice.

## B. Spatial Elements of the Preferred Strategy

### I. Cairo Metropolitan Region (See Chapter III, Section I for detailed discussion.)

The twin concerns of adverse effects of concentration of population in the core areas of Cairo and polarization of the Egyptian settlement system resulting in the primacy of the Cairo region must be addressed in any serious national urban policy for Egypt. The main weapons recommended by NUPS to begin the necessarily slow process of reversing the trend of substantial migration to the Cairo Region are:

- A major effort to improve Alexandria's position as the chief urban competitor in Cairo.
- An enhanced effort and renewed commitment to develop Suez as a major urban region and Suez City as a major center.
- A concentrated decentralization effort in up to three South Upper Egypt "Special Emphasis" cities.

The major weapons recommended by NUPS to accelerate the deconcentration of the core of Cairo while the Region continues to gain population to over 16 million by year 2000 are:

- Preparation of sites in desert fringe areas as alternative locations for low income people in crowded Cairo *kisms* to shift the axis of development from a north-south direction to an east-west direction.
- Acceleration of development at higher densities in current low density portions of the region.
- The development of a larger number of small non-contiguous settlements on the periphery but closer to the current built-up areas than 10th of Ramadan and Sadat City, such as El Obour and 6th of October.
- Consideration of modifying development plans for 10th of Ramadan and Sadat City to permit resources to be allocated for the alternative developments above and, through their development, to make location in 10th of Ramadan and, subsequently, Sadat City more attractive for business and residence in the future. The kinds of modification include reduced standards, higher densities, and greater cost recovery.

It is essential to emphasize, also, the many positive reasons for recommending substantial growth in the Cairo and Alexandria Region. Cairo and Alexandria are the most dynamic elements of the settlement system, attracting private investment in industry, services and housing, and contributing extensively to national economic growth relative to both their size and other places. They combine the advantages of primate cities cited by Harry Richardson:

"The economic advantages of primate cities in developing countries are considerable: higher returns on investment than in other locations; economies of concentration in urban service provision in capital poor economies; transportation advantages; communication economies; the dominant source of innovation and managerial expertise and the diffusion center for developmental impulses and for economic, technical and social change. The finding that in a study of 46 developing countries there was strong positive association between aggregate growth performance and increasing primacy (Mera. 1973) deserves emphasis."<sup>2</sup>

NUPS recommendations support the direction of current government policy favoring core deconcentration. However, we recommend that priority be given to close-in satellites, peripheral areas on desert land, and infill in less dense *kisms* while slowing the investment in free-standing new towns as presently planned, until their comparative economic advantage improves.

The New Towns Policy of Egypt was commendably conceived as a means of ordering and deconcentrating settlement patterns and economic activities in Egypt away from the centers of Cairo and Alexandria. This policy was also seen as a means of encouraging further urban growth on desert land away from prime agricultural land. However, the rapid development of new urban centers cannot be easily achieved as world experience shows, and success will necessarily be subject to the gradual creation of economic activities and jobs.

The establishment of large centers of over 100,000 population is most difficult unless they are very closely linked with existing large cities. Location near existing employment or raw materials is critical. The larger free-standing new towns of 10th of Ramadan, Sadat City and New Ameriyah City lose a considerable part of this advantage by being sited too far from the existing built-up area. They would require major large institutions, such as substantial numbers of government offices, to create the initial critical mass necessary for success and a much longer period than presently planned to meet their target populations.

The smaller satellite cities of 6th of October, El Obour City, and 15th of May City are in much better locations with regard to the above criteria. However, the standards and costs for investment in infrastructure, community facilities and housing in current New Town designs are such as to impose very heavy strain upon the Egyptian economy and to cause many other required infrastructure investments to be foregone. The estimated cost for the completion of Sadat City, 10th of Ramadan City, 15th of May City, and 6th of October City would represent about 16 percent of the total infrastructure investment allocated for the entire Cairo Region over the next 20 years based on the NUPS Preferred Strategy estimate. This huge investment would only serve 4.9 percent of the projected population of the Region in the year 2000 if the NUPS population goals of the New Towns, shown in Chapters III and V, are reached.

The investment strain could be reduced by increased density and land use efficiency. Significant reductions in standards for infrastructure, community facilities, and public housing are required as well as improved cost recovery through the sale of land. In addition, the present scope of the New Towns is so large that

they will put great strain on managerial and organizational abilities, both for construction and for the development control required if their planned design are to be maintained.

Perhaps, most importantly, the present New Towns Policy is a very high risk strategy. The scale and the costs, combined with the lack of a convincing economic and industrial development strategy, make the free-standing towns an enormous gamble. The satellite towns under construction have a better chance of success but still are costly compared to urban expansion projects, such as Nasr City.

If the current New Communities program is continued, it should be approached incrementally. Each stage of a project should be evaluated and show some signs of success before moving on to the next stage. Standards should be reduced and residential densities increased. Satellite towns should be given priority over the free-standing towns. In that way, the risk of loss will be reduced and the New Towns Policy may lead to positive long-term results.

## 2. Alexandria Metropolitan Region (See Chapter III, Section I-C)

NUPS recommended strategy for accelerated growth in Alexandria calls for the allocation of a large portion (18.7 percent) of industrial investment to expand Alexandria's already considerable economic base. Its expanded industrial base is expected to accelerate growth in other sectors which together will provide a substantial attraction to potential migrants from the Delta and elsewhere in competition with Cairo. In Alexandria, as in Cairo, the recommended development strategy within the region is core deconcentration through the development of secondary sub-centers, such as Ameriyah, Moharram Bey, and Idku plus additional fringe development in Dekheila and Agany. Additional infill and vertical development should be encouraged within urban boundaries in the *kisms* of Bab Sharky, Sidi Gaber, Ramleh, and Montazah. The considerations cited above for New Towns apply to New Ameriyah.

## 3. Suez Canal Zone (See Chapter IV, Section I)

The Study Team has concluded that the current Suez Master Plan provides a good basis for future developments to major metropolitan size with some modifications regarding proposed direction of growth, land use, and development standards. Our analysis indicates the desirability of modifying standards for both residential and industrial development. Recent industrial and population expansion are encouraging signs that population targets can be reached.

It is anticipated that major growth in Suez would contribute to urbanization possibilities elsewhere in the Canal region, plus provide an urban anchor to smaller settlements in the Sinai and Red Sea coast.

## 4. The Delta Zone (See Chapter IV, Section III)

NUPS recommended strategy emphasizes the special growth management problems of the Delta -- a zone which has been seriously neglected in planning and overt urban policy design. Significant choices need to be made in the very near future regarding urbanization of the Delta. The overwhelming size of Cairo and its associated service and management problems have diverted attention from



the relatively uncontrolled growth of Delta cities and the substantial build-up of the corridors of Cairo-Benha; Tanta-Damanhour, Kafr El Dawar-Alexandria. The whole set of urban and rural development issues, industrialization and agricultural growth, and orderly use of both urban and arable land find expression in the Delta. It is not an exaggeration to say that the ability to manage urban and rural growth effectively in the Delta may be the key to the long-term development path of Egypt.

The major elements of our proposed growth management strategy for the Delta are:

- Encouragement of migration from the Delta (where most growth is necessarily on arable land) to the major metropolitan regions of Cairo and Alexandria and the growing region of the Suez Canal (where growth is possible on desert land rather than on high productivity agricultural land, if properly managed.)
- Consolidation of regional service center functions (such as major medical facilities, warehousing, service facilities for agricultural equipment) in two to three Delta cities, rather than their duplication in all governorate capitals and other relatively large cities.
- Formal recognition of the entire Delta as a region for regional planning purposes and the development of an integrated economic and physical development plan for the region.
- Immediate development of information and analysis (of the kind provided in NUPS Illustrative Development Projects for Tanta and Qena/Naga Hamadi) to support near-term physical development and land use planning.<sup>3</sup>
- Establishment of a formal, publicly recognized, procedure for defining and adjusting city boundaries.
- A moratorium on all industrial, institutional and housing projects outside existing city boundaries; until any such projects have been determined to be consistent with both national urban policy and the proposed integrated economic and physical regional plan.
- Initiation of a requirement that proposals for sectoral projects, which are the responsibility of national ministries (e.g., Transportation, Industry, and Health) be reviewed for consistency with the regional plan before implementation.
- Initiation of a requirement that all proposed industrial projects for the Delta be examined to determine the possibility of their being located outside the Delta without serious loss of profitability relative to a Delta location.

##### 5. Upper Egypt (See Chapter IV, Section II)

The general policy which we recommend for Upper Egypt is to focus industrial and employment growth efforts on three appropriately spaced regional centers to encourage urban decentralization to the Upper Nile Valley without severe loss of national

economic growth. The development strategy proposed for these places is to develop from the existing urban base of Aswan, Qena/Naga Hamadi and Assiut on non-arable land. The basic industrial strategy is to build on existing industry and local natural resources to broaden inter-industry linkages and to develop industries to produce goods locally for the growing regional market so that import from abroad or from other industrial centers to the region are reduced. A considerable part of this growth will necessarily relate to agriculture -- either as a market for industrial goods or as a supplier of raw materials.

It is expected that, at least over the next 10-15 years, substantial inducements will need to be offered to potential private firms and subsidies to public firms in order to establish a broad enough economic base to support both substantial regional urban populations in the future and linkages to further development of the Southern Red Sea coastal area and the Western Desert.

#### 6. Remote Area Development (See Chapter IV, Section IV)

The National Urban Policy Study recognizes the national importance of initiating a positive program in the Sinai, Red Sea Governorate, Western Desert and Northwest Coastal areas but has concluded that the Remote Areas should not be induced to play a major role in accommodating future urban population by the year 2000.<sup>4</sup> Opportunities for development are limited, resources (notably water) are scarce and investment costs are substantially higher than in other potential sites for decentralization. However, this does not mean that the Remote Areas should be ignored -- some investment and experiments in these areas will lead to greater potential for future expansion and help resolve critical deficiencies which may be faced by Egypt as a whole in the next century.

The strategy for development in the Remote Areas thus, should be on high payoff investment opportunities on a project-by-project basis rather than full regional development programs (at any cost) to reach sizeable predetermined target population objectives. NUPS proposes a general investment allocation which would permit current infrastructure standards to be moderately upgraded and enough direct investment for industry and services to result in higher-than-trend population growth in these areas over the planning period (if projects are developed and implemented which are economically efficient).

Because of their current development constraints, the Remote Areas are locations in which it is desirable to consider controlled and carefully designed innovative projects (particularly those utilizing new technologies) to deal with the potential long-term constraints and needs for greater efficiency and conservation which will increasingly face Egypt as a whole. These include: water resource management, alternative communications, agriculture and energy technologies, and climatically adapted settlement types.

The urban population projection for the year 2000 adopted and costed in the Preferred Strategy was 400,000 based on judgments about the possibilities for developing viable projects, the costs of development in these areas and the need to keep overall costs of urbanization within feasible limits.

At the levels of investment recommended by NUPS, it is possible to achieve some net in-migration into the Remote Areas. Even these levels of growth, however, are

quite expensive relative to growth elsewhere in the settlement system. For these areas to absorb less than three-quarters of 1 percent of the urban population increase between 1985 and 2000 would require almost four times that share of national investment in job creation, housing, intra-urban infrastructure as well as additions to regional water, power, transportation and telecommunications investment. While it is recognized that existing planning proposals for the Northwest Coast, the Red Sea, the Sinai, and the Western Desert suggest larger population targets (and substantially higher costs), it is suggested by NUPS that these need to be reviewed in the context of investment requirements for the whole urban system and likely aggregate resource availability for implementing urban policy.

### C. Sectoral Elements of the Preferred Strategy

#### I. Industrial Policy (See Chapter V, Section I)

Throughout the work of the National Urban Policy Study, the importance of employment as the prime determinant of population location has been emphasized. Further, it is clear that among employment sectors, it is the industrial sector which must provide the basis for employment in other sectors to expand productively in urban centers.

Our basic recommendations for public policy toward industry flow from these propositions. They are:

- Investment should be channelled toward increasing the relative share of manufacturing in Gross Domestic Product and employment.
- Inducements, incentives and taxes should be structured to support spatial and sectoral objectives of national urban policy. This entails making discriminating use of tax abatements, subsidies, and penalty taxes. Discrimination should be exercised with respect to both the number of places where positive inducements are offered and the sectoral activities which are eligible.
- Non-tax incentives should be used, also, in support of spatial objectives. Three such incentives are provision of suitable serviced sites, training of labor and provision of credit facilities in more urban areas available to small firms.
- For the tax and the non-tax incentives alike, it is crucial that they not be overextended geographically. By restricting them to designated cities and applying them differentially they will more likely produce the desired results, while a non-restricted approach will eliminate the locational effects and unnecessarily drain the public budget.
- Encouragement should continue to be given to private investment in industry, both to encourage entrepreneurship and to conserve on the amount of public investment funds required.
- Continuing efforts should be made to enhance the productivity of public enterprises.
- Encouragements should continue for agricultural policy changes that lead to the economic enhancement of the agricultural sector; both to provide additional

agricultural inputs to industry and to increase the demand for products of domestic industry servicing agricultural needs.

- Consideration should be given to developing a tax on new industrial activities within the core area of Cairo, in order to encourage location in more desirable sites within the metropolitan region and to compensate for at least part of the net additions to service and disamenity costs caused by location of industrial firms in core Cairo.

## 2. Intra-Urban Infrastructure Policy (See Chapter V, Section II)

NUPS basic recommendations for shelter and intra-urban infrastructure are:

- The standards of intra-urban infrastructure, thus, investment levels, should be set to achieve national spatial objectives. That is, certain places receiving special emphasis should be targeted to receive higher levels of investment and standards of intra-urban infrastructure than others. However, in determining the standards which will be targeted for special emphasis places, the overall impact of providing these standards should be measured against the ability of government to provide more basic levels of services in other places. Standards in some places should not be set so high that it makes provision of infrastructure in other urban places impossible, or that the higher standards create investment requirements which ultimately cannot be achieved.
- Much of the burden of providing intra-urban infrastructure should be shifted from the public sector to the private sector through appropriate choices of standards which allow direct investment by the private sector, where possible, or greater levels of cost recovery where direct investment is not possible or desirable.
- In non-special emphasis areas of the urban settlement system, government investment priorities should be on the provision of social infrastructure, i.e., education, health, etc., and on provision of basic levels of physical infrastructure such as potable water systems to ensure that the quality of life in all urban settlements is improved and that greater inter-regional equity can be achieved.
- Following from the second recommendation, i.e., shifting the burden of infrastructure investment from the public to private sectors, except in special cases (which will be discussed later) all investment in housing should be made by the private sector. During the past six years, the private/informal sector in Greater Cairo has achieved an annual growth rate in dwelling units of 5.3 percent. Similar, though less dramatic, increases in the housing stock have occurred in other settlements as well. Therefore, due to this demonstrated private capacity, the need for public sector direct investment in housing is much less than for other components of infrastructure.
- Due to the private sector capacity for providing housing, the role of public sector agencies, which have been traditionally charged with providing housing, should be re-examined and modified so that they facilitate private/informal sector activities in desirable locations through provision of serviced land. These same agencies should serve as a mechanism for attracting private/informal sector resources into formal banking activities which could then serve as a

mechanism for regulating the flow of financial resources into different components of intra-urban infrastructure while still providing adequate rates of return to individual investors.

- The major emphasis of public sector direct investment in intra-urban infrastructure, therefore, should be on providing basic levels of physical and social infrastructure which are necessary to encourage industrial expansion and to support private sector investment in other components of infrastructure. These investments should be timed and phased in such a manner to ensure that both private sector housing and industrial investment go into desirable locations consistent with national urban policy objectives. For example, early investment in physical infrastructure in nearby, fringe desert locations of Greater Cairo should be made to shift the axis of development from a north-south direction to an east-west direction.
- Urban settlements should aim at more efficient use of land and infrastructure investment through achieving greater gross densities. We have recommended as a target that settlement gross densities (the densities measured by the settlement's population within its boundaries) be within the range of 300 persons per hectare and that general standards of public land consumption for all uses (excluding public sector industrial and like developments) be roughly 30 percent of the settlement area for new development.
- Although NUPS recommends that standards of intra-urban infrastructure should be set to achieve greater cost recovery, as a result of inter-regional inequities in the settlement system and intra-urban inequities, some subsidies of intra-urban infrastructure costs are likely to be necessary to provide all urban areas with basic standards of living. However, these should be limited to reducing inequities and should be targeted to groups receiving only basic levels of infrastructure services. Furthermore, these subsidies should be limited in duration so that as household incomes increase, the level of subsidies are reduced.
- Finally, due to their size, investment in intra-urban infrastructure in Greater Cairo, and to a lesser extent Alexandria, should be carefully monitored to ensure that standards are fixed at affordable levels to reduce overall subsidy requirements and to aim at producing surplus savings which can be used to finance investment in other areas.

### 3. Inter-Urban Infrastructure Policy (See Chapter VI)

Our basic recommendations for inter-urban infrastructure are:

- Power

Due to the very large investments involved and the long construction periods, the feasibility of initiating a nuclear energy program over continued investment in conventional technologies should carefully weigh the possible impact of economic pricing of energy on demand for electrical power. Even if a nuclear energy program were started, economic pricing of electrical energy could reduce demand by encouraging consumers to be more efficient in energy use and, thus, reduce total investment requirements. For example, a 10 percent annual growth in

electricity tariffs could reduce projected electricity demand by up to 35 percent and a reduction in investment requirements for total generation using nuclear technologies on the order of 46 percent, over a 20 year period compared to a retention of existing relative prices. This reduction in demand would result in a total investment requirement for new conventional power plants which would be roughly L.E. 8 billion less than nuclear energy power (assuming of course, that the location and type of demand remain constant for both).

In selected areas of the country where spatial priorities exist, such as the Upper Egypt settlements proposed for special emphasis, a policy of granting incentives to industries in the form of reduced electricity tariffs resulting from relatively lower generating costs of hydroelectric power should continue to be considered. However, such a policy should be coupled with more economic pricing of electrical power in other regions to compensate the electricity sector for any revenue losses resulting from such incentives.

- Transport

The bulk of future investment in inter-urban transport should be aimed at improving the performance of existing transport infrastructure, particularly the rail network. Major modifications of the existing inter-urban network are not required by NUPS recommendations, although NUPS proposals will cause changes in passenger and freight movements between different parts of the network. When the development of new capacity in inter-urban transport networks is being studied, this capacity development should support national urban policy objectives. For example, continued expansion of the capacity of the Cairo-Alexandria Agricultural Road through the Delta should be carefully studied in terms of its likely impact on continued, uncontrolled expansion of urban settlements in the Delta and the increased difficulties in changing the trends of urban expansion of Greater Cairo and Alexandria, e.g., changing the physical growth of Greater Cairo from a north-south to an east-west direction would be greatly impeded by continued expansion of the Delta Road which would encourage further growth in a northerly direction.

- Telecommunications

Expansion of the telecommunications network should be linked with encouragement of public and private sector consumers to invest in new technologies which provide efficient service but reduce overall demand for plant and equipment. Such policy would improve the current standards of telecommunications 4.7 times, but would result in a reduction of capital requirements for expansion of the system of L.E. 8 billion (over the 1986-2000 period) less than if the standards proposed by the telecommunications sector study were followed, i.e., a national telephone density of 8.65 lines per 100 population vs. 5.5 lines per 100 population if an improved technology were utilized.<sup>5</sup> Further, continued moves should be made by the telecommunications sector towards economic pricing which would allow more of the sector's capital requirements to be financed internationally.

## II. THE CONTEXT FOR POLICY CHOICE

Several aspects of the current population and economic picture contribute strongly to the NUPS conclusion that it is extremely important for the Government of Egypt to develop and implement an integrated set of urban settlement and sectoral strategies over the next two decades with an emphasis on efficiency in the settlement system and conservation of public investment in sectoral policies.

### A. Population

First, the magnitude of the urban population to be settled and served is large and is expected to grow rapidly. The natural rate of population increase remains high as the decline in fertility rates anticipated in many population forecasts has not yet appeared. Consequently, the resident population total of 67.5 in year 2000 adopted by NUPS as a reasonable medium estimate for planning purposes, may turn out to be on the low side. It is highly unlikely that the population will be lower than this estimate.

Secondly, the resident population depends on the rate of migration to other countries, for given rates of natural increase. Although it is very difficult to anticipate the future push and pull factors which will determine this rate of migration, there are indications that the demand for Egyptian labor is declining in other Middle Eastern countries or at least not increasing at rates which have prevailed in recent years. Consequently, external migration may fall below current estimates leading to a higher residential population than anticipated earlier.

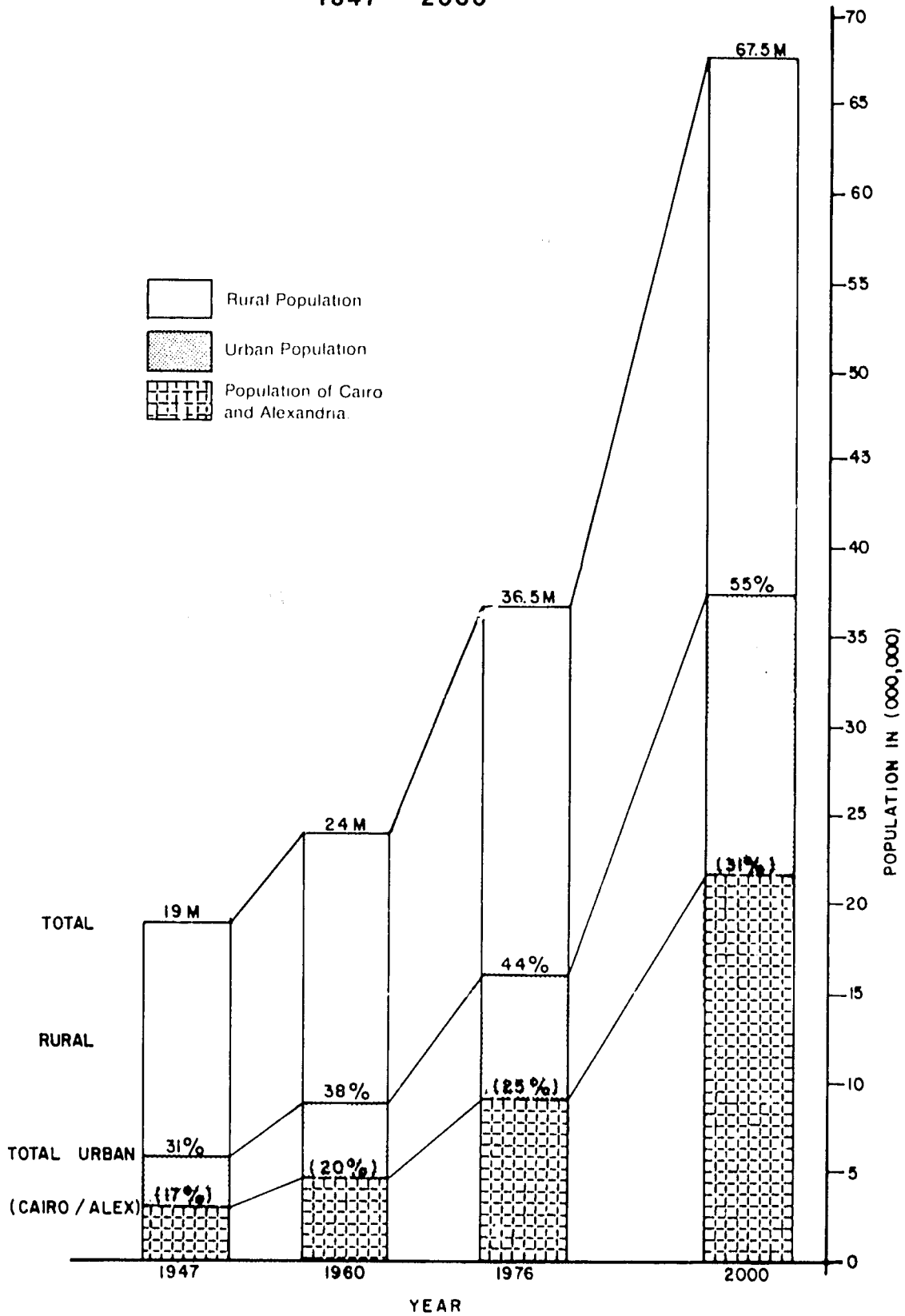
The third aspect of the population issue is the proportion of the resident population which will settle in urban and rural areas, respectively. The estimate of year 2000 urban population used in NUPS calculations of 37.0 million assumes a decline in the rate of population growth in rural areas, but an absolute increase of over 7 million. (Figure 1-5).

The amount of rural to urban migration which will occur between now and year 2000 depends upon urban and rural development policies, as well as the rate of natural increase. Although the detailed examination of rural development policies is outside the scope of our current NUPS work, the team has made an attempt to understand the effects of major elements of rural development policy and agricultural prospects.

Efforts are currently being made to shift agricultural policy in directions which will tend to increase the returns to farmers for their produce. Such changes could result in generally higher incomes in rural areas. At the same time, however, the evidence suggests that aggregate labor requirements in agriculture will increase very slowly, if at all.<sup>6</sup> Thus, the overall prospect is for improvements in rural standards of living, but continued need for the rural population to seek non-farm employment leading to continued high rates of rural to urban migration.

The possible option of large increases in non-farm employment in rural villages and farms is not recommended since it poses a direct threat to land used for farming and fails to take advantage of agglomeration economies afforded by the larger urban areas in rural governorates. These latter advantages support a recommendation of

# URBAN POPULATION PAST GROWTH AND PROJECTIONS 1947 - 2000



Source: Capmas (1947-1960-1976), NUPS "mid-range" projection for 2000

**FIGURE I-5**



locating a substantial portion of agriculturally-related industrial and service activities (which may grow in importance in the economy, if current trends in agricultural policy are maintained) in proximity to the farm areas, but in existing urban centers.

The combination of all these factors (continued high birth rates, possible reductions in the rate of external migration, and continued high rates of rural to urban migration) means that the NUPS assumption of 37 million urban residents by the year 2000 is, if anything, on the low side.<sup>7</sup> Consequently, it is imperative for those dealing with urban issues to plan for at least this much urban population in estimating urban and inter-urban investment requirements. An expanded and effective population policy would clearly be desirable but would have relatively small effects on the population by year 2000.

#### B. The Economy: Aggregate Growth and the Resource Pool for Investment

The recent growth performance of the Egyptian economy, in aggregate terms, has been excellent. The major sources of growth in the last several years have been petroleum revenues, remittances from Egyptians working outside the country, revenues from the Suez Canal, and tourism. A recent report prepared for the Ministry of Economy<sup>8</sup> as well as a recent report from the World Bank,<sup>9</sup> while recognizing the strength of this growth, caution against assuming that: (1) the recently experienced rates of growth in these sectors will continue in the post-1985 period or that (2) the growth represents any major improvement in the economic performance of domestic industry.

The investment required in the Egyptian economy to generate additional output and employment remains high by international standards and indicates the need for productivity improvements in existing industry and agriculture as well as continued efforts to select future industrial projects with a high probability of positive rates of return and locations for the projects which provide the greatest cost advantages.

As shown in earlier reports, these requirements generally favor locations in areas which already have substantial economic bases and are large enough to generate economies of agglomeration.<sup>10</sup>

The NUPS projections of a 7 percent rate of economic growth to the year 2000 assume relative stability in the relationships between investment and both output and employment, although with some increase in capital/outputs and worker/output relationships.<sup>11</sup> A discussion of these projections, investment requirements and financing is provided in Appendix I-B. While these assumed relationships are potentially achievable, they will not hold automatically -- a concerted effort to improve productivity in existing industries and agriculture and to select new investments with technical characteristics and requirements which are aligned with Egypt's factor endowments will be required.

A further aspect of the economic situation which requires specific attention is the generation of resources available for investment. The investment levels required to generate an average annual growth rate of 7 percent are much larger than can be financed from domestic saving unless there is a dramatic change in recent patterns. As shown in the NUPS Working Paper on First Round Alternatives:

"The fraction of output growth which was saved in 1978 and 1979 fell far short of that anticipated in the Development Plan. In other words, an increase in national income of the 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."<sup>12</sup>

There are three basic sources of investible resources available to Egypt: (1) foreign savings, (2) public domestic savings, and (3) private domestic savings. Although foreign resources have been available in the recent past to help permit the very substantial investment program to be followed, it is reasonably clear that major improvements will need to be made in domestic public and private saving for the longer-term maintenance of investment at desired levels.

It is worth repeating here the comment from the Ministry of Planning's Egypt's Development Strategy, Economic Management and Growth Objectives, 1980-1984, cited in our earlier report:

"The domestic savings target will require special efforts, because it calls for 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."<sup>13</sup>

Public saving is defined as the difference between government revenue and current expenditure. In the years 1976 and 1979, current expenditures exceeded government revenue resulting in negative public savings. In 1977 and 1978, public saving was positive but covered a relatively small portion of public investment (18 percent in 1977 and 10 percent in 1978). The Government deficit (the differences between public investment and public saving) rose from L.E. 1.265 billion for 1976 to L.E. 2.637 billion for 1979. The public saving issue remains one of finding ways to increase revenues without stifling private investment and to reduce current expenditures or the unrecovered portions of public investment.

The conclusions from these considerations about public saving and investment are that the Government should select public enterprise investments that will yield relatively high revenues, emphasize urban locations with clear economic advantages and that the Government should select housing and infrastructure policies that result in higher rates of cost recovery per pound of investment than are now achieved.

The means for achieving the first result are careful evaluation of the economic consequences of the types and locations of public enterprise investments, where efficiency criteria should dominate selection. An efficiency orientation in the settlement strategy such as that recommended here will help achieve the second result. The means for achieving the last result are careful selection of affordable standards for housing and infrastructure programs and the initiation of cost-recovery mechanisms from the users of public investments.

Domestic private savings are influenced both by the possibility of direct investment of funds not used for current consumption and the availability of financial instruments (e.g., savings accounts and investment certificates) which yield a positive return. There is, for example, strong private interest in the informal housing sector which already is producing the major share of new housing. Its encouragement on sites the Government finds desirable -- i.e., because it is on non-arable land or because its location could contribute to desired changes in the direction of growth of expanding cities -- could further relieve the Government of requirements for unrecovered public investment in housing. Policies which encourage private entrepreneurs in other lines of productive activity would also increase the private share of the investment pool. Substantial increases in private use of financial instruments are unlikely unless the return is not only positive but greater than the rate of inflation -- otherwise funds are channelled into the purchase of consumer goods rather than into saving.

### C. Summary

This review of the overall context within which national urban policy choices must be made shows that high rates of growth in the national population, relatively little increase in the population absorption capacity of agricultural areas, and a possible slow-down in the rate of external migration all point to a substantial increase in the urban population. This in turn, leads to the conclusion that there will be very high levels of demand for jobs, housing, and infrastructure services in urban areas. Satisfying these demands will require the selection of job-generating investments (both by type and location) with a high probability of positive economic return (and, therefore, their continuing provision of employment opportunities). It will require, also, increasing the contribution of citizens to investment (as in the informal housing sector) and their contribution to the costs the government incurs for housing and services through ensuring that the standards of provided housing and services are affordable and that users pay for a larger share of the services received.

The review of the overall economic picture emphasizes the need to generate higher levels of domestic public and private saving, both to ensure that there are sufficient local resources to make full use of foreign assistance and that the overall resource pool is large enough to finance purely domestic investments.

The NUPS team recognizes that the necessary actions to generate an adequate resource pool and meet the requirements of an expanding population must involve more than the Ministry of Development. The Ministries of Finance, Economy, Planning, Industry, as well as the ministries operating infrastructure programs to serve urban areas, and governors must clearly be involved. However, this review suggests a potentially highly influential role for the Ministry of Development, through its

adoption of a preferred strategy for national urban policy, in setting the stage for complementary actions by other ministries. This can be done by adopting spatial priorities for urban development that contribute to an efficiency-oriented settlement strategy and sectoral policies consistent with a strategy of conserving public investment -- that is, the provision of housing and other infrastructure at affordable standards (reducing initial outlays per capita) accompanied by increased efforts at higher levels of cost-recovery from those served by public investment (increasing the return flow of reinvestable funds). These actions by themselves will not ensure the successful implementation of a national urban policy. The operations of the Ministries of Finance, Planning, Industry and major spatial infrastructure ministries (such as Transportation, Health, Education) will strongly influence whether spatial elements of the strategy can be achieved within feasible investment levels.

### III. BENEFITS AND COSTS OF THE PREFERRED STRATEGY

#### A. Benefits

If the Government of Egypt adopts the Preferred Strategy, NUPS analysis indicates that substantial benefits would accrue to the country and the Egyptian people, relative to other alternatives open to the government at feasible costs. Not only is the Preferred Strategy beneficial relative to other future options explored in considerable detail in this study; but it would represent, also, a substantial improvement over a policy based upon extrapolation of past trends. A particularly striking example of this is that the Preferred Strategy could lead to a savings of over 30,000 feddans of arable land in the Delta compared to the likely land loss calculated from an extrapolation of past trends.

This section of the report is devoted to a description of the major benefits associated with implementation of the Preferred Strategy and an illustration of the strategy's benefits relative to its costs. The benefit/cost advantages of the Preferred Strategy relative to other options are explored also.

It must be emphasized at the start that benefit estimation is not an exact science and, further, that the achievement of the possible benefits within the indicated costs depends enormously on the way the policy is administered as well as on future circumstances which are not possible to predict now. Nevertheless, the previous analysis of a wide range of spatial and sectoral policy possibilities permits a reasonable amount of confidence in describing benefits that are possible to achieve.

Figures 1-6 through 1-8 display a number of the most important performance characteristics of the Preferred Strategy that contribute to benefit assessment. These may be summarized as follows:

- The Strategy performs very well on economic criteria, leading to high rates of economic growth of output and employment at costs which are both within reach, given the resource pool, and lower than most other alternatives explored. NUPS

# دراسة السياسة القومية للتنمية الحضرية

## NATIONAL URBAN POLICY STUDY

### NUPS PERFORMANCE DATA:

#### POPULATION PARAMETERS YEAR 2000

TOTAL	URBAN	LARGE URBAN
67.5	37.0	31.9

(in millions of inhabitants)

المجموع	الحضر	حضر ضخم
٦٧,٥	٣٧,٠	٣١,٩

(بالمليون نسمة)

معطيات الأداء بالدراسة :

معالم السكان سنة ٢٠٠٠ :

### ECONOMIC PERFORMANCE :

ANNUAL GDP GROWTH RATE	: 6.9 - 7.0%
1980: L.E. 267	2000: L.E. 640 - 650 PER CAPITA GDP
TOTAL RESOURCE POOL *	: 105.8
(in L.E. billions)	
TOTAL URBAN DEVELOPMENT COSTS	: 101.1
(in L.E. billions)	

\* Total investment less agriculture and petroleum investment pool

معدل النمو الاقتصادي للبلاد (نصيب الفرد)	٦,٩ - ٧,٠ %
١٩٨٠ : ٢٦٧ ل.ع. في راس	٢٠٠٠ : ٦٤٠ - ٦٥٠ ل.ع. في راس
حجم الموارد المتاحة (بمليارات ل.ع.)	: ١٠٥,٨
مجموع تكاليف التنمية الحضرية (بمليارات ل.ع.)	: ١٠١,١

(\*) مجموع الاستثمارات ناقصاً احتساب الاستثمارات المتوقع توافرها في قطاعات الزراعة والنفط

الأداء الاقتصادي :

COST COMPARISON: PREFERRED AS A PERCENTAGE OF OTHER ALTERNATIVES			
of A	of B <sub>1</sub>	of B <sub>2</sub>	of C
98%	83%	89%	77%

مقارنة التكاليف الاستراتيجية المقترحة إلى البدائل الأخرى			
ح	ب	ب	ج
٧٧%	٨٩%	٨٩%	٧٧%

### PERFORMANCE OF ALTERNATIVES :

- INVESTMENT SURPLUS OR DEFICIT VS. RESOURCE POOL				
NUPS	A	B <sub>1</sub>	B <sub>2</sub>	C
+ 4.7	+ 2.6	- 7.5	- 7.9	- 25.6

(in L.E. billions)

النقص أو العجز في الاستثمار مقارن بإجمالي حجم الاستثمارات المتوقعة				
الدراسة	٢	١	ب	ح
+ ٤,٧	+ ٢,٦	- ٧,٥	- ٧,٩	- ٢٥,٦

(بالمليارات جنيه مصري)

- JOB GROWTH SUPPORTABLE BY RESOURCE POOL		
NUPS PREFERRED	B <sub>2</sub>	C
7.1	6.3	5.4

DIFFERENCE FROM NUPS

(in millions of jobs)

حجم العمالة التي تؤدي إليها الاستثمارات المتوقعة		
الدراسة	ب	ح
٧,١	٦,٣	٥,٤

الفرق عن نابس

- NET ECONOMIC BENEFITS					
CUMULATIVE 1986-2000		CUMULATIVE PER CAPITA		RATIO: NUPS TO C	
NUPS	C	NUPS	C	CUM.	ANNUAL
160.3	123.5	665.3	846.7	1.43	1.27

L.E. billions

L.E. per capita

صافي المنفعة الاقتصادية		
مقارن ١٩٨٦ - ٢٠٠٠	المتوسط السنوي	نسبة العائد من الاستثمارات الحضرية للفرد من
الدراسة	الدراسة	الدراسة
١٦٠,٣	١٢٣,٥	١٢٧
١٢٣,٥	٨٤٦,٧	٨٤٦,٧
١,٤٣	١,٢٧	١,٢٧

(بالمليارات جنيه مصري)

### PHYSICAL PERFORMANCE :

LOCALATIONAL CHARACTERISTICS OF URBAN POPULATION (1,000's OF PERSONS)				
NUPS ZONE	ARABLE LAND (in urban boundaries)	URBAN INFILL (some arable (low productivity)	ARABLE LAND (low productivity)	DESERT SITES
GREATER CAIRO		3,645		6,316
GREATER ALEXANDRIA	416		1,713	1,141
CANAL				1,459
DELTA	3,284			
NORTH UPPER EGYPT	838			
SOUTH UPPER EGYPT		1,418		842
REMOTE AREAS				248
TOTAL	4,538	5,063	1,713	10,006

الميزات الخاصة للمواقع المختلفة للتنمية الحضرية				
المواقع العمرانية	الأراضي الزراعية (بمليارات المترات)	المناطق الحضرية (بمليارات المترات)	الأراضي القابلة للزراعة (بمليارات المترات)	مناطق الدراسة القديمة والحديثة (بمليارات المترات)
٦٣١٦	٣٦٤٥	١٧١٣	٤١٦	القاهرة الكبرى
١١٤١				الأسكندرية
١٤٥٩				القناة
	٣٢٨٤			الدلتا
	٨٣٨			شمال الوجه القبلي
		١٤١٨		جنوب الوجه القبلي
٢٤٨				المناطق النائية
١٠٠٠٦	١٧١٣	٥٠٦٣	٤٥٣٨	المجموع

أداء البنية الأساسية الحضرية :

# دراسة السياسة القومية للتنمية الحضرية NATIONAL URBAN POLICY STUDY

URBAN SERVICES PERFORMANCE

أداء الخدمات الحضرية

PHYSICAL INFRASTRUCTURE ( 1979 PRICES )

الهياكل الرئيسية للمرافق ( أسعار 1979 )

ITEM	COST*	%	ACHIEVEMENTS		الانجازات	التكلفة	النصر
			POPULATION SERVED (000)				
POTABLE WATER	2,466.3	(7.8)	REHABILITATION EXISTING	19,277	مجموع السكان المستفيدين ( ألف نسمة )	٧,٨	المياه الصالحة للشرب
			FUTURE	12,613			
			TOTAL	31,890			
SANITATION	2,647.7	(8.4)	EXISTING	19,277	• الوضع الحالي • تطوير وتنمية بلدية • تعزيز الخدمه	٨,٤	الصرف الصحي
			REHAB. MADE UP DEFICITS	12,613			
			TOTAL	31,890			
CIRCULATION	1,561.7	(5.0)	REHABILITATED ROADS	35,000 KM	تطوير وتطوير البلدية	٥,٠	الطرق
			NEW ROADS	8,860 KM			
TRANSPORT	1,109.9	(3.5)	NEW UNITS	8,860 UNITS	طرق جديدة	٢,٥	المواصلات
OTHER PHYSICAL INFRASTRUCTURE	1,851.1	(5.9)				٥,٩	مرافق أخرى
TOTAL PHYSICAL INFRASTRUCTURE	9,636.7	(30.7)				٢٠,٧	مجموع الهياكل الرئيسية للمرافق
HOUSING	9,488.2	30.2	REHAB. (UNITS)	5,078,000	تطوير وتطوير البلدية	٢٠,٢	الاسكان
			NEW UNITS	3,670,000	وحدات جديدة		
EDUCATION	3,343.6	10.6	REHAB. (UNITS)	10,267	تطوير وتطوير البلدية	١٠,٦	التعليم
			NEW UNITS	18,730	وحدات جديدة		
HEALTH	6,953.3	22.1	REHAB. (BEDS/UNITS)	80,400	تطوير الوضع الحالي (السرير، وحدات)	٨٠,٤	الصحة
			ADDITIONAL BEDS	75,900	• أسرة جديدة • خدمات أخرى	٢٤,١	
OTHER SOCIAL INFRASTRUCTURE	2,005.9	6.4				٦,٤	مباني بناية إجتماعية أخرى
TOTAL INTRA-URBAN INFRASTRUCTURE					مجموع الهياكل الرئيسية للمرافق الحضرية		
31,425.9 100%					٢١٤٢٥,٩ ١٠٠%		

(in L.E. millions)

(بالليرة مليونية ومربع)

ITEM	COST	%	ACHIEVEMENTS		
			EXISTING	FUTURE	LINES (100 POP)
TRANSPORT	5,931.0	22.1			
TELECOMMUNICATIONS	9,777.0	36.5	EXISTING	1,980	2.1
			FUTURE	2,000	9.9
ELECTRICAL POWER	11,063.0	41.3	GENERATION (GWH)	1985	2000
			PER CAPITA (Kwh)	34,007	105,656
BULK WATER	29.0	0.1	CAPACITY M <sup>3</sup> /d	1,511.4	2,854.9
				13,000	20,400
TOTAL INTER-URBAN INFRASTRUCTURE					
26,800.0 100%					

\* (in L.E. millions)

ITEM	COST	%	ACHIEVEMENTS		الانجازات	التكلفة	النصر
			EXISTING	FUTURE			
TRANSPORT	5,931.0	22.1				٥٩٣١,٠	النقل
TELECOMMUNICATIONS	9,777.0	36.5	EXISTING	1,980	2.1	٢٦,٥	المواصلات السلكية واللاسلكية
			FUTURE	2,000	9.9		
ELECTRICAL POWER	11,063.0	41.3	GENERATION (GWH)	1985	2000	٤١,٣	القوى الكهربائية
			PER CAPITA (Kwh)	34,007	105,656		
BULK WATER	29.0	0.1	CAPACITY M <sup>3</sup> /d	1,511.4	2,854.9	٢٩,٠	جملة حجم المياه
				13,000	20,400		
TOTAL INTER-URBAN INFRASTRUCTURE					مجموع الهياكل البنائية الرئيسية الالاقليمية		
26,800.0 100%					٢٦٨٠٠ ١٠٠%		

(بالليرة مليونية ومربع)

TOTAL INTRA-URBAN AND INTER-URBAN INFRASTRUCTURE INVESTMENT	
1986 - 2000	L.E. 58,225.9 million

مجموع الاستثمارات للهياكل البنائية الرئيسية الحضرية والاقليمية	
١٩٨٦ - ٢٠٠٠	٥٨٢٢٥,٩ مليون ليرة ومربع

FIGURE I-7

# دراسة السياسة القومية للتنمية الحضرية

## NATIONAL URBAN POLICY STUDY

### التوفير في الاراضي الزراعية في الدلتا ( اقتراح الاستراتيجية المفضلة )

ARABLE LAND SAVINGS IN DELTA  
UNDER THE PREFERRED STRATEGY

	1976	1985	2000	ARABLE LAND CONSUMED		الأراضي الزراعية المستهلكة		٢٠٠٠	١٩٨٥	١٩٧٦	
	URBAN POPULATION (000's)	URBAN POPULATION (000's)	URBAN POPULATION (000's)	(Hectares)	(Feddans)	فددان	هكتار	السكان الحضر	السكان الحضر	السكان الحضر	
I. Arable land loss if trend population growth occurs 1/	3,668	5,023	8,014	20,079	47,806 2/	٤٧٨٠٦	٢٠٠٧٩	٨٠١٤	٥٠٢٣	٣٦٦٨	١/ العاقد في الأراضي الزراعية مع استمرار معدلات النمو في السكان الحالية ١/
II. NUPS Preferred Strategy											٢/ الأستراتيجية المفضلة للدراسة القومية للتنمية الحضرية
II.1 Land loss if density patterns observed through Landsat analysis occur	3,668	5,023	6,952	15,172	36,124 2/	٣٦١٢٤	١٥١٧٢	٦٩٥٢	٥٠٢٣	٣٦٦٨	٢/ العاقد في الأراضي الزراعية إذا استمرت نماط الكثافة السكانية الحالية الملاحظة من تحليل بيانات القمر الصناعي
II.2 Land loss if NUPS recommended densities are achieved 3/ (1976-1985) (1986-2000)	3,668	5,023	6,952	6,260	14,905	١٤٩٠٥	٦٤٦٠		٥٠٢٣	٣٦٦٨	٢/ العاقد في الأراضي الزراعية إذا طبقت الكثافات المقترحة بواسطة الدراسة القومية للتنمية الحضرية (١٩٧٦ - ١٩٨٥) (١٩٨٦ - ٢٠٠٠)
TOTALS				7,186	17,109	١٧١٠٩	٧١٨٦	٦٤٥٦	٥٠٢٣		المجموع
SAVINGS OF ARABLE LAND (I - II.2)				12,٤93	30,697	٢٠٦٩٧	١٤٨٩٣				التوفير في الأراضي الزراعية (٩١ - ب)
<p>1/ Populations projected using growth rates experienced between 1960 and 1976.</p> <p>2/ Land consumption based on rates of arable land consumed in Delta settlements between 1972 and 1978 noted from Landsat analysis (i.e., roughly 11 feddans consumed per 1,000 additional urban population).</p> <p>3/ Land consumption assumes that trends noted in footnote 2/ above will continue up until 1985, after that time it is assumed that a program to encourage vertical expansion of existing built areas can absorb 60 percent of the new urban population and that the remaining 40 percent will be accommodated in planned settlements having urban gross densities of 350 persons per hectare (147 persons per feddan). See NUPS Tanta Illustrative Project Report Table A.5 for a full analysis of this assumption.</p>						<p>١ - التنبؤات السكانية مبنية على استمرار معدلات النمو السكانية التي حدثت بين ١٩٦٠ و ١٩٧٦.</p> <p>٢ - بيانات استهلاك الأراضي الزراعية مبنية على تحليل صور الأقمار الصناعية للمناطق السكنية في الدلتا بين ١٩٧٢ و ١٩٧٨، حيث لاحظنا أن معدل استهلاك الأراضي الزراعية هو تقريباً ١١ فدان لكل ألف شخص إضافي في التجمعات الحضرية.</p> <p>٣ - استهلاك الأراضي الزراعية يفترض أن يستمر حتى ١٩٨٥، بعد ذلك يفترض أن برنامج لتشجيع التوسع الرأسي للمناطق الحضرية القائمة، والذي يمكن استيعابه ٦٠٪ من السكان الحضر الجدد، وبقية السكان الجدد (٤٠٪) سيتم استيعابهم في تجمعات مخططة ذات كثافات سكانية عالية تبلغ ٣٥٠ شخصاً للهكتار (١٤٧ شخصاً للفدان) - انظر تقرير المخطط التوضيحي لمدينة طنطا للدراسة القومية للتنمية الحضرية، جداول ٥ - ٩، وذلك لتوفير تحليل لهذا الافتراض.</p>					

FIGURE I-8

strategy shows a surplus of about L.E. 5 billion relative to the urban total resource pool which could be utilized for other purposes.

- The Strategy can be expected, therefore, to yield substantial positive net economic benefits (NUPS estimated an annual average net economic benefit of L.E. 521 per capita between 1982-2000.)
- The Preferred Strategy would very substantially increase the utilization of desert sites for future urban development. Our estimate is that more than 10 million new urban inhabitants could be on desert sites, if the NUPS recommendations are followed. In the Delta, as indicated above, the Preferred Strategy could lead to a saving of about 65 percent of the arable land which would be lost if current trends persist.
- The Preferred Strategy provides for substantial increases in both intra-urban and inter-urban social and physical infrastructure (including housing) at supportable costs. As shown in Figure I-8, these gains are possible in all categories of housing and infrastructure. A review of these figures will show that NUPS proposals at supportable costs provide high and, in most cases, improved service levels in all categories of housing and infrastructure.

The benefits of the Preferred Strategy are derived from applying the two major criteria emphasized earlier in the choice of policy recommendations. These criteria are:

- Efficiency in the choice of settlement patterns and population targets for different settlements.
- Conservation of public investment resources.

The first criteria has led to an emphasis on direct investment in jobs in places with strong economic advantages: Cairo, Alexandria and the Canal area (particularly Suez City). This criteria also supports a second major element of the Preferred Strategy; namely, a focused effort to induce growth in only a few secondary cities rather than a more diffused effort to induce growth in many secondary cities and outlying desert regions over the planning period of this study. Growth inducement in places which do not possess strong economic advantages for urbanization (location, skilled labor, access to markets, and to industrial inputs) is necessarily more costly and places investments at a greater risk of underutilization or failure than in places which already have such advantages. A focused effort in a few places (NUPS recommends special emphasis for growth inducement in Aswan, Qena/Naga Hamadi and Assiut) reduces the costs and the level of risk of decentralization efforts, while increasing the probability of being able to more efficiently decentralize further in subsequent years. The cost and risk reduction are consistent also with the second criterion, conservation of public resources.

The application of the two criteria is more complex in our recommended Delta Strategy. The first criterion -- efficiency in the settlement system -- supports the recommendation to concentrate regional service functions in fewer Deltar centers than all governorate capitals and other relatively large cities. This is supported, also, by the need to conserve public resources.



The complication arises because past industrial investment patterns and the desirable location of Delta cities relative to resources and the major markets of Cairo and Alexandria make further industrial investment in the Delta economically attractive. If investment proportional to strict economic advantage is made in the Delta, future rates of urban population growth will be high. Consequently, since virtually all Delta cities necessarily expand onto arable land when horizontal growth occurs, growth entails some loss of agricultural land.

This combination of circumstances has led the NUPS Team to the conclusion that industry should not be located in the Delta in cases where it can be feasibly located elsewhere with a reasonable rate of return. Cairo, Alexandria, Suez and the "Special Emphasis" cities are expected to provide feasible alternatives, where growth can be managed on non-arable land, for many of the investments that would otherwise be made in the Delta. While it is recognized that this recommendation entails a loss of economic efficiency in locating investment, the availability of alternative locations (not very distant from the Delta, in the case of the first three) suggests that the loss would not necessarily be substantial. This recommendation, however, would not be a supportable recommendation unless location of industry in the metropolitan regions of Cairo and Alexandria and the Suez Canal area were encouraged. It would be economically infeasible to locate all the industry which otherwise might be profitable in the Delta in Upper Egypt and outlying desert regions. An attempt to do so would substantially raise costs and required Government subsidies and would probably result in a net loss of investment in the country.

The sectoral recommendations for industry, housing and infrastructure derive primarily from the application of the second criterion -- conservation of public resources. Sectoral emphasis on industry and encouragement of private investment in industry is intended to induce investment in other economic activities and, by encouraging the private sector to make these investments, conserve public resources. Similarly, NUPS housing recommendations are for recognition and encouragement of private investment and careful targeting of residual public investment in this sector to units at affordable standards in order, first, to reduce required public outlays; second, to increase cost recovery of any public housing investments which are made; and third, to reach more people more quickly with viable housing options. Associated infrastructure recommendations for both within city and regional infrastructure call for affordable standards, system expansion to meet identified demands, and increased cost recovery from service beneficiaries, where appropriate.

In summary, the application of these criteria to the national policy choices recommended by NUPS and detailed in this report are expected to provide the following economic and social benefits:

- Economic growth and increases in per capita income at nearly maximum achievable rates.
- Creation of the possibility for improved inter-personal equity through targeted assistance at affordable levels and greater availability of resources to utilize in providing assistance to lower income people.
- Preservation of arable land by providing migration options for Delta population growth and encouragement of growth within metropolitan regions and "Special Emphasis Cities" on non-arable or low productivity lands.

- A feasible level of decentralization away from Cairo to provide a better base for future reduction of polarization of the settlement system in Cairo than currently exists and contribute to income growth in the relatively low income areas of Upper Egypt.

The analysis of benefits associated with specific performance characteristics of the Preferred Strategy and the overall social and economic benefits, enumerated above, is supported by a comparative evaluation of the Preferred Strategy and Second Round Alternatives. Figure I-9 shows graphically how the Preferred Strategy scores relative to other alternatives on social, economic, risk, management and implementation criteria used to assess the relative benefits of alternatives in the "Working Paper on Second Round Alternatives."<sup>14</sup>

Overall, the Preferred Strategy can be expected to perform slightly better than the other alternatives on social effectiveness criteria, only slightly less well than the best alternative (Alternative A) on the other criteria. The Preferred Strategy can be expected to perform consistently better than Alternatives B<sub>1</sub>, B<sub>2</sub> and C on most criteria. The slight loss in economic performance, somewhat higher risk, and extra managerial and implementation load compared to Alternative A, were considered by NUPS to be justified by the earlier start on interregional decentralization, the effort to develop a major metropolitan center on the Suez Canal, and an innovative effort to improve the Remote Area potential for additional settlement.

Thus, the Preferred Strategy is, as any realistic urban policy recommendations must be, a balanced approach to achieving high performance on a number of partially competing objectives. In some cases, as shown, individual objectives might be better achieved under different alternatives. For example, it is probable that a spatial and sectoral strategy of concentrating investment and, therefore, population in places with already established economic potential would generate more national economic growth than the Preferred Strategy. However, it would result in a substantially greater loss of arable land in the Delta and do less in creating a viable decentralization and improved interregional equity than the Preferred Strategy. The Preferred Strategy represents NUPS best estimate of a feasible and beneficial policy set, taking benefits on competing objectives and the costs and risks of various alternatives into account.

## B. Preferred Strategy Settlement Distribution and Costs

The Preferred Strategy results in the year 2000 urban population distribution by zone shown in Table I-1. For comparative purposes, the distribution which would result from a continuation of 1960-1976 urban growth trends is also shown. The most significant differences from the trends are the substantial expansion of growth in Alexandria, the equally substantial reduction of growth in the Delta, and the above trend growth for both Upper Egypt and the core settlements of the Remote Areas. The recommended strategy for the Cairo Region is continued growth, but increased use of peripheral areas and close-in settlements on desert land.

These population estimates are derived from first estimating the mining, manufacturing, construction and service jobs associated with direct job investments and then the populations likely to be associated with the resulting job increases. The allocations of such direct investment are shown in Table I-2 by zone and by time period. Detailed allocations by settlement are shown in Table I-A.2 in

# PREFERRED STRATEGY AND PREVIOUSLY ANALYZED ALTERNATIVES

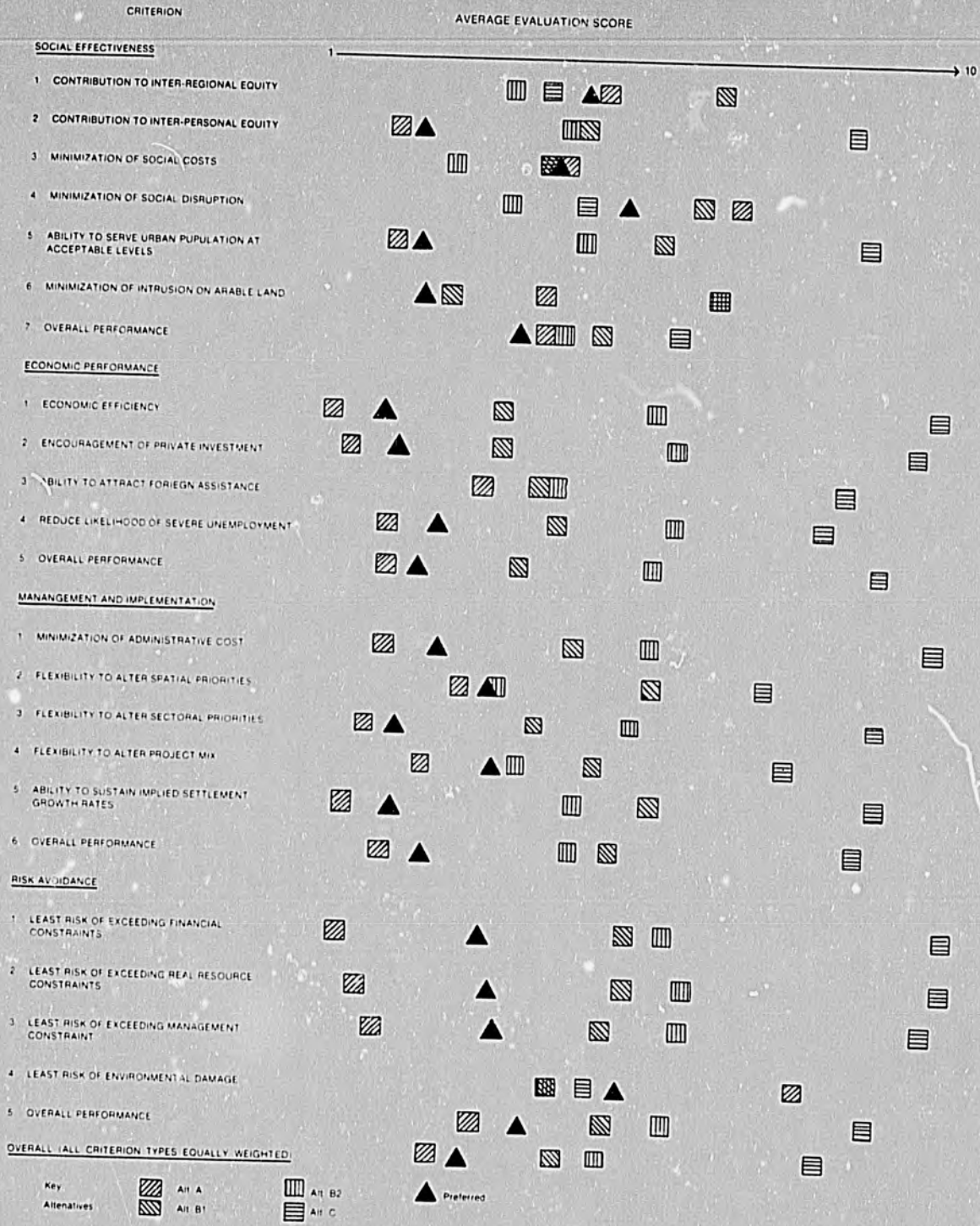


FIGURE I-9

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**TABLE I-1**  
**URBAN POPULATION DISTRIBUTION <sup>1</sup>**

SETTLEMENT	PREFERRED STRATEGY 2000 POPULATION (000's)	ANNUAL POPULATION GROWTH RATE (1985-2000)	TREND 2000 POPULATION	POPULATION GROWTH RATE (1985-2000)
Cairo Metropolitan Region	16,500	3.60	16,368	3.54
Alexandria Metropolitan Region	5,500	4.03	4,495	2.64
Canal	2,089	4.48	2,289 <sup>2</sup>	4.62
Delta	6,952	2.23	8,014	3.20
North Upper Egypt	1,811	2.53	1,830	2.60
South Upper Egypt	3,748	3.69	3,629	3.47
Remote Areas: Sinal, Red Sea Coast, Western Desert, Northwest Coast	400	3.16	375	2.71
TOTAL	37,000	3.37	37,000	3.37

<sup>1</sup> Urban Population is for the resident population for all areas classified as "urban" in the 1976 Census, excluding the population in the occupied portion of the Sinal in 1976 and expatriate workers. This classification generally included all settlements with 1976 populations greater than 20,000. Target populations for individual settlements over 50,000 are shown in Appendix I-A.1.

<sup>2</sup> Trend population for the Suez Canal at 1960-1976 rates not reliable indication due to war evacuation. Figure given is master plan target population.

SOURCE: NUPS Estimates.

**TABLE I-2**  
**PREFERRED STRATEGY - DIRECT INVESTMENT COSTS, ZONE TOTALS<sup>1</sup>**  
**(L.E. MILLIONS)**

<u>ZONE</u>	<u>1986 - 1990</u>		<u>1991 - 1995</u>		<u>1996 - 2000</u>		<u>TOTAL</u>	
	<u>AMOUNT</u>	<u>PERCENTAGE</u>	<u>AMOUNT</u>	<u>PERCENTAGE</u>	<u>AMOUNT</u>	<u>PERCENTAGE</u>	<u>AMOUNT</u>	<u>PERCENTAGE</u>
Calro	4,572	52.7	6,906	53.1	11,892	53.0	23,370	53.0
Alexandria	1,538	17.7	2,409	18.6	4,296	19.2	8,243	18.7
Delta	830	9.6	1,112	8.6	1,761	7.9	3,703	8.4
North Upper Egypt	280	3.2	364	2.8	588	2.6	1,232	2.8
South Upper Egypt	684	7.9	975	7.5	1,595	7.1	3,254	7.4
Canal	672	7.7	1,061	8.2	1,971	8.8	3,704	8.4
Remote	113	1.3	157	1.2	318	1.4	588	1.3
<b>TOTAL</b>	<b>8,689</b>	<b>100</b>	<b>12,984</b>	<b>100</b>	<b>22,421</b>	<b>100</b>	<b>44,094</b>	<b>100</b>

<sup>1</sup> Direct Investment costs are for gross investment in mining, manufacturing, construction, and services industries. They are, therefore, job creation and contribution investments.

SOURCE: NUPS Estimates.

Appendix I-A. Key features of the allocation are shown in Table I-3, including employment change supported by the investment and estimated average cost per job.

Associated infrastructure costs have been estimated to support the Preferred Strategy population distributions. These estimates and their basis are reported fully in Chapter V and its associated appendices and are summarized here in Tables I-4 and I-5. Two estimates of intra-urban infrastructure were made. The first is based primarily upon existing standards for individual elements, such as water, sewer, etc. The second set of estimates is based upon modified standards designed to increase affordability and, therefore, cost recovery by the Government for public outlays. Direct investment costs for job creation are shown, also, on these tables. This is followed by Table I-6 which provides cost estimates, plus descriptions of assumptions by type of settlements.

Inter-urban infrastructure costs have been added to these totals. Such costs have been estimated for power, transportation, telecommunications, and bulk water, as reported in detail in Chapter VI. A high and low estimate of these costs have been made. The high estimate includes the costs of nuclear power stations to meet estimated demand, while the low estimate include costs of non-nuclear means of meeting estimated demand.

All of these costs are shown in Table I-4. Taken together, they yield four alternative cost scenarios for the Preferred Strategy shown in Table I-7. These are:

- Direct job investment plus high estimates for both intra-urban and inter-urban infrastructure. (Cost Scenario 1)
- Direct job investment, plus high estimate for inter-urban and low estimate for inter-urban infrastructure. (Cost Scenario 2)
- Direct job investment, plus low estimate for intra-urban and high estimate for inter-urban infrastructure. (Cost Scenario 3)
- Direct job investment, plus low estimates for both intra- and inter-urban infrastructure. (Cost Scenario 4)

The Preferred Strategy is a relatively low cost strategy compared to all the alternatives presented in earlier reports. It is only slightly more expensive (on the same basis) than the least-cost alternative (Alternative A).<sup>15</sup> Figure I-10 shows the importance of seeking efficiency in the settlement system and in seeking affordable standards. Although the Preferred Strategy is relatively low-cost, only the cost scenario with modified standards and the low inter-urban infrastructure option (Cost Scenario 4) falls within the investment pool required to maintain a 7 percent growth rate in the economy.

Achievement of these investment targets will require very substantial foreign savings. The amount of investment shown to be covered by domestic saving assumes that 13 piasters out of each additional pound of Gross Domestic Product will be saved. This amount is well above the most recent trend, but is plausible to achieve, if private savings are encouraged and investment opportunities are open to domestic savers. The foreign saving requirement, as shown earlier, is still going to be

**TABLE I-3**  
**KEY FEATURES OF THE PREFERRED STRATEGY**

ZONE	2000 POPULATION (000)	1986-2000 EMPLOYMENT CHANGE (000)	AVERAGE COST PER JOB (L.E.)	TOTAL COST (L.E. MILLION)	INVESTMENT (%)	SHARE OF POPULATION INCREASE
Calro	16,500	3,653	6,397	23,370	53.0	53.9
Alexandria	5,500	1,327	6,216	8,243	18.7	19.5
Delta	4,470	597	6,203	3,703	8.4	8.9
North Upper Egypt	990	172	7,163	1,232	2.8	2.5
South Upper Egypt	2,030	436	7,463	3,254	7.4	6.4
Canal	2,000	523	7,082	3,704	8.4	7.6
Remote	400	81	7,259 <sup>1</sup>	588	1.3	1.2
<b>TOTAL</b>	<b>31,890</b>	<b>6,789</b>	<b>6,495</b>	<b>44,094</b>	<b>100</b>	<b>100</b>

<sup>1</sup> These figures are considerably below the average costs per job in the Northwest Coast Plan, the Red Sea Governorate Regional Plan and the Sinal Development Study. They could only be kept at these low levels by financing only high payoff projects. The costs per job in the Sinal, Red Sea Governorate and Northwest Coast Plans are 57,032; 93,700; and 26,700, respectively.

SOURCE: NUP'S Estimates.

**TABLE I-4**  
**SUMMARY OF URBAN DEVELOPMENT COSTS BY ZONE**

PERIOD		(L.E. MILLIONS)							TOTAL
		METROPOLITAN AREAS		CANAL	DELTA	NORTH UPPER	SOUTH UPPER	REMOTE	
		CAIRO	ALEXANDRIA			EGYPT	EGYPT	AREAS	
1986-1990	Industry	4,572	1,538	672	830	280	684	113	8,689
	Intra-Urban Infrastructure								
	Estimate <sup>1</sup>	4,699	2,422	1,237	1,967	682	697	455	12,159
	Estimate <sup>2</sup>	3,446	1,781	1,024	2,094	585	642	507	10,078
	TOTAL Estimate <sup>1</sup>	9,271	3,960	1,909	2,797	962	1,381	568	20,898
	Estimate <sup>2</sup>	8,018	3,319	1,696	2,924	865	1,326	620	18,768
1991-1995	Industry	6,906	2,409	1,061	1,112	364	975	157	12,984
	Intra-Urban Infrastructure								
	Estimate <sup>1</sup>	4,954	2,104	1,250	1,709	579	665	366	11,892
	Estimate <sup>2</sup>	3,880	2,027	1,015	1,547	516	602	435	10,023
	TOTAL Estimate <sup>1</sup>	12,124	4,513	2,311	2,821	943	1,640	523	24,875
	Estimate <sup>2</sup>	10,786	4,436	2,076	2,659	880	1,577	592	23,006
1996-2000	Industry	11,892	4,296	1,971	1,761	588	1,585	318	22,421
	Intra-Urban Infrastructure								
	Estimate <sup>1</sup>	5,533	2,363	1,466	1,681	641	724	379	13,219
	Estimate <sup>1</sup>	4,402	2,355	1,089	1,824	544	647	464	11,324
	TOTAL Estimate <sup>1</sup>	17,831	6,659	3,437	3,442	1,229	2,309	697	35,630
	Estimate <sup>1</sup>	16,294	6,651	3,060	3,585	1,132	2,232	782	33,736
	TOTAL (1986-2000)								
	Estimate <sup>1</sup>	39,252	15,132	7,657	9,060	3,134	5,330	1,788	81,353
	Estimate <sup>2</sup>	35,098	14,406	6,832	9,168	2,877	5,135	1,994	75,510

<sup>1</sup> Master plan standards net of telecommunications.

<sup>2</sup> Modified standards.

SOURCE: NUPS projections.



**TABLE I-5**  
**SUMMARY OF DEVELOPMENT COSTS WITH SPECIAL PRIORITIES IDENTIFIED**

PERIOD		CAIRO	ALEXANDRIA	SPECIAL EMPHASIS	OTHER CANAL	DELTA		NORTH UPPER EGYPT	SOUTH UPPER EGYPT	REMOTE AREAS	TOTAL
						REGIONAL CENTERS	OTHERS				
1986-1990	Industry	4,572	1,538	888	340	299	531	280	128	113	8,689
	Intra-Urban Infrastructure										
	Estimate <sup>1</sup>	4,699	2,422	956	766	889	1,078	682	211	455	12,159
	Estimate <sup>2</sup>	3,446	1,781	700	733	798	1,296	585	233	307	10,078
	TOTAL Estimate <sup>1</sup>	9,271	3,960	1,844	1,106	1,188	1,609	962	339	568	20,898
	Estimate <sup>2</sup>	8,018	3,319	1,588	1,073	1,097	1,827	865	361	620	18,768
1991-1995	Industry	6,906	2,409	1,386	474	431	681	364	176	157	12,984
	Intra-Urban Infrastructure										
	Estimate <sup>1</sup>	5,218	2,104	1,084	664	856	852	579	167	366	11,892
	Estimate <sup>2</sup>	3,880	2,027	749	671	460	1,087	516	197	435	10,023
	TOTAL Estimate <sup>1</sup>	12,124	4,513	2,470	1,138	1,287	1,533	943	343	523	24,875
	Estimate <sup>2</sup>	10,786	4,436	2,135	1,145	891	1,768	880	373	592	23,006
1996-2000	Industry	11,892	4,296	2,532	781	685	1,076	588	243	318	22,421
	Intra-Urban Infrastructure										
	Estimate <sup>1</sup>	5,965	2,363	1,353	678	887	794	641	160	379	13,219
	Estimate <sup>2</sup>	4,402	2,355	906	634	772	1,052	544	195	464	11,324
	TOTAL Estimate <sup>1</sup>	17,857	6,659	3,885	1,459	1,572	1,870	1,229	403	697	35,650
	Estimate <sup>2</sup>	16,294	6,651	3,438	1,415	1,457	2,128	1,132	439	782	33,736
TOTAL (1986-2000)											
	Estimate <sup>1</sup>	39,252	15,132	8,199	3,703	4,047	5,012	3,134	1,085	1,788	81,353
	Estimate <sup>2</sup>	35,098	14,400	7,161	3,633	3,445	5,723	2,877	1,173	1,994	75,510

<sup>1</sup> Master plan standards net of telecommunications.

<sup>2</sup> Modified standards.

SOURCE: NUPS projections.

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**TABLE I-6**  
**SUMMARY OF INTRA-URBAN INFRASTRUCTURE COSTS OF PREFERRED STRATEGY 1986-2000**

SETTLEMENT ZONE	1986- TOTAL COSTS (L.E. MILLIONS)	1990 PER CAPITA COSTS (L.E.)	1991 TOTAL COSTS (L.E. MILLIONS)	1995 PER CAPITA COSTS (L.E.)	1996 TOTAL COSTS (L.E. MILLIONS)	2000 PER CAPITA COSTS (L.E.)	1986-2000 TOTAL COSTS (L.E. MILLION)	DESCRIPTION
<u>I. Greater Cairo</u>								
Estimate I	4,700	404	5,218	376	5,965	362	15,883	<u>Estimate I</u> provides water and sewerage at master plan standard, proposed transport at per capita cost levels indicative of final phase subway plans and proposed expansion of tram system. Housing at average costs equal to 125 percent of National Housing Plan Standards.
Estimate II	3,446	296	3,881	280	4,402	267	11,729	
								<u>Estimate II</u> provides water and sewerage at master plan levels, expanded public bus transport provides year 2000 standard of 10 buses/10,000. Housing at standards affordable to median income groups. Under favorable affordability assumptions, some surplus household savings should be generated.
<u>II. Alexandria</u>								
Estimate I	2,422	651	2,104	464	2,363	430	6,890	Emphasis on infill in Alexandria Metropolitan Region results in large requirement for new infrastructure. Both Estimate I and II use water and sewerage master plan standards. Estimate II has lower costs since housing standards are at levels affordable to middle income groups, however public transport costs are higher than Estimate I.
Estimate II	1,781	479	2,027	447	2,355	428	6,162	
<u>III. Special Emphasis</u>								
Estimate I	956	676	1,084	602	1,353	588	3,392	Emphasis on major growth in Suez and other Special Emphasis Settlements increases requirements for new infrastructure. Suez water and sewerage at Master Plan for both estimates. Estimate I social infrastructure at Sadat City Master Plan levels. Estimate II at Suez Master Plan levels. Estimate I other special emphasis settlements have housing and social infrastructure at levels similar to Greater Cairo. Estimate II other special emphasis settlements have reduced provisions of physical and social infrastructure; Housing standards affordable to median household groups.
Estimate II	670	496	749	416	906	394	2,355	
<u>IV. Other Canal</u>								
Estimate I	766	899	664	670	678	589	2,108	Standards similar to Special Emphasis Settlements, but higher regional construction costs increases per capita costs. In both estimates, water and sewerage have been maintained at master plan levels. Housing and social infrastructure costs have been reduced in Estimate II.
Estimate II	733	860	671	677	634	551	2,037	
<u>Delta</u>								
Estimate I	19,67	532	1,709	339	1,681	339	5,356	Estimate I provides relatively high standards in Tanta and Mansoura to emphasize regional service functions. Other settlements have standards maintaining existing standards. Estimate II provides higher standards in Mansoura and incentives to Delta cities encouraging vertical redevelopment. For inter-regional equity reasons, standards of health care have been increased over Estimate I since existing funding will not maintain existing standards.
Estimate II	2,094	567	1,347	307	1,738	412	5,466	

TABLE I-6 (Continued)  
SUMMARY OF INTRA-URBAN INFRASTRUCTURE COSTS OF PREFERRED STRATEGY 1986-2000

SETTLEMENT ZONE	1986 TOTAL COSTS (L.E.MILLIONS)	1990 PER CAPITA COSTS (L.E.)	1991 TOTAL COSTS (L.E.MILLIONS)	1995 PER CAPITA COSTS (L.E.)	1996 TOTAL COSTS (L.E.MILLIONS)	2000 PER CAPITA COSTS (L.E.)	1986-2000 TOTAL COSTS (L.E.MILLION)	DESCRIPTION
<b>VI. North Upper Egypt-Non Special Emphasis</b>								
Estimate I	682	890	579	754	641	736	1,903	Higher standards have been provided in Governorate capitals in both estimates due to region serving functions. However in Estimate II, housing has been reduced to more affordable levels and social infrastructure costs have been reduced. Due to high regional construction costs, per capita costs remain high.
Estimate II	585	763	516	593	593	549	1,645	
<b>VII. South Upper Egypt-Non Special Emphasis</b>								
Estimate I	211	444	167	352	160	303	538	Governorate capitals at same standards as North Upper Egypt. In Estimate II to provide inter-regional equity standards of health have been increased over Estimate I. Most other standards at levels which maintain existing infrastructure standards.
Estimate II	233	490	197	374	196	337	626	
<b>VIII. Remote Areas</b>								
Estimate I	455	1,569	325	1,121	379	1,128	1,200	Estimate I has standards at national urban average standards. Estimate II provides somewhat higher per capita costs due to increases in standards of housing, health and other social infrastructure. Higher per capita costs also result from higher regional construction costs.
Estimate II	508	1,748	434	1,294	464	1,160	1,405	
<b>IX. Totals</b>								
Estimate I	12,160	532	11,892	444	13,220	415	37,271	Both estimates provide standards aimed at implementing spatial priorities of National Urban Policy. However, although it has lower costs, Estimate II aims at greater inter-regional equity through increased financing of social infrastructure costs in non-special emphasis areas. It also aims at greater private sector participation through non-affordable housing.
Estimate II	10,078	441	10,023	371	11,324	355.1	31,426	

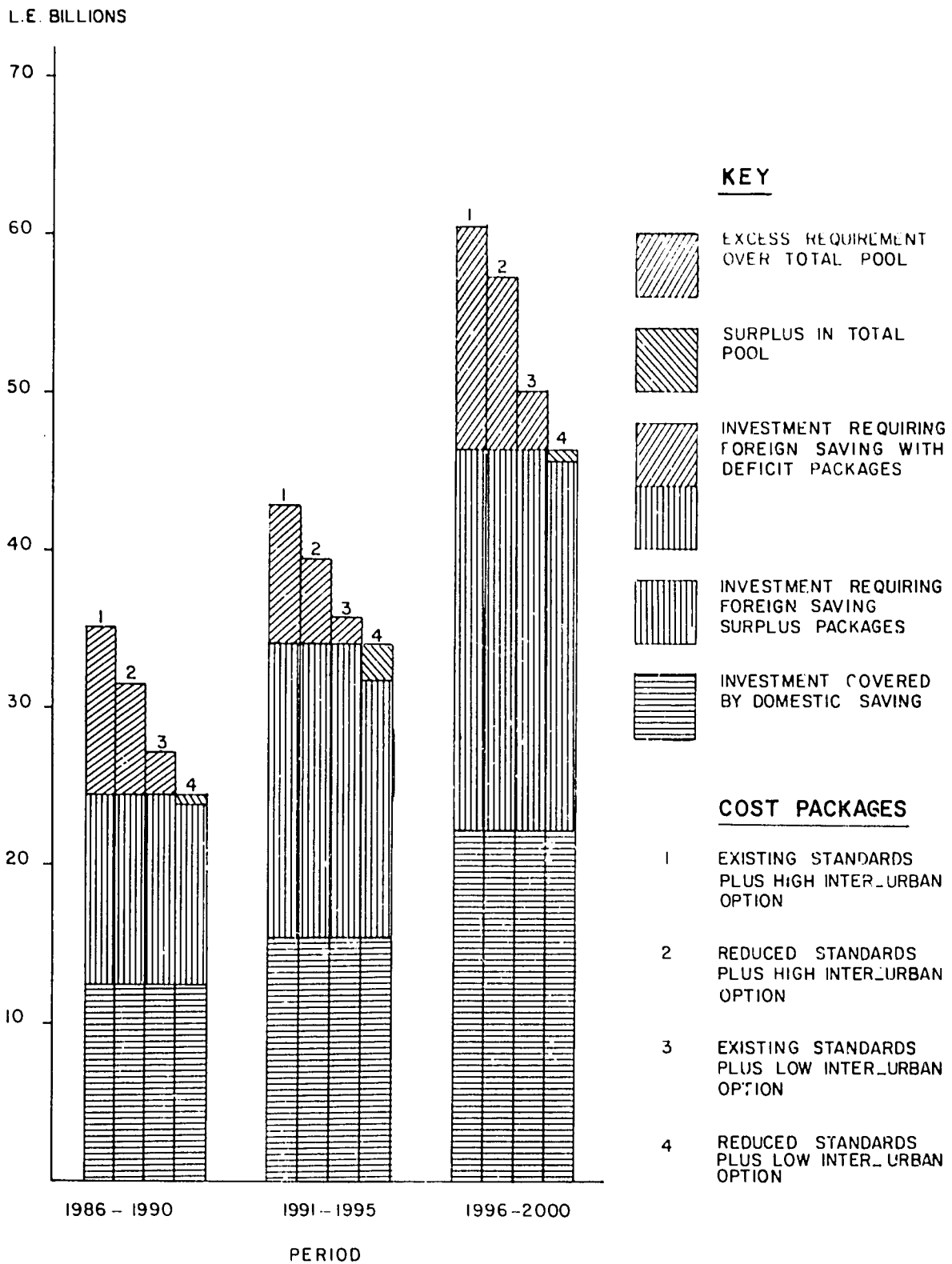
SOURCE: NUPS projections.

**TABLE 1-7**  
**PREFERRED STRATEGY TOTAL COSTS UNDER DIFFERENT COSTS SCENARIOS**

COST SCENARIO	COST CATEGORY	1986-1990 (L.E.Million)	1991-1995 (L.E.Million)	1996-2000 (L.E.Million)	TOTAL (L.E.Million)
1	Direct Job Investment	8,689	12,984	22,421	44,094
	Intra-Urban Infrastructure (High Estimate)	12,159	11,892	13,215	37,270
	Inter-Urban Infrastructure (High Estimate)	12,922	16,316	23,167	52,405
	<b>TOTAL</b>	<b>33,770</b>	<b>41,192</b>	<b>58,807</b>	<b>133,769</b>
2	Direct Job Investment	8,689	12,984	22,421	44,094
	Intra-Urban Infrastructure (High Estimate)	12,159	11,892	13,219	37,270
	Intra-Urban Infrastructure (Low Estimate)	5,071	8,891	11,702	25,464
	<b>TOTAL</b>	<b>25,919</b>	<b>33,767</b>	<b>47,342</b>	<b>107,028</b>
3	Direct Job Investment	8,689	12,984	22,421	44,094
	Intra-Urban Infrastructure (Low Estimate)	10,078	10,023	11,324	31,425
	Intra-Urban Infrastructure (High Estimate)	12,922	16,316	23,167	52,405
	<b>TOTAL</b>	<b>31,689</b>	<b>39,323</b>	<b>56,912</b>	<b>127,924</b>
4	Direct Job Investment	8,689	12,984	22,421	44,094
	Intra-Urban Infrastructure (Low Estimate)	10,078	10,023	11,324	31,425
	Intra-Urban Infrastructure (Low Estimate)	5,071	8,891	11,702	25,464
	<b>TOTAL</b>	<b>23,838</b>	<b>31,898</b>	<b>45,447</b>	<b>101,183</b>

SOURCE: NUPS projections.

## INVESTMENT, SAVING AND COST PACKAGES



**FIGURE I-10**

substantial. Foreign savings are even more difficult to achieve at levels suggested by the most expensive of the Preferred Strategy cost scenarios. It should be clear that even more expensive settlement options than the Preferred Strategy -- such as NUPS Alternatives B<sub>1</sub>, B<sub>2</sub> and C, the latter of which increased population targets in remote areas and many secondary cities and was about 30 percent more expensive than the Preferred Strategy -- would require such exceptionally large amounts of domestic and foreign savings that they would be very high risk choices.

Overall, the Preferred Strategy with substantial efficiency in the settlement system and affordable standards promises substantial benefits as shown earlier and is feasible if affordable standards are adopted, cost recovery is increased to replenish the resource pool in later periods and industrial projects with a relatively high rate of return are adopted.

### C. Aggregate Economic Benefit/Cost Estimates

Any attempt to quantitatively estimate aggregate benefits of all kinds and costs of alternative national urban policies should be treated with caution. This is true for many reasons, including the difficulty of treating benefits on multiple criteria (such as both social, distributional and economic) as if they were commensurable (i.e., subject to a common set of measurements); that different people weigh benefits and costs of various types differently; and that the incidence of benefits and costs (i.e., who receives the benefits and who pays the costs) is often at least as important as their overall magnitudes. That is why the overall benefits described above were not aggregated into a single benefit measure.

Given these caveats, however, an important but limited set of commensurable economic benefits and costs can be calculated to illustrate aggregate economic benefits and costs associated with the Preferred Strategy and other alternatives. Table I-8 presents such a detailed calculation and comparison of the Preferred Strategy, Alternative A and Alternative C. The primary purpose of these calculations is to demonstrate the direction of effects on net benefits of moving from relatively regionally concentrated strategies to an interregionally dispersed strategy. Thus, the exact magnitude of the calculated benefit streams is not as important as the relationship between the streams associated with different strategies.

This analysis makes use of the well-known positive relationship between city size and output or income. In 1973, Koichi Mera showed that for 46 developing countries, increased primacy (that is, increased concentration of urban population in the major metropolitan center) had a high positive correlation with increased economic growth in input.<sup>16</sup> More recently, he had reviewed empirical studies of the relationship between city size and output, which are found also, to be positively correlated.<sup>17</sup> He fitted their data to an equation of the following form:

$$\text{Per Capita Income Benefit} = A (\text{Population Size})^B.$$

The parameter "B" was estimated to range from 0.04 to 0.20, depending on the definition of income or output used. To give an indication of the income benefits of different spatial alternatives in this study, Mera's suggested functional form was used: "A" was estimated from aggregate data on projected non-agricultural output at about L.E. 980 for 1992-93 (in constant 1979 prices); and value of 0.1 was used for

**TABLE I-8**  
**COMPARISON OF BENEFIT AND COSTS**  
**(Large Urban Areas Over 50,000 Plus Remote Areas)**

	1986-2000 Population Change (Thousands)	Average Annual Income Benefit Capita (L.E.)	1986-2000 Total Income Benefits (L.E. Millions)	Growth Management Cost (GMC) (L.E. Millions)	Intra-Urban Cost-Infra- structure Plus GMC (L.E. Millions)	Direct Investment Job Creation (L.E. Millions)	Net Urban Benefits (L.E. Millions)	Average Annual Net Benefits Per Capita (L.E.)	Net Benefits Net of Inter- Urban Infrastructure Costs* Total (L.E. Millions)	Net of Inter- Urban Infrastructure Costs* Per Capita (L.E. Millions)
<b>Preferred Strategy</b>										
Cairo Region	6,793	1,264	128,758	4,618	21,994	23,370	83,394	818	98,687	521
Alexandria Region	2,458	1,130	41,649	1,762	9,835	8,243	23,571	639		
Canal	969	916	13,311	856	4,504	3,704	5,193	351		
Delta	1,123	863	14,531	464	7,063	3,703	3,765	224		
North Upper Egypt	322	842	4,068	195	2,506	1,232	330	67		
South Upper Egypt	809	859	10,419	657	2,515	3,254	4,650	383		
Remote	149	752	1,682	235	1,704	588	-610	-273		
Totals	12,623	1,132	214,418	8,787	50,121	44,094	120,203	635		
<b>Alternative A</b>										
Cairo Region	6,712	1,263	127,183	4,777	20,456	23,909	82,818	823	100,725	540
Alexandria Region	2,736	1,133	46,508	2,095	12,039	9,217	25,252	615		
Canal	546	899	7,360	307	2,799	1,902	2,659	325		
Delta	1,888	865	24,489	1,110	9,552	6,354	8,583	303		
North Upper Egypt	181	835	2,267	71	1,746	682	-161	-59		
South Upper Egypt	355	834	6,443	150	1,593	1,309	1,541	289		
Remote	19	854	243	25	797	165	-719	-2,523		
Totals	12,437	1,139	212,493	8,535	48,982	43,538	119,973	643		
<b>Alternative C</b>										
Cairo Region	5,293	1,256	99,736	3,212	16,441	18,422	64,873	817	54,119	291
Alexandria Region	1,358	1,114	22,695	596	6,438	4,104	12,153	597		
Canal	1,133	919	15,619	1,331	9,676	4,326	1,617	95		
Delta	1,539	856	19,755	812	11,436	5,230	3,089	134		
North Upper Egypt	731	858	9,407	739	6,580	2,912	-85	-8		
South Upper Egypt	1,299	859	16,728	1,338	6,303	5,152	5,273	271		
Remote	1,049	952	14,987	5,009	16,964	6,070	-8,047	-511		
Totals	12,402	1,069	198,927	13,037	73,838	46,216	78,869	423		

**Notes:**

- Column 1: From IJUPS estimates of zone population in 2000 minus 1985 population.  
Column 2: Calculated on basis of 1992-3 population, by settlement, using the relationship  $\text{Income Per Capita} = a(\text{population})^b$  where  $a = 976.97$ ,  $b = 0.75$ , Population in Millions.  
Column 3: Calculated as Column 2 times Column 1 times 15 years.  
Column 4: Calculated as difference between average cost per job times change in jobs at settlement growth rates specified in the strategy and average cost at zero growth times change in jobs.  
Column 5: Sum of growth management cost and intra-urban infrastructure cost.  
Column 6: Total direct investment cost in job creation.  
Column 7: Column 3 minus the sum of Columns 5 and 6.  
Column 8: Calculated as Column 7 divided by Column 1 times 15 years.

\* The inclusion of inter-regional infrastructure costs reduces total benefits shown in Columns 7 and 8 to the figures shown.

SOURCE: IJUPS Calculations.

"B" since this represented the appropriate value for the above output definitions as shown in Mera's study.<sup>18</sup>

Column 2 of Table I-8 shows the calculations for the Preferred Strategy, Alternative A and Alternative C. Because the parameters were not directly estimated from Egyptian data, a sensitivity analysis was performed and is shown in Table I-9. This shows that while the magnitude of the benefits vary considerably with parameter choice, the relative values display a consistent pattern with Alternative A providing the highest per capita gains, the Preferred Strategy slightly lower gains, and both doing considerably better than Alternative C.

Commensurable costs are calculated for growth management costs (increased costs per average job as a result of increasing rates of assumed growth -- which take into account diseconomies and disamenities), direct investment costs in plant and equipment, intra-urban infrastructure and interregional infrastructure requirements. This analysis shows that the Preferred Strategy has comparable benefits, but slightly greater costs than Alternative A. This is due to the greater degree of emphasis in the Preferred Strategy on efforts to decentralize urban population than in Alternative A. Similarly, both the benefits are higher and the costs lower in the Preferred Strategy than in Alternative C, which suggests substantially greater decentralization than the Preferred Strategy. These comparisons are shown in table form below. (Table I-10)

These figures are supportive of the focused decentralization effort in the Preferred Strategy, but demonstrate their economic net benefit loss relative to Alternative A. At the same time, the comparison of the preferred strategy with Alternative C demonstrates the risk of very substantial loss of net benefits associated with attempting too much decentralization over the next 20 years.

#### D. Performance Indicators of the Preferred Strategy

Although it is not possible to compare all the performance characteristics of the Preferred Strategy using a single performance measure, Figures I-1.A and B provide important performance indicators associated with adoption and implementation of the Preferred Strategy. The performance characteristics include economic, physical, urban services, housing and regional services measures. Table I-8 highlights a particularly important characteristic -- arable land saving in the Delta -- which is achievable under the integrated set of activities which comprise NUPS Delta Growth Management Strategy as discussed above.

### IV. PRIORITIES, UNCERTAINTY AND RISK

As indicated in the preceding section, the Preferred Strategy can be expected to provide substantial social and economic benefits at a supportable cost, if the amount of investment can be maintained to produce a 7 percent growth rate per year and development standards and costs are carefully monitored and controlled.



**TABLE I-9**  
**ESTIMATED PER CAPITA INCOME BENEFITS**  
**WITH DIFFERENT PARAMETERS**

		Alternative Values Parameter "B"			
		.025	.05	.10*	.15
500	Preferred =	519	538	589	624
	Alt. A =	520	540	583	629
	Alt. C =	511	523	547	572
750		778	807	869	935
		799	810	874	944
		767	784	821	858
976.97*		1,014	1,052	1,132	1,219
		1,015	1,055	1,139	1,230
		999	1,022	1,069	1,118
1250		1,297	1,346	1,448	1,559
		1,299	1,350	1,457	1,573
		1,278	1,308	1,368	1,430

\* Parameters used in Table I-8.

SOURCE: NUPS analysis.

**TABLE I-10**  
**SUMMARY OF COST/BENEFIT ANALYSIS**

SETTLEMENT ALTERNATIVE	Intra-Urban Annual Average Net Benefits Per Capita		Annual Average Net Benefits with Inter- Urban Infrastructure Included	
	<u>Total</u> (L.E.)	As Percent <u>of Preferred</u> (%)	<u>Total</u> (L.E.)	As Percent <u>of Preferred</u> (%)
Preferred Strategy	635	100	521	100
Alternative A	643	101	540	104
Alternative C	423	67	291	56

SOURCE: NUPS analysis.

However, as NUPS has emphasized and some reviewers of the NUPS Draft Final Report had noted, the urban development agenda recommended in the Preferred Strategy is still large relative to the total resource pool for all investment (about 80 percent of total investment at 7 percent growth rate) and would require over 95 percent of the non-agricultural, non-petroleum resource pool. Thus, even under the comparatively favorable scenario presented in the NUPS Final Report, there are reasons to be concerned about the effects of shortfalls in overall investment, the portion which can be financed by domestic saving, and needed foreign saving, as well as unanticipated demands for investment funds or insufficient control of investment spending.

Obviously, this implies that there is no real alternative to a substantial effort by the Government to develop a means to gather information on investment plans and costs of on-going programs so that overall development experience is carefully monitored. This should be done whether or not the NUPS Preferred Strategy for implementing urban policy is adopted in order to ensure that spatial and sectoral investments are not overtly contradictory and that corrective action can be taken if shortfalls occur or changed circumstances require significant shifts in priorities.

In addition to control of investment planning and monitoring, it is recommended that the Government work out a consolidated sense of priorities within its urban and rural development initiatives. In terms of NUPS urban policy recommendations, the analysis suggests that the highest priority be given to the set of recommended actions in the Canal Cities, Alexandria and Cairo where most of the new urban population are likely to be located and where development could make the greatest contribution to slowing urban growth in Delta cities. Slowing growth in Delta cities is the single most important action to be taken to preserve high quality agricultural land.

A higher degree of decentralization to Upper Egypt and the Remote Areas is a desirable, long-term objective (as NUPS has emphasized) and should be pursued over the next 20 years as recommended in the Preferred Strategy, if sufficient resources are available. However, should overall shortfalls develop or unanticipated demands require other uses of scarce investment resources, investment should be curtailed in these areas before curtailing investment in the priority areas suggested above. The time of any curtailment required can be effectively used to develop an inventory of high-payoff economic projects, lists of most needed physical development needs, and development plans for these areas to be implemented as or when funds become available.

From a sectoral perspective, particularly for inter-regional infrastructure networks, priority should be given to maintenance and upgrading of existing systems over new additions to the networks -- especially if the latter require very large initial capital expenditures, e.g., nuclear power -- should sectoral investment plans need to be curtailed.

Sectorally also, priority should be given to providing service to more people more quickly through further modifications of standards than those recommended by NUPS if shortages of investment funds develop. An approach of this kind could reduce outlays, increase affordability, permit higher levels of cost recovery from users of public services, and reduce subsidy levels.

The analysis done by NUPS suggests that an attempt to simultaneously pursue massive decentralization efforts to the Sinai, Gulf of Suez and the Northwest Coast, such as suggested in existing plans, completion of the New Cities without modification of their plans, and to a multiple growth center strategy for Upper Egypt would not only over-extend the investment requirements beyond a feasible level if growth continues, but also increase the likelihood of a substantial reduction in the rate of economic growth and a corresponding decline in the available resource pool.

Consequently, it is NUPS conclusion that, while the recommended Preferred Strategy promises to make a substantial contribution to each of the Government's development objectives, following the present sectoral and spatial plans without integration or modification raises (as indicated in the Introduction) four major risks which could adversely effect the achievement of the Government's fundamental objectives:

- Because of the overall high costs, there is a risk that sufficient capital investment will not be mobilized to sustain the work over time and, therefore, the full benefits will not be realized.
- Even if the total capital investment was realized, there is a substantial risk that because the standards are so high, the population could not afford to utilize the services and facilities and the Government could not afford the massive subsidies to operate them.
- Even if the full investments in spatial deconcentration to the free standing new cities and remote areas were realized, there is a risk that the population could not be induced to migrate in the massive numbers implied -- targets which have no precedent in world experience -- and therefore, the capital assets created will not be productively utilized.
- The combined effect of the above risks would be a substantial shortfall in the rate of future national economic growth, which in turn would make the future capital investment resource pool smaller than it could be.

## NOTES

### CHAPTER I

#### OVERVIEW OF RECOMMENDED STRATEGY FOR NATIONAL URBAN POLICY

<sup>1</sup> The planning horizon for this study is the year 2000. The expectation is that successful decentralization to these special emphasis cities between now and the year 2000 will provide a basis for additional decentralization efforts in the post-2000 period.

<sup>2</sup> Harry Richardson, "City and National Spatial Strategies in Developing Countries," World Bank Working Paper, No. 252, p. 13.

<sup>3</sup> See NUPS reports "An Illustrative Development Project for Qena/Naga Hamadi" and "An Illustrative Development Project for Tanta."

<sup>4</sup> The Remote Areas consist of the Governorates of Matruh, Red Sea, North and South Sinai and the New Valley. See also R. L. Meier Occasional Paper "Urban Settlement in the Remote Areas of Egypt: the Role of New Technologies." August 1981.

<sup>5</sup> This reduced requirement for national telephone density standards also results from use of a middle projection of per capita GDP relationships to telephone densities. Both this reduced demand projection and improvement in telecommunications technologies assumption are further discussed in Chapter VI.

<sup>6</sup> See W. Weidemann's Occasional Working Papers, "The Agricultural Resource Base: Status & Expectations," December 1980, and "New Directions in Agricultural Policy: Relations to Industrial and Urban Development," August 1981.

<sup>7</sup> H. W. Richard suggests that an urban population of at least 41 million by the year 2000 may be more likely. See Occasional Working Paper, "From First Round Alternatives to a Preferred Strategy: Suggestions & Comments," p. 8.

<sup>8</sup> See Ministry of Economy, A.R.E. Economics Studies Units, Recent Development in the Egyptian Economy, January 1981.

<sup>9</sup> See World Bank, Arab Republic of Egypt. Domestic Resource Mobilization and Growth Prospects for the 1980's, Report No. 3123-EGT, December 1980.

<sup>10</sup> See, in particular, the discussion of the analytical framework in the Status Report, p. 6-8 in "Working Paper on Characteristics of Alternative Strategies," and p. 54-58 in the Interim Action Report.

11 More specifically, we assumed slight increases in the capital per worker in all industries (that is, increased incremental capital/output ratios) and resulting increases in output per worker between 1980 and 2000 of about 2.7 percent year over all sectors.

12 Page 12 of NUPS Working Paper on First Round Alternatives.

13 Ministry of Planning, Egypt's Development Strategy, Economic Management and Growth Objectives, 1980-84, p. 13. It has been suggested by some reviewers that a growth rate as high as 9 percent a year may be achieved. While such higher growth rates would clearly be desirable, the expected difficulties in generating sufficient savings to finance investment to achieve a 7 percent growth rate suggest that it would be very risky to base public policy (and public investment plans) on such a high growth rate.

14 See Working Paper on Second Round Alternatives, pp. 39-49 and pp. D-1 through D-7. The averages are the sum of scores assigned to each alternative by NUPS professional staff divided by their number. Thus, these particular evaluations represent informed judgments rather than scientific derivations.

15 In work leading to this final report, four basic settlement alternatives were developed and costed (Alternatives A, B<sub>1</sub>, B<sub>2</sub> and C). The cost of the alternatives are shown in Appendix II-B.

16 Koichi Mera, Economic Development and Cultural Change, "On the Urban Agglomeration and Economic Efficiency," 1973, Vol. 21.

17 Koichi Mera, "City Size Distribution and Income Distribution in Space," in Regional Science Journal, 1981, pp. 105-120. See p. 113 and 106, in particular.

18 It would have been preferable to estimate these parameters directly from Egyptian urban data but the Study Team was unable to locate appropriate data.

**CHAPTER II**

**THE ANALYTICAL BASIS FOR  
THE RECOMMENDED STRATEGY**

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## CHAPTER II

### THE ANALYTICAL BASIS FOR THE RECOMMENDED STRATEGY

The central purposes of this study is the design of a feasible strategy for national urban policy to regulate urban growth and establish requirements and priorities for investment in urban areas to the year 2000. The major elements of NUPS recommended strategy have been summarized in Chapter I and are described in greater detail in Chapters III-VII.

It would be inappropriate to attempt to summarize all of the material contained in prior reports in this Final Report. Rather, this chapter is provided as a means of emphasizing elements of the work which are most essential for understanding the basis for our national urban policy recommendations.

The Study Team has been guided throughout the study by the view that the adoption of a feasible and successful national urban policy by the Government of Egypt could make a substantial contribution to the well-being of the Egyptian people during a period of rapid development and increasing urbanization of the population. Feasible and successful policies, however, must be based on sound principles and valid inferences from the facts about Egypt. This review of earlier work will concentrate, therefore, on the principles we have employed and the analysis we have done to ensure that the recommendations are worthy of government support.

#### I. KEY PRINCIPLES FOR NATIONAL URBAN STRATEGIES AND POLICIES FOR THEIR IMPLEMENTATION

The NUPS Team understands national urban policy as an important element in the nation's development policy but not the whole of it. Urban policy is primarily concerned with elements of public policy which affect the settlement system. The settlement system is the spatial and functional distribution of economic activity, population and service facilities or activities in the country. National urban policies are those national policies which operate through interventions in the settlement system to achieve national objectives such as economic growth, interpersonal equity, and inter-regional equity.

There are many factors (other than explicit urban policy) which can influence the settlement system in positive or negative ways. That is, there are many causal influences operating on the system of which public actions and policies are only a part. Nevertheless, the outcomes of interest in developing improved policies are the positive or negative effects on the achievement of national goals, regardless of whose actions cause them.

As a result of the study of national settlement systems and urban policies in many countries, it is clear that many of the most important influences of government



on the settlement system are policies and practices of the government that are not necessarily thought of as urban policies. A policy of rapid industrialization, for example, produces increased urbanization and concentration of population in major urban centers, whether or not it is intended to do so. Expansion of public sector activities results in increases in public sector employment which, in turn, fosters growth in major governmental centers relative to other locations. Subsidies designed to alleviate problems of low income people in high cost urban areas increase the rate of migration to such urban areas. Capital subsidies designed to induce additional industrial investment may lead to use of more capital and less labor than is desirable in maintaining urban employment as well as provision of assistance to firms that would have made the investment anyway.

Policies which have these kinds of effects are often called implicit urban policies to distinguish them from policies explicitly chosen to have specific desired effects on the settlement system. In urban policy formulation, it is desirable to consider as many of these kinds of policies as possible. Consequently, this study has explored policy issues that go well beyond the specific mandate of the Ministry of Development in the attempt to define a sound urban policy.

Three such issues are of extreme importance. First, a spatial policy of redistributing urban population to specific locations chosen by the government cannot succeed unless spatial policy and planning is integrated with industrial policy in general and industrial location policy in particular. The location and magnitude of the employment base is the major factor influencing the location of population in Egypt as elsewhere. If spatial policy and industrial location policy diverge significantly, spatial objectives will not be achieved. At the same time, spatial planners must take account of the factors which make some industrial locations better than others setting spatial objectives. The efficient location of industry is not possible everywhere. The choice of spatial targets for population expansion in economically unattractive locations will result in industries which fail, thus, wasting resources, or which require continuous cost subsidy to keep in operation, thus, utilizing funds that could be more effectively used elsewhere.

Consequently, the integration of spatial planning with industrial policy (especially location policy) is essential to: (1) increase the likelihood of achieving spatial targets, and (2) reduce wastage of public investment and hold program costs within reasonable bounds.

The second key issue is the need for integration of spatial policy with sectoral policies for housing and infrastructure. In the housing and infrastructure sectors, public expenditure is substantial and Government policies have a pervasive influence. The amount of public expenditure depends upon the levels of service provided (service standards), the amount of the public outlays which is recovered from recipients of the services, and the number of places receiving housing and infrastructure allocations.

The provision of high levels of public services at relatively low cost to recipients in particular locations can obviously provide an incentive for businesses and people to locate there. If housing and infrastructure policies are intended to be used as instruments for changing the population distribution across cities, rather than solely to meet service demands wherever they are, it is essential to have differential (rather than uniform) standards and cost recovery mechanisms in different places.

Ministries responsible for specific infrastructure or service sectors do not necessarily take account of the incentive effects of the levels of services provided, standards and cost recovery mechanisms used. Consequently, policies in these sectors can, and frequently do, operate at cross-purposes with spatial objectives.

As is true in spatial choices for industry location, it is essential for those determining spatial priorities to assess the implications of their choices on the total requirements placed upon sectoral ministries. If the number of places suggested for spatial emphasis is large, or in places with non-existent or substantially deficient housing or infrastructure, the ability of the sectoral ministries to meet the requirements within acceptable budgeting limits may be seriously impaired.

The third key issue is the need to ensure that spatial and sectoral policies and plans for spending be realistically related in their total requirements and the timing of expenditures with the ability of the public sector to mobilize resources. Since it is generally the case that the sum of resource requirements for desirable programs and projects will exceed the amount of resources it is feasible to make available, choices among desirable activities must continuously be made. This has implications for both resource-raising ministries and resource-using ministries. The former ministries require realistic estimates of requirements as an input to considerations of monetary and fiscal policies (e.g., interest rate policy, tax policy, subsidy and transfer policy, and pricing policies). The latter ministries, in addition to being aware of the general constraint, should consider possibilities of adopting resource-generating (e.g., cost-recovery mechanisms, assessments of profitability of industrial investments) and cost-saving (e.g., choice of standards) approaches to spatial and sectoral policies.

Our analysis shows that it is extremely important for the GOE to adopt two general policies to guide all spatial and sectoral choices for national urban policy in order to achieve a better balance between resource mobilization and resource requirements than is likely if present practices and policies are continued:

- Priority should be given in program choices and spatial locations for investment in programs and locations where economic efficiency can be demonstrated.
- Industrial investment policies and sectoral policies for housing and infrastructure should be based upon the principle of conserving the amount of public investment required. Priority should be given to encouragement of private investment in both job creation and housing, development of standards for housing and infrastructure that are affordable by a broader portion of the urban population, and increased efforts to recover public investment outlays from the recipients of publicly supported housing and services.

While the NUPS Team recognizes the difficulty of correctly anticipating all the public and non-public influences on the settlement system, it is critical to a national urban policy (as a minimum) that a major effort be made to link spatial priorities with the policies of ministries with responsibility for the major policy instruments: job creation investment (or inducement), housing and infrastructure investment, standards of service provision and cost recovery. Finally, it is necessary to make a serious effort to match the investment and other resource-using

plans of the ministries responsible for spatial and sectoral policies with policies for mobilizing resources.

## II. SETTLEMENT STRATEGY OPTIONS

In the search for a suitable urban policy for Egypt, what settlement strategy options need to be considered? As suggested above, settlement strategies are essentially population redistribution and service provision strategies implemented primarily through shifts in the spatial distribution of employment and investment.

In looking for appropriate options, a question is whether some kinds of urban population distributions tend to be better than others in achieving various national objectives.

As indicated in our previous reports, the major national objectives which are likely to be achieved more or less fully depending upon the settlement and sectoral strategy adopted are:

- Achievement of a high rate of national economic growth.
- The maintenance of social justice through interpersonal and inter-regional equity.
- Reduction of the adverse consequences of concentration in the primate city.
- Protection of arable land to contribute to the production of food and the growth of agriculturally based industry.

The experience of other countries and the NUPS study of Egypt show that no single settlement strategy is simultaneously the best way of achieving such multiple objectives. At the same time, it is clear that there is sufficient regularity in the effects of types of settlement systems for some reliable generalizations to be made about what kinds of expectations the Government should have if they promote a particular type of settlement system.

The most pronounced of these regularities is the tendency of more concentrated settlement systems (that is, with relatively large national and regional centers) to be more efficient generators of economic growth and per capita income increase than more dispersed systems. It follows that more concentrated systems also create the possibility of achieving greater inter-personal equity; both because of greater employment opportunity for low income people resulting from growth and because the "growth surplus" can be used to provide a greater range of public services and redistributive transfers.

The other side of the coin is that concentration tends to produce increased polarization of the settlement system in the major metropolitan regions and may increase the disparity between income in these regions and regions which lack economic potential. The polarization of the settlement system can result in

substantial diseconomies (associated with rapid growth and large size in the metropolitan region) which reduce the net benefits of concentration. (See Appendix II-A, for a discussion and indicative estimates of such diseconomies.)<sup>1</sup>

Inter-regional equity (greater equality or convergence of regional incomes) may be better served by a more dispersed settlement system. These benefits (like the benefits of a concentrated system) have associated social costs. That is, they are likely to be achieved at the social cost of reduced rates of national growth in output and per capita income and loss of capability to increase inter-personal equity through reductions in the "growth surplus." It should be noted also, that experience with inter-regional dispersal strategies internationally has not resulted in substantial contributions to reductions in the growth of primate cities.

These general principles have strong theoretical and empirical support in this study and in studies by others of urban systems. The issue was summarized well by Koichi Mera, after an extensive review of both theoretical and empirical literature relating to over 45 countries as follows:

"The available empirical analyses show that large cities are more productive and that the largest cities are likely to be particularly more productive relative to others in a less developed country. Therefore, a decentralization policy of investment and population distribution over the country cannot be encouraged...if the national goal is to maximize the growth of national products.

"However, it is known that urbanization generally increases per capita income of the areas affected. Therefore, if the national goal is to achieve a more equitable distribution over different regions, even at some sacrifice to the GNP growth rate, then a policy directed toward development of under-developed regions can be justified."<sup>2</sup>

The Egyptian Government is strongly committed to the national objectives of achieving a sustained high rate of economic growth and improvements in social equity. The commitment to economic growth which is often stressed by public officials and national development planning is predicated on the maintenance of an annual growth rate of GNP in excess of 7 percent a year. That growth rates at this level are very difficult to achieve is shown by a recent World Bank finding (1979) that such high rates were achieved by only 7 of 125 countries over an extended time period such as the planning period for this study. While there are many uncertainties about whether or not this high level of growth can be maintained, the implication of a high growth objective for settlement strategies for Egypt is clear. The kind of settlement system that would tend to promote maximum growth is a regionally concentrated system which makes full use of the economic potential of major urban settlements, such as the Cairo and Alexandria metropolitan region.

Does the same conclusion follow from the government's commitment to social equity? Here the answer depends upon whether the emphasis is primarily on inter-personal equity (convergence of income and opportunity across individuals) or inter-regional equity (convergence of income and opportunity across all regions of the country).

Considerations of inter-personal equity tend to support a more concentrated, efficiency-oriented, settlement system rather than a dispersed system. Harry Richardson, in his recent NUPS Working Paper,<sup>3</sup> wrote:

"An efficiency-oriented settlement strategy offers the best prospects for promoting inter-personal, as opposed to spatial, equity because metropolitan area concentration is relatively more beneficial to the poor than to the rich and because it generates more surpluses for potential direct redistribution. Also efficiency in the allocation of scarce public investment resources tends to result in a wider distribution of the benefits of urban infrastructure and public services among groups."

For reasons already cited, a more dispersed system and strategy is more likely to promote inter-regional equity than a concentrated system. Hence, whether a more concentrated or a more dispersed system is to be preferred on equity grounds depends upon the relative weight policy makers attach to improving the relative position of low income people wherever they reside or of all the people who reside in lagging regions. If greater weight is attached to the former, a strategy of encouraging urban concentration is likely to serve both national growth and equity goals. If greater weight is attached to the latter, the simultaneous pursuit of growth and equity goals requires a mixed strategy with less concentration than would be optimal on economic growth criteria alone and more concentrated than would be optimal on inter-regional equity criteria alone.

The NUPS recommended strategy is to place primary emphasis on seeking national economic growth and gains in inter-personal equity and less emphasis on attempting to achieve convergence of regional income across all regions of the country over the next two decades. However, we propose that a focused effort be made in selected Upper Egypt cities to develop the industrial base for improving incomes in this relatively low income region.

This overall conclusion remains valid in the current context, even after a generous allowance for additional diseconomies associated with concentration in the Cairo and Alexandria regions, as described in Appendix II-A.

### III. ALTERNATIVES CONSIDERED IN DEVELOPING THE RECOMMENDED STRATEGY

Under any alternative, the settlement system of Egypt must accommodate somewhere all of the future resident population. Our analysis has been based upon the assumption that the resident population in Egypt will rise to at least 67.5 million people by the year 2000.

Figure I-5 showed the year 2000 resident population estimates for rural areas, urban areas and trend population estimates for Cairo and Alexandria compared to earlier years. As discussed in Chapter I, it is possible that the resident total population will be higher than 67.5 million (due to failure of birth rates to decline and potential reductions in foreign demand for Egyptian workers). It is possible, also, that the urban population will increase to more than the estimated 37 million since there is little prospect of enough agricultural employment being added to provide jobs to support the additional rural population. A policy of increasing rural non-farm employment to take up the slack is not recommended because low density industrial development in rural areas would be wasteful of arable land and because agriculturally-related industry will need to form a major element in urban industrialization policy and should be located primarily in urban areas. Our estimate of 37 million urban residents should be treated as a minimum planning figure.

From the perspective of these population growth estimates, urban areas as a whole will experience an annual rate of growth of at least 3.5 percent per year. The policy problem is how to select spatial locations with enough economic potential to make job creation investment both large enough to prevent high levels of unemployment and profitable enough to become largely self-financing over time. If spatial policy is unsuccessful in this regard, there will be too few resources to maintain public infrastructure and build new capacity to meet service the requirements of the urban population.

NUPS analysis of the economic context for urban policy choice recognizes the positive features of the recent performance of the economy; but recommends caution in assuming either that the high rates of economic growth in the last few years will continue or that the growth represents a major improvement in the performance of the domestic economy. The mobilization of sufficient investment resources to maintain high output growth, generate sufficient employment opportunities, and provide needed services requires urgent attention. The shortage of domestic resources slows down implementation of selected projects and limits the ability of the country to fully utilize international assistance.

Thus, the context within which alternative strategies should be considered is one of high and increasing demand for urban jobs and services and probable limitations on the ability of the Government to mobilize enough domestic resources to satisfy these demands fully. In this context our analysis shows that it is essential to select spatial priorities for urban development that contribute to an efficiency-oriented settlement strategy and sectoral policies which are consistent with a strategy of conserving public investment -- that is, the provision of housing and other infrastructure at affordable standards (reducing initial outlays per capita) accompanied by increased efforts at higher levels of cost-recovery from those served by public investment (increasing the return flow of reinvestable funds.)

#### IV. SPECIFIC ALTERNATIVES

In arriving at these conclusions, the implications of four basic alternative settlement strategies were explored. These were:

- Alternative A: This strategy is designed to select spatial priorities by emphasizing generation of economic growth at the least cost. Priority is given to places with established industrial potential.
- Alternative B<sub>1</sub>: This strategy emphasizes inter-regional decentralization through the development of a new major metropolitan area in the Suez region, preferably in Suez City.
- Alternative B<sub>2</sub>: This strategy emphasizes inter-regional decentralization through multiple growth centers.
- Alternative C: This strategy adds an emphasis on urban development in the Remote Areas to the multiple growth center approach of B<sub>2</sub>.

The recommended strategy, described in Chapter I, was developed from the results of examining the settlement distributions which result from these strategies; the estimated costs of developing industrial employment and both inter- and intra-regional infrastructure; and an assessment of the strengths and weaknesses of each of the alternatives. Tables summarizing the analytic framework and assessments of each of these alternatives are shown in Appendix II-B.

The populations for the 40 urban centers with over 50,000 population aggregated by zone and the implied growth rates from 1985-2000 under the various alternatives are shown in Table II-1.

The analysis confirms for Egypt the general principle that more dispersed settlement patterns require substantially greater financial outlays than more concentrated systems. Alternative A, the most concentrated strategy, is estimated to cost approximately 10 percent less than the most concentrated version of B<sub>1</sub>; about 14 percent less than the most dispersed version of B<sub>2</sub>; and about 22 percent less than C, the most dispersed strategy. These costs are summarized in Table II-2. Procedures for estimating the direct investment costs for job creation are described in Appendix II-C. Our analysis of the strengths and weakness of the alternatives on five sets of evaluation criteria is summarized in Table II-3.

## V. SUMMARY OF ANALYSIS LEADING TO THE RECOMMENDED STRATEGY

The key principles, findings and spatial recommendations derived from the earlier analysis are summarized here in order to focus attention on major issues in the choice of a national urban policy for Egypt.

### A. Principles

1. The settlement system is the spatial and functional distribution of economic activity, population, population serving infrastructure in the country.
2. National urban policies are those national policies which operate through interventions in the settlement system to achieve national objectives. Changes in the settlement system are not properly viewed as goals in themselves; rather they are initiated for other purposes.

**TABLE II-1  
POPULATION OF THE SETTLEMENT ALTERNATIVES**

	<u>POPULATION (IN THOUSANDS)</u>						<u>ANNUAL GROWTH RATE (%)</u>					
	<u>1990</u>						<u>1985 - 1990</u>					
	A	B <sub>1</sub>	B <sub>1</sub>	B <sub>2</sub>	B <sub>2</sub>	C	A	B <sub>1</sub>	B <sub>1</sub>	B <sub>2</sub>	B <sub>2</sub>	C
	EFFICIENCY		EQUITY		EFFICIENCY		EQUITY		EFFICIENCY		EQUITY	
Cairo	11,457	11,066	11,066	11,115	11,115	11,029	3.8	3.1	3.1	3.2	3.2	3.0
Alexandria	3,809	3,867	3,637	3,440	3,440	3,440	4.6	4.9	3.6	2.5	2.5	2.5
Delta	3,857	3,728	3,739	3,771	3,767	3,767	2.9	2.2	2.2	2.4	2.4	2.4
Canal	1,187	1,624	1,624	1,483	1,412	1,382	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	1,322	1,342	1,460	1,613	1,657	1,668	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	22,586	22,593	22,596	22,592	22,601	22,603						
	<u>1995</u>						<u>1990 - 1995</u>					
Cairo	13,750	12,899	12,899	12,998	12,998	12,862	3.7	3.1	3.1	3.2	3.2	3.1
Alexandria	4,727	4,640	4,190	3,890	3,890	3,914	4.4	3.7	2.9	2.5	2.5	2.6
Delta	4,466	4,250	4,253	4,355	4,347	4,283	3.0	2.7	2.6	2.9	2.9	2.6
Canal	1,368	2,550	2,550	2,002	1,850	1,761	2.9	9.4	9.4	6.2	5.6	5.0
North Upper Egypt	780	767	913	1,113	1,167	1,149	1.7	1.1	2.7	4.8	5.3	4.7
Remote	254	249	311	361	402	724	1.3	0.8	2.8	4.4	5.5	12.3
TOTAL	26,785	26,781	26,778	26,762	26,781	26,782						
	<u>2000</u>						<u>1995 - 2000</u>					
Cairo	16,419	14,999	15,001	15,200	15,200	15,000	3.6	3.1	3.1	3.2	3.2	3.1
Alexandria	5,778	5,258	4,630	4,400	4,400	4,399	4.1	2.5	2.0	2.5	2.5	2.4
Delta	5,175	4,864	4,869	5,111	5,113	4,861	3.0	2.7	2.7	3.3	3.3	2.6
North Upper Egypt	849	795	9,899	1,374	1,456	1,398	1.8	0.8	1.8	4.3	4.5	4.0
South Upper Egypt	1,581	1,482	1,813	2,526	2,639	2,525	1.9	0.8	1.8	4.3	4.4	3.9
Canal	1,577	3,999	3,999	2,596	2,342	2,165	2.9	9.4	9.4	5.3	4.8	4.2
Remote	270	253	341	438	502	1,300	1.2	0.3	1.9	3.9	4.6	12.4
TOTAL	31,649	31,650	31,652	31,645	31,652	31,648						

SOURCE: NUPS analysis.



**TABLE II-2**  
**SUMMARY OF URBAN DEVELOPMENT COSTS 1986-2000**  
**(L.E. Millions)**

SECTOR	A	B <sub>1</sub> EFFICIENCY	B <sub>1</sub> EQUITY	B <sub>2</sub> EFFICIENCY	B <sub>2</sub> EQUITY	C	NUPS PREFERRED STRATEGY <sup>2</sup>
<u>1986-1990</u>							
INDUSTRY	8,423	8,891	9,030	9,134	9,929	9,531	8,689
URBAN INFRASTRUCTURE	12,429	13,728	15,528	14,646	16,226	17,803	10,078
INTER-URBAN INFRASTRUCTURE	4,883	5,117	5,280	5,192	5,279	6,071	5,071
TOTAL	25,735	27,736	29,838	28,972	30,784	33,405	23,838
<u>1991-1995</u>							
INDUSTRY	12,826	13,493	13,598	13,236	13,360	13,620	12,984
URBAN INFRASTRUCTURE	13,200	16,394	17,129	15,474	17,511	21,884	10,023
INTER-URBAN INFRASTRUCTURE	6,375	6,016	3,877	7,199	5,949	8,212	8,891
TOTAL	32,401	35,903	37,604	35,909	36,860	43,716	31,898
<u>1996-2000</u>							
INDUSTRY	22,247	23,010	23,157	22,268	22,475	23,051	22,421
URBAN INFRASTRUCTURE	14,818	18,357	19,523	17,469	19,675	23,127	11,324
INTER-URBAN INFRASTRUCTURE	7,990	8,285	8,496	9,044	9,136	10,468	11,702
TOTAL	45,055	49,652	51,176	48,781	51,286	56,646	45,447
<u>1986-2000</u>							
INDUSTRY	43,496	45,394	45,785	44,638	45,074	46,202	44,094
URBAN INFRASTRUCTURE	40,447	48,479	52,180	47,589	53,492	60,441	31,425
INTER-URBAN INFRASTRUCTURE	19,248	19,418	20,653	21,435	20,364	24,751	25,464
TOTAL	103,191	113,291	118,618	113,662	118,930	131,394	101,182

<sup>1</sup> The methodology for estimating direct investment costs in industry is described in Appendix II.C.

<sup>2</sup> Includes telecommunications in urban infrastructure other standards similar to Estimate I.

SOURCE: NUPS analysis.

**TABLE II-3  
EVALUATION SUMMARY  
AVERAGE SCORES AND AVERAGE RANKS<sup>1</sup>**

EVALUATION CRITERION <sup>2</sup>	A		B1 EFFICIENCY		B1 EQUITY		B2 EFFICIENCY		B2 EQUITY		C	
	Av. Score	Av. Rank	Av. Score	Av. Rank	Av. Score	Av. Rank	Av. Score	Av. Rank	Av. Score	Av. Rank	Av. Score	Av. Rank
1. Social Effectiveness	4.0	3.0	5.1	3.5	4.8	3.3	4.1	2.8	4.4	3.3	5.9	4.8
2. Economic Efficiency	2.1	1.5	3.1	2.2	4.7	3.4	4.6	3.2	6.7	4.6	8.6	6.0
3. Management & Implementation	2.2	1.7	4.5	3.5	5.5	4.0	4.1	2.8	5.2	3.6	8.2	5.7
4. Risk	3.2	2.1	4.4	2.4	5.3	3.5	4.8	3.0	6.2	4.2	8.3	5.3
5. Cost <sup>3</sup>	-	0.1	-	2.0	-	4.0	-	3.0	-	5.0	-	6.0

<sup>1</sup> Numerical values are shown to help provide a sense of the relative differences among alternatives as judged by NUPS professional staff. Judgments of others may differ or individual criteria may be weighted differently than the equal weighing used to derive the average values. There is no technical or scientific basis for adopting particular weighing system. Average scores and average ranks are both shown in this table. In the procedure used an alternative could be assigned a score of 1 to 10, with a score of 1 best and 10 worst. The numerical values of the scores are a rough guide to not only which alternatives rank highest but how great the differences are among them. The average rank is simply the sum of the ranks assigned by all evaluation staff divided by their number.

<sup>2</sup> See complete list of sub-criteria under each of these general headings in Appendix II-8.

<sup>3</sup> These ranks are derived from cost estimates rather than the evaluation procedure described in footnote 1.

SOURCE: NUPS analysis.

3. Important national objectives which are relevant to the choice of national urban policy are:
  - Achievement of a high rate national economic growth.
  - The maintenance of social justice through interpersonal and inter-regional equity.
  - Reduction of the adverse consequences of concentration in the primate city.
  - Protection of arable land to contribute to the production of food and the growth of agriculturally based industry.
4. Since there are many national purposes or goals, it is not likely that any one settlement system will be best for all purposes or that a single strategy can serve all purposes equally.
5. Settlement systems tend to develop relatively large concentrations of population in a few national and regional centers because of the very strong economic advantages (both nationally and personally) of such agglomeration. These concentrations occur in locations which offer specific advantages; they do not occur randomly across national space.
6. It is extremely difficult to make major changes in the settlement system in a short period of time through government action even if large expenditures of financial and other resources are committed to such change.
7. To affect the settlement system in planned ways, it is absolutely essential for industrial investment and location policies to be consistent with spatial priorities, since the availability of jobs is the most important factor in determining where people live or migrate to.

#### B. Findings

1. More concentrated settlement systems are generally more effective producers of national and regional growth, especially during a period of rapid economic development. More dispersed systems are more costly to initiate and maintain in terms of both financial costs and real resource costs (such as materials for housing and infrastructure, personnel and management costs).
2. Our empirical estimates of alternative spatial strategies presented in the study confirms this conclusion for Egypt. Our estimates show that the costs for both job creation and infrastructure are likely to be about one and a third times as much in a strategy of dispersion as in a strategy which concentrates investment in places with established economic potential.
3. Analysis of population growth and prospects for expansion of rural employment leads to the conclusion that urban population will continue to grow at rates above the national rate of population growth, resulting in substantial increases in the demand for urban jobs, housing, and services.
4. Continuation of recent high rates of economic growth cannot be taken for granted. Even if high rates are maintained, substantial increases in the portion of the

growth allocated to investment (rather than current consumption) will be necessary to finance job creation and needed infrastructure investment. Such substantial increases are required that it would be unwise to base inflexible spending plans on their occurrence.

5. If domestic saving plus foreign assistance does permit sufficient investment to achieve a 7 percent annual rate of economic growth, the total investment pool would amount to about 125 Billion L.E. between 1986 and 2000.<sup>4</sup> Our least cost estimate for investment in job creation and infrastructure for the 40 largest cities and urban population in Remote Areas only is more than four-fifths of this total. The cost estimate for the most dispersed strategy is over 5 Billion L.E. more than the total pool.
6. These estimates demonstrate that a feasible national urban policy will require the government to now make strategic choices which are highly selective among:
  - The numbers of urban places which will receive priority emphasis -- it is not feasible to attempt to simultaneously upgrade all existing urban settlements, develop extensive industrial bases in all of the largest cities, substantially expand urban places in Remote Areas, and build free-standing New Cities as currently planned.
  - The standards of housing, infrastructure and community services -- the standards of housing and service packages need to be selected to reflect both spatial targeting and greater affordability within urban areas.
  - The amount of cost recovery to be sought from recipients of publicly provided services -- subsidies should be reduced by cost recovery mechanisms that are more consistent with ability to pay of various income groups than is true of current practice.
7. There is a significant danger that the failure to adopt feasible strategies regarding spatial emphases and sectoral policies will result in substantial deterioration in the level of services and well-being of the bulk of the urban population, result in even more rapid and uncontrolled growth in Cairo, and limit rural initiatives as well as waste scarce resources.

#### C. Recommendations

1. The NUPS Team recommend, therefore, the adoption of two very important general policies to guide spatial and sectoral choices for national urban policy:
  - Priority should be given in programs and spatial locations or investment to programs and locations where economic efficiency can be demonstrated.
  - Industrial investment policies and sectoral policies for housing and infrastructure should be based upon the principle of conserving the amount of public investment required. Priority should be given to encouragement of private investment in both job creation and housing, development of standards for housing and infrastructure that are affordable by a broader portion of the urban

population, and increased efforts to recover public investment outlays from the recipients of publicly supported housing and services.

## 2. Recommended Spatial Emphases

- We recommend the adoption of a policy of selective decentralization over the next 15-20 years to Suez and two to three Upper Egypt areas -- Qena/Naga Hamadi, Aswan and Assiut -- rather than special decentralization efforts spread over many places.
- A major push in Suez city can lead to the development of a large urban competitor to Cairo and Alexandria, enhance the growth prospects of the Canal region, and build a base for subsequent growth in Sinai and along the Red Sea Coast.
- Special emphasis on Qena/Naga Hamadi can take advantage of recent major investments in industry in Naga Hamadi and enhance future growth prospects in the Western Desert and the Red Sea Coast. The major difficulty will be generation of a larger economic base to attract population and the construction and maintenance of the infrastructure to serve them in the Qena/Naga Hamadi corridor.
- Aswan and Assiut are reasonable choices on locational grounds for special emphasis -- Aswan as the southern anchor of the settlement system and Assiut as a key anchor to the development of the middle portion of the Upper Nile Valley. In these cities, too, the development of an expanded economic base at reasonable cost is the major concern.
- The Delta poses a major challenge for urban policy and its integration with rural policy. The Delta has sufficiently strong economic advantages to attract substantial investment in industry. Unless such economic growth is carefully managed, Delta cities will increasingly spill-over into high yield agricultural land. We recommend special emphasis on Tanta and Mansoura as test cases for the development of growth management strategies and increased consolidation of regional service functions in a few centers to serve smaller urban places, villages, and farms in the Delta Region.
- The Alexandria Metropolitan Region should be encouraged to grow (through increased industrial and infrastructure investment) as the major urban competitor to Cairo. This growth should be planned for and managed as a single metropolitan region although the current urban area is in three separate governorates. The major policy issue is defining and controlling the directions of growth since feasible growth directions are on old agricultural land, newly reclaimed land, or land currently being developed as low density touristic/recreational sites. Priority should be given to:
  - infill in peripheral *kisms*,
  - providing infrastructure services in fringe areas where growth is desired, and
  - additional close-in settlements, rather than in New Ameriyah over the next ten years.

- Under any feasible spatial alternative, the Cairo Metropolitan Region will experience considerable growth; which should be taken into account in spatial and sectoral plans. The major policy issues for Cairo are:
  - The selection of locations for new growth,
  - the redirection of growth trends from rapid expansion in a generally north-south axis to an eastwest axis, and
  - management of services throughout the urban region.

The highest priority should be given to:

- Encouraging more dense development in peripheral, relatively low density *kisms*,
  - provision of serviced fringe sites for low income residential development to encourage the deconcentration of highly dense core *kisms*,
  - development of several close-in settlements (such as 6th of October and El Obour) which in addition to well located desert fringe sites, would provide areas for new industrial and service sector growth as well as new residential sites, and
  - consideration of an extended time frame for further development in 10th of Ramadan and Sadat City to permit investment allocations to be directed to priority developments cited above in the near future and possible restructuring of new city development plans to serve a broader range of population than can now be served at affordable service levels.
- During the next 10 to 15 years, only limited and experimental urban development activities with high economic payoffs or significant learning potential should be undertaken in the remote areas until the priority efforts described above provide improved development linkages to support future urban growth in these regions.

NOTES  
CHAPTER II

THE ANALYTICAL BASIS FOR THE RECOMMENDED STRATEGY

1 See Appendix II-A.

2 Koichi Mera, "On Urban Agglomeration and Economic Efficiency," Economic Development and Change, No. 21, 1973, p. 324.

3 Harry W. Richardson, "From First Round Alternatives to a Preferred Strategy: Suggestions and Comments," pp. 1-2.

4 This figure (125 Billion L.E.) includes investment required for the agriculture and petroleum sectors. This means that the most dispersed strategy is not affordable even if growth is sustained at 7 percent and no investment funds are allocated to these two sectors.

## CHAPTER III

### MAJOR METROPOLITAN REGIONS AND NEW TOWNS



## CHAPTER III

### MAJOR METROPOLITAN DEVELOPMENT

During the study which has led to this Final Report, the NUPS Team has reviewed the possibilities and development problems for all regions of Egypt and, as described in the preceding chapter, analyzed the implications of various combinations of possible future settlement patterns and sectoral investment patterns. Our overall recommendations have been described in Chapter I.

This chapter provides a more detailed discussion of our spatial and related recommendations. Consideration is given first to major metropolitan centers: the Cairo and Alexandria metropolitan regions, the New Towns, and the proposed major metropolitan center at Suez. We next consider recommended special emphasis cities for decentralization through growth encouragement. The third section discusses the growth management strategy for the Delta. The chapter concludes with a discussion of the recommended strategy for Remote Areas.

#### I. MAJOR METROPOLITAN DEVELOPMENT: The National Context

##### A. General

The National Urban Policy Study has concluded that the major metropolitan regions of Cairo and Alexandria will and should play an important part in accommodating Egypt's expected increase in urban population by the year 2000. The reasons for this conclusion include:

- The need which exists for economic and spatial efficiency in the settlement system. Efforts to prevent industrial expansion in major metropolitan regions are likely to result in reduced rates of economic growth in the nation.
- The inertia of the current settlement system is such that it is highly unlikely that a major reduction in the polarization of urban population can be achieved in this century.
- Planning for major metropolitan development will provide a backup mechanism for urban development if proposed decentralization efforts fall short of their targets.
- Absorption of migrants from the Delta (and Nile Valley) in the major metropolitan regions will result in less loss of old cultivated arable lands, if major metropolitan growth can be directed to desert areas in the metropolitan regions than if the population remains in the Delta. Furthermore, the opportunities for expansion of the major metropolitan areas in desert areas are sufficient to absorb the growth suggested.

- Opportunities for improving interpersonal equity among the urban poor, which represent a significant share of the urban population, are enhanced by the growth of the major urban centers.

On the other hand, the disadvantages of major metropolitan growth, in its present form, are also numerous. The associated problems of congestion, overburdened infrastructure, housing needs, security and intra-regional equity are more pronounced and acute at a large urban scale. Furthermore, the problems associated with planning, implementation, and management which are already severely felt in Cairo, present a strong argument in favor of "maximum feasible" decentralization of the future urban population, such as we have recommended.

In realistic terms, it is wise to plan for a major increase in population for both Cairo and Alexandria Regions. Simply left to current trends, both cities will more than double in size by the end of the century. Their natural growth rates alone, which account for two-thirds of their annual population increase, will result in significantly larger urban populations. Thus, for reasons of economic efficiency, improved possibilities for increasing interpersonal equity, and the excessive costs and risks of major decentralization; populations on the order of magnitude of 16-16.5 million for Cairo and 5-5.5 million for Alexandria metropolitan regions should be anticipated. In addition, Suez, though presently not a major metropolitan region, could achieve a population on the order of 750-800,000 and possibly reach 1 million by the end of the century.

As the study team has concluded that the major metropolitan areas will increase substantially in size, special assessments regarding urban form and ease of administration are required. Concept plans prepared by the National Urban Policy Study for Cairo and Alexandria, recommended intra-regional deconcentration in desert areas as the most appropriate urban form for the major metropolitan areas. This principle has also, in essence, been adopted by the New Communities Program.<sup>1</sup>

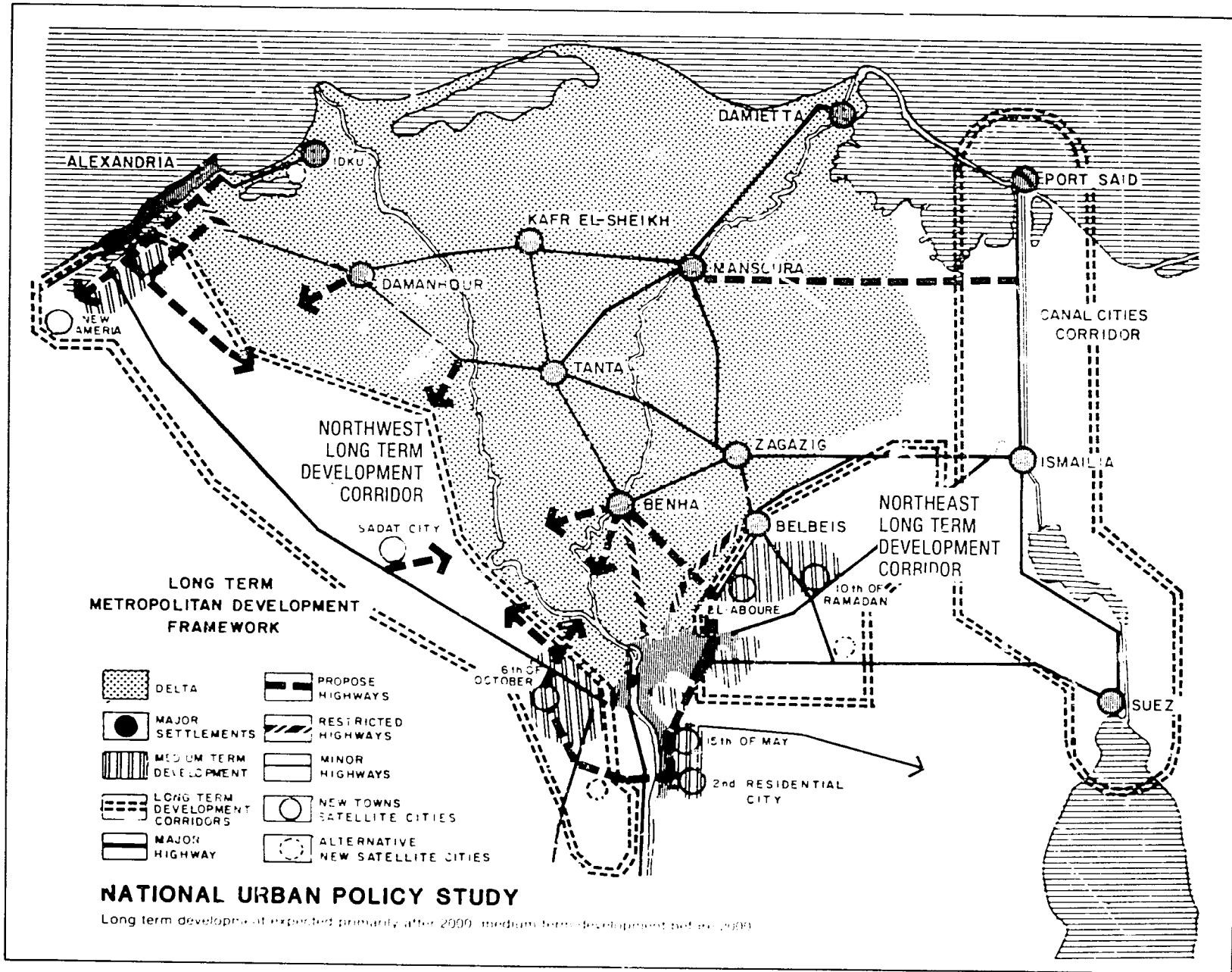
In both the Cairo and Alexandria Concept plans prepared by the National Urban Policy Study, a long-term schematic plan for major metropolitan growth was suggested as shown in Figure III-1. Generally, it consists of "development" corridors along the western and eastern Delta/desert fringes into which the major metropolitan areas can expand. To the northeast, the corridor lies between Ismailia and Cairo parallel the Cairo/Ismailia desert road. To the northwest, the corridor lies between Cairo and Alexandria along the Cairo/Alexandria desert road. In effect, the Canal cities corridor would play a similar role. In addition to deconcentrated metropolitan growth, these corridors should be planned in coordination with a rightly controlled growth management of the Delta Zone.

## B. Future Development of the Cairo Region

### I. Introduction

The development of a feasible and appropriate strategy for the future growth of Cairo is a principal element in the proposed National Urban policy. In terms of scale alone, the expected population target for the Cairo Region of 16 to 16.5 million inhabitants will account for a major share of the expected urban population (43 percent) in the year 2000. This will require careful consideration of the many development issues which remain to be resolved and the application of a strong "political will" to carry out an appropriate development strategy.

# LONG TERM METROPOLITAN DEVELOPMENT FRAMEWORK



LONG TERM METROPOLITAN DEVELOPMENT FRAMEWORK

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

## NATIONAL URBAN POLICY STUDY

Long term development expected primarily after 2000, medium term development before 2000

FIGURE III-1

During the National Urban Policy Study, an overview of the kind of growth strategy which is deemed appropriate for the Cairo Region was suggested in the Cairo Concept Plan.<sup>2</sup> However, the concept plan is viewed as simply a starting point for the more in-depth and detailed analysis and planning which is required. The Concept Plan was meant to illustrate that the enormous growth of Cairo, which is forecast by all observers, need not be the disaster many fear. Indeed, through an aggressively planned, implemented, and managed strategy the tremendous potential contribution of Cairo to national economic growth (with efficiency and equity) can be achieved.

In order to accommodate the population growth expected during the planning period, order of magnitude estimates for required industrial and infrastructure investment were made as presented in Table III-1. The projected investment costs were made at five year intervals to reflect differences in costs per job and to take into account the substantial upgrading of existing industry and infrastructure which will be required during the initial periods. Costs for two standards of development were carried out as indicated in the table. A full description of these standards can be found in Chapter V. At the second standard of development approximately 38 percent of the total cost of the preferred strategy would be required. On the other hand, the Cairo Zone is expected to accommodate 43 percent of the total urban population and 54 percent of the increase in population during the planning period (1986-2000).

## 2. Principal Findings Regarding the Existing Situation and Current Trends

During the course of the preparation of the Cairo Concept Plan a number of development issues were identified which are summarized as follows:

a. The present directions of contiguous urban growth are primarily on the north/south axis while current development trends suggest reinforcement of this pattern of growth. (Figures III-2a and III-2b).

Substantial growth in these areas as well as on the western Nile Valley has or will cause significant loss of some of the most highly productive arable land in the nation. The reasons for these growth trends are summarized as follows:

- The major transport links to Alexandria and Upper Egypt create development attraction. Various inter-regional and intra-urban transportation investments have enhanced this development, while those under consideration (such as the widening of the Cairo/Alexandria Agricultural Road and the proposed subway) are likely to reinforce these trends and lead to further losses of arable land.
- Water and sewer network extensions have generally lagged behind urban growth. Nevertheless, eventual servicing of these areas, as well as planned infrastructure extensions based on current growth trends, will reinforce the attractiveness of the north/south axis.
- Past industrial investment within the Cairo Zone has been predominantly in the north and south. Furthermore, the current 1980-1984 industrial development plan projects 75 percent of the planned investment in arable areas while 90 percent of the realized investment has been on arable land.
- Vacant desert areas in proximity to Cairo, which are under the authority of the military, national ministries, governorates or privately owned, are not readily

**TABLE III-1**  
**CAIRO ZONE**  
**SUMMARY OF POPULATION GROWTH AND INVESTMENT REQUIREMENTS**

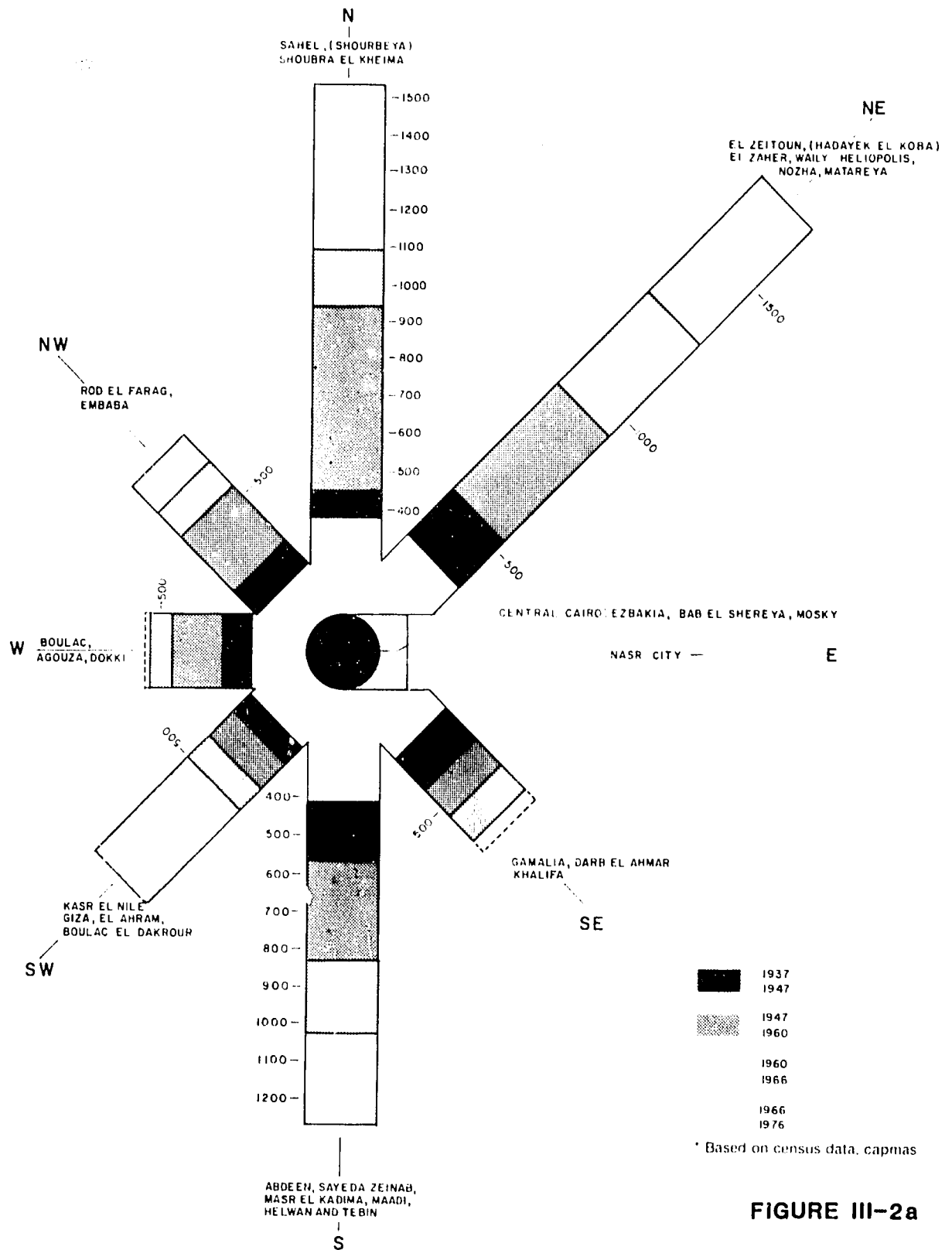
1985	POPULATION (000)			INVESTMENT <sup>1</sup> L.E. (000,000)			PER CAPITA INVESTMENT (BASED ON POPULATION AT END OF PERIOD) L.E.				
	1990	1995	2000	1986-1990	1991-1995	1996-2000	1986-2000	1986-1990	1991-1995	1996-2000	1986-2000
9707	11,629	13,879	16,500								
A.	Direct Investment (Industry and Services)			4,572	6,906	11,392	23,320	393	498	721	1,413
B.	Intra-Urban Infrastructure (Estimate I)			4,700	5,218	5,965	15,883	404	367	362	896
C.	Intra-Urban Infrastructure (Estimate II)			3,446	3,881	4,402	11,729	296	280	267	711
D.	TOTAL (A + B)			9,272	12,124	17,857	39,203	771	847	1,056	2,309
E.	TOTAL (A + C)			8,018	10,787	16,294	35,049	690	777	968	2,124

<sup>1</sup> See Chapter IV \*section I for details of direct investment and section II for details of Intra-urban investments.

SOURCE: NUPS projections.

# GREATER CAIRO DIRECTIONAL POPULATION GROWTH TRENDS \* (1937--1976 BY KISM)

NATIONAL URBAN POLICY STUDY



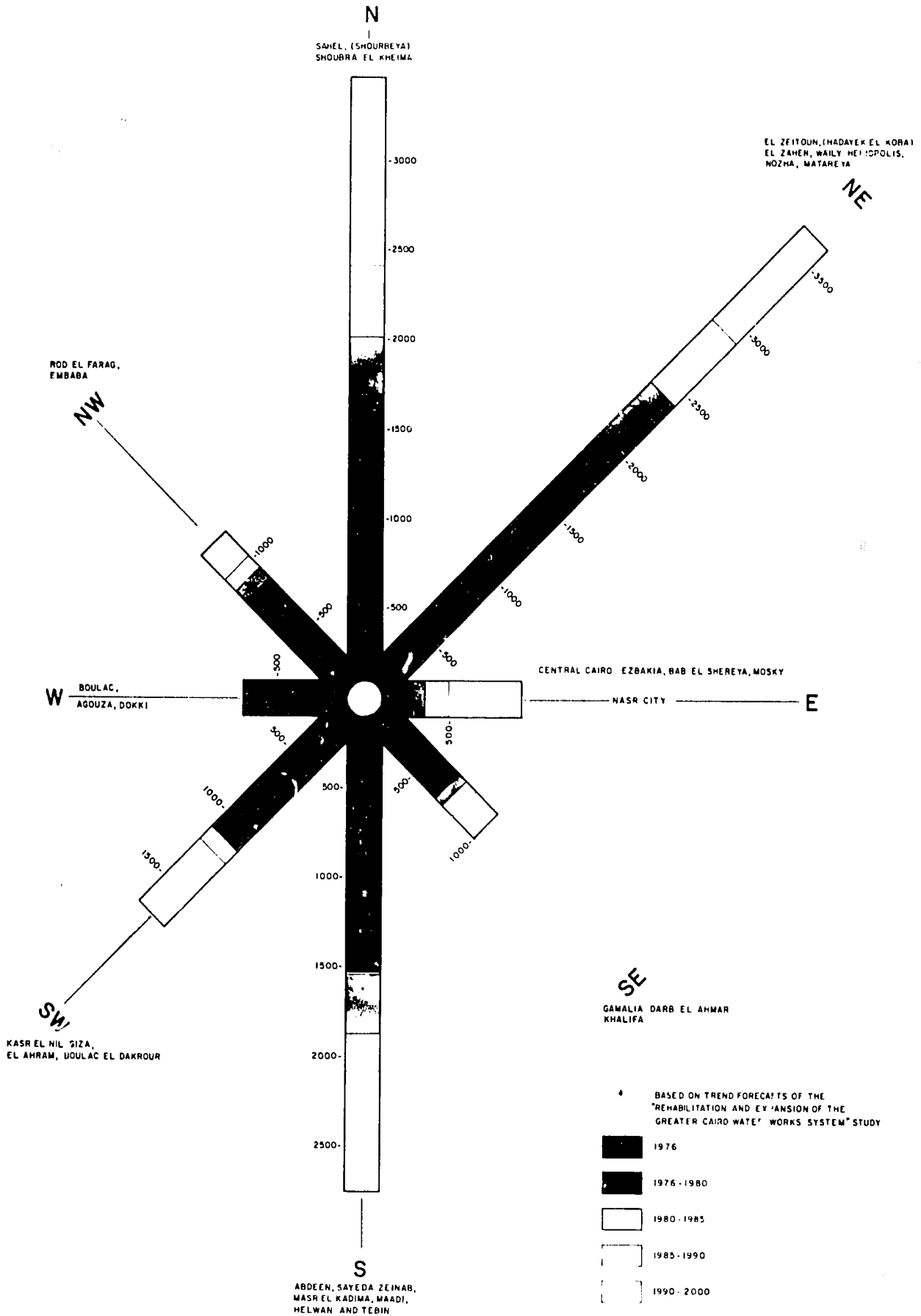
\* Based on census data, capmas

**FIGURE III-2a**

# GREATER CAIRO DIRECTIONAL POPULATION GROWTH TRENDS \* \*

## (1976-2000 BY KISM)

NATIONAL URBAN POLICY STUDY



N.B. Directional growth to the year 1976 shown in previous figure is illustrated in black for comparison purposes

FIGURE III-2b

accessible for low and lower middle income households. Consequently, informal or illegal housing, which represents the vast majority of new housing construction in the zone, has been extensive. LANDSAT imagery of metropolitan areas for the period 1972-1978 (Figure III-3) notes substantial loss of arable land at the urban fringe.

b. The 1970 Preliminary Master Plan for the Cairo Region provided a good conceptual basis for intra-regional deconcentration of Cairo. However, subsequent developments have reduced its value and some aspects require re-evaluation:

- The notion of constraining urban development by the proposed ring road is not likely to work. Growth has already occurred beyond its proposed location and the ring road itself would likely encourage further development beyond its limits.
- The Plan's original proposal for satellite cities has been partially modified by development of free-standing new towns relatively far removed from Cairo proper. Though these may form a basis for long-term development, they are not likely to have much impact on accommodating future urban population by the year 2000. Closer-in satellite communities are preferable in the the shorter term.

c. The multitude of national and local public interests in the Cairo Zone has led to an inefficient planning and investment rationale for desirable urban development. This is illustrated by:

- The lack of a planning body for the entire Zone.
- The proposed industrial investment portfolio.
- Current governorate boundaries.
- Uncontrolled development.

d. Though there is widespread support of the idea of deconcentrating and decongesting central Cairo, past and currently planned development programs are likely to have the opposite effect. For example:

- Planned inter-regional highway entranceways, commitment to flyovers, the proposed underground, etc., will reinforce the potential for concentration in the center, whereas it would be more appropriate, initially, to make efforts to improve traffic management and restrict use of private vehicles in the central areas.
- The absence of a program to control the rapid growth of private vehicle ownership and use in the central core and the lack of proper traffic management and enforcement are likely to exacerbate congestion problems.
- The high floor area ratios which presently exist and are underway in central urban locations (given the relatively low and fixed area of circulation space) will result in continued concentration and possibly irrevocable congestion in the central area.

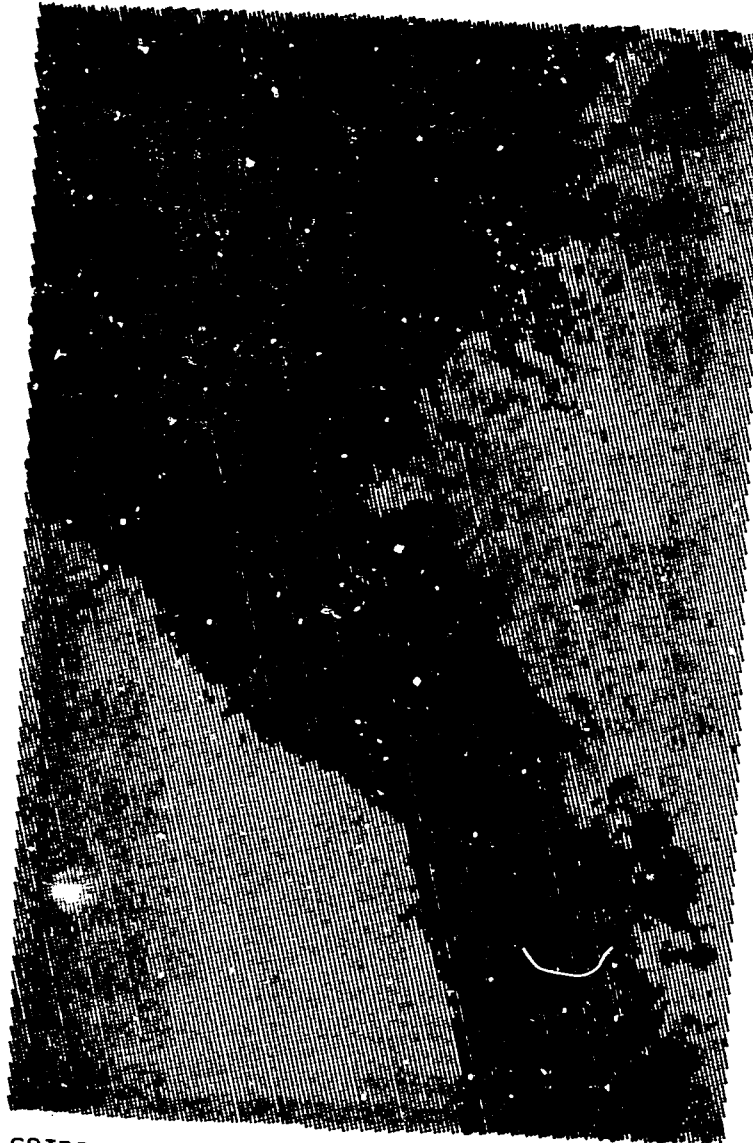


GREATER CAIRO METROPOLITAN URBAN CHANGE  
1972-1978



CAIRO METRO AREA  
1972  
SCALE 1-200,000

- KEY
- URBAN
  - ▨ AGRICULTURE
  - ▩ BARREN
  - WATER

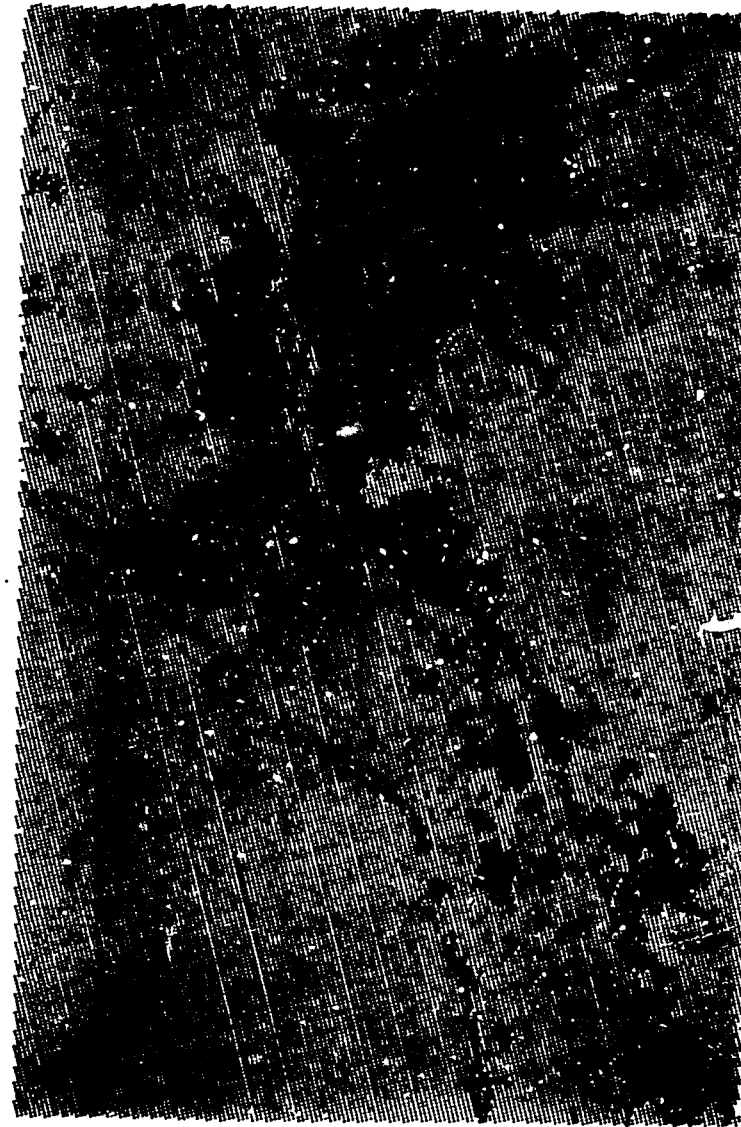


CAIRO METRO AREA  
1978  
SCALE 1-200,000

- KEY
- URBAN
  - ▨ AGRICULTURE
  - ▩ BARREN
  - WATER

FIGURE III-3

(Continued)  
1972-1978



CAIRO METRO AREA  
URBAN CHANGE - 1972 TO 1978  
SCALE 1-200,000

KEY  
 ■ CHANGE TO URBAN  
 ■ EXISTING URBAN  
 □ OTHER



CAIRO METRO AREA  
URBAN CHANGE - 1972 TO 1978  
SCALE 1-200,000

KEY  
 ■ CHANGE TO URBAN  
 □ OTHER

- Despite these developments, some advantageous deconcentration of the core has occurred which should be capitalized on (i.e., Nasr City/Heliopolis; Helwan).

e. Government initiatives in the provision of highly subsidized housing and public services, though desiring to achieve widespread equity, have contributed to creating current deficits:

- Lack of sufficient funds to finance improved service levels and inadequate cost recovery has resulted in deficits and poor levels of service for water supply, sanitation, and other urban services.
- Though housing starts appear to be keeping pace with household formation, most dwelling units are being constructed by the informal sector which has an illegal status. Therefore, the ability of the government to gain control of this sector has been limited. Furthermore, existing public housing programs have benefitted relatively few households and have not adequately addressed the pressing needs of low income groups.

### 3. Objectives for Future Urban Development

Given the findings of the National Urban Policy Study regarding past and current development trends, the following objectives and directives have been established for coherent spatial development in the Cairo Zone:

a. Redirect Cairo's urban growth from an essentially north/south axis to an east/west orientation on vacant desert areas in proximity to the current built up area. This will require:

- A full commitment to the preservation of arable land through enforcement of existing laws and close cooperation among those locating public sector industries, housing and service facilities.
- The introduction of alternative serviced desert sites for informal type settlements and a mechanism to facilitate their development.
- Transportation, industrial, and infrastructure investments in eastern and western desert locations to induce development.
- Full support to the satellite cities of El Obour and 6th of October and further study of additional satellite cities on non-arable land in proximity to the built-up area.
- The introduction of restricted arable and desert areas through the introduction of dual land uses and possibly the acquisition by the government of development rights in key areas.
- Exertion of political will to achieve these objectives.

b. Pursue the deconcentration of central Cairo through the establishment of secondary and tertiary commercial, financial, industrial and administrative centers. This will require:

- An assessment of economic activities which can conceivably be displaced from the core and the obstacles which must be overcome.
- Re-examination of the impact of rent control and other legal controls which constrain efforts at deconcentration.
- Development of a package of incentives to achieve deconcentration and/or the consideration of disincentives for marginal economic activities to remain in the central area would at least compensate for the higher costs to local government of their remaining in the core.
- Future expansion of transport network and systems serving the core area should be subjected to feasibility studies which would evaluate the impact of such projects on the ability to redirect Greater Cairo's growth axis, the economic feasibility of those projects generating sufficient returns to justify them, and their likely contributions to relieving core congestion.

c. Promote an improvement in the general quality of life and environment. This will require:

- Major rehabilitation of the existing housing stock and infrastructure. Reduction or avoidance of high residential densities in northern districts as well as the old city (while pursuing increased densities in high standard high income districts with low densities).
- Improvement of cost recovery mechanisms for public services and housing schemes and greater autonomy and an improved resource base for local Government.
- Implementation of policies to deconcentrate and decongest the central core area.

d. The creation of appropriate instruments of governance to guide and control an integrated set of spatial, economic, social, and financial programs. This will require:

- The establishment of an appropriate structure to control development throughout the Greater Cairo Zone.
- The creation of a zonal wide planning agency.
- The establishment of procedures to integrate levels of Government and the individual agencies making investments and/or decisions affecting the zone.
- Implementation of efforts to enhance the resource base for maintenance and service delivery.

#### 4. Strategy for Future Urban Development

Based on assessments of current growth trends, the overall physical development strategy proposed for the Cairo Zone emphasizes deconcentration of the central core into a hierarchy of secondary and tertiary centers and expansion onto vacant desert areas in proximity to the current built-up area. In the strategy, two major

secondary centers are envisaged; the Nasr City/Heliopolis area, and the Helwan/Maadi corridor. Other sub-centers should also be established in the northeast and southwest desert areas. Smaller district and neighborhood centers should also be encouraged to develop.

The strategy also calls for full support to the satellite cities of El Obour, 6th of October, 15th of May, and possibly another site in the vicinity of Helwan, (i.e., 2nd Residential City). Since the new towns of Sadat City and Tenth of Ramadan do not have the comparative locational advantages of the satellite cities, it is recommended that a reassessment of their potential for major accommodation of future population be made at the end of the first phase of construction. Future levels of investment in the New Towns should be linked to strong evidence of growth potential based on the rate of development of the first stage.

As planned urban extensions some fringe expansion of the contiguous built-up area will inevitably occur. These should be built into the development strategy for the region. However, to avoid excessive densities and loss of arable land, large areas of serviced desert sites should be developed to meet the locational requirements of low income households which tend to reside in informal development areas at the urban fringe. Recommended sites for these developments are found on Figures III-4 and III-5.

Given the large vacant and underutilized areas within the current built-up area, such as Fustat and the Maadi/Helwan corridor, efforts must be made to achieve an efficient absorption of population and land use in these areas. Appropriate standards, costs and procedures should be selected in order to harness the dynamism of the informal sector. Since the built-up area must expect to absorb additional population and service levels are inadequate in many older districts of Cairo, substantial rehabilitation and upgrading of the existing housing stock is required. NUPS suggested levels of investment in the Cairo Zone take into account these requirements at suggested standards.

The proposed development strategy for the Greater Cairo Zone is primarily one of intra-regional deconcentration aimed at reducing core area population growth and providing mainly new desert locations for future urban growth. However, due to the nature of current trends, planned urban extensions and opportunities for infill, the strategy must be mixed in nature. It may be summarized as follows:

- Deconcentration of the central area through the establishment of secondary and tertiary centers encouraging core area activities which could feasibly relocate to do so, and developing mechanisms for taxing activities in the core area to recover the higher costs of providing urban services to them in the core and as an incentive to relocate.
- Emphasis on the development of the close-in satellite cities for future urban expansion in desert areas.
- Introduction of low income settlements in proximate desert locations to forestall development in arable fringe areas.
- Incorporation of planned urban extension projects in desert areas into the strategy (i.e., Nasr City extension).

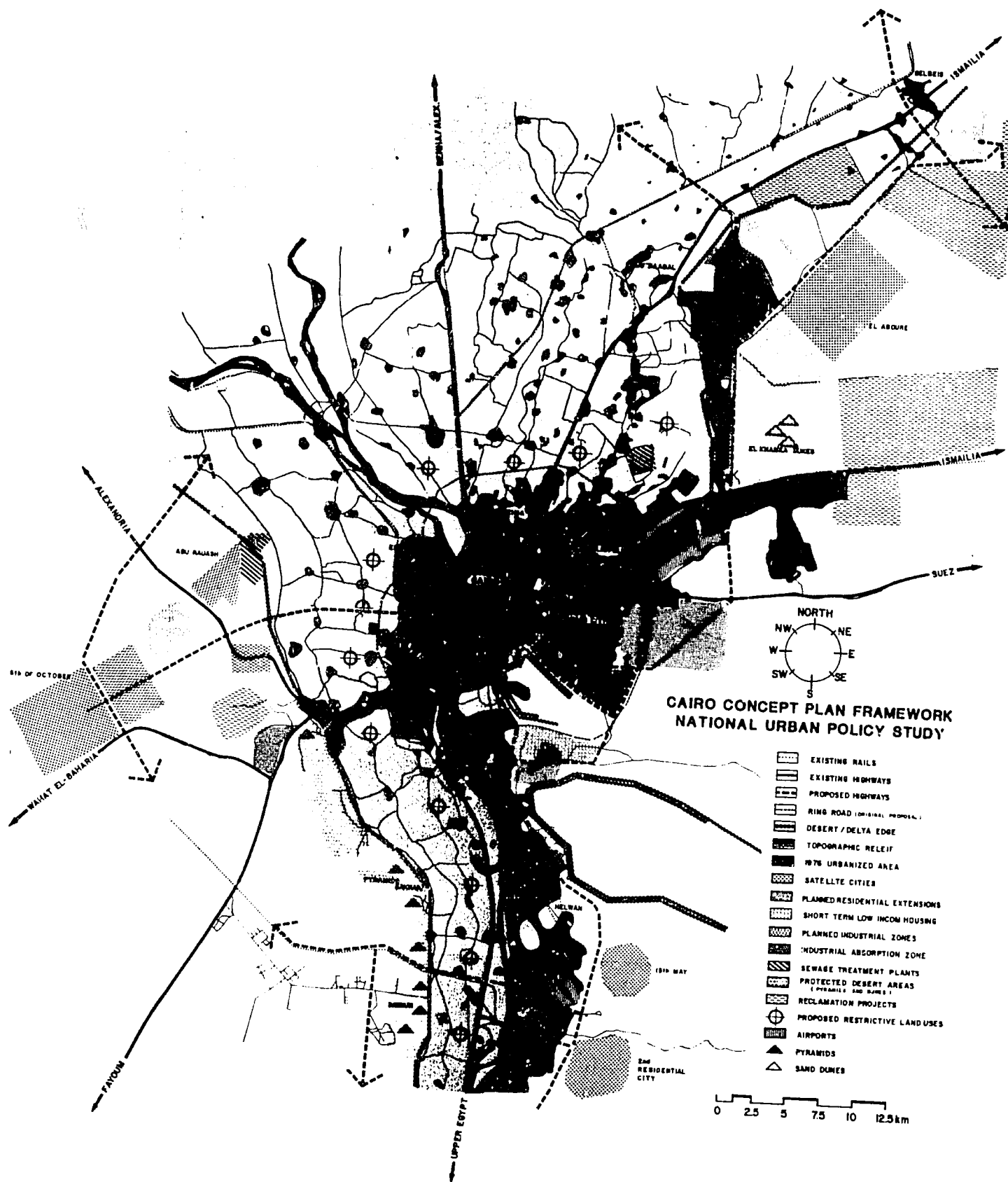


FIGURE III-4

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- Urban infill at appropriate standards, particularly in the Mi.sr El Kadima/Helwan corridor, which meet the affordability requirements of target households.
- Upgrading of existing built-up areas currently having inadequate levels of service.
- Enforcement of legislation for the protection of arable areas to the north and on the west bank (north and south of the Giza-Pyramids road). These efforts should include the introduction of restrictive land uses and possibly public development rights.
- Enforcement of legislation to control development in restricted desert areas such as the Pyramids zone on the west bank and areas between the present built-up area and proposed satellite communities such as the El Khanka sand dunes area north of the Cairo-Ismailia Road.
- Use of investments in transportation, industry, and infrastructure to promote desert development on an east/west orientation. Alternative inter-regional entranceways for inter-regional transport to support this orientation should also be developed. (Figures III-4 and III-5) Specific attention should be given to serving the El Obour and 6th of October development areas.

The concept of restricted areas is critical to the achievement of the proposed development strategy. The three types of restrictions envisaged include:

- Restrictions on the development of arable land: this is a fundamental test of Government's political will to ensure that current laws are enforced and severe penalties assigned to violators.
- Restrictive land uses: large complementary low density land uses which are compatible with alternative uses are envisaged in critical areas which require protection in either desert or arable areas. Military installations, land reclamation areas, experimental farms, large institutional facilities, and telecommunications facilities are examples of possible uses considered.
- Possible purchase of public development rights to permit the Government to control the utilization of land for its planned function.
- Restricted transportation corridors: since transportation corridors stimulate urbanization, existing entranceways should be re-evaluated in light of their development impacts. Those that stimulate growth should be restricted to their present capacities or designed to carry only Cairo origin or destined traffic. To achieve this, alternative routes which promote desirable development patterns must be identified.
- For example the following alternative transportation routes need immediate study: -- a route which would provide a by-pass on the west bank for traffic from Alexandria destined for Upper Egypt -- linkages among the industrial areas in Helwan -- the proposed expanded industrial sites near El Obour new town -- the existing industrial areas in Shoubra El Kheima (such routes should be developed which aim at reducing core area congestion and relieve traffic on the Corniche) -- alternative routes for traffic entering Cairo from the Delta

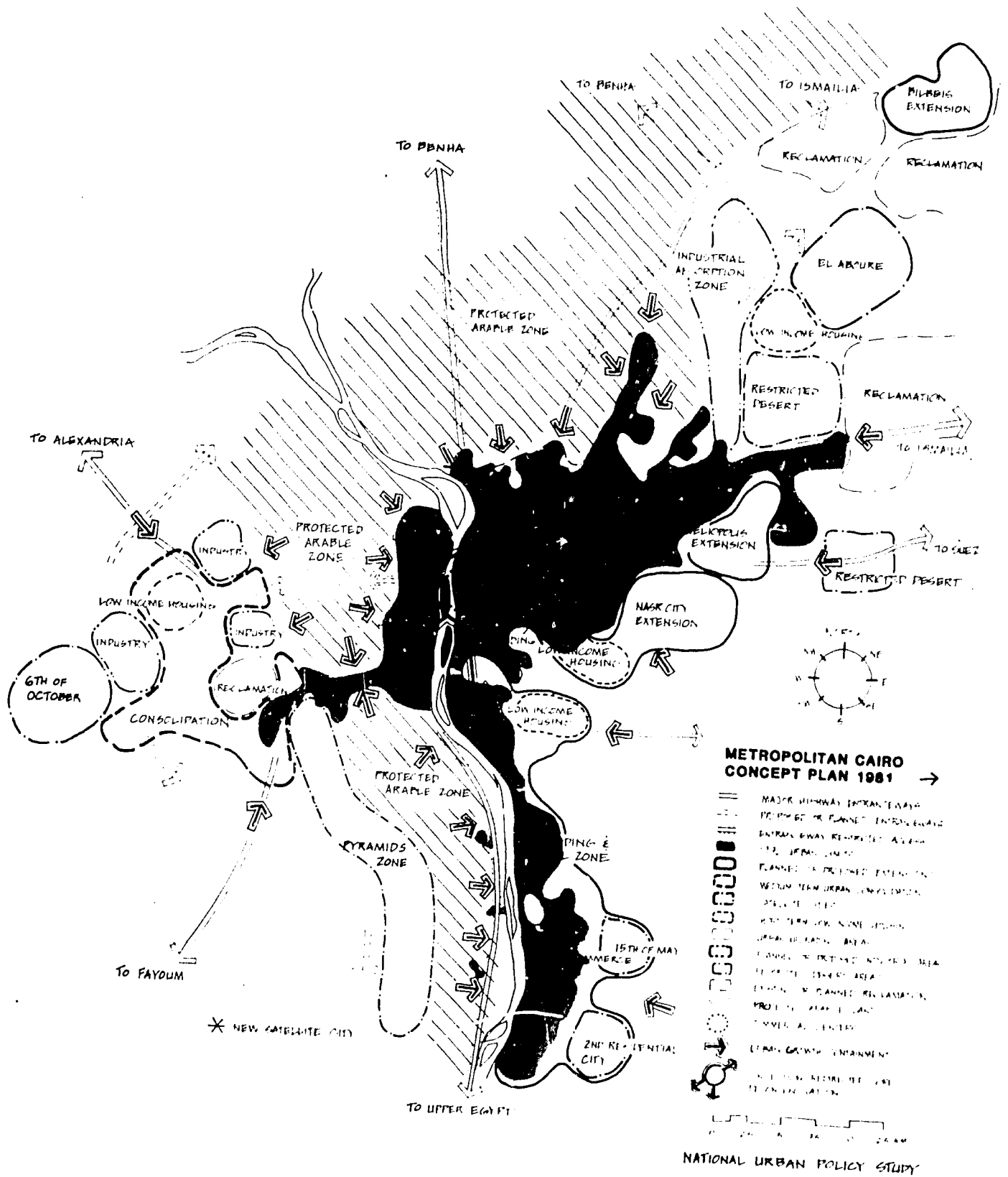


FIGURE III-8

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(among the options which should be studied are expanded capacity on the existing Benha-Cairo segments of the Agricultural Road vs. other routes from Benha to the Khankha industrial area and to proposed industrial areas on the West Bank). The rapidly growing area north of the Giza-Pyramids Road, shown as protected arable land on Figure III-5, is an example of where such restricted land uses mentioned above should be imposed. Although the area is rapidly urbanizing, it could provide a green buffer zone between the existing built areas of Giza and the new development which is proposed on the Pyramids Plateau. However, to do so, immediate steps need to be taken to determine where in this area largely illegal development has occurred, making such restriction pointless, and where existing agricultural uses can be augmented through appropriate controls. Thus, the entire area needs to be planned and suitable uses determined for each portion of the site. Such planning should aim at efficiently using areas where development has already occurred and encouraging low density development in other areas which would protect agricultural land (a Government sponsored experimental farm is an example of such a low density development which could be used to restrict development in the area).

## 5. Distribution of Urban Population

Based on the proposed development strategy described above, an indicative future distribution of population for the year 2000 was developed. The distribution represents a mixed strategy of growth options including satellite cities and new towns, urban extension and infill, as well as possible expansion of other urban areas in the zone.

The distribution is primarily that suggested in the Cairo concept plan, however, certain modifications have been made for clarity due to further assessments.

In Table III-2, population distribution with Greater Cairo *kisms* is presented for the year 2000. In Table III-3, a summary distribution of the enlarged Cairo Zone is shown. In the former, the emphasis has been on the redistribution of trend forecast populations and densities and the reduction of fringe growth.<sup>3</sup> In general, high density and arable fringe growth in northern *kisms* has been reduced and redistributed primarily to the east northeast and south. For this purpose, a maximum density of 800 persons per hectare was projected in northern *kisms*, while increased densities range between 450-650 persons per hectare.

In Table III-3, Greater Cairo *kism* populations derived from Table III-2 and new development areas, including the new communities, are presented. It is noteworthy that growth emphasis has been given to the northeast, east, south and southwest. An explanatory note regarding each settlement area follows the table.

The critical elements of the proposed distribution of population in the Cairo Zone are the following:

- The need to reduce densities and fringe growth in northern Cairo *kisms*.
- The need to increase densities in low density *kisms* which occupy an inordinately high area of land for the population served.

TABLE III-2  
GREATER CAIRO DISTRIBUTION OF POPULATION BY KISM (2000)

KISM/ DIRECTION 1976-2000	1976	FORECAST	RESIDENTIAL	2000	NUPS	RESULTANT POPULATION		FRINGE GROWTH <sup>3</sup>	TOTAL POPULATION	NET INCREASE OR (DECREASE) IN POPULATION
	POPULATION	2000 POPULATION <sup>1</sup>	AREA	FORECAST	2000	INCREASE	DECREASE			
	(000's)	(000's)	(HECTARES)	(PERSONS/ HA)	(PERSON/HA)	(000's)	(000's)	(000's)	(000's)	(000's)
<b>CENTRAL</b>										
Ezbekia	60	51	96	530						
Bab el Shaaria	110	90	107	841	800				51.0	(9)
Mouski	58	46	58				4.4		86.0	(24)
SUBTOTAL	228	187	261	Av. 716					46.0	(12)
									183.0	(45)
<b>NORTH</b>										
Sharabia	444	793	440	1,802	800		441.0		352.0	(92)
Sahel	439	1,105	657	1,682	800		579.4		525.6	86.6
Shoubra	129	102	130	785	800	2.0			104.0	(25)
Shoubra El Khelma	394	1,397	1,761	793	800	11.8		386.0	1,022.8	628.8
SUBTOTAL	1,406	3,397	2,992	Av. 1,135					2,004.4	598.4
<b>NORTHEAST</b>										
Wayli	142	183	159	1,151	800				127.2	(14.8)
El Kobba Gardens	315	503	446	1,126	800		55.8		356.0	41.0
Zaher	104	95	125	760			147.0		95.0	(9.0)
Zeitoun	268	760	560	1,357	800		312.0		448.0	180.0
Mataria	535	1,449	2,034	712				270	1,179.0	644.0
Heliopolis	127	210	690	304	450	100.5			310.5	183.5
Houzha	102	278	750	371	500	97.0			375.0	273.0
SUBTOTAL	1,593	3,478	4,728	Av. 736					2,890.7	1,297.7
<b>EAST</b>										
Nasr City SUBTOTAL	63	725	1,625	446	575	209.4			934.4	869.4
<b>SOUTHEAST</b>										
Derb El Ahmar	146	151	250	604					151.0	5.0
El Gemalliya	167	200	170	1,175	800		64.0		136.0	(31.0)
Khalifa	187	500	1,549	323	550	352.0			852.0	665.0
SUBTOTAL	500	851	1,969	Av. 432					1,139.0	632.0
<b>SOUTH</b>										
Abdeen	88	55	80	688					55.0	(33.0)
Sayeda Zelnab	252	140	250	560	600	10.0			150.0	(102.0)
Misar El Kadima	274	355	705	504	625	85.6			440.6	166.6
Maadi	267	970	2,250	431	600	380.0			1,350.0	1,083.0
Helwan/Tura/Tebbin	316	1,125	2,000	562	625	125.0			1,250.0	934.0
SUBTOTAL	1,197	2,645	6080	Av. 435					3,245.6	2,048.6
<b>SOUTHWEST</b>										
Kasr El Nil	39	32	157	204					32.0	(7.0)
Dokki	102	158	375	421	500	29.5			187.5	85.5
Boulak El Dakrcur	322	830	1,823	455	650	355.0		288.0	897.0	575.0
Giza	209	245	264	928	800			33.8	28.0	(25.8)
El Ahras	150	360	720	500					80.0	280.0
SUBTOTAL	802	1,625	3,339	Av. 487					1,579.7	777.7
<b>WEST</b>										
Boulak	178	115	153	752	752				115.0	(63.0)
Agouza	147	235	494	478					235.0	88.0
SUBTOTAL	325	350	647	Av. 541					350.0	25.0
<b>NORTHWEST</b>										
Rod El Farag	272	285	215	1,326	800		113.0		172.0	(100.0)
Imbaba	336	752	1,700	442	600	268.0		138.0	882.0	546.0
SUBTOTAL	608	1,037	1,915	Av. 542					1,054.0	446.0
TOTAL	6,724	14,295	23,556	Av. 607		2,025.8	1,750.4	1,190.0	13,380.8	6,656.8

<sup>1</sup> Based on trend forecasts of "Rehabilitation and Expansion of the Greater Cairo Wastewater System", otherwise area and population data from Greater Cairo Waterworks Master Plan; rural population excluded.

<sup>2</sup> Expected growth due to unfill of already urbanized area.

<sup>3</sup> Shows the population absorption capacity at NUPS proposed density. Kisms with a decrease in population indicates the drop in 2000 population which would result from using NUPS density standards

SOURCE: NUPS Elaboration.

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TABLE III-3

**SUMMARY OF FUTURE DISTRIBUTION OF POPULATION IN THE CAIRO ZONE  
(IN THOUSANDS)**

	<u>1976</u>	<u>2000</u>	<u>INCREASE 1976-2000</u>
<b><u>CENTRAL</u></b>			
1. Cairo "kisms"	228	183	(45)
<b><u>NORTH</u></b>			
2. Cairo "kisms"	1,406	2,004	598
<b><u>NORTHEAST</u></b>			
3. Cairo "kisms"	1,593	2,891	1,298
4. Short term low income settlement	--	250	250
5. El Obour	--	200	200
6. Belbeis extension	--	150	150
7. 10th of Ramadan	--	150	150
SUBTOTAL	1,593	3,641	2,048
<b><u>EAST</u></b>			
8. Nasr City and Heliopolis extensions	65	934	869
9. Short term low income settlements	--	250	250
SUBTOTAL	65	1,184	1,119
<b><u>SOUTHEAST</u></b>			
10. Cairo "kisms"	500	1,139	639
<b><u>SOUTH</u></b>			
11. Cairo "kisms" <sup>1</sup>	1,197	3,246	2,049
12. Maadi short term low income settlements	--	175	175
13. 15th of May <sup>2</sup>	--	200	200
14. 2nd Residential City <sup>3</sup>	--	130	130
SUBTOTAL	1,197	3,751	2,554
<b><u>SOUTHWEST</u></b>			
15. Cairo and Giza "kisms"	802	1,580	778
16. Southwest extension (consolidation)	--	900	900
17. Short term low income settlements	--	200	200
18. 6th of October	--	175	175
SUBTOTAL	802	2,755	1,953
<b><u>WEST</u></b>			
19. Cairo and Giza "kisms"	325	350	25
<b><u>NORTHWEST</u></b>			
20. Cairo and Giza "kisms"	608	1,054	446
21. New settlement area	--	60	60
SUBTOTAL	608	1,114	546
22. <b><u>OTHER URBAN</u></b>	119	287	168
23. <b><u>SADAT CITY</u></b>	--	100	100
<b>TOTAL</b>	<b>6,843</b>	<b>16,508</b>	<b>9,665</b>

<sup>1</sup> Data for South Cairo "kisms" includes population of New Helwan Community: population - 110,000.

<sup>2</sup> 5th of May year 2000 target population is 150,000. An additional 50,000 was added to increase low gross densities from 145 to 193 persons per hectare and to capitalize on growth momentum in area.

<sup>3</sup> No plans have yet begun for the proposed 2nd Residential City. It is to be located south of 15th of May City. However, if this location is not feasible due to soil conditions, an alternative location in the West Bank Desert area, shown in Figure III-4, should be considered.

SOURCE: Rehabilitation and Expansion of the Cairo Wastewater System, AMBRIC, 1981; MUPS Analysis.

## EXPLANATORY NOTES TO TABLE III-3

1. Central Cairo "Kisms" are expected to decline in population due to renewal, deconcentration, and increased administrative and commercial functions. Forecasts are based on those of the AMBRIC study. Rehabilitation and expansion of the Cairo Wastewater System, January 1981.
2. Northern Cairo "Kisms" have been maintained at a maximum residential density of 800 persons/hectare. In addition, 50 percent of trend forecast fringe growth has been reduced. (See Table V-14, Cairo Concept Plan, Vol. II, NUPS First Round Alternatives.)
3. Northeast Cairo "Kisms" have also been maintained at a maximum density of 800 persons hectare and arable fringe forecast growth reduced by 50 percent op. cit. Cairo Concept Plan).
- 4,5. The proposed short-term low income settlement area and El Obour satellite city should benefit from constraints on density and arable fringe development in northern and northeastern fringe areas. In addition, their growth will be enhanced by the existing industrial and population bases in Abu Zaabal, El Khanka, etc. As a consequence, very rapid development is expected. This will depend, however, on the provision of large areas of serviced land for this purpose.
6. Belbeis Extension is proposed on desert land south of existing Belbeis. Using Belbeis' 1976 population of 70,000 as a base, Belbeis and the new extension areas could reach a year 2000 population of 260,000 at a growth rate of 5.6 percent per annum. One hundred and fifty thousand of this is assumed to be derived from the central and northern "kisms" of Cairo as a result of deconcentration efforts, control of fringe land urbanization and earlier success in growth of the El Obour area and, to a lesser extent, the 10th of Ramadan.
7. According to Table III-3, at its present rate of absorption and an overall growth rate of 10 percent per annum, the 10th of Ramadan will only reach a population of about 100,000 by the year 2000. However, if a base population of about 35,000 can be reached by 1985, the city could reach 150,000 by the year 2000 at these growth rates. To do so, however, will require public initiative regarding industrial investment, displacement of public functions based in Cairo, and providing greater opportunities for informal sector activities and housing to locate there. Emphasis should be on increasing gross densities and construction by both the formal and what is now the private informal sectors. Due to its fairly distant location, the 10th of Ramadan is not expected to benefit from density reduction and arable fringe growth reduction in northern Cairo "kisms."

8. Nasr City population projections include increased densities in the original site and the large planned extension area. Rapid growth is anticipated due to the momentum already existing in the area as well as its proximity to population and employment opportunities in the core areas, Heliopolis, Nasr City, and the Suez Road.
9. Near Nasr City, two short-term low income settlements areas are suggested with populations on the order of 125,000 each. The first is located south of Nasr City, close to the Mukattam Hills and the core area. The second suggested site, south of the airport, is justified by its proximity to industry and service functions near the airport and ongoing settlement there.
10. Southeastern Cairo "Kisms." Forecast populations in this area have been increased to reflect growing pressures on the area from core deconcentration and the proximity of jobs in the core area. Transportation facilities now in progress will enhance development there.
11. Southern Cairo "Kisms." Population in southern "kisms" has been increased from the AMBRIC forecasts due to the large areas of vacant land, the relatively low densities (compared to northern Cairo "kisms"), the high number of existing jobs in the Maadi-Helwan corridor, and planned industrial investment. Thus, very rapid growth is expected in the future. Part of the growth will result from workers currently residing in northern high density "kisms" who wish to relocate near their jobs in the south. Development in this area should be primarily of the informal-type directed by government on privately serviced land. Development standards should primarily be aimed at workers and their levels of income.
12. Maadi short-term low income settlement is suggested to the east of Maadi in an area presently occupied by the military. The project will benefit from the same growth momentum described in Number 11. It also should be aimed at low income households to facilitate deconcentration and reduce loss of arable land in fringe areas.
13. The 15th of May will also benefit from growth momentum in the Helwan area. An additional 50,000 population was added to the target population to increase gross densities and capitalize on growth momentum in the area.
14. 2nd Residential City. No plans have yet been undertaken for this city. Plans should be made to determine the feasibility of construction on the proposed site. If costs of construction are high due to soil conditions, the site should be shifted to a desert site on the west bank location in south western desert area currently occupied by the military.
15. Southwest Cairo and Giza "Kisms." Trend forecast fringe development in Giza "kisms" has been reduced by 50 percent. In addition, higher densities are suggested there than those forecast to absorb some of the population

from decreased densities in northern "kism" and to account for their locational advantages with respect to job opportunities in central Cairo and Giza.

16. The southwestern consolidation or extension area will result as large serviced desert areas are opened up for development beyond the Pyramids. The area will benefit from constraints on the Giza-Pyramids corridor and the growth momentum which already exists. Development in this area will also enhance growth potential in the 6th of October satellite city.
17. A short-term low income settlement of 200,000 is proposed north of the 6th of October. This population will primarily result from increased access to the core area by the new 26th of July extension to the 6th of October, job opportunities along the Alexandria road, and constrained development in arable fringe areas to the west. Although it is not planned yet, this area is expected to grow more rapidly than the 6th of October because it is closer to industrial areas which have already begun to develop along the Cairo/Alexandria Desert Road and its proximity to existing development. It is also expected that this low income settlement will serve higher standard development in 6th of October. However, to achieve this population, planning of the settlement should aim at providing serviced sites for low income developers.
18. 6th of October. Due to the need to create job opportunities, its location, and past delays in construction, the 6th of October is not expected to reach its target population of 150,000 by 2000. Based on the initial growth rates of 15th of May it will only achieve a population of 80,400 by the year 2000. However, if a critical mass of population is in place of about 50,000 by 1985 it could reach 175,000 by the year 2000 at a 10 percent annual growth rate. This implies increased industrial investment and the provision of serviced sites for development by the private sector. Increased access to 6th October by private developers may result in even more rapid growth than is shown. However, this would require rapid industrial growth prior to 1990 to provide an adequate employment base.
19. West Cairo "Kism." Little growth is forecast due to high existing densities and the desire to constrain arable land development. To best protect arable land west of Agouza, they should be turned into experimental farms of the Ministry of Agriculture.
20. Northwestern Cairo and Giza "Kisms." Northwestern Cairo "kisms" which are tied to the existing center are expected to decrease in population. However, Imbaba is expected to increase in density as constraints are put on it to conserve arable land. Excess fringe growth is to be reduced by 50 percent which, if possible, should be targetted to a new settlement area along the Alexandria desert road.
21. New Satellite City to the Northwest. Due to opportunities for development along the Cairo/Alexandria road, a new settlement area is recommended to capitalize on the attraction between these two cities. However, though

the attraction is strong, infrastructure is lacking, as are linkages with the Delta. However, the construction of new roads to Alexandria and the Delta, coupled with a new dual rail line in the area, could lead to a settlement of 60,000 by the year 2000. Also, as this area offers long-term potential for growth, it would be wise to begin settlement in this area.

22. Other Urban. In 1976, those urban settlements not included in the agglomeration of Cairo had a population on the order of 119,000. Assuming that these grow at the rate of the agglomeration, they will attain a population of 287,000 by the year 2000. This growth should occur through infill and densification to preserve arable land. These small settlements are shown in Figure III-4.
23. Sadat City. In Table III-3, it was suggested that at the current growth rates of 10th of Ramadan City and Sadat City will reach populations of only 83,500 by the year 2000. However, if Sadat City can reach a population of 25,000 by the year 1985 and have a sustained growth rate of 10 percent per annum it could reach 100,000 by the year 2000. This will require attracting migrants from the Delta, displacement of public functions from Cairo, and significant job creation.

- The need to intensely develop the Misr El Kadima/ Helwan corridor on the east bank (but protect the western bank from development).
- The need to shift development from northern fringe areas into the northeastern desert areas by providing large serviced sites as an alternative.
- The need to shift western bank development into the southwestern desert area by the provision of large serviced sites and the creation of job opportunities.
- The need to begin development in north western desert areas to provide for long term expansion requirements.
- The need to deconcentrate population and economic activities from the central Cairo *kisms* to outlying areas. Centers should be developed in the northeast, Heliopolis/Nasr City, El Obour, southwest consolidation area, and Maadi/Helwan, in addition to multiple smaller centers throughout the urban area.
- Though the new towns and satellite cities are not expected to reach their year 2000 target populations, an initial base should be established for longer term development.
- Finally, it is essential that most sites currently occupied by the military be freed up for urban development. In addition, private and cooperative developments will need to occur at increased densities and lower standards. Also, services should be provided to large areas of desert land for development by what is now informal type developers.

## 6. Special Considerations

### a. Cairo Industrial Sector

In the past, as in the future, the economic base in Cairo Zone will serve as a motor for national economic development. Its large share and diversified mix of economic activities dominates any other zone or region. The concentration of manufacturing industries in Cairo can be attributed to the size of its market, the ready availability of transportation and supporting services, proximity of other firms, the comparative locational advantage of it with respect to the Delta and the rest of the country, and the wide variety in the city's skill mix.<sup>4</sup>

Compared to the national total, Cairo accommodates 38 percent of the nation's total manufacturing employment, 50 percent of the private manufacturing employment and about 61 percent of the nation's artisans. By contrast, it has only 20 percent of public sector manufacturing -- roughly equal to its share of population. More than 70 percent of the manufacturing employment in Cairo is in private hands, three quarters of which is artisan employment. Thus, small private manufacturing is not only centered in Cairo, but within the city it is the largest source of industrial employment. In 1977, Greater Cairo accommodated 1,291 manufacturing establishments, constituting 54.4 percent of the total national establishments and 45.2 percent of total industrial employment. In addition Cairo accounted for 47.2 percent of the gross manufacturing output, and 46.2 percent of the total manufacturing wages.<sup>5</sup>



**TABLE III-4**  
**DISTRIBUTION OF CAIRO, GIZA, SHOUBRA EL KHEIMA ACTIVE POPULATION**  
**BY ECONOMIC SECTORS, 1976**

SECTORS	ACTIVE POPULATION BY SECTOR							
	CAIRO (000)	%	GIZA <sup>1</sup> (000)	%	SHOUBRA EL KHEIMA (000)	%	TOTAL (000)	%
Agriculture	17.4	1.2	21.1	5.7	2.6	2.5	41.1	2.2
Mining	5.8	0.4	2.1	0.6	0.5	0.5	8.4	0.4
Manufacturing	383.9	26.9	78.3	21.1	49.0	48	511.2	26.9
Electricity & Water	15.6	1.1	3.4	0.9	1.1	1.0	20.1	1.1
Building & Construction	118.5	8.3	33.7	9.1	8.9	8.7	161.1	8.5
Trade	211.2	14.8	52.6	14.1	9.9	9.7	273.7	14.4
Finance	29.7	2.1	7.9	2.1	0.8	0.8	38.4	2.0
Transportation & Storage	126.3	8.8	28.3	7.6	8.6	8.4	163.2	8.6
Services	489.0	34.2	132.6	35.7	17.2	16.8	638.8	33.6
All Else	32.3	2.3	11.*	3.2	3.9	3.8	48.0	2.5
<b>TOTAL</b>	<b>1,429.7</b>	<b>100.1</b>	<b>371.8</b>	<b>100.1</b>	<b>102.4</b>	<b>100.2</b>	<b>1,904.0</b>	<b>100.2</b>
<b>PERCENTAGE OF TOTAL</b>	<b>75.1</b>		<b>19.5</b>		<b>5.4</b>		<b>100.0</b>	

<sup>1</sup> Urban only.

SOURCE: CAPMAS, Population Census of 1976.

**TABLE III-5**  
**DISTRIBUTION OF MANUFACTURING INDUSTRIAL EMPLOYMENT**  
**(By Governorate, 1978)**

	CAIRO	%	GIZA	%	QALYUBIA	%
Food Processing	23,744	11.8	14,230	28.8	5,040	6.1
Tobacco	238	0.1	8,373	17.0	-	-
Spinning & Weaving	30,517	15.1	8,042	16.3	41,270	49.8
Ready-Made Clothes	7,018	3.5	24	-	-	-
Leather & Shoes	5,813	2.9	-	-	-	-
Wood, Cork, Furniture	4,330	2.1	1,057	2.1	578	0.1
Paper & Paper Products	1,134	0.6	72	0.2	1,363	1.6
Printing & Publishing	15,040	7.4	45	0.1	-	-
Chemicals	12,819	6.3	4,158	8.4	5,946	7.2
Oil Refinery	-	-	-	-	3,368	4.1
Oil & Coal Products	3,385	1.7	-	-	204	-
Rubber & Plastic	2,697	1.3	479	1.0	2,501	3.0
Clay, China, Const. Material	14,383	7.1	3,417	6.9	9,929	12.0
Iron & Steel	22,742	11.3	37	0.1	5,822	7.0
Metallics	2,362	1.2	-	-	-	-
Metallurgical, Other than Machinery	21,687	10.7	3,675	7.4	1,693	2.0
Non-Electrical Machinery	9,715	4.8	2,047	4.1	640	0.1
Electrical Machinery	6,578	3.3	2,638	5.3	4,513	5.4
Transportation Equipment	15,452	7.6	1,060	2.1	-	-
Fine & Scientific Equipment	304	0.2	52	0.1	-	-
Miscellaneous	1,928	1.0	-	-	-	-
<b>TOTAL Processing Industries</b>	<b>201,886</b>	<b>-</b>	<b>49,406</b>	<b>-</b>	<b>82,867</b>	<b>-</b>
Mining, Quarrying	189	-	-	-	1,575	-
Oil Extraction	-	-	-	-	-	-
<b>TOTAL</b>	<b>202,075</b>	<b>100.0</b>	<b>49,406</b>	<b>99.9</b>	<b>82,867</b>	<b>98.4</b>
						<b>GRAND TOTAL = 354,348</b>

SOURCE: Employment figures are compiled from the Statistical Indicators of the Planning Regions, CAPMAS, 1978.

- Active Population -- 1976

In Table III-4, the 1976 distribution of active population by sector for Cairo Governorate, Giza Governorate (urban), and Shoubra El Kheima is presented. The large active population in Cairo accounts for about 75 percent of the total active population; followed by Giza, 20 percent; and Shoubra El Kheima, 5 percent. As a consequence, sector totals for the three areas as a whole are generally influenced by those of the Cairo Governorate.

The most dominant sectors for all three areas are: Manufacturing, 26.9 percent; Trade, 14.4 percent; and Services, 33.6 percent of the total active population. In Giza and Shoubra El Kheima, 21.2 and 48 percent, respectively, of the active population is in the manufacturing sector.

- Manufacturing Employment, Distribution, and Value Added

In Table III-5 the distribution of manufacturing employment in 1978 for the Governorates of Cairo, Giza, and Qalyubia is presented for firms of greater than 25 employees.

It is noteworthy that the Cairo Governorate accounted for 60.4 percent of the total manufacturing employment in the three governorates followed by Qalyubia, 24.8 percent and Giza, 14.8 percent.

As the table indicates, Cairo Governorate has the most diversified industrial employment mix followed by the Governorates of Giza and Qalyubia, respectively. The most dominant shares of industrial employment in Cairo were food processing, spinning and weaving, iron and steel, and metallurgical industries. In Giza, the most dominant sectors of industrial employment included food processing followed by tobacco and spinning and weaving. In Qalyubia, on the other hand, spinning and weaving is, by far, most dominant followed by clay, china, and construction materials.

According to the census data for 1960 and 1976, Giza Governorate's share of industrial employment has been on the increase while that of Qalyubia has stabilized and Cairo's share has decreased. (Table III-6)

**TABLE III-6**  
**SHARES OF MANUFACTURING EMPLOYMENT IN GREATER CAIRO**

GOVERNORATE	SHARES OF MANUFACTURING EMPLOYMENT	
	1960	1976
Cairo	73.3 %	64.1 %
Giza	13.8 %	18.6 %
Qalyubia	12.9 %	13.1 %

Source: CAPMAS, Ministry of Planning. Census of 1960 and 1976.

However, during this period Cairo Governorate's manufacturing employment increased by about 89 percent in absolute terms from about 203,400 jobs to 383,800 jobs.

Table III-7 shows the 1976 distribution of employment and value-added in the Cairo Governorate for private and public sector industries.<sup>6</sup> In the public sector, engineering machinery, metallurgical and textile industries account for the largest shares of employment. On the other hand, while the amount of value-added is greatest for the former two, non-metallics and chemicals precede textiles. In terms of value-added per worker, non-metallics, chemicals, and leather industries are the highest, followed by textiles and engineering machinery.

With respect to the private sector employment, paper and printing, food processing and textiles have the largest percentage of employment. In terms of value-added, paper and printing food processing, and chemicals rank highest. While in terms of value-added per worker, chemicals, paper and printing, leather, engineering machinery, and oil rank highest.

Over all, the public sector industries account for nearly 80 percent of the employment in the manufacturing sector and 84 percent of the value-added: thus, the value-added per worker is also higher than in the private sector: (488 vs. 354). Further, the public sector employment, value-added, and value-added per worker dominates the private sector with the exception of chemicals.

- Industrial Mix and Spctial Location

The large variety of industries situated in the Cairo Zone is mainly due to its advantageous location vis-a-vis market and raw materials in Southern and Northern Upper Egypt, the relatively high standard of infrastructure, the concentration of of diverse skilled and semi-skilled labor and the presence of other firms. Generally industries in the Cairo Zone can be divided into the following categories and location:

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

In 1976 Greater Cairo's share of consumer goods industries accounted for about 144,575 jobs or 35 percent of the national total. Its industries in this category primarily included ready-made clothes and tobacco; most spinning and weaving and agro-based industries are located in the Delta and Alexandria.

**TABLE III-7**  
**CAIRO MANUFACTURING INDUSTRIES:**  
**EMPLOYMENT AND VALUE-ADDED**

INDUSTRY	<u>EMPLOYMENT</u> (WORKERS) %		<u>VALUE ADDED</u> (L.E. '000s) %		VALUE ADDED PER WORKER
<b><u>A. PUBLIC SECTOR</u></b>					
Food Processing	11,760	7.9	6,046	8.3	514
Textiles	26,117	17.5	7,688	10.5	294
Leather	1,375	0.9	781	1.1	568
Wood & Furniture	2,228	1.5	486	0.7	218
Paper & Printing	636	0.5	146	0.2	210
Chemicals	11,733	7.9	9,796	13.4	835
Oil	6,469	4.3	2,804	3.8	433
Non-Metallics	10,177	6.8	9,180	12.6	902
Metallurgical	32,320	21.6	11,928	16.4	369
Engineering Machinery	46,473	31.1	24,060	33.0	518
<b>TOTAL</b>	<b>149,348</b>	<b>100.0</b>	<b>72,915</b>	<b>100.0</b>	<b>488</b>
<b>PERCENT OF TOTAL</b>	<b>79.6</b>		<b>84.3</b>		
<b><u>B. PRIVATE SECTOR</u></b>					
Food Processing	6,902	18.0	1,839	13.6	266
Textiles	809	17.8	1,385	10.2	203
Leather	980	2.6	408	3.0	416
Wood & Furniture	1,306	3.4	207	1.5	158
Paper & Printing	11,671	30.4	5,563	41.0	477
Chemicals	2,065	5.4	1,815	13.4	879
Oil	653	1.7	196	1.4	300
Non-Metallics	2,320	6.0	455	3.4	196
Metallurgical	426	1.1	124	0.9	291
Engineering Machinery	5,216	13.6	1,576	11.6	302
<b>TOTAL</b>	<b>38,348</b>	<b>100.0</b>	<b>13,568</b>	<b>100.0</b>	<b>354</b>
<b>PERCENT OF TOTAL</b>	<b>20.4</b>		<b>15.7</b>		

NOTE: Data covers establishments employing 25 or more workers.

SOURCE: CAPMAS, Census for Industrial Production, Second Quarter of 1977.

Basic intermediate industries in Greater Cairo account for about 145,230 jobs or 67 percent of the national total. Furthermore, there is a high concentration of basic capital goods industries which accounts for about 42,850 jobs, 75 percent of the national total.

In general, the consumer oriented industries are found to be heavily concentrated in the city core while most of the intermediate and capital goods industries are located primarily to the south of Maadi, Massara and Helwan. More than 70 percent of the manufacturing employing more than 25 workers in Cairo is private, of which three-fourths is artisanal. These activities are concentrated in the core area and are the largest source of industrial employment.<sup>7</sup>

In Giza, industries are primarily capital intensive. It is in an advantageous location as an agricultural governorate with easy access to Cairo's market, infrastructure and diverse services. Thus, as noted previously, Giza's industrial employment in firms employing 25 workers or more has increased by 174 percent between 1960 and 1976.

Qalyubia shares many of the advantages of Giza vis-a-vis Cairo including a strong infrastructure base between Cairo, the Delta, and Alexandria. Though textiles account for about half of the employment, another third is in intermediate goods production such as iron and steel, and petroleum.

The clustering of manufacturing industries in a few sites enhances productivity, permits the transition of technology, reduces transportation costs, and increases social returns on investment.

Within the Greater Cairo Zone, industries are relatively specialized and concentrated by sector. These include:

#### CAIRO GOVERNORATE

Core Area	Consumer industries such as clothing, leather and shoes, wood and furniture, construction materials.
Helwan Massara	Basic intermediate goods such as iron and steel, cement, construction materials.
Tura and Tebbin Wadi Hof	Metal industries such as vehicles, wagon and car assembly.
Nasr City	Construction materials.

#### GIZA GOVERNORATE

Giza Center	Tobacco.
Sakkiet Meki	Chemicals, construction materials, metals.
Giza South	Food processing (sugar refinery, confectionaries).

GIZA GOVERNORATE  
(Continued)

Imbaba	Textiles and chemicals.
Alexandria Desert Rd.	Equipment and maintenance.

QALYUBIA

Shoubra El Kheima	Textiles, basic metals.
Mostorod	Food processing and construction materials, rubber and plastics.
Abu Zaabal	Chemicals.
Ismailia Road	Food processing and chemicals.
Alexandria Agricultural Road	Textiles and wood industries.

● Industrial investment

Generally industrial investment planning in Egypt has favored Cairo and Alexandria. However, since 1975 Cairo's planned share of national industrial investment has been steadily decreasing: 50 percent, 1975; 45.4 percent, 1980; and 31.2 percent, 1980-84 (excluding new cities).

The 1980-84 industrial investment plan for Cairo, Qalyubia, and Giza is presented in Table III-8. Not unlike past trends, most of the investment in food processing is planned for Giza; spinning and weaving and chemicals in Qalyubia, and basic metals and metal products, chemicals and engineering equipment for Cairo.

In addition, according to the plan, the Cairo Governorate would receive 72.8 percent of the total investment to the three governorates; the remainder being divided about equally between Giza and Qalyubia. Most of the planned allocated investment in Cairo Zone was provided to complete projects started before 1980. Out of a total of 115 projects to be financed, 77 projects were actually under way, and 38 projects are entirely new. Twenty-nine of these new projects are expected to be built on agricultural land.

The distribution of investment within Greater Cairo according to the 1980-84 plan is illustrated in Figure III-6. The importance in absolute terms of investment to the south (Helwan, El Tebbin, Wadi Hof) is striking. Though the investment is relatively well distributed locationally in the region, the Giza corridor, north and south will obtain sizeable shares of total investment. Also, though most of the investment is allocated to rehabilitation and expansion of existing industries, NUPS assessments indicate that about 74 percent of planned investment and 92 percent of allocated investment (to 1979) will or did take place on arable land.<sup>8</sup>

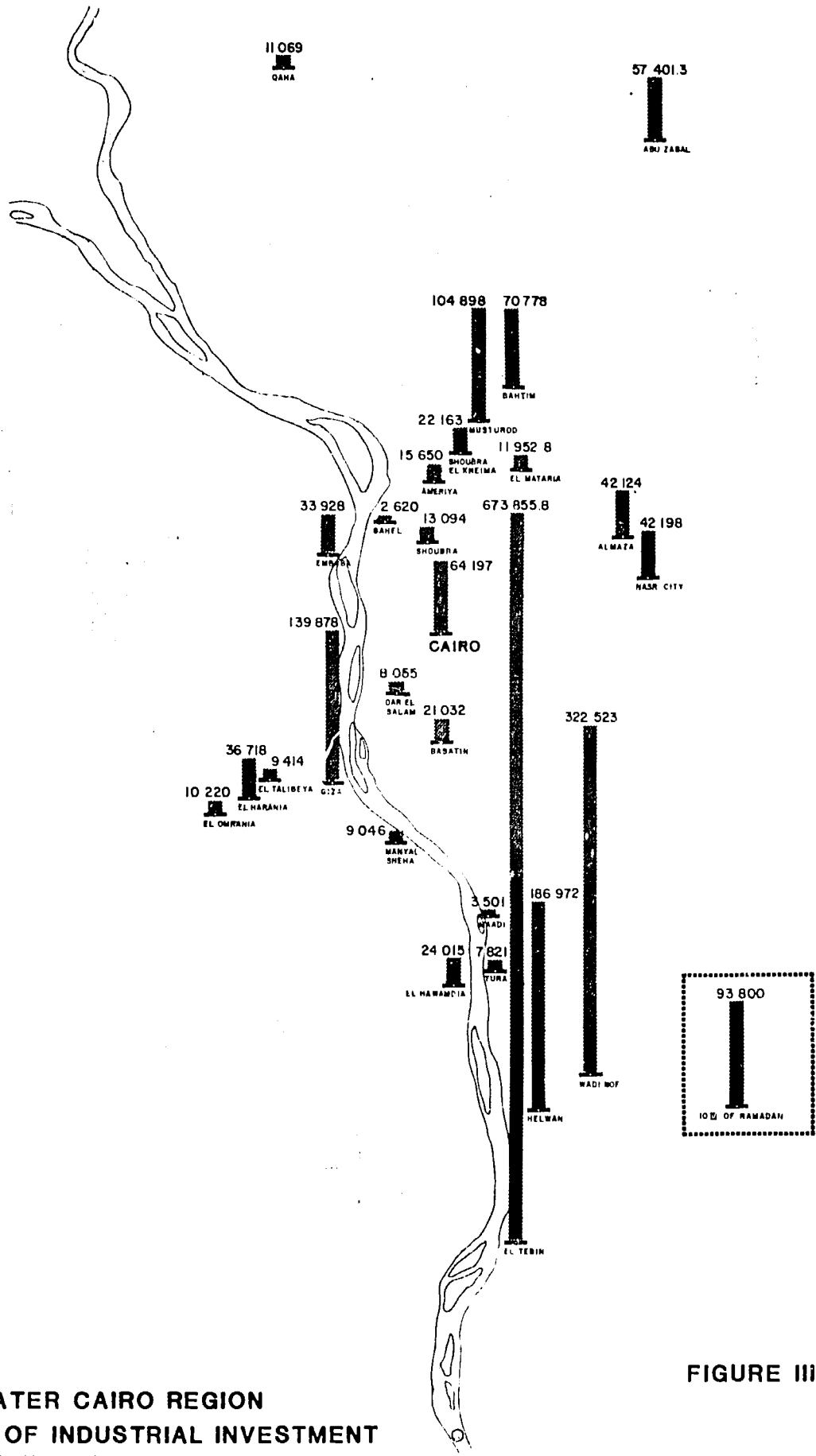
TABLE III-8

## PLANNED INDUSTRIAL INVESTMENTS IN CAIRO, GIZA, AND QALYUBIA, 1980-1984

TYPE OF INDUSTRY	GIZA		QALYUBIA		CAIRO		TOTAL	
	(L.E.'000)	%	(L.E.'000)	%	(L.E.'000)	%	(L.E.'000)	%
Food Processing	194,854	74.0	17,569	6.6	10,511	0.7	222,934	11.4
Spinning & Weaving	32,609	12.4	109,445	41.1	69,689	4.9	211,744	10.9
Chemicals	1,561	0.6	74,399	28.0	151,854	10.7	227,814	11.7
Basic Metals	-	-	-	-	484,897	34.2	484,897	24.9
Metal Products	-	-	33,112	12.4	131,835	9.3	164,947	8.5
Electricity & Electronics	23,829	9.1	-	-	14,686	1.0	38,515	1.9
Engineering Equipment	10,365	3.9	31,781	11.9	556,696	39.2	598,842	30.7
TOTAL	263,218	100.0	266,307	100.0	1,420,168	100.0	1,949,693	100.0
SHARE OF TOTAL		13.5		13.7		72.8		100.0

SOURCE: Ministry of Industry, General Organization for Industrialization, Spatial Allocations of the 1980-84 Industrial Investments, Cairo, October 1980.





**GREATER CAIRO REGION**  
**DISTRIBUTION OF INDUSTRIAL INVESTMENT**  
 1980-1984 INVESTMENT PLAN  
 NATIONAL URBAN POLICY STUDY  
 Units in L.E. thousands

**FIGURE III-6**

- Conclusions

The shifting of industrial employment to Giza, and planned patterns of industrial investment to Giza, Qaiyubia, and north and south Cairo generally follows past investment trends and will lead to further loss of arable land.

The diversity of industry in Cairo and concentration of specialized industry in various parts of the Cairo Region provide opportunities for economies of scale and external economies which are attractive to investors and are potentially advantageous for the economy as a whole.

The vitality of the private manufacturing and small-scale industrial sectors in Cairo demonstrates the powerful influence of Cairo as a market, the relative profitability of Cairo, and the possibility of expanding industrial and related service industries as Cairo grows. Facilitation of such growth in sites selected by the Government could have a strong positive influence on private sector investment and reduce requirements for public financing of industry.

With respect to future industrial location within the Cairo Zone, NUPS has concluded that industrial investment in arable areas should be significantly reduced. Rather, deconcentrated investment to support the new communities, satellite cities, and urban extensions is needed. However, given the high level of employment and expected investment in the Helwan area, arable land on the east bank of the Nile will be urbanized. Rather, protection of arable land should occur on the west bank of the Nile and to the north of Cairo.

Potential sites for deconcentrated population and industry in the Cairo Zone have been indicated by the Cairo Concept Plan. Though more analysis is required, current employment and investment trends would indicate the following suggested general location by industry types:

<u>INDUSTRY</u>	<u>NON-ARABLE LOCATION</u>
Textiles	Northeast, Northwest
Chemicals & Plastics	Northeast, South (Helwan)
Basic Metals	Northeast, Northwest, South
Consumer Industries	East, Southwest
Construction Materials	Northeast, East, Northwest, South
Metal Goods Production	East, Northeast, South
Food Processing	Northeast, Northwest, Southwest
Electric Machinery	Northeast, Northwest, Southwest, East

b. Infrastructure in Cairo

Due to a need to expand Cairo's water supply network to satisfy current and future demand, a waterworks master plan was carried out in 1978 to meet immediate improvement requirements for 1982 and a long term program to the year 2000. The plans aim at a population of 9.65 million in 1982 and 16 million in the year 2000 of which 8.2 and 13.7 million respectively, is expected to be urban.

In 1976, the average water consumption per capita for Cairo, Giza, and Helwan systems was on the order of 232 l/c/d of which domestic use accounted for 135 l/c/d or 59 percent of consumption. However, the levels of consumption varied widely depending upon the residential areas served: some areas such as Nasr City and Heliopolis received 400 l/c/d while low income high density areas received 100 l/c/d or less.

The waterworks master plan aims at correcting current deficiencies and adding sufficient capacity to provide connections to 98 percent of households by the year 2000. In addition, overall water consumption is expected to increase to 584 l/c/d for the Cairo, Giza, and Helwan systems of which 390 l/c/d or 75 percent is for domestic purposes. Due to the projected size of Greater Cairo, and the complexity of the system, NUPS intra-urban infrastructure estimates have used the standards and costs of the master plan.

The existing sewerage network is incapable of accommodating present waste requirements and suffers from leakage in numerous locations about the city. As was done for water supply, a wastewater master plan was prepared in 1978 in order to begin rehabilitation and expansion of the existing system and plan for expansion to the year 2000.

Population projections for the year 2000 by the Greater Cairo Wastewater Master Plan of 17 million are higher than the Waterworks Master Plan estimates but coincide with those of NUPS. The wastewater and waterworks master plans, however, also have slightly different project boundaries.

In 1976, the ratio of water supply to sewage flows was on the order of 1.38 for overall consumption and 1.0 for domestic use. On the other hand, the overall ratio is expected to drop to 1.25 by 1982 and 1.2 by the year 2000. About 410 l/c/d of sewage outflows are expected by the year 2000. NUPS has used these standards for estimating future investment requirements. As is pointed out Appendix V-A., there are apparently considerable economies of scale in both the Greater Cairo Water and Wastewater Master Plans. For example, though the standards are higher -- per capita costs are lower or similar to those of several of the New Town projects where complete new systems are being added.

As pointed out in the Cairo Concept Plan, both master plans are based on population trend projections which would tend to favor development in arable fringe areas particularly to the north. (Figure III-2) The NUPS Preferred Strategy suggests that future networks be used to help orient development to desired growth areas in the northeast, east, south, and southwest. (Figures III-4 and III-5)

Greater Cairo's public transport system consists of public buses, trolley buses and tram services operated by the Cairo Transport Authority, suburban trains operated by the Heliopolis Metro Company and suburban trains operated by

the Egyptian State Railways. These public transport facilities are complemented by privately owned fleets of taxis, private bus fleets operated by large companies and fleets of tourist buses. Table III-9 gives the composition of the public transport fleet as of 1978.

All three transport authorities operate at substantial losses due to the low fares charged to passengers. In the Heliopolis Metro Company, these losses are made up by land sales of the Heliopolis Land Development Agency. The other two public transport systems rely on subsidies from the Government to make up their losses. As a result, cash flow difficulties make adequate maintenance difficult and, as is shown above, large portions of the fleet are non-operational.

The NUPS cost estimates for intra-urban transport are based on two standards for Greater Cairo transport. The first assumes that the present standard of public buses of about 3 buses/10,000 population will be maintained, but that the plans for construction of a subway and regional commuter roads will be implemented at funding levels suggested by the plans for the first phase of the subway. The second estimate assumes that since 77 percent of Greater Cairo public transport demand is now met by bus service, that this service will be expanded to a standard of 5 buses/10,000 by 1990 and after that to 10 buses/10,000. Both of these programs are discussed in more detail in the technical appendix to Chapter V. For such a program to be effective, the future routing of the bus system would have to be rationalized so that average speeds could be increased on the main commuter routes possibly through the establishment of bus priority routes.

A third alternative which is not included in the NUPS intra-urban infrastructure cost estimates for Greater Cairo but which is discussed in Appendix V-A would be to construct the first stage of the underground (including electrification of the El Marg line for future extension to El Obour as proposed) and to rely on a combination of expanded surface rail trams and buses for other routes. This would represent an intermediate solution to Greater Cairo transit problems in that it would have lower costs than the fully developed underground. However, to be effective existing and future tram and bus routes would have to be studied so that priority routes could be established for both, on which higher speeds could be maintained to improve services on high density routes.

As suggested by NUPS Concept Plan for Greater Cairo, full development of the underground as it is now envisioned would result in further fringe growth in arable land areas and increased densities in the heavily populated northern and northwestern *kisms* of Greater Cairo. Further, as currently planned, the system would probably not encourage east-west growth of Cairo but rather reinforce existing north-south trends. NUPS would recommend that public transit systems (and if necessary, underground systems) be used to guide development into desired desert growth areas. Where such systems must pass through arable land areas (such as any extensions of the El Marg line to serve El Obour), access to these systems should be limited areas where the least negative development pressure on arable land would be created. However in all cases, before determining routes, and for that matter public transit nodes, careful benefit/cost analysis should be made to determine the cost effectiveness of one alternative over another.

According to the Telecommunications Sector Study, Cairo was planned to have about 3.1 telephone lines per 100 population by 1980 or roughly 243,000 lines. Under the

**TABLE III-9**  
**GREATER CAIRO'S PUBLIC TRANSPORT FLEET, 1978**

VEHICLE TYPE	FLEET SIZE	VEHICLES OPERATED DAILY	PERCENT OF FLEET OPERATED DAILY (%)	PASSENGERS/DAY INDICATIVE SERVICE LEVEL (000's)
<b>I. <u>Cairo Transport Authority</u><sup>1</sup></b>				
Buses	2,938	1,230	42	3,297
Trolley Buses	100	73	73	113
Trams <sup>2</sup>	409	123	30	391
TOTALS	3,447	1,426	41	3,804
<b>II. <u>Heliopolis Metro Company</u></b>				
Trams <sup>2</sup>	221	N.A.	N.A.	108
<b>III. <u>Egyptian State Railways:</u> <u>Helwan - Bab El Louk Line</u></b>				
Three Car Train Sets <sup>3</sup>	22	18	82	230
Actual Fleet	50	22	44	-
<b>IV. <u>Egyptian State Railways:</u> <u>Ramses - El Marg Line</u></b>				
3 and 5 Coach Diesel Trains <sup>4</sup>	182/daily	N.A.	N.A.	120

<sup>1</sup> Bus totals do not include 400 ward buses which were not commissioned at the time of the study.

<sup>2</sup> Trams consist of 2-car sets for the Cairo Transport Authority and 3-car sets for the Heliopolis Metro Company.

<sup>3</sup> The actual fleet in 1978 consisted of 50 trains, however, only 22 of those were operational. In 1980, funding was allocated for the purchase of 50 new trains, the line operated 18 trains and kept 4 spare train sets.

<sup>4</sup> Ridership on the trains in 1978 was roughly 817 passengers per train for the 3-car sets and 1,341 passengers per train for the 5 car trains. In mid 1980, 37 new diesel locomotives and 130 passenger cars were added to the line.

SOURCE: Ronald F. Kirby, Public Transport in Cairo, Report on World Bank Mission to Cairo, October 30 - November 17, 1978, The Urban Institute, March, 1979.

NUPS high estimate of telecommunications investment requirements for the year 2000, 3.5 million lines would be provided; requiring an investment of L.E. 10.3 billion between 1985-2000. However, improvements in technology and modified pricing structure could result in reduced demand. Thus, for an investment of L.E. 5.6 billion a standard of 11.7 lines per 100 population might be achieved.

Like Alexandria, Cairo is served by one of the seven electrical distribution companies in Egypt. In 1979, the last year for which disaggregated data were available, Cairo received about 34.7 percent of the total power generated in Egypt. About 53 percent of Cairo's energy requirements were generated by hydro electric power while the remainder was produced thermally. Until 1987, most of Cairo's increase in demand will be covered by the production of a new thermal plant in Shoubra El Kheima. However, after that time, the introduction of nuclear and/or the addition of more thermal plants will be required. Details of the projections of electrical power are shown in Chapter VI.

### C. Alexandria Future Metropolitan Development

#### I. Introduction

In the view of the National Urban Policy Study, the Alexandria Zone has the most potential of any urban region in the settlement system to compete for urban migrants with the Cairo Zone, and thereby, of reducing polarization of the latter. Thus, it is recommended that the Alexandria Zone receive increased industrial and infrastructure investment to encourage its growth.

Of all the urban centers outside of Cairo, Alexandria has the most diversified mix of economic activities, strong locational advantages and a substantial share, 21.8 percent, of national employment in industry. Thus, it is expected that its local economy will respond to investment stimulation and generate additional jobs at a lower cost than other smaller urban centers.

According to estimates by the Study Team, the Alexandria Zone should be induced to accommodate a population on the order of 5-5.5 million inhabitants by the year 2000 (an average annual growth rate of 3.66 percent between 1985-2000). By contrast, the Alexandria Zone's trend population in year 2000 and rate of growth would be 4.6 million and 2.84 percent per annum, respectively.

In order to achieve the population growth desired during the planning period, order of magnitude estimates for required industrial and infrastructure investment were made as presented in Table III-10. The projected investment costs were made at five year intervals to reflect differences in costs per job and to take into account the substantial upgrading of existing industry and infrastructure which will be required during the initial periods.

This represents approximately 21 percent of the total cost of the Preferred Strategy. The Alexandria Zone is expected to accommodate about 15 percent of the total urban population and 20 percent of the increase in population during the planning period (1986-2000).

**TABLE III-10**  
**ALEXANDRIA ZONE**  
**SUMMARY OF POPULATION GROWTH AND INVESTMENT REQUIREMENTS**

1985	POPULATION (000's)			INVESTMENT (L.E. MILLIONS)				PER CAPITA INVESTMENT <sup>1</sup> (L.E./CAPITA)			
	1990	1995	2000	1985-1990	1991-1995	1996-2000	1985-2000	1985-1990	1991-1995	1996-2000	1985-2000
3042	3720	4532	5500								
A. Direct Investment (Industry)				1,538	2,409	4,296	8,243	413.4	531.6	781.1	1,498.7
B. Intra-Urban Infrastructure (Estimate I)				2,422.4	2,104.0	2,363.1	6,889.5	651.2	464.2	429.7	1,252.6
C. Intra-Urban Infrastructure (Estimate II)				1,780.7	2,027.0	2,354.7	6,162.4	478.7	447.3	428.1	1,120.4
D. TOTAL (A + B)				3,960.4	4,513	6,659.1	15,132.5	1,064.6	995.8	1,210.8	2,751.3
E. TOTAL (A + C)				3,318.7	4,436	6,650.7	14,405.4	892.1	978.9	1,209.2	2,619.1

<sup>1</sup> Based on end period populations.

SOURCE: NUPS Projections

## 2. Principal Findings Regarding the Existing Situation and Current Trends

Physical development issues and opportunities associated with future urban growth during the planning period were assessed during the course of the study and a "Special Report: Alexandria Concept Plan" was produced. The principal findings of the report are summarized below. In general terms, it was found that a coordinated or metropolitan effort is required to define and control future directions of urban growth to avoid excessive loss of old cultivated lands, and to cope with competing interests for expansion of industry, housing, tourism and land reclamation projects.

### a. Directional Growth

In Figure III-7, a directional population growth diagram for 1976 (dark shade) and 2000 (light shade) based on current trends is presented. The diagram illustrates cumulative *kism* or sub-*kism* population by directional axis using the *kism* of Attarine as centroid. Until 1976, the major axes of development have been as follows:

- Northeast: Coastal development in the *kisms* of Bab Sharky, Sidi Gaber, Ramleh, and Montazah.
- East: Inland arable land development in the *kisms* of Sidi Gaber, Ramleh and Montazah.
- South East: Central fringe development in reclaimed areas from Lake Maryout in the *kism* of Moharram Bey.
- South and Southwestern: Substantial growth also occurred to the south through densification and infill in the central core area of Karmouz and in the southwestern coastal *kisms* of Minet El Basal and Dekheila. Growth to the west (the Ras El Tin peninsula) has occurred at a low level for some time due to its saturation.

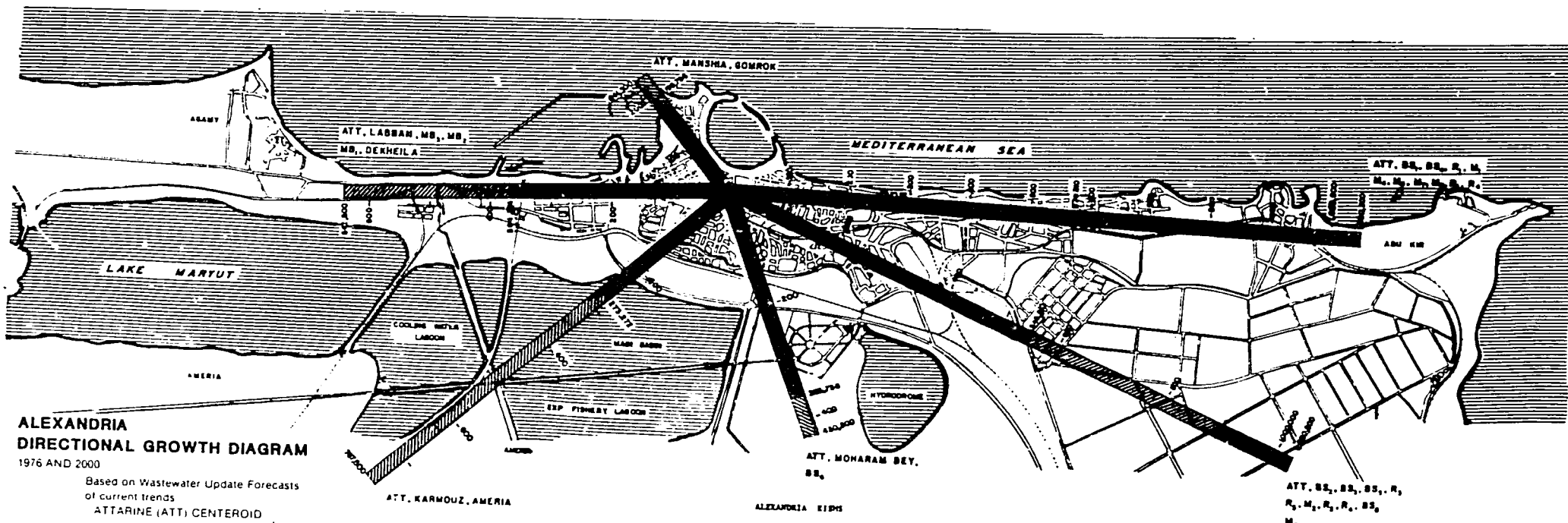
Directional growth pressures for the year 2000, based on trend forecasts, indicate reinforcement of major growth axes to the northeast and east, reduction to the southeast (due to the presence of Government reclamation efforts), enhanced growth to the south (due to expansion in Ameriyah), and limited growth to the west (because of resort development beyond Agamy).

### b. Description of Development Trends

West to east urban expansion from the old port to Abu Kir is nearly complete. Thus, substantial inland development in the eastern *kisms* of Sidi Gaber, Ramleh, and Montazah is occurring.

A comparison of 1978 aerial photographs and visual impressions from site visits indicates substantial loss of old cultivated land, although it was not possible to make an exact estimate. Western development for the purposes of industrial related activities or permanent housing is blocked by existing or planned resort development beyond Agamy. As a consequence, industrial and residential development is occurring along and south of Lake Maryout in the desert district of Ameriyah. Growth there, made feasible by the Alexandria desert road, however, is occurring in an unplanned fashion and will eventually be hemmed in by Government agricultural land

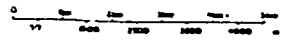




**ALEXANDRIA  
DIRECTIONAL GROWTH DIAGRAM**

1976 AND 2000  
Based on Wastewater Update Forecasts  
of current trends  
ATTARINE (ATT) CENTEROID

Note: Subkism divisions refer to those used  
by the Alexandria Wastewater Master Plan Update



KIRSI		Abb	KIRSI		Abb
Agamy	-	-	Labban	-	-
Amriyah	-	-	Mansha	-	-
Attarine	ATT	-	Higet El Sanaal	MS	-
Beh Sharty	-	-	Hime of Almondria	-	-
Dekheila	-	-	Moharam Bey	-	-
Gomrah	-	-	Houtash	M	-
Karmouz	-	-	Ramlah	R	-

FIGURE III-7

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reclamation efforts. Significant growth is also occurring in proximity to Kafr El Dawar along the Cairo/Alexandria agricultural road. Growth there has been stimulated by strong locational advantages, transportation linkages, and heavy industrial investment within the Beheira Governorate.

### 3. Development Issues

In assessing current and past development trends in the Alexandria Zone, several development issues were identified which require attention. These include:

a. Current governorate boundaries and administrative procedures do not lend themselves to proper planning and administration of the zone.

Due to Alexandria's influence on urban growth outside its governorate boundaries (i.e. in Beheira and Matruh), a need exists for coordinated or unified metropolitan planning and management. Whether this can be achieved by the planning region still needs to be resolved.

b. Land use requirements for industry, housing, tourism and agricultural reclamation projects were often found to functionally conflict and compete for available expansion opportunities.

A clear definition of the various land use priorities and requirements must be established and functional conflicts among uses due to locational choices minimized. Clear policy objectives regarding economic and physical growth policy and lengthening of the planning horizon will assist in this regard.

c. Urban expansion requirements for the year 2000 cannot be entirely satisfied in non-arable areas; a choice must be made between the loss of old cultivated land and newly reclaimed areas.

As maximum feasible growth in outer non-arable areas is not judged to be adequate to halt growth in arable areas, it is suggested that newly reclaimed fringe areas (i.e., Moharram Bey) which are less fertile and productive than the old cultivated lands be urbanized as an alternative.

Reclamation of Lake Maryout for urban purposes has been proposed as an alternative to urban expansion on low productivity reclaimed land by the Alexandria Wastewater Master Plan. However, NUPS does not recommend this approach because of the importance of the lake as a source of food (see item "e" below), and because the lake is a unique feature in Alexandria's urban environment which can be used to regulate urban growth. It also could provide alternative sources of recreation and attractive residential areas could be constructed around the lake (i.e., near the hydrodome). Nevertheless, if reclamation of all or portions of Lake Maryout is contemplated, a cost benefit analysis should be conducted which would weigh the additional costs of filling the lake, the loss of food and potential tourism/recreational activity against the benefits of maintaining low productivity newly reclaimed agricultural land.

d. An assessment of the net benefit of tourism in the Alexandria Governorate needs to be undertaken as it appears to impose an inordinately high burden on the local population and may limit future development opportunities.

A cost benefit analysis is required to determine whether tourism should continue to receive high priority vis-a-vis other economic and residential functions. However, it is likely that it would be better to encourage beach tourism on the northwest coast while in-governorate tourism receives less encouragement. Port Said should also be encouraged to absorb a share of Alexandria's urban-beach tourism. However, since the scale of seasonal tourism in Alexandria will remain important in the planning period, complementary urban functions to fill service gaps during the "off season" such as congresses, research activities, and winter sports should be promoted. In addition, the net costs of tourism to the city should be carried by the seasonal population. This does not appear to be the case at the present time.

e. Alexandria's most proximate and productive sources of food supply including the marine environment, freshwater lakes, and agricultural land are being jeopardized by current development trends and characteristics.

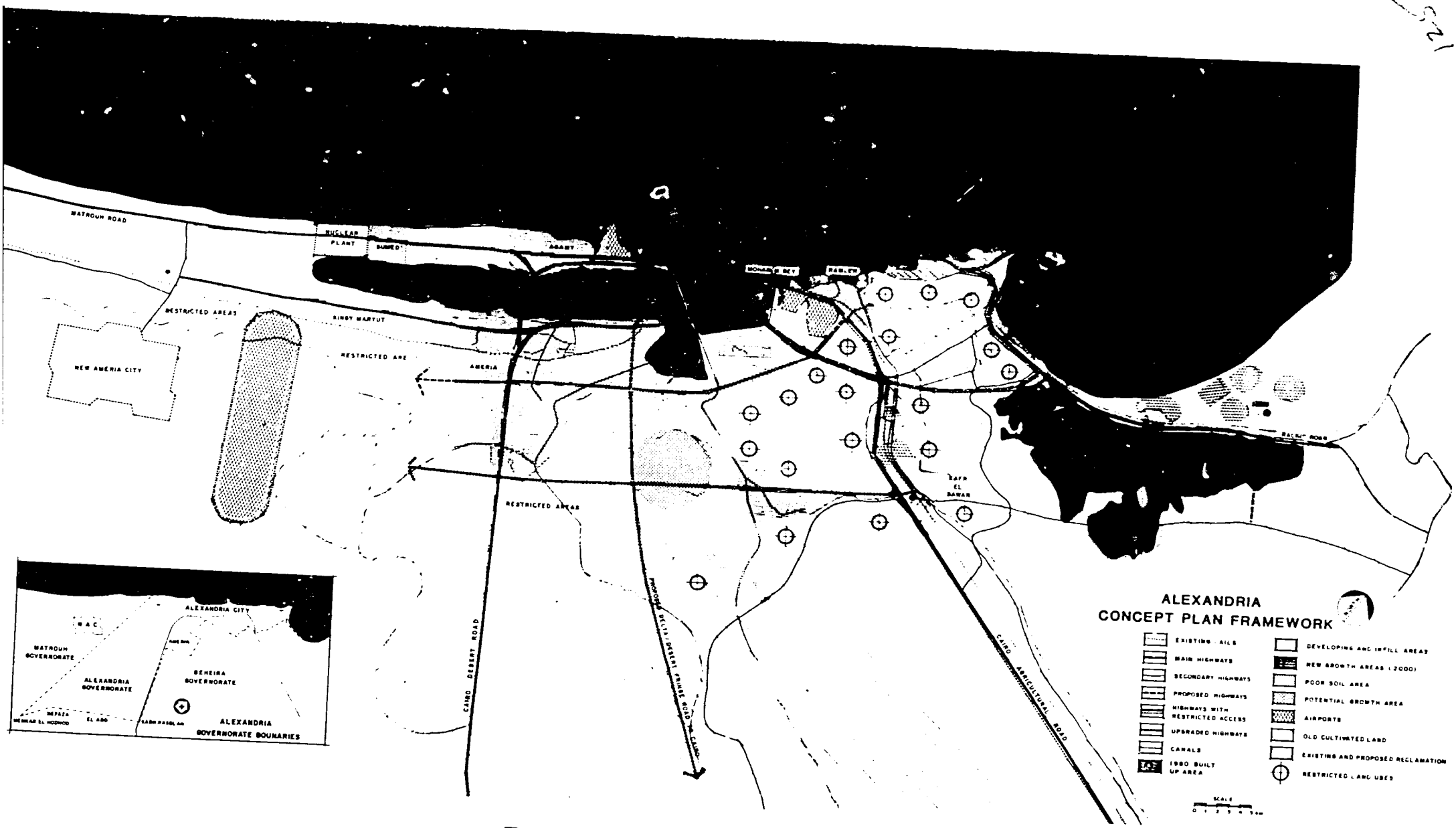
Pollution, urbanization, and loss of productive areas of food supply need to be brought under control. A thorough environmental, economic, and social assessment of food supply sources also needs to be carried out. Protection of these areas requires strict enforcement of existing laws and severe penalties for violators. However, alternative development sites for housing, industry, and other urban uses need to be identified. If losses must realistically occur, it should be in the least productive of these areas. Reclamation of freshwater lakes should only be undertaken if the reclaimed areas will demonstrably be a more efficient form of food supply.

f. Informal housing needs to be brought under control and channelled into more desirable locations.

Informal housing in Alexandria is causing substantial loss of arable land in the southeast and east. Furthermore, informal areas have and will prove more difficult and costly to service due to their irregularity of development. Hence, alternative sites for informal-type settlements need to be identified (i.e., in Ameriyah, Moharram Bey, or Idku) and a means created to channel its development in a more efficient and coherent fashion. Appropriate development standards and building regulations are required to meet low income affordability criteria. (See NUPS suggested standards, Chapter V).

g. Transportation and infrastructure projects and investments need to be assessed not only in terms of future demand but also with respect to their potential for development attraction and core concentration.

Development along the Cairo/Alexandria agricultural and desert roads are examples of development of this kind. In the case of the former, significant losses of agricultural lands between Alexandria and Kafr El Dawar have occurred. Plans for introduction or substantial upgrading of these services should be weighed in terms of their likely development impacts. Care should also be taken to promote core deconcentration by avoiding unnecessary access to the core area by traffic not destined to serve essential core activities. When possible, alternative routes and infrastructure should be devised to assist in inducing development in desired locations. (Alexandria Concept Plan, Figures III-8 and III-9).



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FIGURE III-8

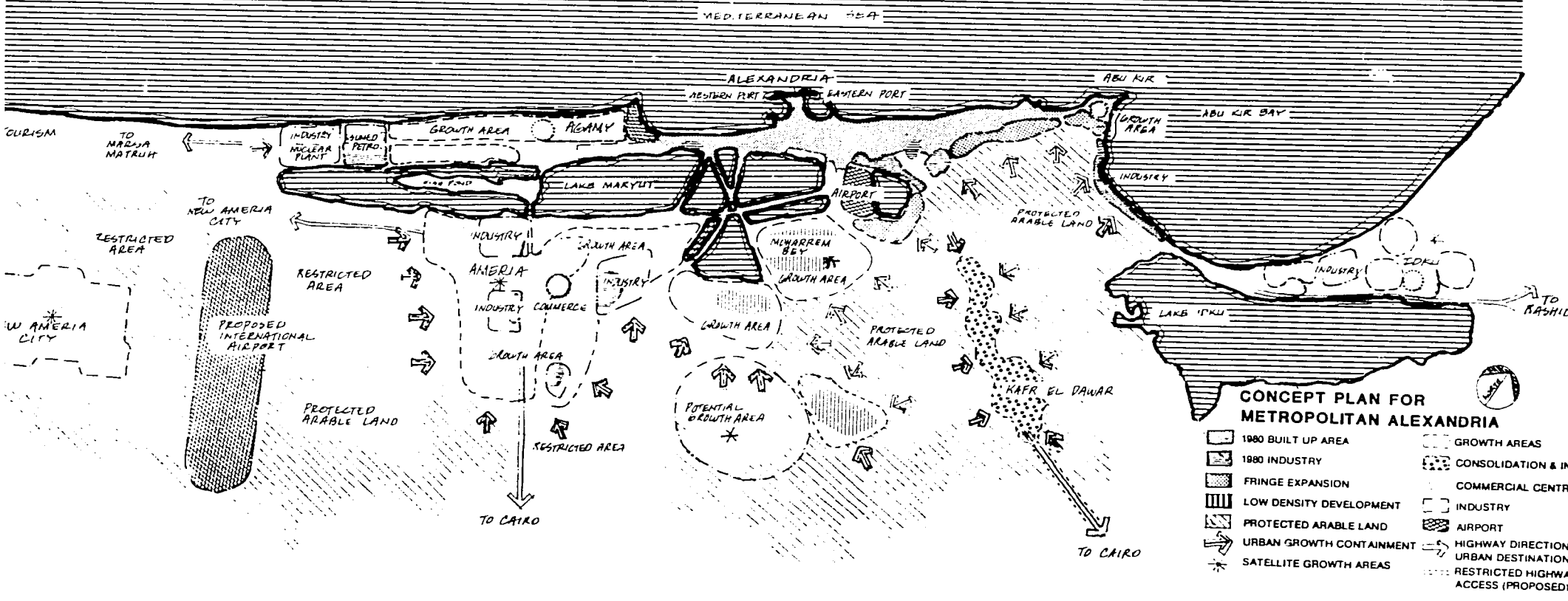


FIGURE III-9

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#### 4. Objectives for Future Urban Development

On the basis of these findings the following objectives for a future development strategy for Alexandria were developed:

- Need to preserve and protect high productivity arable land and other sources of food supply.
- Need for an efficient utilization of development resources and to maximize cost recovery for services rendered.
- Need for efficient governance; planning, development control, and management.
- Need for improved coordination of national, regional, and local investment decisions and programs.
- Need to upgrade the quality of life and environment in both existing and proposed developments.
- Need to promote a development strategy which facilitates deconcentration of the core area.

#### 5. Strategy for Future Urban Development

An overall development strategy for the Alexandria Zone must consider growth dynamics in parts of the Beheira and Matruh Governorate as well as Alexandria Governorate. It must also take into account development trends regarding infill and fringe development as well as outlying "growth" areas.

The recommended strategy for future urban development within the Alexandria Zone favors deconcentration of the future growth of the core area through the development of secondary and tertiary sub-centers. This strategy will also result in a net reduction of core area population (a core area year 2000 population of 872,000 vs. a 1976 population of 1,000,000) and the encouragement of the relocation of core area activities which can be feasibly moved to other areas. However, due to the momentum of current trends, substantial infill and fringe expansion will also be necessary. Furthermore, in addition to planned urban growth, adverse development trends (i.e., resulting in the loss of high-productivity arable land) should be halted or their effects minimized. The basic elements of the proposed strategy include:

##### a. Core deconcentration to Ameriyah, Moharram Bey, Idku, and New Ameriyah City.

These places can absorb a considerable portion of expected growth, but not all. Growth at feasible rates reveals that these areas will accommodate about 66 percent of the expected increase in population. New Ameriyah City, furthermore, is expected to have the least impact in accommodating the future urban growth due to its location (i.e., 40 kilometers from Alexandria) and lack of an initial population mass.

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b. Fringe development in Dekheila (Agamy) and Moharram Bey will be required to meet growth requirements during the planning period. This will require a reassessment of Agamy's role as a resort area and the loss of newly reclaimed arable land in Moharram Bey. Both areas offer distinct locational advantages for future growth. Some fringe growth will also inevitably occur in the more productive arable areas of Sidi Gaber, Ramleh and Montazah, but this should be kept to a minimum. The proposed development of Sadat City in Montazah, for example, should be abandoned.

c. Infill and vertical development within urban boundaries should be encouraged in the urbanizing *kisms* of Bab Sharky, Sidi Gaber, Ramleh, and Montazah. Fully urbanized more central *kisms*, on the other hand, should generally be decreased in density. (Table III-II)

d. Upgrading of Existing Settlement Areas with Inadequate Levels of Services.

Many of Alexandria's central *kisms* as well as informal areas such as those along the Mahmudiya Canal and near the port area, need to be substantially upgraded with higher levels of infrastructure and social services. The ongoing programs for water and sanitation will partially cover these deficits. However, specific programs aimed at these areas also called for in NUPS infrastructure investment costs allow for improvement of these areas.

e. Protection of arable lands topsoil and restricted desert areas should be carried out through strict enforcement of laws, demolition, and severe penalties. However, alternative sites should be made accessible for urban development, since control will not work without alternatives. Other means of protection include the introduction of restrictive or dual land uses which permit a large share of the lands to remain cultivated, as well as the purchase of development rights by the government. Transportation entranceways which cause development attraction should not be increased in capacity if alternative routes can be found.

f. Transportation networks, industrial investment, and infrastructure services should be used as tools to induce development in desired growth areas. An example of development attraction is that caused in Ameriyah by the Alexandria desert road.

## 6. Distribution of Urban Population in the Zone

Based on the proposed development strategy described above, an indicative future distribution of population for the year 2000 was developed. The distribution represents a mixed strategy of growth options including densification of central *kisms*, urban extension and infill, outlying satellite cities as well as possible expansion of other urban areas (Idku) in the Zone.

The suggested distribution is primarily a variant of that proposed in the Alexandria Concept Plan. Certain modifications have been made for the purpose of clarity and to increase the population to the level of the preferred strategy (i.e., 5.5 million inhabitants).

TABLE III-11

## DISTRIBUTION OF POPULATION IN THE ALEXANDRIA ZONE, 1976-2000

	WASTEWATER MASTER PLAN ESTIMATES <sup>1</sup>				NUPS PROPOSALS	
	1976	2000	RESIDENTIAL	RESIDENTIAL	2000	NET
	POPULATION (000)	POPULATION (000)	AREAS HA.	DENSITY IN 2000 PERSONS/HA	POPULATION (000)	POPULATION CHANGE FROM 1976 (000)
<u>URBANIZED "KISMS"</u>						
<b>1. CENTRAL</b>						
Mina of Alexandria	0.5	1	0.4	2,500	0.4	(.1)
Minet El Bassal	228.0	259	174.0	1,489	174.0	(54.0)
Gomrok	143.0	160	105.0	1,524	105.0	(38.0)
Labban	78.5	90	49.0	1,837	49.0	(29.5)
Karmouz	214.0	250	120.0	2,083	120.0	(94.0)
Manshia	45.0	52	51.0	1,020	51.0	6.0
Attarine	75.0	85	130.0	654	85.0	10.0
Bab Sharky	216.0	288	372.0	774	288.0	72.0
SUB TOTAL A	1,000.0	1,185	1,001.4	Av. 1,183	872.4	(127.6)
<u>URBANIZING "KISMS"</u>						
<b>2. WEST</b>						
Dekhella	46	65	1.5	400	9.40	354
<b>3. SOUTH</b>						
Moharram Bey	336	449	1.2	1,500	6.40	1,164
Amerlyah	47	500	10.4	465	10.00	418
<b>4. EAST</b>						
Sidi Gaber	135	360	4.2	360	4.20	225
Ramleh	446	700	1.9	700	1.90	254
Montazah I (Abu Kir)	22 <sup>2</sup>	99 <sup>2</sup>	6.5	170	8.90	148
Montazah II	288 <sup>3</sup>	1,301 <sup>3</sup>	6.5	450	1.90	162
SUB TOTAL B	1,320	3,474	Av. 4.11	4,045	4.78	2,725
TOTAL A + B	2,320	4,659				
<b>5. OTHER</b>						
New Amerlyah City	-	390 <sup>4</sup>	22	137	10.00 <sup>6</sup>	137
Idku	62	160 <sup>5</sup>	4	450	8.60	388
New Settlement Area	-	-	-	50	N.A.	50
SUB TOTAL C	62	550		637		575
TOTAL A + B + C	2,382	5,209	3.31	5,554		3,172.4

Please see attached sheets for notes and footnotes.

SOURCE: NUPS Elaboration.



## NOTES TO TABLE III-11

1 Population forecasts for the year 2000 are those of the Wastewater Master Plan Update conducted in 1980-1981. Residential areas for central "kisms" are those determined by the Wastewater Master Master Plan conducted in 1978. As there is no room for expansion within the urbanized central "kisms," these areas were used to calculate indicative residential densities for the year 2000.

2 As the Wastewater Master Plan Update Study did not disaggregate data for Abu Kir and the rest of Montazah, 1976 data for Abu Kir, as determined by the Wastewater Master Plan Study, has been projected at the same annual rate of growth as the whole of Montazah.

3 Montazah forecasts are those based on the Wastewater Master Plan Update minus the projected population of Abu Kir as described in Note 2.

4 The population of New Ameriyah City was projected at 390,000 in year 20 or 2000, by year 25 or 2005 it was targeted to have a population of 510,000.

5 Idku's population of 160,000 for the year 2000 is based on a growth rate of 4 percent per annum.

6 New Ameriyah's year 2000 population of 137,000 is based on a year 1985 population of 25,000 and an annual growth rate of 12 percent between 1985 and 2000.

### EXPLANATORY NOTES TO TABLE III-11

NOTE: Central, west, south, and east areas do not correspond with district designations in the Alexandria Governorate.

1. Central Urbanized "Kisms." "Kisms" with High Residential Density. These "kisms" have for the most part reached saturation at high residential densities exceeding 1,000 persons per hectare. The 1981 Wastewater Master Plan Update (WWMP) projected small increases in population by the year 2000. NUPS estimates are based on a maximum density of 1,000 persons per hectare. This implies a deconcentration and redistribution of "excess" population in central "kisms" to urbanizing "kisms" and "growth" areas. Residential areas used for computing densities are those areas identified by the 1978 Wastewater Master Master Plan study. The assumption is that no additional areas will be added for residential development due to an increase in storage, commercial, and other functions in central areas.

2. Urbanizing "Kism:" those areas which can expand horizontally.

West: Dekheila

Dekheila (Agamy) was designated by the Wastewater Update Study to accommodate primarily seasonal tourism population. However, NUPS has concluded that the area west of the port offers unique opportunities for industrial and

residential development. Thus, Dekheila should be given special emphasis for these functions rather than tourism. Seasonal tourism functions, on the other hand, should be encouraged further west along the northwest coast. An alternative to substantial residential growth in Agamy would be to build up the area south of Lake Maryout between Ameriyah "kism" and the proposed international airport. This area is already being subdivided and enjoys access to the coast as well as the port, the Ameriyah Free Zone, and the proposed airport.

### 3. Southern "Kisms"

#### Moharram Bay

Moharram Bey presents special opportunities for development because of its proximity to the central area, industrial zones along the Mahmudiya Canal and Lake Maryout and relatively unlimited possibilities for expansion to the south. However, as it abutts on agricultural reclamation areas, the WWMP Update Study did not project significant growth there. It is the view of NUPS, however, that the loss of less fertile agricultural land in Moharram Bey is preferable to the loss of rich old cultivated lands in Montazah (i.e., Sadat City, Alexandria). This area, furthermore, could be developed as a metropolitan subcenter to promote deconcentration of the core area.

#### Ameriyah

Ameriyah "kism" due to its location along the Alexandria Desert Road and relative proximity to Alexandria south of Lake Maryout is undergoing rapid, but haphazard development. The Alexandria Governorate expects 500,000 in this area by the year 2000 (also projection of the WWMP Study). NUPS probably conservative estimate of 465,000 is based on a growth rate of 10 percent per annum between 1976 and 2000. However, as the area is in reality an extension of south central "kisms" such as Minet El Bassal and Karmouz, more rapid growth could occur. It is imperative that swift action be undertaken in order to bring development under control. Also, as the area will also soon be hemmed in by agricultural reclamation projects, future growth options need to be determined. NUPS suggests gradual expansion towards the west (in the direction of the airport and New Ameriyah City). Expansion, however, should be governed by the prospects of development in Agamy and New Ameriyah City. Ameriyah, like Moharram Bey, should be developed as a metropolitan sub-center.

### 4. Eastern "Kisms"

According to the WWMP update projections, which are based on trends, most of the increase in population in Alexandria would be accommodated in eastern "kisms." However, this will result in loss of old cultivated lands, particularly in Montazah (Au Kir drain area). The NUPS alternative strategy is to emphasize growth only in Abu Kir village -- an area which will not result in loss of arable land. Other growth should be shifted to Moharram Bey and Idku (increasingly becoming a workers suburb of the industrial zone along Abu Kir Bay).

The eastern coastal "kisms" already accommodate a large seasonal population which is expected to increase by about 15 percent by the year 2000. NUPS has concluded, however, that the role of tourism in Alexandria should be deemphasized in favor of northwest coast development and other opportunities in Port Said and elsewhere where job generation is required.

## 5. Other Areas

### New Ameriyah City

New Ameriyah City is not expected to reach its year 2000 population of 500,000 primarily because of its location, lack of economic linkages to the west, expected difficulty in attracting industry, etc. In the long term, however, proximity to the proposed international airport, coastal development in Dekheila, and western expansion of Ameriyah will enhance its growth prospects. The NUPS year 2000 population projections of 137,000 is based on the assumption that a critical mass of 25,000 population can be established by 1985 and a subsequent 12 per cent annual growth rate maintained between 1985 and 2000. Alternatively, 50,000 would have to be settled in New Ameriyah City by 1985, after which a 10 percent annual growth rate is needed to the year 2000.

### Idku

Idku experienced a growth rate in excess of 4 percent per annum between 1960 and 1976: benefitting from its proximity to Alexandria and industrial development along Abu Kir Bay. The Idku area has significant opportunity for horizontal expansion in non-arable areas and is within commuting distance by rail and road to the Abu Kir industrial area and industrial development in Beheira Governorate near Kafr El Dawar. It could, thus, absorb population growth from these areas as constraints are applied in the latter to preserve arable land. It is recommended that incremental developments of 25,000 population be undertaken to test Idku's growth potential. NUPS expects that about 450,000 could be accommodated in this area through induced growth (8.6 percent per annum). Feasibility studies are required, however, regarding soil condition in the area and the effects of coastal erosion.

### New Settlement Area

An area of poor quality soil, reclaimed from Lake Maryout, and south of Moharram Bey (5 kilometers) and west of Kafr El Dawar (15 kilometers) has been identified as a possible future expansion area. Aerial photos and field visits reveal that crop growth in this area is considerably poorer than in surrounding areas. Thus, the area may be better suited for urban development. Furthermore, as a new Cairo/Alexandria road is planned and under construction along the Delta/desert fringe, the new settlement area could benefit from its location vis-a-vis this route, as well as current linkages with Kafr El Dawar (i.e., the new settlement area could be alternative location for industrial investment and population growth for Kafr El Dawar). It is recommended that an initial settlement be established in this area to test its potential for long term expansion. As a number of villages already exist in this location, it should be possible to reach a year 2000 population of 50,000 in this area. As was the case in Idku, expansion should occur in incremental fashion.

## 7. Alternative Strategies

The distribution of population worked out by NUPS is meant to preserve as much fertile arable land as possible given current development trends, and to promote deconcentration of the core area. However, the strategy is based on the assumption that Dekheila will be designated as a permanent population district, that Moharram Bey expansion will be possible and that growth in Ameriyah and Idku will be successful.

The best alternative area for substantial development is in Ameriyah south of Lake Maryout. This area could be developed as far as the proposed international airport. It is also possible, but not likely, that New Ameriyah City will exceed NUPS growth expectations. Greater growth in the "new settlement area" south of Moharram Bey would also be possible if a new Alexandria/Cairo road were to be completed in the near future. Infill of Lake Maryout is also possible, though not recommended, due to higher construction costs resulting from filling in the Lake, the loss of fresh water fish, the loss of potential recreational activities, and the loss of urban amenities which could be provided.

Development control and initiatives should be undertaken in all potential growth areas to monitor growth and assess growth potential on a regular basis. Government action should be in planning and establishing potential growth areas and providing needed services and infrastructure. Actual construction should be undertaken for the most part by the private sector, though assistance regarding financing and administration is required. It will also be necessary to adopt appropriate standards to reduce development costs and to permit substantial informal-type development. This strategy should be coupled with efforts to reduce loss of fertile arable lands and direct investments in transportation, infrastructure and industry to desired development areas.

The seasonal population by *kisra* in 1976 and as projected by the Wastewater Update Master Plan Study is presented in Table III-12. As indicated, most of the increase in seasonal population is to be accommodated in Dekheila (Agamy) which is currently designated as a resort area. However, NUPS has concluded that due to requirements for expansion of Alexandria in non-arable areas, Dekheila should be given preference to permanent residential development and some industrial expansion (along Lake Maryout). Tourism facilities should thus, be located further west along the northwest coast.

TABLE III-12

## SEASONAL POPULATION PROJECTIONS AND LOCATIONS

<i>KISMS</i>	1976 (000's)	2000 (000's)	(1976-2000) INCREASE (000's)
Dekheila (Agamy)	25	160	135
Bab Sharky	85	106	21
Sidi Gaber	50	66	16
Ramleh	40	54	14
Montazah	200	214	14
Ameriyah	-	70	70
TOTALS	400	670	270

SOURCE: Alexandria Wastewater Master Plan Study, 1981.

Expansion of tourism in the eastern *kisms* will also force permanent residential development inland and result in the loss of arable land. Thus, a study is required to determine whether the economic benefits of increased seasonal tourism in Alexandria outweighs its disbenefits. Though NUPS has been unable to determine whether increased congestion and burdens on infrastructure and housing is offset by economic returns from tourism, it appears that tourism should rather be encouraged in a number of other sites such as Port Said, and the northwest coast (Matruh), where economic stimulation is needed. At any rate, it would also appear that the costs of seasonal tourism in Alexandria are being predominantly borne by the permanent population. As a consequence, a policy needs to be established to increase the seasonal population's share of these costs.

## 8. Industrial Development

### a. Introduction

Alexandria accounts for more than one-third of the national industrial stock. Its mix is widely diversified to include textiles, chemicals, dyes, paper and printing, metallics, engineering machinery, basic steel, cement, oil refineries and food processing.

By 1977, employment in industrial firms (employing 25 or more workers only) amounted to 156.1 thousand, representing 21.8 percent of the national total. This percentage is relatively high in comparison with Alexandria's 14.4 percent share in the 1976 total national urban population.

A more accurate measure of Alexandria's industrial employment is derived from the 1976 Population Census. The Census reveals that 203.5 thousand, or 33 percent of Alexandria total active population (15 years or older) is engaged in manufacturing activities (Table III-13). Industrial employment is followed by services and trade, with shares of 25.7 percent and 14.2 percent, respectively.

**TABLE III-13**  
**DISTRIBUTION OF ALEXANDRIA ACTIVE POPULATION BY**  
**ECONOMIC SECTORS, 1976**

<u>SECTORS</u>	<u>ACTIVE POPULATION</u> <u>IN 000s</u>	<u>%</u>
Agriculture	30.6	5.0
Mining	2.6	0.4
Industry:	203.5	32.9
Textiles	96.2	
Food Processing	25.5	
Engineering Machinery	24.3	
Chemicals & Petroleum	21.2	
Wood & Furniture	11.0	
Paper & Printing	10.3	
Basic Metals	8.8	
Non-Metallics	5.2	
Other Industries	1.0	
Electricity & Water	8.0	1.3
Building & Construction	40.0	6.5
Trade	87.4	14.2
Finance	8.9	1.4
Transportation & Storage	59.5	9.6
Services	158.6	25.7
Not Stated	17.9	2.9
TOTAL	617.0	99.9

SOURCE: CAPMAS, Population Census of 1976, Alexandria Volume.

- The Relative Importance of Public and Private Sectors

The public sector dominates industrial establishments employing 25 or more workers (Table III-14). It accounts for 93.5 percent of their total employment and 96.4 percent of value-added. Average productivity (as measured in terms of value-added per worker) is found to be much higher in the public sector as compared to the private sector. Much of this variation is explained by the very large and increasing size of the public sector establishments, Government controls and investment allocations and the relatively higher capital intensity in the public sector.

Employment in the private industrial sector is mostly in small-scale (less than 25 workers) and informal activities. Based on the 1976 Census, employment in small scale industries would amount to 57.5 thousand, representing 28.2 percent of Alexandria's total industrial employment.

Recent government policies and regulations, especially the "open door" policy and the liberal investment laws, attracted L.E. 202.4 million in new joint ventures and private investment projects during the period 1973-81. The share of the industrial sector amounted to L.E. 167.5 million, of which textiles and fertilizers alone accounted for L.E. 114.4 million (Table III-15). These new private investment activities should improve the relative importance of the private sector's employment, wages and productivity. Recent investments in public industrial enterprises, however, were aimed at upgrading and renewing the obsolete capital stock of existing industries. These investments will result in increased labor productivity, but are expected to have limited impact on the creation of new jobs.

- Existing Industrial Mix and Spatial Location

Industries are widely scattered throughout Alexandria's subdistricts. Small-scale industries and free standing factories are found to be inter-mixed with residential areas. The large scale establishments are clustered in a few locations with close proximity to transportation, infrastructure, labor pools, sources of water supply and waste discharge sites. Agglomeration of these industries is very noticeable south and north of the Mahmudiya Canal, near the port, and close to the Cairo/Alexandria railroad and highways. Alexandria's principal industrial districts are located in Abu Kir, Smouha, Siouf, Nouzha, Dekheila, Mex and Ameriyah. Most of these sites are in the east and west zones (Table III-16).

Textile factories are located in Hadra, Siouf, Nouzha and Moharram Bey. Supplementary activities such as dying of fabric, printing and manufacturing of wearing apparel are found adjacent to these sites. The textile industry accounts for 47 percent of Alexandria's total industrial employment and contributes 30.9 percent of the industrial sector's value-added. The low labor productivity is mainly due to its obsolete capital stock, which is also a serious problem of the textile industry at the national level. A recent World Bank study revealed that labor productivity in textiles could be raised by 325 percent from its current level.

The second most important industrial sub-group is food processing and related industries. Fruit and vegetable canning is primarily located in Abu Kir and Ras El Soda, with proximity to sources of agricultural raw materials.

**TABLE III-14**  
**ALEXANDRIA MANUFACTURING INDUSTRIES: EMPLOYMENT**  
**AND VALUE-ADDED**

INDUSTRY	EMPLOYMENT		VALUE ADDED		VALUE ADDED
INDUSTRY	(WORKERS)	%	(L.E. MILLIONS)	(%)	PER WORKER
INDUSTRY	(WORKERS)	%	(L.E. MILLIONS)	(%)	(L.E./WORKER)
<b>A. PUBLIC SECTOR</b>					
Food Processing	24,394	16.7	15,977	24.2	655
Textiles	70,975	48.6	20,777	31.1	293
Leather	3,856	2.6	1,594	2.4	413
Wood & Furniture	709	0.5	21.0	0.0	30
Paper & Printing	9,662	6.6	4,664	7.0	183
Chemicals	9,656	6.6	6,174	9.3	639
Oil	4,251	2.9	6,288	9.5	1,479
Non-Metallics	3,276	2.2	1,722	2.6	526
Metallurgical	8,067	5.5	4,653	7.0	577
Engineering Machinery	11,160	7.6	4,269	6.4	382
<b>TOTAL</b>	<b>146,006</b>	<b>99.8</b>	<b>66,139</b>	<b>99.9</b>	<b>453</b>
<b>B. PRIVATE SECTOR</b>					
Food Processing	1,901	18.8	311	12.6	163
Textiles	2,518	24.9	405	16.5	160
Leather	206	2.0	21	1.0	102
Wood & Furniture	591	5.8	82	3.3	139
Paper & Printing	614	6.1	182	7.5	299
Chemicals	1,495	14.8	468	19.0	313
Oil	-	-	-	-	-
Non-Metallics	594	5.9	128	7.2	300
Metallurgical	378	3.7	133	5.4	352
Engineering Machinery	1,823	18.0	680	27.6	373
<b>TOTAL</b>	<b>10,120</b>	<b>100.0</b>	<b>2,462</b>	<b>100.1</b>	<b>243</b>

NOTE: Data covers establishments employing 25 or more workers.

SOURCE: CAPMAS, Census for Industrial Production, second quarter of 1977.



TABLE III-15

**PRIVATE INVESTMENT IN ALEXANDRIA ECONOMIC BASE  
ACCORDING TO LAW 43**

ECONOMIC ACTIVITY	TOTAL INVESTMENT (L.E. MILLIONS)	%
Agricultural Projects	10.12	5.0
Housing & Hotel Construction	20.95	10.4
Transportation	2.80	1.4
Health Services	0.84	0.4
Industry:	167.50	82.8
Textiles	74.4	
Fertilizers	40.0	
Food Products	13.2	
Chemicals	12.1	
Plastics & Rubber	11.8	
Metallics & Iron	10.9	
Construction Material	2.8	
Transport Equipment	2.1	
Electric Equipment	0.2	
TOTAL	202.21	100%

NOTE: These data represent the status of Investment as of March 1981.

SOURCE: General Authority for Investment and Free Zones, Alexandria Office.

TABLE III-16

SPATIAL LOCATIONS OF MAJOR INDUSTRIES AMONG ALEXANDRIA SUB-DISTRICTS

INDUSTRY	SUB-DISTRICT																
	CANNING OF AGRICULTURAL PRODUCTS	PAPER	PRINTING	PETROLEUM	CERAMIC TILES* AND GLASS	PLASTIC TILES	EDIBLE OIL, HYD. OIL, SOAP, DETERGENT, CATTLE FOOD, YEAST	LEATHER	TEXTILES	CEMENT	METALLICS	PHARMACEUTICALS	WOODEN MATCHES	CHEMICALS	INDUSTRIAL GASES	ELECTRIC & ELECTRONIC PRODUCTS	DRIED VEGETABLES
HADRA					Gx			x							x		x
LABBAN																	
MOUSTAFA PASHA																	
BAB SHARKY																	
VICTORIA						x											
NOUZHA			x		Cx		x	x							x		
IBRAHIMIA																	
MEX				x			x		x								
EL ZAHERIA										x							
SIOUF							x	x			x						
MANSHIA											x						
MOHARRAM BEY		x					x	x			x		x				
DAKAHLIA														x			
GABBAR I							x										x
HAGAR EL NAWATIA																	x
RAS EL SODA	x							x									
BAKOUS								x									
ABU KIR	x	x															
KARMOUZ				x			x										
EL ANFOUSHI																	
MINET EL BASSAL																	
GIET EL ENAB																	
SMOUHA						x											
AMERIYAH				x													

\* C = Ceramics; G = Glass

SOURCE: 1978 Wastewater Master Plan.

Edible oil and cattle feed industries are found adjacent to cotton ginning and textile sites. Processing of dried vegetables for export are located in Hadra and Gabari with easy access to the port.

Chemical industries are concentrated in a few sites: paper in Moharram Bey and Abu Kir, pharmaceuticals in Siouf, fertilizers in Dekheila, leather dying in Mex adjacent to the slaughter houses and petroleum refineries in Mex and Dekheila.

In general, the existing locational pattern of industries in Alexandria reveals that the capital intensive, heavy polluting and land consuming industries (such as petroleum refineries, chemicals, dying of leather) are located on the city outskirts. In contrast, small-scale and relatively labor intensive industries (such as confectionary dairy products, beverages, leather and shoes, ice and cold storage, workshops and garages) are scattered throughout the city's residential areas.

- Potential Industrial Development

In order to help identify potential areas for industrial development, an assessment was made of the industrial inventory prepared by the Alexandria Wastewater Master Plan.<sup>9</sup> Based on its land use analysis, the built-up central areas of Gomrok, Manshia, Labban and Attarine are expected to experience very limited future industrial development. In contrast, areas to the east along Abu Kir Bay, to the west in Dekheila, and southwest in Ameriyah will experience very significant industrial growth. New Ameriyah City to the extreme west also appears to have longer-term industrial growth potential. According to the Wastewater Master Plan, 5970 hectares of land in the Ameriyah and Dekheila *kisms* could be developed for industry (1978). (Table III-17) Based on the number of industrial and infrastructure activities that are currently being constructed or planned, considerable pressure for industrial expansion in both the west and southwest directions already exists. These activities include:

- The development of an industrial free zone in Ameriyah on an area of 700 ha, with 36 firms, and employing 1,360 workers. Two of these firms are industrial enterprises, manufacturing video units and ready-made clothes. The rest are mainly storage facilities for petroleum products, construction materials, vehicles, food products, general commodities and equipment. An additional 17 projects are currently under construction, of which 9 are industrial. The new projects are expected to create 720 new jobs. Moreover, 21 additional projects have been already approved but not yet started with a potential for 1,545 new jobs.
- Outside the free zone, other private industrial projects created under Law 43 have already taken place in Ameriyah adjacent to the Alexandria/Cairo desert road. These industries produce carpets, prefabricated housing units, paper products, soft drinks, houseware items, hollow cement blocks, and light weight cement. It is anticipated that these activities will attract other industries, commerce and supporting services.
- Industrial projects planned to the west of the city include: a cement plant along the coastal road north of Borg El Arab with a capacity of one million

**TABLE III-17**  
**AREAS OF POTENTIAL INDUSTRIAL GROWTH**

DISTRICT	PRESENT INDUSTRIAL AREA	POTENTIAL AREAS IN HA	TOTAL IN HA
<u>East</u>			
Abu Kir	289	256	545
Montazah	95	482	577
Ramleh	146	358	504
<u>Central</u>			
Moharram Bey	115	64	179
Bab Sharky	115	233	348
<u>West</u>			
Karmouz	71	-	71
Minet El Bassal	17	-	17
Dekheila	83	3,890	3,973
<u>South:</u>			
Amer Iyah	19	2,081	2,100
<b>TOTAL</b>	<b>950</b>	<b>7,364</b>	<b>8,314</b>

SOURCE: Camp Dresser & McKee, Inc., Alexandria Wastewater Master Plan Study. Prepared for the Ministry of Housing and Reconstruction, A.P.E., May 1978.

tons of cement a year and ultimate employment of 1,200 jobs, a large chemicals complex west of Al Hamam, and an integrated steel complex in Dekheila with an employment potential of 1,977 new jobs. These projects will function as a growth nucleus and thus induce other industries and stimulate construction activities through the provision of steel and cement (thus, minimizing the transportation cost of these materials from other parts of the country).

- Several major infrastructure projects are either planned or under construction in the western coastal area. Among these projects are the new sea port at Dekheila for the bulk handling of iron ore, the completed SUMED crude oil terminal, the future nuclear power plant at Sidi Kerier, and the proposed international airport facility. These projects are further valid indications of industrial and urban growth potential along the western coast of Alexandria.

- The 1980-1984 Industrial Investment Plan

The subsectoral and spatial allocations of proposed 1980-1984 industrial investments are presented in Table III-18. The main features of the Plan are:

- Emphasis on improving the efficiency of existing industries through the allocation of investment funds for upgrading capital stock and production capacity. Target industries include the electric and metallic operations located in the inner city, food processing and textiles in the eastern outskirts, and chemical industries in the west. These funds are expected to raise productivity, but will have a limited effect on creating additional jobs or changing the prevailing industrial locational patterns.
- Expansion of basic industries such as chemicals and steel in the western zone. The investment share of the western zone areas of Dekheila, Mex and Ameriyah amounts to 67.8 percent of Alexandria's total proposed investments. (Figure III-10) These industries possess strong forward linkages which if implemented, would attract additional industrial and supporting services. The availability of non-arable flat land in this direction will, furthermore, reduce the real cost of industrial expansion. However, land management mechanisms and regulations should be established in order to minimize conflicts between industrial and other urban land uses.

The implementation of the 1980-1984 Plan has been slow. For example, committed industrial investment in Alexandria over the period 1981-82 amounts to only L.E. 78.2 million, or 8.9 percent of the total planned industrial investment. Furthermore, no allocations for the proposed steel complex in Dekheila have been made. Distribution of industrial investments committed for 1981-1982 are also shown in Table III-18.

- Policy Recommendations

The textile industry is expected to remain Alexandria's largest industry. Thus, special efforts should be directed toward making it substantially more efficient through the introduction of modern management techniques, renewal and

TABLE III-18

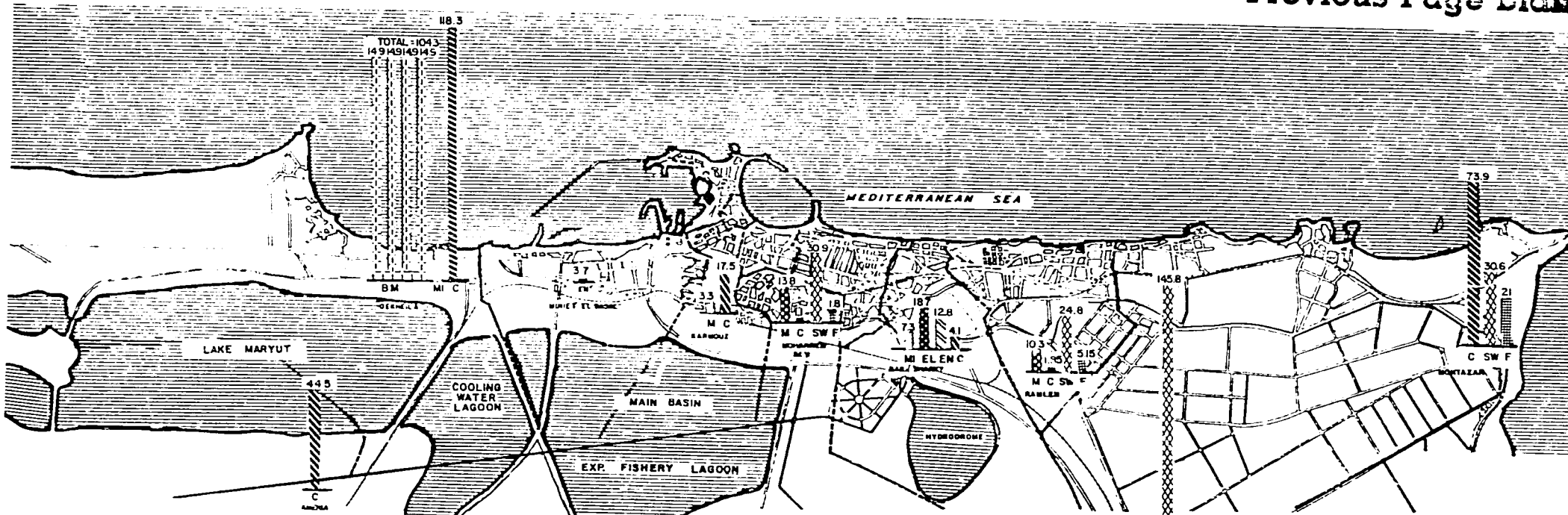
## SUGGESTED INDUSTRIAL INVESTMENT 1980-1984 (L.E. Millions)

	FOOD PRODUCTION	SPINNING, WEAVING	CHEMICALS	METALLICS	ENGINEERING	ELECTRICITY	MINING	BASIC METALS	PLASTICS	TOTAL
<u>East</u>										
Montazah	21.0	30.6	73.90							125.5
<u>Central</u>										
Moharram Bey	1.8	30.9	1.10	13.8						47.6
Karmouz			17.50	3.3						20.8
Ramleh	5.15	24.8	1.85	10.3						42.1
Sidi Gaber			4.10		12.8	18.7	7.3			42.9
Minet El Bassal					3.7					3.7
<u>West</u>										
Dekhella			118.3				14.8	418.5		551.6
Ameriyah			44.5							44.5
TOTAL PLANNED	27.95	86.3	261.25	27.40	16.5	18.7	22.1	418.5	-	878.7
COMMITTED 1981/82	16.98	22.4	22.95	9.54	-	2.5	3.21	-	0.3	78.2

NOTE: These Investment are for the Ministry of Industry projects.

SOURCE: General Organization for Industrialization, 1980-84 Development Plan and the Regional Allocation of Its Projects, October 1979.

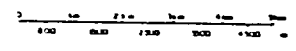
Committed from Investment Allocations for Alexandria Region, Ministry of Planning, June 1981.



**ALEXANDRIA  
DISTRIBUTION OF INDUSTRIAL INVESTMENT  
(1980-1984)**

**BY KISM AND INDUSTRY TYPE**

- FOOD PRODUCTION (F)
- SPINNING & WEAVING (SW)
- CHEMICALS (C)
- METALLICS (M)
- ENGINEERING (EN)
- ELECTRICITY (EL)
- MINING (MI)
- BASIC METALS (BM)



**FIGURE III-10**

replacement of machinery, better use of equipment and improved raw material conservation. Moreover, the industry's output quality should conform to international standards. Efforts should be directed toward the expansion of the ready-made clothes industry, aiming at both local and foreign markets. However, export promotion of Egyptian ready-made clothes will necessitate strict and high quality standards.

Proposals of new locational sites for expansion of the textile industry outside Alexandria should consider, among other factors, the efficient management and coordination advantages associated with the potential expansion of the textile industry in nearby Kafr El Dawar. Because of its very fast growing textile industry, Kafr El Dawar's share of textile industry investment in the 1980-1984 Industrial Plan amounted to 145.7 million pounds. This figure represents 98.2 percent of the Beheira Governorate's total investment in manufacturing. However, further expansion of this industry in Kafr El Dawar would impinge on arable land. Possible alternative sites include Idku, Moharram Bey, New Ameriyah City and Sadat City.

Construction of transport links in a southwesterly direction to the Delta and Cairo via the desert road are needed. Also, the existing Alexandria/Marsa Matruh railway must be upgraded and extended to areas of potential industrial and urban growth south of the coastal road.

Medium size industrial parks for small-scale and supporting industries (such as tool and die making, printing, and packing of materials) should be established in order to achieve land management efficiency and minimize requirements for industrial expansion along the western coastal areas. Also, Government should use zoning controls and provision of related facilities as a basic tool in guiding the location of new large-scale industries. These regulations should be flexible to ensure the possibility for further expansions.

Identification and development of vacant land parcels not required for residential use in the inner city is required for labor intensive, non-polluting small-scale industries. The type of industries to be introduced will vary, depending on the size of the vacant areas and the nature of nearby industries.

#### b. Port

An objective urban strategy for Alexandria should be examined within the context of the future requirements and developments associated with the port. Development plans for the port are expected to have a major effect, not only on the local economy, but also on the volume of traffic in the port area and along the arteries connecting the port with the main roads to Cairo and the Delta. Currently, the port of Alexandria handles around 68.8 percent of Egypt's commodity flows (65.6 percent of the exports, and 71.8 percent of the imports). Over the last five years, and due to the increased imports, the port has been experiencing serious congestion problems. During the first five months of 1981, for example, the average waiting time for cargo ships was between five and six days.

Based on the main findings of the Egypt National Transportation Study, the Port of Alexandria will continue to be Egypt's largest port, handling more than two-thirds



of overseas commodity flows. The study's projected allocations of commodity flows among Egypt's ports for the year 1987 and the year 2000 are presented in Table III-19.

The table reveals that commodity flows through the port are expected to increase at an annual growth rate ranging between 1.7 and 2.9 percent over the period 1987 to the year 2000. However, its share of commodity flows over the period is expected to remain relatively constant.

The National Transportation Study, furthermore, does not expect the port to have serious limitations in handling bulk cargo provided that efforts to modernize and upgrade the port facilities continue and optimal use is made of its facilities.

Bulk cargoes including sulphur, wheat, maize, wood, cotton, coal, animal and vegetable oils will continue to be handled through the port of Alexandria. The study's justifications for the continued handling of these products by the Alexandria port is based on:

- Access of fertilizer plants using sulphur to the port via existing waterways.
- Existence of a coal wharf with a current capacity of 3-5 million tons per year. This capacity far exceeds the projected coal imports of two million tons for the year 2000.
- Current plans to increase the silo capacity of the port to 15,000 tons and future handling capacity at the silo berths to 3 million tons annually.
- Existence of a traditional area near the port for the grading and preparation of cotton for export.
- Existence of a reserved area within the port for the special unloading of timber.

Apart from bulk cargo, the general cargo trade volume for Alexandria is projected to range between 11.1 and 17.1 million tons (included in the flows shown in Table III-19) by the year 2000. The study states that the combined port facilities of Dekheila/Alexandria should have no difficulty in handling this volume if modern measures are introduced for handling containerized cargo and considerations are given to the development of Dekheila as a commercial port.

For the last three years, interim actions for the rehabilitation of the port facilities have been underway. The 1981-1982 investment plan for Alexandria commits L.E. 67.7 million or 12.6 percent of governorate investment for the upgrading of the port. The funds allocated are shown in Table III-20.

**TABLE III-19**  
**PROJECTED COMMODITY FLOWS BY PORT 1987 AND 2000**

<u>PORTS</u>	<u>1987</u>	<u>%</u>	<u>2000</u>	<u>%</u>	<u>YEAR 2000</u>	<u>%</u>
	( <u>'000 Tons</u> )		Low Projection ( <u>'000 Tons</u> )		High Projection ( <u>'000 Tons</u> )	
Alexandria	15,496	72.9	22,404	68.5	29,496	72.3
Port Said	2,950	13.9	4,000	12.2	4,500	11.1
Suez	1,290	6.1	3,265	10.0	3,575	8.8
Safaga	1,517	7.1	3,057	9.3	3,200	7.8
TOTAL	21,253	100.0	32,726	100.0	40,771	100.0

NOTE: In preparing this analysis of port related export/import flows the Egypt National Transport Study reviewed all of the major port studies which had been prepared to date including the "Port Policy and Damietta Master Plan Studies" (PPDMS). In its detailed review of the PPDMS, the National Transport Study found serious analytical shortcomings in the PPDMS including: inappropriate methodology for calculating inland transport costs, inadequate assessments of existing port capacities, unjustified differential sea transport costs between Alexandria and Port Said, and unrealistic assumptions about regional variations in port construction costs (PPDMS assumed that these costs were equal in all locations). Therefore, the Egypt National Transport Study prepared two projections of import/export flows based on different economic assumptions which are shown above.

These commodity flows include: wheat, animal/vegetable oils, alumina (Safaga only), cotton, coal, sulphur/pyrites, cement (Suez only), and other miscellaneous commodities. Excluded from the table are imports for the Dekhella steel complex.

SOURCE: NEDECO, Egypt National Transport Study, Draft Final Report - 1981, Phase II. Annex VII. Prepared for the Transport Planning Authority of the Ministry of Transport, 1981, Tables 1-5 and 1-7.

TABLE III-20

## 1981-1982 INVESTMENT IN DAKAHLIA PORT FACILITIES

<u>L.E. (Millions)</u>	<u>Purpose</u>
19.0	Ease congestion
12.4	Edible oil terminal
18.5	Dekheila port
7.5	Wheat silo
10.3	Railroad connections between wheat silos
—	
TOTAL 67.7	

SOURCE: Alexandria Region Investment Plan 1981-82

c. Infrastructure in Alexandria

Master plans have been developed for both the water and wastewater systems in Alexandria aimed at improving the levels of service in existing areas and expanding the populations served by the systems almost two times. However, the service populations for the two different systems are different. In 2000, the water master plan projects a service population of 4,570,000, while the sewerage master plan projects a population similar to NUPS projections, i.e., 5,500,000.<sup>10</sup> The differences between the two projections are not explained by tourism, which is included in both population projections, but result from differences in projected service areas and locations of outlying populations. Since the city-wide master plan was not prepared prior to preparation of the water and sewerage master plans, it should develop consistent service populations and service areas for both utilities. In addition, as the Alexandria Concept Plan indicated, forecasts by these studies based on current trends will reinforce development in old cultivated arable areas. The Alexandria Concept Plan suggested distribution of population be aimed at diverting such growth into desert areas or less fertile agricultural land. (See Table III-11) It is assumed that the ongoing Alexandria Master Plan will also modify population distribution according to similar objectives.

The water supply system, which is under the jurisdiction of the Alexandria Water Supply Utility, had a service standard of 283 liters/capita/day or a production capacity of 688,000 cubic meters per day in 1979. This is projected to increase to 1.7 million cubic meters per day or 373 liters/capita/day by the year 2000. The sewerage system had a total flow in 1979 of approximately 520,000 cubic meters (216 liters/capita/day) and is projected to increase to 1.5 million cubic meters by 2000. Unlike most other cities in Egypt, Alexandria's sewerage system has a relatively high ratio of sewerage flows to water consumption (roughly 88 percent of water consumption). Only Suez, of the other five major settlements for which water and sewerage master plan have been prepared, has a similar ratio of sewage to water flows. Although this higher ratio is somewhat explained by the need to design for surface runoff in Alexandria, it could also indicate an area where a reduction in standards might result in savings of investment.

Alexandria, like Greater Cairo, has a transport authority charged with operating a public bus fleet and metro system. As of 1979, the bus fleet had 1,020 registered public buses. However, like the Greater Cairo Transport Authority, up to 30 percent of the fleet can be non-operational due to maintenance requirements. Therefore, Alexandria has an effective standard of buses of about 2.7 buses per 10,000 population, a higher standard than most other urban settlements in Egypt, but less than demand for bus services. Because of its linear configuration, Alexandria lends itself to an efficient metro system.

As pointed out by the Alexandria Concept Plan, future investments in transportation will influence Alexandria's future pattern of growth. Particular care should be given to avoid development attraction in Montazah *kism* which will result in loss of arable land. In addition, though access improvements to the port area are needed, care should be taken to avoid too great access to the core area which will in turn lead to concentration. The areas where transportation could be used to induce development include Moharram Bey, Idku, Ameriyah and New Ameriyah City. Although NUPS intra-urban infrastructure cost estimates are based on expanded bus service, a feasibility study should be conducted to determine Alexandria's future public transport requirements. This study should evaluate proposals for investment in different transport modes and the impact different modes and routes will have on Alexandria's future growth.

The Telecommunications Sector Study projected that Alexandria would have roughly 71,700 telephone lines by 1980 or a standard of 2.78 telephone lines per 100 population. Under the NUPS high estimate of telecommunications investment requirements, the total number of telephone lines is projected to increase to 1.2 million by 2000 and require a total investment of L.E. 3.2 billion over the 1985-2000 period. However, if improved technology were introduced, the lower rate of growth in demand as projected by NUPS occurs. This investment could be reduced to roughly L.E. 1.7 billion and provide 647,000 telephone lines (roughly 11.8 lines per 100 population or 4 times that of the 1980 standard).

Due to the size of the market, Alexandria is served by one of the seven electrical distribution companies in Egypt. In 1979, the last year for which disaggregated data is available, this company sold about 9.7 percent of the total power generated in Egypt. Presently, Alexandria is served by petroleum and natural gas fueled power generating facilities. However, a site along the Mediterranean Coast has been selected as a potential site for future nuclear generation of electrical power. Due to expanded demand for electrical power, if nuclear generation plants are not constructed, Alexandria will require additional construction of thermal plants as the present capacity will not meet the demand of future populations.

#### D. The New Communities Program: Evaluation and Proposals for Change

##### I. Introduction

Egypt has a long history of planned urban development -- a number of its major cities were once new towns; planned as government or trading centers, including Cairo (Fustat), Alexandria and the Canal cities. In addition, the planning and growth of Cairo over the past 100 years has included the new communities of Nasr City, Garden City, Maadi and Heliopolis to order growth; the latter two being planned as satellite cities, separated from the urban mass of Cairo.

The present New Towns policy had its beginnings in the work of the Greater Cairo Planning Commission during the late 1960's.<sup>11</sup> In 1968, that Commission presented a Regional Plan which called for the structuring of Cairo's future growth through the establishment of four new satellite cities on desert land by the year 1990. These new cities were to accommodate 250,000 persons.<sup>12</sup> In a 1973 Working Paper, President Anwar El Sadat emphasized the need to create areas for population concentration and new economic activities able to equal the pulling power of the capital.<sup>13</sup> That paper called for the construction of new cities upon desert land to conserve arable land and to accelerate the process of decentralization of urban population. In 1975, planning began for both 10th of Ramadan City and Sadat City, each expected to ultimately have 500,000 persons by the year 2000. Those two cities were seen as an alternative to the contiguous development of Cairo. In 1977, planning began for New Ameriyah City which was to have the same size and to serve the same function for the city of Alexandria. At the same time, planning was carried out for 15th of May City, a satellite city of 150,000 expected population, which is to serve as a residential city for workers in the Helwan industrial area.

Meanwhile, in early 1979 it was decided to plan a number of new towns as satellite cities in the Cairo Metropolitan Area. These cities were planned to be smaller than the free-standing cities mentioned above and to be more closely integrated with Cairo. In addition to the 15th of May City, three such cities are now in some stage of planning or development -- 6th of October City, El Obour City and El Amal City. Thus, the emphasis of the Egyptian New Towns Policy has evolved to one of deconcentrating and ordering the growth of the Cairo and Alexandria Metropolitan Areas. Even the free-standing cities can be thought of as closely related to one of these two metropolitan giants.

In November 1979, Law No. 59 of 1979 established the New Urban Communities Authority to be responsible for the creation and management of new urban communities developed outside of the boundaries of existing towns and villages. The Board of Directors of the New Community Authority was appointed by Presidential Decree (for the governmental members) in July 1980, and by the Prime Minister for five expert members in January 1981. The Board held its first meetings in August 1981. However, construction and planning for the new towns have continued in the interim, based upon prior policies.

As of September 1981, there had only been a significant amount of housing construction at 15th of May City and 10th of Ramadan City, although a large amount of infrastructure works has been completed at Sadat City.<sup>14</sup> Therefore, the New Towns program in Egypt is very much in its beginning stages and still capable of being modified.

One well established fact of planning and economic theory is that people follow jobs, not vice versa. Thus, a successful growth center or new town must have an employment base or a critical mass of population and jobs as a precondition to rapid self-sustaining growth. They must provide some attraction that will cause people to leave their present homes. Unfortunately, jobs are not easily created, especially in places far from existing infrastructure, labor, and potential markets. Plants locate only after the provision of adequate infrastructure, and assurance that a critical mass of associated economic activities has been reached so that investment is not wasted. Twenty years is a short time period for this critical mass to be achieved. It is much easier to create jobs in urban places, which already meet industrial location requirements.

Incremental urban development, or deconcentration of population in areas close to existing large cities, has the most chance of success based upon current world experience. Ordered deconcentrated development such as satellite cities can overcome some of the disbenefits of largeness per se, yet benefit from the agglomeration effects of a metropolitan area. However undesirably perceived, major growth of the primate cities of Cairo and Alexandria cannot be stopped in the foreseeable future, certainly not in the next 20 years. The New Towns policy should be reassessed in light of the maximum realistic impact it can make in this regard. Emphasis on closer-in satellite cities is recommended while attempts are made to create an early mass of jobs and population in the free-standing new towns through public investment.

New communities must also be examined with regard to the spatial reorganization of the major metropolitan regions appropriate to the specific economy in which the regions are located. In North America and western Europe, metropolitan decentralization has occurred through the growth of a limited number of sub-centers, specialized in higher order commercial and business functions. Such decentralization is suited to the economic structure of the economy, as agglomeration economies are very important to the growth of those functions. It is also appropriate to household income levels where widespread automobile ownership provides accessibility over a wide area. This form of decentralization is much less appropriate for Egypt where a better polycentric metropolitan region would take the form of a large number of smaller urban subcenters that are both employment centers (particularly for small-scale industry and informal sector activity) and locations for public service facilities, rather than a small number of very large centers specializing in large-scale industry.<sup>15</sup> The majority of the urban population of Egypt must have access to jobs and services near their places of residence since many people walk to work and shop.

## 2. Evaluation and Proposals

Due to the limited amount of monies available for investment in the next 20 years, it is critical that priorities are set which permit future major metropolitan development to be structured as efficiently as possible. A number of criteria were thus developed to evaluate the success to date in planning and implementing the New Communities program, as well as to how the program could be improved. Possible alternatives to the program were also suggested. These criteria include:

- Location
- Projected size
- Development costs and standards
- Target group affordability
- Industry and employment attraction
- Development control
- Organization and management requirements

a. Location

Experience in other countries has shown that a new urban center must be able to reach a critical mass of approximately 50,000 population in order to provide sufficient rates of return to spontaneously attract additional private industry and secondary and service jobs without the need for public subsidy.<sup>16</sup> Thus, even a planned self-contained community must be close to existing sources of employment or be able to attract such employment at the outset. Generally, it is very difficult to attract private industry even with substantial incentives. Prerequisites include adequate infrastructure, communications and transportation; services which can best be obtained in existing settlements such as Cairo and Alexandria. For a new center to be successful, it must offer these types of services. World-wide experience has shown that free-standing new towns need other forms of attraction to be successful such as a new government capital (Brasilia) or military bases, universities and port/trading facilities; but even with these elements the successes have been few and growth rates lower than planned.

The three free-standing new towns of 10th of Ramadan City, Sadat City and New Ameriyah City do not have these advantages and are too far away from the center city to attract major industrial development activities, without very substantial public subsidy, within the next 20 years. All of these new cities are further than 40 kilometers from the nearest large city center; the distance used as a rule of thumb for the French New Towns and by experience in Great Britain, Scandinavia and the United States.<sup>17</sup>

Sadat City is in the least desirable location, being 95 kilometers away from central Cairo and 75 kilometers away from any present urban development. 10th of Ramadan City is slightly better located, 58 kilometers from the center city and 30 minutes drive from Heliopolis. New Ameriyah is only 40 kilometers from Alexandria, however, it is one hour away given transportation conditions. The greatest concern for the latter is the lack of potential economic linkages to the site other than with Alexandria.<sup>18</sup> In each case, more reasonable sites could have been selected closer to both Cairo and Alexandria, such as those proposed by NUPS concept plans for Cairo and Alexandria.<sup>19</sup>

The French New Towns, which are similar to the Egyptian New Towns program in size, have been carefully planned within 40 kilometers of Paris on a good road system. Yet, they are still experiencing difficulties in attracting industry and other employers despite significant incentives.<sup>20</sup> The British New Town Program has built much smaller centers many of them linked with the London Region; although, as shown in Table III-21, none of them had achieved their targetted population since the initiation of construction.

In Egypt the situation is brighter for the satellite cities of 15th of May, 6th of October and El Obour than for the larger new towns. These cities are located along existing development corridors and close enough to Cairo to attract industries and a residential population. 15th of May City has the potential of attracting workers from industries in Helwan though current costs of dwelling units are high. 6th of October is located in a potential development area of the Giza Governorate, attractive for both industry and tourism facilities. El Obour City is located near to the Cairo-Ismailia Corridor, near the Belbeis Desert Road and close to the El Khanka industrial site

TABLE III-21

DESIGNATION, POPULATION SIZE, AND OBJECTIVES  
OF BRITISH NEW TOWNS 1

NAME (DATE OF DESIGNATION)	POPULATION (IN THOUSANDS)			OBJECTIVES
	AT DESIGNATION	1972	PROPOSED CAPACITY	
<u>PHASE ONE: LONDON</u>				Decentralization/ Containment
1. Stevenage (1946)	7	72	105	Overspill
2. Crawley (1947)	9	68	79	Overspill
3. Hemel Hempstead (1947)	21	72	80	Overspill
4. Harlow (1947)	5	79	90	Overspill
5. Hatfield (1948)	9	29	30	Overspill
6. Welwyn (1948)	19	41	50	Overspill
7. Basildon (1949)	25	80	134	Overspill
8. Bracknell (1949)	5	38	60	Overspill
SUB TOTAL	98	478	628	
<u>PHASE ONE: PROVINCES</u>				Housing/Jobs/Overspill
9. Aycliffe (1947)	0	22	45	Industrial Housing
10. East Kilbride (1947)	2	66	100	Overspill-(Glasgow)
11. Peterlee (1948)	0	26	30	Housing Improvement
12. Glenrothes (1948)	1	31	75	Industrial/Housing/ Growth Center
13. Cwmbran (1949)	12	42	55	Housing Improvement
14. Corby (1950)	16	50	83	Industrial Housing
SUB TOTAL	31	237	388	



**TABLE III-21  
(Continued)**

NAME (DATE OF DESIGNATION)	POPULATION (IN THOUSANDS)			OBJECTIVES
	AT DESIGNATION	1972	PROPOSED CAPACITY	
<u>PHASE TWO: NEW CENTERS</u>				Housing/Regional/Growth Centers
15. Cumborauld (1955)	3	34		Overspill - (Glasgow)
16. Skelmersdale (1961)	10	34	80	Overspill - (Liverpool)
17. Livingston (1962)	2	18	100	Overspill/Redistribution
18. Redditch (1964)	32	43	90	Overspill - (Birmingham)
19. Runcorn (1964)	30	44	90	Redevelopment/Overspill
20. Washington (1964)	20	32	80	Growth Center
21. Irvine (1966)	35	48	120	Growth Center
22. Newton, Wates (1967)	6	6	13	Growth Center - Rural Migration
SUB TOTAL	138	259	553	
<u>PHASE THREE: NEW CITIES</u>				Major Alternative Centers
23. Milton Keynes (1967)	44	47	250	Counter-Magnet
24. Peterborough (1967)	83	89	187	Counter-Magnet/Growth Center
25. Northampton (1968)	131	139	260	Counter-Magnet/Growth Center
26. Warrington (1968)	122	130	202	Overspill/Renewal
27. Telford (1968)	70	82	250	Overspill/Renewal
28. Central Lancashire (1970)	250	250	500	Counter-Magnet/Renewal
SUB TOTAL	700	733	1,649	
TOTAL	967	1,686	3,338	

<sup>1</sup> This table is from L.S. Bourne, Urban Systems: Strategies for Regulation, Oxford University Press, 1975, pp. 70 and 71.

SOURCE: Statistics adapted from Town and Country Planning, 40,1, January 1972; The Department of the Environment, and Barber (1973).

overlooking the Delta and closer to Cairo than 10th of Ramadan. It is, therefore, more attractive for industrial and residential development.<sup>21</sup> However, El Amal City, located in the Eastern Desert plateau, 55 km from Tahrir Square, as noted in the Cairo Concept Plan, is located in an area that is not likely to have large-scale development in the near future.

b. Size

Cities in Egypt do not tend to grow rapidly unless they enjoy strong locational advantages and are directly stimulated by significant national government investment. Only Cairo and Alexandria now have populations of over 500,000 persons. Even the Canal cities were not able to reach 300,000 population prior to 1967, while only in urban Egypt Shoubra El Kheima, Giza, Kafr El Dawar and Aswan have maintained very high growth rates over an extended period. However, since completion of the High Dam, Aswan's rate of growth has considerably slowed. (Appendix III-H.) Of these, Giza alone has maintained a growth rate of over 10 percent per annum over a period of 15 or more years. Thus, based on historical trends in urban Egypt, only urban centers closely connected to the two metropolitan areas are likely to grow rapidly in the near future. Suez could be a possible exception to this rule if adequate investment is maintained.

Table III-22 compares likely population sizes for ongoing New Communities in the year 2000 (based upon past growth rates of urban centers in Egypt and upon present construction plans) to the target populations. The table indicates that growth rates of from 8-24 percent per annum for the next 20 years would be required to reach year 2000 target populations.

Even considering a growth rate of 10 percent per annum once a critical population mass is achieved until the year 2000 would be highly optimistic in a historical perspective. Under this assumption, however, only the 15th of May will reach its year 2000 population target of 150,000 while the 10th of Ramadan would reach a population on the order of 100,000. The other new communities, on the other hand, are only likely to attain populations of about 80,000 by that time. It should be pointed out that even these rates of growth will require a significant and sustained governmental effort and care should be taken to avoid an unduly high level of investment if net benefits are not likely to be high.

c. Development Costs and Standards

The costs of constructing new towns are significantly greater than the costs associated with contiguous urban development. For this reason, with the exception of new government capitals such as Brasilia or Islamabad, few such plans have been fully implemented. Yet, even these cities do not function as true urban centers; they tend to be deserted on weekends and during vacation periods. World experience in new towns has been poor; unimplemented plans and half-finished infrastructure are common. Generally, the amount of investment required over a 20 to 30 year period to complete the plans for cities on the order of 100,000-150,000 population, such as Colombia, Maryland in the United States, is more than any private investor and most governments can afford.

The New Communities Authority's estimated cost between 1986-2000 for Sadat City, 10th of Ramadan City, 15th of May City, and 6th of October is approximately

**TABLE III-22**  
**NEW COMMUNITY PROJECTED POPULATIONS IN YEAR 2000**  
**AND IMPLIED RATES OF GROWTH**

COMMUNITY	BASE YEAR	BASE POPULATION	ASSUMED MAXIMUM AVERAGE RATE OF GROWTH PER ANNUM	YEAR 2000 POPULATION		IMPLIED ANNUAL GROWTH RATE OF NEW COMMUNITY POPULATION TARGETS
				PROJECTION AT OPTIMUM HISTORICAL URBAN TRENDS <sup>6</sup>	NEW COMMUNITY TARGETED POPULATION	
10th of Ramadan City	1983	20,000 <sup>1</sup>	10 %	101,100	500,000	21 %
Sadat City	1985	20,000 <sup>2</sup>	10 %	83,500	500,000	24 %
New Ameriyah City	1985	20,000 <sup>3</sup>	10 %	83,500	390,000	20 %
6th of October City	1984	17,500 <sup>4</sup>	10 %	80,400	350,000	21 %
15th of May City	1985	50,000 <sup>5</sup>		150,000 <sup>7</sup>	150,000	8 %
TOTAL	-	127,500	-	498,500	1,890,000	

NOTES: Base population estimates are optimistic and critical if the proposed year 2000 populations are to be achieved.

Year 2000 population projections of the New Communities by NUPS in Tables III-3 & III-11 are generally higher than these figures as it was assumed that measures will be taken to establish a higher base population through improved management, marketing and investment actions.

- 1 Based on occupancy of units now being constructed.
- 2 Based on rate of construction of 10th of Ramadan City.
- 3 Based on rate of construction of 10th of Ramadan City.
- 4 Based upon 1979-1981 rate of construction for 15th of May City.
- 5 Based upon occupancy of complete first phase of construction (12,000 units).
- 6 Based on 10 percent growth rates achieved by fastest growing existing settlements.
- 7 This population is based upon completion of the project, assuming 50,000 population in 1985, rather than upon the 10 percent maximum assumption.

SOURCE: NIIPS Analysis

L.E. 3,519 million. (Table III-23) This figure represents about 22 to 30 percent of the total capital investment for intra-urban infrastructure allocated in NUPS alternatives for the entire Cairo region over the 1986-2000 period.<sup>22</sup> If the projects were completed successfully, these four centers would serve 1.5 million persons or, at most, 9 percent of the population of the Cairo region in the year 2000 and about 22 percent of the increase over the 20 year period. More likely, the year 2000 population in the new towns will be no more than 625,000 persons or 3.8 percent of the population of the Cairo Region. The percentage of total infrastructure costs would then be about 13 percent of the estimate of the region's costs which is within the constraints of the likely total NUPS investment pool. Thus, the New Towns would require a very large proportion of the monies available for urban investment over the period, while producing a minimal return with regard to ordering of population growth. This fact is indicated already by the 1979-1982 Five Year Plan.

The risks involved in the building of New Towns are consequently enormous. In fact, worldwide experience in New Towns has shown that, due to the long period of implementation required, few administrations have been able to see a project through to completion. Government changes in ministries, staff, and top officials have tended to slow the momentum of such projects and stall them midway through the period of execution. Incomplete New Towns represent a loss in infrastructure investment. On the other hand, infrastructure placed just beyond existing urban areas is rarely a loss. Given the growth pressures active in Cairo and Alexandria, it is almost inconceivable that infrastructure development in proximity to the built-up areas would be "unused" for very long.

If infrastructure is installed too quickly, or if plans change, there can be a great amount of assets which are frozen without any return on investment. Such frozen assets may account at any one time for perhaps 10 percent of the total amount of investment.<sup>23</sup> This is a gigantic risk since initial investment in free-standing new towns is so large. It would be prudent to evaluate development on each of the New Towns at the end of their first stage and postpone smaller-scale second stage development until a significant amount of residences and industries has been established in Stage I.

Development costs can be alleviated somewhat by good financial and management practices, including:

- The need for incremental development completing small stages before beginning others.
- The need for better cost recovery.
- Reduction of infrastructure standards and increases in residential densities to reduce per capita costs.
- Increases in land use efficiency.
- Reduction of community facilities, costs and standards.
- Reduction of cost, and amount of publicly built housing.

**TABLE III-23**  
**PRESENT AND PROJECTED COSTS FOR NEW CITIES, 1977-2000**  
**(L.E. MILLIONS)**

CITY	EXPENDITURES* (Through Fiscal Year 1981)	STAGE I COSTS* (Expected by 1985)	TOTAL COSTS* (By Approx. year 2000)
1. 10th of Ramadan City	85.0	191.0	1,500.0
2. Sadat City	45.8	450.0	1,500.0
3. 6th of October (Giza)	-	300.0	1,050.0
4. 15th of May (Helwan)	120.0	190.0	600.0
 TOTAL Cairo-Related New Towns	 250.8	 1,131.0	 4,650.0
 TOTAL New Ameriyah City (Alexandria)	 23.0	 350.0	 1,200.0
 GRAND TOTAL	 213.8	 1,481.0	 5,850.0

\* Cost generally include Intra-urban Infrastructure and some components of Inter-regional Infrastructure (notably power transmission links, bulkwater and limited road construction).

SOURCE: New Urban Communities Authority, August 1981.

In Figures III-11 and III-12 per capita investment costs for 1980 derived from tender documents for the New Communities of 15th of May, 6th of October, Sadat City and 10th of Ramadan are presented. The first provides a greater level of investment detail by sector while the second clearly shows the individual shares for housing, infrastructure and services (community facilities). A comparison is also made to household per capita affordability at market rates of financing. The figures are meant to serve as a reference for the subsequent analyses.

- The Need for Incremental Development

It is very difficult to execute large scale development projects involving significant units of population and area. The stages of development planned for the free-standing new towns are for populations of at least 150,000 each (a good-sized city in and of itself). The 15th of May is planned for stages of 50,000 each, still large-scale by international standards. The size of these stages is in effect increased by the fact that often work for a second stage is begun before demand is shown for the first stage. The most extreme example of this practice is in Sadat City where much of the infrastructure and main roads have been completed before the completion of even one urban neighborhood. This is also the case in the 10th of Ramadan City where an adequate water supply is still lacking while implementation continues on other less important elements. The costs of hiring a third party to manage subcontractors in 10th of Ramadan City, for example, would not be required with proper management and cost control of the project.

It is much easier to complete projects incrementally, both in terms of time and resources. One can then determine if the project concept is correct before committing more resources. New Town projects should be developed in stages of 50,000 persons or less. If the jobs have been provided for that critical mass of population, then the chances of increasing that population to 150,000-200,000 in several decades and from there to the level of 500,000 are significantly increased.

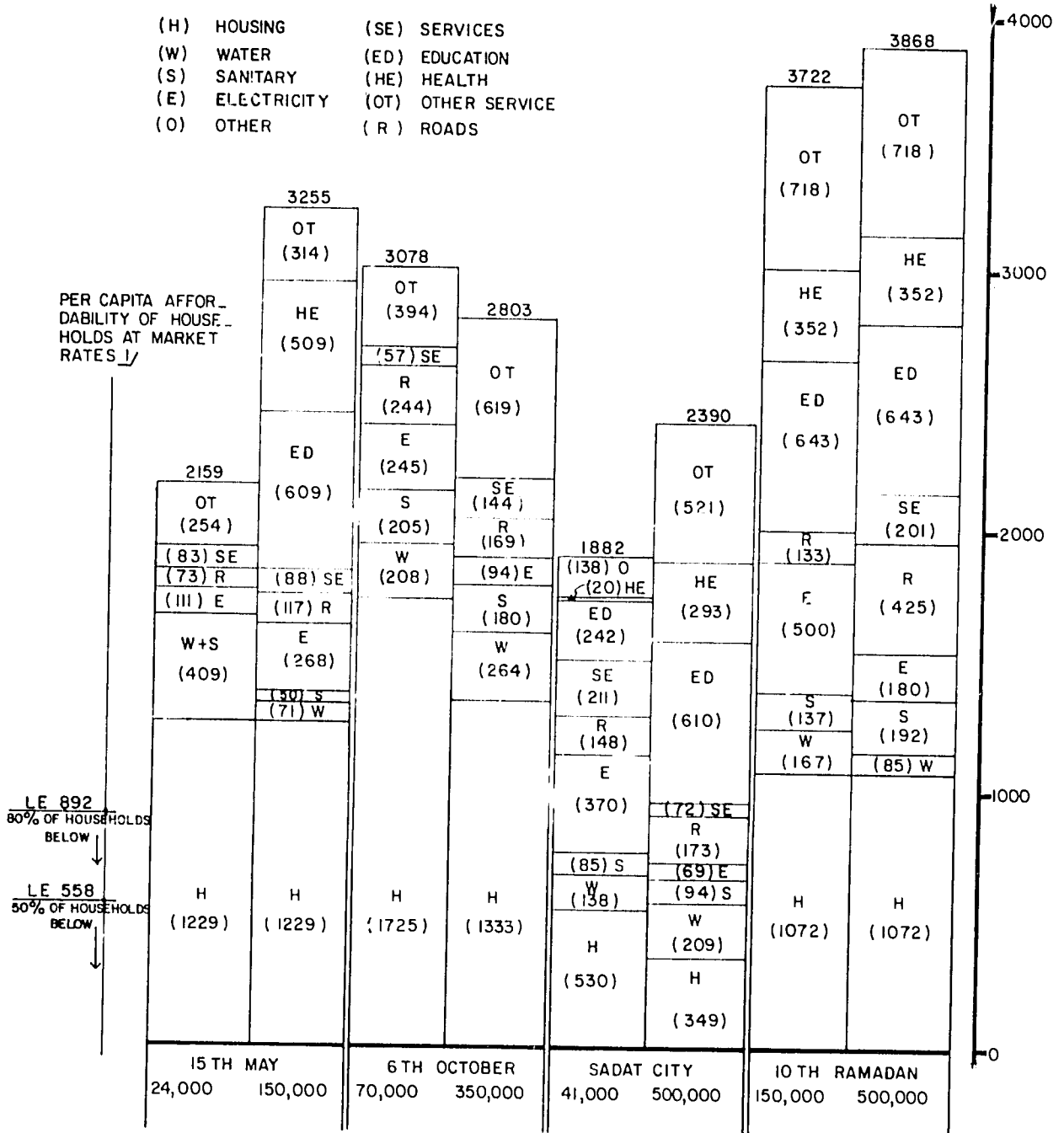
- The Need for Improved Cost Recovery

To date, very little attention has been given to cost recovery in the new towns. High direct or indirect subsidies are apparent in sales policies for land, infrastructure and housing. The size of the subsidies is so great as to create concern about whether sufficient investment funds can possibly be found to see the projects through to completion. In theory, only the 6th of October City is planned on a self-financing basis, but the level of expected cross subsidy from land sales appears to be high. (Table III-24)

The lowest levels of cost recovery which will be achieved are in 10th of Ramadan City. Since all of residential and 75 percent of industrial land in Stage I has been sold at low prices, annual government subsidies have represented about two-thirds of the annual budget even in the years when the sale of land was the highest.<sup>24</sup>

Based upon estimated infrastructure and community facilities costs, the 10th of Ramadan per capita expenditures for infrastructure and community facilities in Stage I were L.E. 937 and L.E. 1,713, respectively, but total revenue from land

## NEW COMMUNITIES PER CAPITA INVESTMENT (BY INVESTMENT CATEGORY)



✓ ASSUMPTION: HOUSEHOLD INCOME AT 50% - LE 1065, AT 80% - LE 1700 HOUSEHOLD SIZE 4.8, LOAN TERMS, 12% INTEREST, 30 YEARS, PAYMENT 25% OF INCOME

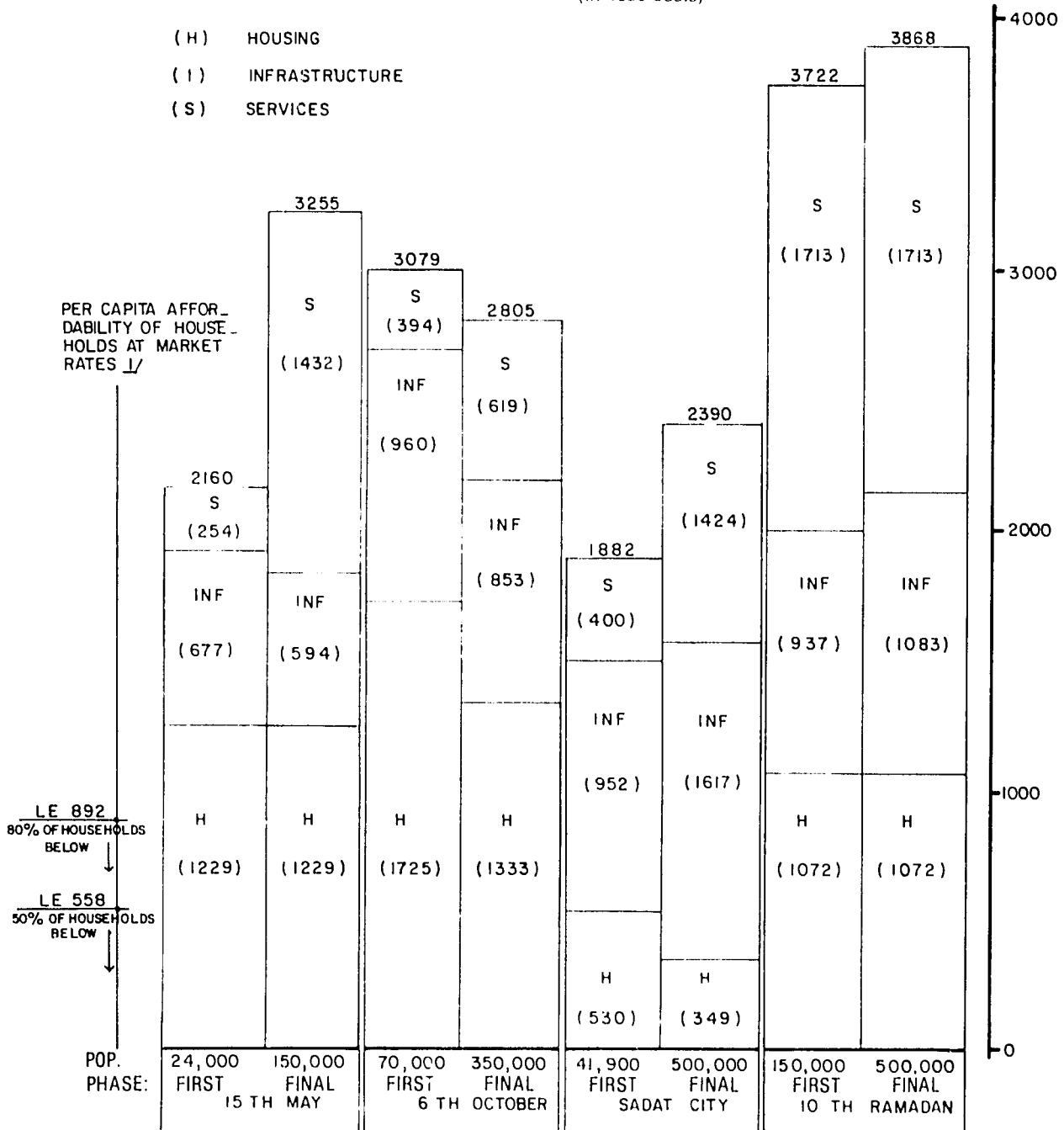
SOURCE: NUPS "New Communities" Report, October 1981.

FIGURE III-11

# NEW COMMUNITIES PER CAPITA INVESTMENT (PER HOUSING INFRASTRUCTURE AND SERVICES)

(In 1980 costs)

( H ) HOUSING  
( I ) INFRASTRUCTURE  
( S ) SERVICES



$\downarrow$  ASSUMPTION : HOUSEHOLD INCOME AT 50% - LE 1065, AT 80% - LE 1700 HOUSEHOLD SIZE 4.8; LOAN TERMS; 12% INTEREST; 30 YEARS; PAYMENT 25% OF INCOME

SOURCE : NUPS "New Communities" Report Oct. 1981

**FIGURE III-12**



**TABLE III-24**  
**EXPECTED COST RECOVERY BY NEW TOWNS**

CITY	POPULATION	PER CAPITA EXPENDITURES			PER CAPITA REVENUES <sup>1</sup>			TOTAL CAPITAL SURPLUS OR (DEFICIT) PER CAPITA	TOTAL SURPLUS OR (DEFICIT) L.E. MILLION
		INFRASTRUCTURE COMMUNITY FACILITIES	HOUSING	TOTAL	LAND	DWELLING UNIT	TOTAL		
10th of Ramadan City	500,000	2,796	1,072	3,868	35	1,252	1,287	(2,581)	(1,290)
Sadat City	500,000	2,041	349	2,390	222	903	1,125	(1,265)	(633)
6th of October City	350,000	1,472	1,333	2,805	4,134	1,725	5,859	3,054	+ 1,069
15th of May City	150,000	2,026	1,229	3,255	N.A.	N.A.	1,408	(1,847)	(277)

<sup>1</sup> The New Communities Law exempts most development in the New Towns from taxation, which could otherwise be an alternative source of revenue for the New Towns Authorities. Further, since cooperatives are expected to play a major role in new town development, the 1981 Cooperatives Law which excludes all types of cooperatives from local council fees removes another potential source of revenue. Finally, the New Towns Authorities are too new to have established policies about user charges, but if they adopt policies prevalent in other areas, these charges will be too low to recover capital costs. Therefore, under present policies it is unlikely that alternative revenue sources can materialize which will change this picture substantially.

SOURCE: National Urban Policy Study, "Working Paper on Urban Development Standards and Costs" (Cairo, October 10, 1980) Table 22, p. 105, as adjusted and updated in Annex 2, Table 1-4, of "New Communities Report."

sales of only L.E. 35 per capita is anticipated. This represents a recovery of only about 1.3 percent of the capital invested on the infrastructure and community facilities.<sup>25</sup> Thus, there is an approximate subsidy of 98.7 percent on the capital cost of infrastructure and community facilities in Stage I (a subsidy of L.E. 388.1 million). Large interest rate subsidies due to the provision of low interest housing loans through cooperatives are not included in these estimates.

The situation would be improved if the Authority adopted the uniform land disposition policy now under consideration.<sup>26</sup> Under that policy, the price of land is to include the costs of providing physical infrastructure, levelling and clearing of the land, and the cost of loans and administration. However, even this change will not greatly reduce subsidies since a large percentage of investment monies goes for community facilities which are not included in the above formula. Almost two-thirds of the total subsidy for infrastructure and facilities at the 10th of Ramadan City are for community facilities. Thus, under the new policy, the subsidy would be L.E. 156.9 million (65.3 percent) as compared to L.E. 388.1 million (98.7 percent). Similar ratios of infrastructure cost to community facilities cost exist for Sadat City (overall - 68 percent vs. 32 percent) and the 15th of May City (overall - 70 percent vs. 42 percent for community facilities).<sup>27</sup> Thus, overall, the total subsidy for land, infrastructure and community facilities would be cut by about one-third with the adoption of the new land disposal policy.

- The Need to Reduce Infrastructure Standards and Increase Residential Densities

Four major ways to significantly improve cost recovery and, thus, reduce the tremendous costs of new towns are:

- Reduction of infrastructure standards
- Increase in residential density
- Increase in land use efficiency
- Reduction of costs of community facilities.

There are positive reasons for providing a high standard of primary infrastructure to new developments since maintenance and repair costs may be reduced by doing so. However, the combination of very high standards for infrastructure and very low residential densities produces very high costs.<sup>28</sup>

The highest cost standard is that of 10th of Ramadan City. Its cost of L.E. 3,868 per capita for first stage housing and infrastructure, for example, is 3.4 times that of the Cairo Governorate's Berket Public Housing Project (now called El Salaam City) (L.E. 1,141). The costs are 3 times those of the average urban standards development (L.E. 1,228) proposed for the Greater Cairo Region by the NUPS Estimate II of the Preferred Strategy intra-urban costs.

- The Need to Increase Land Use Efficiency

There is a need for increased land use efficiency in each of the New Communities Plans.<sup>29</sup> Open space and services combined exceed the area for residential uses by a great margin in all of the new communities with the exception of 6th of October City. In their final development, the three free-standing new towns of 10th of Ramadan City, Sadat City and New Ameriyah City will budget more land for services than they do for residential development. The proportion of land allocated for residential uses is very low by normal planning standards: 25 percent of the total in Sadat City (33 percent of non-industrial land) 27 percent of the total in New Ameriyah City (31 percent of non-industrial land); 35 percent of the total in the first phase of 10th of Ramadan City (46 percent of non-industrial land); 24 percent of the total in 6th of October City (30 percent of non-industrial land). The usual planning standard, excluding land for industrial uses, is 50 to 60 percent of land area devoted to residential uses. NUPS has adopted a standard of 65 percent for all non-public uses for new urban development.

The ability of the new communities to finance themselves through land sales is critical to their success. Thus, the percentage of saleable land must be kept as high as possible. A percentage of saleable land in areas not set aside for industry and tourism of only 30 to 35 percent, as compared to 50 to 60 percent, means a loss of 30 to 50 percent of potential land sale revenues from residents. It might be argued that these losses, generally for purposes of elaborate road circulation systems, can be made up by the sale of industrial land. However, this is risky since the attractiveness for industry in these sites is not immediately self-evident.

- The Need to Reduce Community Facility, Costs and Standards

The expected costs of community facilities in the New Communities is exceedingly high and the standards generally are greater than those proposed by the General Organization for Physical Planning (GOPP).<sup>30</sup> Community facility costs have been estimated at L.E. 1,713 per capita for 10th of Ramadan City, L.E. 1,423 per capita for Sadat City and L.E. 1,512 per capita for 15th of May City. These costs are about five times the per capita costs of community facilities in the NUPS development proposals for the Cairo Zone (L.E. 300.7 per capita).

The high costs and standards of community facilities in the New Communities is further emphasized by the fact that they represent almost 50 percent of the total cost in the three new communities mentioned above. (Figures III-11 and III-12) On the other hand, costs for community facilities are roughly 38 percent the NUPS development package proposed for Greater Cairo. (Chapter V)

Some of this difference is understandable; Sadat City and 10th of Ramadan City, being completely self-contained, must provide a higher level of community facilities than satellite cities or urban extension settlements. Both provide educational facilities from kindergarden through university, as well as complete health delivery systems ranging from health centers through specialized hospitals. However, since these costs are substantially greater than those for infrastructure alone, they should be reduced through increases in densities and reduction in standards to lower overall per capita development costs.

Several steps could be taken to reduce the costs of community facilities in the New Towns. For example, Sadat City social and administrative facilities are provided at a level which are generally not found in similar sized settlements in Egypt. (Appendix Table V-A.25) As is shown in Appendix Table V-A.14, these costs can be reduced by 70 percent by modifying the structure of facilities provided. The social infrastructure standards targetted for a 500,000 service population which were adopted from the Suez Master Plan (Appendix Table V-A.16) are almost 74 percent lower than those provided in the Sadat City Master Plan. Similar reductions in education costs are also possible. The NUPS proposed educational standard represents an increase in per capita spending of 60 percent over those found in Assiut, but are 71 percent less than those found in Sadat City and 93 percent less than those found in 10th of Ramadan (both comparisons exclude provisions for universities).

- The Need to Reduce Public Housing Costs and Programs

The previous discussion has concentrated upon the subsidies inherent in high standards of infrastructure and community facilities. Yet, there is also a large subsidy for housing construction. At the 15th of May City, for example, all of the housing will be constructed by the Government and construction will be financed by 30 year government loans at 3 percent. Administrative costs will be met through a number of sources, generally charging an additional administrative fee of  $\frac{1}{2}$  of 1 percent of the total loan amount. As Stage I of 15th of May will consist of 12,000 housing units, each unit sale will, therefore, entail an indirect interest subsidy on the difference between 3 percent per annum and the present Central Bank interest rate (12 percent per annum). Technically, this subsidy will not affect the financial operations of the authority as it will be borne by the national Government which provides the financing to the Authority. However, it must be considered as part of the total subsidy given by the Egyptian government to the New Towns Program. Further, such subsidies will prevent the Authority from ever becoming a self-sustaining entity.

The subsidy cost in this case could be reduced only if there were housing loans available from other sources to potential homebuilders or if the interest rate of such government loans was increased. The latter is more likely, since no private or Government body could afford to give loans at much less than 12 percent per annum in the present financial climate.

Even in the latter case, the subsidy would remain considerable and the amount of Government investment tied up in housing would be enormous. Generally, it would be better for the Government to leave housing construction to the more responsive and efficient small-scale sector. Government policy could then concentrate upon providing serviced urban land in desert areas, on coordinating measures to bring jobs to the new communities, and on increasing the supply and reducing the costs of building materials. Thus, the informal-type housing sector should not only be allowed in the new communities, but should become the predominant source of housing. Future growth must be ordered, but this can be done best through the planning and location of basic infrastructure and community facilities.

- d. Target Group Affordability

The high costs for housing in the New Communities implies that the types of units provided are not affordable by low and middle income families. In fact, as Figures III-11 and III-12 indicate, -- per capita costs far exceed household

affordability.<sup>31</sup> In fact, with respect to dwelling units per se, only 9 of 54 dwelling types considered are affordable by households with annual incomes less than L.E. 1,500 per annum; yet, only 25 percent of the households of Cairo have annual incomes over L.E. 1,500.

The satellite cities of 15th of May and 6th of October are even less affordable to median income households than the free-standing New Towns. Not one dwelling unit type at the 15th of May is affordable by such households, even based on current sales policies rather than full cost recovery. Under full cost recovery, the least expensive unit costs over L.E. 13,000 and is affordable only to households with annual incomes of almost L.E. 3,000; affordable to only about 5 percent of Cairo's households in the absence of a subsidy of approximately two-thirds of the cost.<sup>32</sup>

#### e. Industry and Employment Attraction

Jobs are the most important requirement for the development of an urban center. A critical mass of jobs must be in place for rapid development. Yet the provision of adequate infrastructure is required before industry can be attracted to a new location. A good water supply, a good telecommunications system, adequate power, and good transportation links are necessary requirements for any new industrial area.

It is very difficult to get industry to locate in a new city unless that city has easy access to resources required by that industry. Thus, even the prohibition of siting new industry in other locations in Egypt would not necessarily bring industry to the New Towns. Industry needs proximity to labor supply, markets and other firms. Thus, when a critical mass of population has not been reached, the public sector will still have to take the lead to develop the necessary critical mass.

Sites for satellite cities, like El Obour City, which are located near existing industry would be less of a gamble for entrepreneurs. However, these cities would still need adequately prepared industrial zones anchored by plants with large public sector investment. Sites for small-scale firms with suitable levels of infrastructure and transportation facilities are also necessary to develop a critical mass in a settlement.

Marketing of industrial sites (and residential plots plus units) is critical to the success of new towns and satellite cities. Yet, marketing efforts to date have put too little emphasis upon the attraction of small-scale industry, which would provide substantial employment in the new city. Greater efforts need to be made to provide shops for such entrepreneurs in both the industrial and commercial areas. Financing and housing might serve as an additional inducement to lure employers away from the workshops in central Cairo and Alexandria.

Efforts aimed at attracting large-scale industry must be more aggressive and effective. As industrial land at the 10th of Ramadan was all sold, potential investors are now being turned away. The proposed new disposition policy would permit only rental of industrial sites during the period of plant construction. An agreed upon implementation schedule would also be required. If a project's implementation schedule is not followed, a warning would be issued by the Authority and if the violation was not corrected within one year, the

land would be taken back and the sales contract abrogated. Enforcement of such provisions is necessary to avoid speculation and to assure the necessary access of key industries.

To ensure that industrial sites are effectively utilized, extensive efforts must be made to attract investors. The tax incentives given to new towns are unlikely to be enough to offset the uncertainties of locating in a city without a large current population.<sup>33</sup> The Government can pressure such investors to situate in the New Towns through refusal to grant industrial permits for other locations. However, such a policy is not likely to be pursued for long, given the desire for large-scale industrial development in Egypt, whatever the location.

Therefore, the government should use public sector companies as the industrial base of new towns. However, to attract other industries, New Towns will require a solid base of infrastructure, an efficient permit process, and adequate sources of necessary raw materials and skilled labor. The problem of skilled construction labor has already appeared in the construction of 15th of May City, and will certainly continue for the industries locating in new towns. Other general problems with modern industrial development in Egypt also apply to the New Towns. These include: absence of markets for goods, high inflation rates, lack of capital for investment, and dependence on multinational firms who require high standards of infrastructure and are quick to move if not satisfied. Thus, an industrial program in the new communities would be difficult to implement even under the best of circumstances.

#### f. Development Control

One of the attractions of a new town is its purity: the land has not yet been defiled by existing disorganized uses. Thus, it is easier to establish and enforce controls over future development than in development adjacent to existing urban areas. However, this attraction can be overestimated since development is less likely to occur in such isolated places. Unfortunately, if development begins at a rapid pace with inadequate management the same problems of development control are going to occur in the New Towns.

The underlying problems of administration will surface unless special efforts are made at early enforcement. Thus, the New Urban Communities Law (Law No. 59 of 1979), Article 8, states that the area of 100 meters on either side of public roads leading to a new urban community shall be reserved and their use put under the control of the New Urban Communities Authority. That provision is already being violated along the main road to New Ameriyah City. Action is not being taken for enforcement because the police come under the jurisdiction of the Alexandria Governorate, not of the Authority. In addition, it is likely that similar violations will occur with regard to the development controls supposedly exercised by the Authority over a five-kilometer area surrounding the boundaries of other New Communities.

#### g. Organization and Management Requirements

The larger the project, the more organization and managerial skills are required for successful execution. Besides cost, a major reason for the failure of new towns programs throughout the world has been the lack of sufficient managerial skills and

technical personnel to carry out such projects. Egypt is blessed with a large number of technically trained persons, despite ongoing out-migration. The heads of the New Towns projects and their technical staff, for example, are doing an excellent job under very difficult situations with regard to construction, provision of building materials and labor. However, the simultaneous execution of all these projects at the scale currently planned creates an enormous drain on the development potential of the country, given the number of other jobs that need to be done. Other needed works are being neglected and technical personnel diverted to provide infrastructure for only a small percentage of the urban population. Such a course may mean that, not only are the New Towns likely not to reach their goals, but major metropolitan areas will be less well served than if a more balanced and realistic urban population deconcentration program had been pursued with priority development in smaller centers closer to the built-up area.<sup>34</sup>

Law No. 59 of 1979 gives the Authority broad-ranging powers for planning and control of development and management. However, given the scales of the New Communities and the size of each phase, problems are already occurring in the coordination between the new community projects and the governorates. Alexandria Governorate, for example, is approving industrial and cooperative housing applications along the main road to New Ameriyah City.

Related to the above issue is the question of on-going maintenance of facilities in new cities and the local Government administration of such communities. Article 13 of Law 59 of 1979 gives the New Urban Communities Authority the power to act as the local Government for the new urban community until such time as the community is delivered to the control of the governorate by a Cabinet Decree. With regard to 15th of May City, the furthest advanced in construction, it is being considered to have the Stage I area (population of 50,000) transferred to the Cairo Governorate as soon as it is completed, while construction continues on the other stages of the city.

Experience in other parts of the world has shown that it is probably better for the Authority to maintain control over the new community for the entire period of construction, despite the administrative burden thus imposed. Only in that way is it likely that uniform development controls can be enforced, including enforcement of maintenance of buildings by their owners and of community facilities. The Cairo Governorate presently does not have the necessary personnel to enforce such provisions, and thus, is unlikely to make a more active effort to enforce them in 15th of May City. If such controls are not enforced in the first stage of the project, then they are unlikely to be controlled in its later stages. It is imperative that the Authority recognizes this reality and establishes a special division to carry out the maintenance and utility functions normally carried out by local Government during the period when the city is still being constructed. However, such responsibility will require a larger staff than is available at present.

## NOTES

### CHAPTER III

#### SPATIAL ELEMENTS OF THE RECOMMENDED STRATEGY

- 1 As adapted from the 1970 Preliminary Master Plan for Cairo.
- 2 NUPS First Round Alternatives, Vol. II, "Cairo Concept Plan", June, 1981.
- 3 Trend Forecasts presented in Table III-3 are those developed by the Ambric Study, "Rehabilitation and Expansion of the Greater Cairo Wastewater System, 1981." Residential areas in year 2000 were taken from the Greater Cairo Waterworks Master Plan prepared by E.S. Parsons and E.G.G. February 1979, which projected similar populations by "kism" for the year 2000.
- 4 In 1973, the density coefficient (i.e., the number of industries in an area as a proportion of total industries) of Cairo was 0.95, NUPS Working Paper by M. Rahman, "Manufacturing Industries in Egypt — Spatial Location and Investment Allocations," 1981, p. 12.
- 5 Op. cit.
- 6 CAPMAS, Industrial Production Census, 2nd Quarter, 1977, for establishments with 25 or more workers.
- 7 NUPS "Cairo Concept Plan," 1981, p. 156, as derived from CAPMAS Industrial Census.
- 8 NUPS "Cairo Concept Plan," 1981, p. 150.
- 9 The Alexandria Wastewater Master Plan Update 1981.
- 10 No explanation was noted for the differing target population levels.
- 11 See "New Towns and Satellite Cities: A Strategy for Deconcentration of Urban Development," NUPS Working Paper by S. Sherrer, October 1981, Annex 1. Subsequently referred to as New Communities Report.
- 12 Similar proposal in the 1956 Cairo Master Plan led to the development of Nasr City.
- 13 Anwar El Sadat, The October Working Paper (Cairo: Ministry of Information, April 1974, English Translation) pp. 80-82.
- 14 The total expenditures to date at these cities, plus New Ameriya City have been about L.E. 274 million, with the expected cost of Stage 1 of the four cities set



at about L.E. 741 million and total expected construction cost at L.E. 4800 million (1978 prices) see *New Communities Report*, Annex 2.

15 See extended argument to this effect in H. Richardson's "From The First Round Alternatives to a Preferred Strategy Suggestions and Comments," Cairo: National Urban Policy Study, August 1981.

16 James M. Rubenstein, *The French New Towns*, The John Hopkins University Press, 1978.

17 Op. Cit.

18 West and south of New Ameriya City, the northwest Coast and western Desert show little prospect for economic growth and urbanization.

19 See "Cairo Concept Plan," Vol. 2 NUPS First Round Alternatives Report and NUPS "Special Report: Alexandria Concept Plan."

20 For example, the French New Towns are all within 40 kilometers of a major urban center. However, in that close location they had difficulty achieving their goals. There were only 50,000 housing starts in the 5 such towns in the Paris Region in 1971-75, while the projected planning by the year 2000 was 1,730,000. The projected populations had been reduced dramatically from an initial projection of 2,800,00-3,600,00 in these 5 centers. The French New Towns.

21 This assumes that its original site near to existing industry and infrastructure facilities is maintained.

22 See *New Communities Report*, Annex 4.

23 See *New Communities Report*, Annex 4.

24 The same mistake was committed at Nasr City 15 years earlier. It appears that this problem will be rectified in land sales in some of the other New Towns. For example, the development authority of Sadat City has not yet sold land in either residential or industrial areas (as of late 1981). It intends to lease the land for a period of at least 2 years prior to sale to ensure that construction begins. However, this mechanism will only partially recover costs as land prices are not high enough to fully cover costs.

25 For the first stage population of 150,000 total revenues from land sales was about L.E. 5.25 million as compared to infrastructure costs of L.E. 136.5 million and community facilities costs of L.E. 256.9 million. (See *New Communities Report*, Annex 2).

26 See NUPS *New Communities Report*, Annex 6.

27 See National Urban Policy Study, "Working paper on Urban Development Standards and Costs" (Cairo: October 1980) Table 22, p. 105.

28 Annex 4 of the NUPS *New Communities Report* includes a detailed comparison of infrastructure costs for the New Communities and other urban projects.

29 See *New Communities Report*, Annex 4.

30 See *New Communities Report*, Annex 4.

31 The income data presented is based on the USAID Memorandum which adjusted the CAPMAS 1974-75 Urban Income and Expenditure Survey for inflation (households were defined as a nuclear family). The 1979 data were in turn increased by 7 percent to reflect 1980 incomes. A definition of affordability used in this report is given in note 11 to Chapter VI.

32 See *New Communities Report*, p. 115.

33 See *New Communities Report*, Annex 3.

34 The size of the new communities is already putting tremendous strain on the existing organizational capacity. Supervision of the contractors of 10th of Ramadan City has been contracted out at a tremendous cost. 15th of May City is having trouble getting sufficient skilled workers to carry out their well managed, but ambitious efforts in stage 1.

CHAPTER IV

SUEZ, SPECIAL EMPHASIS CITIES,  
OTHER URBAN AREAS, AND REMOTE AREAS

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**CHAPTER IV**  
**SUEZ, SPECIAL EMPHASIS SETTLEMENTS,**  
**DELTA GROWTH MANAGEMENT AND REMOTE AREAS**

**I. FUTURE URBAN DEVELOPMENT OF SUEZ**

In the view of the National Urban Policy Study, Government efforts at decentralization outside the major metropolitan centers of Cairo and Alexandria will be most effective in the Canal Region, particularly in Suez. Due to its strong locational advantages, availability of resources, and expanding industrial base and port facilities, Suez has significant prospects for future economic and demographic growth.

According to the Suez Master Plan, Suez is targetted to reach a population of one million by the year 2000. This would require a sustained 7 percent annual growth rate, however, which while possibly achievable, may be difficult to manage.<sup>1</sup> Thus, a more conservative population range of between 750,000-850,000 has been adopted with an implied annual growth rate of ranging between 5.8 to 6.35 percent per annum.

In order to achieve significant population growth, many development issues, particularly regarding urban management, must be resolved. With respect to investment required to induce and accommodate the projected growth, order of magnitude estimates for industrial and infrastructure investment are presented in Table IV-1. The projected investment costs were made at five year intervals to reflect differences in cost per job and to account for substantial upgrading of existing infrastructure and industry required during the initial periods.

Suez's share of the NUPS national urban investment for the entire period (1986-2000) would be as follows:

Industry and Services	5.6%
Infrastructure	4.0%
Total Investment	4.9%

If population targets are reached, Suez would accommodate 2.3 percent of the projected urban population in the year 2000 and 3.1 percent of the expected urban population increase during the same period.

**A. Physical Findings Regarding the Existing Situation and Current Trends**

Physical development issues and opportunities associated with the future growth of Suez were assessed on the basis of a review of the Suez Master Plan, discussions with local authorities and consultants, and review of a recent publication by the IBRD, "A Case Study -- The Governorate and the City of Suez."<sup>2</sup>

**TABLE IV-1**  
**SUEZ ZONE**  
**SUMMARY OF POPULATION GROWTH AND INVESTMENT REQUIREMENTS**

POPULATION (000s)				INVESTMENT (L.E. MILLIONS)				PER CAPITA INVESTMENT <sup>1</sup> (L.E. PER CAPITA)			
1985	1990	1995	2000	1986-1990	1991-1995	1996-2000	1986-2000	1986-1990	1991-1995	1996-2000	1986-2000
312	438	610	850								
A. Direct Investment (Industry and Services)				332.0	587.0	1,190.0	2,109.0	758.0	962.3	1,400.0	2,481.0
B. Intra-Urban Infrastructure (Standard One)				470.4	585.8	788.7	1,844.9	1,073.9	960.3	927.9	2,170.5
C. Intra-Urban Infrastructure (Standard Two)				291.2	344.0	454.8	1,090.0	664.9	564.0	535.0	1,282.3
D. TOTAL (A + B)				802.4	1,172.8	1,978.7	3,953.9	1,831.9	1,922.6	2,327.9	4,651.5
E. TOTAL (A + C)				623.2	931.0	1,644.8	3,199.0	1,422.9	1,526.3	1,935.0	3,763.3

<sup>1</sup> Based upon population at the end of each period.

SOURCE: NUPS Preferred Strategy, See Table I-A.1 In Appendix I and Tables V-A.30 to V-A.38 In Appendix V.

## 1. Directional Growth

Directional growth has been predominantly along the Cairo/Suez road, in coastal areas to the south, and in the direction of Port Tewfik. The most recent developments include the introduction of a large cooperative housing project west of the city and south of the Cairo/Suez Road, port development at Adabiya, and industrial development in the southern sector.

## 2. Description of Development Trends

According to the Suez Master Plan there has been little evidence of planned growth in Suez. Rather, the city has been shaped by a series of physical constraints and causal factors. These include:

- The Bay of Suez to the south.
- Jebel Ataka to the extreme west.
- The Suez Canal on the east.
- The Sweetwater Canal and irrigated areas to the north.
- Port Tewfik and the causeway to the southeast.
- The Cairo/Suez Road and railway and their extensions to the north and west respectively.
- The oil terminal and refineries (and other industrial development to the southwest taking much of the shoreline).
- The Suez Ismailia road and rail to the north.
- Suez Creek to the northeast.

As a consequence, most development outside of the old city has occurred to the northwest along the Cairo/Suez road, in coastal areas, at the base of Jebel Ataka to the southwest, and southeast in the direction of Port Tewfik. (Figures IV-1 and IV-2)

Suez City proper is divided into four distinct parts by the Suez/Cairo railway and a branch line to serve industrial areas to the west. These include:

- Qalsam to the north.
- Gharib to the east.
- New Suez to the south.
- Arbaeen to the northwest.

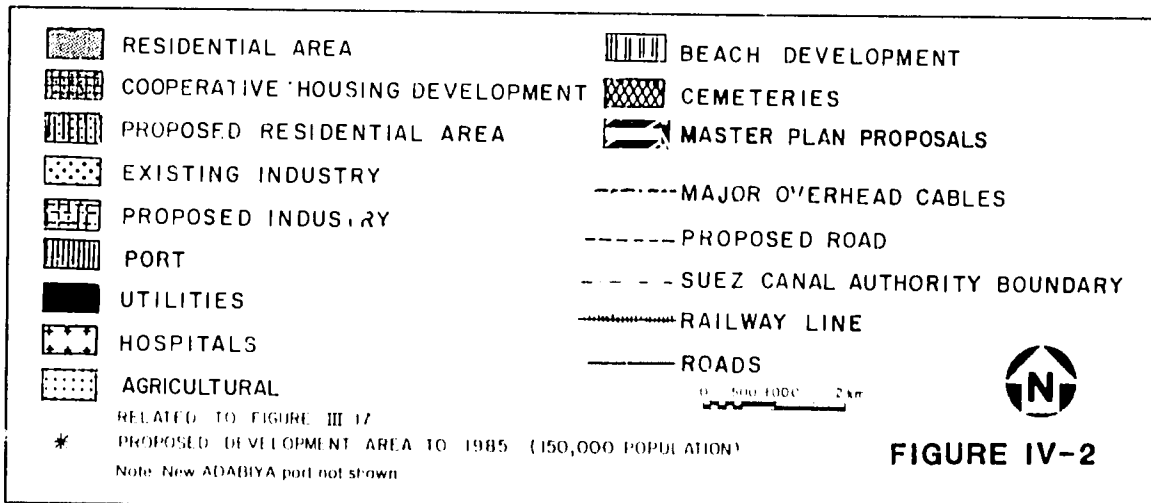
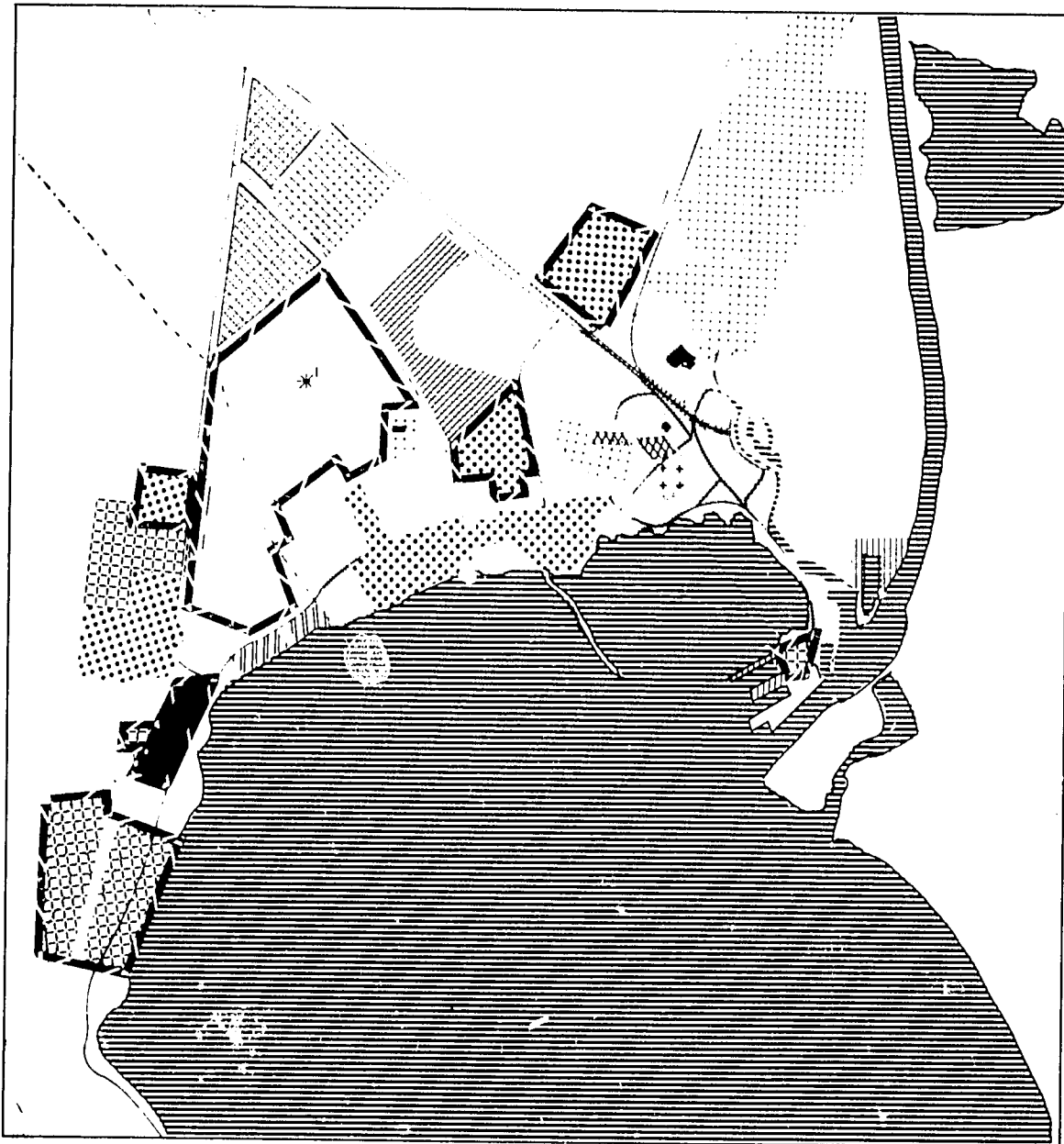
More recent development includes the communities of Faisal, Sabbah, Harafein, and the cooperative project along the Cairo/Suez Road to the northwest; the light

# POTENTIAL DIRECTIONS OF URBAN GROWTH



FIGURE IV-1

# EXISTING SITUATION ONGOING DEVELOPMENT PROPOSALS





industrial areas along the Ismailia and Nasser roads to the north and west, respectively; western expansion of the oil refineries and housing in coastal areas as well as the fertilizer plant and other industrial development at the foot of Jebel Ataka.

In 1975, the Suez Master Plan described existing development patterns as follows:

"The pattern of development (in Suez) which has emerged is one of distinct residential areas compact, varying in size, age and character, aligned along either side of the main road to Cairo and separated by roads, railways, and canals."

The master plan, furthermore, concluded that the existing structure does not provide a clear, workable structure for substantial expansion. In Subsection 5, a review of the master plan is made and a concept plan with suggested NUPS modifications is proposed. The concept plan, contrary to the Master Plan, gives more emphasis to supporting current trends.

### 3. Principal Findings and Recommendations

- In order to cope with the substantial urban growth envisaged in Suez, urban administration and management need to be strengthened. Among the problems areas:
  - Efforts to achieve governmental decentralization at the district level has resulted in considerable overlapping of functions within the Governorate, unclear organization, responsibilities, and inadequate staff;
  - Lack of an adequate pay-scale and financial incentives restricts Governorate and district government in hiring and promoting qualified staff: this results in a lack of initiative.
  - Lack of management tools such as budgeting, programming, and cost control procedures reduce administrative efficiency.
  - Lack of governorate priority to manpower and program emphasis has resulted in a multitude of staff in bookkeeping and service functions, inadequate professional staff and an unclear investment program.
  - Bureaucratic procedures and centralized decision-making at the national level inhibit efficient management (i.e., it takes up to one year to process a request for plots in the industrial estates).

Before decentralization at the district level can effectively take place, urban management and administration at the governorate level must be strengthened. Prioritization of manpower requirements (including increased emphasis on professional staff) and a clear organization of Government and staff responsibilities need to be established. Recruitment of qualified technical staff will require financial incentives including bonuses and fringe benefits which compare with those offered in the private sector. Management and technical training and a greater delegation of authority are also required.

- If Suez is to manage future growth, and decentralization is to be effective, greater administrative and financial autonomy at the Governorate level is required:

- Until recently the Suez Governorate had to rely on the Central Government for most of its revenues, making it difficult to efficiently prioritize projects, take initiative, or effectively respond to immediate problems.
- Recently, however, the sale of governorate land brought L.E. 7.5 million into governorate coffers -- and the most recent capital budget was on the order of L.E. 111.5 million. Thus, local initiative should prove more fruitful in the future.
- Nevertheless, in other sectors such as industry, recent efforts to enhance the local tax base have been put down at the central Government level.

Means must be found to increase administrative and financial autonomy through decentralized decision making and increases in the local resource base. Industrial taxes, improved cost recovery for urban services, and market prices for the sale of land serviced by the Governorate will help in this regard.

- Given the requirements for urban expansion onto publicly owned desert land, and the large areas of vacant land within the urban perimeter, a means must be found to facilitate development and control.

- In the past, the siting of public projects has not optimized resource efficiencies: e.g., housing projects have been located beyond infrastructure networks with little regard for efficient land use.
- Low density, land consumptive uses have not been discouraged.
- Penalties for undeveloped private land within City boundaries have not been sufficiently severe. Thus, possible development economies have not taken place and land hoarding has occurred.<sup>3</sup>
- Discontinuous and irregular development in industrial areas has occurred due to inadequate surveys and control.

In order to bring land development under control in Suez, a Planning and Development Department (SPDD) was created in Suez with the assistance of the UNDP. Its function is to meet expansion requirements through the provision of serviced public land in accordance with the Master Plan. However, as the department is attached to the governorate, it cannot offer employees a pay scale which exceeds that of the governorate. Thus, they are having grave difficulty in recruiting qualified staff. This will inevitably reduce the impact of the department. Consequently, if increased financial and other incentives cannot be provided, it should be detached from the governorate as a semi-autonomous authority.<sup>4</sup>

- Assuming means are found to develop an efficient system for land development and control, greater attention should be given to appropriate standards and affordability.

- In the post-war period, due to reconstruction efforts, the public sector has dominated overall development. However, as Suez expands the private sector's role can be expected to become more important.
- Government development standards for subdivision and housing construction are too high to be affordable by low income households without substantial subsidies.
- Scarce Government resources for housing have been utilized for the construction of relatively few units at high standards.

The Suez Governorate Planning and Development Department (SPDD) can play a crucial part in providing serviced land for the full spectrum of housing needs expected in the future. However, this will require the establishment of adequate but minimum levels of services to insure affordability. Government housing programs, on the other hand should, primarily, be limited to financial assistance and demonstration programs. Subsidies should be aimed specifically at low income households.

- A rationalization of infrastructure services is required in order increase efficiency, improve levels of service, and reduce risk:

- Presently, Suez is dependent upon the Ismailia Canal for provision of water for all purposes; yet, increasing and competing demands are being made on the canal for irrigation and urban development (i.e., other Canal cities, 10th of Ramadan, El Obour, etc.).
- Increases in the capacity of the canal and the provision of a pipeline are not expected to significantly increase provision of water to Suez before 1985. This could jeopardize immediate growth prospects for both Ismailia and Suez.
- Distribution of water is under the authority of the Suez Canal Authority (SCA). However, several parallel and competing distribution systems (particularly for raw water) have been installed by large enterprises resulting in some duplication of service; uncontrolled routing, water usage, and competing demands, and lack of coordination.
- As water is considered a nearly "free commodity" and user charges are not adequate to cover service costs, an extensive use of water has occurred; no recycling or conservation efforts have been made and the SCA has been unable to expand or maintain the system.

Although plans are underway to increase the capacity of the canal and provide a pipeline to Suez (to benefit Sinai and the Red Sea as well) shortages could occur in the short term. If this is so, an assessment of priorities must be made regarding irrigation and urban development. Also, though plans are underway for an improvement and expansion of the water supply system, little has been done to improve cost recovery and maintenance capabilities within the system. Higher tariffs, reduced standards, and better coordination are required.

- Basic infrastructure in the urban area requires substantial upgrading and greater attention to affordability and cost recovery.

- In 1976, 53.5 percent of all dwelling units in the city were not serviced by sanitary sewers, 38 percent were without electricity, and 35 percent without water.
- The existing sewer system is inadequate to meet current needs. Suffering from blockages and poor maintenance, most sewage is untreated and dumped into waterways.
- Sources of potable water supply are in risk of contamination; the network suffers from poor maintenance and large losses (i.e., 50 percent).
- Industrial and residential pollution of the bay and waterways continues unabated.
- There is currently no systematic collection of solid waste in all areas.
- User charges for water and electricity are insufficient to cover operating, maintenance and expansion costs.
- Levels of service for telecommunications are currently below the level of urban services provided at the national level.

Plans have been made to upgrade and expand existing water and sewer systems and implement a solid waste disposal facility. However, little specific attention has been given in the past to the most poorly serviced areas and inadequate attention has been given to cost recovery. Neither the General Organization for Sanitary Sewerage nor the governorate charges tariffs for sewer services, while tariffs structures for water and electricity will not currently permit full cost recovery for these services. The SPDD suggests that those costs, however, be recovered through land pricing rather than tariffs.

Affordability analysis by the World Bank suggests the current rehabilitation and expansion program for water and sewerage would be unaffordable to the majority of household without substantial subsidies.<sup>5</sup> It suggests that alternative less expensive means of sewage disposal -- besides the conventional water based system -- should have been considered. However, due to the high water table in Suez, alternative solutions were ruled out by the Suez Master Plan.

Plans and equipment are ready to increase the current number of telephone lines (roughly 2,150 in 1980). A capacity of 196,750 is currently being planned by the year 2000.

Sectoral improvements in water, sewerage, solid waste disposal, etc., are also under way. However, no regular program for general environmental upgrading has been initiated. Clearly, sectoral action must be undertaken within an overall plan of required improvements at the governorate level.

- Housing policy and investment policies at both the National and local level need to be reassessed in order to effectively meet current and future requirements.

- Past Government emphasis on relatively high standard and costly units has provided benefits for relatively few at high cost.
- Informal development areas and low income districts have generally been neglected. However, expansion of the water and sewerage systems now underway will serve these areas.
- Government housing solutions consisting of low density blocks of flats at high costs and with inefficient use of public space need to be reassessed and alternatives developed.

In the future, Government housing emphasis should be on the provision of serviced desert land while housing construction is carried out by the private sector. Financial and technical assistance for facilitated administrative procedures, and more selective use of subsidies to benefit low income households are required. Major problems such as the shortage of building materials and lack of development control must also be dealt with.

#### 4. Objectives For Future Urban Development

Based on the future role that Suez will play in the implementation of the National Urban Policy, the following parameters must be applied:

- The administrative, planning, and implementation capacity must be increased to facilitate the rapid expansion of Suez.
- The installation of industry and other economic activities should be facilitated through the provision of serviced sites and streamlined administrative procedures.
- Residential development, primarily by the private sector should be facilitated through the provision of serviced sites and appropriate standards of development.
- Cost recovery should be maximized through sale of serviced land to reduce Government subsidies.
- The natural advantages of the site for residential, industrial, tourism, recreational and land reclamation purposes need to be exploited;
- Adequate standards of housing, health, and education need to be provided in conjunction with job opportunities as an attraction to potential migrants.

#### 5. Suez Master Plan Development Strategy

The proposed master plan cites new development inland on a relatively flat area extending from the foothills of Jebel Ataka around the existing city and northwards along the Suez Canal and agricultural areas. Planned urban expansion on the east bank of the Canal and Bay is limited to a few villages to serve land reclamation efforts there. Beyond Jebel Ataka to the south, development is also limited to settlements involved in mineral extraction and tourism.

The urban form adopted by the Suez Master Plan is a directional grid with a primarily northern orientation for long term growth. Though western expansion was considered as an alternative, it was ruled out due to the rising elevation of the terrain, the desire to expand in the direction of the other Canal cities, and because of possible pollution from the proposed cement factory to the west. Expansion opportunities to the south are limited because of Jebel Ataka.

The directional grid adopted consists of a central spine on a north/south orientation with parallel and perpendicular secondary routes running east/west. The central spine is to provide city and district level transport, commerce, and service activities. Districts of approximately 160,000 inhabitants are located on either side of the central spine which is to provide city and district wide commerce, transport, and service functions. (Figure IV-3)

The current major axis of urban growth, the Cairo/Suez Road, is to be downgraded and an alternative, greater capacity road to the old city and port area developed to the south. This road is to link-up with a proposed ring road which ties into the interregional network to Cairo, Ismailia, the Sinai, and Ghardaka.

The main elements of the proposed plan include:

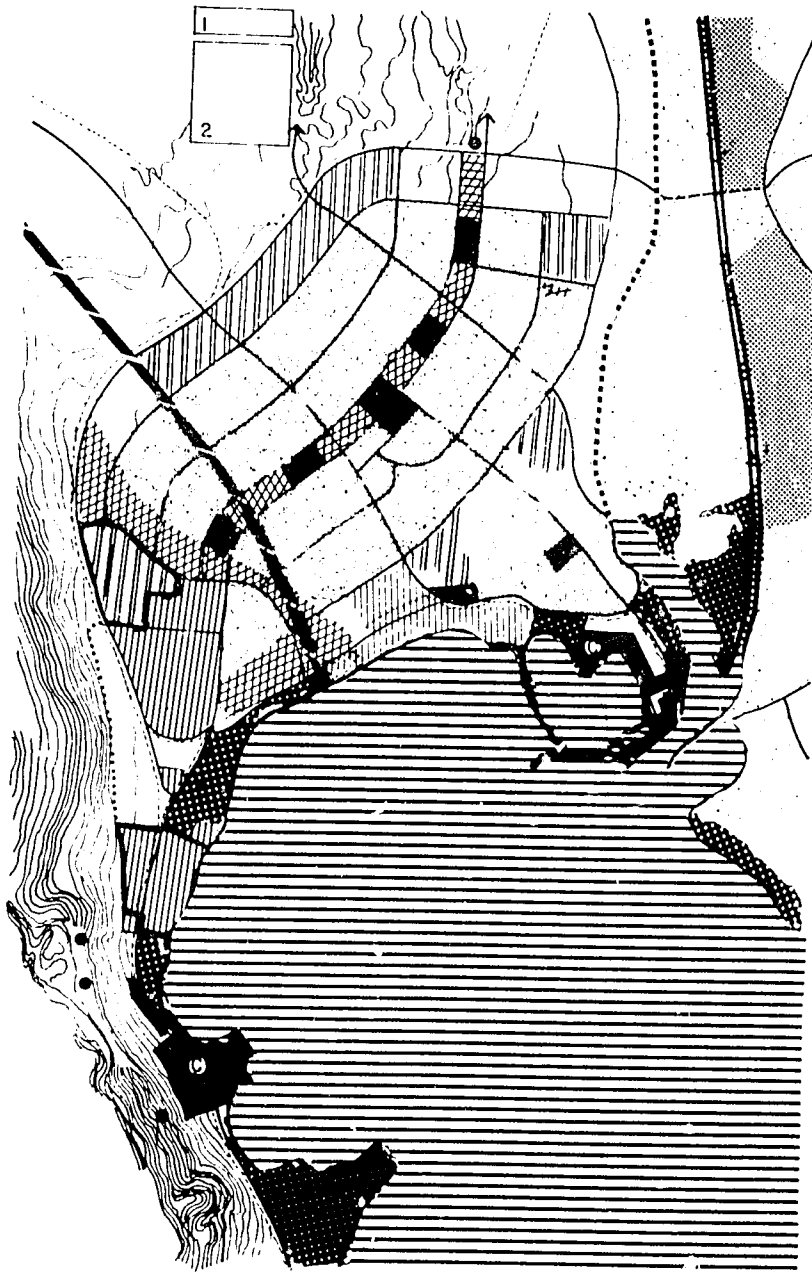
- The central spine, CBD, and district centers.
- Restructuring and rehabilitation of the old city.
- Residential districts along either side of the central spine.
- The principal industrial zone to the west along Jebel Ataka and the coastline.
- Light industrial areas near the fertilizer plant and refineries, at their existing location north of the old city, and at the western boundary of the new development area.
- Port development, including a new container port at Adabiya, a general cargo and passenger port at Port Ibrahim, and a fishing port near the old city.
- Recreational facilities outside the urban area at Ain Musa and Ain Sukna and inside the urban area at Suez Creek and along the central spine.
- Agricultural reclamation on the west and east of the Suez Canal.

















The Study Team feels that, while the Suez Master Plan provides a good basis for future development, some modifications regarding proposed direction of growth, land use, and development standards are appropriate. A separate discussion of suggested standards for residential and industrial development is found in Appendix IV-C.

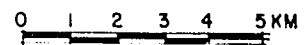
With respect to urban form and land use the following modifications are suggested:

- The urban area should have two major directions of growth: to the west as well as to the north.

# SUEZ MASTER PLAN



- |   |                         |   |                             |
|---|-------------------------|---|-----------------------------|
|  | MILITARY                |  | PRIMARY ROAD                |
|  | CIVIL                   |  | MAJOR OVERHEAD CABLES       |
|  | LIGHT INDUSTRY          |  | LIGHT INDUSTRIAL FREE ZONES |
|  | HEAVY INDUSTRY          |  | HEAVY INDUSTRIAL FREE ZONES |
|  | AGRICULTURE             |  | CONTAINER PORT              |
|  | SPOIL TIPPING           |  | DISTRICT CENTERS            |
|  | RESIDENTIAL             |  | COASTAL RECREATION          |
|  | MAJOR PUBLIC OPEN SPACE |  | CONTOUR LINES               |



Source: Suez Master Plan

FIGURE IV-3

- The Suez/Cairo road should serve as a secondary spine for western commercial development as there is currently a considerable level of commerce on the road and development is expected to enhance the commercial potential of the proposed new CBD.
- The role of the old city and port area should receive more emphasis and retain its function as the principal CBD, at least during most of the planning period.
- The proposed light industrial zone to the west blocks possible western development; it should be disaggregated and included in light industrial areas to the north and south.
- The principal industrial zone should be expanded towards the south with an enlarged light manufacturing zone.<sup>6</sup>

The Study Team feels that the single corridor for future development to the north underestimated the strength of existing trends and the likelihood of considerable development attraction along the Suez/Cairo corridor. In addition, the ongoing improvement of the sewerage network will permit greater reclamation north of Suez than anticipated -- through use of the effluent for irrigation purposes. Though the northern corridor may remain the primary direction of growth, opportunities for western development would render the plan more flexible.

As the master plan relates, street life is a fundamental and positive quality of Egyptian cities. This quality, which exists in the old city of Suez, will require considerable time to evolve in the new CBD. Therefore, at least in the planning period, the old city should retain its function as the principal CBD linked to the new CBD by a commercial corridor along the Cairo/Suez Road. The quality of life in the old city and port area should be considerably upgraded to become a center for commerce and leisure. Further, the port area coupled with planned long-term recreational facilities in Suez Creek should function as a marina, beach and recreational area, and thus, add a needed amenity for local tourism and the enlarged city.

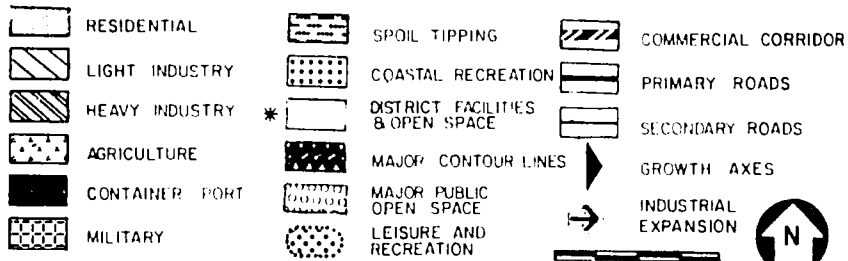
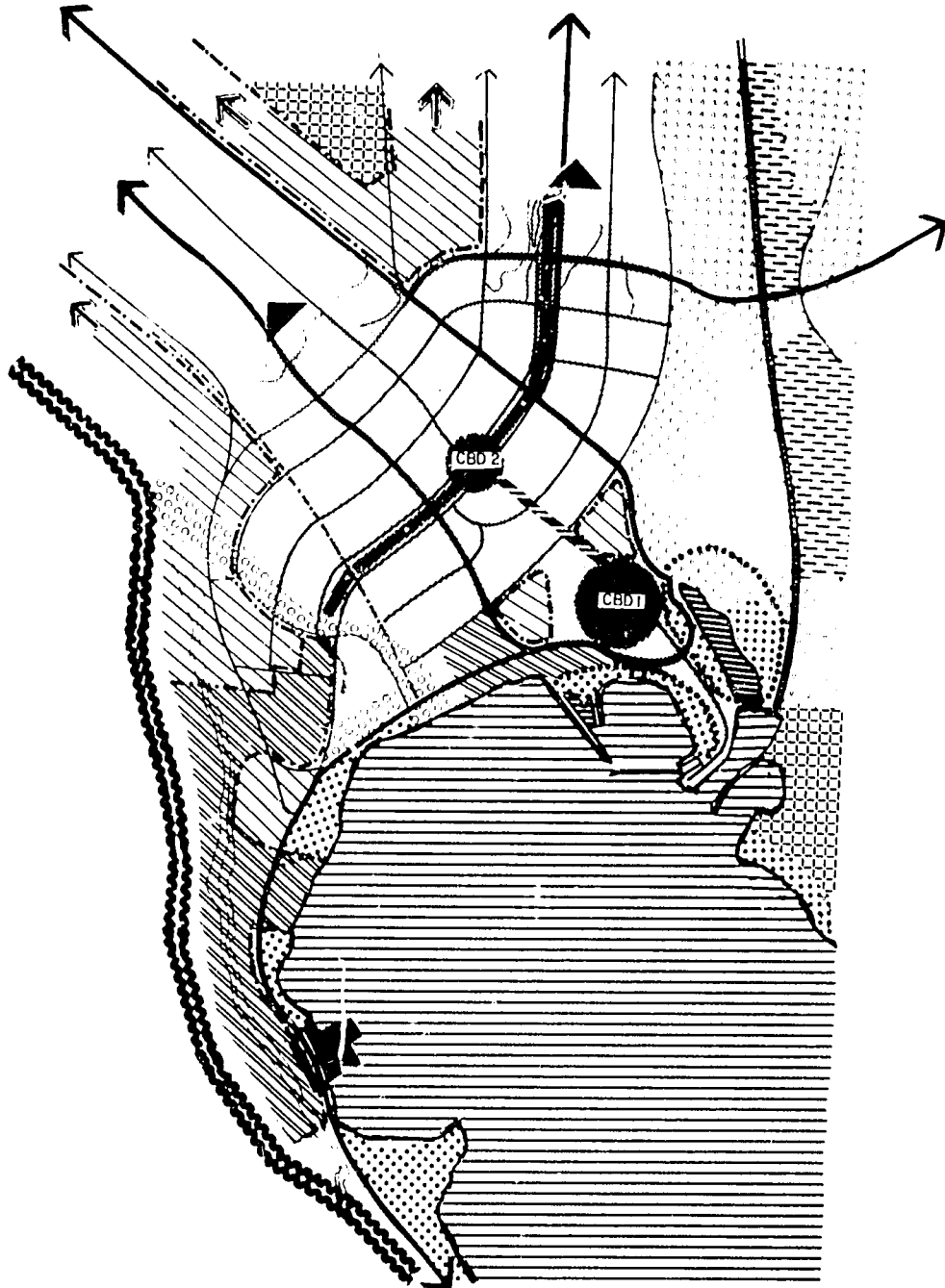
According to local authorities, planned industrial areas, both heavy and light, are not likely to meet future requirements. For this reason, industrial growth corridors to the west and south along Jebel Ataka, and to the north parallel to the Canal are suggested because they have relatively unlimited physical expansion opportunities.

The Suez Master Plan and the modified concept plan are illustrated in Figures IV-3 and IV-4. The concept plan attempts to retain the fundamental qualities of the master plan, yet provide it with greater flexibility and attention to current trends. As the current trends imply expansion into desert areas along the Cairo/Suez road, they are not perceived as undesirable.

Many of the suggested changes or modifications made by NUPS have already been noted by the Suez Governorate Planning and Development Department. In fact, the SPDD has provided NUPS with a list of current developments that will effect the master plan implementation in the future. These are included in Appendix III-C.



# SUEZ CONCEPT PLAN



\* NOTE: SMALLER AMOUNT OPEN SPACE SUGGESTED

FIGURE IV-4

Figure IV-2, illustrates principal parts of the master plan which have been implemented as well as constraints which are likely to influence physical development. These include:

- Key Elements Implemented
  - Light manufacturing zones in the principal industrial zone, Ismailia Road and Nasser Road.
  - Transit free zone.
  - New power station.
  - New sewage treatment plant.
  - Adabiya manufacturing free zone.
- Potential Constraints Imposed
  - Military areas to the southwest and northeast (the latter blocking possible extension of the Ismailia light manufacturing zone).
  - The enlarged cooperative housing scheme to the west (does not conform to master plan specifications).

The Suez Planning and Development Department recognizes the need for a review of master plan proposals including standards and phasing to bring it in line with current developments.

## 6. Special Consideration and Growth Potential

### a. Population Growth Potential

- General

Since the 1976 Census, which recorded a Suez City population on the order of 190,200, the population of Suez has been increasing at a rapid rate. In mid 1980, according to SPDD estimates, the population was about 288,000 for Suez City -- representing a growth rate of about 12 percent per annum. If this rate has continued into 1981, the current population of Suez would be about 317,000. In fact, the SPDD now expects the 1985 population in Suez to be on the order of 480,000 -- more than was projected by the master plan. In addition, 1981 employment surveys indicate that there is sufficient basic employment in place to support a population of about 400,000. Furthermore, a recent survey of planned industrial investment indicated that by mid-1985 Suez industrial investment could support a population of 480,000 (Appendices IV-A and IV-C). In addition, by 1985 a population of 620,000 is conceivable if currently low levels of service employment were to keep pace with the basic sector. Other factors which indicate a rapid rate of growth include housing starts in the formal and informal sector, which according to the SPDD have been increasing at a rate of 10 percent per annum in the past few years. As a consequence of these recent studies, it now appears that Suez City has the potential to reach and exceed NUPS population

growth estimates. To do so effectively, however, greatly enhanced planning, control and implementation capacity is required.

- Distribution of Population

The distribution of population for 1985 originally called for by the Suez Master Plan has been modified due to current developments and to increase gross residential densities from 185 to 300 persons/hectare. This density increase will permit about 50 percent more population within a given residential area.

In addition, though the master plan suggested reductions in density in the old city this does not now appear likely. As a result, about 305,000 will be accommodated in the old city and recent expansion areas while the new development area (illustrated in Figure IV-2) will accommodate about 150,000 by 1985.

The regional distribution of population suggested in the Suez Master Plan study areas for the year 2000 is presented in Table IV-2.

- b. Industry and Employment

According to SPDD, growth in industrial employment is expected to surpass master plan projections for 1985. Although Table IV-3 indicates that manufacturing employment for 1981 is slightly below master plan estimates, detailed surveys of planned industrial investment suggest that by 1985 manufacturing jobs will exceed those of the master plan.

Non-manufacturing employment, according to the SPDD, as a whole, already exceeds master plan estimates. Thus, even with an expected decrease in the rate of growth of non-manufacturing basic employment by 1985, employment as a whole is expected to be about 15 percent greater than projected by the master plan.

Those manufacturing industries expected to have the largest increases in growth include the pre-fab factory, the Nasser road light industrial area, the cement factory, the free zones and the SCA shipyard. In absolute terms, however, dispersed employment, the Nasser Road area, glass, oil, and fertilizer plants are expected to account for the largest increases. In the basic non-manufacturing sector, the port, fishing, power, and construction are expected to increase most rapidly in percentage terms. Construction, the port, and fishing, however, show the largest absolute increases.

According to Table IV-3 there is, thus, no shortage of jobs at the investment levels anticipated. However, of all manufacturing jobs anticipated by 1985, less than 5,000 or only 11 percent are in totally new projects. The majority of investment, furthermore, is in large scale manufacturing industries and concentrated in the public sector. However, substantial foreign investment is also anticipated in the Red Sea Free Zone (Ain Sukhna), the second Fertilizer Plant, Miratex, the Glass Factory and the Cement Plant. Private investment in the light manufacturing industrial areas is estimated at about L.E. 48,000 per establishment, although no comprehensive data is available.

**TABLE IV-2**  
**DISTRIBUTION OF URBAN POPULATION, SUEZ STUDY AREA,**  
**YEAR 2000**

SETTLEMENT	POPULATION
El Sadat	5,000
Agrud	5,000
El Kubri	500
Sinal	400
Ras El Adabiya	350
Amer Village	600
SUBTOTAL	11,850
Existing Suez	
Existing Development	104,970
New Development (Vacant Land)	82,280
SUBTOTAL	187,250
New Areas:	
Existing Development	55,215
New Development	745,685
SUBTOTAL	800,900
TOTAL	1,000,000

SOURCE: Suez Master Plan Study, 1976.

**TABLE IV-3**  
**SUEZ GOVERNORATE PLANNING AND**  
**DEVELOPMENT DEPARTMENT**  
**BASIC EMPLOYMENT ESTIMATES: DECEMBER 1981**

	TYPE OF INDUSTRY	EMPLOYMENT		PERCENTAGE		SOURCE OF INFORMATION
		1980-81	1985	INCREASE (%)	INVESTMENT (L.E. MILLIONS)	
1.	Manufacturing					
	Free Zone/Red Sea	240	470	96	N.A.	SGPDD
	Free Zone/Adabliya		930	-	N.A.	GOFI
	Oil Industries	6,435	8,080	26	46	SOPCO
	Fertilizer I	3,600	5,170	43	35	GOFI
	Fertilizer II	-	1,000	-	555	SEMADCO
	Miratex Textile	1,400	2,050	46	39	MIRATEX
	Glass	-	2,000	-	30	ACDIMA
	Cement	135	400	196	120	USAID
	Brick Factory	-	550	-	9	MOH
	Pre-Fabricated	120	550	358	3.2	MOH
	Suez Shipyard	795	1,000	26	9.7	SGPDD
	SCA Shipyard	560	1,060	90	16	SCA
	Montubi	370	370	-	N.A.	SGPDD
	Nasser Road	375	1,690	351	N.A.	PRIVATE
	Ismailia Road	2,030	2,380	17	N.A.	PRIVATE
	Dispersed	6,880	11,870	73		
2.	TOTAL MANUFACTURING	22,940	39,570	72	863	
	(MASTER PLAN ESTIMATE)	24,500	37,500	53		
	Fishing	5,040	7,050	40		
	Quarrying	730	900	23		
	Power	600	915	53	50	
	Construction	15,000	20,000	33		
	Canal	1,575	1,730	10		
	Port	1,655	3,650	121		
	Free Zone - Transit	700	850	21		
3.	TOTAL NON-MANUFACTURING	25,300	35,095	39		
	(MASTER PLAN ESTIMATE)	11,500	27,500	139		
4.	TOTAL BASIC	48,240	74,665	55		
	(MASTER PLAN ESTIMATE)	36,000	65,000	81		
5.	IMPLIED POPULATION	402,000	622,210	54		

SOURCE: Suez Planning and Development Department.

### c. Administration

The capacity of the Suez Governorate to administer, implement and control future growth in Suez is the key element needing reassessment and support. Whether at the more conservative levels of population growth put forward by NUPS or at master plan growth levels, this problem needs to be urgently addressed. Based upon NUPS findings, opportunities for structured growth and major employment increases are largely in place at least until 1985. Of utmost importance to facilitating planned and coordinated growth in Suez are:

- The need to "designate" the master plan by Presidential Decree (as is done for British New Towns) and similar to status of lands under authority of the Suez Canal Authority. In the "designation," the Governorate should be identified as the sole controlling authority together with the People's Council.
- A Master Plan Coordination Committee must be established with representatives from all appropriate agencies to communicate plans, proposals, and policies.
- The cumbersome and conflicting authorities, particularly in local government, should be simplified. The District Authorities, for example, are an unnecessary dilution of control and coordination.
- Finally, the Governorate and Suez Planning and Development Department, in particular, should be provided with sufficient and qualified staff to undertake their responsibilities.

To illustrate current problems associated with these recommendations, a list of current agencies and authorities with overlapping and often conflicting responsibilities is discussed below:

#### ● Current Development Responsibilities<sup>7</sup>

##### - The Governor

Under recent Local Government legislation, the governor has the ability to initiate development on any Government owned land. In theory, such development should have the prior approval of the People's Council, but this is not always sought. In the past, land has been allocated to local organizations and institutions, and development approved which has not always been consistent with the Master Plan. The governor also has the ability to use approvals granted by the People's Council.

##### - The Executive Committee of the Governorate

Composed of senior governorate staff (department heads, etc.) and some members of the People's Council. The Executive Committee should, in theory, approve all development applications which relate to Government land and projects prior to submission to the People's Council.

##### - Board of Directors of the Economic Housing Fund

Chaired by the Governor, the Board has to approve all applications for the purchase and/or development of Government-owned land, prior to submission to the People's Council.

- District Authorities/Councils

The District "Tanzim" officer is responsible for granting "planning permission" for private development within his district. The districts have also approved and/or initiated development on Government-owned land and have often come into conflict with the governorate and the People's Council.

- The Local People's Council

The People's Council is the 'legal owners' of all Government land, and is supposed to approve all development. In practice, much development takes place without their knowledge. The Council has also initiated development, approved and vetoed applications without reference to the governor or the governorate technical departments.

- Ministries Departments

Outpost departments of the Ministries of Housing, Agriculture, Irrigation, etc., are in theory, part of and under the control of the governorate. However, these departments have initiated development of Government land without reference to the governorate or the People's Council.

- Port Authority

The Port Authority has a historical responsibility for approving all marine and marine related development on or close to the shore. This responsibility is often exercised without reference to the governorate or the People's Council. There have been examples of the Port Authority granting permission for development of land close to the shore for "non-marine" activities such as residential compounds, industry, etc.

- Free Zone Authority

The local Free Zone Authority, a branch of the General Authority for Investment & Free Zones, is responsible for approving development within Free Zones. In the past, the General Authority has granted "private free zone" status to projects which have been developed without reference to the governorate or the People's Council, e.g., Red Sea Oceanic Contractors at Ein Sukhna.

- Suez Canal Authority

The Suez Canal Authority has a variety of responsibilities: managing canal traffic, ship building and repair, dredging, quarrying, water treatment and distribution, all types of engineering construction, e.g., pipe laying, and the development of all kinds of uses within the designated boundaries of land owned by the Authority. As the latter is quite substantial, considerable development takes place without reference to the Governorate or the People's Council. The activities

of the Authority often impinge on Government or privately-owned land, e.g., dumping dredged material in Suez Creek. The Authority can also restrict the use and height of buildings in Port Tewfik to safeguard their control of the Canal entrance.

- Army

The Third Army units already occupy substantial areas of land zoned for housing and industry in the Master Plan. There appears to be no control over their activities, nor do they consult the Governorate or People's Council about occupying new land close to the city. The army reserves the right to grant approval to all new development, particularly new industry, which is located on the edges of the city, i.e., in the desert. Their communications and utility networks through and close to the city have proved a constraint on the implementation of new development, especially utility services -- water and sewer pipelines.

- Utilities and Major Industries

Until recently major companies and national utility authorities, e.g., electricity, felt free to occupy and develop any open land close to the city which they required without consulting the Governorate or the People's Council.

- Central Government Authorities

General authorities, industry, tourism, etc., have the right to refuse permission for projects related to their area of interest. They also have, in the past, initiated development without reference to the Governorate or People's Council. These problems are diminishing.

## **II. SPECIAL EMPHASIS SETTLEMENTS FOR GROWTH ENCOURAGEMENT**

### **A. General**

Unlike Delta cities, such as Tanta and Mansoura, which have a strong potential for economic growth in a setting where any horizontal expansion threatens arable land and, therefore, growth must be managed carefully; the cities selected for growth emphasis will require inducement to stimulate economic growth to support increased populations during the planning period. These include the Canal cities of Ismailia and Port Said, and the Upper Egypt settlements of Assiut, Qena Naga/Hamadi and Aswan. Each of these settlements have been treated individually in the Appendices to this report. (Appendices IV-D through IV-G)

The city of Suez which has considerable economic potential, is to receive special attention as an eventual major urban competitor to Cairo and Alexandria



and, as a consequence, has been treated individually in Section I, of this Chapter. However, as growth in Suez is also expected to enhance the development potential of the other Canal cities, it is mentioned briefly in this context.

Upper Egypt presents a category of settlements, which through increased regional investment and improvements in the administrative capacity at the local level, could be developed over time into growth centers. Severe development constraints presently exist, however. The industrial bases of the cities of Assuit, Qena and Aswan are limited to either a single industry or to largely agro-based industries and small-scale workshops. Naga Hamadi, with its proximity to a major aluminum plant, possesses a potentially strong industrial base which could serve as basis for future diversification. Locational disadvantages vis-a-vis Cairo and the rest of Lower Egypt are exacerbated by the deterioration of inter-regional transportation networks and poor telecommunication links. Harsh living conditions are not helped by low service levels for public infrastructure and deficiencies in adequate higher standard housing.

The strategy for growth emphasis in the selected cities is based on phased and selective decentralization. The strategy focuses on a few settlements which are expected to contribute most substantially to national economic growth, yet permit a wider geographic distribution of economic activity and population than if current trends were allowed to persist. The strategy is based also on what can feasibly be achieved within the planning horizon without severely depleting scarce development resources.

The diverse nature of the settlements and regions selected for growth inducement will provide a broad foundation of experience and knowledge for future decentralization in the post planning period.

## B. The Canal Cities

Each of the Canal cities has been the subject of a Master Plan Study and has benefitted from reconstruction efforts since the end of hostilities in the region. However, with the possible exception of Suez, the Canal cities have, thus far, fallen short of population growth objectives and will have difficulty reaching their respective master plan population targets by the year 2000. For example, a special census conducted in Port Said in December 1980 indicated that the population was 345,000, or roughly 40,000 short of the Port Said Master Plan target for 1980 of 384,000. Partial surveys of low income areas in Ismailia also indicate that the rates of migration may have been less than those projected by the Master Plan.<sup>8</sup> Thus, in the planning horizon, economic and population growth in the Canal cities is not likely to reflect their importance in the settlement hierarchy. However, over time, their location advantages with respect to the Suez Canal, the increasingly constrained Delta and the opportunities for furthering future development in the the Sinai will add to their importance.

Though each of the Canal cities differ significantly in terms of development potential, each has special characteristics which qualify it for growth

encouragement. Suez will function as a secondary major industrial center and trans-shipment point to Africa and Asia. Port Said will function as a secondary port, free zone, and services center for the northeast Delta. Ismailia, as the seat of the Suez Canal Authority and the Canal University, will continue as a major service center and benefit from its close proximity to the Delta and central location vis-a-vis the other Canal cities and the Sinai.

### C. North and South Upper Egypt

In Upper Egypt, it is recommended that initially no more than three settlement areas receive special emphasis for growth encouragement in order to concentrate development resources. To ensure that sufficient emphasis is given, it is recommended that public investment in other centers be limited to provision of basic services and industrial projects with likely high rates of return. The selected settlement areas (Qena/Naga Hamadi, Assiut, and Aswan) offer unique economic and locational advantages for growth encouragement. Each of the settlement areas can anchor development in their respective regions. A major concern is to establish appropriate economic bases at reasonable cost which are complementary with policy efforts in other parts of the settlement system.

The nature of the selected settlements, furthermore, will provide the basis for a long term strategy of increased decentralization to the region. According to Richardson, the role of Upper Egypt is likely to remain modest for some years to come due to its distance from national markets, the need to stress short-run economic potential (in other areas) and to cope with investment resource constraints; however, in the long-run (Upper Egypt) will play a greater part in both economic development and population absorption.

The selection of settlements in Upper Egypt was made after a careful review of the economic and population absorption capacities nationwide. Each of the selected settlement areas ranked higher than other Nile Valley settlements in the NUPS matrix of economic and population growth potential presented in the Interim Action Report with the exception of those settlements likely to be increasingly affected by the growth of Metropolitan Cairo.<sup>9</sup> Specifically, the Qena/Naga Hamadi corridor offers potential as a nucleus for industrial activity given its access to the Port of Safaga and mineral resources in both the Red Sea and Western Desert. Assiut, as the unofficial capital, largest urban, and most central settlement in Upper Egypt, also enjoys reasonable access to the Western Desert and Lower Egypt. As it is a university center and a governorate capital, it has potential as a social development pole. To date though, Assiut has limited industrial prospects. Aswan, located at the extreme point of the nation's spinal axis has been the subject of regional development efforts associated with the construction of the High Dam. Though these efforts have not been fully successful, Aswan is considered by NUPS to have considerable unrealized potential. It is anticipated that with increased communications and commitment to the Aswan and other centers designated for special emphasis that growth rates exceeding recent trends can be realized.

It is not anticipated, however, that in the early stages of emphasis that all industry types can, or should be induced, to locate in these

centers. Rather, the focus for economic development of these centers should be primarily on domestic import substitution, promotion of agro-based industry appropriate to each region, and private investment in small scale industry and the informal sector. Naga Hamadi does present opportunities for linked metal product industries and opportunities for feasibly exploited mineral deposits should also be explored.

Thus, though large-scale population growth in the selected settlement areas is not anticipated, it is expected that growth rates exceeding the long term trend rate of growth for each of the settlements can be achieved. The relative impact of the NUPS strategy for selective decentralization in Upper Egypt is evident in Figures 1-1 through 1-3; Chapter 1, which shows the distribution and hierarchy of settlements in 1976 and that projected for the year 2000.

#### D. Population Growth Targets

Table IV-4 indicates the population targets of the Canal Cities from master plans and the National Urban Policy Study for the year 2000.

In general, NUPS estimates for growth in the Canal cities are lower than master plan projections. In Suez, public investment in industry may taper off after 1985 while private investors will initially require an improvement in basic services provided in the area. There is also a question of whether local authorities can conceivably cope with the level of growth anticipated by the master plan. Port Said and Ismailia lack the industrial potential afforded by Suez. Port Said, in particular, cannot expand horizontally without considerable expense do to infill requirements.<sup>10</sup> As a consequence, these settlements are also unlikely to reach their master plan target populations.

In Table IV-5, trend projections for the special emphasis cities of Qena/Naga Hamadi, Assiut, and Aswan are presented along with NUPS year 2000 population projections. Trend projections are based on growth rates experienced in the settlements between 1960-1976. NUPS projections are based, on proposed levels of investment in infrastructure and industry from 1986-2000.

For Assiut and Qena, the NUPS population projections indicate a marked increase in population over the trend projections. However, for Naga Hamadi and Aswan, trend growth rates exceed NUPS estimates. This is due to the inordinately high rates of short-term growth incurred in these settlements during the construction of the aluminum plant and High Dam respectively. For example, after construction of the High Dam, Aswan grew at a modest annual rate of only 1.2 percent between 1966-1976. Generally, however, the projected populations for all special emphasis cities in Upper Egypt are greater than that which would be likely to occur at current levels of population growth in these areas.

#### E. Growth Encouragement: Required Industrial and Infrastructure Investment

In order to achieve the population growth desired in the settlement areas identified for special emphasis, larger per capita shares of investment will be required than in settlements not designated for growth encouragement. In Table IV-6, order of magnitude estimates for required industrial and infrastructure

**TABLE IV-4**  
**MASTER PLAN AND NUPS POPULATION PROPOSALS**  
**FOR THE CANAL CITIES (YEAR 2000)**

CANAL CITY	1976 POPULATION	MASTER PLAN (2000) TARGET POPULATION	IMPLIED GROWTH RATE PER ANNUM	NUPS PROPOSED (2000) POPULATION	IMPLIED GROWTH RATE PER ANNUM
SUEZ	190,200	988,150	7.1%	750-850,000	5.8-6.4%
ISMAILIA	147,000	560,000	5.73%	400-500,000	3.1-4.1%
PORT SAID	262,600	750,000	4.5%	550-650,000	3.1-3.85%

SOURCE: Master Plans and NUPS proposals.

**TABLE IV-5**  
**PROPOSED TARGET POPULATIONS FOR**  
**SPECIAL EMPHASIS CITIES IN UPPER EGYPT**

Settlement Area	1976 Population	TREND PROJECTION		NUPS TARGET PROJECTION	
		Population Trend Year 2000	Implied Growth Rate Per Annum	Population Year 2000	Implied Rate of Growth per Annum
Qena/	93,800	186,000	2.89%	175-225,000	2.6-3.7%
Naga Hamad I	19,800	264,000*	11.4%	150-175,000	8.8-9.5%
Assiut	213,900	438,000	3.03%	550-60,0000	4.01-4.4%
Aswan	144,400	700,000*	6.8%	400-450,000	4.3-4.9%

\* Trend growth rates for Naga Hamad I and Aswan were based on the intercensal period 1960-1976 and are inflated due to construction of the aluminum plant and High Dam, respectively.

**TABLE IV-6**  
**INVESTMENT COSTS FOR SPECIAL EMPHASIS CITIES FOR**  
**GROWTH ENCOURAGEMENT**  
**(IN L.E. MILLIONS)**

SPECIAL EMPHASIS CITIES	INDUSTRY <sup>2</sup>			INTRA-URBAN <sup>3</sup> INFRASTRUCTURE			TOTAL INVESTMENT 1985 - 2000 INFRASTRUCTURE	
	1985	1991	1996	1985	1991	1996	Industry	Intra-Urban
	1990	1995	2000	1990	1995	2000		
<b>CANAL CITIES</b>								
Suez <sup>1</sup>	332	587	1190	291.2	344.0	454.8	2,109	1,090.0
Jobs (000)	51	87	158				296	
Ismailia	161	235	394	310.9	329.8	306.0	790	946.7
Jobs (000)	24	35	54				113	
Port Said	179	239	387	421.8	341.2	328.1	805	1,091.1
Jobs (000)	26	35.1	52				113	
<b>UPPER EGYPT</b>								
Naga Hamadi	67	103	158	44.6	45.3	49.9	328	139.8
Jobs (000)	9	14	20.9				44	
Qena	81	112	189	67.7	59.5	64.2	382	191.4
Jobs (000)	11	15.9	25				51.9	
Assiut	260	386	669	178.4	195.1	225.9	1,315	599.4
Jobs (000)	32	50	83				165	
Aswan	148	198	326	118.0	105.2	111.6	672	334.8
Jobs (000)	21	29	44				94.1	

1 Suez is discussed in Chapter IV, Section I.

2 Industry and Jobs include mining, manufacturing construction and services.

3 Intra-Urban Infrastructure from Estimate II standards, Estimate I standards are shown in Table V-24, Chapter V.

SOURCE: NUPS Analysis.

investment in each of the settlements are presented for the period between 1985 and 2000. The projected investments were made at five year intervals to reflect differences in costs per job and to take into account the substantial upgrading of existing industry and infrastructure which will be necessary for each of the respective settlements in the initial period. Table IV-7 presents the sum of investments required for each of the special emphasis cities during the planning period as well as their respective shares of overall national investment and increase in population. In Appendices IV-D to IV-G, a more complete discussion of development issues affecting Port Said, Ismailia, Assiut and Aswan has been presented.

#### F. Qena/Naga Hamadi

The Qena/Naga Hamadi settlement area was the subject of a special report on "Illustrative Development." The key findings of this study were meant to illustrate development issues and recommendations associated with implementation of the NUPS strategy of selective decentralization.

The following section focuses, in some detail, on the constraints presently confronting the implementation of the NUPS growth encouragement strategy for Upper Egypt. Then NUPS recommendations on interventions required to successfully carry out this implementation are described. The underlying ideas for both sections draw heavily from the Illustrative Development Project for Qena/Naga Hamadi. While this exercise addresses issues and proposes recommendations specific to the Qena/Naga Hamadi region, the NUPS team believes that this region is sufficiently representative of southern Upper Egypt that specific Qena/Naga Hamadi recommendations will be relevant to the development of other "special emphasis" settlements in Upper Egypt as well.

#### I. Specific Constraints on Development in Qena/Naga Hamadi

##### a. Industrial Constraints

- Large-scale industry in Qena/Naga Hamadi is currently limited to agricultural processing and the recently established aluminum plant near Naga Hamadi. Three public sector industries, including the spinning mill in Qena, the aluminum plant, and four sugar refineries (Naga Hamadi, Dishna, Gous and Armant) employ approximately 21,000 workers or almost 98 percent of total large-scale industrial employment in the region.
- Small-Scale industry in the region which is dispersed in rural, as well as urban areas, suffers from a number of problems. Small-scale industry is prevalent in the manufacture of bricks and tiles, hand weaving, furniture, mechanical workshops, and molasses syrup. Small-scale industries suffer from the following problems:
  - The shortage of skilled local workers.
  - The lack of credit and financial institutions responsive to local needs.
  - The deficiency in transport and marketing networks.

**TABLE IV-7**  
**SPECIAL EMPHASIS SETTLEMENTS FOR GROWTH ENCOURAGEMENT**  
**SHARE OF NATIONAL INCREASE IN URBAN POPULATION**  
**AND OVERALL INVESTMENT**  
**1985-2000**

SPECIAL EMPHASIS SETTLEMENT	PROJECTED YEAR 2000 POPULATION (000)	PERCENT SHARE OF URBAN POPULATION INCREASE <sup>1</sup> (%)	TOTAL INVESTMENT 1985-2000 (L.E. MILLIONS)	PERCENT SHARE OF URBAN INVESTMENT 1985-2000 <sup>2</sup> (%)	PER CAPITA INVESTMENT 1985-2000 <sup>3</sup> (L.E.)
<u>CANAL CITIES</u>					
- Suez	750-850	3.1	3,199.0	4.2	3,764
- Ismailia	400-500	1.5	1,736.7	2.3	3,473
- Port Said	550-650	1.5	1,896.1	2.5	2,917
<u>UPPER EGYPT</u>					
- Naga Hamadi	150-175	0.5	467.8	0.6	2,673
- Qena	175-225	0.7	573.4	0.8	2,548
- Assiut	550-600	1.8	1,914.4	2.5	3,191
- Aswan	400-450	1.5	1,006.9	1.5	2,237

<sup>1</sup> Total projected change between 1976 to 2000 in urban population is 20.9 million.

<sup>2</sup> Total urban investment between 1985-2000 is L.E. 75,510 millions.

<sup>3</sup> Per capita investments based on high population projection.

SOURCE: NUPS Analysis.

- The Government regulation of insurance for trainee and full-time employees.
- The social attitudes toward working women.
- The lack of incentives for small-scale industrial trainees who are usually offered relatively higher wages for non-skilled work in the agricultural sector.

b. Physical Constraints

● Planning

- With few exceptions urban development is occurring in a haphazard fashion along major transportation corridors and on the periphery of most built-up areas.
- Planning and development control tools such as maps and aerial photos are severely out-of-date or non-existent.
- Lack of an urban development strategy for future growth is resulting in losses of scarce arable land. These losses are particularly unnecessary due to the opportunity for desert development.
- Major new industrial and residential development sited on the desert plateau near Naga Hamadi is taking place in a self-contained way with little thought given to minimizing costs through the integration of infrastructure networks, housing and commercial facilities. A major aluminum smelting plant and a power substation have already been constructed and are in operation on the desert plateau. In addition, plans exist for a cement plant and a new community (El Salaam City) to be located in the same general area. Each is planned independently as self-contained entities. Presently, there exists no mechanism for planning the projects in an integrated fashion with a common set of housing and commercial facilities.

● Infrastructure Constraints

- The central cores of Qena and Naga Hamadi are fully saturated, thus, further population absorption is unlikely.
- New town proposals in Qena and Naga Hamadi are at very high standards and out of line with what households can afford to pay. (See the NUPS Tanta, Qena Naga Hamadi Illustrative Development Projects Report, 1982).
- The present design process for public housing and infrastructure leaves little opportunity to design for local climatic or site conditions or to take advantage of local building materials or techniques.
- Until recently, a major intra- and inter-regional infrastructure has been allowed to deteriorate due to inadequate maintenance. Inter-regional telecommunications are particularly inadequate.



- Urban systems for the provision of water and the disposal of sewage and solid waste have suffered from a period of neglect.

- Administrative Constraints

- There exists no planning framework, and limited capacity at the governorate level, to assist in the identification, and review, of projects to be planned and designed by central Government physical development and infrastructure ministries.
- There exists little capacity at the governorate level to effectively use the budget as a programming and planning tool in order to establish local council needs and to allocate limited local revenues on a predetermined priority basis.
- There exists a lack of middle level professionals and technicians with sufficient urban management skills.
- The committee headed by the Ministry of Agriculture's governorate department, in conjunction with the local council engineering departments, has had uneven success in preventing the illegal subdivision and development of agricultural land for building purposes.

## 2. Recommendations Aimed at Facilitating the Implementation of NUPS Growth Encouragement Strategy for Upper Egypt

This section presents the kinds of interventions required to implement the NUPS growth encouragement strategy.

### a. Long-Term Industrial Development Possibilities

Long term industrial growth for Upper Egypt is based on the following principles:

- Modernization of already existing industries.
- Expansion of the existing economic base through the attraction of new industries with backward and forward linkages wherever possible.
- Establishment of new regional industries on the basis of: (1) natural resources already exploited in the region, (2) the existing industrial base, (3) import substitution industries for the region. Some of the most important possibilities include the following industries:
  - Sugar based industries: Alternative uses of sugar cane baggase should be investigated. These might include the manufacture of paper pulp and wood fibre. This industrial use, in turn, could stimulate further uses such as furniture making and printing.
  - Building material products: The proposed cement plant could supply adequate quantities of cement for the production of a range of concrete products including concrete blocks, panels, pipe and tiles.

- Textile products: The existing spinning mill in Qena, in combination with the plans for future expansion, would support the establishment of a weaving mill which, in turn, could induce a local ready-made clothing industry.
- Metal products: Production from the aluminum plant could be used to establish aluminum-based industries. Such as the manufacture of hollow ware, die casting (valves, taps, window catches, locks and hinges), and aluminum extrusions (window and door sections).
- Animal feed stuffs: Local expansion of the Food Security program will necessitate the increased supply of animal feed stuffs. The availability of molasses from the sugar refineries, in combination with other additives, could provide increased and improved local production.
- Mining-based products: Mining activities in the area, especially along the Qena/Safaga road, could contribute to the manufacture of ceramics, pottery and tableware products.
- Agricultural: Agricultural equipment production could include the fabrication and assembly of light agricultural implements such as ploughs, seed and fertilizer drills, irrigation equipment, cultivators, and hand tools.
- Small Scale Industries: A successful industrial development strategy for the Qena/Naga Hamadi region should emphasize appropriate large-scale, capital intensive industries, as well as small-scale industries to generate sufficient employment opportunities.

Small-scale and service industries are mostly suited for products that serve local markets. The NUPS team identified certain small-scale industries that would have a potential to grow in the region:

- 1) Leather dying and footwear industries
- 2) Carpets and woolen mats
- 3) Canning of molasses syrup
- 4) Plastic bags, straps and containers
- 5) Confectionaries
- 6) Fabricated metal products (tin cans, hand and edge tools, enamel ware, and nuts and bolts)

The basic advantages of these types of industries are:

- 1) Ease of adoption to local market conditions
- 2) Relatively high job creation
- 3) Ability to provide productive channels for local savings

Strengthening the role of the small-scale industry in the region will initially require Government support. Possible incentives include:

- 1) Subsidization of on-the-job training in order as to compensate for differences in prevailing wage rates between the agricultor and the trainee's stipends.
  - 2) Modifications of the existing insurance laws to permit lower insurance payments on current employees and waiver of insurance payments for trainees for two years, rather than the current six month period.
  - 3) Allocation of special funds for long-term financing of small-scale industries.
  - 4) Tax exemptions for the first five years after an industry's start up.
  - 5) Provision of technical assistance to advise and help potential investors to define the most appropriate financing plan to start up a small-scale industry and to select locations with potential positive rates of return and cost advantages.
- Finally, in Upper Egypt it is proposed that the establishment of industrial estates should be considered. The provision of industrial estates could lead to agglomeration economies, to the minimization of public start-up capital, and to the control of future industrial growth. Furthermore, immediate steps should be taken to increase the supply of specific skilled workers. This could be accomplished through the more efficient use of local vocational training facilities and the reorientation of existing training programs to fit local needs.

b. Physical Development Recommendations

- In its capacity as the physical planning body in the Qena Governorate, the proposed planning unit (see following section) should obtain an up-to-date set of aerial photos (preferably at a scale of 1:5,000) of all existing and future development areas. It should oversee the preparation of topographic maps for Qena and Naga Hamadi and their surrounding districts. These maps will allow the planning unit to undertake its proposed physical planning role. The maps will also serve to map existing infrastructure, undertake accurate site planning, etc.
- Contingent upon the completion of the necessary mapping, and in coordination with the establishment of the proposed planning unit within the Governorate, the GOPP should undertake development plans for Qena and Naga Hamadi. In addition to specific sectoral recommendations for the two urban centers, the development plans would provide a framework for the planned physical growth of the cities and their surrounding districts.
- Given saturation and past deterioration of the central cores of most Upper Egypt cities, major upgrading is required. An assessment of existing and planned infrastructure services, such as the new sewerage system for Qena, needs to be undertaken and a package developed to serve old and new development

areas. Means should also be found to upgrade the existing housing stock, in addition to finding appropriate housing solutions regarding climate, local construction techniques and materials.

- Implementation of ongoing and proposed programs for upgrading and rehabilitating existing inter-regional transportation and telecommunications networks should be assured through the provision of adequate and timely investment.
- Programs for the upgrading extension or installation of new intra-urban infrastructure networks (water supply and sewerage) should continue to receive priority investment.

### c. Administrative Recommendations

- Establish Planning Framework to Guide and Control Physical Growth in Qena Governorate. The following recommendations are intended to establish the framework for controlling and guiding physical development in the Qena Governorate to the year 2000.

Major policy, planning and design responsibilities for economic planning and public finance, physical and industrial development and infrastructure, manpower and training, etc., should be maintained at the central government level. (See Chapter VII of the NUPS Final Report for recommended policy and planning changes at the national level.)

Within the Qena Governorate's Ministry of Development Department, a physical planning unit should be established whose scope would be to implement planning-related decisions taken by central level ministries and authorities. At the same time, the unit formally would represent local interests in the discussions leading to these centrally taken decisions. It would, thus, serve as a conduit which links central level physical plans and projects with local needs, customs and practices. In this capacity, the unit would:

- Work closely with the GOPP in the preparation of all physical planning for the Governorate.
  - Review all major infrastructure and public building designs and site locations.
  - Provide major guidance in the siting and preparation of development plans for public sector companies to be located in the Governorate.
  - Review and provide assistance to the local councils in the preparation of site plans for public facilities.
- The unit should also have sufficient social-economic and engineering capacity to survey existing service levels of physical infrastructure and programs, and to identify potential target groups for future programs. It should have sufficient technical capacity to undertake pre-feasibility studies for programs or projects proposed at the local

level. More specialized studies would, however, have to be conducted at the central level with local inputs.

Presently, adequate technical staff at the governorate level does not exist. However, this capacity could be developed by augmenting staff already in the governorate with staff having more specialized skills than are now available.

The existing and proposed development of the desert plateau south of the city of Naga Hamadi poses a particular challenge to central government implementation of the NUPS strategy: an excellent opportunity exists to examine the potential for controlling and guiding future growth in desert areas. The Qena/Naga Hamadi Illustrative Development Project presents five alternative administrative mechanisms, with their respective advantages and disadvantages, for addressing this particular problem issue. Regardless of which alternative administrative strategy is eventually selected, there presently exists a statutory measure which establishes a mechanism for introducing integrated planning into the desert plateau with a maximum of community participation.

Article 110-111 of Law No. 50 of 1981 concerning amendment of the Law of Local Government promulgated by the Decree of Law No. 43 of 1979 provides for establishing industrial zones in governorates which would be administered by a service committee reformation. The aluminum industrial zone could possibly be expanded to include Naga Hamadi, as well as the desert plateau and a service committee could then begin discussing the issues of integrated physical development in the area. In addition, such a committee could collaborate with the GOPP and the proposed planning unit to formulate and develop plans for the area. The professionals initially assigned to the planning unit could begin to participate in the discussions at an early date, and as capacity increases, take a greater leadership role within the committee.

- Reorientation of Functions of Governorate Economic Planning and Finance Offices

The central Planning and Finance Ministries, in addition to providing guidelines and special procedures to be used by local Government in developing budgets (mainly BABs 1 and 2), should begin to assist and train the Governorate Planning Office in the preparation of investment budgets (BAB 3). The Ministry should provide the Governorate Planning Office with rough estimates of the amount of capital investment funding to be made available by each ministry for budgeting of programs and projects at the local level. The present amount is very limited; currently in Qena Governorate, most ministries' budgeting takes place in Cairo with the local Economic Planning Office simply integrating final sectoral budgets into a single governorate document. Due to a lack of technical capacity at the local level, this practice should continue for the foreseeable future. However, minor changes which will lay the foundation for future local functional responsibility can begin to be made.

The limited investment resources available for local Government budgeting should be allocated among competing local Government units on the basis of pre-determined priorities. It is recommended that the Planning and Finance offices work closely with the Governorate ministerial departments to ensure that

locally proposed budgets, albeit limited, reflect the needs of the local units. Discussions should be held with the local units in order to prioritize project and program needs when it is apparent that sufficient resources are not available to cover all requests. The Economic Planning Office should consult with the proposed Physical Planning Office in order to identify and discover those major infrastructure projects earmarked for the Governorate which do not go through the normal governorate budgetary process. In addition, the proposed Physical Planning Unit will be able to assist the Economic Planning Office in the preparation of feasibility studies to justify investment in competing capital projects.

● Improve Technical and Managerial Capacity of Governorate Middle Management Staff

Additional skilled manpower, or at a minimum, the maintenance of present staff, will be required to establish the proposed Physical Planning Unit within the Governorate's Ministry of Development Department. The unit should include professionals with a planning orientation and backgrounds in engineering, architecture, sociology and economics. Based on the obvious dedication of the present Governorate department heads, most of whom are from Upper Egypt, an aggressive campaign should be organized to recruit the required professional talent for the Planning Unit from middle management professionals from Upper Egypt, but who are presently working in Government in other areas of Egypt. This recruitment program must be coupled with an attractive remuneration package which would offer top civil service grades, a special salary scale with incentive bonuses, housing, and transportation allowances.

The new directions indicated for the Governorate's Economic Planning and Finance Offices required training for certain technical, administrative and financial personnel, in order to substantially increase these offices capacity to effectively begin to use the budget as a planning and programming tool. No massive influx of new personnel is envisaged. Perhaps a few key people will have to be brought in to provide these offices with the new orientation.

The training program should emphasize management skills which would prepare the professional staff to undertake the following tasks:

- Survey functional capacity of all local government units in the Governorate.
- Collection, processing and analysis of baseline data; determine implications for future programming of current service levels of public facilities.
- Identification of local investment needs and services (determined in conjunction with local unit officials and professionals from the Planning Unit).
- Prioritization of needs within and between local government units.
- Rationalize allocation of governorate resources between competing local units.

- Initiation of up-to-date budgeting, bookkeeping, and auditing techniques.

As much as possible, the training envisaged should take place on-the-job and should be linked to similar type training being provided at the central Government Ministry of Planning, Finance and Economics. If the proposed reorientation in the Governorate's Economic Planning and Finance Offices is to be achieved, the training program requires sustained technical support at the local level.

- Strengthen the Governorate/Local Council Capacity to Prohibit Illegal Subdivision and Building on Agricultural Land

The following recommendations focus on rationalizing and strengthening local Government's procedures for controlling illegal land conversion and building within existing legal and administrative capacities:

- Coordinate activities between the Governorate's Agricultural Department and the various city councils in the issuance of building permits. Due to a lack of communication and coordination with the Ministry's Governorate Department, the city council Engineering Departments often issue building permits without the proper authorization (i.e., without Ministry of Agriculture approval to build on arable land). This practice can be curtailed by requiring that a person seeking a building permit present written approval from the Governorate's Agricultural Department stating that the piece of land in question has been legally subdivided or that the proposed dwelling will be the owner's sole home. The Agricultural Department's present staff is adequate to implement this recommended procedure. It should aid in reducing illegal subdivision of small parcels of land, at the same time legalizing what is technically illegal building.
- Strengthen specific enforcement procedures for Laws No. 59 of 1973 and 1978. The Governor should play an active role in ensuring that local courts act quickly when a complaint of illegal subdivision or building has been issued by the Governorate's Agricultural Department and impose the full penalty as called for in the law. If needed, the Governorate should be supplied with the necessary equipment to rapidly carry out a demolition order.

#### G. Development Issues In Special Emphasis Cities

In addition to the issues identified in the Qena/Naga Hamadi, study which are in most cases applicable to each of the special emphasis cities, a list of key issues regarding the others, based on analysis of these settlements included in respective appendices, is presented.

##### I. Key Development Issues Common to All Settlements:

- Emphasis on industrial investment which satisfies local demand but can be economically efficient in doing so.
- Need for significantly enhanced planning and development control capacity.

- Need for planning tools such as regular aerial photography and mapping.
  - Need for increased administrative and financial autonomy.
  - Need for much improved levels of infrastructure and communications.
2. Key Development Issues by Settlement for Special Emphasis Settlements Other than Qena/Naga Hamadi

#### Port Said

- Ability to reclaim land from Lake Manzala at economical costs is critical to reaching NUPS targets for employment population growth and future standards of development.
- Improved linkages with the northeast Delta are needed.
- The impact of the proposed port at Damietta on the growth of Port Said (as well as the rest of the Delta) should be reexamined.
- To date, the Port Said Free Zone has attracted primarily transit related development; means must be found to attract or create manufacturing establishments.
- Port Said, like the other Canal cities, is dependent on canals for water supply. Expected increases in demand need to be assessed in terms of their likely impact on the city's development.

#### Ismailia

- Like Port Said, Ismailia's future development will hinge on the availability of bulk water. Given high expected demands on the Sweetwater Canal for irrigation and urban development, regular assessments of water availability and management are needed.
- Ismailia's prospects for growth depend on its ability to become a major services center for the Canal Region, the eastern Delta, and its agricultural hinterland.
- Success in land reclamation in Ismailia's hinterland will greatly influence the city's potential as a regional service center.
- Imposition of development constraints for light manufacturing in the Delta is critical to Ismailia's potential in this sector. Agro-industrial potential is also related to success in land reclamation.

#### Assiut

- Assiut City currently has no equally attractive alternative for urban and industrial development other than the proposed site of El Shams City.
- The existing plans for El Shams City, however, will not accommodate a sufficiently large population nor employment base. Furthermore, standards



recommended by the study would drain available resources and benefit a relatively small population with respect to overall needs.

- Assiut City's existing industrial base needs strengthening as it is currently dominated by a single large industry. The focus of this industrial development should be agro-based industries.
- A master plan for the city is urgently required.

#### Aswan

- Aswan's potential as a regional service center and southern anchor for development depends largely on development of its region. These include mineral extraction, fishing (through improved management), tourism, and industry. An industrial focus should be on reducing imports of foodstuffs and full economic exploitation of available mineral water and energy resources.
- Special attention should be given to a full review of mineral extraction potential to identify economically exploitable resources, appropriate industries for the region, communications, and a city master plan.

### **III. DELTA GROWTH MANAGEMENT**

#### **A. Overview**

NUPS recommended strategy emphasizes the need to address the special growth management problems of the Delta -- a zone which has been seriously neglected in urban planning and overt urban policy design. The overwhelming size of Cairo and its associated service and management problems have diverted attention from the relatively uncontrolled growth of Delta cities and the substantial build-up of the corridors of Cairo/Benha, Tanta/Damanhour, Kafr El Dawar/Alexandria.

During the 1960-76 period, Delta Cities with over 50,000 population in 1976 grew more rapidly even than the Cairo Metropolitan Region (3.74 percent a year versus 3.67 percent a year). If this rate of growth for Delta Cities were to be maintained to the year 2000, their population in the year 2000 would be almost two and a half times their 1976 population. NUPS growth management strategy for the Delta, on the other hand, is designed to hold growth in the urban areas of the Delta to about 2.25 percent a year.

As shown in the NUPS "Interim Action Report," Delta Cities, in general, have no horizontal expansion possibilities except on arable land. Thus, it is essential to emphasize that the danger of losing prime agricultural land is especially severe in the Delta. The problem is amply illustrated in our special Illustrative Development Project on Tanta which shows that while Tanta's population grew by 39.6 thousand between 1972 and 1978, 446.5 feddans

of agricultural land became urbanized. That is, for every 1,000 new people in Tanta, 11.28 feddans were lost. Although it must be interpreted with caution, available Landsat data for eight Delta Cities showed an average loss of 10.7 feddans per 1,000 new population, indicating that Tanta's experience is fairly representative of the Delta generally. Cairo growth over the same period provides a useful contrast, since everyone is aware of the urbanization of arable land around Cairo. From data prepared for the "Long Range Urban Development Scheme for the Greater Cairo Region," the urbanized area of Cairo Metropolitan grew by 4,441 hectares during this period. Even if one assumes that all of this growth was on arable land (which substantially exaggerates arable land loss around Cairo), the land lost per 1,000 new population was 7.2 feddans or considerably less than the loss in the Delta.

The danger of prime land loss is exacerbated by the fact that the existing industry base and location of Delta Cities is such that they have substantial economic potential and, as is evident by the build-up along the Cairo-Alexandria Agricultural Road, are likely to be attractive as locations for industry unless such location is controlled. A major part of the solution to the Delta growth management problem, if there is to be one, must lie in encouraging out-migration of people from the Delta and finding alternative locations for types of industry which do not require a Delta location. The Cairo and Alexandria metropolitan regions (including closer-in satellite cities and New Towns), as well as Suez, provide alternative locations where there are opportunities to encourage growth on non-arable land. Thus, NUPS recommendations for major metropolitan growth should be seen as an essential element of a growth management strategy for the Delta.

This element of the strategy, however, needs to be supplemented by other Delta-specific elements. The NUPS Team sees a need for greater consolidation of regional service center activities in two, or at most three, Delta Cities rather than their duplication in all governorate capitals and other relatively large cities as a means of managing Delta growth. This is more likely to occur if the entire Delta is treated as a region for economic and physical development planning, which we also recommend. Such consolidation would tend to lead to greater scale economies in the provision of regional services and reduce population pressure in other Delta cities.

Since the Delta has been neglected in national urban planning, there is an immediate need to develop for each of the Delta cities the kind of data and analysis for land use and physical development planning that NUPS has undertaken for Tanta with the assistance of the Governorate and local planners. This analysis has demonstrated the value of a formal, publicly recognized procedure for adjusting city boundaries when necessary and the establishment of clear criteria for such proposals.

Given the urgency of the problem of arable land conversion, NUPS recommends a moratorium on all industrial, institutional and housing projects outside city boundaries. Exceptions should only be allowed if such projects are consistent with the recommended integrated economic and physical development regional plan. Industrial projects proposed for the Delta (even within city boundaries) should be examined to determine if there are alternative sites outside the Delta where they might be located without severe loss of profitability relative to a Delta location.

Since Tanta was the subject of the special NUPS Illustrative Development Project, the basic recommendations of that study are provided here to demonstrate the specific issues which need to be addressed in managing the growth of Delta Cities.

## B. Recommendations from NUPS Illustrative Development Strategy in Tanta

Tanta and its region were selected as a means of illustrating the site-specific implications of operating within the preferred NUPS spatial framework. The following recommendations, therefore, emphasize this site-specific bias. However, Tanta's specific role within an overall Delta Management strategy must also be taken into consideration. The NUPS strategy envisages that regional service center functions for the Delta will be consolidated in Tanta, and one or two other major urban centers. Consolidating these services into two or three urban areas will tend to reduce overall expenditures on infrastructure, assist in rationalizing the settlement hierarchy, and conserve arable land.

### I. Industrial Development

The basic issues of Tanta's industrial growth prospects is how to provide a sufficient number of new jobs to support population projections to the year 2000 and simultaneously minimize loss of arable land. The physical nature of the city imposes a constraint on industrial growth or expansion and highlights the necessity to adopt an industrial development strategy which limits development in agricultural areas to those services and industries which must necessarily be located in Tanta. Any industries to be located in Tanta should satisfy the following conditions:

- Be labor intensive
- Possess strong linkages with the agricultural and service sectors
- Have relatively low import content and high export potential
- Use primarily local raw materials and
- Have low land requirements per worker.

Based on these criteria, potential industries to be sited in Tanta can be classified under two groups: desirable and undesirable. It should be stressed that industries listed under the undesirable category are mostly land consuming and would serve a national market. These undesirable industries would probably be better located in other areas, mainly outside the Delta region.

#### DESIRABLE INDUSTRIES

Food Processing  
Textiles  
Ready-Made Clothes

#### UNDESIRABLE INDUSTRIES

Chemicals, Construction Materials  
Basic Iron and Steel  
Transport Equipment  
Electrical and Electronic Machinery  
Light Metallics (except in special cases)

Food processing and textiles are Tanta's traditional industries. They possess strong linkages with the agricultural sector and have low import content and

relatively high export potential. Short to medium-term actions should continue to strengthen these industries and improve their efficiency through new production techniques and skill training.

The success of any industrial development policy for Tanta requires that local authorities are able to provide attractive locations for new industries. (See following section). The study team realizes the difficulty in locating new sites for industrial growth. It is recommended that new sites be located both within the existing built-up area and in selected peripheral areas. Conversion of arable land needs to have strong justification whenever it is authorized. Furthermore, the efficient utilization of already existing and fenced warehouses for the open storage of grain and cotton should be encouraged. More compact storage facilities would release scarce peripheral land for industrial or other uses.

## 2. Physical Development

The Tanta Illustrative Development Project proposed an indicative physical development strategy for the city of Tanta and its surrounding hinterland for the period to the year 2000. This development strategy is based on the following underlying principles:

- Only where absolutely necessary will arable land be used for expansion of the city's built-up area.
- The use of arable land, including the provision of urban services at appropriate density levels, will be done in the most efficient way possible.
- Urban growth and consolidation should be governed by realistic land use planning.

The principal conclusions reached as a result of the analysis of existing physical development in Tanta include:

- Physical development both within and outside existing city boundaries is occurring in an uncontrolled and unplanned manner on arable land.
- A significant amount of the demand for well located peripheral sites on arable land comes from public sector users.
- Tanta would certainly not reach either the trend population or the NUPS year 2000 projected populations without major encroachment on agricultural land outside the city's boundary.
- Several small, strategically located villages in close proximity to Tanta's major transportation corridors are rapidly expanding their built-up areas on agricultural land.

The following recommendations are made for Tanta's physical development.

- a. Tanta's Existing City Boundaries Should be Extended to Include Sufficient Land to Accommodate Projected Year 2000 Populations and Specific Rapidly Growing Villages Located in Close Proximity to Tanta's Present Boundary.

The recommended boundary change, in conjunction with specific physical development directives, will provide for a more rational future growth of the Tanta region for the following reasons:

- Sufficient land area will be provided not only to accommodate Tanta's projected population, but also to meet the demand for institutional and industrial uses.
- Less Agricultural land will be lost due to induced higher density development within the expanded planning area.
- Allocation of scarce financial resources for public services will take place on a more efficient basis.
- The rapidly growing surrounding villages will be integrated within Tanta's built-up area in a planned manner.

b. Guidelines to Orient Tanta's Growth to the Year 2000 Should be Provided in Order to Encourage Vertical Densification of Existing Informal Peripheral Areas and to Plan for New Urban Extensions at Densities Which Will Make Efficient Use of Scarce Infrastructure Resources and Conserve Arable Land.

c. Specific Development Zones Should be Identified in Order to Accommodate Tanta's Projected Land Requirements to the Year 2000 in a Planned and Orderly Manner.

d. The Governorate's Redevelopment Project Should Address the Key Issues of Affordability and Landlord-Tenant Relations.

e. In Order to Provide the Time Required to Refine and/or Modify the Recommended NUPS Development Strategy, an Immediate Moratorium Should be Instituted on the Issuance of Any Building Permit (Residential or Industrial) for Construction Outside of Tanta's Existing 1942 Boundary.

The NUPS Team believes that Tanta's future development should take place within a well-defined planning area that can accommodate growth to the year 2000. The NUPS strategy meets this criterion. In order to provide sufficient lead-time to prepare the development strategy, a moratorium on all development outside the city limits is recommended. The moratorium should have a limited duration (say one year) to permit time for strategy development, but sufficiently short to force strategic choices to be expeditiously made.

### 3. Administrative Recommendations (See also Chapter VII, Section V.)

The Gharbia local Government structure has only recently begun to undertake the functions required for successful implementation of the NUPS Preferred Strategy for Tanta. While major policy decisions originate, and should continue to be formulated, at the central level in Cairo, the Gharbia Governorate has begun to play an increased role in the development of projects for physical infrastructure and public buildings. It has begun to take the lead in the physical planning of the small villages which surround Tanta. Furthermore, the Ministry of Planning's governorate office, working in close coordination with the Delta Regional Planning Authority, has initiated, albeit on a limited scale, planning and budgeting for certain sectoral capital

investment projects to be sited in the Governorate. Middle and upper level professionals and managers are usually from the Delta, with staffing problems not being nearly as severe as is the case with Qena and Naga Hamadi. One major area of concern to the NUPS team is the inability of the combined efforts of the Governorate and City Council to halt illegal development on agricultural land and to effectively plan for the future growth of Tanta and its surrounding villages. Certainly, limited local revenues remains a constant problem and a severe constraint to implementation of the NUPS strategy.

The major thrust of the administrative recommendations, therefore, focuses on strengthening specific Governorate functions presently in an embryonic stage, in addition to concentrating and prioritizing Governorate and City Council efforts in the areas of prohibiting illegal building and use of arable land building. Improvements to the region's administrative structure should further the following principles:

- Provide for a planned and orderly growth for Tanta through the efficient use of arable land scarce financial resources for public infrastructure.
- More fully integrate appropriate Governorate departments within the framework decisions which will continue to be taken at the national level, but whose implementation has spatial and economic implications for the local level.
- Reinforce city and village council participation in decisions being taken at the governorate level regarding the planning and budgeting of small-scale development projects.

The following points highlight what are believed to be the most critical administrative areas where intervention is necessary to implement a growth management strategy for Tanta to the year 2000. While in most areas the problem issues identified are specific to the Tanta region, the NUPS team believes that the recommendations are sufficiently general to be applicable to the other major urban areas in the Delta. Specific areas of recommendation include:

- Strengthen and expand the existing governorate physical planning capacity to undertake growth management planning for Tanta and its hinterland.
- Include the Delta Regional Planning Authority and the appropriate ministry of planning governorate offices as necessary participants in major infrastructure and industrial location decisions taken at the central Government level.
- Facilitate and strengthen governorate and city council capacity to implement and coordinate a physical development strategy for Tanta to the year 2000.

#### C. Recommendations for Mansoura

A single regional service center in the Delta would probably not be able to serve all the needs of the Delta settlements. Therefore, the NUPS Delta Growth Management strategy recommended development of one and possibly two other Delta settlements into regional service centers. Due to its existing

population base and its location in the northeastern portion of the Delta, Mansoura was selected as the second candidate for special emphasis. This selection was based on its current population base 257,900 in 1976 or the third largest settlement in the Delta after El Mahallu and Tanta, recent economic activities, and Mansoura's relatively high population absorption capacity within its 1976 settlement boundaries. Based on 1976 census data, Mansoura had a gross density of 104 persons per hectare. If the gross densities recommended for Tanta in the NUPS Tanta, Qena/Naga Hamadi Illustrative Development Projects Report (350 persons per hectare) were used to calculate Mansoura's population absorption capacity, an additional 616,000 persons could be added to its 1976 population without extending its 1976 boundaries onto arable land.

Like Tanta, Mansoura is also the location of a university serving a broad hinterland. Mansoura also has a higher level medical facilities including a medical faculty on its university and a university hospital providing specialized medical care. When the road between Mansoura and Port Said is completed, Mansoura will have good access to ports in Port Said and Alexandria. If the proposed port at Damietta is also constructed, it will also serve Mansoura.

NUPS has proposed a year 2000 population target for Mansoura of 550,000 and interim 1990-1995 targets of 400,000 and 471,000, respectively. To achieve these population targets, the NUPS Preferred Strategy allocated L.E. 784.0 million over the 1986-2000 period for direct investment in urban job creation. A further L.E. 946.7 million has been allocated for supporting intra-urban infrastructure investment in Mansoura.

Unlike Tanta, Mansoura has a major sister settlement, Talkha, across the Damietta Branch of the Nile. In 1976, Talkha had a population of 37,800, which when combined with Mansoura's population resulted in a total metropolitan population of 295,700. Functionally, the two settlements interact closely. Talkha has been the site of major industrial investment which provides employment for both populations. Mansoura is the capital of Dakahlia Governorate and, thus, provides higher level administrative services in addition to its other regional functions.

#### 1. Industrial Development

Mansoura's industrial structure is similar to that of Tanta in that employment is heavily concentrated in food processing and textiles. However, unlike Tanta, the Mansoura (Talkha) metropolitan area is the site of chemical industries, i.e., the Talkha Fertilizer Plant.

Future industrial growth in Mansoura (Talkha) should be centered in the Textile, food processing and clothing industries. Since investment has already occurred in the chemical industries, further expansion of the Talkha Fertilizer Plant may also be acceptable under the NUPS Delta growth management strategy. However, such investment should be carefully studied due to its likely contribution to arable land loss. Further, future industrial growth should be carefully sited in the Mansoura (Talkha) metropolitan area to ensure that future growth occurs in desirable locations.

Further, Mansoura (Talkha), is the site of a major electric power generation plant serving the northern Delta. Continued expansion of this plant needs to be studied in terms of not only electrical power generating efficiency, but also its impact on undesirable Delta industrial growth.

## 2. Physical Development

A physical development strategy similar to that developed for Tanta is needed to plan future urban growth for Mansoura, and its sister settlement Talkha across the Damietta branch of the Nile, and nearby surrounding villages. Such a study should identify core areas suitable for redevelopment, built-up zones capable of vertical expansion and zones where land-use efficient expansion of the built area should be permitted.

## 3. Administrative Recommendations

It is likely that many of the administrative recommendations made for Tanta and Gharbia Governorate may also be appropriate for Mansoura and Dekheila Governorates with some site specific modifications. Like the Gharbia Governorate, it is likely that staff capabilities in Dekheila Governorate are stronger than Upper Egypt, nevertheless, the capacity of governorate and local council staff to implement broader Delta growth management strategies needs to be reviewed.

## D. Summary

The NUPS Preferred Strategy addresses a specific set of development issues when dealing with Delta urban settlements. These include:

- Accommodating the projected urban population growth at higher densities within existing settlement boundaries while minimizing and managing future encroachment on arable land.
- Diversifying and expansion of the Delta's already strong economic base without encouraging uncontrolled growth.
- Improving and strengthening the regional service functions of the region's main urban centers.

The strategy focuses a concerted planning effort in several key cities -- Tanta, Mansoura, Mahalla -- to develop growth management techniques, to encourage more intensive use of land within the existing built-up area, to rationalize urban extension on to arable land where absolutely necessary, and to determine which industries can and should be encouraged to expand or start up in these areas.



## IV. REMOTE AREA DEVELOPMENT

### A. Introduction

The National Urban Policy Study has concluded that the remote areas consisting of the Red Sea, Matruh, New Valley, and North and South Sinai Governorates should not be expected to play a major role in accommodating future urban population by the Year 2000.<sup>11</sup> Opportunities for development are limited, resources (notably water) are scarce and investment costs are substantially higher than in other potential sites suitable for decentralization. However, the remote areas should not be ignored -- some investment and controlled development in these areas may lead to greater future potential for their expansion and help resolve critical deficiencies which may be faced by Egypt, as a whole, in the next century.

The strategy for development in the remote areas, thus, should be on high-payoff investment opportunities on a project-by project basis rather than full regional development programs (at any cost) to reach sizeable target population objectives. Nevertheless, NUPS proposes a general investment allocation which would permit current infrastructure to be moderately upgraded and enough direct investment for industry and services to result in slightly higher-than-trend population growth in these areas over the planning period (if projects are developed and implemented which are economically efficient).

Because of their current development constraints, the remote areas are locations in which it is desirable to investigate the use of innovative but carefully designed and controlled development techniques. These techniques may then, in turn, help overcome potential long term development constraints and needs for greater efficiency and conservation which will increasingly face Egypt as a whole. These include:

- Water resource management.
- Alternative communications.
- Agriculture and energy technologies.
- Climatically adapted settlement types.

During the National Urban Policy Study, alternative levels of urban population growth in the remote areas -- in the context of an overall settlement strategy -- were assessed. The range in population considered was between 270,000 to 1,300,000 by the year 2000. The urban population projection of 400,000 for the year 2000 which was adopted and costed in the NUPS Preferred Strategy was based on probable new project developments and the need to keep overall costs of

urbanization within feasible limits. It was also found, that in the next 20 years selective decentralization is more likely to be successful in other parts of the country (e.g., Southern Upper Egypt and the Canal area) rather than the remote areas.

In Figure IV-5, comparative estimates of development costs per 1,000 population for the settlement zones of North and South Upper Egypt, Cairo, Alexandria, and the Remote Areas are presented. The estimates are based on the range in development costs worked out for alternative settlement patterns assessed in the First and Second Round Alternatives Reports.

As Figure IV-5 indicates, the development costs for each new 1,000 population by the year 2000 in the remote areas is considerably higher than in Upper Egypt where alternative selective decentralization can also occur. To further illustrate what the high development costs in the remote areas mean, a hypothetical example is provided:

If all of the intra-urban and direct investment proposed by NUPS for the Cairo Metropolitan Region between 1985-2000 (to serve 16.5 million in 2000) were diverted instead to the Remote Areas, this would support a year 2000 population of not more than 2.6 million. That is, these funds could support in the Remote Areas, only 7 percent of the year 2000 urban population versus serving 45 percent in Cairo at the same cost. Furthermore, these figures exclude inter-urban investments in transportation, bulk water, telecommunications, and power, which would be very high in the Remote Areas if substantial urbanization were to occur.

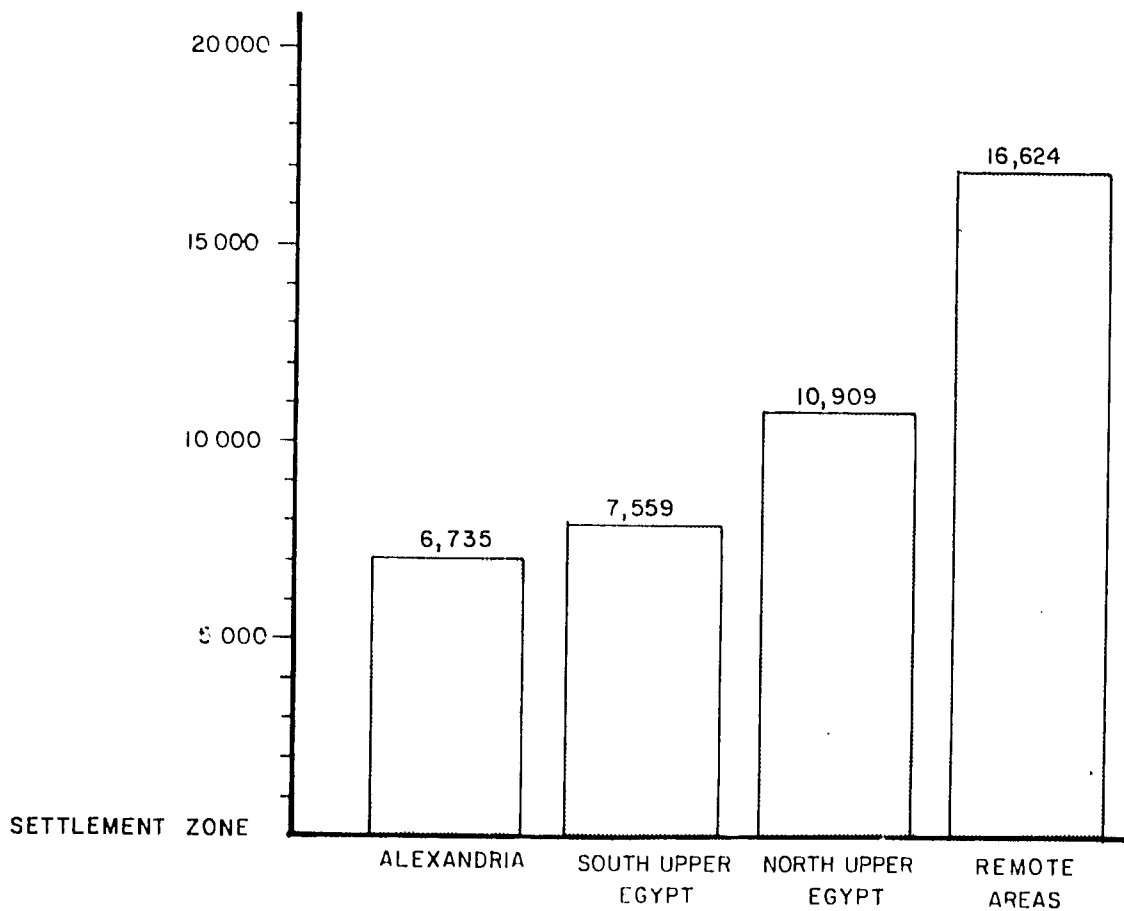
The preferred future settlement strategy aims, rather, at encouraging growth in the Special Emphasis Cities of Assiut, Qena/Naga Hamadi, and Aswan in Upper Egypt over the planning period of the study. NUPS assessments of these settlement areas have indicated that future growth can be accommodated in non-arable areas, thus, accomplishing one of the primary objectives of remote area development. To achieve selective and sustainable decentralization to Upper Egypt would, in itself, be a major accomplishment and will require a concerted and sustained effort. The experience gained, in turn, will be useful in longer term efforts in the remote areas if technological advancement makes substantial development there more feasible. Furthermore, the development of the Special Emphasis Cities in Upper Egypt will enhance the development prospects for both the Red Sea coast and Western Desert.

#### B. Urban Population Growth and Investment

In Table IV-8, projected urban population growth and levels of investment for the remote areas are presented. In general, population growth in the remote areas over the period 1976-2000, estimated at 4.12 percent per annum, will exceed natural rates of increase which are expected to average about 2.5 percent per annum over the planning period. Part of the growth is expected to result from former evacuees returning to the Sinai, though some net immigration is possible in the New Valley and the Red Sea in addition to the Sinai. Exploitation of

**COMPARATIVE ESTIMATES OF DEVELOPMENT COSTS  
PER 1,000 POPULATION IN ALEXANDRIA,  
UPPER EGYPT AND REMOTE AREA SETTLEMENT ZONES<sup>1</sup>  
(In L.E. Millions)**

DEVELOPMENT COST FOR EACH ADDITIONAL 1000 POPULATION (L.E. MILLIONS).



Based on previous cost and population estimates of NUP's Alternative Settlement. The costs shown are the costs as a function of population size.

**TABLE IV-8**  
**NUPS PREFERRED STRATEGY OF REMOTE AREAS PROJECTED URBAN POPULATION GROWTH AND INVESTMENT**

REMOTE AREA	URBAN POPULATION					INVESTMENT <sup>1</sup> 1985 - 2000							
	1976 (000)	2000 (000)	INCREASE 1976 2000 (000)	SHARE OF NATIONAL INCREASE (%)	ANNUAL GROWTH RATE 1976 - 2000 (%)	INDUSTRY		INTRA-URBAN INFRASTRUCTURE		TOTAL INDUSTRY AND INTRA-URBAN INFRASTRUCTURE		SHARE OF TOTAL URBAN INVESTMENT (%)	
						TOTAL (L.E. MILLIONS)	PER CAPITA <sup>1</sup> (L.E.)	TOTAL (L.E. MILLIONS)	PER CAPITA <sup>2</sup> (L.E.)	TOTAL (L.E. MILLIONS)	PER CAPITA (L.E.)		
Matruh <sup>2</sup>	51	90	39	0.11	2.39	78	3,545	275.1	12,504	353.1	16,050	0.46	
New Valley <sup>3</sup>	34.4	100	65.6	0.18	4.55	99	3,960	277.8	11,112	376.8	15,072	0.50	
Red Sea <sup>4</sup>	56.4	110	53.6	0.14	2.82	100	3,846	405.2	15,585	505.2	19,430	0.67	
Sinai	10	100	90	0.24	10.07 8.66 <sup>5</sup>	311	7,585	511.3	12,471	822.3	20,056	1.08	
TOTAL	151.8	400	248.2	0.67	4.12	588	5,158	1,468.4	12,890	2,057.4	18,047	2.71	

<sup>1</sup> Investment is for the period 1986-2000 only.

<sup>2</sup> Matruh urban population is for the settlement of Mersa Matruh as classified by the 1976 census.

<sup>3</sup> New Valley urban population is for Kharga and Dhakla/Mut according to the 1976 census.

<sup>4</sup> Red Sea urban population is for Ras Gharib, Ghardaka, Safaga and Qosair as shown in the 1976 census.

<sup>5</sup> Sinai urban population is based on the 1976 census urban population of El Arish. The year 2000 urban population is based partly on returning evacuees. The first growth rate (10.01%) is based on 1976 urban population while the second is based on an urban population in 1980 of 19,000.

Per capita investments are based on the 1986-2000 change in population.

SOURCE: - Red Sea Government Master Plan 1981

- Regional Plan for the Coastal Region of the Western Desert 1976

- Sinai Development Study, Phase I 1982

phosphates and other minerals in the New Valley and Red Sea, as well as a build up of the port and industry in Safaga, in particular, will lead to these developments. Matruh, on the other hand is expected to be largely dependent on tourism and will have a largely seasonal population and workforce. Also, though New Ameriyah City (which may have a population on the order of 84-137 thousand by the year 2000) is part of Matruh Governorate, it has been considered as part of Metropolitan Alexandria for the purpose of this report.

It should be noted that although the projected population increase in the remote areas is less than one percent of the total expected increase in urban population (14.5 million) between the year 1985 and 2000, the remote areas share of total job creation and intra-urban investment between 1985-2000 amounts to about 2.7 percent. This is due to the relatively higher cost of job creation and infrastructure in these areas.

### C. NUPS and Remote Area Master Plan Targets

In Table IV-9, a comparison is made between NUPS and Remote Area Master Plan projections for population in the year 2000 and projected investment between 1985-2000. Master plans currently do not exist for the New Valley and the Sinai,<sup>12</sup> but data from the Red Sea and Matruh master plans and the most recent Sinai Development Study data available to the NUPS Team is presented.

Proposed master plan investments for Matruh and the Red Sea, as well as the Sinai proposals, are significantly higher than those proposed by NUPS and represent a higher share of total national investment. Based on the previous findings of NUPS alternative settlement strategies, an inordinately high share of national investment such as those proposed by the master plans could lead to deficits in jobs and infrastructure in other parts of the settlement system. Consequently, the levels of population growth and investments proposed by NUPS are less risky in terms of achieving population targets and avoidance of losses associated with financing under-utilized investments.

The most recent information available to the NUPS Team on the Sinai, is the current draft recommendation of a preferred strategy for the Sinai prepared by Dames and Moore. This calls for a projected year 2000 population of 423,000 (an increase of 293,000 over their estimated current population of the entire Sinai: 130,000). They have estimated the investment costs shown in Table IV-10 for industry and tourism to reach these targets.

An additional cost of L.E. 388 million for intra-urban infrastructure is estimated by the study. Thus, total estimated direct job investment and settlement infrastructure costs are L.E. 3,766 million. If this recommendation were to be followed, the above costs would equal 4.7-5.0 percent of the total amount NUPS recommends for all urban investment in these cost categories and would serve (if planned population targets are met) only about 1 percent of the year 2000 urban population.

Corresponding information on investments in job creation and infrastructure for the Red Sea and Matruh are shown in Tables IV-11 and IV-12a and b.

**TABLE IV-9**  
**COMPARISON OF NUPS AND MASTER PLAN PROJECTIONS OF POPULATION AND INVESTMENT**  
**FOR URBAN DEVELOPMENT IN THE REMOTE AREAS**

REMOTE AREAS	NUPS PROJECTIONS						MASTER PLAN PROJECTIONS					
	URBAN POPULATION	SHARE OF URBAN POPULATION IN 2000	INVESTMENT (1986 - 2000)			SHARE OF NATIONAL INVESTMENT <sup>4</sup>	URBAN POPULATION	SHARE OF URBAN POPULATION IN 2000	INDUSTRY	INFRA- STRUCTURE	TOTAL	SHARE OF NATIONAL INVESTMENT <sup>4</sup>
			INDUSTRY	INFRA- STRUCTURE	TOTAL							
(000's)	(%)				(%)	(000's)	(%)				(%)	
<b>MATRUH<sup>1</sup></b>	90	0.24					608	1.64				
Total (L.E. Millions)			78	275.1	353.1	0.34			2,770	915	3,685	3.50
Per Capita (L.E.)			867	3,057	3,423				4,556	1,504	6,061	
<b>RED SEA<sup>2</sup></b>	110	0.30					515	1.39				
Total (L.E. Millions)			100	405.2	505.2	0.49			2,618	3,022	5,640	5.40
Per Capita (L.E.)			909	3,684	4,593				5,083	5,868	10,951	
<b>SINAI<sup>3</sup></b>	100	0.27					326.7	1.20				
Total (L.E. Millions)			311	511.3	822.3	0.79			862	388	1,250	1.05
Per Capita (L.E.)			3,110	5,113	8,223				2,638	1,187	3,826	
<b>NEW VALLEY</b>	100	0.27					No master plan projections prepared					
Total (L.E. Millions)			99	277.8	376.8	0.36						
Per Capita (L.E.)			990	2,778	3,768							

<sup>1</sup> From the regional Plan for the Coastal Region of the Western Desert, 1976. The total projections population for the region prepared by the Regional Plan was 781,000 by 2000. Investment is for the period 1986 - 2000.

<sup>2</sup> From the Red Sea Governorate Regional Plan, 1980 (Main Volume), p. 241. The total Regional Plan projected population for the year 2005 was 700,000. Master Plan Investment is measured against the 1986 - 2000 NUPS total national investment since implementation of the plan has not begun as projected by the Regional Plan.

<sup>3</sup> From the Sinai Development Study, Phase I. Draft Final Report, Vol. 1, Main Report, pp. 4-25 and 5-15. The total Sinai Study year 2000 projected population is 426,000. Note Master Plan Investments reflect the period 1982-2000 since urban infrastructure investments are not disaggregated. Master plan total investments are shown against NUPS total investment for the period 1982-2000 even though implementation has not begun of the master plan.

<sup>4</sup> Refers to the NUPS total urban resource pool projected to be available for urban investment or during the 1986-2000 period L.E. 104 billion; and 1982-2000 period, L.E. 119.5 billion.

SOURCE: Remote Area Master Plans and Studies as indicated in footnotes 1 - 4; and NUPS Analysis.

**TABLE IV-10**  
**SINAI DEVELOPMENT STUDY PROPOSED INDUSTRIAL AND**  
**TOURISM INVESTMENT AND EMPLOYMENT**

	INVESTMENT (L.E. MILLION)	EMPLOYMENT	COST/JOB
<u>Industry</u>			
Total	3,133	30,000	104,433
Excluding Refining/ Chemicals	617	23,000	26,826
<u>Tourism</u>			
Total	<u>245</u> 3,378	<u>11,000</u> 41,000	22,272 82,390
Excluding Refining/ Chemicals	862	52,440	16,437

SOURCE: Sinai Development Study, Phase I. Draft Final Report Vol. I Main Report. Prepared for the Advisory Committee for Reconstruction, Ministry of Development by Dames and Moore's Center for International Development and Technology, April 1982. Pp. 75-15 and 6-7. (Covers the period 1982-2000).

**TABLE IV-11**  
**PROJECT INVESTMENTS PROPOSED IN**  
**RED SEA GOVERNORATE REGIONAL PLAN**

	INVESTMENT <sup>1</sup> 1981-2005 (L.F. MILLION)	EMPLOYMENT 1981-2005	COST/JOB
Fisheries/aquaculture	31.4	4,108 <sup>2</sup>	7,644
Industry	2,230.5	24,470 <sup>3</sup>	93,700 <sup>3</sup>
Mines	189.9 <sup>4</sup>	100,000 <sup>4</sup>	1,899
Oil and Gas	N/A		
Tourism	166.4	5,820 <sup>5</sup>	28,591
Sub Total	2,428.3	34,398	70,594 <sup>5</sup>
Towns	2,060		
Energy	160.5		
Roads	268.7		
Railways	10.5		
Airports	13.5		
Ports	22.5		
Telecommunications	9.9		
Agriculture	179.4		
Animal Husbandry	24.9		
Water Supply	271.9		
Sub Total	3,021.9		
Grand Total	5,640.1		

<sup>1</sup> From Page 241 of Main Report, Red Sea Governorate Regional Plan, 1980.

<sup>2</sup> Ibid, pp. 128 and 133.

<sup>3</sup> Ibid, p. 156.

<sup>4</sup> Ibid, p. 142, but basis not clear; therefore not included in total employment or investment in calculating overall cost/job.

<sup>5</sup> Ibid, pp. 167 and 169

SOURCE: Red Sea Governorate Regional Plan, 1980.



EXPLANATORY NOTES TO TABLE IV-11

1. *Population forecasts for the year 2000 are those of the Wastewater Master Plan Update conducted in 1980-1981. Residential areas for central "kisms" are those determined by the Wastewater Master Plan conducted in 1978. As there is no room for expansion within the urbanized central "kisms", these areas were used to calculate indicative residential densities for the year 2000.*
2. *As the Wastewater Master Plan Update Study did not disaggregate data for Abu Kir and the rest of Montazah, 1976 data for Abu Kir as determined by the Wastewater Master Plan Study, has been projected at the same annual rate of growth as the whole of Montazah.*
3. *Montazah forecasts are those based on the Wastewater Master Plan Update minus the projected population of Abu Kir as described in Note 2.*
4. *The population of New Ameriyah City was projected at 390,000 in year 20 or 2000, by year 25 or 2005 it was targeted to have a population of 510,000.*
5. *Idku's population of 160,000 for the year 2000 is based on a growth rate of 4 percent per annum.*
6. *New Ameriyah's year 2000 population of 137,000 is based on a year 1985 population of 25,000 and an annual growth rate of 12 percent between 1985 and 2000.*

**TABLE IV-12a**  
**INDUSTRIAL INVESTMENT AND EMPLOYMENT PROJECTIONS OF**  
**THE REGIONAL PLAN FOR THE**  
**COASTAL REGION OF THE WESTERN DESERT (MATRUH)**

TYPE OF INDUSTRY <sup>2</sup>	INVESTMENT 1980-2000 (L.E. MILLION)		ADDITIONAL EMPLOYMENT 1980-2000	COST PER	COST PER
	1976 COSTS <sup>4</sup>	1979 COSTS <sup>5</sup>		JOB 1976 COSTS (L.E. 000's)	JOB 1979 <sup>5</sup> COSTS (L.E. 000's)
Refinery	670	1,019.0	2,400	279.2	424.6
Chemical based Industry	600	912.5	7,000	85.7	130.3
Light Chemical Industry	21	31.9	2,300	9.1	13.8
Building materials	53	80.6	2,250	23.6	35.9
Food and beverages	13	19.8	2,000	6.5	9.9
Metalllectro Industry	100	152.1	15,500	6.5	9.9
Clothing and leather	8.3	12.6	4,300	1.9	2.9
Woodworking	2.5	3.8	900	2.8	4.3
Printing	7	10.7	900	7.8	11.9
Sub Total	1,474.8	2,243.0	37,550	39.3	59.8
Agro-Industries <sup>3</sup>	45.3	68.9	5,900	7.7	11.7
Tourism	301.5	458.5	24,884	12.1	18.4
Sub Total	346.8	527.4	30,784	N.A.	N.A.
TOTAL	1,821.6	2,770.4	68,334	26.7	40.5

Notes: In the Regional Plan, services are to account for 103,700 jobs (Table 4.B.02 Main Report), Agro-Industry 5,900 jobs (Table 3.C.01) and Textiles 2,000 jobs (Table 7.1 Vol IV).

- 1 From Tables 7.1 and 7.2 Vol. IV, Annex 5, Regional Plan for the Coastal Zone of the Western Desert, 1976, ILACO.
- 2 Excludes hotels, public utilities, mining and quarrying, and services.
- 3 The agro-Industry Investments and employment are dependent on additional agricultural investments on the order of L.E. 157.8 million not included the table figures.
- 4 1976 costs from the Regional Plan.
- 5 1976 costs updated by 15 percent annually to 1979.

SOURCE: Regional Plan for the Coastal Zone of the Western Desert, 1976, ILACO; and NUPS Analysis.

**TABLE IV-12b**  
**INTRA-URBAN INFRASTRUCTURE INVESTMENT AS PROJECTED**  
**BY THE REGIONAL PLAN FOR THE COASTAL REGION**  
**OF THE WESTERN DESERT (MATRUH)**

TYPE OF INFRASTRUCTURE <sup>1</sup>	INVESTMENT		SOURCE: ALL DATA FROM MAIN REPORT VOLUME I
	1976 COST <sup>1</sup>	1979 COSTS	
- Housing and physical Infrastructure <sup>2</sup>	442.90	673.60	(Table 3.G.03) <sup>3</sup>
- Telecommunications and postal services	12.20	28.60	(Table 3 H.06)
- Urban power transmission	19.70	30.00	(Table 3.I.01)
- Sewage systems	41.30	62.80	(p. 154)
- Water supply system	51.30	78.00	(Table 3.J.03 Urban only)
- Health	8.80	13.40	(page 155 para. L.25) <sup>4</sup>
- Education	22.30	33.90	(page 162 para. L.25) <sup>4</sup>
- Social welfare	3.12	4.75	(page 164 para. M.05) <sup>4</sup>
<b>TOTAL</b>	<b>601.62</b>	<b>915.05</b>	

<sup>1</sup> Inter-urban Infrastructure costs excluded, note all costs based on high urban population estimate of 608,000 in year 2000. The time covered by the plan was the 1976-2000 period. However, since many of the projects proposed by the plan for early periods have not occurred total regional costs have been assumed to be phased during the NUPS 1986-2000 period.

<sup>2</sup> Includes housing, site preparation, local water, sewage, road and electrical networks, public buildings, mosques and recreation facilities. Does not include major network facilities nor schools, hospitals, or telecommunications.

<sup>3</sup> From Table 3.G.03 Main Report. 74,700 urban units are to be provided by the public sector and 9,600 by the private sector as no cost data was provided for private sector, L.E. 3,012 cost of public unit was used as proxy. In addition, land servicing costs and public buildings added as indicated.

<sup>4</sup> As urban costs for health, education, and social welfare were not indicated, the urban population ratio of 78 percent was applied to given values.

SOURCE: Regional Plan for the Coastal Zone of the Western Desert, 1976, ILACO; and NUPS Analysis.

#### D. Development Constraints and Potential

The primary development constraint in the remote areas is the scarcity of water; a problem which will be compounded as future demands for bulk water increase in other parts of the country and the Nile's carrying capacity is approached.

Of the remote areas, the Sinai and New Valley currently are not supplied by water pipelines from the Nile — and all areas rely on groundwater which is often brackish and saline. The New Valley oases currently have the most plentiful groundwater supplies but there are indications that its ground water resources are recharging less rapidly than the rate of withdrawal. As a consequence, though NUPS expects that sufficient irrigation to support moderate population growth appears feasible, no large urban population is expected by the year 2000.<sup>13</sup>

A pipeline is under consideration to serve the northern Sinai and a canal was proposed to serve Matruh by the Regional Master Plan to supplement the existing pipeline. These proposals are intended to permit major urbanization and land reclamation for agricultural purposes. Though these proposals are technically feasible, they are costly and must be considered in terms of the future carrying capacity of the Nile and likely net benefits in terms of population served. None of the master plans for the Canal Regions, for example, proposed land reclamation in the Sinai until after 1990 and noted that further feasibility studies were required. Further, the Ministry of Irrigation's National Water Master Plan recommended that the most favorable cases for large scale land reclamation in Sinai using Nile water were for areas close to Ismailia and east of the Suez Canal near Suez City. The plan ranked other projects relying on major new canals such as the proposed El Salaam Canal very poorly in comparison to other reclamation projects in Egypt planning to use Nile Water.<sup>14</sup> Thus, partially based on this assessment of Nile water usage, the recommended strategy of the Sinai Development Study proposed modest reclamation programs relatively close to existing Nile water sources and well water and rainfed reclamation based on new irrigation technologies in other areas.

According to studies published in 1981 by Haynes and Whittington, the Nile is likely to reach its carrying in the 1990's at current levels of consumption and population growth.<sup>15</sup> Furthermore, the study concluded that ongoing large scale projects in the Sudan will only postpone probable deficits in Egypt for about 5 to 10 years. Thus, there is an increasing need to conserve, recycle, and manage Egypt's water resources.

As the remote areas are already coping with severe water resource constraints, they are an ideal arena for initial efforts to introduce innovative practices in water management, pricing, and conservation. It is recommended that water authorities be established in the remote areas to maximize the use of available resources. The Sinai is an appropriate area in which to begin initial efforts in allocating and pricing groundwater supplies as rainfall in this area averages about 2 million cubic meters annually, but only about one-quarter is said to be used.

Opportunities to increase water resources through desalination have met with limited success in Egypt. There is a plant in Matruh, but it is presently functioning at only 25 percent of design capacity due to management and maintenance problems. However, it is conceivable that in the future, natural gas and solar energy could be used to operate both large and small programs in remote areas. Also,

as the government is committed to developing nuclear energy alternatives, the siting of these projects in remote areas could be used for large scale desalination (i.e., at Zaafarana).<sup>16</sup>

Related to water resources, are possible gains in agriculture to permit urban settlement. Suitable, but not necessarily excellent, soil conditions have been found in parts of each of the remote areas. However, those identified in the Red Sea Governorate would, in fact, be extensions of the Nile Valley and result in greater settlement there rather than on the coast. No soil in the Sinai is classified above Class III, suggesting limited reclamation efforts which can be supported by available groundwater.

Given the high levels of water consumption associated with traditional agricultural irrigation techniques, it is suggested that other more sophisticated means be developed for agricultural production in the remote areas. These include: drip and sprinkler irrigation and, possibly, hydroponics.

So far, sophisticated methods have not met with much success in Egypt due to operation and maintenance requirements. However, carefully designed and controlled projects using these techniques are possible and success in their use has been demonstrated in the United States and elsewhere. Initial efforts should be kept small and carefully organized with sustained training in operation and maintenance. The Matruh region is suggested as an appropriate region for test projects as less heat stress may be expected and adequate supplies of water can be guaranteed by the existing pipeline for small-scale efforts. The Sinai, may also be appropriate for initial programs.

Presently, there does not appear to be vast deposits of mineral resources in the remote areas which will lead to major increases in employment during the planning period. Furthermore, mining generally provides a relatively weak base for urbanization. However, full mineral surveys for these areas are currently either incomplete or non-existent. The key sector, in production to date, is the petroleum industry which is predominantly located in the Red Sea area (in parts of the Red Sea and Sinai Governorates). Less important exploitation exists in the western desert (south of the Matruh Region.) Where new finds have recently been reported. Petroleum production is not labor intensive and refineries and petroleum related industries have been located primarily in Suez, Cairo, and Alexandria. Finally, through no detailed data on petroleum exploration and possible new production is available to the Study Team, concern has been expressed that existing reserves may be depleted by the year 2000.

Phosphates exist in large quantities in the New Valley and Red Sea Governorates and a new rail facility is being implemented between Abu Tartour and Safaga which will facilitate their exploitation. However, at the present time, international prospects for exportation do not look good; phosphates can be more easily exploited in countries such as Morocco and Saudi Arabia and in the past few years prices have dropped sharply. Thus, domestic requirements are the only guaranteed market.

Coal, kaoline, gypsum, manganese and other mineral deposits exist in the Sinai, but not in sufficient quantities to justify basing the long-term strategy on mining and mineral processing. The Sinai Development Strategy team,

however, suggest investing about 10 percent of total industrial investment in these activities. In the Red Sea Governorate, most of the mineral deposits between Qena and Aswan are in proximity to the Nile Valley. Exploitation of resources of medium value such as non-ferrous metals and uranium will need to depend on shared infrastructure to justify required investments. Due to the vastness and topography of the territory and high development costs, infrastructure should be carefully sited in order to support a broad range of projects. Low value resources such as gravel, clay, marble, asbestos and sulphur will most likely continue to be employed as raw materials for regional infrastructure and local industries. No major mineral deposits, other than low value resources for construction, are known to exist in the Matruh region. Little data is available on the New Valley other than that regarding phosphates.<sup>17</sup>

Comprehensive surveys and technical and economic feasibility studies are required to evaluate the potential of mineral exploitation in the remote areas. As pointed out earlier, emphasis should be given to high pay-off projects but the nature of these developments are not likely to result in major urbanization -- industrial processing and related industries will still be more feasible in cities designated for special emphasis due to their higher levels of infrastructure, availability of water and energy, and proximity to labor and markets.

Major infrastructure projects, including upgrading the Port of Safaga, construction of the Abu Tartour/Safaga railway line, tunnels to the Sinai, etc., are either underway or planned to serve the remote areas and a major international airport is planned west of Alexandria in Matruh. In addition, basic improvements to existing infrastructure including transportation, water supply, energy, telecommunications and social infrastructure are planned and being implemented. NUPS investment proposals are designed to supplement ongoing efforts to moderately upgrade these facilities with particular emphasis on social infrastructure.

The problem of isolation and lack of communications is most severely felt in the remote areas, though all of Egypt currently suffers from this problem. Telecommunications standards proposed by NUPS will increase national urban line densities from 1 line per 100 population currently to 9 by the year 2000. However, immobile exchanges do not really lend themselves to the remote regions due to the likelihood that mineral exploration and exploitation are likely to be scattered throughout the vastness of the territories. Radio communications, initially (currently governed by the military), and eventually portable telephones (possibly on the market by 1983-1984) using microwave relays and/or communications satellites will help in this regard. In addition, radio and television broadcasts (eventually closed circuit) could be used effectively for education and health purposes. The area deemed most suitable for experimentation in these fields is the Red Sea Governorate due to ongoing shipping, trucking and resource exploitation.

Energy opportunities in the remote areas currently revolve around petroleum and natural gas. Coal deposits in the Sinai could fuel a power plant for generating electricity and solar energy opportunities are being investigated. Large scale nuclear power plants are under consideration for the northwest coast and along the Gulf of Suez. Wind and waves could be harnessed for productive uses. However, the technologies available for many of these uses are best suited to small scale

applications due to their costs relative to more conventional sources, as shown in Table IV-13.

In the long run, when fuel costs are higher, solar energy (now too expensive for widespread practical use) should be feasible for some practical applications. As a consequence, the sunny remote areas of Egypt offer distinct opportunities in this respect. Small scale operations could meet a variety of needs in remote settlements. The most immediate prospects for solar energy experiments appear to be in the Matruh and Sinai regions, though the concept is generally applicable to the other regions as well. Windmills offer potential for practical energy application on a small scale. Although windmills were experimented with on the Northwest Coast, they fell into disrepair as electrical pumps and the pipeline were installed.

With the exception of northern coastal areas in Matruh and the Sinai, environmental conditions in the remote areas are harsh throughout most of the year. Aridity is high and average temperatures are several degrees centigrade higher than in Cairo and the Delta. Thus, there is a need for comfort and convenience in remote area human settlements if the population is to be stabilized and specialized labor is to be attracted. Trends in "modern" structures requiring large amounts of energy (i.e., air conditioning) for cooling and humidity are inappropriate to these regions. Rather, experimental construction techniques which meet the specific requirements of their users need to be developed. Demonstration projects for housing, public buildings and schools using innovative techniques could easily be undertaken as alternatives to ongoing methods of construction currently in use and help sway public opinion and attitudes to change. Projects of this nature are equally applicable to each of the remote areas. Architect Hassan Fathy has been internationally recognized for years as a proponent of this type of indigenous architecture. His work could serve as a departure point for further housing prototypes.

### I. Industry

Proposals for industrial development programs have been suggested for the Red Sea, the Sinai and Matruh Governorates. The Red Sea Governorate Regional Plan notes that the primary constraints for industrial development in the region are the lack of water and high costs of supply, the shortage and high costs of labor, lack of cheap energy, remoteness of markets and the current military status of the zone. It emphasized the availability of resources, port facility potentials, and linkages with the Nile Valley as its key advantages. Prior to the Red Sea plan, a steel plant was suggested for Safaga and the plan suggested some spin off industry if the plant is built. However, there does not appear to be a strong economic justification for such a plant; raw materials would have to be transported from abroad and steel plants exist or are proposed in other locations in Egypt (e.g., Dekheila, Helwan, Sadat City). Furthermore, steel industries worldwide are suffering from serious economic difficulties.

The other principal industries recommended by the Red Sea plan include fish processing, building materials, chemicals (from phosphates), petro-chemicals (from Suez outputs), and a flour mill. The tourism industry is suggested for major expansion by the plan; 1,200 beds are proposed by 1985 and 5,700 by the year 2000. The plan aims at both domestic and international markets searching for "alternatives" to traditional Nile Valley tourism with emphasis

**TABLE IV-13**  
**COMPARATIVE COSTS OF FUEL PRODUCTION 1980 PRICES**

PRODUCTION COST \$/BARREL OF OIL EQUIVALENT	FUEL TECHNOLOGIES	GENERATION COST IN CENTS PER Kwh	ELECTRICITY TECHNOLOGIES
86 and above	<ul style="list-style-type: none"> <li>- Corn to ethanol</li> <li>- Wood to high-BTU gas</li> <li>- Manure to high-BTU gas</li> </ul>	8.1 and above	<ul style="list-style-type: none"> <li>- Solar, thermal</li> <li>- Wind</li> <li>- Ocean thermal energy conversion</li> <li>- Solar photovoltaic</li> </ul>
58-85	<ul style="list-style-type: none"> <li>- Coal to methanol</li> <li>- Coal gasification, high BTU gas</li> </ul>	6.6-8.0	<ul style="list-style-type: none"> <li>- Biomass (wood chip fuel)</li> <li>- Combined cycle, integrated coal gasification</li> </ul>
31-55	<ul style="list-style-type: none"> <li>- Sugar to alcohol</li> <li>- Wood to ethanol</li> <li>- Coal gasification, medium BTU gas</li> <li>- Coal liquefaction</li> <li>- Wood to methanol</li> <li>- Light Arabian crude</li> </ul>	4.1-6.5	<ul style="list-style-type: none"> <li>- Conventional oil fired plant</li> <li>- Breeder reactor</li> <li>- Fluidized bed combustion</li> </ul>
30 and under	<ul style="list-style-type: none"> <li>- Liquid natural gas</li> <li>- Oil sands and shales</li> <li>- Natural gas</li> <li>- Coal</li> </ul>	4.0 and under	<ul style="list-style-type: none"> <li>- Hydroelectricity</li> <li>- Conventional natural gas fired plant</li> <li>- Conventional coal-fired plant</li> <li>- Geothermal, steam</li> <li>- Nuclear, light water reactor</li> </ul>

SOURCE: The Economist, December 28, 1981.



on beach, fishing, and underwater activities. However, the specialized nature of these proposals would probably not justify more than 1,500 new beds by 1990 according to the National plan for tourism.

The industrial strategy which has been suggested for the Sinai aims at satisfying the local regional market, mining and mineral processing, and very substantial investment in refinery and chemical industries. Table IV-14 shows the proposed distribution of investment and employment by sector.

As indicated earlier, the absolute investment costs per job in this strategy are extremely high relative to alternative locations in Egypt. Furthermore, the strategy's success depends on achieving a very high and probably overly optimistic participation of foreign investment (65 percent overall). Though NUPS also recommends focussing industrialization on meeting local demand for industrial products, expected targets should include only those industries with sufficiently high economic returns to attract Egyptian private, and foreign investors.

The Master Plan for the northwest Coast (Matruh) noted that the region "is not endowed with potential for rapid industrialization." The only industry in place at the time was two gypsum plants for the manufacture of plaster. The plan recommended chemicals, food and beverages, clothing and leather, metal-electro industries, textiles, and mining and quarrying as the principal industries, as well as agro-industries based on reclamation efforts.

A key proposal of the Northwest Coast plan is tourism development. The plan aims at both international and domestic markets with emphasis on large and small holiday resorts with a capacity ranging between 7,000 and 10,000 beds by the year 2000 (excluding bungalows and urban facilities). The National Plan for Tourism, however, noted that the high costs of infrastructure and construction, the short season (six months), and strong competition from other Mediterranean countries will likely result in low returns and weak occupancy from the international sector. Only about 1,500 beds were deemed feasible by 1990.

Both plans, on the other hand, stress the potential of the region for domestic tourism for which a good deal of attraction has been generated. The National Tourism Plan recommends smaller scale investments of the type currently existing at Ras El Barr for most of this market. It stresses the short domestic seasonal tourism period (three months), and limited resources of the domestic market as principal constraints.

The Sinai Development Plan suggests a tourism potential to provide about 11,000 direct jobs in regional beach development at El Arish, warm water beaches in the southeast Sinai, and general touristic development at El Tor, St. Catherine, Qantara and Ras Sudr. The plan recognizes the difficulty of overcoming accessibility disadvantages and the need to provide very high standards of service. In these circumstances, the pay-off from tourism investments can be expected to be slow while the tourist market is being penetrated. This suggests caution in expecting Sinai tourism to provide the plan's targetted employment of about 30,000 in direct and induced jobs related to tourism.

**TABLE IV-14**  
**INDUSTRIAL ACTIVITIES**  
**PROPOSED FOR SINAI DEVELOPMENT STUDY**

<u>CATEGORY</u>	<u>EMPLOYMENT</u>		<u>INVESTMENT</u>	
	<u>1981-2000</u>	<u>PERCENT OF TOTAL</u>	<u>1981-2000 (L.E. 000's)</u>	<u>PERCENT OF TOTAL</u>
Food beverages, oils	2,470	8.2	51,820	1.6
Clothing and accessories	13,500	45.0	108,040	3.4
Building materials	2,360	7.8	157,400	5.0
Durable goods, furniture	1,300	4.3	11,080	0.4
Mining, mineral processing	3,620	12.0	288,900	9.2
Refinery/chemical	6,790	22.6	2,516,000	80.3
TOTAL	30,050	99.9	3,133,240	99.9

SOURCE: Sinai Development Study, Phase I, Draft Final Report, Vol. 1: Main Report. Proposed for the Advisory Committee for Reconstruction of the Ministry of Development by Dames & Moore Center for International Development and Technology, April 1982, p. 4-13.

## 2. NUPS Preferred Strategy and the SDS Preferred Strategy for the Sinai

Some discrepancies between the population estimates used by NUPS and the Sinai Development Study (SDS) exist for the Sinai. Unfortunately, neither study, nor for that matter CAPMAS, was able to determine the urban and rural population living for the Sinai. Now that the disengagement is complete, more accurate data will be feasible.

NUPS in its medium population projections used the 1976 census of Egypt's resident population which excluded an estimated 147,000 population living in then occupied areas of the Sinai from population projections, but included the 10,000 urban residents listed by CAPMAS in both national and urban population totals for 1976. The SDS has used the Ministry of Social Affairs estimate of total population for all of the Sinai (both liberated and occupied) in 1976 of 157,000 (which included the CAPMAS census figure of 10,000 urban population) in its estimates of population as is shown in Table IV-15.

**TABLE IV-15**  
**SINAI DEVELOPMENT STUDY**  
**ESTIMATES OF TOTAL SINAI POPULATION**

Period	Population	Annual Growth Rate (%)	Remarks
1966	78,113	--	CAPMAS census of 1966.
1976	157,000	7.25	Ministry of Social Affairs estimates
1980	180,000	3.48	Sinai Development Study Phase I estimates based on field surveys and discussions with local officials

Source: Census of 1976, Ministry of Social Affairs as reported by the Sinai Development Study Phase I, Draft Final Report, April 1982, pp. 2-18 and 2-19.

The 1976 total population estimates for the Sinai of the Ministry of Social Affairs must be viewed with some skepticism since they imply a population growth rate between 1966 and 1976 which, in Egypt, was only surpassed by the urban population growth rate of the Giza Governorate between 1960 and 1976 7.49 percent. At this rate of growth, there would have had to have been substantial immigration to the Sinai -- a doubtful hypothesis since during this period the Suez Canal governorate was evacuated and, as of 1976, only Ismailia had a total population which exceeded its 1966 population. Nevertheless, the Sinai Development Study estimates the Sinai's 1981 total population as follows in Table IV-16:

**TABLE IV-16**  
**ESTIMATES AREAS WITH**  
**SINAI 1981 POPULATION**  
**POPULATIONS GREATER**  
**THAN 10,000**

El Arish	70,000
Sheikh Zuwayid	35,000
Bir El Abd	13,000
All Other Places	<u>62,000</u>
Total Urban and Rural Populations	180,000

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SOURCE: Sinai Development Study, Phase I, Draft Final Report,  
April 1982.

The study notes that these populations include Bedouin populations (some of whom are nomadic) estimated to be between 50 to 70 percent of the total populations shown. If the higher percentage is a more accurate estimate of the non-urban population, then the 1981 urban population of El Arish would be approximately 21,000 similar to the NUPS 1985 base projection for major urban settlements in the Sinai of 24,000 (in this case El Arish only).

Due to the uncertainties about the existing urban and rural populations in the Sinai, NUPS would strongly recommend that an immediate census be made to determine the actual resident population in the Sinai. Such a census should accurately distinguish between urban and rural populations and would then be a more accurate basis for projections on direct investment in job creation and infrastructure investment than estimates based on based on partial surveys.

Although NUPS has not changed total urban population estimates of the recommended spatial allocation of population in its Preferred Strategy, the following procedure illustrates how those modifications could be made if the SDS 1981 population estimates of the Sinai are used to project the 1985 base year urban population. Two estimates of Sinai population are shown, the first is the urban population in settlements having populations greater than 10,000 if 50 percent of the population is resident, while the second shows the populations if all of the population is resident. Both estimates exclude populations living in settlement areas having populations in 1981 less than 10,000 as shown by the SDS Phase I estimates because such settlements are generally classed as rural by CAPMAS, and such settlements in other parts of Egypt including the other remote area governorates have been excluded from urban population projections. These are shown in Table IV-17. The impact of these changes in base population are shown for direct investment costs in Table IV-18 and for intra-urban infrastructure in Table IV-19.

The National average direct investment costs per job estimated by NUPS are approximately L.E. 6,500 in 1979 prices. Consequently, if the urban investments shown in Table IV-18 were made in an average location in the existing urban settlement system, rather than the Sinai, the following number of jobs could be created:

	NUPS Preferred Strategy	NUPS + SDS Estimate I	NUPS + SDS Estimate II	SDS Recommended Strategy (Urban Population In 2000 of 326,700)
Potential Jobs Elsewhere	47,800	56,800	49,700	68,200
Job Loss to rest of Egypt as a result of Sinai Investment	4,800	13,800	6,700	25,200

SOURCE: NUPS estimates.

**TABLE IV-17**  
**NUPS PREFERRED STRATEGY POPULATIONS ADJUSTED BY**  
**SINAI DEVELOPMENT STUDY POPULATION ESTIMATES**

YEAR	NUPS PREFERRED STRATEGY POPULATIONS			ESTIMATE 1 <sup>1</sup>			ESTIMATE 1 <sup>2</sup>		
				TOTAL		URBAN		TOTAL	
	TOTAL	SINAI URBAN		URBAN POPULA- TION	SINAI POPULATION		URBAN POPULA- TION	SINAI POPULATION	
		TOTAL	ANNUAL GROWTH RATE		TOTAL	ANNUAL GROWTH RATE		TOTAL	ANNUAL GROWTH RATE
(000's)	(000's)	(%)	(000's)	(000's)	(%)	(000's)	(000's)	(%)	
1	19,132	16	--	19,163	47	--	19,250	118	--
5	22,500	24	10.67	22,531	53	3.05	22,618	142	4.74
0	26,600	39	10.02	26,631	68	4.92	26,718	157	2.89
5	31,400	63	10.07	31,431	91	5.82	31,518	180	2.89
0	37,010	100	9.68	37,041	129	7.07	37,128	218	3.79

1 Shows Sinai urban populations if 50% of population in SDS settlement areas having populations greater than 10,000 in 1981 are resident urban populations.

2 Shows Sinai urban populations if 100% of population in SDS settlement areas having 1981 population greater than 10,000 are resident urban.

SOURCE: NUPS Projections.

**TABLE IV-18**  
**ESTIMATES OF SINAI DIRECT INVESTMENT IN JOB CREATION USING NUPS PREFERRED STRATEGY**  
**AND SDS POPULATIONS**

	1979 NUPS DATA				NUPS SINAI PROJECTIONS USING SDS DATA <sup>3</sup>		
	NUPS PREFERRED STRATEGY	SDS ESTIMATE I <sup>2</sup>	SDS ESTIMATE II <sup>2</sup>	SINAI DEVELOPMENT STUDY 2000 URBAN OF 326,700	SDS ESTIMATE I	SDS ESTIMATE II	SINAI DEVELOPMENT <sup>4</sup> STUDY 2000 URBAN OF 326,700
<u>1985</u>							
<u>1986-1990</u>							
TOTAL EMPLOYMENT 1990 (000's)	13	22	49	5	22	49	65
EMPLOYMENT GROWTH RATE	1		1.026	1.054	1.065	1.027	1.054
AVERAGE COST/NEW JOB (L.E.)	6,900	7,729	6,887	7,670	18,614	16,017	17,806
TOTAL COSTS: NEW JOBS (L.E. MILLIONS)	41	46	41	115	111	96	267
<u>1991-1995</u>							
TOTAL EMPLOYMENT-1995 (000's)	25	34	61	93	34	61	93
EMPLOYMENT GROWTH RATE	1	1.0816	1.038	1.074	1.091	1.045	1.074
AVERAGE COST/NEW JOB (L.E.)	6,800	8,194	6,950	6,464	21,120	17,764	19,836
TOTAL COSTS: NEW JOBS (L.E. MILLIONS)	82	98.3	83	181	255	213	555
<u>1996-2000</u>							
TOTAL EMPLOYMENTS-2000 (000's)	50	59	86	114	59	86	114
EMPLOYMENT GROWTH RATE	1	1.1088	1.063	1.082	1.112	1.071	1.042
AVERAGE COST/NEW JOB (L.E.)	7,500	8,985	7,589	7,008	23,634	20,019	17,930
TOTAL COSTS: NEW JOBS (L.E. MILLIONS)	188	225	199	147	591	500	377
					955	809	1,199

<sup>1</sup> Employment growth rates are difficult to establish due to uncertainties about the potential 1985 employment base. As a result NUPS used an average cost per job derived from other remote area urban settlements where more data about population and employment is available. The sources of 1979 employment costs are shown in Appendix II-C as is the methodology used for calculating all job creation costs shown in this table.

<sup>2</sup> The employment base for each period was derived from population estimates shown in Table III-40 using the relationships between employment and population growth shown on page 7-8 of the Sinai Development Study Phase I Draft Final Report, Main Volume, since detailed population and employment figures are not disaggregated in this volume of the study. Job costs for 1979 were derived from data shown in Appendix II-C.

<sup>3</sup> Job costs were derived using the distribution of industry, tourism and other indirect employment shown on page 7-3 of the Main Volume of the SDS and the total investment costs shown on page 5-15 of the same volume for industry (excluding refineries), and tourism. Since the SDS does not provide estimates of non-tourism service sector job costs, the 1979 service sector costs of the Ministry of Planning (see Appendix II-C) were updated and used as a proxy for these costs. Further, since this volume does not disaggregate urban employment, the El Arish figures shown on page 7-3 of the report were used as a proxy for total urban employment. Using this methodology, the following weighted costs per job resulted: 1985, L.E. 14,428; 1990, L.E. 14,909; and 1995, L.E. 15,209.

<sup>4</sup> The Sinai Development Study, Phase I, projects total 2000 urban populations of 326,000. However, phasing of urban employment growth to support this total growth is not shown in the main volume of the report. Therefore as a proxy for this growth, the relationships between employment and population growth for El Arish (shown on page 7-3 of the SDS Main Volume) was used as a proxy for total urban employment. The derivation of job costs is shown in footnote 3 above.

SOURCE: NUPS Projections.

**TABLE IV-19**  
**NUPS HOUSING AND INTRA-URBAN INFRASTRUCTURE COSTS**  
**USING SDS 1981 URBAN POPULATION BASE**

PERIOD	INVESTMENT (L.E. MILLIONS - 1979 PRICES) <sup>1</sup>			TOTAL BASE COSTS	ADJUSTED TOTAL COSTS	PERCENT REHABILITATION (\$)	PER CAPITA COSTS (L.E.) <sup>2</sup>		
	PHYSICAL INFRASTRUCTURE	HOUSING	SOCIAL INFRASTRUCTURE				AVERAGE COSTS	NEW AREAS	EXISTING AREAS
<u>1986-1990</u>									
NUPS PREFERRED STRATEGY	9.2	6.8	5.1	21.1	123.5	13.1	3,167	7,100	703
SDS ESTIMATE I <sup>3</sup>	7.8	7.4	6.2	21.4	123.3	27.1	1,814	5,995	630
SDS ESTIMATE II <sup>3</sup>	12.4	9.2	9.5	31.1	194.7	49.9	1,240	6,506	684
SDS TOTAL URBAN <sup>4</sup>	27.9	28.5	23.1	79.5	451.2	22.5	2,006	5,820	615
<u>1991-1995</u>									
NUPS PREFERRED STRATEGY	9.4	10.4	7.7	27.6	146.8	11.0	2,368	5,682	415
SDS ESTIMATE I	9.5	11.0	8.8	29.3	154.2	18.7	1,695	5,453	424
SDS ESTIMATE II	12.0	12.9	12.1	37.0	197.8	35.4	1,099	5,552	447
SDS TOTAL URBAN <sup>4</sup>	22.9	26.9	22.5	72.3	381.1	24.6	1,370	5,423	416
<u>1996-2000</u>									
NUPS PREFERRED STRATEGY	11.5	17.2	12.5	41.2	194.7	10.1	1,947	4,607	316
SDS ESTIMATE I	14.0	17.8	13.6	45.4	230.7	14.2	1,788	5,211	359
SDS ESTIMATE II	15.6	19.6	16.9	52.2	263.4	25.3	1,209	5,176	371
SDS TOTAL URBAN <sup>4</sup>	22.1	26.2	22.6	70.8	368.1	29.6	1,127	5,318	392
<u>1986-2000</u>									
NUPS PREFERRED STRATEGY	30.1	34.4	25.3	89.9	465.0				
SDS ESTIMATE I	31.3	36.2	28.6	96.1	508.2				
SDS ESTIMATE II	40.0	41.7	38.5	120.3	655.9				
SDS TOTAL URBAN <sup>4</sup>	72.0	81.6	106.7	222.6	1,200.4				

Totals may not add due to rounding.

<sup>1</sup> See Appendix V-A for the the data used to generate these costs. All costs are based on NUPS ESTIMATE II costs.

<sup>2</sup> Average per capita costs are calculated by dividing total adjusted costs by the end period population, per capita costs in new areas serve new population while existing per capita costs are the costs of rehabilitating existing infrastructure.

<sup>3</sup> Source Table III, SDS.

<sup>4</sup> Based on the SDS total year 2000 population of 426,000 and an urban population of 326,700.

SOURCE: Sinai Development Study, Phase I, Draft Final Report, April, 1982.



It should be noted that the slightly lower average costs per jobs noted in the NUPS population estimate using 100 percent of SDS 1982 reported urban population as a base, result from relatively lower employment growth rates and thus lower costs.

A comparison of the NUPS Preferred Strategy intra-urban infrastructure costs and the costs which would result if the SDS higher 1982 population base is used to project NUPS costs is shown in Table IV-19. As the table shows, if the Sinai has an urban population base in 1982 of 118,000, an additional investment of roughly L.E.190 million should be added to the NUPS Preferred Strategy Estimate II projection of intra-urban infrastructure costs, an increase of roughly 0.6 percent. However, if the SDS total urban population of 326,700 is to be achieved, the NUPS Estimate II would increase by L.E.735 million or roughly 2.3 percent.

**NOTES**  
**CHAPTER IV**

**SUEZ, SPECIAL EMPHASIS CITIES, OTHER URBAN AREAS, AND REMOTE AREAS**

<sup>1</sup> However, recent assessment by the Suez Governorate planning and Development Department (SPDD) indicate that employment growth projections for 1985 will exceed those of the Master Plan.

<sup>2</sup> IBRD, National Urban Sector Report, Volume II, "A Case Study -- The Governorate and the City of Suez," 1980.

<sup>3</sup> There are indications, however, that the private vacant land within city boundaries was in part to the war and inheritance practices; many of these areas are now being developed.

<sup>4</sup> Land Development Authorities with greater autonomy have been set up in Port Said and Ismailia.

<sup>5</sup> Op. cit. IBRD, p. 49.

<sup>6</sup> As no topographic surveys were available at the time the master plan was conducted, the potential areas of the principal industrial zone was underestimated. It now appears that the zone can be expanded to the south.

<sup>7</sup> Prepared at NUPS request by the SPDD, December 1981.

<sup>8</sup> Spectrum Training Services, Ltd., "Suez Canal Region -- Human Resources Development Study," Socio-Economic Survey, Vol. III. Prepared for the Ministry of Development & State Ministry of Housing and Land Reclamation and the United Nations Development Programme, January 1981.

It should be noted that surveys in Port Said, Ismailia and Suez were only conducted in lower income areas of the three settlements. Further, although the surveys indicate a much lower rate of population growth than master plan projections, the populations prepared by the study underestimated the actual populations in both Suez and Port Said in 1980 where more intensive surveys or special censuses were made.

<sup>9</sup> Beni Suef, for example ranked high population growth potential. However, due to its proximity to Greater Cairo, its future growth is likely to be dependant on Greater Cairo's growth. Therefore, Beni Suef and similar settlements would be less likely to develop into independent growth centers.

<sup>10</sup> Future expansion must occur on areas reclaimed from Lake Manzala.

<sup>11</sup> The High Dam Lake area has been considered in the scheme for development of Aswan. See Special Emphasis Cities for Growth Encouragement Appendix IV-G.

12 Both of these regions are currently being studied and development prospects assessed; but there do not yet exist detailed overall development plans. Furthermore, the plans that exist for these and other places (such as the Red Sea and Northwest Coast) have been done without considering the effects of proposed expenditures on the ability of the Government to meet other investment objectives. Thus, the implications of high population targets for these areas on levels of living in other urban areas have not been taken into account.

13 Master Plan for Water Resources Development and Use, UNDP/EGY/73/024, (Cairo: Ministry of Irrigation 1981), as quoted by the Sinai Development Study. Phase I, Draft Final Report, Vol. I: Main Report. April 1982.

14 NUPS Urban Growth and Data Draft Report, water resources analyses, p. 64.

15 K. E. Haynes and D. Whittington, "International Management of the Nile-Stage Three," Geographical Review, 71, 1981, 17-32; Guarison, Haynes, Whittington, Yannis, "Energy, Agriculture, and Water: A Multi Objective Planning Analysis," Environment and Planning, A12, 1980, 369-379.

16 In 1968, the Oak Ridge National Laboratory proposed a theoretical nuclear reactor which would produce large quantities of thermal energy in conjunction with 1,000-3,000 MW of power. On a coastal desert site, it could produce large quantities of desalinated water at lower costs than any other method. They investigated a half dozen of the most promising sites in the world; one of them at El Arish, another in the Matruh region. In addition, the reactor was to be part of an agro-industrial complex.

A team of planning students, the University of California at Berkeley, found that the water so produced could assure food for 5-8 million people. While the community involved in the production was expected to reach 250,000 - 400,000 persons. However, the capital cost extrapolated to present prices would probably exceed L.E. 2.5 billion, (See R. Meir, Urban Settlement in the Remote Areas of Egypt, The Role of New Technologies, NUPS Working Paper 1981).

17 It is possible that the ore at Abu Tartour contains some economically exploitable trace minerals.

**CHAPTER V**

**INDUSTRIAL AND SHELTER POLICY**

## CHAPTER V

### SECTORAL ISSUES AND RECOMMENDATIONS: INDUSTRIAL AND SHELTER POLICY

In the opening chapter, the importance of integrating spatial and sectoral strategies in the recommended urban policy was emphasized. It was also stressed, that sectoral policies should be adopted which have as their purpose the encouragement of private investment, and the provision of required services at affordable standards with appropriate cost recovery mechanisms. Adoption of sectoral policies, particularly for industrial growth and location, and appropriate infrastructure provision, which are consistent with spatial targets is the minimum requirement for a national urban policy which aims at the long-term redistribution of urban population over national space. Affordable standards and improved cost recovery for urban services are essential to provide a reasonable assurance that the urban policy is feasible-within existing resource constraints and to provide the best chance of quickly providing needed services to more of the population. This chapter discusses sectoral issues and recommendations for industrial policy, shelter policy and inter-regional infrastructure.

#### I. INDUSTRIAL POLICY ISSUES

##### A. Overview of the Sectoral Issues

Industrial policies reflect a national development strategy. Industrial policies often come to be identified or characterized by one of their main elements; examples are import substitution or export promotion, heavy industries or consumer industries, capital-intensive or labor intensive. Rarely do they become known by their locational content. This is unfortunate because industrial policies and plans profoundly affect the urban configuration and, in turn, the urban configuration affects the efficiency of the economic system and the distribution of the benefits of economic growth throughout the country.

Full integration of industrial and settlement policy offers a better approach. However, full integration means more than determining that the policies do not work at cross purposes. It means that they become mutually reinforcing so that the benefits to the economy exceed what would have been expected from the individual policies alone.

What then, are the main elements of an industrial policy that affect or are affected by the settlement policy? The most important element is employment growth. The vitality of any city depends on increasing the number of productive jobs. Industry in general, and manufacturing in particular, play the leading roles in urban employment growth. Cities in which employment and incomes are rising because of industrialization will support a growing and productive service sector. Only in special circumstances, such as some tourist cities, can the service sector provide a

self-sustaining economic base for a city. From both an economic development viewpoint and a settlement policy viewpoint a high growth rate of employment is desirable.

The location of new employment is, thus, the direct link between industrial policy and settlement policy. Cities and regions favored with new industrial investments can support larger populations and are more likely to hold on to their population. Concentrations of investments induce migration flows when the demand for labor exceeds the local supply. Once established, these migration patterns tend to perpetuate themselves, especially when "push" factors are present in other locations.

The spatial element of the industrial policy can be explicit or implicit, intentional or accidental, but it cannot be neutral. It will either reinforce existing patterns or alter the economic system of cities. Bertrand Renaud in a World Bank staff paper on settlement policy, provides support for this view:

"A realistic understanding of the location of manufacturing activities is central to the understanding of the growth of cities and the organization of economic activities in space."<sup>1</sup>

Other elements of the industrial plan affect the settlement strategy more subtly. The operating surplus of public industrial companies and the tax revenue from private industrial companies contribute to the financial resources available for the Government's urban development programs. Investment projects with a long gestation and payback period offer little prospect of an immediate contribution to urban development or other development efforts. The industrial sector should contribute to the national saving effort through reinvestment of profits and operating surpluses, through transfers to the Government and through foreign exchange earnings.

The importance of private sector investment in the industrial plan is likely to have spatial implications. The Government can influence, but not necessarily dictate, the location of private investments even when these private locational decisions are based on market prices which may not reflect social costs. The incentives and disincentives for private investment in an industrial policy offer an opportunity to reduce the spread between private and social costs. The incentive package ought to reflect the settlement policy; encouraging expansion in designated growth areas and limiting expansion in areas where it conflicts with other social objectives.

Finally, the existing industrial base imposes limitations on industrial policy and through it on the settlement policy. Major and dramatic shifts away from the existing base -- either in type of goods produced or location -- increase the possibilities of error and waste. Firms, public or private, can economize on their resources by locating near existing input and output markets. They can move into new product areas, but not without regard to the current availability of raw materials and intermediate products. New industrial areas and products should, and can, emerge. However, the costs of altering the structural and locational characteristics of the industrial base quickly may be so high as to endanger the overall development program.

The question of where it is best to locate new capacity is often answered piecemeal, without regard to any locational strategy in the broader context of a national settlement policy. We recommend integration of the industrial policy and the settlement policy so that industrial locational decisions facilitate the population movements envisioned in the settlement policy and that the settlement policy takes account of the existing industrial base and the social and private costs involved in its modifications.

## B. Public Policy Toward Industry

Throughout the work of the National Urban Policy Study, the importance of employment as the prime determinant of population location has been emphasized. Further, it is clear that among employment sectors it is the industrial sector which must provide the basis for employment in other urban sectors. Our basic recommendations for public policy toward industry flow from the following propositions.

1. Investment should be channelled toward increasing the relative share of manufacturing in Gross Domestic Product and employment.
2. Inducements, incentives and taxes should be structured to support spatial and sectoral objectives of national urban policy. This entails making discriminating use of tax abatements, subsidies, and taxes. Discrimination should be exercised with respect to both the number of places where positive inducements are offered and the sectoral activities which are eligible.
3. Non-tax incentives should be used, also, in support of spatial objectives. Three such incentives are sites, labor and credit.

### a. Sites

One study of the effects of Law 43 inferred that "the most important problem causing delays (in implementation of Law 43 projects) was finding a suitable location, with adequate land, infrastructure, telephone and utility."<sup>2</sup> Areas into which the Government wants to direct investment can be made attractive by having serviced sites and a responsive local organization responsible for each industrial estate.

These industrial estates will need to accommodate both large and small scale firms. The specific site requirements of firms differ, so an estate will need to offer a variety of specific site characteristics, such as rail access, outdoor storage areas, etc. The time-phasing of estate availability must strike a balance between the desire to have a variety of sites ready to offer investors and the danger of building far ahead of demand and tying up too much capital.

### b. Labor

The establishment of vocational training centers willing to tailor their programs to an employer's needs signifies a public commitment to potential investors. Firms can be deterred by the fear that the local labor market will not have sufficient workers with the appropriate skills. Where labor requirements are peculiar, as in the operation of equipment not available in technical institutes, subsidies for

company training programs offer an alternative approach. Job Information Centers, for example, located in selected Delta cities, would be helpful as clearinghouses to inform people looking for work about specific opportunities in the cities designated for growth emphasis.

c. Credit

Access to credit is often the binding constraint to small firms since banks and other lending institutions prefer to avoid the administrative burden of handling a large volume of relatively small loans. Therefore, credit facilities for these firms should be locally available. Whether or not an interest subsidy is advisable will depend on how much of a push local entrepreneurs need to start or expand their operations. The World Bank announced on December 24, 1981, a loan of US\$1,120 million dollars to the Development Industrial Bank to provide credit to the private sector. The loan is designed to assist small and medium-scale industries, especially small ones.

For the tax and the non-tax incentives alike it is crucial that they not be over-extended geographically. By restricting them to designated cities and applying them differentially they will more likely produce the desired results, while a non-restricted approach will eliminate the locational effects and unnecessarily drain the public budget.

4. Private investment in industry should continue to be encouraged. It is extremely difficult to forecast the amount of required direct investment in industry (a total of L.E. 44.1 billion between 1986-2000) which might be provided by private investors. The difficulty arises from the absence of detailed data on the current shares of public and private investment by location and by sector and, also, from the sensitivity of private investment to policy choices, real or perceived instability, regulations and a host of similar factors.

It is the current policy of the Government of Egypt, however, to encourage private investment. Such encouragement is consistent with the NUPS recommendation to find ways to conserve on the amount of public investment funds required. It is useful, therefore, to have some sense of how much of the L.E. 44.1 billion estimated to be needed to generate industrial jobs might come from private sources (both domestic and foreign). The following data provides a rough indication of the probable minimum level, based upon NUPS projections of increased value-added by sector and the 1977 distribution of the private contribution to sectoral value-added. The assumption made is that the private sector share of value-added will be at least as large as it was in 1977 and that private investment will be proportional to its share of the increased value added. On this basis, private sector investment (given continued government encouragement of the private sector) would be L.E. 16.4 billion or about 37 percent of the industrial investment. (Table V-1) If only this level of private sector investment is achieved, public investment in direct job creation of about L.E. 28 billion would be required.

The achievement of private investment at these levels should be possible if private investment is encouraged by industrial policy choices. One extremely important element in the encouragement of private investment, in addition to other sectoral policies discussed above, is the type of settlement strategy



**TABLE V-1**  
**NUPS PROJECTED PUBLIC AND PRIVATE SHARES**  
**IN INDUSTRIAL INVESTMENT**

INDUSTRY	PERCENT OF PROJECTED INCREASE VALUE ADDED <sup>1</sup>	PRIVATE SHARE 1977 <sup>2</sup>	WEIGHTED SHARE %
Food, Beverage, Tobacco	14.8	52.6	7.8
Textiles	19.9	18.0	3.6
Clothing, Footwear, Leather	8.5	86.3	7.3
Wood Products	5.3	90.0	4.8
Paper and Paper Products	2.9	2.0	0.1
Printing and Publishing	5.7	55.0	3.1
Chemicals, Coal and Petroleum	9.7	20.0	1.9
Rubber and Plastics	2.9	7.0	0.2
Non-Metallic Minerals	6.0	25.0	1.5
Basic Metals	8.3	8.0	0.7
Metal Products	16.0	38.0	6.1
TOTAL	100.0	-	37.1

Total Industrial Investment (1986-2000)	L.E. 44.1 Billion
Estimated Private Share	37.1 Percent
Estimated Private Investment	L.E. 16.4 Billion
Estimated Public Investment	L.E. 27.7 Billion

SOURCE: NUPS analysis.

<sup>1</sup> NUPS Projections. For absolute increases see Table V.13.

<sup>2</sup> From Table 1, "Private Sector Industrial Development Strategy", Boston University Consultants, August, 1981.

adopted. The NUPS recommended strategy recommends substantial growth in Cairo, Alexandria, and Suez regions which have already demonstrated that they are attractive to private investors. The adoption of this strategy would enhance the prospects of achieving at least the levels of private sector industrial investment projected above. As has been suggested earlier, continued movement of agricultural policy in the direction of economic enhancement could, also, make a major contribution through opening up new lines of activity to the private sector.

5. Efforts should continue to be made to enhance the productivity of public enterprise. This subject has been extensively studied and many recommendations have been made including:

- Reduction of numbers of employees.
- Raised wages and salaries for the reduced work force with tie-ins to demonstrated productivity improvements.
- Economic pricing of inputs and outputs so that performance can be judged on profitability.
- Improved project evaluation for proposed new public enterprise investments.
- Better quality control to improve export potential and consumer willingness to purchase domestic goods.
- Training for industrial managers.
- The ability to dismiss unproductive employees.

Current policy is moving in the direction of these changes and this should be continued.

6. Continuation of agricultural policy changes cited above which lead to:

- Economic enhancement of the agricultural sector.
- Additional input to agro industry.
- Expansion of domestic industries to supply agricultural needs.
- Improved marketing and distribution of agricultural products.

7. Consideration should be given to developing a tax on new industrial activities within the core areas of Cairo and Alexandria, in order to encourage location in more desirable sites within the metropolitan region (e.g., desert fringe areas or new satellite communities) or other cities and to compensate for at least part of the net additions to service and disamenity costs caused by firms which find it economically attractive to locate in the core in spite of the tax. More detailed study of such a tax is needed than NUPS could provide before a decision to adopt it could be made. The major problem with such a tax is to set the rate at a level which does not result

in a substantial net loss of investment and output. If the rate is high enough to be a major factor in location, it may be sufficiently high to discourage the activity altogether. Finally, if such a tax is deemed feasible, it should only be imposed in selected locations (i.e., the core areas of major metropolitan regions and possibly a few other clearly identified areas) to insure that it is effective in controlling industrial location.

### C. The Structure and Location of Industry

The development of an industrial policy and its integration with a settlement policy requires an understanding of the existing industrial base. The current features of the industrial base provide the point of departure for future plans while an understanding of the dynamic forces operating on the economy provides guidance on how and where public policy must intervene in the economy to achieve social objectives.

Industrialization in Egypt has a long and interesting history and has been well researched by a number of scholars. Our analysis has benefitted from these studies and does not attempt to duplicate their extensive historical research. We concentrate on the structure and trends of Egyptian industry during the past 20 years to identify the forces that will either help or hinder achieving the objectives of the national urban policy.

#### I. The Structure of Industry

Two broad indicators of the importance of a sector in the national economy are the sectoral shares of total employment and gross domestic product. Table V-2 shows the percentage distribution of employment among main sectors for various years. Three of these sectors have increased their shares over the period shown while only one, agriculture, has declined. The sectoral shifts seen in Table V-2 differ from the pattern expected in developing economies. The usual pattern is a shift from the primary sector (agriculture) to the secondary sector (industry) followed by a shift from both of these sectors to the tertiary (service) sector after incomes have risen substantially.

**TABLE V-2**

#### PERCENTAGE DISTRIBUTION OF EMPLOYMENT, SELECTED YEARS

<u>Sector</u>	<u>1957/58</u>	<u>1964/65</u>	<u>1975</u>	<u>1979</u>
Agriculture	56	52	44	39
Industry	11	12	12	13
Construction	2	5	5	6
Services	31	31	39	41

SOURCE: 1957/58 and 1964/65 from Mettwally, Regional Aspects of the UARs Economic Development, p.53.

1975 and 1979 CAPMAS, Statistical Yearbook, July 1980, p.226.

The direct employment shift from the primary sector to the tertiary sector in Egypt is explained by the low levels of industrial investment during the war years of the late 1960's and early 1970's and the lack of sufficient new employment opportunities in agriculture. The labor force moved into low productivity service employment in both the public and private sectors. In our judgment, it is essential to increase the sectoral share of industry.

The modest increase in the share of industrial employment nationally, however, understates the change in the employment structure of urban areas. In 1970, 72 percent of manufacturing employment was in urban areas. By 1975 the urban portion of manufacturing employment had increased to 80 percent. There was an absolute decline in rural manufacturing during this period. Consequently, manufacturing employment growth has been more important for urban areas than the two percentage points national increase would indicate. Nevertheless, the general conclusion is that, at least in employment terms, the industrial sector has not yet provided the dynamic impetus to national development in Egypt that was envisioned for it in the early 1960's or that will be required over the next two decades.

A second indicator of sector importance is the sectoral shares of Gross Domestic Product. These are shown in Table V-3. Although the trends in these data are affected by price changes and other factors (such as the closing of the Suez Canal), the general trends reinforce the conclusions based on the employment data. The agricultural sector is becoming relatively less important as industry expands. The previous suggestion of the increase in low productivity service jobs is supported by the fact that the substantial increase in employment share resulted in virtually no increase in the service sector share of Gross Domestic Product.

Expansion of the industrial sector usually entails both an increase in the level and a change in the composition of output. Ideas about how the composition of industrial output should evolve during the development process are subject to more variation than ideas about the appropriate evolution of the basic three sectors.

The composition of output is affected by the local availability of raw materials, the size and income level of the domestic market, the extent of foreign trade, and the industrial policy (explicit or implicit) of the country. There is a general tendency for basic consumer goods, food, leather goods and textiles to predominate at low income levels, but to become less important as incomes rise due to their low income elasticity. Rapid expansion is typical in non-metallic minerals, rubber products, wood products, and chemicals and petroleum refining when the industry share of GDP approaches 25-30 percent. At high levels of income; clothing, printing, basic metals, paper and metal products usually account for most of the increase in the share of industry.<sup>3</sup>

To emphasize the special role of manufacturing employment in the settlement pattern, it is useful to distinguish between manufacturing and the broader category, Industry.<sup>4</sup> Table V-4 is a disaggregation of industry sector shares for the 1975-1979 period. A comparison of Table V-4a and Table V-4b clearly shows the effect of rising petroleum prices on the share of GDP. The petroleum sector, an important source of finance for development, has little direct significance in analysis of urban-based industrial employment (petroleum is relatively cheap to transport so that refineries need not be located near production sites and only about 1 percent of

**TABLE V-3**  
**SHARES IN GDP FACTOR COSTS**  
**(PERCENTAGES OF TOTAL GDP)**

SECTOR	IN 1964/65 PRICES		IN 1970 PRICES		IN 1975 PRICES		IN 1979 PRICES
	1960/61	1965/66	1970/71	1975	1975	1979	1979
Agriculture	31.5	28.1	27.4	24.0	29.0	22.4	22.5
Industry <sup>1</sup>	21.0	21.9	24.1	23.6	21.8	24.9	29.2
Construction	2.8	4.5	4.2	3.7	4.8	4.9	5.5
Transportation & Communication	7.3	9.3	5.1	6.9	5.1	8.8	7.5
Services <sup>2</sup>	<u>37.4</u>	<u>36.2</u>	<u>39.1</u>	<u>41.8</u>	<u>39.3</u>	<u>39.0</u>	<u>35.3</u>
TOTAL	100.0	100.0	99.9	100.0	100.0	100.0	100.0

<sup>1</sup> Industry includes manufacturing, mining, petroleum, and electricity.

<sup>2</sup> Services include trade and finance, housing, public utilities, and other services.

SOURCE: Col. 1-4, IBRD, Economic Management in a Period of Transition, Vol VI, Table 2.4, p. 24.

Col. 5-7 IMF, Recent Economic Development, January 1981, Table 1, p. 3.

**TABLE V-4**  
**SECTOR SHARES OF GDP AT FACTOR COSTS**

(A) <u>AT 1975 PRICES</u>					
	<u>1975</u> (% of Total GDP)	<u>1976</u> (% of Total GDP)	<u>1977</u> (% of Total GDP)	<u>1978</u> (% of Total GDP)	<u>1979</u> (% of Total GDP)
Manufacturing and Mining	17.5	17.2	17.1	16.3	16.7
Petroleum	2.9	4.8	5.9	6.5	6.7
Electricity	<u>1.4</u>	<u>1.4</u>	<u>1.5</u>	<u>1.6</u>	<u>1.5</u>
Industry Total as percent of Total GDP	21.8	23.4	24.5	24.4	24.9
(B) <u>AT CURRENT PRICES</u>					
Manufacturing and Mining	17.5	16.1	15.1	14.6	12.4
Petroleum	2.9	4.0	6.3	7.0	16.0
Electricity	<u>1.4</u>	<u>1.2</u>	<u>1.1</u>	<u>1.1</u>	<u>.9</u>
Industry Total as percent of Total GDP	21.8	21.3	22.5	22.7	29.3

SOURCE: IMF Recent Economic Developments, January 1981.

total industrial employment is in the capital intensive petroleum sector). Growth in the manufacturing sector, a respectable 7.4 percent (in constant prices) in the four year period, lagged behind GDP growth (8.7 percent) resulting in a falling share for manufacturing.

In Table V-5, further detail is provided on the structure of the manufacturing sector. Food, beverage, and textiles have been, and continue to be, the dominant elements. The group of industries based on metals and machinery have increased noticeably in importance. Machinery production has mainly been in consumer durables rather than capital goods. Other sectors that increased in importance are paper, leather, non-metallic products (building materials), and chemicals, where the rapid growth occurred in the 1950's and 1960's. Clearly, the manufacturing sector in Egypt has been diversifying during the last 20 years. Aided by the import substitution policies of the Government, a more diverse group of industries has developed that sells primarily in the domestic market. In the remainder of this section the location of these established and emerging industries will be described.

## 2. The Location of Industry

The spatial location of industries in Egypt is explored by examining two periods: the period prior to 1952, where most industrial production was undertaken by private enterprise; and the period after 1952, when the Government started to emphasize diversification of the industrial mix and some dispersion of industry over national space.

### a. Industrial Location Prior to 1952

Major developments in establishing Egypt's current industrial base took place after 1920, when Misr Bank started to grant loans to private industrial investors. Industrial establishments were highly concentrated in Cairo and Alexandria and both centers developed a widely diversified industrial mix. Cairo's industrial mix included chemicals, printing, construction material, mechanical and ferrous engineering and tobacco. The major industrial sites in Cairo were located around the city fringes at Shoubra El Kheima, Qalyub, Imbaba, Abou Zaabal, Musturud and Giza. Alexandria was mostly known for the dominance of paper, textiles, metallic products and cement in its industrial mix. Outside these two urban centers, industrial activities were limited to textiles, food processing, fertilizers and mining. Textile industries were to be found in many locations in the Delta, but highly concentrated at Mahalla El Kubra and Kafr El Dawar. Food processing was dispersed also in the Delta, with the sugar industry its major subsector. The sugar industry was the only industry in South Upper Egypt. Mining activities were confined to the Red Sea and Sinai and fertilizers were located at Suez. During this era, as indicated in Table V-6, Greater Cairo and Alexandria acquired 69 percent of total capital sum invested in industries.

### b. Industrial Location 1952-1970

After the Revolution of 1952, the Government's major efforts were directed toward introducing new types of industries and dispersing some industrial activities away from Cairo and Alexandria. Examining data presented in Table V-7 indicates that Cairo and Alexandria, however, received 55.2 percent of total investment allocated for the industrial sector between 1952 and 1963. The basic features of the government industrial development strategy during this period were:

**TABLE V-5**  
**STRUCTURE OF GROSS VALUE-ADDED IN**  
**MANUFACTURING 1952, 1966/67 AND 1977**

	<u>1952</u>	<u>1966/67</u>	<u>1977</u>
Food, Beverage	22.4	11.9	17.6
Tobacco	7.4	4.4	7.5
Textiles	33.1	38.1	25.2
Clothing	1.9	1.2	.8
Wood and Products	1.6	1.2	1.1
Paper and Products	1.3	2.8	2.0
Printing and Publishing	2.8	2.1	2.1
Leather and Rubber	0.9	1.3	2.1
Chemicals	7.4	12.7	10.6
Coal and Petroleum	8.6	5.2	4.5
Non-Metallic Products	4.3	4.2	6.4
Basic Metals	1.6	3.9	4.6
Metallic Products	1.7	3.3	4.9
Machinery	0.7	4.4	6.8
Transport Equipment	3.1	2.1	3.8
Others	<u>1.2</u>	<u>1.2</u>	<u>-</u>
	100.0	100.0	100.0

SOURCE: 1952 and 1966/67 Robert Mabro, The Egyptian Economy 1952-1972, Table 7.2, p. 145.

1977 CAPMAS Census of Industries, 1977.



**TABLE V-6**  
**PAID UP CAPITAL BY MAJOR URBAN CENTERS,**  
**1920-1952**

<u>URBAN CENTER</u>	<u>PAID UP CAPITAL (IN L.F. MILLIONS)</u>	<u>PERCENTAGE</u>	<u>MAJOR INDUSTRIES</u>
Greater Cairo	32.5	51.2	Chemicals, textiles, cement, metallics.
Alexandria Mahalla El Kubra & Kafr El Dawar	11.2	17.6	Textiles, paper
Suez	11.6	18.3	Textiles
All Others	7.0	11.0	Fertilizers
	1.2	1.9	Textiles, sugar
	—	—	
TOTAL	63.5	100.0	

SOURCE: Barbour, K.M., The Growth, Location and Structure of Industry in Egypt, Praeger, N.Y., 1972. pp. 66-67.

**TABLE V-7**  
**SPATIAL DISTRIBUTION OF MAJOR INDUSTRIAL**  
**INVESTMENT, 1952-63**

<u>GOVERNORATE</u>	<u>INDUSTRIAL INVESTMENT (IN LE. MILLIONS)</u>	<u>PERCENT OF TOTAL</u>	<u>MAJOR INDUSTRIES</u>
Greater Cairo*	45.69	38.7	Iron & steel, auto ass. oil refinery
Alexandria	19.26	16.3	Paper, chemicals, textiles
Red Sea & Suez	18.00	15.3	Petroleum, paper
Aswan	25.60	21.7	Fertilizers, sugar, mining
Gharbia	1.50	1.3	Cottonseed oil, textiles
All other Gov.	7.79	6.6	Textiles, food
	—	—	
TOTAL	117.84	99.9	

\* Greater Cairo includes its industrial suburbs located in Giza and Qalyubia Governorates.

SOURCE: Barbour, op.cit.

- Location of the new industries that authorities were anxious to introduce in Egypt, mainly basic iron and steel, engineering, metallics, transport equipment in Cairo and its industrial suburbs in Helwan, Giza and Qalyubia.
- Strengthening Alexandria's already established industries by directing large sums of investment toward its textile, chemicals, paper and metallic industries.
- Dispersing agro-based industries in closer proximity to sources of raw material, thus, emphasizing textiles in the Delta area close to cotton farms and sugar industries in South Upper Egypt.
- Establishing a highly capitalized fertilizer industry at Aswan and a petrochemical industry at Suez.
- Extractive industries received most attention in Sinai and the Red Sea areas. The share of these remote areas amounted to 14 percent of total industrial investment in this period.

The industrial development strategy of the fifties and early sixties shaped to a great extent the present map of industrial Egypt. Emphasis on establishing a strong industrial base in Cairo and Alexandria and the initial efforts to create industrial growth centers at Suez and Aswan continued during the sixties. As shown in Table V-8, the share of these four urban centers in total industrial investment during 1960-68 amounted to 78 percent of the national total. Cairo and Alexandria were well established as industrial growth poles in that their own industries were progressively growing and attracting complementary industries. In contrast, the industrial investment in Aswan or Suez, which was more highly specialized, did not create this phenomenon.

**TABLE V-8**  
**PERCENTAGE DISTRIBUTION OF INDUSTRIAL**  
**INVESTMENT BY MAJOR AREAS (1960-1968)**

<u>MAJOR URBAN AREAS</u>	<u>%</u>
Greater Cairo	36.8
Alexandria	12.1
Suez	16.6
Aswan	12.5
All other	22.0
TOTAL	100.0
<u>TOTAL INVESTMENT, (In L.E. Millions) 580.6</u>	

SOURCE: Barbour, op.cit, p.74.

c. The Era of the Seventies

During the seventies, most of Egypt's industrial investment was allocated to the upgrading, expansion and renovation of the already established industries. Thus, there was no new locational strategy that could have created a dispersal of the industry pattern which was already set during the 1960's. As an indication, the transitional industrial investment plan of 1975 (Table V-9) directed 50.1 percent of the investment to the already existing industrial base of Greater Cairo, and half of Greater Cairo's share was allocated for revitalizing its Iron and Steel Complex.

The decline of Greater Cairo's share in 1980 as compared to 1975, was attributable to the rehabilitation effort in the Suez Canal and mineral exploitation in the remote areas. Although the Delta share in total investment increased, most of it was directed toward Gharbia and Beheira. These two governorates received 66.2 percent of all the Delta investment and it was mostly allocated for their textile industries in Mahalla El Kubra and Kafr El Dawar. The major new industrial activity in the Delta was the newly established fertilizer plant adjacent to Mansoura.

An additional attempt to diversify and expand the industrial base of South Upper Egypt away from over dependence on food industries was made by establishing a new aluminum plant at Naga Hamadi. As a result, the South Upper Egypt share in both 1975 and the 1980 investment plans has increased considerably over earlier periods. The importance that industrial planners attached to extractive industry in the remote areas and the reconstruction of the Suez Canal industries is shown in Table V-9. The 1980 plan allocated 6.7 percent for extractive industries in the New Valley, the Red Sea and Sinai, and almost an equal amount for the Suez Canal Cities.

**TABLE V-9**  
**PERCENTAGE OF DISTRIBUTION OF 1975 AND**  
**1980 INDUSTRIAL INVESTMENT**

AREA	1975	1980
Greater Cairo	50.1	41.2
Alexandria	11.3	12.7
Delta (including Qalyubia)	15.3	18.6
North Upper Egypt	0.8	2.0
South Upper Egypt	16.3	12.2
Suez Canal	3.1	6.4
Remote Areas	3.1	6.7
TOTAL	100%	99.8%
TOTAL INVESTMENT IN L.E. MILLIONS	168.76	765.4

SOURCE: Ministry of Planning, The Transitional Plan of 1974-75.  
Gordon, Peter, Urbanization in Arab Republic of Egypt, World  
Bank Working Paper, May 1980.

d. The Continuation of the Trend Through 1984

Based on the Ministry of Industry Investment Plan of 1980-84, combined shares of Cairo and Alexandria would exhaust more than 50 percent of all the investment pool. The increase in Alexandria's share is mainly due to the allocation of large investment funds for the construction of an iron and steel complex at Dakahlia, west of Alexandria. Table V-10 indicates that if the new towns investments are included in the metropolitan totals, subsectoral investment follows the already established industrial locational pattern. All main investment in capital goods industries is planned primarily for the Cairo and Alexandria regions. The most dispersed investment is that directed toward the already dispersed industries of textiles and food processing.

**TABLE V-10**  
**SPATIAL DISTRIBUTION OF 1980-1984**  
**INDUSTRIAL INVESTMENT PLAN**

<u>AREA</u>	<u>INVESTMENT</u> <u>(IN L.E. MILLIONS)</u>	<u>PERCENTAGE</u>
Greater Cairo	1,258.3	31.2
Alexandria	922.2	22.9
The Delta	575.4	14.3
North Upper Egypt	61.9	1.5
South Upper Egypt	383.3	9.5
Suez Canal	62.5	1.6
Remote Areas	50.0	1.2
New Towns	718.0	17.8
<b>TOTAL</b>	<b>4,031.6</b>	<b>100.0</b>

SOURCE: Compiled from Ministry of Industry, GOFI, The Spatial Location of Industrial Investment, 1980-84, Oct. 1980.

#### D. Industrial Growth to the Year 2000

Integrating the settlement policy and the industrial policy requires an awareness of the form that future industrial growth will take after the current five year plan. Our characterization of industrial growth, presented in this section, is based on discussions with and documents of the Ministry of Industry and the experiences of other countries that are at comparable levels of economic development.

The method employed to project the sectoral shares of industrial value added to the year 2000 was to determine the "typical" pattern of industrial output of a country with GDP and population levels equal to those projected for Egypt by the NUPS team and then adjust the projections as necessary in view of Egypt's natural resources and long-range industrial plans.<sup>5</sup>

Egyptian industrial planners predict that by the year 2000, the industrial sector will contribute 22.5 percent of Gross Domestic Product. Achieving this target necessitates an increase in the sector's output of an annual growth rate of 9.0 percent between 1975 and the year 2000, given their projected service sector annual growth rate of 10.5 percent and its 2000 GDP share of 40.9 percent. The three reasons given for this rapid growth in services are:

- The raising of the standard of living.
- The urbanization of about 60 percent of the population.
- The increased importance of tourism.

The NUPS projection of the service sector growth rate is about 6 percent per year between 1985 and 2000. In the judgment of the Study Team there are unlikely to be sufficient investment resources to generate an industrial growth rate of 9 percent and a service growth rate of 10.5 percent. A lower growth rate for services increases the relative share of industry. In the NUPS projection, the share of industry and construction is 32.5 percent in the year 2000 compared to the Ministry of Industry Projection of 29.4 percent. (Table V-11)

The major contributors to industrial growth as projected by the Ministry are intermediate and capital good industries, especially basic iron, metallics, machinery and transport equipment. Table V-12 compares the relative importance of employment and output mix of the major subindustrial groups for 1975 and the year 2000. It is evident from the table that Egypt's two largest industries, food and textiles, are predicted to gradually lose their relative dominance in Egypt's industrial composition despite accounting for 40 percent of the employment growth and 21 percent of output growth. On the other hand, basic metals, metallics, machinery, and transport equipment, as a group, account for 38 percent of employment growth and 60 percent of output growth.

The difference between output growth rates and employment growth rates for each industry type in Table V-12 is explained by changes in labor productivity (output per worker). Labor productivity is estimated to increase at annual growth rates of 3.2 percent and 4.9 percent in basic metals, metallics, machinery, and transport equipment, respectively. Such growth rates, especially sustained over 25 years, imply the introduction of heavily capital-intensive production processes. Annual

**TABLE V-11**  
**SUB-SECTORAL ALLOCATION OF 1980-1984**  
**INDUSTRIAL INVESTMENT PLAN**

INDUSTRY	INVESTMENT IN (L.F. MILLIONS)	TARGETED LOCATIONS
Food Processing	412.4	Kafr El Sheikh, Schag Qena
Tobacco	157.0	Greater Cairo (Giza)
Textiles	740.9	Alexandria, Gharbia, Beheira
Leather	18.9	Cairo, Alexandria
Wood	16.4	Alexandria
Paper	180.4	Alexandria, Qena, Aswan
Chemicals	233.2	Greater Cairo, Alexandria
Coal Products	0.9	Greater Cairo
Rubber & Plastic	86.8	Greater Cairo, Alexandria, Gharbia
Glass	91.0	10th of Ramadan
Iron & Steel	868.9	Cairo, Alexandria, Sadat City
Metallics	701.6	Greater Cairo
Electrics & Electronics	49.9	Greater Cairo & Alexandria
Transport Equipment	473.3	Greater Cairo & Alexandria
<b>TOTAL</b>	<b>4,031.6</b>	

SOURCE: Compiled from Ministry of Industry, GOFI, The Spatial Location of Industrial Investment, 1980-84, October, 1980.

TABLE V-12

PERCENTAGE DISTRIBUTION OF MAJOR INDUSTRIES  
EMPLOYMENT AND OUTPUT MIX FOR 1975 AND 2000

<u>INDUSTRY TYPES</u>	<u>EMPLOYMENT</u>		<u>OUTPUT</u>		<u>ANNUAL GROWTH RATES (%)</u>	
	<u>1975 (%)</u>	<u>2000 (%)</u>	<u>1975 (%)</u>	<u>2000 (%)</u>	<u>EMPLOY- MENT</u>	<u>OUTPUT</u>
Mining	1.2	0.5	0.4	0.1	2.17	1.9
Ginning	1.8	1.9	0.7	1.2	2.2	2.0
Food, Beverage, Tobacco	24.6	15.5	41.3	15.4	3.8	4.3
Textiles, Ready Made Clothes	38.9	30.2	22.4	11.5	4.6	5.7
Chemicals	10.0	10.9	14.2	11.5	6.0	7.6
Non-Metallics	3.0	4.3	2.8	2.0	7.0	6.9
Basic Metal, Metallics	4.5	13.6	7.8	26.9	10.5	14.9
Machinery, Transport Equip.	7.0	18.1	6.3	26.9	9.8	15.1
Miscellaneous	6.2	2.1	0.5	0.8	1.3	10.4
Military	2.6	2.8	3.5	3.8	6.0	8.9
TOTAL	100 %	100 %	100 %	100 %		

SOURCE: Ministry of Industry, General Organization for Industrialization.

employment growth rate targets of 10 percent sustained for 25 years in such capital-intensive industries is a high risk venture for Egypt.

The Study Team has incorporated in its own projections of industrial expansion (shown in Table V-12), a more conservative estimate of output growth in metals and machinery (10 percent p.a.), while at the same time remaining consistent with the stated policy that increases in steel output are an indispensable prerequisite for diversified industrial growth.

Because of its large and growing population, it is expected that much of Egypt's additional industrial output will be sold in domestic markets. This means that domestic demand takes on more importance in the determination of the composition of output than is the case with small countries that specialize in one or two products and sell their output primarily in foreign markets. Inter-industry linkages and inter-country similarities in the structure of demand in countries with large populations, plus the emphasis on input substitution, offer a reasonable assurance that Egypt's development pattern will not deviate greatly from the pattern of such countries.

The Ministry of Industry projections and the implications of our cross-country analysis are combined in Table V-13, which shows the sector shares of total manufacturing output and the absolute increase in output between 1977 and 2000 developed by NUPS. While the absolute value of all the subsectors is expected to increase, differential growth rates cause the relative shares to change.

The main points to be drawn from this table are that the traditional industries of food and textiles will generate over one-third of the increase in manufacturing value-added even though their shares are declining. There will be a large expansion in metal products especially if the plans to increase steel output to 15 million tons annually by year 2000 are achieved. Chemicals and construction material (non-metallic minerals), both important sectors in 1977, will contribute 16 percent of the projected increase.

All of the caveats usually applied to long term projections apply here. The reason for constructing Table V-13 is to develop guidelines for industrial location policy. It is not presented as an industrial plan or a framework for individual project identification. It does offer a notion of the types of industries for which locational decisions will be required and permits, in the Section G, an analysis of how these industries might be spatially distributed to achieve both economic growth and the desired settlement pattern.

#### E. The Special Role of Agriculturally Related Industry<sup>6</sup>

Although the NUPS projections anticipate a declining share for traditional agricultural processing industries, a large absolute increase is expected. Furthermore, it is expected that agricultural activities will provide substantial demand for industrial output in other sectors, particularly since recent developments in agricultural policy indicate the Government is taking steps toward a new approach toward agriculture which could lead to its economic intensification. The general approach being contemplated includes:

- Turning the terms of trade more to the favor of agriculture.



**TABLE V-13**  
**SHARES OF SECTORAL CONTRIBUTIONS TO OUTPUT**  
**AND ABSOLUTE INCREASE IN MANUFACTURING**

			<u>ABSOLUTE INCREASE<sup>1</sup></u>
Food, Beverage, Tobacco	25.1	15.3	1,411
Textiles	25.2	20.1	1,891
Clothing, Footware, Leather	1.1	7.6	810
Wood Products	1.1	4.8	508
Paper & Paper Products	2.0	2.8	277
Printing & Publishing	2.1	5.2	540
Chemicals, Coal & Petroleum	15.1	10.5	928
Rubber & Plastic	1.8	2.8	280
Non-Metallic Minerals	6.4	6.0	570
Basic Metals	4.6	8.1	786
Metal Products	<u>14.5</u>	<u>16.1</u>	<u>1,522</u>
TOTAL	100%	100%	9,523

<sup>1</sup> L.E. Million, 1979 prices.

SOURCE : NUPS projections. See Appendix I-B for details.

- Decontrolling agriculture and reducing the role of Government in certain areas.
- Increasing levels of investment in agriculture.

All of the aspects of the new agricultural policy would have positive impacts on urban industrial development. This is because some of the same bureaucratic requirements which hinder the growth of agriculture also hinder growth of agriculturally related industry and because most agriculturally related industry should be located in urban areas, even in rural Governments. Additionally, agriculture must intensify production and higher intensity requires industrial inputs, services and processing.

Tentative steps which indicate a changed attitude toward agriculture are the following. Starting in 1979, prices paid to farmers have been increasing at the same time that levels of input subsidies were being reduced. This is a step toward rationalizing the pricing structure so that farmers will face a pricing system that more closely approximates costs and benefits. Allowing input and commodity prices to seek more realistic levels removes the effective tax on agriculture production. It is not yet clear how far or how fast policy will proceed in this direction.

Investments in the agricultural sector are one of the primary means by which the contribution of agriculture to gross domestic product can be sustained at a reasonable level. Intensification of agriculture will come through increased and more efficient use of agricultural inputs produced by industry. Value of agricultural commodities will be increased by industry processing of agricultural commodities. In the present situation therefore, industrial development and agricultural development are functionally inked and complementary because many of the constraints on agriculture are binding on agro-industries and vice versa. The spatial ramifications of the functional complementarity are that rural development strategy and urban development strategy are complementary through increased income from agricultural products and increased urban industry in agriculturally-related industries.

Linkages between agricultural investments and needed or useful industrial outputs exist with respect to drainage, renovation of irrigation facilities, provision of agricultural chemicals, machinery and implements, seed production, distribution systems for inputs, and commodity marketing as well as agro-industrial processing. These linkages can be exploited to expand industrial output and employment substantially if current policy directions toward economic intensification of industry are maintained.

#### F. Small Scale Industry

A program to encourage the private sector in Egypt will need to focus considerable attention on small scale industry. In 1966-67, over 99 percent of all private sector manufacturing establishments employing over 87 percent of private employees were in the size class of 1-49 employees. The great majority of these were in firms employing 1-9 persons.

The provision of assistance to small scale firms is notoriously difficult but the value of small-scale industry in Egypt (because of relatively low capital intensity,

ability to employ relatively low-skilled workers, and utilize locally available raw materials) is indisputable.

Some progress could be made if current practices which tend to discriminate against small scale firms were addressed. These include:

- Fractionalized responsibility for small enterprises among numerous ministries.
- Taxation and duties on imports of capital goods.
- A 10 percent price margin in favor of the public sector in Government purchases.
- Lack of sites suitable for small scale firms.

The World Bank has recommended that the tax benefits available to private domestic companies under Law 86/1974 and joint venture companies under Law 43/1974 as amended by Law 32/1977 be extended to small firms by removing the requirement that eligible projects are included in the national plan. A more appropriate rule would be for benefits to be available to small firms if their location supports spatial objectives and are in sectors which are planned for expansion.

The NUPS study has highlighted the potential importance of small firms for encouraging industrial growth in Upper Egypt. In the report on Illustrative Development Projects for Qena/Naga Hamadi, NUPS concluded that a successful industrial development strategy for the Qena/Naga Hamadi corridor should emphasize not only the large scale, capital intensive industries, but should also encourage small scale industries to generate sufficient employment opportunities.

#### G. Spatial Recommendations for Industrial Expansion

In Section D, a growth scenario for Egyptian industry will be suggested. How the industrial growth might be distributed over the national space, consistent with the National Urban Policy, is the theme of this section. Consistency with the Preferred Strategy entails meeting four objectives. First, the limited, traditional industrial base of Upper Egypt cities should expand, especially in Assiut, Qena/Naga Hamadi, and Aswan. Second, a major industrial center should be established in Suez to support a population of at least 850,000. Third, arable land in the Delta should be preserved for agricultural uses except in cases where there is a compelling economic reason to convert land use to industry. Fourth, industrial growth should be permitted in Cairo and Alexandria metropolitan regions in designated locations to take advantage of the economic efficiency of these two major metropolitan regions. Initially these locations should be in the closer-in satellite cities and desert fringe sites designated for industry. Later in the planning period as these sites develop emphasis should be shifted away from the closer-in sites and the present new towns should receive development priority.

All industrial subsectors are not equally suited to achieve each of these objectives. Which type of industry goes to Suez or Upper Egypt, for example, should not be a matter of indifference. Some industries will succeed where others fail.

Scarce investment resources will be wasted unless care is taken to fit industry to the economic space. What characteristics of an industry lead to success or failure in a particular place is a complex matter which often depends on specific project design. Despite this, there is some value in developing general guidelines for industrial location that take account of the characteristics of each industry. Table V-14 displays industrial characteristics that are considered relevant in choosing industry-type for particular regions. It can be thought of as the "menu" from which the industrial planner can select industries for specific places.

Looking at the first two rows of Table V-14 one obtains a picture of the traditional food and textile sectors. They will continue to be important, they use domestic resources and earn foreign exchange. Their average wages are below the industrial average wage. They are competitive and have multiple links with other industries. The iron and steel industry, further down in the table, will have a more significant role than its contribution to output growth indicates. The reason is that its output, expected to be 15 million tons by 2000 -- from 5 steel complexes -- is used by the metal products industry. This industry has important inter-industry linkages. The poor competitive performance of the iron and steel industry is a cause for concern, however, since it has a key role envisioned for it by industrial planners, as described above.

The currently available industrial subsectors studies do not provide a comprehensive identification of the location of planned industrial expansion. However, locations of some major industries were identified. The Ministry of Industry has already proposed the location of four new steel mills to be established at Dakahlia west of Alexandria, Sadat City, the west Nubariya area, and south of Suez. Currently the first one is under construction. These mills will be designed to increase output to the 15 million tons of steel targeted by the year 2000.

As for food industries, new locations are expected to be dispersed in the Nile Valley, adjacent to the sources of the agricultural raw material, following the already existing locational pattern. Sugar manufacturing, the main subsector in the food industry, is proposed for Upper Egypt; The Ministry of Industry proposed the establishment of a sugar factory at Assiut by 1990 and similar plant at Beni Suef by 1993. If the current plan is followed, new projects for paper and paper products will be located in the east Delta and South Upper Egypt.

The fertilizers industry is targetted to increase its output level at an annual growth rate of 6.5 percent between 1985 and the year 2000. To achieve this target, new fertilizers plants have been proposed for Alexandria, Suez, the Delta and Aswan area.

#### 1. Industrial Guidelines for Upper Egypt<sup>7</sup>

In the opinion of the Study Team, expansion of the industrial base in Upper Egypt is the most difficult part of the industrial allocation proposed, yet it is vitally important if the population targets of the Preferred Strategy are to be achieved and substantial decentralization is to be possible. The Government will have to take the leading role in this region's industrial expansion. Successful operation of new public sector factories would bring the area to the attention of private sector investors. The first round of public investments should be in industries with characteristics that are compatible with the current situation in the region.

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**TABLE V-14**  
**SECTORIAL CHARACTERISTICS OF MANUFACTURING INDUSTRY**

SECTOR	(1) CONTRIBUTION TO OUTPUT GROWTH	(2) EMPLOY- MENT GROWTH	(3) FOREIGN INPUTS	(4) COMPONENT OF OUTPUTS	(5) RATIO OF PRODUCTION WORKERS TO TOTAL EMPLOY- MENT (\$)	(6) RATIO OF WAGE TO INDUS- TRIAL AVERAGE	(7) LAND REQUIREMENT PER WORKER	(8) DOMESTIC RESOURCE COST	(9) EFFECTIVE RATE OF PROTECTION	(10) LABOR INTENSITY	(11) AVERAGE FIRM SIZE	(12) BACKWARD LINKAGES	(13) FORWARD LINKAGES
Food	15	9	11	9	84	.82	Low	Highly Competi- titive	Discouraged	Low	Low	Very High	Very High
Beverage	Included in Food							Marginally Competitive	Protected	Very Low	Medium	High	Low
Tobacco								Marginally Competitive	Protected	Medium	Medium	Low	Low
Spinning & Weaving	20	29	6	31	88	.93	Low	Marginally Competitive	Discouraged	Very High	Medium	Very High	Very High
Clothing & Footwear	8	11	2	16	76	.87	Low	Marginally Competitive	Protected	High	Low	High	Low
Wood, Corch, Furniture	5	9	41	6	86	1.00	Medium	Highly Incompetitive	Highly Protected	Very High	Low	Medium	Low
Paper & Paper Products	3	3			86	.92	High	Marginally Competitive	Protected	Very Low	Medium	Medium	High
Printing & Publishing	6	5	45	3	68	1.59	Low	1	1	1	Medium	1	1
Chemicals	10	6	30	4	80	1.20	Medium	Marginally Competitive	Protected	Medium	Medium	Very High	High
Rubber & Plastic	3	2	60	0	85	.96	Low	Not Competitive	Protected	Low	Medium	Medium	Low
Building Materials	6	5	28	12	87	1.20	High	Highly Competitive	Discouraged	Low	Low	Medium	Medium
Iron & Steel	8	8	31	2	81	1.21	Medium	Highly Incompetitive	Protected	Medium	Medium	High	Very High
Metal Products	16	13	40	4	82	1.07	Medium	Highly Competitive	Protected	Low	High	High	Medium

<sup>1</sup> Not included in study due to lack of data.

SOURCE: Col. 1 & 2 M.F.S. projections.

3,4,12,13 Ministry of Planning, MIT Cairo University, 1972 Input/Output Table.

5, CAPMAS Annual Industrial Census, 1971-72.

6,11. CAPMAS Industrial Census, 1977.

7. Suez Canal Regional Plan, Working Paper No. 151-ECO, Appendix 2.

8-10, Briston University Consultants, "Comparative Advantage in Egyptian Manufacturing," August, 1981.

Notes to Table V-14

Columns	Description
1,2	The contributions to output and employment growth are derived from the industrial output scenario presented above. They indicate the relative importance of each sector in the growth process.
3,4	The ratio of imported inputs to total inputs and the ratio of exported output to total output, measures the importance of foreign trade in a sector and the need to have access to port facilities or international airports.
5,6	Ratio of production workers to total employment and rates of wages to industrial average; these two ratios indicate the required skill level and mix in an industry. Low ratios for the former suggest the industry employs a relatively larger technical and administrative staff. Higher ratios for the latter suggest that the jobs demand a higher level of skill than otherwise.
7	Land requirement per worker is an important characteristic in those areas where arable land may be converted to non-agricultural uses.
8	Domestic Resource Cost measures how efficiently, in terms of domestic resources, an industry earns or saves foreign exchange.
9	Effective rate of protection indicates whether the prevailing tariff structure favors or discourages an industry.  These two statistics suggest how well an industry can compete in international markets and how the tariff structure affects domestic resource allocation.
10	Labor intensity measures the relative use of labor as against capital inputs.
11	Average firm size suggests the efficient scale of operation of firms in an industry and is an indication of the relative prevalence of small scale firms in the industry.
12,13	Backward and forward linkages are the market exchanges an industry has, both direct and indirect, with other industries. It measures the extent to which an industry is "tied into" the overall industrial sector.

The following industry characteristics are important for industrial location in Upper Egypt:

- Satisfy local demand
- A low import content
- A low requirement for high skilled workers
- Multiple linkages with other industries
- High expected growth in employment
- Labor intensive

Industries that have these characteristics are listed in Table V-15.

**TABLE V-15**  
**INDUSTRIES HAVING CHARACTERISTICS SUITABLE**  
**FOR UPPER EGYPT**

<u>SATISFY LOCAL DEMAND</u>	<u>LOW IMPORT CONTEXT</u>	<u>LOW AVERAGE WAGE</u>
Food	Food	Food
Clothing	Textiles	Textiles
Wood	Clothing	Clothing
Chemicals <sup>1</sup>	Building Materials	Paper
Building Materials	Chemicals	Rubber
<u>MULTIPLE LINKAGE</u>	<u>HIGH EMPLOYMENT GROWTH</u>	<u>LABOR INTENSIVE</u>
Food	Textiles	Textiles
Textiles	Clothing	Clothing
Clothing	Metal Products	Wood
Iron & Steel	Food	
Metal Products	Wood	
	Iron & Steel	

<sup>1</sup> Agro-related chemicals only.

Source: NUPS analysis based on Table V-14.

Industries with multiple appearances in Table V-15 have the highest probability of success in Upper Egypt. Those that appear infrequently, or not at all, are more likely to require subsidization and drain the investment fund rather than add to it. Thus, industrial investments in Upper Egypt should be predominantly in industries classified as low risk in Table V-16.

**TABLE V-16**  
**UPPER EGYPT: ASSESSMENT OF INDUSTRIAL LOCATION**

<u>LOW RISK</u>	<u>MEDIUM RISK</u>	<u>HIGH RISK</u>
Food	Chemicals <sup>3</sup>	Printing
Textiles <sup>1</sup>	Metal Products <sup>1</sup>	Rubber & Plastic
Clothing		Iron & Steel
Paper <sup>2</sup>		
Wood <sup>2</sup>		
Building Materials		

<sup>1</sup> North Upper Egypt only

<sup>2</sup> South Upper Egypt

<sup>3</sup> Fertilizer may be relatively low risk in Upper Egypt

Source: NUPS analysis based on Table V-14.

Expansion of the food industry will require concurrent expansion in the production of foodstuffs in the agricultural sector. Paper and wood industries will use bagasse, a sugar cane by-product.

These investments should be clustered mainly in the special emphasis cities: Assiut, Qena/Naga Hamadi and Aswan, to facilitate economies of scale in the provision of infrastructure services and to develop the agglomeration economies needed to encourage private sector investment and expansion of service industries.

## 2. Industrial Guidelines for Suez<sup>8</sup>

At the present time there is a sizable industrial base in Suez. As rebuilding of the city's housing and infrastructure proceeds it will attract a larger share of private sector investment. Still, achieving the NUPS population target probably will require public sector industrial investment. Suez offers sufficient locational advantages that a risk assessment similar to the one done for Upper Egypt would not be as informative. Instead, industries are classified as very desirable or undesirable. The first and second categories include those industries that are linked to the existing industrial base and/or foreign markets. Industries listed as undesirable are better suited to go elsewhere although they may succeed in Suez. Table V-17 presents our assessments.



**TABLE V-17**  
**INDUSTRY SUITABILITY FOR LOCATION IN SUEZ**

<u>VERY DESIRABLE</u>	<u>DESIRABLE</u>	<u>UNDESIRABLE</u>
Chemicals	Rubber and Plastic	Food
Metal Products	Clothing <sup>1</sup>	Textiles
Iron and Steel	Paper	Printing & Publishing
Building Materials	Wood	

<sup>1</sup> For export rather than domestic consumption.

SOURCE: NUPS analysis based on Table V-14.

### 3. Industrial Guidelines for the Delta<sup>9</sup>

Previous NUPS reports have stressed the need to preserve arable land, especially in the Delta where much of the population lives and competing demands for land are greatest. Here the need is to manage economic growth which is likely to occur spontaneously. Industrial investments should take place in the Delta when it is the only possible location and the investments improve the productivity of the existing agricultural or industrial base. This would include food, textiles (only expansion of existing facilities), and clothing. The emphasis should be on services such as warehousing, seed distribution, and irrigation system maintenance. Other industries, such as chemicals, should be introduced only if they must be in close proximity to existing facilities. Table V-18 summarizes this recommendation.

**TABLE V-18**  
**INDUSTRY SUITABILITY FOR THE DELTA**

<u>ACCEPTABLE</u>	<u>EXCLUDED</u>
Textiles	Building Materials
Food	Paper
Clothing	Chemicals <sup>1</sup>
	Iron & Steel
	Metal Products <sup>1</sup>
	Printing & Publishing
	Wood
	Rubber & Plastic

<sup>1</sup> May be acceptable in a limited number of cases.

SOURCE: NUPS analysis based on Table V-14.

#### 4. Industrial Guidelines for Cairo/Alexandria

Cairo and Alexandria, especially the former, are the most attractive locations for private sector investment. They also receive the majority of public sector industrial investment. As in the Delta case, we must identify industries to be discouraged from these regions and encouraged to locate elsewhere. The obvious choices for such reduction are those industries identified as low risk for Upper Egypt. Cairo and Alexandria should concentrate on those industries that need what Cairo and Alexandria offer: large and skilled labor forces, central positions in the national transport network, a large industrial base, and immediate access to the commercial and banking centers. Table V-19 summarizes this recommendation.

**TABLE V-19**  
**INDUSTRY SUITABILITY FOR CAIRO/ALEXANDRIA**  
**LOCATIONS**

<u>VERY DESIRABLE</u>	<u>DESIRABLE</u>	<u>UNDESIRABLE</u>
Printing & Publishing	Clothing	Building Materials
Metal Products	Chemicals	Food
Wood <sup>1</sup>	Rubber & Plastic	Textiles
Paper <sup>2</sup>		Wood <sup>3</sup>
		Paper <sup>3</sup>

1 Alexandria only. Applies to production processes using imported timber.

2 Alexandria only.

3 Cairo only.

SOURCE: NUPS analysis based on Table V-14.

Because Cairo and Alexandria are attractive locations for industry, the basic policy problem is not so much attracting industry as it is to steer its location to reinforce core deconcentration, fringe development on desirable (i.e., desert) sites, employment expansion in peripheral *kisms* on desert land (i.e., Nasr City) and providing an employment base for close-in satellites.

Current policy calls for a moratorium on industrial investment in Cairo. If strictly enforced, this policy creates a serious danger of limiting national economic growth and of high rates of unemployment among the metropolitan labor force. As suggested above, a better course of action would be to combine positive incentives for location in sites which are consistent with the concept plan for metropolitan growth, even though some of them are in the current built-up area.

Consideration should be given, also, to devising a system of tax penalties for locations where it is undesirable to have additional industrial expansion, e.g., the core of Cairo. These penalties would be designed to compensate for diseconomies produced and to pay for provided services. There are numerous mechanisms which might be employed to create such an effective tax penalty. One method could be to add a positive increment to real estate taxes in order to insure that some of the benefits of publicly provided services are paid for in the firm's taxes. Another method would be to develop a discriminating corporate profit or income tax. A third method would be to allow firms desiring to locate in undesirable sites to be eligible for none of the business subsidies which are now available as inducements under the law. The advantage of potentially adjustable mechanisms such as these over a moratorium is that they are more likely to be enforceable and can be altered to reflect changing circumstances or sectoral and spatial priorities.

The danger of such taxes is that placing a high enough tax rate on a firm to influence its location may cause the investment not to occur in Egypt anywhere rather than to cause it to locate where the Government would prefer. International experience suggests that such taxes are worth looking into; so long as it is recognized that establishing a rate that captures revenues and steers locations requires very careful analysis and design in order to avoid a substantial national cost in lost investment, employment and output.

## 5. Summary

In developing guidelines for industrial location policy, the Study Team has tried to implement a valuable observation made by Leo Klaassen:

"The industrialization policy must be based on a reconciliation of, on the one hand, the industrial structure and the human, social and natural resources of the areas, and, on the other hand, the locational requirements of the industries to be attracted to the area."<sup>10</sup>

Increased diversification of industry throughout the country offers the hope that the benefits of the development process will be shared more widely than would be the case if existing patterns continued indefinitely. Set against this is the danger of trying to diversify more quickly than is feasible. Failed projects, despite good intentions, can doom the development plan. Spreading industry throughout the country should proceed from a recognition of the strengths and weaknesses of the various regions.

The recommendations of the Study Team is that diversification should start in the basic consumer goods industries, food and clothing, and building materials. The planned installation of steel mills in Alexandria, West Nubariya and Suez could lead

to diversification of the metal products industry. New factories in the textile industry should be located outside the Delta, preferably in North Upper Egypt. The diversification of intermediate industries; wood, paper, chemicals, rubber and plastics should occur where it is consistent with economic efficiency. If these recommendations are followed in the next Five Year Industrial Plan, each subsequent plan will have more scope for industrial diversification.

## II. SHELTER POLICY ISSUES

### A. Housing Policy as a Component of National Urban Policy

#### I. Housing Policy Overview

The development of housing and intra-urban infrastructure (infrastructure serving only the population of an urban settlement) policies or shelter policies (as they are more popularly called) are usually undertaken to ensure that national policies regarding inter-personal equity and other specific objectives are met. They are developed, also, to ensure that scarce resources, particularly public resources, are not wasted and that these resources are directed in such a manner that national objectives can be met without creating undue strains on other sectors of the national economy. Furthermore, as is pointed out in the National Housing Plan of 1979, housing policies must be developed jointly with social and physical infrastructure policies.

It is important for the Government to determine where in the spectrum of housing and infrastructure policies public sector intervention is not only necessary but can achieve the greatest impact. As is illustrated in the National Housing Plan, this can be done by identifying target groups whose housing and infrastructure needs should be provided by Government and other target groups whose needs can be best met by facilitating private sector action (private sector in this case using a very broad definition to include actions now occurring in the informal sector). Once target groups have been identified, packages of urban services (housing and infrastructure) can be developed to: (1) meet the specific affordability<sup>11</sup> or other socio-economic criteria of the target group, or (2) achieve other specific objectives of Government, such as the national urban policy specific spatial objectives. Frequently, these two income and spatial criteria can be combined in a single set of housing policy actions.

In line with the overall principles articulated by the national urban policy, it is our recommendation that specific housing policies follow the following broad policy principles:

- That the public sector's role in the direct construction of housing be limited to two specific objectives: (1) achieving greater inter-personal equity across population groups through meeting the housing needs of disadvantaged groups, and (2) achieving the spatial objectives of national urban policy through investments

directed to urban places where private sector housing investments are not now occurring or are not occurring in a manner consistent with national urban policy.

- The Government's role in all other housing should be to facilitate and encourage the private sector to fulfill the bulk of the housing requirements remaining.

The first policy principle, that of the public sector's direct role in housing construction, is aimed at broadly improving the housing conditions of urban Egyptians who are suffering from inequities resulting from the present distribution of urban services or who might suffer as a result of Government's other spatial objectives. For example, creating a major countermagnet in the Canal Zone could easily result in achieving high standards of housing provision in Suez, but neglect of housing conditions in settlements not receiving spatial priorities. Therefore, the first objective is not restricted to settlements receiving spatial priority, but aims at providing for the basic shelter needs of disadvantaged groups throughout the settlement system. The second objective on the other hand, aims at developing specific investment packages for the Government which are necessary to achieve desirable modifications in the settlement system. Coupled with these specific investment packages is the notion that government's role in providing housing is not limited to achieving specific spatial objectives, it is also limited to specific time periods after which the stage will have been set for the private sector to take over responsibility for housing production.

The second principle of the recommended housing policy recognizes that between 1966 and 1976, roughly 93 percent of the housing built was constructed by the private sector (78 percent by the informal sector and 15 percent by the formal private sector). However, much of this housing was built in undesirable areas such as prime agricultural land or served very small groups (such as much of the upper income formal private construction). Furthermore, vast resources of untapped household savings which might have been available to finance urban services did not enter into the financial system and, thus, were not available to alleviate some of the existing inequities. Therefore, Government's major role regarding the private sector should be:

- To encourage the private sector to play an even greater role in the provision of housing through appropriate administrative and legal actions.
- To facilitate greater private sector activities through provision of those urban services which the private sector cannot easily provide (such as municipal water supply), and, where necessary, inject capital into the system to ensure private sector involvement is timely.

These major housing policy principles suggest major target groups for which housing standards should be developed to guide Government action:

- Economically disadvantaged groups.
- Spatial target groups receiving special priority as components of national spatial objectives.
- Private sector target groups.

Although these major target groups are presented as distinct groups, there is considerable overlap among them. However, as pointed out, while the first two target groups require direct investment by Government, and if public sector resources are to be conserved, private sector target groups will also have to play an increasingly larger role in providing housing which serves disadvantaged groups and spatial target groups.

Due to the lack of reliable data about who the disadvantaged groups are in urban Egypt, a short-term policy aimed at disadvantaged groups in existing built areas of urban settlements is recommended to deal with immediately recognizable housing needs, while a longer term approach which would build on experiences gained during immediate action programs and would be further developed once more detailed data about housing conditions is obtained is recommended to be targetted at more precisely defined groups.

The recommended short-term policy aims at assisting households living in overcrowded conditions in existing areas. Assistance would be aimed at households living in dwellings which have occupancy rates (persons per room) which are higher than average settlement occupancy rates, and/or living in high density *kisms*.<sup>12</sup> Since disaggregated *kisms* data is only available for Cairo and Alexandria, a measurement of the total number of households who should benefit from this program was estimated for only those two settlements to show how such programs could be devised. Since the aim of this program is to benefit economically disadvantaged, minimum standards are recommended for households which would benefit under this program. This program is outlined in Appendix V-A. As an initial target until more precise data is available, it aims at assisting roughly 80,000 households living in over-crowded conditions and having incomes at the World Bank defined "Urban Poverty" level or having annual incomes below the 30th percentile of urban incomes.

The longer-term housing program for disadvantaged groups would depend on more precise definitions of beneficiary households to be developed, once more thorough housing census data are available. This census data should provide the following information to policy-makers:

- Detailed information about household occupancy rates within settlements, at *kism* or sub-*kism* level.
- Information about the structural condition of housing and the location of deficient stock.
- Conditions about household access to infrastructure, especially water supply, sanitation and power supply.
- Estimates of household income.
- Estimates of household assets including:
  - savings
  - durable goods, etc.

## 2. Description of Spatial Target Groups

Spatial target groups consist of packages of housing and intra-urban infrastructure investments which are necessary for Government to make in particular urban places to encourage changes in settlement patterns which are desirable objectives of the national urban policy. Besides being spatially located investments, standards designed for spatial target groups have the added function of encouraging particular types of growth patterns. For example, standards developed for Delta cities aim at conserving urban land through vertical rather than horizontal development. These spatial target groups are as follows:

### a. Metropolitan Area Target Groups

The definition of the metropolitan area target groups follows definition of the spatial groups suggested by the Greater Cairo and Alexandria Concept Plans:

#### ● New Settlement Areas

These target groups consist primarily of the close-in satellite communities and other residential areas that are not now connected with the existing built-areas of Greater Cairo or Alexandria.

#### ● Infill or Extension Areas

These target groups are located adjacent to existing built areas of Greater Cairo and Alexandria. In addition to new, largely low income population, it is expected that infill areas will also be recipients of disadvantaged target groups who hope to move out of overcrowded *kisms*. Two forms of direct public sector involvement is recommended for these areas:

- Provision of serviced land
- Limited construction of housing for disadvantaged groups.

#### ● Existing Built Areas

No direct housing construction by the Government is recommended for these areas. Rather, it is recommended that efforts be focussed on upgrading and maintenance of existing stock and improvements to infrastructure. In selected areas where the building is so deteriorated that rehabilitation is not feasible, some efforts on the part of the Government may be necessary to encourage redevelopment. In such areas redevelopment zones similar to those proposed for the NUPS Tanta Illustrative Development Project should be established to encourage private sector redevelopment of deteriorated areas. This redevelopment should focus on vertical expansion rather than low density horizontal expansion.

### b. High Growth Areas (Suez and Other Canal Cities)

It is expected that housing policies for high growth areas such as Suez will be directed towards ensuring that growth in the housing stock keeps pace with employment growth to maintain the attractiveness of Suez to industrial investors in Suez. Due to the current shortage in housing in Suez (See Chapter IV) during early periods of the development plan, direct public sector investment in housing will be necessary.

Since the three Canal Governorates are in the process of setting up land development agencies which will provide serviced land, investment in housing should complement land packages developed by these agencies. In the early stages of Suez's development to maintain the investment momentum which is occurring now, it is recommended that a broader range of public sector investments in housing be made than in other areas. These should include housing for industrial workers, housing for professional and managerial staff and should be supplemented with expatriate housing.

Although Suez is expected to maintain high growth rates throughout the planning period, after 1985 public sector direct housing construction should be minimized and the private sector encouraged to take over the role of production of housing. This should be done through continued investment in servicing of land for sale or leasehold ownership and through provision of adequate housing finance.

#### c. Urban Areas Selected for Phased Decentralization

A greater commitment in direct construction of housing by the public sector is likely to be necessary to promote decentralization efforts away from Cairo to Assiut, Qena/Naga Hamadi and Aswan due to their past relatively slow economic growth. However, investments in infrastructure (such as housing projects) should be closely linked with likely growth in employment to avoid under-utilized infrastructure investments. While initial housing investments in all three settlements should be aimed at improving existing stock as much of it is deteriorated, all three settlements have new town areas or potential areas for urban extensions which initially will need public sector investments to ensure their orderly growth. However, this investment should focus on provision of physical and social infrastructure and limited public sector investments in housing. (A more complete description of these new growth areas is given in Chapter IV.)

#### d. Delta Settlements

Three major sub-target groups have been identified for the Delta urban settlements: (1) Regional Service Centers, (2) High Density Settlements, and (3) Other Delta Settlements.

##### ● Regional Service Centers

The choice of Tanta and Mansoura as having potential for broader regional functions was made due to their existing strong regional service facilities and their potential for absorbing new urban population within their boundaries. Therefore, higher standards of physical and social infrastructure have been suggested for these two settlements as a means of promoting the attractiveness of their regional functions. Since vertical redevelopment of the core area is an important component of additional growth of these settlements, it is recommended that Government intervention in housing provide assistance to low income households in the form of compensation for their existing dwellings and new dwellings in higher density redeveloped areas. Initial subsidies which might be required can be recovered through increased revenues from property taxes distributed among the new, increased population. As previously mentioned, the NUPS Tanta Illustrative Development Final Report proposed establishment of four zones in which specific types of urban development would be permitted:



- Verticle redevelopment zones.
- Zones where additional floors could be added.
- Zones where current development is adequate.
- Built area expansion zones where development at appropriate densities (urban gross densities of 350 persons/hectare) would be permitted. (NUPS Tanta and Gena/Naga Hamadi Illustrative Development Projects, Part I: Tanta V-D. 1981.)

- High Density Settlements

Enforcement of arable land constraints on the horizontal growth of Damanhour, Kafr El Dawar and Zagazig, due to their high 1976 gross densities, will be difficult without concerted strategies of limiting population growth and encouraging only vertical expansion. However, due to the very high gross densities which would occur if arable land constraints could be imposed, limited new settlement areas will have to be identified to complement additional vertical expansion of the existing built areas. Thus, the following target groups have been identified:

- Vertical expansion of built areas. No direct public sector construction is recommended. Private sector redevelopment of existing areas to be encouraged through provision of loans for construction of additional floors and replacement of one- and two-story buildings with multi-story buildings. Limited assistance as was proposed for Regional Service Centers could be provided to compensate existing residents during redevelopment phases.
- New settlement areas. Three sets of public sector action are recommended to conserve arable land loss and public sector expenditure:
  - 1) The new areas should be selected to infill existing built-areas or be designed to minimize both land area and loss of prime arable land.
  - 2) Infrastructure should be designed which is adequate to ensure high densities.
  - 3) Due to the high natural growth rates of these settlements, no direct public sector construction of housing is recommended; rather, assistance in the form of loans should be given to private sector development which conforms to high density design requirements of these new settlement areas. All non-conforming development should be strictly prohibited.

- Other Delta Settlements

No direct public sector construction of housing, other than housing aimed at disadvantaged groups, is recommended for other Delta settlements rather, public investment should focus on provision of basic levels of physical and social infrastructure.

Due to the possibility of high population growth in Delta settlements, special emphasis should be given to assisting private sector developers in redeveloping one- and two-storey buildings into multi-storey buildings.

e. Non-Special Emphasis Nile Valley Settlements

Public sector housing investments in non-special emphasis governorate capitals should aim at, first, disadvantaged groups and, secondly, at ensuring adequate private sector construction occurs to maintain the existing stock and to accommodate future population growth. Like other non-priority Delta Settlements, public sector action in Nile Valley settlements should encourage vertical redevelopment of existing built-areas through providing finance for construction of additional floors and renewal of existing buildings.

Similarly, public investment should focus on provision of infrastructure service facilities serving surrounding smaller settlements and rural areas.

Public sector involvement in other smaller, non-governorate capital settlements should be limited to ensuring that adequate levels of infrastructure are available, access to higher level service facilities in governorate capitals and regional service centers is provided, and disadvantaged groups are served.

f. Remote Area Settlements

Due to the limited population bases of existing remote area settlements, greater public sector direct construction of housing will probably be necessary than in other settlements. However, due to the higher costs of construction in these settlements and the greater risks associated with under-utilized infrastructure investments being made in remote areas, an approach to housing solutions should be adopted which aims at minimizing inputs imported to the region and which is more climatically suited to the region than is housing now under construction. Further, due to the higher costs of construction and the need to provide incentives to attract qualified people to remote areas, higher subsidies will be necessary than other settlements zones.

B. Recent Private/Informal Sector Housing Activities

Because the private/informal sector has been very active in the last few years and because the private sector can be more effectively used to achieve urban policy objectives, a review of its recent activities is both relevant and informative. The private/informal sector (the two are combined here to denote non-public sector) production of housing has been dramatic. Census data between 1966 and 1976 indicates that dwelling unit production throughout the country more than kept pace with population growth, as the annual urban population growth rate was 2.9 percent while dwelling units increased at an annual growth rate of 3.8 percent.<sup>13</sup> However, during the period, formal private sector construction amounted to 15 percent of the additions to the dwelling unit stock while the informal sector contributed 78 percent.<sup>14</sup> However, due to the lagging growth of public sector housing (governorate plus public sector companies), it was widely perceived that there was a housing crisis in urban Egypt.

Recent surveys of housing construction in Greater Cairo, Beni Suef and Suez indicate that growth rates in the stock have either surpassed those of earlier

periods or at least kept pace with population growth rates. In Greater Cairo, an annual growth rate in the housing stock of 5.3 percent between 1976 and 1981 has resulted in a vacancy rate of 5.5 percent of the occupied housing stock, while the units under construction equal 4.3 percent of the occupied stock. In Suez, an urban area which has experienced very rapid population growth rates since 1976, the Planning Department of the Government has conducted surveys of informal dwelling unit construction in portions of the city and reports that growth in a single year's period is equal to an annual rate of 6 percent. In Beni Suef, where much slower population growth rates have been encountered, the annual rate of growth in the housing stock has been 2.1 percent vs. its estimated population growth rate of 2.4 percent. Nevertheless, vacancies in Beni Suef are estimated at 3.0 percent of the occupied stock.<sup>15</sup>

These dramatic increases in the stock have generally resulted in improvements in the condition of the housing stock, and in Greater Cairo at least, vertical expansion of the stock. Regarding the latter, a comparison of the average number of floors per building in new construction and the increase in the number of floors per building of the total housing stock (existing and new units) suggests that the bulk of the vertical expansion has occurred in existing built-up areas and not in newly formed areas, since the average number of floors per building in new construction dropped from 2.45 in 1971-1976 to 2.25 after 1976, while total floors per building in Greater Cairo as a whole increased from 2.09 in 1976 to 2.45 in 1981.<sup>16</sup>

This increase in densities is desirable if it is accompanied by improvements in infrastructure and in the condition of the housing stock and if it occurs in desirable locations. In Greater Cairo, where statistical data is available, improvement in the condition of the stock occurred simultaneously with increases in densities. During the 1976-1981 period, the number of rooms per household increased from 2.50 to 3.35, while the number of households having access to water, sewerage and electricity also improved.

Much of this growth in the housing stock has occurred due to the efforts of the informal sector (defined as being illegal since building occurs either without a building permit and/or on land which is not legally subdivided). In Greater Cairo, 75 percent of the increase in dwelling units has proceeded without legal sanctions.

While the informal housing sector has made valuable contributions to the housing stock, both in terms of increasing the supply of housing and improving its condition, much of this growth has not been in desirable locations and has resulted in conversion of arable land indiscriminately to urban uses or further densification of urban *kisms* which do not have adequate infrastructure to accommodate increased densities. This conversion of arable land to urban uses by the informal sector has occurred primarily due to the access to infrastructure which urban fringe agricultural land has. These lands already have rudimentary roads and water can be obtained from shallow wells or canals. While it is argued by some that urban uses may present a higher use of the land than maintaining agricultural uses, alternative close-in desert sites exist, which if serviced with basic infrastructure such as water supply, access and electricity, could provide expansion areas for what is now informal housing activities without conversion of agricultural land.

The actual value of the investment in housing represented by informal activities is not available due to the illegality of the process. However, estimates of the

value of informal housing in Greater Cairo can be made from survey data of the Informal Housing Study. This study estimates that roughly 75 percent of the dwelling units constructed in 50 census innumeration districts of Greater Cairo where scanning surveys were conducted in 1981 between 1976 and 1981 were informal.<sup>17</sup> Although the study is not precise about the division between informal construction in new areas and additions to existing buildings, a comparison of the average number of dwelling units per building in Greater Cairo as a whole (3.84 dwelling units /building) and the average number of dwelling units per building in new areas (2.87 units/building) suggests that roughly 66 percent of the construction probably occurred in new areas. The study further indicates that the median plot size in its survey areas is 88 square meters and average dwelling units consist of 3.35 rooms per household (roughly 36 square meters per unit).<sup>18</sup>

An order of magnitude estimate of the total investment made by the informal sector in housing construction and land acquisition in urban areas was made using these parameters plus similar times series data from Beni Suef. This projection indicates that the total value invested in land and dwelling units could have reached L.E. 2,197 million or roughly L.E. 3,686 per/informal unit.<sup>19</sup> The actual amount invested in dwelling units was in the range of L.E. 2,237 per unit. A summary of the estimated investments made by the informal sector in Greater Cairo and other urban areas is shown in Table V-20, while back-up tables detailing these calculations are shown in the Appendix V-A.

A comparison of investment levels in formal sector housing with informal sector housing is suggested by the standards of housing in the new towns. For example, the average investment in dwelling units set of intra-urban infra-structure in the 10th of Ramadan is L.E. 4,838, while it is roughly L.E. 6,145 per unit in the 15th of May (1979 prices). However, both new towns have dwelling unit standards which are higher than those of the informal sector; in the 10th of Ramadan the average dwelling unit size is 70 square meters, while it is 79 square meters in the 15th of May.<sup>20</sup>

Although the informal sector finances housing through cash payments or savings, these average unit construction costs (excluding projected land values) are affordable to households at the 40th percentile of Greater Cairo incomes at current Central Bank lending rates (roughly 12.5 percent) if conventional "level payment" mortgages were granted over 30 years with 20 percent downpayments and initially 25 percent of income were devoted to mortgage payments.<sup>21</sup> Further, as is shown in Table V-21, rents presently comprise less than 15 percent of household expenditures throughout Greater Cairo, although in newer construction the average can reach 25 to 30 percent.

Thus, through a combination of rental construction and owner-occupancy, the informal sector reaches a broad range of target groups and could continue to do so even through more conventional forms of housing finance if such finance were available to the informal housing sector.

This brief assessment of affordability in the informal sector has excluded land values because these values have been subject to heavy speculation in recent years (the average annual growth rate in land prices in Greater Cairo between 1968 and 1981 has been 25 percent), and because this investment represents a source of finance which could be diverted to more productive uses if alternative lower priced land were provided and investment instruments were available to attract the resource. (Table

**TABLE V-20**  
**ESTIMATE OF TOTAL VALUE OF INFORMAL HOUSING INVESTMENTS IN GREATER CAIRO**  
**AND OTHER URBAN AREAS (1976-1981)**

YEAR	GREATER CAIRO						TOTAL ESTIMATED VALUE OF INFORMAL HOUSING - ALL URBAN AREAS <sup>6</sup>		
	TOTAL NUMBER OF DWELLING UNITS ('000s) <sup>1</sup>	NEW UNITS ADDED TO STOCK ('000s) <sup>2</sup>	INFORMAL SECTOR SHARE ('000s) <sup>3</sup>	ESTIMATED VALUE OF INFORMAL HOUSING (L.E. MILLIONS)			(L.E. MILLIONS)		
				LAND <sup>4</sup>	DWELLING UNITS <sup>5</sup>	TOTALS	LAND	DWELLING UNITS	TOTAL
1976	1,534								
1977	1,615	81	61	39	86	125	90	150	240
1978	1,701	86	65	56	108	164	113	202	315
1979	1,791	90	68	74	140	214	167	245	412
1980	1,886	95	71	97	179	276	203	338	541
1981	1,986	100	75	120	229	349	291	398	689
TOTALS		452	340	386	742	1,128	864	1,333	2,197
AVERAGES PER DWELLING UNIT (L.E.)				1,135	2,182	3,318	1,449	2,237	3,686

Totals may not add due to rounding.

<sup>1</sup> 1976 figures from 1976 Census of Housing (CAPMAS).

<sup>2</sup> Projected from 1976 census data using 5.3 percent annual growth rate from Informal Housing in Egypt sample survey of 50 Greater Cairo enumeration districts.

<sup>3</sup> Projected to be 75 percent of new housing construction according to sample surveys in Greater Cairo enumeration districts. See Table V-A.39.

<sup>4</sup> Estimated from free market time series of land costs shown in Table V-A.39 and assumes that the relationship between dwelling unit construction in new areas and existing areas remains constant, i.e., 66 percent of total additions in new areas.

<sup>5</sup> From free market time series of building costs. See Table V-A.39.

<sup>6</sup> Projected from 1976 Census of Housing and annual growth rates experienced in housing stock in urban areas between 1966 and 1976. Appendix Table V-A.40 shows the details of these estimates.

SOURCE: NUPS analysis from data sources shown above.

**TABLE V-21**  
**PERCENT OF ANNUAL HOUSEHOLD INCOME**  
**SPENT ON RENT**

QUARTILE INCOME GROUP	1979 <sup>1</sup>		1981 <sup>2</sup>	
	GROSS ANNUAL RENT (L.E.)	PERCENT OF INCOME (%)	GROSS ANNUAL RENT (L.E.)	PERCENT OF INCOME (%)
1	61	9.5	92	14.0
2	91	9.1	103	10.0
3	129	8.9	122	8.0
4	156	6.5	183	8.0

Note: These are average rents calculated at the median income level of each household income quartile. Recent movers have experienced much higher rent burdens as a proportion of income. For example, those who have moved recently, have rents which are 75 percent higher than the median for Cairo renters. For some households, particularly low income households, these rent burdens can reach 25 to 30 percent of annual income.

SOURCE: <sup>1</sup> Interpolated from 1979 AID Urban Expenditure Distribution  
<sup>2</sup> Informal Housing in Egypt. Apt Associates for USAID  
Cairo, 1981 Table 8-5 and 8-8 (Cairo data only).

V-A.39 and V-A.40 of the Appendix.) As is shown in Table V-20, this resource in all urban areas is roughly equal to L.E. 1,449 per informal sector dwelling unit or a total of L.E. 864 million.

### C. Household Affordability

So far, housing policy has been discussed at the national level and has been related to spatial target groups. However, since housing is a commodity which is consumed by individual households and a household's ability to consume housing is related to its access to housing as measured either by the portion of its income the household is willing to devote to housing or its access to financial assistance such as housing subsidies, national spatial target groups need to be linked more closely with individual household target groups as measured by household incomes and other socio-economic criteria.

#### I. Structure of Household Affordability

Household affordability in urban Egypt is characterized by three major components:

- Wages and salaries from one or more sources
- Savings
- Remittance income from overseas workers.

Of the three, the most data exists about household incomes as measured by household expenditures for food, rent, clothing, education, etc.<sup>22</sup> Several data sources exist about household expenditures and are discussed in the NUPS Urban Growth and Urban Data Report; here we present the results of recent household surveys in Cairo and Beni Suef and compare them with previous survey results. (Table V-22)

The other two sources of household affordability, household savings and remittance income, are more difficult to measure due to lack of precise data sources. Savings in particular is hard to measure because it frequently takes the form of investments in assets which can be easily liquidated, such as jewelry (usually made of gold) or property. Households are also thought to have substantial cash savings due to the high currency component of the money supply, but again, the distribution of this form of savings is unknown. Worker remittance income is hard to measure because it is frequently used to finance "Own Exchange Imports" (imports of goods financed by privately held foreign currencies) and because much of it is exchanged through other than official channels. Due to the higher exchange rates prevailing on the free market, the component of worker remittances exchanged outside official sources has been increasing recently. (Table V-23)

#### 2. Household Incomes

All income groups have experienced real increases in income (as measured by household expenditures) since 1974, the base year in which CAPMAS conducted its first urban household expenditure survey. The most dramatic growth in household incomes has occurred in the first and second quartiles of household incomes averaging real

**TABLE V-22**  
**ESTIMATED ANNUAL INCOME FOR URBAN HOUSEHOLDS**  
**BY PERCENTILE INCOME GROUP**

**1975-1981**

(L.E. CURRENT PRICES)

HOUSEHOLD INCOME PERCENTILE GROUPS

YEAR <sup>1</sup>	10th	20th	50th	80th	90th	CONSUMER PRICE INDEX <sup>2</sup>
1975	100	170	360	800	1,100	100.0
1976	NA	NA	NA	NA	NA	110.3
1977	150	300	520	1,000	1,600	123.5
1978	230	350	750	1,250	2,000	137.0
1979	420	620	1,000	1,600	2,200	150.5
1980	NA	NA	NA	NA	NA	184.0
1981	444	600	1,032	1,880	2,292	
1975-1981						
NOMINAL						
ANNUAL						
GROWTH						
RATE (%)	28.2	23.4	19.2	15.3	13.0	13.0
1981						
INCOME						
IN 1975						
PRICES (L.E.) <sup>241</sup>		326	561	1,022	1,246	-
1975-1981						
REAL ANNUAL						
GROWTH RATE						
(%)	15.8	11.5	7.7	4.2	2.1	-

SOURCE: <sup>1</sup> 1975 - USAID Estimates.  
1977 - World Bank Estimates.  
1978 - USAID Estimates.  
1979 - USAID Estimates.  
1981 - Informal Housing In Egypt. APT Associates, Inc. Draft Final Report, 1981 (Cairo Incomes Only)

<sup>2</sup> CAPMAS as quoted by IMF, A.R.E. Recent Economic Developments, January 1981, p.61.



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TABLE V-23  
WORKER REMITTANCES AND PRIVATE SECTOR SAVINGS - TOTAL AMOUNTS AND PER HOUSEHOLD SAVINGS

YEAR	TOTAL NO. OF HOUSEHOLDS (MILLIONS) <sup>1</sup>	TOTAL WORKER REMITTANCES (LE MILLIONS) <sup>2</sup>	TOTAL REMITTANCES/HOUSEHOLDS (L.E.)	OWN EXCHANGE IMPORTS (LE MILLIONS) <sup>2</sup>	OWN EXCHANGE IMPORTS/HOUSEHOLD (L.E.)	TOTAL VALUE OF REMITTANCES (LE MILLIONS) <sup>2</sup>	TOTAL VALUE/HOUSEHOLD (L.E.)	TOTAL PRIVATE SECTOR SAVINGS (LE MILLIONS) <sup>3</sup>	TOTAL PRIVATE SECTOR SAVINGS/HOUSEHOLD (L.E.)	TOTAL CURRENCY IN CIRCULATION (LE MILLIONS) <sup>3</sup>	TOTAL CURRENCY PER HOUSEHOLD (L.E.)
1975	7.40	N.A.						725.9		1,155.9	
1976	7.58	238.1	31.4	155.7	20.5	193.8	51.9	1,022.0	134.8	1,387.8	183.1
1977	7.55	358.2	46.8	265.2	34.7	623.4	81.5	1,406.5	183.9	1,749.5	228.7
1978	7.99	644.5	80.7	587.2	73.5	1,231.7	154.2	1,903.3	238.2	2,183.3	273.3
1979	8.21	610.5	74.4	839.2	102.2	1,449.8	176.5	2,633.9	320.8	2,656.9	323.6
1980 (Actuals)	8.43	335.0		579.4		914.4		3,479.9		3,150.7	
(Annualized)		570.6	67.7	1,036.8	123.0	1,572.8	186.6	3,705.2	439.5	3,310.5	392.7
Average Annual Growth Rate (%) (1976-1980)		24.4	21.2	60.6	56.5	41.1	31.7	38.4	34.4	24.3	21.0

SOURCE:

<sup>1</sup> NUPS Analysis.

<sup>2</sup> International Monetary Fund, "Development of a Capital Market in Egypt," Draft Report, January 1981, p. 8, Note 1980. Figures are annualized amounts derived from amounts for first six months of 1980.

<sup>3</sup> International Monetary Fund, "Arab Republic of Egypt - Recent Economic Developments," January 1981, Table 45 p. 85. 1980 Figures are annualized from data as of September 1980.

annual growth rates of 15.0 and 11.5 percent; respectively. Upper income groups have also experienced income increases, but as expenditures are a less reliable measure of income for these groups, the increases measured by surveys appear less substantial than lower quartiles. A summary of the 1974 CAPMAS Household Expenditure Survey, USAID 1979 Updated Household Income Distribution and the results of the 1981 Informal Housing in Egypt Study of household expenditures in Greater Cairo and Beni Suef are presented in Table V-22. Overall, these surveys indicate that at the median (50th percentile of household expenditures) household incomes have increased by an annual growth rate of 7.7 percent.

Price subsidies for food, fuel and other consumer goods play an important role in household incomes in urban Egypt. In an internal memorandum of USAID, it is estimated that subsidies for food and fuels comprise as much as 49.5 percent of household expenditures at the median and 51.9 percent for lowest income quartile.<sup>23</sup> While the intent of these subsidies is to provide a more equitable distribution of national income, particularly to low income groups, the USAID memorandum estimates that fuel subsidies in the form of subsidized prices for petroleum products<sup>24</sup> have had a much greater impact on upper income groups than lower income groups because upper income groups consume greater amounts of fuel due to private car ownership and greater electricity consumption.

Subsidies in-kind such as controlled rents for dwelling units and building materials subsidies are thought to have a much lesser impact on household incomes than food and fuel subsidies due to the increasing of illegal key money payments and the volume of housing construction occurring in the informal sector which does not have access to subsidized building materials.

Except for the lowest quartiles, rent burdens on household incomes have remained relatively constant; the median in 1981 was 10 percent of income. However, within the lowest income quartile, there are indications that rent burdens have increased and by 1981 reached a median of 14 percent of income. Rent burdens in the highest quartiles have also tended to increase somewhat, but still remain low in terms to total monthly expenditures averaging about 8 percent of income. (Table V-21) Rent burdens for recent movers tend to be much higher than more established households. For example in Cairo, rents for households who have moved into new units are 75 percent higher than the median for Cairo renters or roughly 17 percent of income. However, since household incomes have experienced real increases since 1975, over time this rent burden as a percent of income should reduce as incomes increase.

### 3. Household Savings

Measurement of household savings tends to be more difficult than measurement of expenditures due to the propensity of households to save in kind outside formal banking systems. However, roughly 70 percent of owners of informal housing financed the purchase of their units through some form of savings whether it be in banks, in currency, in gamiya or in the form of assets easily liquidated such as jewelry or property.<sup>25</sup> Typically, these units have been about three rooms in size (the mean for Cairo is 3.35 rooms per household), and have cost between L.E. 1,400 to L.E. 2,600 (1979 prices). Key money payments, which also represent a measure of savings, as in most cases, are greater than annual household expenditures. For example, 53 percent of the households who moved in the last two years reported that they made key money payments. Those payments over the last five years have averaged L.E. 1,387, or 135 percent of reported median annual expenditures.<sup>26</sup>

This savings capacity among households is further suggested by increases in private sector deposits in commercial banks. These deposits as an aggregate have increased at an annual growth rate of 38 percent between 1975 and 1980. While these increases in private sector savings deposits have been coupled with dramatic increases in total money supply (reaching 35 percent between September 1979 and September 1980),<sup>27</sup> they have been accompanied by a much slower rate in the total currency component of money supply (24 percent). (Table V-23) It is important to note however, that savings of remittance income is probably being increasingly held outside formal sector institutions. While the estimated total value of remittances increased at a rate of 41 percent between 1976 and 1980, remittances transmitted through formal banking institutions dropped from L.E. 611 million in 1979 to L.E. 571 million in 1980 and overall grew at a much slower rate between 1976 and 1980 of 24 percent.

These national level monetary and remittance statistics were compared with growth in the total households to give an indication of the average savings capacity of households in Egypt. (Table V-23) While the table does not indicate the distribution of savings among household groups nor among households and other private sector entities, it does indicate that by 1980 the combination of private sector savings deposits in commercial banks and currency holdings averaged L.E. 832 per household.

#### 4. Future Growth of Household Income

Future household income growth is projected by assuming that household disposable income (minus worker remittances) as a percentage of GDP would remain constant at the 1979 level (58.6 percent) and that the urban median income would equal the national average (mean) household disposable income, as was the case in 1979. Thus when applied to the NUPS population and GDP growth rates, urban household disposable income is projected to increase at an annual rate of 3.85 percent between 1980-2000. It should be noted that this projection is less than the growth rates experienced between 1975 and 1981 as are shown in Table V-22, because it excludes worker remittances since there is no data about its proportion of household income and because household incomes in Table V-22 were deflated using the Consumer Price Index which is heavily influenced by subsidies. Because of this implied ability to afford larger portions of infrastructure costs, this projected growth in incomes was used to determine affordability shown in the following section of this report.

#### D. Standards, Per Capital Costs and Affordability of Spatial Target Groups of Preferred Strategy

##### I. Background

The physical standards of housing and intra-urban infrastructure for the spatial target groups were derived with the aim of implementing the spatial objectives of NUPS through:

- Providing higher levels of standards in places receiving special emphasis, thus, providing incentives for industries to locate in them.
- Providing lower standards in other settlements not receiving spatial emphasis but which either improve existing deficits and bring service levels of infrastructure

to national urban average standards or provide basic levels of urban infrastructure.

Inter-personal equity considerations have been suggested through ensuring that standards in all settlements improve the existing levels of urban services. Higher levels of subsidies have been suggested to provide basic levels of infrastructure in places where household incomes are not adequate to fully finance it. Regarding the latter, since household incomes may well be lower in settlements not receiving special emphasis while at the same time construction costs may be higher, partially due to the lack of sufficient economic activities to generate economies of scale, greater per capita subsidies may be needed in non-special emphasis settlements even though they have not been targeted for higher infrastructure standards. For example, even though higher infrastructure standards have been suggested for the contiguous area of Greater Cairo than say, in Beni Suef which has not been targeted for special emphasis, per capita subsidy requirements in Beni Suef are estimated to be L.E. 1,901 during the 1986-1990 period while they are only L.E. 128 in Greater Cairo. Similarly, both Assiut and Qena have been targeted for special emphasis, however, per capita subsidy requirements are higher in Qena than they are in Suez (L.E. 636 vs. L.E. 749) due to relatively higher incomes in Suez.

## 2. Settlement Gross Densities

The NUPS Interim Action Report demonstrated the potential impact of increased gross densities on the population absorption capacity of settlements. For example, if Delta settlements grew at densities in the 1976 range of Damanshour (400 persons per hectare), they could accommodate an additional 14 million population or 67 percent of the expected total urban population increase between 1980 and 2000 without further incursion on arable land beyond 1976 settlement boundaries. Increased densities also have a significant impact on reducing per capita costs of infrastructure and increasing the revenue generating portion of urban areas.

Thus, throughout the costing of intra-urban infrastructure in the First and Second Round Alternatives and the intra-urban infrastructure costing of the Preferred Strategy, settlement gross densities were treated as an independent variable along with other physical standards in calculation of intra-urban infrastructure costs. Delta settlements which have no horizontal expansion possibilities except onto arable land were constrained to their existing boundaries as presented by the 1976 Census. Since many delta settlements had 1976 gross densities which would permit infill prior to reaching 300 persons per hectare (the standard suggested for horizontal expansion), this constraint could be imposed with a fair chance for success. Settlements with very high densities are discussed below. All other settlements with horizontal expansion possibilities were assumed to expand beyond their 1976 boundaries when their gross densities reached a target standard of 300 persons per hectare. This gross density target was used because it allows most settlements to expand within their settlement boundaries through either infill of existing built areas or vertical expansion prior to horizontal expansion. It also allows fairly efficient land use in developing new urban areas. For example, this density would allow average plot sizes in the range of 117 square meters if 70 percent of the urban area were devoted to private uses. This potentially represents a 33 percent increase in private land consumption over the informal sector Greater Cairo median plot size of 88 square meters. While 70 percent saleable land area was

treated as a target for new urban development areas, most urban settlements may not achieve saleable private land areas of more than 65 percent of their total areas due to physical barriers or unusual configuration.

While it is not expected that all future settlements will have uniform gross densities by the year 2000, using the target gross density of 300 persons per hectare or tracing through the impact of constraining Delta settlements to their 1976 boundaries illustrates the potential for increasing the efficiencies of the settlement system through adopting different policies towards physical growth.

In settlements such as Damanhour, Kafr El Dawar, Zagazig and possibly some of the other settlements, constraining growth to the 1976 boundaries may not be possible due to the very high gross densities which would result, in excess of 600 persons per hectare. In these settlements, some new settlement areas will have to be designated to accommodate overflow populations. However, if this is done, adequate densities should be maintained to ensure efficient land use. In other settlements with lower gross densities, policies of constraining development within settlement boundaries have greater chances of success. In them, infill development should aim at overall settlement gross densities of 300 persons per hectare to achieve maximum population absorption and to minimize the risks of further expansion onto arable land. In the Tanta Illustrative Development Project, a second gross density concept was introduced to allow expansion of built areas within settlement boundaries. This concept was urban gross densities which is defined as the gross densities which include all urban uses but exclude protected agricultural land within the Delta. It was recommended that these densities should be at least 350 persons per hectare.

### 3. Intra-Urban Infrastructure Estimates (See Appendix V-A for a more detailed discussion of these estimates.)

Two sets of standards were used to cost the intra-urban infrastructure of the Preferred Strategy. The first is composed of standards which were derived from various master plans for water and sewerage, master plans for new towns or standards proposed by development ministries such as health or education standards. These standards which are summarized in Table V-24, were used in different combinations to cost the different settlement alternatives. This projection of costs was made so that the Preferred Strategy could be compared with the other settlement alternatives. These costs over the three periods total L.E. 37,271 million.

The second set of standards used to cost the Preferred Strategy aimed at reducing per capita expenditure, and thus, the total costs of intra-urban infrastructure. It also aims at greater private sector financing of intra-urban infrastructure by providing housing targetted for median household income groups at standards which are equal to the median standards of housing built in Greater Cairo between 1976 to 1981, 3.35 rooms per household or roughly 56 square meters per unit. (See Appendix V-A for a further description of average unit sizes.) Since 75 percent of this housing was built by the private informal sector largely through household savings, standards targetted at this level are likely to be affordable to median households. The total costs over the 1986-2000 period of the Preferred Strategy housing and intra-urban infrastructure at these reduced standards are L.E. 31,426 million.

Table V-25 shows a summary of the major standards used to cost the spatial target groups for Estimate II of the Preferred Strategy housing and intra-urban

TABLE V-24

**SUMMARY OF MAJOR STANDARDS, PER CAPITA CAPITAL COSTS OF SPATIAL TARGET GROUP PACKAGES AND AFFORDABILITY (1986-1990)**  
**ESTIMATE I: EXISTING PROPOSALS EXCLUDING TELECOMMUNICATIONS**

SPATIAL TARGET GROUP AND EXAMPLE SETTLEMENTS	STANDARDS AND COST PARAMETERS <sup>1</sup>								(1979 PRICES)			AFFORDABILITY <sup>2</sup>	
	HOUSING STANDARD (L.E./CAPITA)	WATER STANDARD (l/c/d)	SEWERAGE STANDARD (l/c/d)	TRANSPORT STANDARD (BUSES/10,000)	EDUCATION (L.E./CAPITA)	HEALTH (BEDS/1,000)	OTHER SOCIAL INFRASTRUCTURE (L.E./CAPITA)	TOTAL AVERAGE (L.E./CAPITA)	NEW AREAS (L.E./CAPITA)	EXISTING AREAS (L.E./CAPITA)	PORTION NOT AFFORDABLE BY HOUSEHOLDS \$	PER CAPITA SUBSIDY NEW AREAS (L.E./CAPITA)	
<b>I. MAJOR METROPOLITAN AREAS</b>													
Greater Cairo	690	584	462	5 <sup>2</sup>	81	4.5	128	404.1	1,809.9	125.8	49.7	899.3	
Alexandria	690	373	322	3	81	4.5	128	651.2	2,623.5	93.1	56.7	1,486.8	
<b>II. HIGH GROWTH AREAS</b>													
Suez	1,040	353	282	3	153	5.36	429	1,074	3,062.4	271.1	70.4	2,154.9	
Phased Decentralization													
Assiut	690	300	180	3	81	4.5	128	568.5	1,999.0	180.6	57.9	1,156.6	
Qena	690	300	180	3	41	4.5	128	518.6	2,216.7	147.7	61.9	1,372.7	
Naga Hamadi	690	300	180	3	41	4.5	128	449.6	1,902.3	113.8	55.9	1,063.3	
Aswan	690	300	180	3	41	4.5	128	424.6	1,811.7	156.8	66.9	1,212.4	
<b>III. OTHER CANAL CITIES</b>													
Ismailia	552	353	282	3	81	4.5	128	986.9	3,22.5	318.7	91.2	2,939.2	
Port Said	552	381	275	3	41	4.5	128	838.4	3,876.6	394.3	76.6	2,968.1	
<b>IV. DELTA</b>													
Regional Service Centers													
Tanta	891	351	189	3	81	4.5	128	654.4	3,019.4	282.2	69.8	210.0	
High Density Settlements													
Damanhour	391	300	165	3	59	0.5 <sup>3</sup>	91	283.0	2,185.0	211.8	44.8	978.5	
<b>V. OTHER SETTLEMENTS IN UPPER EGYPT AND DELTA</b>													
Governorate Capitals													
Beni Suet	552	237	142	3	41	4.5	128	729.9	3,779.2	311.3	77.8	2,940.9	
Other Settlements													
Belbels	391	167	100	3	59	0.5 <sup>3</sup>	91	210.6	3,254.1	89.0	72.3	2,351.8	
<b>VI. REMOTE AREAS SETTLEMENTS</b>													
Red Sea (Hurgada)	391	167	100	3	59	0.5 <sup>3</sup>	91	1,687.1	13,105.1	464.9	93.5	12,253.3	

<sup>1</sup> More complete details are shown in Appendix V-A.

<sup>2</sup> Estimates include provisions for subway at the costs currently being estimated for the first phase line between Ramses Station and the Bab El Louk Station and electrification of the El Marg line plus expansion of the tram way system by 100 kilometers.

<sup>3</sup> Existing level of finance see the section of health provision in Appendix V-A,13.

<sup>4</sup> Total average per capita costs are the total costs of new infrastructure plus rehabilitation of existing infrastructure divided by the total end period population. Per capita costs in new areas are the costs of providing infrastructure for new populations, while the per capita costs in existing areas are the costs of rehabilitating and strengthening existing infrastructure. All costs have been adjusted by regional construction cost variation indices. (See Table V-A,22.)

<sup>5</sup> Based on the assumption that household incomes remain at the 1979 level of L.E. 208 per capita (median income) and that house savings remain at the 1979 level of L.E. 457 per capita. (See Table V-29). Affordability was based on the present worth of incomes rising at 3.85 percent per annum and an annual opportunity cost of capital of 12 percent over an investment life of 30 years.

SOURCE: NUPS projections.

TABLE V-25

## SUMMARY OF MAJOR STANDARDS, PER CAPITA CAPITAL COSTS OF SPATIAL TARGET GROUP PACKAGES AND AFFORDABILITY (1986-1990)

## ESTIMATE II: MODIFIED STANDARDS

SPATIAL TARGET GROUPS AND EXAMPLE SETTLEMENTS	STANDARDS AND COST PARAMETERS <sup>1</sup>								ADJUSTED PER CAPITA COSTS <sup>2</sup>			1. AFFORDABILITY WITH SAVINGS <sup>3</sup>		2. AFFORDABILITY WITHOUT SAVINGS <sup>3</sup>	
	GROSS DENSITY (PERSONS/HA)	HOUSING STANDARD (LE./CAPITA)	WATER STANDARD (l/c/d)	SEWERAGE STANDARD (l/c/d)	TRANSPORT STANDARD (BUSES/10,000)	EDUCATION (LE./CAPITA)	HEALTH (BEDS/1,000)	OTHER SOCIAL INFRASTRUCTURE (LE./CAPITA)	TOTAL AVERAGE (LE./CAPITA)	NEW AREAS (LE./CAPITA)	EXISTING AREAS (LE./CAPITA)	PORTION NOT AFFORDABLE BY HOUSEHOLDS (\$)	PER CAPITA SUBSIDY IN NEW AREAS (LE./CAPITA)	PORTION NOT AFFORDABLE BY HOUSEHOLDS (\$)	PER CAPITA SUBSIDY IN NEW AREAS (LE./CAPITA)
<b>I. MAJOR METROPOLITAN AREAS</b>															
Greater Cairo Contiguous Areas	300	418	581	462	5.0	81	4.5	128	299.6	1,227.8	109.1	10.5	128.7	55.0	675.75
Alexandria Contiguous Areas	187	418	385	322	4.0	81	4.5	128	478.7	1,982.0	143.6	44.9	889.0	72.5	1,436.0
<b>II. HIGH GROWTH AREAS</b>															
Suez	300	418	353	282	2.0	41	4.5	112	659.3	1,733.5	225.5	36.7	636.0	68.2	1,182.3
Phased Decentralization															
Assiut	300	418	300	...	1.2	81	4.5	43	475.7	1,517.4	193.2	33.1	502.7	69.2	1,048.7
Oena	80	418	300	180	0.2	41	4.5	43	434.3	1,763.2	143.6	42.5	748.5	73.5	1,295.5
Naga Hamadi	300	418	300	180	1.2	41	4.5	43	381.0	1,488.6	124.5	31.8	474.0	68.6	1,021.0
Aswan	210	418	300	180	1.2	41	4.5	43	361.9	1,395.9	170.2	27.3	381.3	66.5	927.3
<b>III. OTHER CANAL CITIES</b>															
Ismailia	245	418	353	275	1.2	81	4.5	43	963.0	3,373.7	474.2	67.5	2,276.2	83.7	2,825.7
Port Said	70	418	381	282	1.2	41	4.5	43	778.5	3,258.0	416.3	66.3	2,160.5	83.1	2,710.5
<b>IV. DELTA</b>															
Regional Service Centers Tanta	179	468	351	189	3.0	81	5.79 <sup>4</sup>	128	588.0	2,436.4	297.2	55.0	1,339.0	77.4	1,885.9
High Density Settlements Damanhour	611	468 <sup>5</sup>	300	165	0.5	41	4.00	13	388.9	2,718.6	233.6	50.5	1,121.2	75.2	1,668.2
<b>V. OTHER SETTLEMENTS IN N. &amp; S. UPPER EGYPT &amp; DELTA</b>															
Governorate Capitals															
Beni Suef	168.3	418	237	142	0.2	41	4.00	7	654.5	2,915.9	344.1	65.2	1,900.7	84.9	2,449.9
Other Settlements															
Belbels	208	390	167	100	0.1	41	2.50	3	255.0	3,185.7	137.8	65.6	2,008.2	82.7	2,635.2
<b>VI. REMOTE AREA SETTLEMENTS</b>															
Red Sea (Hurghada)	17	418	167	100	0.3	41	4.00	13	1,877.9	13,269.3	657.4	92.3	12,254.0	96.5	14,573.0

<sup>1</sup> More details of standards and per capita cost parameters are shown in Appendix V-A to this chapter.

<sup>2</sup> Base costs have been adjusted by regional construction indexes shown Appendix V-4. Total average per capita cost is the average capital cost of new development areas plus rehabilitation of existing areas divided by the total population. Per capita costs in new areas are the costs of providing infrastructure for new populations, while the per capita costs in existing areas are the costs of rehabilitating and strengthening infrastructure in existing areas.

<sup>3</sup> Affordability is based on 1979 per capita incomes projected to a 1985 base and annuity factors calculated using an opportunity cost of capital of 12 percent, a program life of 30 years, and incomes rising at 3.85 percent per annum. Savings in the first projection have been projected from a 1979 base to a 1985 base at a growth rate of 3.85 percent per annum. The second projection shows affordability with no savings. Details of these formulas are shown in Appendix V-A.

<sup>4</sup> Existing standard maintained.

<sup>5</sup> Shows provisions for vertical redevelopment.

SOURCE: NUPS projections.

infrastructure costs. Like the data presented in Table V-24, Table V-25 shows example settlements used to illustrate how these standards were used to cost housing and intra-urban infrastructure. (These standards and cost parameters are further discussed in this chapter and are detailed in the technical appendices to the chapter.) Both tables show the impact of these standards on household affordability, however, three different assumptions are presented in them. In Table V-24, showing Estimate I costs, the impact of pursuing a policy of relatively high standards in an atmosphere where there is a low growth in household incomes and savings is presented. In Table V-25, two other affordability and standards assumptions are made: the first shows a policy of restraint in infrastructure standards in order to allow greater financing of costs by household income and savings which are growing at a more rapid rate than the first estimate, while the second projection shows the impact of implementing the same standards, but an inability to mobilize household savings. Details of these three assumptions are further discussed in Section V-II-D.

These three assumptions about household income and savings growth were developed to illustrate the importance of linking policies about standards with policies which stimulate both income and savings growth. For example, if the first scenario occurs, its impact on household affordability is much the same as the third where a policy of lower standards is being followed, but increases in household savings do not materialize. In the first case, up to 50 percent of Greater Cairo infrastructure costs must be subsidized, while in the third, 55 percent are not affordable. Thus, in order to be successful, policies regarding physical standards must be linked with policies which aim at improving household affordability through income and savings growth. Details of these three assumptions are further discussed in Section V-II-D.

The impact of these three assumptions can be traced through in the standards and resulting per capita capital costs and subsidy requirements of Greater Cairo. In Estimate I, where an attempt was made to include the master plan standards being proposed for infrastructure in Greater Cairo, the total per capita capital costs are L.E. 404.1, while subsidy requirements for new construction are roughly 50 percent of total capital costs. However, in Estimate II, if a policy of restraint in selection of standards aimed at greater private sector financing through increasing household incomes and savings is successful, then Greater Cairo's per capita capital costs during the 1986-1990 period are projected to be L.E. 300, of which only about 11 percent of the cost will not be affordable. However, if policies of attracting household savings to formal sector banking institutions are not successful and the capital costs of Estimate II are financed only through household incomes, then total subsidy requirements will increase to 55 percent of total investment costs. However, due to lower cost standards, the per capita subsidy requirements in Estimate II will still be less than Estimate I, L.E. 676 vs. L.E. 899. Complete estimates for the 40 major urban settlements for these 2 projections are presented in the technical appendices to this chapter.

The total capital costs and capital subsidy requirements of these two estimates of housing and intra-urban infrastructure costs for the Preferred Strategy are shown in Table V-26. As is shown, over the 1986-2000 period, the first estimate of Preferred Strategy intra-urban infrastructure costs is projected to be almost L.E. 5.8 billion greater than the second estimate. Similarly, due to different standards and assumptions about growth in household incomes and savings, the subsidy requirements for Estimate I are almost three times as great as the second estimate.



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TABLE V-26

**SUMMARY OF PREFERRED STRATEGY INFRASTRUCTURE CAPITAL COSTS AND SUBSIDY REQUIREMENTS: ESTIMATES I AND II**  
**SETTLEMENTS WITH 1976 POPULATIONS GREATER THAN 50,000**

SETTLEMENT ZONE	1986 - 1990				1991 - 1995				1996 - 2000				1996 - 2000	
	TOTAL COSTS <sup>1</sup> (L.E. MILLION)	PER CAPITA COSTS <sup>2</sup> (L.E.)	TOTAL SUBSIDIES <sup>3</sup> (L.E. MILLION)	PER CAPITA SUBSIDIES (L.E.)	TOTAL COSTS <sup>1</sup> (L.E. MILLION)	PER CAPITA COSTS <sup>2</sup> (L.E.)	TOTAL SUBSIDIES <sup>3</sup> (L.E. MILLION)	PER CAPITA SUBSIDIES (L.E.)	TOTAL COSTS <sup>1</sup> (L.E. MILLION)	PER CAPITA COSTS <sup>2</sup> (L.E.)	TOTAL SUBSIDIES <sup>3</sup> (L.E. MILLIONS)	PER CAPITA SUBSIDIES (L.E.)	TOTAL COSTS (L.E. MILLIONS)	TOTAL SUBSIDIES (L.E. MILLIONS)
<b>ESTIMATE I: MASTER PLAN STANDARDS NET OF TELECOMMUNICATIONS</b>														
I. Cairo	4,699.5	404.1	1,728.5	899.3	5,218.2	376.0	1,988.2	883.7	5,965.9	361.5	2,321.8	885.8	15,883.1	6,038.5
II. Alexandria	2,422.4	651.2	907.7	244.0	2,104.0	464.2	785.0	173.2	2,363.1	429.7	911.7	165.8	6,889.5	2,604.4
III. Special Emphasis	955.5	676.7	456.5	323.3	1,083.5	602.0	536.5	298.1	1,353.0	588.2	125.2	54.4	3,392.0	1,118.2
IV. Other Canal	766.3	899.4	327.8	384.7	664.3	670.3	313.2	316.1	677.7	589.3	327.7	285.0	2,108.3	968.7
V. Delta														
Regional Centers	888.7	1,068.2	54.1	65.9	856.2	880.0	452.8	455.4	886.7	788.2	475.0	422.2	2,631.6	1,431.9
Others	1,078.3	376.7	287.5	100.4	852.4	275.6	155.3	50.2	794.0	256.7	124.6	40.3	2,724.7	567.4
VI. North Upper Egypt	682.3	889.6	342.8	446.9	579.3	754.5	344.3	448.4	641.3	736.3	281.8	323.5	1,902.9	968.9
VII. South Upper Egypt	211.4	444.1	89.5	188.0	167.4	351.7	54.0	113.4	159.5	303.2	43.5	82.7	538.3	187.0
VIII. Remote Areas	455.1	1,569.3	325.1	1,121.0	366.3	1,263.1	217.3	749.3	378.9	1,127.6	202.4	655.4	1,200.3	744.8
TOTAL	12,159.5	532.3	4,969.5	217.6	11,891.6	440.4	4,616.6	179.5	13,219.6	414.6	4,813.7	150.9	37,270.7	14,629.8
<b>ESTIMATE II: MODIFIED STANDARDS</b>														
I. Cairo	3,445.7	296.3	272.7	23.4	3,880.8	279.6	31.4	2.3	4,402.2	266.8	- 854.5	- 51.8	11,728.7	- 550.4
II. Alexandria	1,780.7	478.7	602.7	162.0	2,027.0	447.3	543.9	120.0	2,354.7	428.1	268.4	48.8	6,162.4	1,145.0
III. Special Emphasis	699.9	495.7	173.7	123.0	749.1	416.2	111.9	62.2	906.4	394.1	- 48.2	- 21.0	2,355.4	237.4
IV. Other Canal	732.7	860.0	272.0	319.2	671.0	677.1	280.3	282.8	634.1	551.4	183.2	159.3	2,037.8	735.5
V. Delta														
Regional Centers	798.1	957.0	368.4	441.7	460.2	437.0	144.9	148.9	772.2	686.4	138.8	123.4	2,030.5	652.1
Others	1,296.3	452.9	299.0	104.5	1,087.0	351.4	227.4	73.5	1,051.8	314.4	156.5	46.8	3,435.1	682.9
VI. North Upper Egypt	585.2	763.0	228.4	297.8	516.1	592.5	199.6	229.2	543.6	549.1	177.4	179.2	1,644.9	605.4
VII. South Upper Egypt	233.1	489.7	68.7	144.3	197.2	374.9	52.1	99.1	195.6	337.2	33.7	58.1	625.9	154.5
VIII. Remote Areas	506.7	1,747.2	349.8	1,206.2	434.7	1,293.8	244.8	738.6	463.8	1,159.5	242.4	606.6	1,405.2	837.0
TOTAL	10,078.4	441.2	2,635.4	115.4	10,023.1	371.2	1,836.4	68.0	11,324.4	355.1	297.7	9.3	31,425.9	4,769.5

<sup>1</sup> Total costs are the costs of providing infrastructure for new population plus rehabilitation of existing infrastructure.

<sup>2</sup> Per capita costs are found by dividing total costs by the end period population.

<sup>3</sup> Total subsidies are the portions of total costs not affordable by household incomes. For Estimate I, household affordability was based on 1979 household per capita incomes remaining constant at L.E. 208 and household savings remaining constant at the 1979 level of L.E. 457. For Estimate II, household affordability was based on incomes rising at a 3.85 percent annual growth rate, thus the 1985 base income is L.E. 251 per capita, while savings are L.E. 547 per capita. After 1990, it was assumed that incomes would continue to increase at the same rate but that savings would increase at a slower rate of 1.93 percent per annum. Both estimates assume an opportunity cost of capital of 12 percent over an investment life of 30 years and 20 percent of household income available to finance housing and intra-urban infrastructure investment.

SOURCE: MJP5 projections.

However, if household incomes and savings increase as they were projected to do in Estimate II, then total capital subsidy requirements for Estimate I can be reduced from L.E. 14.6 billion to L.E. 10.6 billion, a saving of public resources of L.E. 4 billion.

Since only 6 percent of the cumulative revenues of the telecommunications authority between 1984 to 2000 are projected to be derived from residential consumers by the Telecommunications Sector Study, the costs of telecommunications were excluded from intra-urban infrastructure estimates of the Preferred Strategy.

To allow comparability of the Preferred Strategy at "Master Plan" standards, since similar standards were used to cost the other settlement alternatives examined, telecommunications costs have been included in the intra-urban cost comparisons shown in Chapter II. Total telecommunications costs have, however, been shown separately in Section III (Inter-Urban Infrastructure) of this chapter.

Both sets of costs shown in Table V-25 and V-26 above exclude telecommunications; however, a comparative Table V-27 shows the impact of not financing telecommunications through the household sector on household affordability.

To further reduce the capital cost requirements of the Preferred Strategy, the second projection of intra-urban costs emphasizes provision of urban services crucial to proper functioning of urban places, i.e., water supply, sanitation, health, education, transport, etc., but at more affordable standards, particularly in non-special emphasis urban centers where rapid population growth is not envisioned. For example, we have recommended improving water supply standards in secondary cities to levels which maintain the current national average level of water supply. However, in special emphasis settlements such as Suez, the present master plan standards have been maintained. Furthermore, Estimate II aims at greater inter-regional equity through maintaining education standards shown in Estimate I, but improving health standards in non-special emphasis settlements.

Since we have suggested increased densities as a mechanism for reducing arable land loss and more efficiently using urban infrastructure investment, we have suggested increases in funding of intra-urban public transport in settlements which are expected to have very rapid population growth or, as in the case of Greater Cairo, currently have over-burdened public transport systems. In the Greater Cairo case, we are suggesting increases in the intra-urban public bus fleet from roughly 3 buses/10,000 to 5 buses/10,000 during the 1985-2000 period; after that, due to the projected growth of Greater Cairo, this standard was increased to 10 buses/10,000. As is shown on Table V-25, public bus fleet increases have been suggested for other special emphasis settlements as well.

The Transport Planning Authority of the Ministry of Transport has developed plans for construction of a subway, the first phase of which will link Ramses Station with Bab El Louk Station. This initial eight kilometers is very roughly projected to cost L.E. 523 million. This subway line is to be linked with a surface rail line which will join Ramses Station with El Marg. The electrification of the El Marg line, an additional 14 kilometers, is estimated to cost an additional L.E. 180 million.

In addition to the proposed subway construction, the Cairo Transport Authority also plans to extend the present metro (tram) system by an additional 100 kilometers.

**TABLE V-27**  
**SUMMARY OF PER CAPITA COST OF INTRA-URBAN INFRASTRUCTURE AND AFFORDABILITY ESTIMATES OF SPATIAL TARGET GROUPS OF**  
**MASTER PLAN STANDARDS USED TO COST THE PREFERRED STRATEGY**  
**ESTIMATE I EXISTING PROPOSALS**

SPATIAL TARGET GROUP	CAPITAL COSTS INCLUDING TELECOMMUNICATIONS					CAPITAL COSTS EXCLUDING TELECOMMUNICATIONS				
	TOTAL AVERAGE (L.E./CAPITA)	NEW AREAS (L.E./CAPITA)	EXISTING AREAS (L.E./CAPITA)	PORTION NOT AFFORDABLE BY HOUSEHOLDS %	PER CAPITA SUBSIDY IN NEW AREAS (L.E./CAPITA)	TOTAL AVERAGE (L.E./CAPITA)	NEW AREAS (L.E./CAPITA)	EXISTING AREAS (L.E./CAPITA)	PORTION NOT AFFORDABLE BY HOUSEHOLDS %	PER CAPITA SUBSIDY BY NEW AREAS (L.E./CAPITA)
<b>MAJOR METROPOLITAN AREAS</b>										
Greater Cairo	430.5	1,961.9	127.31	53.6	1,051.3	404.1	1,809.9	125.79	49.7	899.34
Alexandria	738.8	2,953.37	126.07	66.7	1,816.7	651.2	2,623.5	93.1	56.7	1,486.8
<b>HIGH GROWTH AREAS</b>										
Suez	1,180.6	3,359.50	300.80	73.0	2,452.0	1,074	3,062.4	271.1	70.4	2,154.9
Phased Decentralization										
Assiut	658.9	2,308.7	211.60	63.6	1,466.3	568.5	1,999.0	180.6	57.9	1,155.6
Qena	586.5	2,476.1	173.60	66.0	1,632.1	518.6	2,216.7	147.7	61.9	1,372.7
Naga Hamadi	519.7	2,161.7	139.70	61.1	1,322.7	449.6	1,902.3	113.8	55.9	1,063.3
Aswan	485.9	2,066.0	182.20	63.6	1,466.7	424.6	1,811.7	156.8	66.9	1,212.4
<b>OTHER CANAL CITIES</b>										
Ismailia	1,126.3	3,776.5	374.10	79.4	3,493.2	906.9	322.5	318.7	91.2	2,939.2
Port Said	942.2	4,360.1	442.60	79.2	3,451.6	838.4	3,876.6	394.3	76.6	2,968.1
<b>DELTA</b>										
Regional Service Centers										
Tanta	742.9	3,417.2	322.00	72.4	2,506.8	654.4	3,019.4	282.2	69.8	210.0
High Density Settlements										
Damanhour	374.8	2,723.9	265.70	62.3	1,517.4	283.0	2,185.0	211.8	44.8	978.5
<b>OTHER SETTLEMENTS IN NORTH &amp; SOUTH UPPER EGYPT &amp; DELTA</b>										
Governorate Capitals										
Beni Suef	865.5	4,428.80	376.30	81.0	3,590.5	729.9	3,779.2	311.3	77.8	2,940.9
Other Settlements										
Belbel	271.2	3,702.30	133.80	75.4	2,800.0	210.6	3,254.1	89.0	72.3	2,351.8
<b>REMOTE AREA SETTLEMENTS</b>										
Red Sea (Hurghada)	1,900.0	14,240.70	578.50	94.1	13,388.9	1,687.1	13,105.1	464.9	93.5	12,253.3

SOURCE: MUPS Analysis.

This expansion of the existing metro system is roughly estimated to cost L.E. 125 million. If both of these transport additions were implemented during the 1986-1990 period and the present standard of buses were increased to 5 buses/10,000, Greater Cairo's transport component of the reduced cost estimate (Estimate II) would increase from roughly L.E. 57 to L.E. 354 per capita. This would increase subsidy requirements under the most favorable assumptions about household savings and incomes from L.E. 23 to L.E. 440.<sup>28</sup> A third Cairo transport proposal which would construct only the first phase of the subway phased over the 1982-1990 period and provide a greater reliance of surface rail (metro) and buses is described in Appendix V-A. This alternative would have transport costs of L.E. 247 per capita during the 1986-1990 period. Such an alternative would be more likely to fit within overall total urban resource pool constraints than would Estimate I which would fully construct the underground.

Education standards have been kept fairly consistent throughout the settlement system to maintain inter-regional equity. The standards suggested have been derived from the current standards of the Alexandria system since these standards are relatively high in comparison with other standards. These standards assume that urban secondary schools will continue to serve rural hinterlands. Primary and preparatory schools standards have been designed to serve only urban populations. These standards are based on population and enrollment standards of the Ministry of Education. Cost standards were derived from data supplied by the Ministry and Governorate of Cairo. The increased per capita costs shown in some settlements reflect university education requirements.

Reductions in health care facilities costs are more difficult due to the rapid increases in costs of equipment experienced in recent years. Furthermore, since rural areas have good access to urban areas throughout most of Egypt, they are served by urban facilities. Thus, reductions in urban standards such as the number of hospital beds per 1,000 population also results in reduction in rural standards. However, as is pointed out in the Appendices to this chapter, the current level of funding for new facilities is inadequate to maintain existing standards. Therefore, we have recommended provision of health care facilities in special emphasis settlements and governorate capitals which would maintain the current urban average standard. This standard (4.5 beds/1,000) was derived by dividing the total stock of hospital beds in 1978 (according to Ministry of Health data) by the 1978 urban population. However, it is expected that urban facilities will continue to serve rural populations. Thus, a national standard of 2.1 beds/1,000 is aimed at in this projection. In non-special emphasis settlements, increased funding of health care facilities to bring standards to 2.5 beds/1,000 and increased construction of primary health care facilities have been suggested.

Details of these estimates are provided in the technical appendices to this chapter.

#### 4. Affordability Projections

If Egypt is able to sustain the 7 percent GDP growth rates which have been used in NUPS economic projections, this high GDP growth rate will have a major impact on household affordability in later periods, since as was mentioned earlier, household disposable income is projected to grow at a real rate of 3.85 percent per annum at median household incomes. This growth in disposable household income

will mean that households in later periods will be able to finance greater portions of intra-urban infrastructure costs than they are able to do now. The second major factor of household affordability, savings outside formal sector banking institutions, also has a major role in financing future investment in intra-urban infrastructure. As has been pointed out earlier, this form of savings has been responsible for financing the major portion of new housing construction, both in Greater Cairo and probably in other urban places in Egypt. If properly channelled into the economy, this resource could also be available to finance other portions of intra-urban infrastructure.

The total capacity of urban households to finance or afford intra-urban infrastructure investment is indicated by that portion of total per capita household disposable income measured at the median (50th percentile of urban household incomes) which is available to spend on gross rent. This total capacity is the potential household resources available to finance intra-urban infrastructure through any of a host of financial mechanisms: rents, taxes, mortgage payments or user charges. For the purposes of this assessment, we have assumed that 20 percent of per capita household income can be devoted to financing both housing and intra-urban infrastructure. This assumption was based on the commodity weights used to adjust the urban consumer price index. Housing expenditures were weighted at 15.7 percent while transport and communications were weighted at 4.4 percent.<sup>29</sup> This percentage is higher than the average gross rent burden found in the Informal Housing Survey of Greater Cairo (10 percent) since total household affordability is being measured against the total capital costs of intra-urban infrastructure, not just housing costs. Thus, a higher rate is justified.

However, larger portions of household incomes were not used because household incomes must also finance portions of operating costs of intra-urban infrastructure in addition to capital costs.

Since detailed information about informal household savings is not available (the Informal Housing Survey did not specifically elicit information about the volume of informal savings), we have used the average per capita investment in informal sector housing (excluding land) in 1979 as projected in Table V-20 as a proxy for household savings. This estimate of total accumulated household savings amounts to L.E. 457 per capita and is similar to informal sector expenditures for new dwelling units in Beni Suef. Fixing savings at this level roughly means that, under the basic services projection of the Preferred Strategy housing and intra-urban infrastructure costs, most of the housing costs proposed for the standards packages can be financed by the private sector without public sector financing.

None of the recent income distributions provide much information about regional variations in household income. However, basic variation is likely due to changes in the composition of employment from one region to another. The World Bank in its unpublished Urban Sector Report quotes regional variations in annual urban household income from L.E. 341 in Greater Cairo to L.E. 289 in Upper Egypt based on 1975 CAPMAS data. Although there have been some changes in industrial location since 1975, it is unlikely these changes have been significant enough to have changed the trends shown in the 1975 data. Therefore, this data was used to construct an index of regional variations in urban household incomes shown in Table V-28. Since the bulk of industrial investment has occurred in Greater Cairo, Alexandria, the Delta and the Canal Region, only minor variations in regional household incomes are shown by the

index. Similarly, since relatively little industrial investment has occurred in Upper Egypt, household incomes tend to be lower.

**TABLE V-28**  
**INDEX OF REGIONAL VARIATIONS IN URBAN**  
**HOUSEHOLD INCOME**

ZONE	MEDIAN URBAN HOUSEHOLD INCOME 1975 (L.E.)	REGIONAL INDEX OF HOUSEHOLD INCOME
Greater Cairo	341.1	1.000
Alexandria	337.2	0.989
Lower Egypt (Including the Canal)	340.5	0.997
Upper Egypt *	289.1	0.847

\* The distribution does not provide data on the urban areas in remote areas. Therefore, the Upper Egypt Index was used for those areas due to the lack of industrial investment in those areas.

SOURCE: World Bank, National Urban Sector Report, Vol. 1, February 1981, p.15. As quoted from the 1975 Labor Force Survey.

Thus, using these components of urban per capita household income (household savings and housing expenditures weighted by regional income variations), the proportion of intra-urban infrastructure which is affordable by median household incomes was measured by comparing the sum of per capita household savings and the present worth of the affordable housing portion of per capita household incomes rising at 3.85 percent per annum with the total per capita costs of intra-urban infrastructure. An opportunity cost of capital of 12 percent was used in these affordability calculations since this rate has been the Central Bank discount or lending rate for much of 1981 and it also reflects the cost of money from international lenders during much of 1981.

The three sets of affordability projections have been based on different assumptions about the impact which household savings and increasing incomes have on affordability:

- A base projection in which household incomes and savings are fixed at the 1979 level in each period and it is assumed that as new households require new infrastructure their incomes start at the 1979 level but will increase at a growth rate of 3.85 percent per annum.
- A second projection whereby the 1979 base incomes and savings have been increased to a 1985, or 1990 or 1995 level depending on the period being reviewed, and then incomes are allowed to grow at 3.85 percent per annum.

- A third projection in which no household savings is included in the affordability projection.

This latter projection in addition to showing the potential impact of household savings on financing requirements for intra-urban infrastructure, also shows the increased public sector financing requirements for intra-urban infrastructure which will result if there is no household savings. These different assumptions have been shown in Tables V-24 through V-26, which the household savings and income projections are shown in Table V-29.

**TABLE V-29**  
**ASSUMPTIONS ABOUT HOUSEHOLD INCOME AND**  
**SAVINGS GROWTH**

PERIOD	HOUSEHOLD INCOMES PER CAPITA (L.E.)	ACCUMULATED HOUSEHOLD SAVINGS PER CAPITA (L.E.)
1986-1990		
Estimate I	208	453
Estimate II	251	547
1991-1995		
Estimate I	208	453
Estimate II	303	602
1996-2000		
Estimate I	208	453
Estimate II	366	622

SOURCE: NUPS analysis.

Since it is likely that the source of much of the household savings which financed informal sector housing between 1976 and 1981 was probably worker remittances, a slower rate of growth of savings was used to project household savings after the 1985-1990 period (half of the projected rate of growth of household incomes or 1.93 percent). At this rate of growth, per capita household savings would have reached L.E. 622 by the 1995-2000 period. To achieve this savings level, the average private sector savings per household shown in Table V-23 (L.E. 87 per capita) would have to grow at a rate of 10.3 percent over the 20 year period.

#### 5. Affordability in Later Periods

If, indeed, household incomes do rise at the projected 3.85 percent annual growth rate projected from interpolation from national GDP growth rate projections, households will be able to afford large shares of the costs of financing new infrastructure. Furthermore, once the large reconstruction efforts which have been

phased during the 1986-1990 periods near completion, some settlements, notably Greater Cairo, could generate surplus capital resources which could be used to improve standards of infrastructure in Greater Cairo and in other settlements. However, for this to happen, infrastructure investments in earlier periods need to be carefully monitored so that they meet household affordability in those periods.

To conserve scarce public resources in earlier periods, investment priority should probably be given to large intra-urban infrastructure investments which require extensive networks difficult to replace, such as water supply, sanitation, and to a lesser extent, electrical power. Standards of this infrastructure should be adequate to serve future demands of both residential and non-residential users. Thus, master plan service levels have been maintained for special emphasis settlements. In other settlements where large scale industrial growth is not projected, we have suggested lower standards aimed at primarily residential and commercial users. For other types of intra-urban infrastructure which do not rely on construction of elaborate underground networks such as transport (excluding of course subways), education, health care, etc., we suggest a more gradual phasing of standards which are targetted to match increases in household affordability. Improvements in these systems can be made in these facilities without disrupting other urban functions.

Regarding the standards of housing, the standards proposed for the earlier periods appear low as they have been targetted at household affordability levels of median household income groups. As was stated earlier, this was done to ensure greater private sector participation in provision of housing. Past improvements in the standards of housing would seem to indicate that gradual improvements in the condition of housing will occur naturally as household incomes improve. Therefore, the primary concern of government regarding standards would seem to be to ensure that when improvements, particularly expansion of the housing stock, occur that these improvements occur in appropriate locations and that they do not result in abandonment of existing stock in the core areas of settlements.

## 6. Impact of New Towns on Greater Cairo's Costs

The Preferred Strategy housing and intra-urban infrastructure costs have treated Greater Cairo's costs as if it were a more or less homogeneous area. However, several new towns and satellite cities have been proposed as future settlements to which Greater Cairo's future population growth could be deconcentrated away from the core areas. Three of these new settlement areas are presently under construction and have been the subject of other NUPS analysis (see NUPS "Urban Development Standards and Costs Report" and NUPS "New Towns and Satellite Cities: A Strategy for Deconcentration of Urban Development"). The others, such as the 6th of October and El Obour, are in master plan phases or in an initial detailed design stage, while those such as the Belbeis Extension and Second Phase of 15th of May are under initial planning phases.

Year 2000 populations for the new towns and satellite cities were projected by NUPS in the description of Greater Cairo's future settlement areas shown in Chapter III. The 1986 populations of the new towns and satellite cities were projected using estimates from the various new town development authorities about the number of housing units either under construction or likely to be completed under their current construction programs. The 1990 and 1995 populations were projected



from these 1985 base populations by assuming that higher growth rates can be achieved during earlier periods of new town growth due to relatively low population bases. However, once a critical mass is achieved (usually around 50,000 population), it is more difficult to sustain very high population growth rates due to the large numbers of population which must be added. Therefore, for most settlements after 1990 we have projected population growth using lower growth rates. However, due to their locations, El Obour and the two phases of 15th of May populations were generally projected using higher growth rates since they are both close to fast growing areas of Cairo. As a result of emphasis on the closer in satellites, growth in Greater Cairo's contiguous area is projected at a slower rate than the total Metropolitan Region's growth. These population estimates are shown in Table V-30.

Two sets of housing and intra-urban infrastructure capital cost estimates were made for the new towns. The first estimate was derived from the per capita tender costs and master plan estimated costs for 10th of Ramadan, 6th of October, 15th of May and Sadat City. (Table V-31)

However, since these per capita costs exclude portions of intra-urban infrastructure costs included in the estimates of other settlement costs, the costs of intra-urban transport and provisions for other types of physical and social infrastructure not covered by these costs were included. Using the populations shown in Table V-30 and these modified intra-urban costs, the total costs of the new towns and satellite cities were estimated as is shown in Table V-32. The subsidy requirements shown on the table result from using the high assumptions about household incomes and savings previously discussed. (Section V-II-C.4)

Based on these assumptions by the year 2000 roughly 7 percent of Greater Cairo's total population (16 percent of the NUPS projected Preferred Strategy increase in Greater Cairo's population between 1986 and 2000) will be living in one of these new settlement areas. However at current expenditure levels of the new towns, housing and intra-urban infrastructure costs will require 17 percent of the total investment allocated for Greater Cairo's total population under Estimate I of the Preferred Strategy intra-urban costs while they will require 23 percent of the total investment allocated to Greater Cairo's total population under Estimate II.

A second estimate of the new town's costs was developed to illustrate how total costs could be reduced after 1985, but still provide infrastructure at levels which would be attractive to future migrants. However, in preparing this estimate of new town costs, the spatial objectives of National Urban Policy must also be recognized. If these new town standards are too much higher than other locations, then they might induce even more migration to the Greater Cairo zone than is desirable. Further, if they are substantially lower than other areas, new town growth rates may be slower than projected in Table V-30. Therefore, to provide a policy consistent with other national policy objectives, we have suggested that later phases of the new towns might be developed at standards which are similar to those suggested by NUPS for Suez, a settlement selected for special emphasis under the Preferred Strategy. These total cost estimates of "Suez Standard" housing and intra-urban infrastructure provisions for the new towns are also shown in Table V-32. In summary, these standards propose that settlement densities be increased to 300 persons per hectare gross densities (the proposed new town densities range from 76 persons per hectare in 10th of Ramadan to 145 in 15th of May), that average housing standards be affordable to households in the median income bracket, that water and sewerage standards be

**TABLE V-30**  
**NUPS PROJECTIONS OF POPULATION GROWTH OF GREATER CAIRO NEW TOWNS**  
**AND SATELLITE CITIES (1986-2000)**

SETTLEMENT	1985 POPULATION	GROWTH RATE %	1990 POPULATION	GROWTH RATE %	1995 POPULATION	GROWTH RATE %	2000 POPULATION
10th of Ramadan	34,560	15%	69,510	10%	111,950	6%	150,000
El Obour	20,000	20%	49,800	15%	100,200	15%	200,000
Belbels Extension	20,000	20%	49,800	12%	87,800	11%	150,000
6th of October	21,000	20%	52,300	15%	105,200	11%	175,000
15th of May I	50,000	15%	100,600	10%	162,000	4.3%	200,000
15th of May II			50,000	10%	81,000	10%	130,000
Sadat City	20,000	15%	40,000	10%	65,000	9%	100,000
Total New Settlement Areas	165,560	20%	412,010	12%	713,150	9.2%	1,105,000
Percent of Greater Cairo's Population	1.7%		3.7%		5.1		6.7%
Greater Cairo's Population In Contiguous	9,542,000	3.3	11,217,000	3.3	13,878,000	3.2	16,500,000
TOTAL GREATER CAIRO POPULATION	9,707,000	3.7	11,629,000	3.6	13,878,000	3.5	16,500,000

SOURCE: NUPS analysis, see also Chapter III.

**TABLE V-31**  
**PER CAPITA COSTS OF HOUSING AND INFRASTRUCTURE**  
**FOR SELECTED NEW TOWNS**

NEW SETTLEMENT AREA	PER CAPITA COST  (1979 L.E. PRICES)	SOURCE
10th of Ramadan (Final Stage)	3,234	At tender cost levels
15th of May (Final Stage)	2,903	At tender cost levels
Sadat City (Final Stage)	2,091	Tenders and Master Plan

See also "New Towns and Satellite Cities: A Strategy for Deconcentration of Urban Development" and "Urban Growth and Urban Data Report" (Part III).

SOURCE: NUPS "New Towns and Satellite Cities: A Strategy for Deconcentration of Urban Development." (1981)

TABLE V-32

HOUSING AND INTRA-URBAN INFRASTRUCTURE COSTS OF GREATER CAIRO'S NEW TOWNS AND SATELLITE CITIES: NUPS PROJECTIONS

SETTLEMENT	1986 - 1990				1979 L.E. PRICES				1996 - 2000				TOTAL 1986 - 2000		
	PER CAPITA		TOTAL	PER CAPITA	1991 - 1995		TOTAL	PER CAPITA	PER CAPITA		TOTAL	PER CAPITA	TOTAL	TOTAL	TOTAL
	TOTAL COSTS	COSTS			COSTS	SUBSIDIES			COSTS	SUBSIDIES					
(L.E. MILLIONS)	(L.E.)	(L.E. MILLIONS)	(L.E.)	(L.E. MILLIONS)	(L.E.)	(L.E. MILLIONS)	(L.E.)	(L.E. MILLIONS)	(L.E.)	(L.E. MILLIONS)	(L.E. MILLIONS)	(L.E.)	(L.E. MILLIONS)	(L.E. MILLIONS)	(L.E. MILLIONS)
<b>ESTIMATE I: NEW TOWNS AND SATELLITE CITY AT MASTER PLAN STANDARDS</b>															
10th of Ramadan City	136.64	3,774.9	93.5	2,675.80	169.44	3,774.2	106.20	2,504.80	158.84	3,773.30	89.31	2,347.20	464.92	289.00	
El Obour City (Sadat City)	63.27	2,066.3	28.8	967.20	108.11	2,061.8	40.00	793.36	213.10	2,051.70	62.34	624.69	384.50	131.10	
Belbels Extension (10th of Ramadan City)	115.10	3,770.3	79.6	2,671.20	149.97	3,768.5	95.00	2,500.00	245.97	3,763.30	145.30	2,336.30	511.00	319.90	
6th of October City	77.64	2,405.2	40.9	1,306.20	132.82	2,397.1	59.90	1,132.20	179.01	2,400.60	67.71	970.07	389.47	168.50	
15th of May I City	168.29	3,186.1	105.6	2,087.00	209.70	3,188.8	117.63	1,915.40	144.14	3,183.80	67.00	1,761.70	522.13	290.20	
II City	-	-	-	-	105.99	3,190.3	59.68	1,921.80	167.60	3,186.40	86.20	1,759.40	273.60	145.80	
Sadat City	42.75	2,032.0	18.9	933.73	53.78	2,029.5	18.90	763.34	76.50	2,031.80	21.10	602.54	173.03	58.90	
<b>TOTALS</b>	<b>603.70</b>		<b>367.3</b>	<b>891.50</b>	<b>299.80</b>		<b>497.20</b>	<b>697.20</b>	<b>1,185.2</b>		<b>538.90</b>	<b>487.70</b>	<b>2,718.70</b>	<b>1,403.40</b>	
<b>ESTIMATE II: NEW TOWNS AND SATELLITE CITIES AT REDUCED COSTS - "SUEZ COSTS"<sup>1</sup></b>															
10th of Ramadan City	47.63	1,293.44	6.79	194.35	59.63	1,291.84	0.99	23.30	57.02	1,292.77	(5.11)	(134.27)	164.3	2.70	
El Obour City	39.98	1,294.56	5.82	195.47	68.49	1,290.13	1.09	21.66	134.63	1,280.04	(14.67)	(147.01)	243.1	(7.80)	
Belbels Extension	39.98	1,294.56	5.83	195.47	52.61	1,292.78	0.92	24.31	86.19	1,287.65	(8.67)	(139.40)	178.8	(1.90)	
6th of October City	41.98	1,294.24	6.11	195.14	71.86	1,289.60	1.12	21.13	97.06	1,286.08	(9.84)	(140.97)	(210.9)	(2.60)	
15th of May I City	68.77	1,290.09	9.66	190.99	86.06	1,287.82	1.19	19.35	60.47	1,292.78	(5.10)	(134.26)	215.3	5.80	
II City	-	-	-	-	43.63	1,294.30	0.80	25.83	68.88	1,290.43	(6.69)	(136.60)	112.5	(5.90)	
Sadat City	27.60	1,296.68	3.99	197.58	34.96	1,295.66	0.67	27.19	49.82	1,293.43	(4.68)	(133.61)	(112.4)	(0.02)	
<b>TOTALS</b>	<b>265.90</b>		<b>38.20</b>	<b>92.70</b>	<b>417.20</b>		<b>6.80</b>	<b>9.50</b>	<b>554.10</b>		<b>(54.8)</b>	<b>(49.60)</b>	<b>1,237.2</b>	<b>(9.80)</b>	

<sup>1</sup> See Table V-25.  
<sup>2</sup> Numbers in parenthesis indicate surplus or conditions where total household affordability exceeds costs.

SOURCE: NUPS projections.

developed at levels similar to Suez (which has also been planned as an industrial town), and that reductions in other costs are also possible.

If these new towns and satellite cities are not treated as portions of Greater Cairo's population and their population subtracted out of Greater Cairo's population, then their total costs under new town master plan estimate of infrastructure costs will increase the Estimate II costs of Greater Cairo's costs by L.E. 1,420 million from L.E. 11,729 million (as has been shown in other Preferred Strategy estimates) to L.E. 13,149 million. (Table V-33) Overall, this increase in Greater Cairo's costs will increase the total Preferred Strategy costs by roughly 5 percent. In the last period, the reduced affordability of the new towns will require most of the surplus savings which might be generated in Greater Cairo and thus will reduce the potential for achieving greater inter-regional equity. However, if modified standards can be developed such as those suggested, then, due to the reduction of total intra-urban cost requirements, the new towns have a much greater chance for success.

#### E. Increasing the Private/Informal Sector Role in Housing

The greatest impact which the Government can have on the role of the private sector in housing is to encourage its continued active role by providing access to non-arable land serviced with basic infrastructure and having access to employment opportunities both in large formal sector and small industrial and service sector activities.

Administratively, this could be accomplished through vastly expanding the target groups being served by the existing housing institutions such as the mortgage banks or the cooperatives organization. However, their activities have to be expanded to attract the estimated L.E. 2.2 billion which financed informal housing and land purchased between 1976 and 1981. To do so, we recommended that positive incentives be used to encourage greater household savings in any of the existing financial institutions. These should include more attractive interest rates, market rates for foreign currency transactions, and transferability of savings in non-mortgage bank institutions to institutions which provide mortgage financing.

Any of the existing mortgage banking institutions could be expanded to provide greater lending to private/informal sector housing. However, here we discuss the General Authority for Housing and Building Cooperatives (GABHC) because it benefits from both legislative and financial policies of Government, particularly, easy access to non-arable land but like the other housing institutions, has not yet been able to assist large numbers of households now finding housing through informal sector activities to its programs. GABHC has also developed a physical development branch which could act as an implementation agency for other mortgage banks. To expand the target groups it serves and enable it to have a broader role in providing urban services not now provided by informal sector builders, we recommended the following:

1. As an immediate action target, public sector employees both in government and public sector companies and employees of private sector companies at all income levels should be provided easy access to cooperative lending activities. For low income employees, small plots of serviced land, plus building loans, should be provided; however, if subsidized interest rates are included in the lending package, the land should be sold on a leasehold basis with an initial grace

**TABLE V-33**  
**COSTS OF GREATER CAIRO HOUSING AND INTRA-URBAN**  
**INFRASTRUCTURE WITH AND WITHOUT NEW TOWNS**

PERIOD	END PERIOD POPULATION ('000s)	TOTAL COSTS (L.E. MILLIONS)	TOTAL SUBSIDY REQUIRED (L.E. MILLIONS)	CONTIGUOUS AREAS PLUS NEW TOWNS AS A PROPORTION OF GREATER CAIRO PREFERRED STRATEGY COSTS
<b>I. ESTIMATE I CONTIGUOUS AREAS (WITHOUT NEW TOWNS AND SATELLITE CITIES)</b>				
1985	9,541.44			
1986 - 1990	11,217.00	4,189.6	1,455.6	0.89
1991 - 1995	13,165.90	4,669.0	1,726.7	0.89
1996 - 2000	15,395.00	5,217.3	1,760.5	0.87
TOTAL 1986 - 2000		14,075.9	4,942.8	0.89
<b>II. ESTIMATE I CONTIGUOUS AREA PLUS NEW TOWNS AND SATELLITE CITIES AT MASTER PLAN STANDARDS</b>				
1985	9,707.0			
1986 - 1990	11,629.0	4,793.3	1,822.9	1.02
1991 - 1995	13,878.0	5,598.8	2,223.9	1.07
1996 - 2000	16,500.0	6,402.5	2,299.4	1.07
TOTAL 1986 - 2000		16,794.6	6,346.2	1.06
<b>III. ESTIMATE I CONTIGUOUS AREA PLUS NEW TOWNS AND SATELLITE CITIES AT "SUEZ STANDARDS"</b>				
1985	9,707.0			
1986 - 1990	11,692.0	4,455.5	1,493.8	0.95
1991 - 1995	13,878.0	5,086.2	1,733.5	0.97
1996 - 2000	16,500.0	5,771.4	1,705.7	0.97
TOTAL 1986 - 2000		1,513.1	4,933.0	0.96
<b>IV. ESTIMATE II CONTIGUOUS AREA (WITHOUT NEW TOWNS AND SATELLITE CITIES)</b>				
1985	9,542.00			
1986 - 1990	11,217.00	3,087.6	195.2	0.90
1991 - 1995	13,165.00	3,476.6	31.8	0.90
1996 - 2000	15,395.00	3,866.0	(698.5)	0.88
TOTAL 1986 - 2000		10,430.2	(471.5)	0.89
<b>V. ESTIMATE II CONTIGUOUS AREA PLUS NEW TOWNS AND SATELLITE CITIES AT MASTER PLAN STANDARDS</b>				
1985	9,707.0			
1986 - 1990	11,629.0	3,691.3	567.5	1.07
1991 - 1995	13,878.0	4,406.4	529.0	1.14
1996 - 2000	16,500.0	5,051.2	(159.6)	1.15
TOTAL 1986 - 2000		13,148.9	931.9	1.12
<b>VI. ESTIMATE II CONTIGUOUS AREA PLUS NEW TOWNS AND SATELLITE CITIES AT "SUEZ STANDARDS"</b>				
1985	9,707.0			
1986 - 1990	11,629.0	3,353.5	233.4	0.97
1991 - 1995	13,878.0	3,893.8	38.6	1.00
1996 - 2000	16,500.0	4,420.1	(753.3)	1.00
TOTAL 1986 - 2000		11,667.4	(481.3)	0.99

SOURCE: See Tables V-31 and V-32.

period over which lease payments are not required. For all other beneficiaries, either market rate loans should be offered or land sold at its market value on a leasehold basis.

2. The GABHC's (and the mortgage banking institutions in general) total lending program should be tailored to benefit all income groups and its lending portfolio should generally reflect a percentile distribution of household incomes.
3. Since not all income groups have the immediate ability to service mortgage loans (their incomes may not have stable sources, they might consist of new household who have not yet achieved financial stability, they may be migrants, or have other special conditions), portions of GABHC's lending portfolio (possibly as much as the current distribution of rental housing in Greater Cairo) should be lent to private builders for rental housing. However, when this is done commercial rates should be used. Furthermore, to make this type of investment attractive to small builders, restrictions on profits accruing from rents should be modified to the point where they reflect current market conditions. As an interim measure, we suggest that this return should be at least equal to the current Central Bank lending discount rate, or be set one or two points above the lending rates available from commercial banks.
4. When government land is allocated to cooperative societies, under Article 67 of law No. 14 of 1981 which permits up to 50 percent reductions in the price of the land, portions of the land should be reserved for low income households who for various reasons are unable to form cooperative societies, but once development of middle and upper income neighborhoods has occurred, might be attracted to these areas. The intent of this recommendation is to provide serviced land for what is now informal housing activities in locations which are more desirable from a national policy point of view. By staging low income developments in this manner, households would have access to secondary forms of employment. This land should be held by the GABHC, who can then lease it to individual households on an individual or neighborhood cooperative society basis. If for social reasons, interest rate subsidies are still deemed necessary, then government land granted to the cooperatives should not be sold but should be leased to households so that GABHC or other lending institutions can realize an income stream to recover part of the costs of the subsidies. GABHC is presently pursuing this policy on projects which it develops, and should expand this policy to all cooperatives building housing who benefit from interest rate subsidies.
5. To enable the GABHC to play a broader role in provision of urban services the following are recommended:
  - Article 66.2 of law 14 of 1981 which exempts land held by cooperatives from all local council fees should be amended to limit this exemption to a period of not more than five years. This would allow local Governments a future revenue source for provision of urban services.
  - Greater portions of the costs of intra-urban infrastructure, particularly water supply, sanitation, circulation, and local electricity distribution,<sup>30</sup> should be financed through mortgage lending. As is the case with all of GABHC's own housing projects, we recommend that all the capital costs of neighborhood infrastructure be financed in this manner. Once cooperative loans are granted,

the infrastructure portion of these loans should be paid directly to the appropriate utility. The construction programs of both the GABHC and the infrastructure utilities will have to be coordinated to ensure timely provision of infrastructure and housing. This coordination is essential if informal housing activity is to be diverted to non-arable land since one of the primary locational criteria for informal settlements is access to water, transport and electricity. A second component of this financing mechanism for infrastructure is to take advantage of household's willingness and ability to make one-time payments for infrastructure due to various forms of savings, but due to low incomes their inability to sustain large monthly payments.

6. Affordability, as described in the introduction of Section II, rather than unit size or cost criteria should be the basis for access to cooperative lending programs. Since it is frequently difficult for low income households to demonstrate ownership of assets, staged lending programs should be tried in which initial loans would be made for land purchases only. However, this loan would cover the capital costs of installation of neighborhood infrastructure not currently being financed through user charges and the capitalized costs of both the financing agency and utility providing infrastructure which is not being initially used for low income households, no other charge might be levied if the government retains ownership of the land through leasehold sale of the land, e.g., a renewable period of 30 years.

While in an economic sense this may entail some loss of revenue since the land could presumably be sold for its full value, this loss should be measured against likely further loss of arable land if non-arable is not provided to informal settlements, and other urban diseconomies which might result from continued unplanned informal development. Also, this form of development should be viewed as a future revenue source for local Government from which other components of intra-urban infrastructure could be financed.

The second stage of the program would occur once a basic level of infrastructure installation is complete. Then, the property leasor would be required to construct a habitable dwelling on the plot within a reasonable period of time, not exceeding three years. If required, a second loan for housing construction could be consolidated with the original property purchase to finance construction. Further, the leasor would be encouraged to build additional rental units through other loans. If the property is not developed within the three year period, and not being inhabited, the household would be repaid any investment already made, plus a reasonable return on that investment, possibly equal to either the interest foregone if the money had been kept in a savings account or the increase in value of the land. This payment could be recovered by the GABHC by reselling the plot to another household ready to construct on it.

## F. Housing Finance

### I. General Issues

The primary issues pertaining to housing finance are not related so much to the adequacy of finance to produce housing as they relate to issues of how best to provide greater access to housing finance, the desirability of expanding formal



sector housing finance activities and to improving the efficiency of the sector. Adequacy of housing finance is not the issue it would appear to be as is evidenced by the volume of housing construction which is occurring.

As is shown in Table V-20, the total volume of this financing of housing in the informal sector could have reached L.E. 2.2 billion during the 1976-1981 period. During the same period, public sector financing of housing through the mortgage banks reached L.E. 202.3 million by September 1980. Although this was a dramatic increase in the loan portfolios of the mortgage banks of 300 percent between 1975 to 1980,<sup>31</sup> it nevertheless represents only about 3 percent of the value of land and housing made by the informal sector.

Given the relative efficiency of the informal sector in providing housing, there is some question as to the desirability of expanding formal sector banking activities to take over more of that role. The arguments in favor of leaving the informal sector financing as it is center around the very dramatic increases in housing stock which the informal sector has achieved without formal sector assistance, the relative efficiency with which the informal sector relates housing standards to both the housing market and household affordability (the informal sector relies only on household financial resources, not subsidies from other sectors, therefore, the housing which gets built reflects the informal sector's willingness to consume housing), and the generally good condition of the informal units which have been built. The Cairo data indicate that largely as a result of informal building, room occupancy rates (persons per room) have dropped from 2.30 in 1960 to 1.87 in 1981. Furthermore, fairly widespread satisfaction with housing was found.<sup>32</sup>

The primary problems with unchecked informal housing development are:

- There is no control over where development occurs.
- Beneficiaries of the informal housing process are limited to those who have sufficient wealth to enter into the process.
- There is relatively no market control over the flow of finance into the housing sector.

Since informal housing almost always is built on agricultural land where there is access to water, uncontrolled informal housing activities will result in a continuation of recent urban growth trends onto arable lands. Further, when housing finance is based on accumulated wealth or savings as is the case with a large part of the formal sector activities and all of the informal sector, access to these forms of finance is limited. Households without large savings are forced out of both systems of finance. Although this is less a problem in the informal sector as is suggested by the very rapid expansion of housing, nevertheless, the potential for inequities in the distribution of housing finance still exists.

The NUPS affordability projections showed household saving as an aggregate resource available to all households. At the median household income level, this was projected to average L.E. 457 per capita based on estimates of investment in housing by the informal sector during 1979. As data is lacking about the distribution of savings among various household income groups, particularly informal savings resulting from worker remittance income, this assumption may over-estimate house-hold

savings in lower income groups. Nevertheless, this aggregate resource, which is likely understated, was invested by the informal sector and represents a financial resource which if properly managed could have financed other types of infrastructure.

Finally, neither the public sector finance system nor the informal system is structured to conserve financial resources nor necessarily expand housing finance. The public sector as it is now constituted requires ever increasing injections of capital from the Central Bank to expand its operations due to the heavy subsidies involved. Similarly, the financing of informal housing through household savings which are maintained outside the banking system in currency holdings does not provide any mechanism for control of the flow of funds to the sector or expansion of the resources represented by those currency holdings. If those household savings were in a banking system that had relative flexibility regarding the end use of financial resources, the system would serve as a rationing mechanism which would ensure that resources would flow into sectors with high rates of return. While some controls on the banking system might be necessary to ensure that there is adequate access to financial resources for the housing sector, such a reconstituted banking sector could ensure that both inter-personal equity and spatial objectives could be better met. If necessary, limited use of subsidies could also be used in areas where high rates of return cannot be assured.

Expansion of private savings in the domestic banking system is particularly difficult to achieve during periods of high inflation when interest rates paid on time and savings deposits are less than the rate of inflation or less than those paid on foreign currency deposits. This problem is further compounded by the private/informal sector's desire to maintain high liquidity due to its historical distrust of the banking sector. While there has been some improvement in private sector savings in the commercial banking sector as a proportion of total money supply due to increases in interest rates paid on local currency deposits, there has been a large differential between interest rates paid on foreign currency deposits and, for that matter, the Central Bank discount rate.<sup>33</sup> Thus, most households still maintain savings outside the banking system.

Equally important to the very slow growth of private sector savings in the banking system is the very high rate of return which has been experienced in the growth of urban land prices (ranging between 23-30 percent between 1968-1981 vs. 8 percent paid on savings deposits). However, given the very rapid growth of housing between 1976-1981 (5.3 percent in Cairo), and the resulting increase in vacant units, the rate of growth of housing may slow somewhat freeing some of the resources which had been going into housing and land speculation for other uses.

Although the potential for increasing the household savings component of domestic bank resources exists, many of current banking practices limit access to savings instruments to large investors. For example, large deposit requirements needed to open savings accounts require a household to have substantial informal savings before they even have access to the banking system.

The requirements for high downpayments prior to obtaining housing finance who limit households from using the formal housing finance sector. One of the impacts of the loan ceilings which have been placed on cooperative loans has been to reduce the percent of financing of cooperative loans. Mainly middle and upper income households

have either gone to other lending institutions, such as the Credit Foncier, for additional loans or have paid larger cash deposits in order to obtain cooperative loans. While in one sense this form of lending program has met the affordability standards of the groups being served, it is questionable as to whether the initial objectives of the program are being met, i.e., to serve lower income households. There still exists a large disparity between the two groups. The informal sector is financing housing at roughly L.F. 2,200 per unit and at that level of expenditure could do so at current Central Bank lending rates of 12.5 percent. On the other hand, the groups being served by the cooperative lending program are receiving units which average in costs between L.F. 6,000 to 7,000 and are receiving them at concessional lending terms (roughly 3.5 percent annual interest). If a household has informal savings equal to 50 percent of the cost of a dwelling unit, it is much more likely to finance construction through the informal sector by building incrementally and completing the unit when additional savings permit.

## 2. Improving the Performance of the Formal Housing Finance Sector

Several measures could be taken to improve access to the formal housing finance sector and expand the volume of its activities. Some of these changes would require legislative changes in banking structure and planning legislation while others could be accomplished through changes in administrative procedures or internal policy changes. In all cases, expanding the formal sector's activities would have the objective of improving inter-personal and inter-regional equity of housing finance by enlarging beneficiary groups, particularly low and middle income households who may not have large savings.

The demands for financing both housing and other infrastructure over the NUPS planning period are large and will place severe constraints on public sector resources if a larger share of financing housing and infrastructure is not allocated to private sector savings, either in or outside the informal sector. The primary issues at stake regarding housing finance are:

- To continue the rather narrow focus of formal sector housing finance, but direct it more towards achieving equity or spatial objectives of NUPS which cannot be financed by the informal sector and then seek to facilitate informal sector housing finance through providing infrastructure in desirable locations.
- To attempt to attract more of the informal sector's financial resources to the banking system and broaden the functions of the formal sector banking system to allow it a greater role in financing urban development.

We would argue that both objectives are probably necessary to meet National Urban Policy Objectives, and would make the following recommendations aimed at improving access to formal sector housing finance, improving the efficiency of housing finance generally (both formal and informal systems), and at the same time expanding the financial resources which are available for implementing housing and infrastructure requirements of National Urban Policy.

### a. Subdivision and Building Permits

As a first step in improving access to formal sector housing finance, the delays and costs currently encountered in obtaining subdivision and building permits should

be reduced. While it is recognized that building permits and subdivision fees represent a source of local Government finance, this resource could be enhanced through increasing the number of permits granted at more reasonable costs than by maintaining the current system which entails long delays in obtaining permits. These requirements are further discussed in Chapter VII.

b. Increased Percent of Financing Available

One of the primary constraints to low and medium income groups in obtaining formal sector housing finance is the requirements for relatively large downpayments as a condition of securing mortgage financing. Access to mortgage finance is further restricted by the practice of granting private sector mortgage loans on the appraised value of construction rather than market values which further reduced the percent of housing finance actually being provided.<sup>34</sup>

Further, data provided by the GABHC suggests that placing loan ceilings on cooperative loans has not had the desired effect of increasing the number of low income beneficiaries to the program. The average dwelling unit financed under the program cost between L.E. 7,000 to 8,000; however, only about 50 percent of those costs are financed by cooperative loans. The remaining portion of dwelling unit costs are either financed through savings (as much as L.E. 4,000 per unit) or through loans from other institutions.<sup>35</sup> This situation has resulted because GABHC's loan ceilings are based on unit sizes and values resulting from those standards rather than on the actual affordability of low income groups.<sup>36</sup> A better mechanism for determining household affordability would be to determine affordable loan value of household incomes and savings based on a true opportunity cost of capital. If subsidies are deemed necessary to meet other criteria, then a better basis for distributing these subsidies to low income or disadvantaged groups is established.

c. Increasing the Number of Institutions Providing Housing Finance

Presently, access to housing finance is severely constrained by limiting mortgage financing to a small number of banks and institutions like the GABHC. However, there are roughly 500 branches of commercial banks which could, if they were allowed to engage in mortgage financing, significantly increase regional access to housing finance.<sup>37</sup>

d. Provision of Package Financing

The lack of timely provision of infrastructure to informal settlements is one of the major drawbacks of the informal settlement process. Furthermore, it is one of the primary reasons for the proliferation of informal settlements on agricultural land where there is access to agricultural or ground water supplies. Therefore, to improve the locational aspects of informal settlements, as well as improve the environmental quality of them, it is recommended that package financing of housing developments be provided in which financing of the costs of local infrastructure and land be offered to low and middle income groups. The details of this program have been discussed in the previous section.

e. Limiting the Period Over Which Subsidies are Granted

When subsidies are granted, particularly interest rate subsidies, it is recommended that they be provided for only initial periods of the life of the

mortgage loan. Since it is likely that household incomes will continue to increase while a household may not be able to afford servicing a loan initially, later increases in real income will allow it to afford more of the costs of mortgage financing, therefore, subsidies can be reduced. More frequent and more comprehensive data about household incomes and savings will be necessary to make this program successful. Furthermore, it will require careful monitoring to ensure that it does not create an undue strain on household incomes even if they are increasing. However, given the periods when subsidies are being granted, unless the lending institution has sizeable and very flexible financial resources, it will require assistance in servicing the subsidies. Therefore, programs of this nature should be limited to very specific target groups such as disadvantaged groups or occupants of new settlement areas in which some financial assistance is necessary.

f. Improved Cost Recovery

If it is determined for socio-cultural reasons that it is desirable to continue subsidizing interest rates for mortgage loans, particularly cooperatives, then lending institutions should be allowed to participate in the equity of the project being financed. It is recommended that this take the form of providing leasehold ownership for land in cooperative projects. The financing institution could then realize an income stream from leasing the land which could be aimed at covering the difference between the institution's lending and borrowing rates. These lease payments could eventually relieve the Treasury of the need for subsidizing most housing loans.

Although not part of the formal sector housing finance sector, equally important to improving cost recovery is the need to gradually increase user charges for urban services such as water supply, sanitation, electricity, etc. As is pointed out in Chapter VI and in Appendix V-B., these charges are not adequate to finance the salaries and operating expense of most public utilities, let alone requirements for expansion of their systems. While portions of the capital requirements for expansion of infrastructure can be met through mortgage financing, not all requirements can be. There will still be a need for public utilities to finance trunk infrastructure through other means. Therefore, to improve the capability of public utilities to finance needed expansion of renewal of infrastructure, greater portions of the financing costs will need to be met through gradually increasing user charges.

g. Finance for Advance Deposits and Renewal

The Rent Control Law 136 of 1981 allows developers of new rental properties to take advance deposits from potential renters equal to two years rent. This change in the rent control law represents a mechanism whereby key money payments which are now outside of the formal financial sector due to their illegality can be formalized. This form of tenancy should be strengthened to the point where it represents a form of collateral which potential renters could use to obtain medium term loans from financial institutions.

While providing finance for key money payments to obtain tenancy rights in existing buildings is a more complex issue, the ultimate aim of the formal housing finance sector should be to include financing for the purchase of tenancy rights, both as a mechanism for ensuring that the resources represented by these payments are

available to the formal financial sector, and as a means of providing finance for renewal of existing built-up areas of Egypt's urban places. Finance for renewal of structures in existing built-up areas is especially critical if vertical redevelopment of the low density cores of many settlements is to occur.

While these recommendations have been aimed specifically at the housing finance sector, the following are aimed more generally at increasing household savings within the banking sector:

- Interest rates on medium and long term deposits and savings accounts in local currency accounts should be made as attractive as those denominated in foreign currencies. Further, as recommended by the International Monetary Fund, this increase in interest rates on medium and long term deposits should be coupled with a reduction or removal of taxes on interest paid on those accounts.<sup>38</sup>
- Consideration should be given to paying free market rates for worker remittance income which is deposited into the financial system, especially into time or saving accounts. Indications are that amount of remittance income flowing through the financial system is decreasing, although the volume of remittance income is not.<sup>39</sup> Therefore, the aim of this measure is to attract more of this income to the formal financial sector.
- Minimum deposit requirements should be reduced substantially. The effect of current minimum deposit requirements is to require a household to accumulate substantial savings prior to gaining access to the formal sector.
- Household savings must be more aggressively courted by the banking sector than they are now. Although there have been substantial increases in private sector time and savings deposits, when compared with the current rate of expansion of the money supply (reaching 35 percent during 1980), the actual rate of increase is far less dramatic.<sup>40</sup> Advertising campaigns illustrating the benefits of having savings accounts should be developed to attract household savings. Although long term deposits form the backbone of mortgage lending activity, the aim of these initial savings programs should be to attract households to any type of savings programs. However, emphasis might be placed on medium to longer term maturities to provide more stability for the banking system.

Once people have fulfilled their most urgent aspirations to a plot of land, a house and basic consumer durable goods, they have a natural incentive to establish a stake in, and a continuing source of income for themselves and their families, from a dynamic Egyptian industry. Recent indications, however, suggest that the proportion of expatriate earnings that is not effectively repatriated through the financial system has been increasing. The share of these savings utilized for own exchange imports has expanded much more rapidly than their overall savings, and at least since 1978, remittances through the banking system have increased only modestly. This is indicated in Table V-34.

#### h. Summary of Recommendations for Housing and Intra-Urban Infrastructure

The following is a summary of the major recommendations of the types of actions which will be necessary to implement the intra-urban infrastructure portions of the Preferred Strategy.

**TABLE V-34**  
**SAVINGS BY EGYPTIANS WORKING ABROAD**  
**1976 - JUNE 1980**

REMITTANCES AND OWN EXCHANGES IMPORTS

(L.E. MILLIONS)

<u>YEAR</u>	<u>REMITTANCES THROUGH AUTHORIZED BANKS</u>		<u>OWN EXCHANGE IMPORTS</u>		<u>TOTAL</u>
	<u>VALUE</u>	<u>£</u>	<u>VALUE</u>	<u>£</u>	<u>VALUE</u>
1976	238.1	60.5	155.7	39.5	393.8
1977	358.2	57.5	265.2	42.5	623.4
1978	644.5*	52.3	587.2	47.7	1,231.7
1979	610.5	42.1	839.3	57.9	1,449.8
Jan-June 1978	277.8	51.7	259.8	48.3	537.6
Jan-June 1979	278.2	41.1	398.9	58.9	677.1
Jan-June 1980	335.0	36.7	579.4	63.3	914.4

\* Revised from preliminary estimates of L.E. 661.6 million.

SOURCE: Central Bank of Egypt.

- The standards of housing and intra-urban infrastructure should be determined according to the spatial priorities of National Urban Policy. Thus, these standards become tools for implementing specific objectives such as the creation of a major urban center in Suez. We have recommended nine major spatial target groups for which different sets of standards have been suggested.
- Most public sector investment in intra-urban infrastructure should be aimed at increasing private sector participation in these investments, either through direct investment in housing or through selecting standards which permit greater cost recovery. We have illustrated how careful selection of standards of housing and intra-urban infrastructure which are targetted to household affordability can reduce total public sector financial requirements, and in some settlements (notably Greater Cairo) can potentially generate surpluses in household savings which could be available to finance shelter needs in other areas.
- When subsidies are granted, they should be directed to disadvantaged groups which exist either as a result of existing inequities or who, because of spatial priorities being granted in other areas, have lower incomes and, thus, require assistance. However, when these subsidies are granted, they should be used to finance basic levels of infrastructure and should be limited in time duration.
- If public resources are to be minimized in the financing of intra-urban infrastructure investment, then greater attempts will have to be made to attract household savings to formal sector institutions. We have recommended that this can be done by encouraging households to directly finance greater portions of housing costs through setting standards at levels which are affordable to households. It can also be done through making banking institutions more attractive to households such as paying market rates for real estate income denominated in foreign currencies and providing returns on investments which are attractive to savers.
- The existing housing institutions, particularly the cooperatives, should aim at serving much broader target groups. As a target, these institutions should aim at serving households who are now finding housing through informal sector processes by providing serviced land having basic infrastructure provisions. This land should be located in close-in locations and have access to existing built areas so that low income households can find secondary forms of employment. Further, if a policy of providing subsidized interest rates is pursued for social reasons, then these loans should be granted to low income households. However, the development agency should retain ownership of the land and attempt to recover more of the actual costs of development through lease payments.



## NOTES

### CHAPTER V

#### SECTORIAL ISSUES AND RECOMMENDATIONS

<sup>1</sup> Bertrand Renaud, National Urbanization Policies in Developing Countries, IBRD, July 1979, p. 82.

<sup>2</sup> Galeel El Emary Abdel, Study of Law 43 Investment Policies, cited in Paul Clark, Private Sector Industrial Development Strategy, August 1981, p. 7. One of a set of studies of Egypt's industrial development strategy undertaken by Boston University consultants for USAID.

<sup>3</sup> These patterns are discerned and analyzed in H. Chenery and L. Taylor, Development Patterns: Among Countries and Over Time, Review of Economics and Statistics, November, 1968, p. 31.

<sup>4</sup> CAPMAS publications combines manufacturing and mining. This is unfortunate since mining, like petroleum extraction, offers no locational flexibility. The small number of workers employed in mining, however, mitigates the problem.

<sup>5</sup> This procedure was used also by the Suez Canal regional planning team. It is found in the statistical study by Chenery and Taylor referred to in Footnote 3.

<sup>6</sup> From Wesley Weidemann, NUPS occasional working paper, "New Directions in Agricultural Policy," August 1981.

<sup>7</sup> See also NUPS Illustrative Development Project Report on Qena/Naga Hamadi.

<sup>8</sup> See also discussion of Suez in Chapter III.

<sup>9</sup> See also NUPS illustrative development project report on Tanta.

<sup>10</sup> Leo Klaassen, "Methods for Selecting Industries for Depressed Areas," OECD, 1967, p. 25.

<sup>11</sup> Affordability is defined throughout this section as the amounts of shelter and intra-urban infrastructure costs, both initial capital investment costs and long run marginal costs (usually operations and maintenance, but the concept can include other types of costs such as depreciation) which a household can afford at a true opportunity cost for capital. This definition of affordability does not fix standards of housing and intra-urban infrastructure at a particular level since

difference mixes of standards can be used to achieve the same objective, e.g., meeting household affordability. The concept does, however, aim at reaching a mix of standards, and, thus, costs which households can and are willing to pay for either directly or through other cost recovery mechanisms. When the costs of housing and intra-urban infrastructure (since intra-urban infrastructure serves groups greater than just the household sector, costs generally need to be apportioned according to end users in some fashion) exceed household affordability, some form of long term or short term assistance (subsidies) is required to make up the difference. These subsidies can be used to meet a variety of social and economic objectives as we discuss in this section.

12 1976 CAPMAS data was used for this assessment as the 1981 data is not available to NUPS. Based on this data roughly 6 percent of Greater Cairo's households are living in overcrowded "kisms" and could be defined as being disadvantaged.

13 1976 and 1966 Census of Housing, CAPMAS.

14 IBRD, Arab Republic of Egypt, National Urban Sector Report, unpublished draft, February, 1981. As quoted from CAPMAS Statistical Indicators and Statistical Yearbook (various issues) and Ministry of Housing statistics, as reported in the Joint Housing Team, Immediate Action Proposals for Housing in Egypt, Statistical Appendix 19.

15 Informal Housing in Egypt, ABT Associates Inc., for USAID, 1981, p. 12.

16 *Ibid.*, pp. 13-16.

17 *Ibid.*, p. 25.

18 Neither the Informal Housing Survey nor the Housing Census of 1976 estimated the area of dwelling units. However, visual inspection by NUPS Team members of informal dwellings suggests that most room sizes might be in the range of 10.5 square meters; which, if true, would yield an average unit size of 36 square meters.

19 This L.E. 2.2 billion is only an order of magnitude estimate of informal housing activity as reflected in national accounts due to the illegality of the transactions involved. For example, the National Accounts show an investment in housing in 1979 of only L.E. 289 millions (International Monetary Fund, A.R.E. Recent Economic Development, January 1981, Table 14, p. 54). This estimate was prepared by projecting the total number of housing units built in each year and multiplying those costs times estimates of informal sector building costs and land acquisition prices.

20 Tenth of Ramadan First Stage, Final Report, Arab Republic of Egypt, Ministry of Development and New Communities, Advisory Committee for Reconstruction, 1978. 10th of Ramadan Development Authority, 15th of May Development Authority.

21 If non-conventional mortgages were offered such as variable payment mortgages in which annual mortgage payments increased at 3 percent per year to reflect the NUPS projected increase in household disposable income, such units become affordable to households at the 30th percentile at similar interest rates and lending periods.

- 22 In almost all household income surveys conducted throughout the world in low income neighborhoods, households report expenditures higher than their incomes. The usual explanations for this variation are that households are reluctant to discuss their actual incomes and, thus, under-report them; they have access to multiple income sources which households do not consider part of their main income, or they have access to credit sources. However, as the Informal Housing in Egypt report felt that households were relatively open about their responses to survey questions, the difference between expenditures and income in Egypt could also be worker remittances from other countries. However, the survey did not specifically request data about remittances, thus, only conjectures about remittance income can be made from the data.
- 23 USAID Internal Memorandum, "Egypt's Food and Energy Subsidies," (Cairo, 1980.)
- 24 For example, petroleum products were sold in Egypt in 1979 at L.E. 7.50 per ton while the international price was L.E. 122.00.
- 25 Informal Housing in Egypt, pp. 108. Cairo data only.
- 26 *Ibid.*, p. 160.
- 27 International Monetary Fund, A.R.E. Recent Economic Developments, January 1981, Table 45, p. 85 and p. 38.
- 28 These different proposals for Greater Cairo transport are further discussed in the Appendices to Chapter V.
- 29 International Monetary Fund, A.R.E. Recent Economic Developments, January 1981, Table 2. p. 61.
- 30 These components of physical infrastructure have been included because their user charges presently do not cover the costs of new installations nor their current operations expense and very large increases in user charges would be necessary to achieve full cost recovery.
- 31 IMF, Table 52, p. 92.
- 32 Informal Housing in Egypt, pp. 112 and 123-131.
- 33 By 1980, private sector deposits equalled 35 percent of total money supply, a dramatic increase since 1977 when they equalled only 23 percent. (International Monetary Fund, A.R.E. Recent Economic Developments, January 1981, Table 45.)
- 34 Richard T. Pratt, Housing Finance in Egypt, Prospects for Development. Prepared for the Agency for International Development, 1979. Pp. 5-6.
- 35 Discussions with the Chairman of GABHC. See also Housing Finance, An Analysis of the Prospects for Increased Activity. Prepared for USAID by the National Savings and Loan League, March 1981.
- 36 A description of the GABHC program is given in the NUPS Urban Growth and Urban Data Report, Part IV. (PADCO and Others, 1981.)

37 *Op. cit.*, Richard T. Pratt, pp. 5-6.

38 International Monetary Fund, Report and Recommendations on Development of Capital Markets in Egypt, January 1981, pp. 19-21. The report suggests that these tax incentives be graduated in favor of longer term deposits to increase the flow of funds into savings with longer maturities.

39 *Ibid.*, p. 3.

40 International Monetary Fund, A.R.E. Recent Economic Development, January 1981, p. 39.

**CHAPTER VI**

**INTER URBAN INFRASTRUCTURE**

# CHAPTER VI

## INTER-URBAN INFRASTRUCTURE

### I. INTRODUCTION

Four major components of inter-urban infrastructure requirements have been reviewed for the Preferred Strategy: inter-urban transport, bulk electrical power generation and transmission, telecommunications, and bulk water requirements. Of the four, the largest financial requirements are for the power and telecommunications components of inter-regional infrastructure. Due to the very large capital requirements of these two components, two sets of projections of their costs were made to indicate the potential impact on total investment requirements. These two projections are shown in Table VI-1.

The variation in these two estimates results from modifications in plant or estimates of demand for inter-urban infrastructure. The high estimate for power results from inclusion of nuclear power plants in the estimates of capital costs. The two estimates of telecommunications costs result from different projections of telecommunications demand. The first shows investment requirements if demand is projected from the telecommunications sector study, while the second shows investment requirements if demand is reduced through reliance on technology which permits more telephones per line and if overall demand requirements are in the range projected by telephone demand/per capital GDP relationships observed from international cross sectional data.

The two different investment projections have a significant impact on total investment as a proportion of GDP as is shown in Table VI-2.

The overall policy choice is not to develop one sector and leave another undeveloped, but rather whether one or more sectors will be emphasized through a higher level of spending, rather than each sector receiving a more uniform level of development. Coupled with these major policy choices are choices about the degree to which the Government will regulate demand for inter-regional infrastructure services through pricing mechanisms which increase cost recovery and encourage consumers of inter-urban infrastructure to improve the efficiency of utilization of the services. For example, the section on power indicates that national demand for electrical power could be reduced 35 percent over the planning period if there was a move towards pricing electrical power at its international market prices. Although the telecommunications sector study does not give disaggregated marginal cost data from which the effect of pricing policies could be illustrated, it is likely that similar possibilities exist there.

The following four sections discuss individual components of inter-urban infrastructure. In each, data for the projections of the investment requirements of the Preferred Strategy came from either master plans prepared for the infrastructure sector or projections of either demand or investment requirements for the sector. Where the data permitted, alternative projections were prepared to

**TABLE VI-1**  
**INVESTMENT REQUIREMENTS OF**  
**INTER-URBAN INFRASTRUCTURE, 1986-2000**

Inter-Urban Infrastructure Component	High Estimate (L.E.Millions)	Low Estimate (L.E.Millions)
Transport	5,931	5,931
Power	29,828	11,063
Telecommunications	17,779	9,777
Bulk Water	29	29
<b>TOTAL</b>	<b>53,565</b>	<b>26,800</b>

Source: NUPS analysis

**TABLE VI-2**  
**INVESTMENT REQUIREMENTS FOR**  
**INTER-URBAN INFRASTRUCTURE**  
**AS A PROPORTION OF GDP, 1986-2000**

Period	Inter-Urban Infrastructure Investment		Cumulative GDP	Inter-Urban Infrastructure Investment as a Percent of GDP	
	(L.E.Millions)	(L.E.Millions)		(%)	(%)
	Estimate I	Estimate II		Estimate I	Estimate II
1986-1990	13,209	3,350	104,516	12.6	5.1
1991-1995	16,698	9,269	140,894	11.9	6.5
1996-2000	23,654	12,131	190,868	12.4	6.9
<b>Total 1986-2000</b>	<b>56,565</b>	<b>26,800</b>	<b>435,270</b>	<b>13.2</b>	<b>6.1</b>

NOTE: Totals may not add due to rounding.

SOURCE: NUPS GDP projections and Inter-urban Infrastructure projections.

illustrate policy choices. In all four cases, the projected investment requirements should be viewed as indicative of the order of magnitude trends which would result from following a particular inter-urban investment policy and not the actual costs which would be incurred since detailed feasibility studies of individual projects would be required to achieve that level of accuracy. However, in preparing more detailed feasibility studies of individual projects, an important component of those studies should be the likely demand which will be imposed by the preferred strategy.

## II. THE PREFERRED STRATEGY AND INTER-URBAN TRANSPORT

### A. Background

The identification of the Preferred Settlement Strategy makes it feasible to relate that strategy to the transport sector, particularly inter-urban transport. What is vital, in terms of the inter-urban transport sector, is that the Preferred Strategy represents a relatively low cost solution to urban development in Egypt, and thereby tends to rely on the existing transport network rather than requiring the need for extensive new capacity. In the context of this finding, the following spatial choices are particularly important in terms of future transport needs:

- Adoption of a policy of selective decentralization over the next 15 to 20 years to Suez and 3 Upper Egypt settlements: Assiut, the Qena/Naga Hamadi corridor and Aswan.
- Major emphasis on Suez as a counter-attraction to Cairo and Alexandria, and as a longer term regional strategy, the development of Suez into a base for subsequent growth in the Sinai and along the Red Sea coast.
- A strategy of managed growth in the Delta aimed at conserving arable land through controlled growth of Delta settlements. Tanta and Mansoura are recommended as test cases.
- Alexandria should be encouraged to grow as a major urban competitor to Cairo through planned growth within its metropolitan region.
- Recognition that the Greater Cairo Metropolitan Region will experience considerable growth which must be accommodated within both sectoral and spatial plans. Of particular relevance to transport policy is the recommendation that the axis of Greater Cairo's growth be shifted from a north-south direction to an east-west direction.

These recommendations illustrate the interactive relationship between urban development and inter-urban transport. If followed, they will specify, to a considerable extent, the nature and location of inter-urban transportation demands. Trip volumes along particular origin/destination pairs will be largely determined by these recommendations, and obviously the transport sector must be prepared to respond once these objectives become national policy.



Transportation interacts with urban development by not only responding to the spatial demands imposed by an urban development strategy, but also attracting development to its services and thereby either reinforcing or subverting the selected urban strategy. Though these interacting relationships are not always immediately apparent, they are steady and often inexorable. The linear highway development, the concentration of development around rail and lightrail stations and highway interchanges are only two examples out of many of this interaction. Thus, the transportation implications of the NUPS Preferred Strategy are important not only in terms of their effects on transportation, but also the potential impact transportation policies have on the Preferred Strategy.

#### B. Current and Future Inter-Urban Transport

Planning for the future inter-urban transport needs of any country is complex. It is made even more difficult when data collection and availability is still relatively rudimentary and only in the early development stages themselves. However, in the developing countries, decisions on investment in transport are often easier than might be implied by planning studies. Many of the modal systems and networks are so run-down relative to needs (especially if economic growth is rapid) that high yield investment can be found in improving the existing systems and networks. The decision then tends to focus not on whether to invest but into which mode (rail vs. road) first and how to phase the investments in the face of scarce capital resources.

Egypt is no stranger to this condition. Since 1976, there have been two major national transportation studies with a Draft Final Report having been completed in April of 1981. Both studies confirm that there is little lack of investment opportunity. Though they differ on many issues and priorities, they are in agreement in their major conclusions: primary emphasis should be on improving existing networks -- very few major new corridors were recommended for development.

The basic emphasis of these studies has been rehabilitation and improvement in inter-urban service. This included, in the most recent report by NEDECO, The Egypt National Transport Study (April 1981), more economic pricing, better modal balance between rail, bus, truck and taxi, greater use of unit trains for freight, enforcement of truck weight limits, rehabilitation of the existing highway and rail networks (the latter given first priority), improved maintenance of the waterways, and some capacity expansion on key rail and highway corridors. Thus, no major new corridors have been recommended for transport development that would conflict with the Preferred Strategy. Issues of concern are largely timing and emphasis of one corridor over another, and what role the sector might play in helping to implement the Preferred Strategy.

#### C. Review of National Transport Study

The NEDECO Egypt National Transport Study (NTS) covers passenger and freight transportation for rail, highway and waterway transport. The NTS provides a significant number of investment recommendations phased over the period to the year 2000. Detailed rail investments have been recommended to the year 2000 and highway investments in detail to 1987, and in aggregate terms to 2000. Waterway investments were recommended in only aggregate terms for the period 1982 to 2000. Ports, pipelines and air investment recommendations contained little detail that could be

related to the proposed NUPS preferred alternative. These aggregate recommendations are shown in Table VI-3.

**TABLE VI-3**  
**TOTAL TRANSPORT INVESTMENTS 1981 TO 2000**  
**MILLION L.E. IN 1979 PRICES**

<u>AMOUNT</u>	<u>RAIL</u>	<u>HIGHWAY</u>	<u>WATER WAY</u>	<u>PORTS, PIPELINES</u> <u>AIR TRANSPORT</u>	<u>TOTAL</u>
L.E.	898.9	6,923.9	169.5	No details available	7,991.3
Percent	11.3	86.6	2.1	-	100.0

SOURCE: Egypt National Transport Study; Draft Final Report -1981 Phase I, Main Report and Annexes V, IV, and VII.

Almost 90 percent of the NTS investment is directed to the highway sector. This is consistent with the dominant role played by the highway sector for both passenger and freight transport in Egypt. However, in terms of priorities, the rail sector has been identified as the most neglected mode in the transportation sector. Beyond the rail sector and selected highway investments, investments in the other modes are less specifically defined. The investment allocation emphasizes maintenance and rehabilitation of existing capacity: out of a total investment of L.E. 7,991.3 million, L.E. 6,455.5 represents maintenance and fleet requirements or about 80 percent of the total. The corresponding share for maintenance and fleet replacement for each mode is about at the same level. The general conclusion is that the inter-urban investments recommended in the NTS will not negatively impact the preferred strategy through creating conflicting new corridors and spatial implications. The more significant interactions will occur in terms of changes in needs for projected capacity requirements at specific locations (rail and road especially) and/or in the timing of the projected requirements.

#### D. The Preferred Strategy and Inter-Urban Transport Impacts

The inter-urban transportation implications of the NUPS Preferred Strategy are directly related to the implied differences between the population and employment distributions of the NEDECO Transport Study and the Preferred Strategy. Two aspects of transportation will be affected, operating costs and investment requirements, and should be considered as follows:

1. The difference in aggregate operating costs implied by the difference between the Preferred Strategy and Phase II NTS distribution of population and employment results from:

- Longer average trip distances between the Phase II NTS and the Preferred Alternative.
- Changes in operating costs attributable to shifts in modal use (i.e., from truck to rail or vice veras as a result of longer or shorter average trip lengths).
- The impact of scale effects as the result of differences in level of service assumed needed for the remote areas and an associated change in the scale of operations.

2. Increases or decreases or other changes in capital investment requirements resulting from:

- The differences in the capacity requirements and the investment cost between the Preferred Strategy and the NTS study.
- Changes in the location of transport investments and the effects of these locational changes on the cost of investment (i.e., lower land cost in remote areas in contrast to higher land cost in more densely developed areas).
- Changes in the phasing of investment. An analysis has been undertaken of the differences between the NEDECO Phase II NTS and the Preferred Strategy. These differences are considered in the discussion of the cost implications of the Preferred Alternative.

E. The Preferred Strategy and the NEDECO Phase II NTS National Transport Study

The most direct indicators of differences in the transportation implications of the NEDECO Phase II NTS and the NUPS Preferred Alternative are the respective population distributions for the year 2000. These are shown for each of the 40 major urban locations used by the NUPS study (Table VI-4) and grouped by major zones<sup>1</sup> (Table VI-5).

The single most significant difference may be found in the 1976-2000 annual growth rates. The NEDECO rates tend to be quite uniform for most locations -- reflecting an annual rate range of about 3.6 to 3.9 percent. This results largely from the manner in which the projections were developed -- on the basis of assumed changes in the rural-urban mix. The NUPS projections reflect considerable variations reflecting the results of designating urban growth to a specific growth objective and projecting on a site-by-site basis.

The most significant differences between the NUPS Preferred Strategy population projections and the NTS population projections affecting transport demand are:

- Emphasis on accepting growth in Cairo but deconcentrating within the region, results in a NUPS population estimate that is about 1.5 million larger than the NTS Phase II low estimates.
- Given the higher NUPS population estimates for Cairo, growth in Alexandria is kept to about 5.5 million which corresponds closely to the NTS low estimates indicating that this would probably be a reasonable base on which to plan urban transport systems for Alexandria.

TABLE VI-4

**NEDECO AND NUPS POPULATION ESTIMATES FOR MAJOR URBAN AREAS  
1976 AND 2000**

URBAN AREA	1976 Population (000's)	NEDECO POPULATION EST.		NEDECO ANNUAL GROWTH		NUPS PREFERRED STRATEGY POP. 2000 IN 000's	NUPS PREFERRED STRATEGY ANNUAL GROWTH 76 - 2000
		YEAR 2000 - LOW	IN 000's HIGH	LOW	HIGH		
GREATER CAIRO	6,711(6,843) <sup>a</sup>	14,990	15,455	3.32	3.45	16,500	3.82
ALEXANDRIA	2,319	5,549	6,012	3.70	4.05	5,500	3.66
<u>DELTA</u>							
TANTA	285	660	715	3.56	3.91	575	2.97
MANSOURA	258	597	647	3.56	3.91	550	3.20
MAHALLA	293	678	735	3.56	3.91	565	2.77
ZAGAZIG	203	469	508	3.55	3.90	335	2.11
DAMANHUR	189	438	474	3.56	3.91	340	2.48
SHEBIN EL KOM	103	238	258	3.55	3.90	175	2.23
KAFR EL DAWAR	161	373	404	3.56	3.91	415	4.02
DAMIETTA	93	222	241	3.69	4.05	190	3.02
QALYUB	63	137	148	3.29	3.62	120	2.72
DESSOUK	59	137	148	3.57	3.91	90	1.78
ABU KEBIR	55	127	138	3.55	3.91	85	1.83
ZEFTA	50	116	125	3.57	3.89	95	2.71
BENHA	89	194	210	3.30	3.64	165	2.61
BELKAS	50	116	125	3.57	3.59	85	2.23
MIT GHAMR	72	177	180	3.57	3.89	120	2.15
BELBEIS	69 (92) <sup>a</sup>	213	230	3.56	3.89	110	1.96
MATARIA	61	141	153	3.55	3.91	105	2.29
KAFR EL SHEIKH	78	176	191	4.51	4.87	170	2.15
IDKU	67	b	b	b	b	120	2.79
MENOUF	82	189	205	3.54	3.89	100	2.52
<u>NORTH UPPER EGYPT</u>							
FAYOUM	167	388	420	3.57	3.92	355	3.19
GENI SUEF	118	274	297	3.57	3.92	220	2.43
MINIA	146	340	369	3.59	3.94	284	1.84
MALLAWY	74	171	186	3.55	3.92	129	1.39
<u>SOUTH UPPER EGYPT</u>							
ASSIUT	214	495	536	3.56	3.90	600	4.39
ASWAN	144	334	361	3.57	3.90	450	4.86
SOHAG	102	236	256	3.56	3.91	184	2.49
QENA	94	218	236	3.57	3.91	225	3.70
LUXOR	93	216	233	3.57	3.90	220	3.65
IKHMIM	53	123	133	3.57	3.91	90	2.23
GERGA	52	118	128	3.47	3.82	86	2.12
NAGA HAMADI	47	109	118	3.57	3.91	175	5.63
<u>CANAL</u>							
PORT SAID	263	745	807	4.43	4.78	650	3.84
ISMAILIYA	146	504	546	5.30	5.65	500	5.26
SUEZ	194	670	726	5.30	5.65	850	6.35
<u>REMOTE</u>							
MATRUH	52 (c)	119	129	c	c	90	2.31
NEW VALLEY	56 (18) <sup>b</sup>	78	85	6.30	6.68	100	2.45
RED SEA	61 (47) <sup>a</sup>	112	121	3.68	4.02	110	2.44
SINAI	c	c	c	-	-	100	3.60
<b>TOTAL</b>	<b>13,454(13,470)</b>	<b>31,177</b>	<b>32,989</b>	<b>3.56</b>	<b>3.80</b>	<b>31,890</b>	<b>3.66</b>

<sup>a</sup> Population based on 1976 Census. Where NUPS and NEDECO used differed data, NEDECO data is shown with parenthesis (6,843). Differences appear to be due to minor definitions of area, especially Cairo, or unexplained differences in published sources.

<sup>b</sup> Idku not shown in NEDECO population data in Annex 1, Appendix 11.5.

<sup>c</sup> No entry shown by NEDECO in source cited in <sup>b</sup> above.

SOURCE: NEDECO, Phase Natural Transportation Study, Annex 1, Appendix 1.5 and NUPS Projections and Data.

**TABLE VI-5**  
**NEDECO AND NUPS POPULATION ESTIMATES**  
**FORTY URBAN AREAS BY BROAD REGION - 2000**

ZONE	NEDECO POPULATION EST. YEAR 2000 (IN 000's)		NUPS PREFERRED STRATEGY POP. EST. 2000 (IN 000's)	DIFFERENCE BETWEEN NTS AND NUPS POPULATION (000's)	
	LOW	HIGH		LOW	HIGH
CAIRO	14,990	15,455	16,500	-1,510	-1,045
ALEXANDRIA	5,549	6,012	5,500	+ 49	+ 512
DELTA	5,388	5,835	4,350	+1,038	+1,485
NORTH UPPER EGYPT	173	1,272	990	+ 183	+ 282
SOUTH UPPER EGYPT	1,849	2,001	2,030	- 181	- 29
CANAL	1,919	2,079	2,000	- 81	+ 79
REMOTE	309	335	400	- 91	- 65
<b>TOTAL</b>	<b>31,177</b>	<b>32,989</b>	<b>31,770*</b>	<b>- 593</b>	<b>+1,219</b>

\* Total excludes Idku (120,000)

SOURCE: Table V-2, NTS.

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- As a result of a NUPS recommended Delta growth management strategy, it is not surprising that the NTS Phase II estimates are about 1.0 to 1.5 million larger than the NUPS estimates (Table VI-5). A review of the city data in Table VI-4 reveals that most of the NTS estimates are in excess of the corresponding NUPS estimates. The high NTS estimates are especially high for the cities that have been considered by NUPS as possible candidates for expanded regional service functions, e.g., Tanta and Mansoura. The NTS estimates for these cities exceed the NUPS estimates by 132,000.
- Given the limited urban development effort recommended by NUPS for the Remote Areas under the Preferred Strategy, but with some selective experimentation, the NUPS totals for these areas are slightly higher than those of the NTS in some cases (e.g., New Valley), slightly lower for Matruh and the Red Sea. There are no comparable NTS figures for the Sinai.
- In South Upper Egypt, Assiut, Aswan and Qena/Naga Hamadi have been identified as "special emphasis" centers for Upper Egypt. This is reflected in the higher population estimates by NUPS -- except Qena (Table VI-4).
- The Canal Zone reflects the impact of the NUPS Preferred Strategy. The NTS population estimates for Suez are between 120-180,000 lower than the NUPS estimates. (Table VI-4) Correspondingly, the NTS estimates for Port Said are between 95 and 160,000 higher than the NUPS equivalents, reflecting the NUPS strategy that complementary growth would occur in Ismailia and Port Said, but at lower rates than Suez. (Table VI-4)
- In North Upper Egypt, the identification of "special emphasis" centers for Upper Egypt imply more controlled growth rates than suggested by the NTS estimates -- all of which are higher than the NUPS estimates.

A great many of the investment recommendations of the NTS are directed toward removing "existing bottlenecks." In the highway sector, some 20 percent of the road sections inventoried by the NTS are operating with restricted to congested flow conditions.<sup>2</sup> This does not mean that all segments will require major improvement -- the frequency of the restriction on congestion is an important consideration. However, it is quite clear that many of these restricted road sections are located on critical segments of the road network and are likely to need improvement whatever the urban development strategy. However phasing and selection of improvements have important impacts on the urban development strategy. The development of the Agricultural vs. the Desert Road between Cairo and Alexandria is a perfectly good illustration. The scope of the improvement in these two alternative alignments could profoundly impact the urban development strategy for not only the suggested Cairo and Alexandria Concept Plans, but any growth management strategy developed for the Delta.

It is not possible in the context of this study to undertake a detailed examination of each and every road segment in terms of the implications for the NUPS Preferred Alternative. However, such a review will be needed if the Preferred Strategy (or any national urban policy strategy) is to be implemented.<sup>3</sup>

The NTS recognized the need for more careful feasibility studies, and it is quite evident that in addition to the direct feasibility considerations recommended by NTS, the national urban policy must also be taken into account.<sup>4</sup>

A similar situation exists for rail transport. Many recommendations have been made in the NTS study that would affect the rail share of both passenger and freight traffic. Although a good deal of the proposed NTS rail investment is designed to make up the "substantial areas and deficiencies," the importance of passenger traffic and its impact on land transport warrant an evaluation of the proposed NTS investment program in terms of the national urban policy. The potential for also contributing to urban development objectives through suburban rail services already in place is of particular importance.

#### F. Policy and Program Conclusions

The important interaction between inter-urban transport and national urban development policies suggests the following policy conclusions:

- The Phase II National Transport Study investment recommendations need to be re-evaluated in terms of their impact on the selected national urban policy.
- Such a re-evaluation must not only consider how the Preferred Strategy would affect the transport plan (in terms of investment levels, spatial requirements and priorities and phasing), but also how transport operations and investments can be actively used as a policy mechanism to influence and assist in the implementation and realization of the national objectives implied by the Preferred Alternative.
- All road investment should be justified on a rate of return, benefit/cost basis. Since many of the recommended highway investments require further feasibility studies, these studies should be required to specifically include consideration of the impacts on national urban development objectives as an addition to standard transport benefit-cost objectives.
- Careful traffic and related data monitoring should be implemented because there are likely to be some significant differences in the location of transport demands under the proposed Preferred Strategy. However, as noted, consideration of urban development implications in terms of the strategy must be given a high priority and strong emphasis.
- The importance placed by the Phase II NTS on reducing and/or eliminating public subsidies in inter-urban transports is consistent with the emphasis by NUPS on efficient (low real resource cost) urban development and public cost recovery.
- The respective inter-urban modal roles of rail and road transport must be evaluated in terms of the Preferred Strategy. This links to transport policies generally with respect to pricing and user charges and the extent to which the public recovers the full cost of investments.
- The priority given to either the Cairo-Alexandria Agricultural Road through the Delta or the Desert Road will be an important policy element contributing to the success or failure of the Greater Cairo and Alexandria Concept Plans. The implications of access control and the degree it is imposed on these two roads need to be carefully studied to determine the proposed levels of service of these two roads and their contributions to national urban policy. The study of a solution for the Cairo-Alexandria corridor road capacity problems is urgently required and was recommended by the Phase II NTS.<sup>5</sup>

However, such a study should take into account the urgent need to shift the axis of growth of the two major metropolitan areas away from prime arable land onto desert areas. Increases in capacity of the Agricultural Road which do not support this objective should be carefully studied to seek alternatives which improve inter-regional transport conditions, but which do not stimulate development in prime agricultural areas. Further, study of the Agricultural Road access control should take account of the need to control development in local areas. A prime example of areas where the present road configuration is encouraging unplanned development can be found along practically all of the length of the Agricultural Road as it passes through Tanta. Strict access control and realignment of the road could usefully aid in control of such unrestricted development.

- The priority being assigned to Suez and the likelihood that traffic levels to Suez could increase more rapidly than projected by the Phase II NTS Study, could require road capacity increases between Cairo and Suez at an earlier date than indicated by the NTS Study. Similarly, the potential rail connection needs to be considered and the role of rail evaluated vis-a-vis a road alternative.
- Under the NUPS Preferred Strategy, the Western Desert region is recommended for high pay-off development only. This strategy results in a population level slightly higher than the NTS. Since a proposed improved and expanded Western Desert Road might have been only marginally feasible with currently scheduled development, the Preferred Alternative Strategy may not make it infeasible. Therefore, a detailed study is needed to confirm or reject any feasibility hypothesis.
- It is recommended that a similar feasibility evaluation be undertaken for the road and rail corridors in Upper Egypt using the changed population focus described earlier, especially for service to and from the "special emphasis" centers of Assiut, Aswan and Qena/Naga Hamadi.
- A conclusion of the NTS Phase II Study is that "the potential of pricing policy tools has not been exploited in Egypt." This is particularly true of the rail sector where rates have not been changed over a period of almost 20 years. The situation is quite different for highways where no systematic underpricing exists. In terms of freight, rail recovers only 24 percent (as revenue) of its total economic costs (transport and infrastructure) in contrast to 71 percent for road; the corresponding percentages for passenger-transport are 28 percent rail and 86 percent for road.

Despite the relatively good performance of road transport, there remains a productive opportunity to develop better pricing in the future. The recommendations of the NTS regarding pricing are complementary to NUPS recommendations about efficient use of public investment and greater cost recovery.<sup>6</sup>

- There are a number of specific road segments identified for added capacity (to 6-8 lanes) that are not warranted on the basis of either population differences that would result from the Preferred Strategy or are inconsistent with the Preferred Strategy because of conflicting objectives. The road segments from Suez to Cairo is an illustration of the former. The Tanta/Damanhour road segment through the Delta is a case of the latter.



Six to ten lanes of highway, especially approaching Alexandria, would make a controlled growth axis difficult. Improvement along the road (as it passes through the Delta) of 6-8 lane levels of service would make controlled growth in Delta almost impossible.

A similar situation of added lanes is identified by NTS Phase II study for the road from Beni Suef to Cairo. Again, such added capacity could subvert any east-west growth axis for Cairo. Added capacity without strict access control for this road must be evaluated against development objectives.

#### G. Investment and Operating Costs of the Preferred Strategy

The discussion of transport has so far centered on modifications in the National Transport Study which would impact either negatively or positively on implementation of the Preferred Strategy. Some of the recommendations for modifications of the transport plans would be required under any national urban policy since an urban settlement strategy was not clearly articulated before preparation of the National Transport Study.

The following analysis of the inter-urban transport requirements of the Preferred Strategy illustrates its order of magnitude costs, and to the point possible without conducting a national transport study, the implications which adopting the Preferred Strategy might have on inter-urban transportation. The National Urban Policy Study Team has utilized the Draft Final Report of the Egypt National Transport Study to develop these inter-regional investment and operating costs and to provide order of magnitude differences in costs between the Preferred Strategy and the National Transport Study.

The total investments recommended by NTS between 1981 and 2000 for rail, highway and internal waterways are shown in detail in Table VI-6. The NTS investments are usually given in their report as two period totals (1981-1987 and 1987-2000). They have been distributed on an annual basis as described by NTS for 1981-1987 but by the NUPS Team for 1987-2000 since NTS did not generally provide such annual totals.

The total investment costs include fixed and variable maintenance costs, costs of new investment, plus rehabilitation and costs of initial investments in vehicle fleets for the three modes. They do not include, however, operating costs which are calculated by mode on a passenger-kilometer or ton-kilometer basis.

Table VI-7 shows the distribution of financial costs by mode and between passenger and freight for 1979, which do include operating costs. Because of the subsidies involved relative to the opportunity cost of materials and labor, there are substantial differences between financial and economic costs. The economic costs in 1979, which are equivalent to the financial costs in Table VI-7, are shown in Table VI-8.

It is worth noting that economic costs for transportation are 24.8 percent higher than financial costs and that economic costs exceed financial costs for infrastructure by 37 percent. Overall, economic costs are 25 percent higher than financial costs. Revenue covers about 66 percent of economic costs under current transportation policies and about 83 percent of financial costs. Under current practices the railroads are more heavily subsidized than road and water.

**TABLE VI-6**  
**TOTAL NTS TRANSPORT INVESTMENTS 1981-2000**  
**L.E. MILLIONS IN ECONOMIC PRICES**

YEAR	RAIL INVESTMENT <sup>1</sup>		HIGHWAY EXCLUDES MAINTENANCE AND FLEET EXPANSION	INVESTMENTS <sup>2</sup> INCLUDES MAINTENANCE AND FLEET <sup>a</sup> EXPANSION	WATERWAY EXCLUDES MAINTENANCE AND FLEET EXPANSION	INVESTMENT <sup>3</sup> INCLUDES MAINTENANCE AND FLEET EXPANSION	PORTS <sup>4</sup> AIR TRANSPORT AND PIPELINES <sup>b</sup>	TOTAL INVESTMENT	
	ROLLING STOCK ONLY	TOTAL ALL						INCLUDES	EXCLUDES
1981		13.8	32.7	282.5	2.6	8.8		305.1	49.1
1982		15.3	54.4	307.1	2.6	8.8		331.2	72.3
1983		21.1	51.7	307.5	2.6	8.8		337.4	55.4
1984	(57.0)	76.8	55.3	314.6	2.6	8.8		400.2	77.7
1985	(9.7)	29.0	42.4	305.4	2.6	8.8		343.2	64.8
1986	(9.3)	31.3	52.1	319.1	2.6	8.8		359.2	76.7
1987	(23.2)	43.1	52.7	324.0	2.9	9.1		376.8	75.5
1988	(15.6)	43.5	52.0	326.4	1.1	8.2		378.1	81.0
1989	(17.7)	37.4	52.0	329.8	1.1	8.2		375.4	72.8
1990	(76.2)	49.9	55.0	335.4	1.1	8.7		393.5	79.8
1991	(27.6)	53.0	58.0	342.0	1.2	8.3		403.3	83.6
1992	(28.9)	46.1	61.0	348.4	1.2	8.3		402.8	79.4
1993	(74.4)	35.1	64.0	356.6	1.2	8.3		400.0	70.9
1994	(32.1)	37.8	66.0	362.6	1.2	8.3		408.7	72.9
1995	(45.7)	51.0	70.0	370.7	1.2	8.3		430.0	76.5
1996	(37.2)	39.9	74.0	379.9	1.2	8.3		428.1	77.9
1997	(38.7)	41.4	78.0	388.2	1.2	8.3		437.9	81.9
1998	(77.8)	75.5	82.0	397.7	1.2	8.3		481.5	85.9
1999	(60.7)	63.4	86.0	407.3	1.2	8.3		479.0	89.9
2000	(93.9)	94.5	90.0	417.1	1.2	8.3		519.9	91.8
TOTALS	(625.2)	898.9	1,229.3	6,923.9	33.8	169.5		7,991.3	1,535.8

<sup>a</sup> Includes maintenance that increases from L.E. 14.0 million in 1981 to 49.1 million in 2000; bus intercity replacement and renewal from L.E. 20.8 million in 1981 to L.E. 73 million in 2000 and L.E. 215 million per year throughout the period for truck renewal and replacement.

<sup>b</sup> Pipeline data indicate no facility expansion 1981-1987 (See Main Report); some expansion thereafter but no amount given. Of L.E. 218.8 million allocated to the transport/distribution component within the petroleum/natural gas sector, about L.E. 109 million is not allocated to specific projects (to be specified in the second half of the 1978-1982 Five Year Plan. The remainder (also in the Five Year Plan 1978-1982 and not in transport sector) are described in Annex VII p.2.

SOURCES: <sup>1</sup> Egypt National Transport Study Main Report, p. 69, Annex V Chapter 13.

<sup>2</sup> Main Report, p. 94, Annex IV, Chapter 9.

<sup>3</sup> Main Report, p. 71, Annex VI, Chapter 12.

<sup>4</sup> Port and airport development are not included as they were outside the scope of work of the NTS.

**TABLE VI-7**  
**FINANCIAL COSTS AND DEFICITS OF INTER-URBAN TRANSPORT <sup>1</sup>**

	(1979 L.E. MILLIONS)							
	TOTAL			FREIGHT			PASSENGERS	
	RAIL	ROAD	WATER	RAIL	ROAD	WATER	RAIL	ROAD
Financial Costs of Transport <sup>1</sup>	167.2	725.4	13.35	55.6	452.6	13.35	111.6	272.8
Financial Costs of Infrastructure <sup>2</sup>	<u>4.9</u>	<u>44.7</u>	<u>1.96</u>	<u>1.6</u>	<u>30.9</u>	<u>1.96</u>	<u>3.3</u>	<u>13.8</u>
Total Financial Costs	172.1	770.1	15.31	57.2	483.5	15.31	114.9	286.6
Revenues	<u>59.0</u>	<u>725.4</u>	<u>11.36</u>	<u>17.8</u>	<u>452.6</u>	<u>11.36</u>	<u>41.2</u>	<u>272.8</u>
Total Financial <u>Deficit</u>	113.1	44.7	3.95	39.4	30.9	3.95	73.7	13.8
Percent Revenue/Total Financial Cost (%)	34	94	74	31	94	74	36	95

<sup>1</sup> Costs of transportation include fleet additions and operating costs of vehicles per ton-kilometer or passenger-kilometer for estimated loads and passenger movement.

<sup>2</sup> Cost of Infrastructure include fixed and variable maintenance and rehabilitation of network plus new investments in capacity.

SOURCE: Egypt National Transport Study, Main Report, NEDECO, P. 154.

**TABLE VI-8**  
**ECONOMIC COSTS AND BALANCES OF INTER-URBAN TRANSPORT**

	(1979 L.E. MILLIONS)							
	TOTAL			FREIGHT			PASSENGERS	
	RAIL	ROAD	WATER	RAIL	ROAD	WATER	RAIL	ROAD
Economic Cost of Transport	218.8	891.6	20.19	73.4	593.6	20.19	145.4	298.0
Economic Cost of Infrastructure	<u>4.9</u>	<u>63.7</u>	<u>2.10</u>	<u>1.6</u>	<u>44.1</u>	<u>2.10</u>	<u>3.3</u>	<u>19.6</u>
Total Economic Cost	223.7	955.3	22.29	75.0	637.7	22.29	148.7	317.6
Revenue	<u>59.0</u>	<u>725.4</u>	<u>11.36</u>	<u>17.8</u>	<u>458.4</u>	<u>11.36</u>	<u>41.2</u>	<u>272.0</u>
"Economic" <u>Deficit</u>	164.7	229.9	10.93	57.2	185.3	10.93	107.5	44.6
Percent Revenue/Total Economic Cost (%)	26	76	51	24	71	51	28	86

SOURCE: Egypt National Transport Study, Main Report, NEDECO, p. 154.

The NUPS Team used NTS's estimates of unit operating costs and their estimates of volumes at origins and destinations to calculate operating costs for both passenger movement and freight in year 2000. These figures in L.E. millions are:

Freight	2,125
Passengers	<u>1,521</u>
TOTAL	3,646

From Table VI-9 total operating costs in L.E. million in 1979 were:

Freight	522
Passengers	<u>384</u>
TOTAL	906

Since NTS's total recommended investment to year 2000 was L.E. 7,992 million, it can be said that, from their parameters, it takes an investment of L.E. 2.19 between now and year 2000 to provide L.E. 1.00 of total operating capacity (the ability to transport goods and passengers measured in constant 1979 prices) in the year 2000. This constant has been used to estimate capital requirements from operating costs for the Preferred Strategy.<sup>7</sup>

The NUPS Team used the NTS data to calculate year 2000 per capita ton-kilometer and passenger-kilometer costs. These per capita figures are derived from the NTS's assumed spatial distribution of population and economic activity, based largely upon trend patterns of growth. The national derived freight cost/capita is L.E. 57.05 and the passenger cost/capita is L.E. 40.84 (1979 prices.)

Detailed freight and passenger costs per capita by major settlement were used to provide indicative operating cost for the Preferred Strategy by multiplying them by NUPS population targets. The indicative operating costs derived using this procedure may underestimate the differences in operating costs in regions where NUPS populations exceed those of the NTS. Pursuit of a phased decentralization program as suggested by NUPS would increase passenger flows, average trip distances, and ton-kilometers of freight beyond operating costs implied by this procedure.<sup>8</sup> The implied investment costs for the Preferred Strategy are compared with the National Transport Study investment costs in Table VI-9 below. If we assume that operating costs grow at a uniform annual rate from 1979-2000<sup>9</sup> and that investment costs grow at rates indicated by the time-phasing of investment in Table VI-6, the annual operating and investment costs by NUPS Preferred Strategy are as shown in Table VI-10.

Inter-regional transportation costs are mainly borne by the users of the various transportation networks and the national Government. (Tables VI-7 and VI-8 for data on cost recovery through transport sector revenues.) Consequently, the operating and investment costs associated with the NUPS Preferred Strategy are summarized for the country as a whole rather than being assigned as costs to particular settlement zones as was done for intra-urban investment costs. (Table VI-11) However, to the extent that there are unrecovered inter-urban transportation costs anywhere in the settlement system, they will result in a reduction in the total investment pool available to the urban settlement system as a whole.

**TABLE VI-9**  
**OPERATING AND INVESTMENT COSTS OF INTER-URBAN**  
**TRANSPORT OF THE NUPS PREFERRED STRATEGY**  
**AND THE EGYPT NATIONAL TRANSPORT STUDY**

ITEM	UNIT	EGYPT NATIONAL TRANSPORT STUDY	NUPS PREFERRED STRATEGY
<u>OPERATING COSTS</u>			
Total Operating Costs In Year 2000	(L.E. Millions) <sup>1</sup>	3,646	3,449
Total Operating Costs Per Capita	(L.E.) <sup>1</sup>	97.89	92.60
<u>INVESTMENT</u>			
Investment Costs (1981-2000)	(L.E. Millions) <sup>1</sup>	7,993	7,554

<sup>1</sup> 1979 L.E. prices.

SOURCE: Egypt National Transport Study and NUPS projections based on parameters from the Egypt National Transport Study.

### III. ELECTRICAL POWER SECTOR

#### A. Issues in Electrical Power Sector

Energy development has a crucial role to play in Egypt's future urbanization over the next 20 years. This challenge is particularly significant in the electrical energy sector, a sector which has been assigned a dual role in Egypt by energy planners: that of overall economic development through fairly heavy reliance on electrical energy for industrial expansion and that of increased equity through expansion of the residential component of total energy use. As a result of these dual demands, net generation requirements are projected to increase by an annual growth rate of 9.08 percent, and total investment in electrical power generation, bulk transmission and distribution are expected to increase as a proportion of GDP from 3.1 percent during the 1980-1985 period to 6.5 percent during the 1995-2000 period if a program of investment in nuclear facilities is initiated.

While this growth rate of electrical energy demand is greater than the projected growth rate of total commercial energy demand in Egypt (5 percent) it is consistent with Egypt's historic rate of growth of commercial energy. However, with this large projected growth rate in both commercial energy, and more specifically, electrical energy, several major issues emerge relating to development of electrical generating capacity, efficiency of end use of energy, energy subsidies and implementation of spatial policies.

**TABLE VI-10**  
**OPERATING AND INVESTMENT COSTS OF**  
**INTER-URBAN TRANSPORT**  
**FOR THE PREFERRED STRATEGY**  
**(L.E. MILLIONS)**

<u>YEAR</u>	<u>OPERATING COST</u>	<u>INVESTMENT COST</u>
1981	1,030	288
1982	1,098	313
1983	1,170	319
1984	1,247	378
1985	1,328	325
1986	1,416	340
1987	1,509	357
1988	1,608	358
1989	1,713	355
1990	1,826	372
1991	1,946	381
1992	2,073	380
1993	2,210	378
1994	2,355	386
1995	2,509	406
1996	2,674	405
1997	2,850	414
1998	3,037	456
1999	3,236	453
2000	3,449	490
TOTAL	40,284	7,554

SOURCE: NUPS Calculations.

**TABLE VI-11**  
**SUMMARY OF CUMULATIVE OPERATING AND**  
**INVESTMENT COSTS FOR INTRA-URBAN TRANSPORT**

(L.E. MILLIONS, 1979 PRICES)

ALTERNATIVE	PREFERRED STRATEGY	A	B1	B2	C
<u>1981-1985</u>					
Operating Cost	5,873	6,108	6,257	6,256	6,372
Investment Cost	1,623	1,595	1,804	1,801	1,965
TOTAL	7,496	7,703	8,061	8,057	8,290
<u>1986-1990</u>					
Operating Cost	8,072	8,254	8,707	8,701	9,035
Investment Cost	1,782	2,250	1,977	1,976	2,144
TOTAL	9,854	10,504	10,684	10,677	11,179
<u>1991-1995</u>					
Operating Cost	11,093	11,154	12,114	12,103	12,830
Investment Cost	1,931	1,901	2,148	2,146	2,340
TOTAL	13,024	13,055	14,262	14,249	15,170
<u>1996-2000</u>					
Operating Cost	15,246	15,072	16,839	16,838	18,215
Investment Cost	2,218	2,182	2,467	2,464	2,687
TOTAL	17,464	17,250	19,306	19,302	20,902

SOURCE: NUPS Calculations.



1. The very large reliance which Egypt's energy planners have placed on electrical energy would result in electrical energy consumption exceeding 20 percent of total commercial energy consumption, which is a ratio about twice the current ratio of industrialized countries such as France and the U.S.<sup>10</sup> Given the high costs of construction of electrical energy facilities, a more direct use of energy might result in considerable savings in energy infrastructure investment.
2. The choice of technology for generating Egypt's future electrical energy requirements has an important role in the costs of providing electrical energy and in energy resource requirements. Nuclear energy facilities involve high capital costs during construction, require longer construction periods than conventional technologies, and unless economically recoverable uranium reserves are found, a heavy reliance on foreign inputs. However, once constructed, nuclear facilities can result in higher efficiencies in electrical energy generation and reduced marginal costs.
3. Although Egypt's electrical demand will increase due to increased population pressures and increased commercial and industrial demands, significant energy savings are possible through modernization of existing industrial plants to be more efficient in energy consumption and through careful choice of industrial technology for future industries which efficiently utilize energy.
4. Egypt's present energy policy results in a significant loss of revenue to the electrical energy sector due to petroleum subsidies. The current pricing structure has the effect of subsidizing the largest consumers through higher tariffs to small consumers. Given the high import component for new construction of the sector, a move towards economic pricing of electrical energy could result in reduced demands on public resources and greater conservation of use of electrical energy.
5. The present configuration of the national power grid is largely adequate to meet the future settlement pattern recommended by NUPS. However, within that grid, investments will have to be made to increase transmission capacity. Due to expected relatively small populations projected for the remote areas, it is not recommended that major investments in extension of the national grid be undertaken to serve them. Rather, alternative technologies aimed at utilizing local renewable energy resources, notably solar and wind power, should be developed to provide them with electrical energy.
6. Consideration should be given to using the relatively lower costs of generating electrical power in North and South Upper Egypt as incentives to industrial location in those zones. At economic prices, the costs of hydroelectric power generation are in the range of 4.02 millimes/kWh vs. 45.6 millimes/kWh for oil-fired power plants. However in siting future industries in Upper Egypt, consideration should be given to total future electrical energy demands as full hydroelectric capacity should be reached during the 1985-1990 period. Thus, development of very large industrial consumers of electrical energy may result in electricity demands which exceed hydroelectric capacity and, thus, necessitate construction of thermal plants which may not be justifiable in those locations.
7. Much greater attention should be paid towards energy conservation in the development of both new industrial plant and expansion of commercial and

residential electrical uses. Conservation by these consumers can lead to reduced demand and, thus, a lessened requirement for new construction of generating facilities. Recent experience in the U.S., particularly after the fuel price increases in 1973, has shown that conservation efforts can lead to reduced demand without reducing either standards of living or economic growth. The trend in America is now to build much smaller, more efficient power plants rather than invest in large projects requiring heavy outlays of capital over long periods of time which when completed, run the risk of being underutilized due to changes in demand.

## B. Past Development of the Electrical Energy Sector

The nationwide electrical power system is composed of major hydroelectric power generation plants located at Aswan, and 26 petroleum or natural gas-fired thermal power generation plants located mainly in the NUPS Greater Cairo, Alexandria, Delta and Canal Zones. All of these plants are interlinked by the Unified Power Grid, a high and medium voltage grid of transmission lines linking major load centers with power generation sources. In addition to the power plants interlinked via the National Power Grid, smaller thermal power generation plants also exist in the Remote Areas and Port Said.

The generation and bulk distribution of power is the responsibility of the Egyptian Electrical Authority (EEA) which sells power to large industrial users and to seven power distribution companies. The distribution companies sell power to medium and small consumers. The construction of electrical power facilities is the responsibility of EEA (bulk power facilities on a nationwide basis) while the Rural Electric Authority (REA) is responsible for planning and constructing power facilities within urban and rural areas. Nuclear power facility construction is under the jurisdiction of the Nuclear Power Plants Authority (NPPA).

The Unified Power system had a total installed capacity of 4,491 megawatts (MW) in 1979, of which 54 percent was located in the hydroelectric power plants in Aswan. During 1979, the sector's total gross generation was 16,803 million kilowatt hours (GWh) and gross sales were 14,675 GWh.<sup>11</sup> Losses accounted for the remaining 12 percent of gross generation. Although the system's total installed capacity was 4,491 MW, its total available capacity was 3,404 MW due to use of hydro facilities for irrigation and power generation, derating of plants due to age and deterioration and system stability limits over the 550 KV transmission network. In 1979, the system had a total peak demand capacity of 2,814 MW due to reserve capacity requirements of 21 percent and a load factor of 67 percent. Administratively, the system is divided into five transmission zones by the EEA. These are:

- Greater Cairo
- Alexandria
- Delta or Lower Egypt
- Canal
- Upper Egypt.<sup>12</sup>

During the period 1969 to 1979, the electrical power sector achieved an annual average growth rate in gross generation of 10 percent. The EEA forecasts that gross generation will increase to approximately 105,000 GWh by the year 2000 at an annual average growth rate of 9.1 percent.<sup>13</sup> These aggregate electricity load projections are based on total demand of five economic sectors:

- Industry
- Agriculture
- Transportation
- Public Utilities
- Residential and other military, government and public sector organizations.

The basis of these projections was developed by the 1977 Power Sector Study prepared for the Ministry of Electricity and the International Bank for Reconstruction and Development. These projections are updated periodically to reflect changes in sectorial demand and growth rates in other economic sectors.<sup>14</sup> Since these aggregate demand forecasts reflect GDP growth rates similar to NUPS projections and were the basis for EEA's least cost investment program (least cost in that the model EEA uses to determine its program aims at seeking locations for new installations which minimize overall investment requirements as well as operating expense), they were used to project future capital and operating cost requirements for the electrical sector in the NUPS alternative settlement strategies and for the preferred strategy.<sup>15</sup>

The Egyptian electrical system presently has wide regional variations in the generation and end consumption of electrical power, as is shown in Table VI-12. This regional pattern of electrical power distribution results from the location of major power generation facilities in Upper Egypt and major load centers in Greater Cairo and Alexandria necessitating the transmission of power from one zone to another. In 1979, roughly 41 percent total power generated was transmitted from power surplus zones to load centers in power deficit zones.<sup>16</sup>

### C. Estimates of Electrical Power Demand

The aggregate demand estimates of power consumption prepared by the Egyptian Electricity Authority are based on GDP projections similar to those of NUPS, therefore, these aggregate demand estimates were used to project power demand for the zones connected to the Unified Power Grid of the Preferred Strategy.<sup>17</sup> Aggregate demand for zones outside the Unified Power Grid is discussed below.

Zonal power demand was projected for NUPS Preferred Strategy as follows: the change in total electrical power demand including allowances for losses was distributed by the percent distribution of the change in the zone's population to the total change in urban population. The resulting increase in demand was then added to existing consumption to get total zonal projected consumption of electrical energy. During the 1980-1985 period where projections of expansion of demand for the two large industrial users in Upper Egypt are available, their increase in demand was subtracted from the total projected change in demand, then the remaining change in projected unified grid demand was distributed among the zones as described above. For later periods, any expansion in demand by the two large Upper Egypt consumers of electrical energy (i.e., the Kima Fertilizer Factory in Aswan and the Naga Hamadi Aluminium Factory) is assumed to be included in the power demand allocated to Upper Egypt Zones. Table VI-13 shows the composition of EEA's projected electrical demand while Table VI-14 shows the NUPS distribution of that demand among the NUPS settlement zones.

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TABLE VI-12

REGIONAL GENERATION OF THERMAL AND HYDRO POWER BY TRANSMISSION ZONE AND DISTRIBUTION COMPANY - 1979

TRANSMISSION ZONE	ELECTRICAL DISTRIBUTION COMPANY	GENERATOR STATION	TYPE OF GENERATION PLANT	POWER GENERATED (GWh)	TOTAL POWER GENERATED IN ZONE (GWh)	POWER DISTRIBUTED TO OTHER ZONES (GWh)	POWER RECEIVED FROM OTHER ZONES (GWh)	TOTAL END CONSUMPTION IN ZONE (GWh)	PERCENT OF END CONSUMPTION POWER WHICH IS HYDRO POWER
Cairo	Cairo	West Cairo	Thermal	1,314.6	3,385.6	Canal (881.6)	Upper Egypt 2,993.2	5,671.7	52.8 %
		South Cairo	"	1,201.1					
		North Cairo	"	529.0					
		East Cairo	"	59.4					
		El Tebin I	"	208.5					
		El Tebin	"	73.0					
Alexandria	Alexandria	Shoubra El Kheima <sup>4</sup>	"	-	697.9	-	High Dam 820.0 Lower Egypt 425.5	1,943.4	42.2 %
		El Slouf	"	325.0					
		Karmouz	"	197.1					
		El Maz	"	91.3					
		Abou El Matamir	"	28.7					
		Kafr El Dawar	"	55.8					
Lower Egypt <sup>1</sup>	Behelra Delta	Damanhour	"	1,083.7	1,833.7	Alexandria (425.5) Cairo (174.5)	Upper Egypt 985.9 Canal 445.7	2,665.3	37.0 %
		Talkha Thermal	"	728.4					
		Talkha Gas	"	21.6					
Canal <sup>2</sup>	Canal	Suez Thermal	"	357.1	466.4	Lower Egypt (445.7)	Cairo 881.6	902.3	-
		Suez Gas	"	32.2					
		Ismailia	"	77.1					
Upper Egypt <sup>3</sup>	Northern Upper Egypt	Assiut	"	367.2	9,608.3	Lower Egypt (985.9)	-	5,176.4 <sup>5</sup>	92.9 %
		Southern Upper Egypt	Naga Hamadi	Hydro					
	Aswan Dam	"	1,639.0						
	High Dam	"	7,969.3						
TOTALS				16,359.1	(6,726.4)	6,726.4	16,359.1	58.7 %	

<sup>1</sup> Power stations in Marsa Matruh not connected to the Grid are excluded.

<sup>2</sup> Power stations in Port Said, the Sidi el Red Sea not connected to the Grid are excluded.

<sup>3</sup> Power stations in Fayoum, and the Western Desert are not included. The Naga Hamadi plant is not functioning.

<sup>4</sup> Shoubra El Kheima power station will not be commissioned until 1982.

<sup>5</sup> This total consumption includes major industrial consumers who purchase power directly from the EEA in addition to the distribution companies.

SOURCE: "Annual Report: Electricity Statistics," Egyptian Electrical Authority (1981).

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**TABLE VI-13**  
**EGYPTIAN ELECTRICITY AUTHORITY**  
**ELECTRICITY DEMAND PROJECTIONS 1980-2000**

SECTOR	(GWH)					PROJECTED AVERAGE ANNUAL GROWTH RATES (%)
	1980	1985	1990	1995	2000	
INDUSTRIAL						
General	3,936	6,249	8,972	12,588	17,688	7.87
Large Consumer	6,662	12,794	18,100	26,596	36,746	9.02
Total	10,598	19,043	27,072	39,184	54,404	8.52
Percentage of Sales	65.8	64.0	60.4	59.5	58.9	
RESIDENTIAL/COMMERCIAL	3,900	8,391	14,791	22,654	32,698	11.21
Percentage of Sales	24.2	28.2	33.0	34.4	35.4	
AGRICULTURE	700	952	1,165	1,580	2,032	5.47
Percentage of Sales	4.3	3.2	2.6	2.4	2.2	
GENERAL PURPOSE	564	774	898	1,120	1,386	5.3
Percentage of Sales	3.5	2.6	2.0	1.7	1.5	
GOVERNMENT BUILDINGS	355	595	896	1,318	1,847	8.73
Percentage of Sales	2.2	2.0	2.0	2.0	2.0	
TOTAL SALES	16,117	29,755	44,822	65,856	92,367	9.12
PERCENTAGE OF SALES	100.0	100.0	100.0	100.0	100.0	
LOSSES	2,624	4,057	6,112	8,980	12,596	
NET GENERATION	18,741	33,812	50,934	74,836	104,963	9.08

SOURCE: Unpublished Statistics of the EEA (1980).

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**TABLE VI-14**  
**PREFERRED STRATEGY TOTAL ENDPower CONSUMPTION: NON-NUCLEAR OPTION**

PERIOD	ITEM	UNITS	GREATER CAIRO	ALEXANDRIA	DELTA	NORTH AND SOUTH UPPER EGYPT			CANAL	TOTAL UNIFIED GRID	REMOTE AREAS	GRAND TOTAL
						LARGE INDUSTRIES	OTHERS	TOTAL				
1980-1985	Zone Population (1985)	('000s)	9,703	3,307	4,807	-	3,441	3,441	1,013	22,271	229	22,500
	Consumption/Capita	(KWh/Capita)	1,222.4	1,200.8	1,067.2	-	1,136.3	3,231.3	1,708.8	1,518.2	850.0	1,511.4
	Total Generation Required	(Gwh)	11,861	3,971	5,130	7,209	3,910	11,119	1,731	33,812	195	34,007
	- Hydroelectric	(Gwh)	-	-	-	7,209	3,122	10,331	-	10,331	-	10,331
	- Thermal	(Gwh)	11,861	3,971	5,130	-	788	788	1,731	23,481	195	23,676
1986-1990	Zone Population (1990)	('000s)	11,618	3,929	5,454	-	4,047	4,047	1,289	26,337	763	26,600
	Consumption/Capita	(KWh/Capita)	1,715	1,677.3	1,440.2	-	1,596.7	3,378	2,244.4	1,933.9	1,080.0	1,925.5
	Total Generation Required	(Gwh)	19,925	6,590	7,855	7,209	6,462	13,671	2,893	50,934	284	51,218
	- Hydroelectric	(Gwh)	-	-	-	7,209	5,399	12,608	-	12,608	-	12,608
	- Thermal	(Gwh)	19,925	6,590	7,855	-	1,063	1,063	2,893	38,326	284	38,610
1991-1995	Zone Population (1995)	('000s)	13,870	4,654	6,173	-	4,758	4,758	1,542	31,097	503	31,400
	Consumption/Capita	(KWh/Capita)	2,251.8	2,198.3	1,857.3	-	2,108.4	3,623.6	2,841.7	2,406.5	1,340.0	2,396.2
	Total Generation Required	(Gwh)	31,233	10,231	11,465	7,209	10,032	17,241	4,666	74,836	406	75,242
	- Hydroelectric	(Gwh)	-	-	-	7,209	5,399	12,608	-	12,608	-	12,608
	- Thermal	(Gwh)	31,233	10,231	11,465	-	4,633	4,633	4,666	62,228	406	62,634
1996-2000	Zone Population (2000)	('000s)	16,500	5,500	6,972	-	5,578	5,578	2,090	36,640	369	37,009
	Consumption/Capita	(KWh/Capita)	2,759.2	2,696.2	2,267.4	-	2,597.5	3,890	3,397.6	2,864.7	1,878.0	2,854.9
	Total Generation Required	(Gwh)	45,522	14,829	15,808	7,209	14,489	21,698	7,101	104,963	693	105,656
	- Hydroelectric	(Gwh)	-	-	-	7,209	5,399	12,608	-	12,608	-	12,608
	- Thermal	(Gwh)	45,522	14,829	15,808	-	9,090	9,090	7,101	92,355	693	93,048

SOURCE: NUPS analysis.

#### D. Capital Costs of New Electrical Power Generation and Transmission

The capital costs of new power generation plants and transmission facilities were estimated for each five year period using the demand forecasts shown in Table VI-14. Generally, it was assumed that the demand for additional capacity would be met first by existing zonal plant capacity (especially in the Upper Egypt Zone) to reduce transmission losses and, thus, increase system efficiency. However, after 1985, Upper Egypt zonal demand forecasts indicate that there will be no surplus hydroelectric power in the zone. Therefore, construction of new capacity in other zones will be necessary in any event.<sup>18</sup>

Since both the EEA 1980-1987 investment program and the Joint Egypt/United States Energy Assessment forecast that existing fossil fuels and conventional technologies will be adequate to meet Egypt's electrical needs to the year 2000, no projection of nuclear plant costs was included in the first projection. However, to provide a basis for comparison, a second projection was made in which it was assumed that 14 percent of Egypt's generating capacity would be met by nuclear plants by 1990 and additional increments of nuclear generating capacity added to the network which by the year 2000 would equal 20 percent of the total year 2000 generating capacity. Since Egypt has had no experience in construction of nuclear facilities, costs of nuclear plants were derived from cost comparisons of nuclear and non-nuclear plants developed by the "Bechtel Energy Supply Model."<sup>19</sup> (Table VI-15) These costs were updated to 1979 costs by using the projected rates of increase in power plant construction of the EEA and assuming that the cost relationships shown by the Bechtel Energy Supply Planning Model remain constant. The nuclear facilities cost include costs of construction of supporting infrastructure such as waste disposal facilities, spent fuel reprocessors and fuel fabrication units. Since Egypt's uranium resources have not yet proven to be economically recoverable, it was assumed that nuclear fuels would have to be imported, thus no costs were included for mining facilities or uranium enrichment plants which, would also be needed to support a nuclear power facility.

Due to the very long periods required for the construction of nuclear power plants and the higher risks associated with investing in such projects due to likely cost over-runs, changes in demand and changes in technologies which make the original designs obsolete before they are operational, a slow program of construction of nuclear capacity is presented. This program envisions completion of the two 900 MW nuclear plants now being contemplated by 1990 and construction of two additional 900 MW facilities by the year 2000. However, unlike the non-nuclear option in which it is assumed additional demand can be met by construction of new plants during the period, portions of the costs of building two additional 900 MW nuclear plants were added into the 1995-2000 period costs to serve future demand after 2000. Finally, since electrical power demand in Upper Egypt can be met by hydroelectric power through the planning period, it is assumed that all four nuclear facilities will be sited in Lower Egypt in desert sites away from population centers. The end consumption of electrical power under the nuclear generating option are shown in Table VI-16.

Since the Quattarra Depression Project is only expected to provide an additional 640 MW by the year 2000 (assuming the project is proven economically feasible and construction begins within the planning period), its construction costs were also excluded. It should be noted, however, that 640 MW is equal to roughly one year's projected demand for additional generating capacity. Therefore, even if implemented, substantial investment in other power generating facilities will be necessary.<sup>20</sup>

**TABLE VI-15**  
**COMPARISON OF NUCLEAR AND CONVENTIONAL POWER GENERATING FACILITIES**

TYPE OF FACILITY	INSTALLED CAPACITY (MW)	ESTIMATED CONSTRUCTION COST (1978 L.E. MILLIONS)	ESTIMATED COST/INSTALLED MEGAWATT (L.E. MILLIONS)	ESTIMATED OPERATING COST NET OF FUEL (L.E. MILLIONS/YEAR)	FUEL COSTS (L.E. MILLIONS/YEAR) <sup>1</sup>	TOTAL ANNUAL OPERATING COSTS (L.E. MILLIONS)	ESTIMATED COSTS/UNIT OF ENERGY PRODUCED (MILLIEMES/KWh)
OIL FIRED	800	162.0	0.20	2.6	138.0	140.6	29.22
	600	132.2	0.22	2.0	104.0	106.2	29.22
	450	112.6	0.25	4.3	78.7	82.2	29.97
COAL FIRED	800	204.9	0.26	3.5	138.2	141.7	29.42
	600	200.2	0.33	3.3	104.3	107.6	29.60
GAS FIRED	800	100.4	0.13	2.8	136.2	140.9	29.25
	600	82.7	0.14	2.2	104.3	106.4	29.28
LIGHT WATER REACTOR	1200	1,111.0 <sup>2</sup>	0.93	8.1	43.7	95.7 <sup>3</sup>	12.27
	900	1,007.9 <sup>2</sup>	1.12	6.2	32.8	82.9 <sup>3</sup>	14.17
	600	897.0 <sup>2</sup>	1.50	4.3	21.8	70.0 <sup>3</sup>	17.95
DAM AND HYDRO-ELECTRIC	200	76.9	0.38	0.5	-	0.5	0.37

- <sup>1</sup> Fuel costs are based on 1978 average costs as presented by Appendix E (p. E-17) of the Energy Assessment or roughly L.E. 53/ton of Petroleum products. The 1979 costs used in the NUPS energy assessment are L.E. 122/ton which accounts for higher operating costs. Nuclear fuel costs are based on a "thrown-away" fuel cycle at an average 1978 cost of US \$ 0.007/KWh. Comparable 1979 costs are estimated at US \$ 0.008/KWh.
- <sup>2</sup> Capital costs include necessary supporting infrastructure: a light water fuel fabrication unit, spent fuel reprocessors, and high level waste disposal.
- <sup>3</sup> Total operating costs include supporting infrastructure for nuclear facilities.



TABLE VI-16

REFERRED STRATEGY TOTAL END POWER CONSUMPTION: NUCLEAR OPTION

PERIOD	ITEM	UNITS	GREATER CAIRO	ALEXANDRIA	DELTA	NORTH AND SOUTH UPPER EGYPT			CANAL	TOTAL UNIFIED GRID	REMOTE AREAS	GRAND TOTAL
						LARGE INDUSTRIES	OTHERS	TOTAL				
1980-1985	Zone Population (1985)	('000s)	9,703	3,307	4,807	n.a.	3,441	3,441	1,013	22,271	229	22,500
	Consumption/Capita	(KWh/Capita)	1,222.4	1,200.8	1,067.2	n.a.	1,136	323.1	1,708.8	1,518.2	850	1,511.4
	Total Generation Required	GWh	11,861	3,971	5,130	7,209	3,910	11,119	1,731	33,812	195	34,007
	- Hydroelectric	GWh	-	-	-	7,209	3,122	10,331	-	10,331	-	10,331
	- Thermal	GWh	11,861	3,971	5,130	-	788	788	1,731	23,481	195	23,676
- Nuclear	GWh	-	-	-	-	-	-	-	-	-	-	
1986-1990	Zone Population (1990)	('000s)	11,618	3,929	5,454	n.a.	4,047	4,047	1,289	26,337	263	26,600
	Consumption/Capita	(KWh/Capita)	1,715	1,677.5	1,440.2	n.a.	1,596.7	3,378.0	2,244.4	1,933.9	1,080	1,925.5
	Total Generation Required	GWh	19,925	6,590	7,855	7,209	6,462	13,671	2,893	5,934	284	51,218
	- Hydroelectric	GWh	-	-	-	7,209	5,399	12,608	-	12,608	-	12,608
	- Thermal	GWh	19,925	6,590	7,855	-	1,063	1,063	2,893	38,324	284	38,610
- Nuclear	GWh	-	-	-	-	-	-	-	-	-	-	
1991-1995	Zone Population (1995)	('000s)	13,870	4,654	6,173	n.a.	4,758	4,758	1,642	31,097	303	31,400
	Consumption/Capita	(KWh/Capita)	2,251.8	2,198.3	1,857.3	n.a.	2,108.4	3,623.6	2,841.7	2,406.5	1,340	2,396.2
	Total Generation Required	GWh	31,233	10,231	11,465	7,209	10,032	17,241	4,666	74,836	406	75,242
	- Hydroelectric	GWh	-	-	-	7,209	5,399	12,608	-	12,608	-	12,608
	- Thermal	GWh	25,827	6,590	9,700	-	4,633	4,633	4,666	51,416	406	51,822
- Nuclear	GWh	5,406	3,641	1,765	-	-	-	-	10,812	-	10,812	
1996-2000	Zone Population (2000)	('000s)	16,500	5,500	6,972	n.a.	5,578	5,578	2,090	36,640	400	37,010
	Consumption/Capita	(KWh/Capita)	2,759.2	2,696.2	2,267.4	n.a.	2,597.5	3,890.0	3,397.6	2,864.7	1,878	2,854.9
	Total Generation Required	GWh	45,522	14,829	15,808	7,209	14,489	21,698	7,101	104,963	693	105,656
	- Hydroelectric	GWh	-	-	-	7,209	5,399	12,608	-	12,608	-	12,608
	- Thermal	GWh	34,715	6,590	13,235	-	9,090	9,090	7,101	70,731	693	71,424
- Nuclear	GWh	10,812	8,239	2,573	-	-	-	-	21,624	-	21,624	

SOURCE: MUPS analysis.

The base costs for non-nuclear generating plants were derived from the EEA's 1980-1987 planned investment program. This program aims at adding 4,213 mega watts of thermal generating capacity for a total capacity of 8,128 MW by 1987.

Regional variations in construction costs were reflected by multiplying these average costs times a regional index developed from 1980 unpublished statistics of the Ministry of Planning showing regional construction output due to the electrical sector and EEA information about plant capacity under construction. Since only very small plants or plant expansion is under construction in the Delta, the Alexandria index was used for Delta construction in the final index. Similarly, since only very small package plants are under construction in the Red Sea Governorate (20 MW), its index is probably not comparable to the indices of larger construction projects in other regions. Therefore, the general Remote Area construction index shown in the Appendices to Chapter V was used to reflect likely higher construction costs in remote areas. The index for hydroelectric plant construction was shown as 1.00, since actual project cost estimates were used for expansion of hydroelectric facilities in Aswan and in Upper Egypt (Table VI-17). Table VI-18 shows the regional distribution of investment in non-nuclear generating facilities, while Table VI-19 shows capital investment required for a nuclear energy program.

**TABLE VI-17**  
**REGIONAL CONSTRUCTION COST INDEX**  
**FOR ELECTRICAL POWER GENERATING FACILITIES**

ZONE	ZONAL INDEX (L.E. MILLIONS/ ADDITIONAL MW)	WEIGHTED INDEX
Greater Cairo	19.77	1.00
Alexandria	21.94	1.11
Delta		1.11
Canal	22.35	1.13
Aswan (hydroelectric)	0.09	1.00
Asiut (thermal)	46.33	2.34
Red Sea (Remote Areas)	17.50*	4.51

\* Since only a very small package plant is being constructed, it was felt that its costs were probably not comparable to the costs of constructing much larger facilities in other regions, therefore, the general Remote Area construction index was used. (See Appendix V -A, Table V -A.22)

SOURCE: 1980 unpublished construction statistics from Ministry of Planning and unpublished EEA data about plans under construction.

TABLE VI-18

**CAPITAL COSTS OF NEW ELECTRICAL POWER GENERATION AND BULK TRANSMISSION BY FIVE YEAR PERIOD AND SETTLEMENT ZONE IN NON-NUCLEAR OPTION**

PERIOD	UNITS	GREATER CAIRO	ALEXANDRIA	DELTA	NORTH & SOUTH UPPER EGYPT	CANAL	TOTAL UNIFIED GRID	TRANSMISSION	TOTAL	REMOTE GENERATION	TRANSMISSION	GRAND TOTAL
<b>1980-1985</b>												
Peak Demand	GWh	11,861.0	3,971.0	5,130.0	11,119.0	1,731.0	33,812.0			195.00		
Additional Hydro	GWh	-	-	-	5,154.6	-	5,154.6			-		
Additional Thermal	GWh	6,189.3	2,027.6	2,464.7	788.0	828.7	12,298.3			21.70		
Total System Capacity	(MW)	2,008.0	657.0	853.0	1,880.0	281.0	5,679.0			30.20		
Total Base Costs	(L.E. Millions)	695.4	222.4	271.5	413.9	89.2	1,692.4	274.1	1,966.5	2.15	0.55	1,969.2
Total Costs <sup>1</sup>	(L.E. Millions)	695.4	246.9	301.4	527.4	100.8	1,871.9	274.1	2,146.0	9.70	0.55	2,156.3
<b>1986-1990</b>												
Peak Demand	GWh	19,925.0	6,590.0	7,855.0	13,671.0	2,893.0	50,934.0			284.00		
Additional Hydro	GWh	-	-	-	2,277.0	-	2,277.0			-		
Additional Thermal	GWh	8,064.0	2,619.0	2,725.0	275.0	1,162.0	14,845.0			89.00		
Total System Capacity	(MW)	3,411.0	1,102.0	1,318.0	2,322.0	475.0	8,628.0			44.40		
Total Costs <sup>1</sup>	(L.E. Millions)	911.1	288.9	300.9	171.8	126.0	1,793.7	268.8	2,062.5	9.15	2.30	2,074.0
Total	(L.E. Millions)	911.1	320.7	334.0	210.5	142.5	1,918.7	268.8	2,187.5	41.30	2.30	2,231.0
<b>1991-1995</b>												
Peak Demand	GWh	31,233.0	10,231.0	11,465.0	17,241.0	4,666.0	74,836.0			406.00		
Additional Hydro	GWh	-	-	-	-	-	-			-		
Additional Thermal	GWh	11,308.0	3,641.0	3,610.0	3,570.0	1,773.0	23,902.0			122.00		
Total System Capacity	(MW)	5,398.0	1,727.0	1,940.0	2,942.0	774.0	12,781.0			63.90		
Total Base Cost	(L.E. Millions)	1,268.0	404.4	400.9	396.4	193.9	2,663.6	377.9	3,041.5	12.60	3.20	3,057.0
Total Cost <sup>1</sup>	(L.E. Millions)	1,268.0	448.9	445.0	927.6	219.1	3,308.6	377.9	3,686.5	56.80	3.20	3,746.5
<b>1996-2000</b>												
Peak Demand	GWh	45,527.0	14,829.0	15,808.0	21,698.0	7,101.0	104,963.0			693.00		
Additional Hydro	GWh	-	-	-	-	-	-			-		
Additional Thermal	GWh	14,294.0	4,598.0	4,343.0	4,457.0	2,435.0	30,127.0			287.00		
Total System Capacity	(MW)	7,933.0	2,523.0	2,693.0	3,721.0	1,189.0	18,059.0			110.40		
Total Base Costs	(L.E. Millions)	1,612.0	762.8	484.2	497.2	268.2	3,624.4	478.7	4,103.1	30.20	7.70	4,141.0
Total Costs <sup>1</sup>	(L.E. Millions)	1,612.0	846.7	537.5	1,163.4	303.1	4,462.7	478.7	4,941.4	136.30	7.70	5,085.4
<b>TOTALS</b> 1980-2000	(L.E. Millions)	4,486.5	1,863.2	1,617.9	2,828.9	765.5	11,561.9	1,399.5	12,961.4	244.10	13.75	13,219.3

<sup>1</sup> Base costs weighted by zonal electrical power facility zonal index.

SOURCE: MUPS analysis.

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TABLE VI-19

**CAPITAL COSTS OF NEW ELECTRICAL POWER GENERATION AND BULK TRANSMISSION BY FIVE YEAR PERIOD AND SETTLEMENT ZONE NON-NUCLEAR OPTION**

PERIOD	UNITS	GREATER CAIRO <sup>2</sup>	ALEXANDRIA <sup>2</sup>	DELTA <sup>2</sup>	NORTH & SOUTH UPPER EGYPT	CANAL	TOTAL UNIFIED GRID	TRANSMISSION	TOTAL	REMOTE GENERATION	AREAS TRANSMISSION	GRAND TOTAL
<b>1980-1985</b>												
Total Demand	GWh	11,861.0	3,971.0	5,130.0	11,119.0	1,731.0	33,812.0			195.00		
Additional Hydro	GWh	-	-	-	5,154.6	-	5,154.6			-		
Additional Thermal	GWh	6,189.3	2,027.6	2,464.7	788.0	828.7	12,298.3			21.70		
Additional Nuclear	GWh	-	-	-	-	-	-			-		
Total Capacity	MW	2,008.0	687.0	853.0	1,880.0	281.0	5,679.0			-		
Base Cost	L.E.Millions	695.4	222.4	271.5	413.9	89.2	1,692.4	274.1		30.20		
Total Base Cost	L.E.Millions	695.4	246.9	301.4	527.4	100.8	1,871.9	274.1	2,146.0	9.70	0.55	2,156.3
Nuclear Cost <sup>1</sup>	L.E.Millions	1,017.4	1,017.4	-	-	-	2,034.8	-	2,034.8	-	-	2,034.8
Total Cost	L.E.Millions	1,712.8	1,264.3	301.4	527.4	100.8	3,906.7	274.1	4,180.8	9.70	0.55	4,191.1
<b>1986-1990</b>												
Total Demand	GWh	19,925.0	6,590.0	7,855.0	13,671.0	2,893.0	50,934.0			284.00		
Additional Hydro	GWh	-	-	-	2,277.0	-	2,277.0			-		
Additional Thermal	GWh	8,064.0	2,619.0	2,725.0	275.0	1,162.0	14,845.0			89.00		
Additional Nuclear	GWh	-	-	-	-	-	-			-		
Total Capacity	MW	3,411.0	1,102.0	1,318.0	2,322.0	475.0	8,628.0			44.40		
Base Cost	L.E.Millions	911.1	288.9	300.9	171.8	126.0	1,798.7	268.8		9.15	2.30	
Total Base Cost	L.E.Millions	911.1	320.7	334.0	210.5	142.4	1,918.7	268.8	2,187.5	41.30	2.30	2,231.1
Nuclear Cost <sup>1</sup>	L.E.Millions	3,391.4	3,391.4	-	-	-	6,782.8	-	6,782.8	-	-	6,782.8
Total Cost	L.E.Millions	4,302.5	3,712.1	334.0	210.5	142.4	8,701.5	268.8	8,970.3	41.30	2.30	9,013.9
<b>1991-1995</b>												
Total Demand	GWh	31,233.0	10,231.0	11,465.0	17,241.0	4,666.0	74,836.0			406.00		
Additional Hydro	GWh	-	-	-	-	-	-			-		
Additional Thermal	GWh	5,902.0	-	1,845.0	3,570.0	1,773.0	13,090.0			122.00		
Additional Nuclear	GWh	5,406.0	3,641.0	1,765.0	-	-	10,812.0			-		
Total Capacity	MW	5,398.0	1,727.0	1,940.0	2,942.0	774.0	12,781.0			63.90		
Base Cost	L.E.Millions	662.4	-	202.0	396.4	193.9	1,454.7	377.9	1,832.6	12.60	3.20	1,848.4
Total Base Cost	L.E.Millions	662.4	-	224.2	927.6	219.1	2,033.3	377.9	2,411.2	56.80	3.20	2,471.2
Nuclear Cost <sup>1</sup>	L.E.Millions	3,391.4	2,374.0	-	-	-	5,765.4	-	5,765.4	-	-	5,765.4
Total Cost	L.E.Millions	4,053.8	2,374.0	224.2	927.6	219.1	7,798.7	377.9	8,176.6	56.80	3.20	8,236.6

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TABLE VI-19 (Continued)

PERIOD	UNITS	GREATER CAIRO <sup>2</sup>	ALEXANDRIA <sup>2</sup>	DELTA <sup>2</sup>	NORTH & SOUTH UPPER EGYPT	CANAL	TOTAL UNIFIED GRID	TRANSMISSION	TOTAL	REMOTE GENERATION	AREAS TRANSMISSION	GRAND TOTAL
<u>1996-2000</u>												
Total Demand	Gwh	45,527.0	14,829.0	15,808.0	21,698.0	7,101.0	104,963.0			693.0		
Additional Hydro	Gwh	-	-	-	-	-	-			-		
Additional Thermal	Gwh	8,888	-	3,535	4,457.0	2,435.0	19,315.0			287.0		
Additional Nuclear	Gwh	5,406	4,598.0	808.0	-	-	10,812.0			-		
Total Capacity	MW	7,933.0	2,523.0	2,693.0	3,721.0	1,189.0	18,059.0			110.4		
Base Cost	(L.E.Millions)	1,006.3	-	392.4	497.2	268.2	2,164.1	478.7		30.2	7.7	
Total Base Cost	(L.E.Millions)	1,006.3	-	435.6	1,163.4	303.1	2,908.4	478.7	3,387.1	136.3	7.7	3,531.1
Nuclear Cost <sup>3</sup>	(L.E.Millions)	5,704.0	3,330.0	-	-	-	9,034.0	-	9,034.0	-	-	9,034.0
Total Cost	(L.E.Millions)	6,710.3	3,330.0	435.6	1,163.4	303.1	11,942.4	478.7	12,421.1	136.3	7.7	12,565.1
<hr/>												
Total Costs 1980-2000(L.E.Millions)		16,779.4	10,680.4	1,295.2	2,828.9	765.4	32,349.3	1,399.5	33,748.8	244.4	13.7	34,006.8

<sup>1</sup> The nuclear generation costs shown here were derived from the Batchel "Energy Planning Model." Since these were 1978 costs, they were updated by maintaining the same relationships between thermal generation costs and nuclear costs shown by the model. This results in a cost per mega watt of a 900 MW nuclear plant of L.E. 3.7 million. This figure is higher than costs being quoted for nuclear facilities in Egypt (L.E. 1.1 million/mega watt for a 900 MW plant), but they are in the range of current nuclear plant costs being built in the United States. For example, the Washington (State) Public Power Supply System is presently constructing 5 nuclear power stations (light water reactors) each of 1,200 MW capacity. Their estimated costs in 1981 are projected to be US \$ 4.76 billion per plant or about US \$ 4.0 million per mega watt (Engineers News Record of July 23, 1981, p.26). Texas Utilities Company of Dallas, Texas is presently constructing a twin unit 2,300 MW total capacity nuclear power station which is projected to have costs of US \$ 3.44 billion by the time of its completion in 1984. When the costs of the plant were first estimated in 1972, they were projected to be US \$ 779 million. This represents an annual average growth in costs of 18 percent (Engineers News Record of November 12, 1981, p.42).

<sup>2</sup> Location of nuclear facilities: capital costs for nuclear facilities were determined by estimating the demand for additional electrical power by zone and then showing the costs of meeting that demand by zone. However, we are not suggesting locating nuclear power plants in highly populated zones where demand originates, i.e., Greater Cairo, Alexandria and the Delta. It is assumed that demand in these zones will be met by nuclear power plants located in the desert nearby these zones, but in locations which will not endanger populated areas. It may also be feasible to locate nuclear power facilities in other locations such as along the Gulf of Suez south of Suez City. However, these need to be studied on a case by case basis.

<sup>3</sup> The 50 percent of the costs of two additional 900 MW nuclear power facilities have been added to the 1996-2000 period to meet demand during the 2000-2005 period. This is necessary to due to the very long construction period of nuclear facilities.

SOURCE: NUPS analysis.

Although not a complete projection of capital costs, a third projection was made to show the relative reduction in capital costs of construction of new power plants if greater conservation of electrical energy occurred. (Table VI-20) Since the industrial and residential/commercial consumers account for 94 percent of total projected sales by year 2000 (59 percent industrial and 35 percent residential/commercial), maximum conservation could occur through pricing policies which encourage large consumers to reduce their electrical demand through more efficient operation of plant and equipment. For example, the largest consumers of electrical power, the Aluminum Plant at Naga Hamadi, the Kima Fertilizer Plant at Aswan and the cement manufacturers could reduce their consumption by 2,369 GWH through installing more modern equipment which uses electricity more efficiently.<sup>21</sup> Residential consumption could be reduced through encouraging greater usage of fluorescent lighting and ensuring locally produced electrical equipment has energy saving features such as is now required of electrical appliances manufactured for consumption by U.S. markets.

#### E. Financial and Economic Costs of Electrical Power Generation

The financial and economic costs of bulk generation and transmission of electrical power generation were calculated for both thermal and hydroelectric power generation.<sup>22</sup> The financial costs of hydroelectric power generation were estimated by subtracting the fuel costs of operating thermal plants from EEA's total 1979 operations budget (BAB 1 plus BAB 2)<sup>23</sup> and dividing the remainder by the 1979 gross generation. The extra financial costs of operating thermal plants were estimated by dividing the financial costs of fuel by the total power generation of thermal plants. This was added to the average financial operating costs to illustrate the additional costs of thermal power generation.

The "economic costs" of generating electrical power were estimated by costing petroleum products used in thermal plants at their 1979 international prices. The "economic" operating costs of hydroelectric plants are similar to financial costs as the primary subsidized inputs to electrical power sector are petroleum products.<sup>24</sup>

Since the EEA is classed an "economic" entity by the budgetary systems, both estimates of recurrent financial and economic costs take account of the fixed component of power generation costs through provisions in BAB2 for depreciation and interest expense. Since Egypt has had no experience in operating nuclear plants, the operating costs shown in Table VI-15 may underestimate these costs. However, no data is available to indicate what these provisions should be in Egypt. The ESPM does, however, include provisions for component costs in its estimates.

The financial and economic costs of power generation in the remote areas were estimated similarly to costs in other regions except that the salary component of power generation costs was increased by 100 percent to reflect incentives required to attract trained personnel to Remote Areas.<sup>25</sup>

As mentioned in the introduction to this section, seven regional power distribution companies are responsible for selling electrical power to medium and small consumers, therefore, their 1979 operating costs (BAB 1 and BAB 2) were added to the operating costs of bulk generation and transmission of electrical power.<sup>26</sup> In the North and South Upper Egypt Zone, a weighted average distribution cost was estimated for each period due to the large proportion of electrical power

**TABLE VI-20**  
**SUMMARY TABLE OF ELECTRICAL POWER CAPITAL AND OPERATING COSTS - PREFERRED STRATEGY**

(L.E. MILLIONS - 1979 PRICES)

	<u>CAPITAL COSTS</u>					<u>OPERATING COSTS<sup>2</sup></u>					<u>TOTAL CAPITAL &amp; OPERATING COSTS</u>	
	<u>1980-1985</u>	<u>1986-1990</u>	<u>1991-1995</u>	<u>1996-2000</u>	<u>TOTAL</u>	<u>1980-1985</u>	<u>1986-1990</u>	<u>1991-1995</u>	<u>1996-2000</u>	<u>TOTAL</u>	<u>1980-2000</u>	
<u>Non-Nuclear Option</u>	2,156.3	2,231.1	3,746.5	5,085.4	13,219.3							
Financial						2,036.7	3,565.9	5,390.1	7,817.0	18,809.7	32,029.0	
Economic						4,914.0	9,714.4	15,354.5	23,177.0	53,159.9	66,379.2	
 <u>Nuclear Option<sup>1</sup></u>	 4,191.1	 9,013.9	 8,236.6	 12,565.1	 34,006.7							
Financial						2,036.7	3,565.9	5,390.1	7,817.0	18,809.7	52,816.4	
Economic						4,914.0	9,714.4	14,467.1	20,580.3	49,675.8	83,682.5	

<sup>1</sup> Due to the very long construction periods of nuclear facilities, capital costs have been phased over 10 year periods. This also means that capital costs will have to be incurred during the 1995-2000 period to serve nuclear requirements after the year 2000. These requirements add roughly L.E. 6.7 billion to the costs of the 1995-2000 period.

<sup>2</sup> Since unit financial costs are assumed to be the same for both options, only the "economic" cost column shows differences in costs. The lower economic costs in the nuclear option result from construction of four nuclear plants.

SOURCE: NUPS analysis. See Tables VI-18, 19, 21, 22.

**TABLE VI-21**  
**UNIT COSTS OF OPERATING DIFFERENT TYPES**  
**OF ELECTRICAL POWER FACILITIES**

	UNITS	RECURRENT COST CONSTANTS	
		FINANCIAL *	ECONOMIC *
<b>I. GENERATION</b>			
Hydro	Millimes/kWh <sup>1</sup>	4.02 <sup>1</sup>	4.02
Thermal	Millimes/kWh	6.57	45.53 <sup>2</sup>
Nuclear	Millimes/kWh <sup>3</sup>	6.57 <sup>3</sup>	14.17
<b>II. DISTRIBUTION</b>			
Cairo	L.E./GWh <sup>4</sup>	9,670	9,670
Alexandria	L.E./GWh	10,670	10,670
Delta	L.E./GWh	12,230	12,230
Canal	L.E./GWh	13,600	13,600
<b>NORTH AND SOUTH UPPER EGYPT</b>			
Hydro	L.E./GWh	8,047	8,047
Thermal	L.E./GWh	13,099	13,099
<b>III. REMOTE</b>			
Generation	Millimes/KWh <sup>5</sup>	7.37	46.33
Distribution	LE/GWh	13,600	13,600

\* All prices in 1979 L.E.

SOURCES: NUPS Calculations.

- 1 Hydroelectric generation costs were estimated by subtracting the fuel cost component from the total 1979 EEA budget and dividing that amount by total 1979 generation. This yields the average cost of generating electrical power of any type of power generation facility. Thermal costs were estimated by adding the 1979 EEA budgetary provision for fuels divided by thermal generation to average generating costs.  
  
Both financial and economic costs take account of fixed and variable costs in their provisions. The EEA being classed by the Egyptian standardized budgetary and accounting system as an "economic" company has provisions in BAB 2 of its budget for depreciation and interest expense. Variable costs, to the point that they are measured are included in both BAB 1 (salaries) and BAB 2 (operating expense including depreciation and interest expense as well as fuel costs.)
- 2 Economic costs for thermal generation plants were calculated using 1979 International prices for petroleum products. This use of "economic costs" may understate the costs of other inputs which are not priced at their International costs by EEA, but to more fully account for these costs would require a more detailed study of the electrical power sector than NUPS could perform.
- 3 Since no policy for nuclear generation costs exists, it was assumed that financial costs of nuclear power generation would be the same as financial costs for thermal generation. Economic costs were estimated using costs shown in Table VI-15.
- 4 Distribution costs were calculated using 1979 budgetary data for the seven distribution companies and dividing that amount by zone and consumption. In the Upper Egypt Zones, thermal costs were calculated using total zone consumption net of the consumption of two large industrial consumers since they are supplied directly from EEA.
- 5 Remote Area generation costs were estimated by increasing the salary component of unit costs by 100 percent to reflect incentives necessary to attract skilled workers to these regions. The Suez distribution costs were used to reflect Remote Area distribution costs because both the Sinal and Red Sea Governorates are under the jurisdiction of the Canal Distribution Company, and because the Canal unit costs are higher than other zones, reflecting higher costs incurred in attracting skilled workers to Remote Areas.



which is sold directly to large industrial users in these zones. This weighted average was estimated by increasing the salary portion of distribution costs by 100 percent to reflect regional wage incentives and adding that amount to the operating costs of the North and South Upper Egypt distribution companies. Since the composition of power consumption changes in each period in North and South Upper Egypt due to the changes in the relative proportion of the demand of large users supplied directly by EEA to the total zone consumption, these average distribution costs were calculated for each period. (Tables VI-22 and VI-23)

Because Egypt has had no experience in operating nuclear power facilities, estimates of operating costs were derived from a comparison of operating costs of different types of power generating facilities estimated by the "Bechtel Energy Supply Planning Model" (ESPM) for use in Egypt.<sup>27</sup> For the purposes of this assessment, it was assumed that Egypt would purchase nuclear fuels from abroad since adequate local fuel sources have not been identified. Thus, only provisions for operations of spent fuel reprocessors and nuclear waste disposal sites were included in estimates of supporting infrastructure for nuclear facilities. Since nuclear facilities only become economically feasible when petroleum products are costed at their international prices (at subsidized prices, the costs of operating thermal facilities using fossil fuels are lower than the costs of operating nuclear facilities, at least to the electricity sector), only estimates of economic costs of operations for electrical generating facilities were provided.

A summary of the capital and operating costs of both non-nuclear and nuclear generating plant options are presented in Table VI-21. Back-up tables showing the derivation of total operations costs are shown at the end of this section. (Tables VI-22 and VI-23) It is significant to note that after 1990, when the first two nuclear plants come on stream, that they begin to have an impact on reducing the economic costs of power generation. Due to the large investment which would have to be made in non-nuclear generating facilities, this reduction in operating costs between 1980 and 2000 is only about 7 percent. However, the capital investment in power generating facilities for plants which would be in service during the 1980-2000 period is almost twice as great in the nuclear power plant options as it is in the non-nuclear option. A greater investment in nuclear facilities than the four 900 megawatt plants shown in the nuclear option would, of course, further reduce operating costs, but the capital investment requirements would also increase as would the risk of having investment too heavily in unused generating capacity due to changes in total power demand.

It is fairly significant to note that there are large economies of scale in the operations of nuclear facilities. According to the ESPM data, a 1,200 MW nuclear facility has operations costs which are 32 percent lower than a 600 MW facility. However to achieve these savings, capital costs of constructing nuclear facilities are 6 to 7 times as expensive per installed megawatt as are comparable sized thermal facilities. (Table VI-15)

## F. Financing

The very high capital outlays required to finance expansion of the electrical power sector at an annual growth of 9 percent is likely to prove an increasing economic constraint due to the high import component of power generating facilities (63 percent for conventional and 73 percent for nuclear facilities), the large

**TABLE VI-22**  
**CUMULATIVE OPERATING AND MAINTENANCE COSTS OF ELECTRICAL POWER GENERATION,**  
**BULK TRANSMISSION AND DISTRIBUTION**  
**BY FIVE YEAR PERIOD AND BY SETTLEMENT ZONE - NON-NUCLEAR OPTION \***

PERIOD	UNITS	GREATER CAIRO	ALEXANDRIA	DELTA	NORTH & SOUTH UPPER EGYPT	CANAL	TOTAL UNIFIED GRID	REMOTE AREAS	GRAND TOTAL
<b>1980-1985</b>									
Financial	(L.E. Millions)	693.90	249.20	363.10	575.80	134.30	2,016.30	20.40	2,036.70
Economic	(L.E. Millions)	2,047.40	707.10	1,018.40	689.20	393.70	4,855.80	58.20	4,914.00
- Financial Costs	(Millimeses/KWh)	15.69	16.70	18.43	14.02	20.17	15.92	20.97	15.96
- Economic	(Millimeses/KWh)	46.30	47.37	51.68	16.79	59.13	38.36	59.93	38.50
<b>1986-1990</b>									
Financial	(L.E. Millions)	1,307.90	461.30	618.60	916.40	236.30	3,540.50	25.40	3,565.90
Economic	(L.E. Millions)	4,445.50	1,503.90	1,900.60	1,098.90	692.80	9,641.70	72.70	9,714.40
- Financial	(Millimeses/KWh)	16.24	17.24	18.80	14.65	20.17	16.51	20.97	16.54
- Economic	(Millimeses/KWh)	55.20	56.20	57.76	17.56	59.13	44.95	59.93	45.06
<b>1991-1995</b>									
Financial	(L.E. Millions)	2,105.50	734.90	920.10	1,206.60	386.40	5,353.50	36.60	5,390.10
Economic	(L.E. Millions)	7,156.60	2,395.70	2,827.00	1,737.80	1,132.70	15,249.80	104.70	15,354.55
- Financial	(Millimeses/KWh)	16.24	17.24	18.80	15.45	20.17	16.81	20.97	16.83
- Economic	(Millimeses/KWh)	55.20	56.20	57.76	22.25	59.13	47.88	59.93	47.95
<b>1996-2000</b>									
Financial	(L.E. Millions)	3,157.90	1,094.40	1,297.90	1,607.00	601.40	7,758.60	58.40	7,817.00
Economic	(L.E. Millions)	10,733.80	3,567.60	3,987.50	2,958.00	1,763.20	23,010.10	166.90	23,177.00
- Financial	(Millimeses/KWh)	16.24	17.24	18.80	16.34	20.17	17.05	20.97	17.08
- Economic	(Millimeses/KWh)	55.20	56.20	57.76	30.07	59.13	50.56	59.93	50.62
Grand Total Financial Costs	(L.E. Millions)	7,265.20	2,539.80	3,199.70	4,305.80	1,358.40	18,668.90	140.80	18,809.70
Economic Costs	(L.E. Millions)	24,383.30	8,174.30	9,733.50	6,483.90	3,982.40	52,757.40	402.50	53,159.90

\* 1979 Prices.

SOURCE: NUPS analysis from Tables VI-14 and VI-20.

**TABLE VI-23**  
**CUMULATIVE OPERATING AND MAINTENANCE COSTS OF ELECTRICAL POWER GENERATION,**  
**BULK TRANSMISSION AND DISTRIBUTION BY FIVE YEAR PERIOD AND BY**  
**SETTLEMENT ZONE - NUCLEAR OPTION \***

PERIOD	UNITS	GREATER CAIRO	ALEXANDRIA	DELTA	NORTH & SOUTH UPPER EGYPT	CANAL	TOTAL UNIFIED GRID	REMOTE AREAS	GRAND TOTAL
<b>1980-1985</b>									
Financial	(L.E. Millions)	693.90	249.20	363.10	575.80	134.30	2,016.30	20.40	2,036.70
Economic	(L.E. Millions)	2,047.40	707.10	1,018.40	689.20	393.70	4,855.80	58.20	4,914.00
- Financial Costs	(Millimeses/KWh)	15.69	16.70	18.43	14.02	20.17	15.92	20.97	15.96
- Economic	(Millimeses/KWh)	46.30	47.37	51.68	16.79	59.13	38.36	59.93	38.50
<b>1986-1990</b>									
Financial	(L.E. Millions)	1,307.90	461.30	618.60	916.40	236.30	3,540.50	25.40	3,565.90
Economic	(L.E. Millions)	4,445.50	1,503.90	1,909.60	1,098.90	692.80	9,641.70	72.70	9,714.40
- Financial	(Millimeses/KWh)	16.24	17.24	18.80	14.65	20.17	16.51	20.97	16.54
- Economic	(Millimeses/KWh)	55.20	56.20	57.76	17.56	59.13	44.95	59.93	45.06
<b>1991-1995</b>									
Financial	(L.E. Millions)	2,105.50	734.90	920.10	1,206.60	386.40	5,353.50	36.60	5,390.10
Economic	(L.E. Millions)	6,717.90	2,092.20	2,681.80	1,737.80	1,132.70	14,362.40	104.70	14,467.10
- Financial	(Millimeses/KWh)	16.24	17.24	18.80	15.45	20.17	16.81	20.97	16.83
- Economic	(Millimeses/KWh)	57.82	49.08	54.80	22.25	59.13	45.10	59.93	45.17
<b>1996-2000</b>									
Financial	(L.E. Millions)	3,157.90	1,094.40	1,297.90	1,607.00	601.40	7,758.60	58.40	7,817.00
Economic	(L.E. Millions)	9,439.30	2,610.10	3,642.80	2,958.00	1,763.20	20,413.40	166.90	20,580.30
- Financial	(Millimeses/KWh)	16.24	17.24	18.80	16.34	20.17	17.05	20.97	17.08
- Economic	(Millimeses/KWh)	48.54	41.12	52.77	30.07	59.13		59.93	45.23
Grand Total Financial Costs	(L.E. Millions)	7,265.20	2,539.80	3,199.70	4,305.80	1,358.40	18,668.90	140.80	18,809.70
Economic Costs	(L.E. Millions)	22,650.10	6,913.30	9,243.60	6,483.90	3,982.40	49,273.30	402.50	49,675.80

\* 1979 L.E. Prices.

SOURCE: NUPS analysis from Tables VI-16 and VI-20.

losses being incurred by the sector through fuel subsidies and financial subsidies to large users, and the likely need to finance much of the expansion of the sector internationally, possibly at market rates. This situation is likely to be exacerbated if the present low levels of tariffs are maintained and an increasing share of total power generated is due to nuclear power facilities fueled by even more imported inputs than conventional plants and having even higher capital cost requirements. Presently, the debt servicing capacity of the sector is severely limited by low levels of cost recovery. The average financial costs of operating non-nuclear plants, estimated at 7.59 millimes/KWh, do not provide adequate revenues to finance interest requirements of debt servicing nor do they provide a mechanism for internal generation of financial resources within the sector.

The present low level of cost recovery results from fuel subsidies to the sector and subsidies to the largest consumers of electricity. As mentioned, fuel subsidies result in a loss to the sector of 22.5 millimes/KWh generated. As the sector becomes more dependent on non-hydroelectric sources of power generation, this loss to the sector will increase to 33.5 millimes/KWh by year 2000. If nuclear power generating facilities are to play an increasing role in the sector, this loss of revenue to the sector will be somewhat minimized due to the greater efficiencies of the nuclear power plants, i.e., the loss will be 28.2 millimes/KWh by the year 2000. However, the loss of revenue to the sector will be even greater in an economic sense as the total foreign financing of nuclear power plants per installed MW is greater and there will be a greater reliance on imported inputs.

The resource demands of the electrical power sector are likely to place undue pressures on other sectors, particularly if an increasing role of nuclear facilities is introduced to support a 9 percent growth rate in electricity demand without a concerted policy of industrial and residential/commercial development aimed at energy conservation. Except for the periods when the High Dam was under construction, electrical investment has been in the range of 4 to 6 percent of total investment.<sup>28</sup> If the 9 percent growth rate in electrical power consumption is achieved, total capital costs are expected to reach 9.1 percent of cumulative investment between 1996-2000 for the non-nuclear option and 22.4 percent for the nuclear option. The following paragraphs illustrates how this total investment requirement might be minimized through policies coupling energy conservation with changes in pricing policies.

Maintaining the existing revenue base without increasing tariffs and achieving a 9 percent growth rate in demand is likely to result in resource constraints for the sector. This situation may be helped somewhat by diverting some electricity generation to nuclear facilities and selling the petroleum products saved on international markets to finance importation of nuclear fuels and foreign debt servicing requirements of nuclear facilities. However, this option would require a very rapid rate of construction of nuclear facilities which would probably not be feasible given the large financial and construction commitments necessary.

Therefore, it is recommended that a combined policy of energy conservation and improvement in the sector's revenue base through increased tariffs be jointly considered. Initially, since many of the largest consumers of electrical power are public sector industries, there may not be as much resistance to encouraging greater efficiencies in end consumption while increasing tariff structures for large users than if the sector's main consumers were private sector. The Joint

Egypt/United States Energy Assessment gives three examples of methods of electrical energy savings:

- Conversion of cement production to more efficient grinding of clinker and greater usage of blended cements.
- Reduction of anode current density in the aluminum process to improve energy efficiency from 18,000 KWh/ton to 16,760 KWh/ton.
- Replace Kima Fertilizer Electrolysis process with Naptha process by year 2000.

These three industrial conversion processes would result in electrical energy savings in the range of 2,369 GWh. The assessment estimates that similar conservation measures by other industrial users and residential/commercial consumers could result in a 19 percent reduction in electrical demand by year 2000.

The EEA demand projections which have been used so far have implicit assumptions of income elasticities to NUPS GDP growth which range from 1.18 during the 1980-1985 period to 1.02 during the 1995-2000 period. However, due to subsidized energy costs in Egypt, total commercial energy consumption has had higher elasticities between 1970-1975, in the range of 1.30. These have resulted in relatively high demand for commercial energy, particularly electricity. While other energy pricing policies tend to benefit the poor more than the rich (such as subsidies for kerosene), electricity subsidies have less impact on household expenditures of the poor because they consume relatively little electricity. Furthermore, the present electricity tariff structure has the added negative impact of charging smaller consumers more than large consumers: the very low tariffs charged to the two largest industrial consumers are a case in point. These two factors have led to relatively rapid growth in electrical demand, particularly by large consumers, without complementary conservation policies.

Since demand for electrical energy (actually all commercial energy) is related closely to the structure of prices imposed on consumption, relatively dramatic reductions in demand can occur when more economic pricing is used both to enforce conservation and to reduce subsidy levels. The projections shown in Table VI-24 illustrate the effects on electricity demand if the income elasticities experienced between 1970-1975 are maintained, but price changes reflecting recent increases in world oil prices are imposed (and a price elasticity of -0.30) to modify demand.<sup>29</sup> Two different growth rates in tariffs are shown on the table to illustrate the price increases over 20 years necessary to move from the present subsidized prices to non-subsidized prices by the year 2000 (a 10 percent annual growth rate), and secondly the impact if half that growth in tariffs is achieved.

These reductions in demand have very significant impacts on reduction of capital costs for generation facilities. For example, the reduction in demand due to the 5 percent growth rate in prices results in a 19 percent reduction in total demand between 1980 and 2000. During the 1986-2000 period, this reduction in demand reduces investment requirements for non-nuclear generating facilities from L.E. 11,063 million to L.E. 8,436, a 24 percent reduction in costs. Similarly, if a program of constructing nuclear facilities were begun, the 1986-2000 capital requirements for this program reduce by about L.E. 7.3 billion to roughly L.E. 22.5 billion. This reduces the electrical sector's proportion of total NUPS investment

**TABLE VI-24**  
**RELATIONSHIP BETWEEN ELECTRICAL DEMAND AND**  
**CHANGES IN PRICING POLICIES**

	NUPS GDP ESTIMATES (L.E. MILLIONS) <sup>1</sup>	EEA ELECTRICAL ENERGY DEMAND (GWH) <sup>2</sup>	ELECTRICAL DEMAND PROJECTIONS <sup>3</sup>			
			(1) 5% ANNUAL GROWTH IN PRICES DEMAND (MILLIEMES/KWh) (GWh)		(2) 10% ANNUAL GROWTH IN PRICES DEMAND (MILLIEMES/KWh) (GWh)	
1980	11,227	16,117	8.51	16,117	8.51	16,117
1985	17,500	29,755	10.86	27,238	13.71	25,960
1990	23,400	44,822	13.86	37,473	22.07	33,638
1995	31,700	65,856	17.69	52,548	35.55	44,479
2000	43,400	92,367	22.58	74,628	57.25	59,611
GROWTH RATES						
1980-2000						
(%)	7.0	9.08	5.00	8.00	10.00	5.90

<sup>1</sup> NUPS Interim Action Report, p.95.

<sup>2</sup> Electrical demand is net of system losses.

<sup>3</sup> Assumes income elasticities of 1.30 and price elasticities of -0.30.

SOURCE: World Bank Development Policy Staff, Prospects for Developing Countries 1978-1985, November 1977, Washington, D.C. as quoted by Joint Egypt/United States Report on Egypt/United States Cooperative Energy Assessment. Vol. 1, pp. G 18 - G 23.

SOURCE: NUPS Analysis and source quoted above.

pool for the 1996-2000 period from 9.1 percent to 7.5 percent for the non-nuclear option. The 10 percent increase in prices reduces demand by the year 2000 by 35 percent and results in almost a 40 percent reduction in investment requirements for non-nuclear generating facilities (costs reduce from L.E. 11.0 billion to L.E. 6.7 billion). Even larger reductions in nuclear generating costs can result, as they could be reduced by roughly 46 percent to about L.E. 16 billion. However, even with this reduction in nuclear generating costs, the total investment requirements for the electricity sector would remain high (about 14 percent of the total NUPS cumulative investment pool during the 1996-2000 period). A summary of these projected reductions in capital costs is presented in Table VI-25. These costs have not been detailed since they were determined through interpolation from the average unit costs of both the nuclear and non-nuclear generating costs. These two illustrations of the impact which changes in pricing could have on the sector's investment requirements demonstrate the need to more carefully evaluate future demand before embarking on large infrastructure projects which may result in substantial excess capacity.

**TABLE VI-25**  
**REDUCTIONS IN CAPITAL COSTS FOR**  
**TO**  
**POWER GENERATION DUE TO REDUCTIONS IN DEMAND**

GENERATING OPTION	L.E. MILLIONS			TOTAL 1986-2000
	1986-1990	1991-1995	1996-2000	
<b>1. Reduction In Total Demand Through 5 Percent Growth Rate In Prices</b>				
Non-nuclear *	1,516	2,685	4,235	8,436
Nuclear *	6,123	5,909	10,465	22,497
<b>2. Reduction In Total Demand Through a 10 Percent Growth Rate In Prices</b>				
Non-nuclear *	1,136	2,684	2,905	6,725
Nuclear *	4,591	4,250	7,172	16,013

\* Costs were found by dividing total capital costs shown in Table VI-20 for each period by the EEA demand shown in Table VI-21 to determine unit costs. These unit costs were then used to calculate the reduced capital requirements for each of the demand calculations shown in Table VI-21.

SOURCE: NUPS analysis from Tables VI-20 and VI-21.

## IV. TELECOMMUNICATIONS

### A. Background

Access to good telecommunications facilities is a major factor in the decision for economic activities to locate in one region over another. The availability and quality of facilities and services influences the desirability of locations both economically and in terms of the quality of life enjoyed by its population. Thus, due to the poor condition of the telecommunications system, a telecommunications sector study was conducted in 1977 and 1978 to determine the present condition of the system and project future telecommunications requirements.

The existing telecommunications network in Egypt consists of a basic network of automatic switching equipment, an associated network of inter-office junctions within the multi-exchange areas of Cairo and Alexandria, and a national trunk network operating between the manual and automatic systems. Responsibility for the operations and planning of the network is under the jurisdiction of the Arab Republic of Egypt Telecommunications Organization (ARETO) of the Ministry of Transport, Communications and Marine Transport.

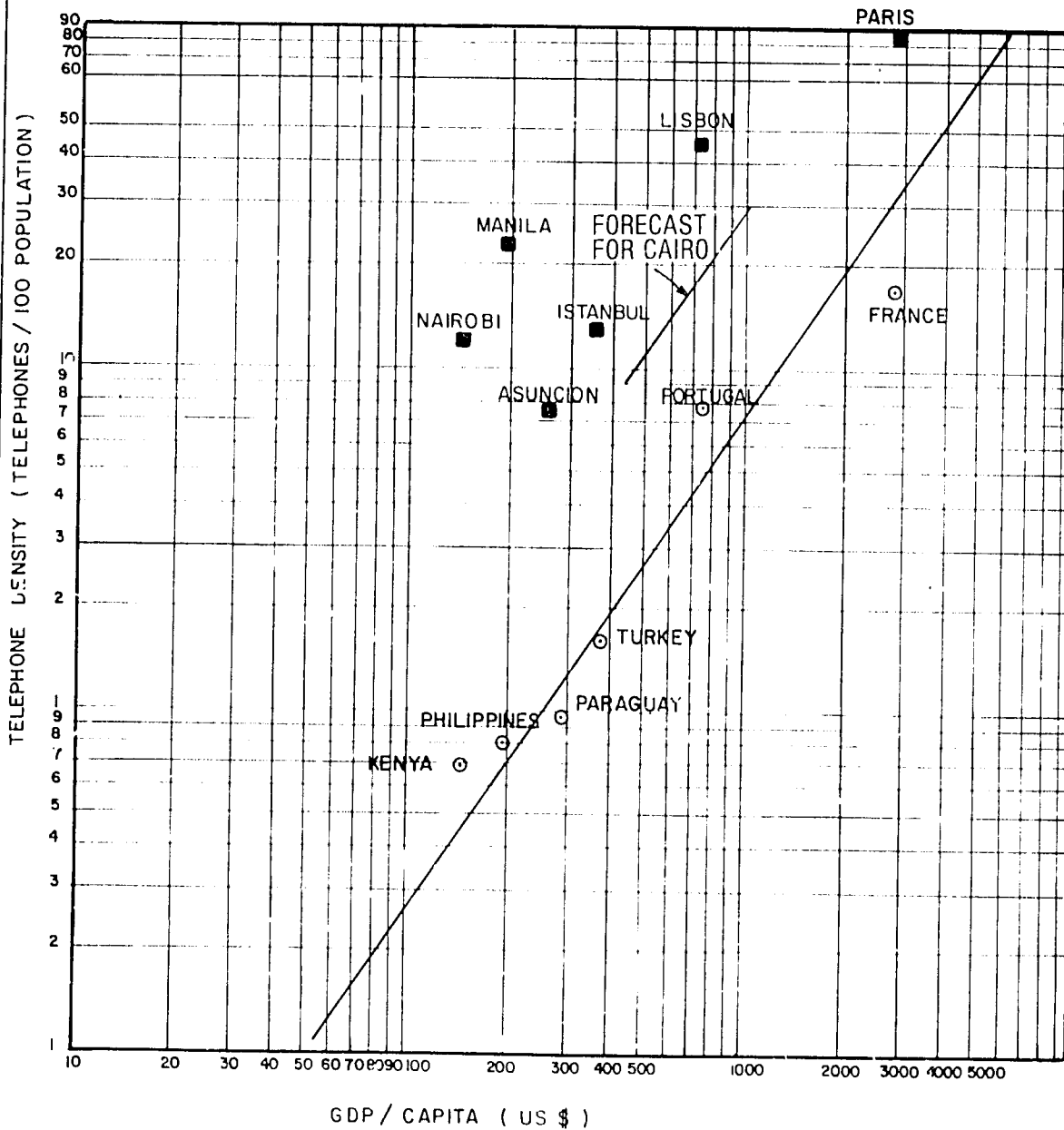
The automatic exchanges of the system have a capacity of about 393,260 lines of which about 78 percent are operational. The manual exchanges of the Delta and Upper Egypt add another 30 percent to the total capacity of the telecommunications network. These manual and automatic exchanges vary in size from small manual switchboard of a 10 line capacity to large multi-office installations consisting of 35,000 lines of X-bar automatic switching equipment. All units, regardless of size or location, are connected by an extensive network of long distance circuits, frequently consisting of open wires, which converge on zone centers linked together by VF cable, coaxial cables and microwaves. Most access to the national toll network is through seven national centers in Greater Cairo, Alexandria, Mahalla, Damanshour, Mansoura, and Tanta. All international connections to and from Egypt are routed through Cairo with coaxial cable connections to Alexandria.

### B. Future Demand for Telecommunications

The telecommunication sector study projected future telephone demand based on data derived from relationships between GDP per capita growth and telephone density (number of telephones per 100 population) from 64 countries ranging from under-developed nations in Africa and Asia to industrialized nations in Europe and North America. A summary of this cross sectional data showing locations of some of the 64 countries and their capital cities are presented in Figure VI-1. (The regression line shown in the figure has a very high correlation coefficient, 0.97, indicating a very close relationship between demand as expressed by telephone densities and GDP per capita.) Based on this data, and 1976 population projections of total year 2000 populations of 53 million, the telecommunications sector study projected an increased demand for telephone lines from roughly 311,000 in 1977 to roughly 4.6 million by year 2000 and a total investment program over the 20 year period (1980-2000) amounting to L.E. 12 billion (1978 prices). This capital



## RELATIONSHIP BETWEEN GDP/CAPITA AND TELEPHONE DENSITY



SOURCE : TELECOMMUNICATIONS SECTOR STUDY. TELECOMMUNICATIONS NEEDS AND DEMAND FORECAST. VOLUME III. EXHIBIT III-3. CONTINENTAL TELEPHONE HOLDINGS CORPORATION FOR THE MINISTRY OF TRANSPORT, COMMUNICATION AND MARITIME TRANSPORT. 1978.

REGRESSION LINE :  $\log Y = 1.46 \log X - 3.54$  WHERE : X = GDP/CAPITA ( US \$ )  
Y = TELEPHONE DENSITY

investment program is summarized in Table VI-26. The demand projections for 1980 of the sector study estimated that 1980 demand for domestic telephone lines was approximately one million lines or roughly three times the number of lines in services.

The actual number of telephone lines required by the network was determined by using a ratio of telephones to telephone lines equalling 1.2. This represented a significant increase in the quality of service as ARETO estimated there are presently a telephone-to-telephone line ratio of 1.6. The sector study justified this dramatic increase in the quality of service as necessary because ratios as high as 1.6 are rarely encountered in developing nations where technology is not advanced enough to provide quality service at high telephone-to-telephone line ratios. Thus, maintaining the 1.6 ratio would not result in substantial improvement in the quality of service.

Sub-regional demand for telecommunications service was determined by using governorate output data for agriculture and industry as a proxy for governorate GDP. The study projects that business and government telephone usage will continue to represent a proportion of demand for telecommunications service (roughly 52 percent of all lines by the year 2000) due to the high costs to subscribers of the service. Only the Greater Cairo exchanges are projected to significantly reverse this trend where only 39 percent of the subscribers are expected to be business or Government. The sector study projects this reversal in trends due to the likely high expatriate population of Greater Cairo and likely higher incomes of Egyptian subscribers.

### C. Projection of Future Demand: NUPS Preferred Strategy

When the telecommunications sector study projected future telephone demand, it based its projections on preliminary 1976 population projections which showed dramatic decreases in population growth rates during later periods of the century. This resulted in a projected year 2000 population of 53 million, and based on GDP per capita -- telephone density relationships, a projected requirement for an additional 4 million telephones. More recent demographic projections used by NUPS show that these earlier population projections were overly optimistic about the rate of decline of population growth rates, and thus the total year 2000 total population is more likely to be in the range of 67 million. Thus, if both NUPS GDP and population projections based on more recent data hold true, the telecommunications sector study probably underestimated total telephone demand in its investment program.<sup>30</sup>

We have updated the telecommunications sector study demand projections using the density standards developed by the sector study rather than developing separate standards. This was done by calculating the telephone line density for major settlements using the sector study population estimates. These densities were then used to project telephone line demand of the population distribution of the Preferred Strategy. In a similar fashion, the costs of expanding the telecommunication system to meet new demands represented by NUPS population projections were projected by calculating the cost per line for adding new lines shown by the detailed capital investment program of the sector study. These costs, which were updated to 1979 prices, were then used to estimate the new capital cost requirements represented by the NUPS Preferred Strategy if the sector study telephone line density standards are

**TABLE VI-26**  
**PROJECTED CAPITAL INVESTMENT AND**  
**YEAR 2000 DISTRIBUTION OF TELEPHONE LINES OF**  
**THE TELECOMMUNICATIONS SECTOR STUDY**

COMMUNICATIONS ZONE AND MAJOR SETTLEMENT EXCHANGES	PROJECTED CAPITAL INVESTMENT PROGRAM 1980 - 2000 (LE. '000)	EXISTING NUMBER OF LINES 1977	TOTAL NUMBER OF LINES <sup>3</sup> (2000)	COST PER NEW LINE (LE.)
Cairo Zone	5,705,053	196,629	2,209,168	2,583
Districts	4,782,726	196,629	2,209,168	
Miscellaneous	874,750			
Others	47,577			
Alexandria Zone	1,950,833	58,753	691,256	2,822
Districts	1,674,315	57,966	684,343	
Kafr El Dawar	18,479	607	6,913	
Others <sup>1</sup>	9,007	180		
Canal Zone	11,333,152	7,019	481,790	2,764
Ismailia	341,518	575	133,040	
Port Said	495,489	4,625	196,750	
Suez	361,610	1,819	138,990	
Other Canal Settlements	38,830	-	14,010	
Miscellaneous	95,705			
Delta	2,124,178	31,928	778,330	2,729
Banha	86,392	1,929	36,230	
Damanhour	117,770	2,722	51,110	
Damietta	83,687	1,991	37,400	
Dessouk	52,174	1,199	22,520	
Kafr El Shelkh	48,681	1,198	22,490	
Mansoura	154,005	5,967	75,920	
Mahalla El Kubra	122,004	2,804	54,540	
Mit Chamr	62,827	1,972	30,140	
Tanta	241,266	5,980	112,340	
Zagazig	100,672	2,395	44,990	
Other Exchanges	736,641	3,671	290,650	
Miscellaneous	317,259			
Upper Egypt Zone	1,146,834	15,891	346,790	3,019
Assiut	75,767	3,943	31,770	
Aswan	73,702	1,704	28,940	
Beni Suef	41,519	1,576	16,540	
Fayoum	129,283	1,986	49,570	
Minia	83,120	2,406	32,630	
Mallawi	19,142	896	9,410	
Sohag	35,574	1,600	16,780	
Gerga	11,341	395	5,020	
Qena	100,689	789	34,700	
Luxor	75,403	597	28,090	
Other Exchanges <sup>1</sup>	253,188			
Miscellaneous	148,106			
Others				
TOTAL <sup>2</sup>	12,160,050	310,820	4,597,150	2,645,13

Total per capita cost/urban population = 328.65.

<sup>1</sup> Included in main exchanges estimates.

<sup>2</sup> Totals are those of the telecommunications sector study.

<sup>3</sup> Investment program includes replacement of existing telephone lines.

SOURCE: Telecommunications Sector Study.

used to project telephone demand. These density standards and cost per additional line by settlement are shown in Table VI-27, while the projected costs of the Preferred Strategy using these costs is shown in Table VI-28.

This methodology results in dramatic increases in the quality of service in most settlements. For example, Greater Cairo, which has a 1980 telephone line density of approximately 3.2 lines per 100 population is projected to have a density of 21.4 by the year 2000. Using this methodology, overall, the national urban telephone line density is projected to increase from an urban density of 2.1 lines per 100 population in 1980 to an urban density of 18.01 by year 2000.<sup>31</sup> This density is roughly in the range of that of the total population of France. (Figure VI-1)

This increased telephone line demand results in an increase in the total number of telephone lines from the sector study projection of 4.6 million lines to 6.7 million lines in year 2000. The total costs of maintaining the sector study telephone line density standards to serve the increased demand represented by the Preferred Strategy are estimated to be L.E. 21.7 billion over the 1980-2000 period, or roughly L.E. 5.7 billion greater than those projected by the sector study.<sup>32</sup>

Due to the high capital requirements of the investment program for telecommunications resulting from projecting demand for the Preferred Strategy at telecommunications sector study standards, we have projected a second variant of those density standards which assumed that improved telecommunications technology will allow an increase in the ratio of telephones-to-telephone lines from the 1.2 ratio proposed by the sector study to 1.35. This would represent a 16.7 percent reduction in requirements for telephone lines. This assumption is based on the very high ratio of business/government to residential lines which is projected to exist by the year 2000 which suggests that through improved technology, more business/government telephones could be joined together through more efficient switching technology. Thus, business/government demand could be reduced for individual telephone lines without reducing the quality of the service. Our second assumption is that telephones will more closely follow the middle level of the demand forecast shown on Figure VI-1. This assumption is supported by the projection of telephone density based on the GDP per capita relationships resulting from the 64 nation cross sectional data as is shown in Table VI-29. These two modifications in demand result in a reduction of urban telephone line densities from 18.01 shown in Table VI-30 to roughly 9.9 lines per 100 population. Overall, this results in a national density standard of roughly 7.4 telephones (5.5 telephone lines) per 100 population or an increase in the 1980 standard of more than 450 percent. As is shown in Table VI-30, this projection of demand would require roughly 3.7 million new lines by the year 2000 and a capital investment program of L.E. 11.3 billion (1979 prices) during the period 1986-2000.

#### D. Revenue Requirements of Telecommunications

The telecommunications sector plan recommended increases in tariff schedules and financing procedures which would allow ARETO an average return on its assets over the 1980-2000 period of 12.9 percent and, thus, be able to finance its operations and capital investment programs through generation of revenues from domestic and international subscribers rather than subsidies. The sector plan recommended rate structures be revised according to a "value of service" concept whereby it is assumed that the availability of the service has a basic value to a customer and that these

**TABLE VI-27**  
**TELECOMMUNICATION SECTOR STUDY PROJECTED TELEPHONE DENSITIES AND UNIT COSTS**

ZONE AND SETTLEMENT	NUMBER OF TELEPHONE LINES 1980	TELEPHONE DENSITY (LINES/100 POPULATION)				COST PER ADDITIONAL TELEPHONE LINE			
		1985	1990	1995	2000	1985 (LE 1000)	1990 (LE 1000)	1995 (LE 1000)	2000 (LE 1000)
Greater Cairo	243,230	8.7	12.2	16.2	21.4	3.17	2.07	4.55	4.13
Alexandria	71,743	9.6	12.2	16.2	21.4	3.9	1.9	4.66	3.74
<u>CANAL ZONE</u>									
Port Said	5,844	5.16	22.07	29.09	34.67	3.2	2.1	2.32	3.60
Suez	2,149	3.29	22.00	33.30	37.10	2.9	2.1	3.24	3.24
Ismailia	1,900	4.30	19.17	24.69	28.74	3.1	2.2	3.21	3.25
Other Settlements	314	3.00	4.00	4.50	5.00	3.1	2.2	3.21	3.25
<u>DELTA</u>									
Tanta	6,567	5.16	12.88	16.18	20.50	2.14	1.1	3.52	3.42
Mansoura	5,967	4.97	11.89	13.45	15.42	3.7	1.6	2.80	2.47
Mahaila	3,828	2.58	5.75	7.09	8.85	3.87	1.1	4.09	2.72
Zagazig	2,689	2.85	6.91	8.53	10.67	1.9	2.0	3.61	2.81
Damanhour	3,049	3.28	7.71	9.22	11.18	3.9	1.0	4.17	3.01
Kafr El Dawar	607	0.45	0.67	0.64	0.60	6.04	2.0	3.10	3.18
Shebin El Kom	2,005	3.03	5.49	6.49	7.77	3.3	1.9	5.76	3.44
Damietta	1,991	5.51	15.18	20.12	26.99	4.8	1.1	2.68	3.30
Benha	2,082	5.02	12.28	14.98	18.54	2.6	2.0	3.18	3.31
Kafr El Sheikh	1,473	3.47	7.54	8.42	10.20	2.3	1.7	2.85	3.21
Mit Ghamr	2,666	6.59	13.65	15.23	17.21	3.6	1.2	4.01	2.65
Belbels	590	1.82	4.50	5.37	6.47	1.9	2.0	3.61	2.81
Qalyub	657	1.95	3.99	5.25	6.86	3.3	1.9	5.76	3.44
Idku	174	0.55	1.32	1.52	1.76	6.0	2.0	3.10	3.18
Mataria	827	1.97	3.8	5.0	6.6	3.7	1.6	2.80	2.47
Dessouk	1,566	5.59	12.95	16.45	21.17	4.6	1.2	3.52	2.92
Menouf	1,079	2.59	4.12	4.73	5.48	3.3	1.9	5.76	3.44
Abu Kabir	1,166	3.32	5.74	7.26	8.36	1.9	2.0	3.61	2.81
Zefta <sup>1</sup>	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Belkas	1,130	3.41	5.85	7.17	8.89	3.7	1.6	2.80	2.47
Other Urban	781	3.0	4.0	4.5	5.00	1.9	2.0	3.61	2.81

TABLE VI-27 (Continued)

<u>NORTH UPPER EGYPT</u>										
Beni Suef	1,857	2.59	4.72	5.78	7.63	4.7	1.8	3.08	3.49	
Fayoum	2,104	3.21	9.24	11.01	14.16	2.7	2.5	3.06	3.40	
Minia	2,658	3.45	7.29	8.84	11.57	2.8	1.8	4.40	3.38	
Mallawi	896	2.23	4.50	5.63	7.57	3.1	1.5	2.61	2.94	
Other Urban	4,349	2.23	4.50	5.63	7.57	3.1	1.5	2.61	2.94	
<u>SOUTH UPPER EGYPT</u>										
Assiut	4,236	9.78	11.54	13.75	17.69	3.1	1.7	4.51	3.90	
Naga Hamadi	398	9.78	11.54	13.75	17.69	5.6	1.7	3.69	3.6	
Qena	942	5.78	11.54	13.75	17.69	5.6	1.7	3.69	3.6	
Aswan	1,895	9.78	11.54	13.75	17.69	4.7	1.3	4.87	2.9	
Sohag	1,704	2.75	5.12	6.09	7.81	2.8	1.8	2.56	3.2	
Luxor	641	1.83	6.20	6.37	7.06	3.6	2.3	2.95	3.6	
Ikhmim <sup>2</sup>	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	
Gerga	803	2.21	3.26	5.18	7.32	2.1	2.0	2.97	3.7	
Other Urban	3,545	3.0	4.0	4.5	5.0	2.8	1.8	2.56	3.2	
<u>REMOTE AREAS<sup>3</sup></u>										
Matruh	373	4.0	4.8	7.1	9.4	6.3	3.7	3.2	4.7	
New Valley	373	4.0	4.8	7.1	9.4	6.3	3.7	3.2	4.7	
Red Sea	373	4.0	4.8	7.1	9.4	6.3	3.7	3.2	4.7	
Sinal	373	4.0	4.8	7.1	9.4	6.3	3.7	3.2	4.7	
TOTAL <sup>4</sup>	393,594	7.03	10.55	13.89	18.01					

n.a. Not available.

<sup>1</sup> The Telecommunications Sector Study does not provide data on Zeffa. Therefore, Mit Ghamr standards were used to project Zeffa requirements.

<sup>2</sup> Projected from Sohag standards.

<sup>3</sup> Telephone lines existing in Remote Areas were projected from Red Sea Governorate data as the Telecommunications Sector Study does not provide disaggregated data for other Remote Area governorates or settlements.

<sup>4</sup> The sector study does not give summary line densities. The densities shown result from dividing the total number of lines (shown in Table VI-28) by NUPS Total urban populations.

395

SOURCE: Telephone lines in 1980 and projected Capital Expenditures Program: Main Station Gain Objectives; Telecommunications Sector Study, Volume 81. Prepared for the Arab Republic of Egypt Telecommunications Organization by the Continental Telephone International, 1978.

**TABLE VI-28**  
**PREFERRED STRATEGY TELEPHONE DEMAND AND ESTIMATED TOTAL CAPITAL COSTS**  
**OF NEW INSTALLATIONS AND REHABILITATION:**  
**TELECOMMUNICATIONS SECTOR STUDY DENSITY STANDARDS**

ZONE AND SETTLEMENT	TOTAL TELEPHONE DEMAND (1,000 LINES) <sup>1</sup>				TOTAL PROJECTED CAPITAL COSTS (L.E. MILLIONS) <sup>2</sup>				
	1985	1990	1995	2000	1980-1985	1986-1990	1991-1995	1996-2000	TOTAL 1980-2000
Greater Cairo	844	1,417	2,247	3,531	1,905.0	1,187.0	3,774.0	5,303.0	12,169.0
Alexandria	317	479	754	1,177	958.0	307.0	1,280.0	1,582.0	4,127.0
Total Metropolitan	1,161	1,896	3,001	4,708	2,863.0	1,494.0	5,054.0	6,885.0	16,296.0
<u>CANAL ZONE</u>									
Port Said	20	101	159	225	44.2	170.5	133.8	240.5	589.1
Suez	65	103	211	315	181.0	81.6	349.0	369.0	980.5
Ismailia	10	59	97	144	26.0	106.4	122.4	152.5	407.3
Other Settlements	1	2	3	5	3.1	2.0	3.1	4.2	12.4
Total Canal Zone	96	265	470	689	254.3	360.5	608.3	766.2	1,989.3
<u>DELTA</u>									
Tanta	20	57	82	118	28.2	40.5	88.0	126.0	282.7
Mansoura	18	49	64	85	43.0	50.0	42.1	51.4	186.5
Subtotal	38	106	146	203	71.2	90.5	130.1	177.4	469.2
Mahalla	10	25	35	50	23.8	16.8	41.5	39.8	121.9
Zagazig	7	19	26	36	8.6	24.0	24.9	27.1	84.6
Damanhour	8	21	28	38	19.2	13.0	29.7	30.2	92.1
Kafr El Dawar	1	2	2	2	2.5	1.8	0.9	0.9	6.1
Shebin El Kom	4	8	10	14	6.4	7.4	14.2	11.3	39.3
Damietta	7	22	33	51	23.5	16.5	30.9	59.0	129.9
Benha	6	16	21	31	9.6	20.6	14.1	33.3	77.6
Kafr El Shelkh	3	8	10	13	4.4	8.1	6.4	9.3	28.2
Mit Ghamr	6	14	16	21	11.8	9.1	9.9	12.4	43.2
Belbels	2	4	5	7	1.8	5.2	4.6	4.8	16.4
Qalyub	2	4	6	8	3.1	4.1	10.5	9.4	27.1
Idku	0.4	1	2	2	1.6	1.6	1.2	1.6	6.0
Mataria	2	3	5	7	2.6	2.8	4.1	5.4	15.0
Dessouk	4	10	14	19	11.1	7.2	13.5	15.3	47.1
Menouf	2	3	4	5	2.5	2.8	5.3	4.4	15.0
Abu Kabir	2	4	6	8	2.0	3.9	6.4	5.6	17.9
Zefta	7	13	16	21	14.4	7.2	13.1	13.2	47.9
Belkas	2	4	5	8	3.8	3.1	3.8	5.2	15.9
Other Urban	52	79	100	125	97.2	53.2	77.2	70.8	298.4
SUB TOTAL	127.4	260	344	466	249.9	208.4	312.2	359	1,129.5
DELTA TOTAL	165.4	366	490	669	321.1	298.9	442.3	536.4	1,598.7

TABLE VI-28 (Continued)

ZONE AND SETTLEMENT	TOTAL TELEPHONE DEMAND (1,000 LINES) <sup>1</sup>				TOTAL PROJECTED CAPITAL COSTS (L.E. MILLIONS) <sup>2</sup>				
	1985	1990	1995	2000	1985	1990	1995	2000	TOTAL 1985-2000
<u>NORTH UPPER EGYPT</u>									
Beni Suef	4	8	11	17	10.0	7.6	9.6	19.0	46.2
Fayoum	7	24	34	50	14.1	42.9	28.8	55.6	141.9
Minia	7	16	22	33	11.3	17.0	27.1	36.5	91.9
Subtotal	18	48	67	100	35.4	67.5	65.5	111.1	279.5
Mallawy	2	5	7	10	1.8	3.9	4.9	9.6	20.2
Other Urban	14	30	42	63	28.4	25.2	30.8	60.2	141.6
Total North Upper Egypt	34	83	116	173	65.6	96.6	101.2	180.9	444.3
<u>SOUTH UPPER EGYPT</u>									
Assiut	32	46	68	106	85.4	24.2	96.8	150.6	357.1
Naga Hamadi	21	30	45	71	108.2	16.4	52.9	93.6	271.1
Qena	22	33	50	80	95.9	14.1	79.8	86.4	276.1
Subtotal	75	109	163	257	289.5	54.7	229.5	330.6	904.3
Sohag	4	7	10	14	5.2	6.8	6.2	14.5	32.8
Luxor	2	10	12	16	6.4	17.0	6.2	13.0	42.6
Ikhmim	4	6	8	11	6.6	2.8	5.1	10.8	25.3
Gerga	1	2	4	6	1.4	1.9	5.5	7.6	16.3
Other Urban	30	48	65	87	74.4	32.8	43.1	67.8	218.1
Subtotal	41	73	99	134	94.0	61.3	66.1	113.7	335.1
Total South Upper Egypt	116	182	262	391	383.5	116.0	295.6	444.3	1,239.4
<u>REMOTE AREAS</u>									
Matruh	3	3	5	8	13.4	3.1	6.1	10.6	33.2
New Valley	3	4	6	8	14.9	3.3	7.2	12.0	37.4
Red Sea	3	4	6	8	15.7	3.2	7.1	11.7	37.6
Sinai	1	2	4	9	3.9	3.2	8.1	23.3	38.6
Total Remote Areas	10	13	21	33	47.9	12.8	28.5	57.6	146.8
<b>GRAND TOTAL</b>	<b>1,582.4</b>	<b>2,805.0</b>	<b>4,360.0</b>	<b>6,663.3</b>	<b>3,935.4</b>	<b>2,378.8</b>	<b>6,529.9</b>	<b>8,870.4</b>	<b>21,714.5</b>

<sup>1</sup> Assumes average number of telephones/line is 1.2 and average telephone density in 2000 of 18.01 lines/100 urban population. The 1980 telephone line base is shown in Table VI-26.

<sup>2</sup> Total costs include provisions for trunk network and other telecommunications systems.

SOURCE: NUPS analysis based on Table VI-26.



**TABLE VI-29**  
**TOTAL TELEPHONE DEMAND**

YEAR	NUPS PER CAPITA GDP (1979 Prices) (US \$) <sup>1</sup>	TOTAL POPULATION (MILLIONS)	TELEPHONE DENSITY (TELEPHONE/ 100 PERSONS) <sup>2</sup>	TOTAL NUMBER TELEPHONES (1000's)
1980	381	42.1	1.77	745
1985	524	47.7	2.82	1,345
1990	621	53.8	3.61	1,944
1995	751	60.3	4.77	2,876
2000	919	67.7	6.40	4,335
GROWTH RATE %	4.5	2.4	6.6	9.2

<sup>1</sup> L.E. per capita GDP converted to US \$ using L.E. 0.70 = US \$ 1.00, the exchange rate prevailing in 1979.

<sup>2</sup> Telephone density based on following formula:  
 $\text{LOG } Y = 1.46 \text{ LOG } X - 3.54$   
 Where Y = Telephone Density  
 X = GDP/Capita (Expressed in US Dollars)

SOURCE: NUPS calculations and Telecommunications Sector Study.

TABLE VI-30

**PREFERRED STRATEGY TELEPHONE DEMAND AND ESTIMATED TOTAL CAPITAL COSTS OF  
NEW INSTALLATIONS AND REHABILITATION: IMPROVED TECHNOLOGY AND REDUCED DEMAND OPTION**

ZONE AND SETTLEMENT	TOTAL PROJECTED TELEPHONE DEMAND (1000 LINES) <sup>1</sup>				TOTAL PROJECTED CAPITAL COSTS <sup>2</sup> (LE. MILLION)				TOTAL 1986 - 2000	
	YEAR:	1985	1990	1995	2000	YEAR:	1980-	1986-		1991-
Greater Cairo		464	780	1236	1942	700.8	€52.6	2075.9	2916.7	6346.0
Alexandria		175	264	415	647	401.2	169.1	703.8	870.2	2144.3
TOTAL METROPOLITAN		639	1044	1651	2589	1102.0	821.7	2779.7	3786.9	8490.3
<u>CANAL ZONE</u>										
Port Said		11	55	87	124	15.9	93.8	73.6	132.3	315.6
Suez		36	57	116	173	96.7	44.9	192.0	202.9	536.5
Ismailia		6	32	86	79	11.6	58.5	67.3	83.9	221.3
Other Settlements		1	1	2	2	1.3	1.1	1.7	2.3	6.4
TOTAL CANAL ZONE		54	145	258	378	125.5	198.3	334.6	421.4	1079.8
<u>DELTA</u>										
Tanta		11	31	45	65	9.2	22.3	48.4	68.3	148.2
Mansoura		10	27	35	47	13.7	27.5	23.1	28.4	92.7
SUB TOTAL		21	58	80	112	22.9	49.8	71.5	96.7	840.9
Mahalla		5	14	19	28	6.4	3.2	22.8	21.9	60.3
Zagazig		4	11	14	20	2.4	13.2	13.6	14.9	44.1
Damanhour		4	12	15	21	5.2	7.2	16.4	16.4	45.2
Kafr El Dawar		1	1	1	1	0.3	0.8	0.5	0.5	2.1
Shebin El Kom		2	4	6	7	0.5	4.1	7.8	6.2	18.6
Damiatta		4	12	48	285	8.6	9.1	17.0	32.5	57.2
Benha		3	9	11	47	2.8	11.3	7.8	18.3	40.2
Kafr El Sheikh		2	4	6	7	0.9	4.5	3.5	5.1	14.0
Mit Gharr		3	7	9	11	2.1	5.0	5.5	6.8	19.4
Belbels		1	2	3	4	0.5	2.9	2.5	2.6	8.5
Qalyub		1	2	3	5	0.7	2.2	5.7	5.2	13.8
Idku		0.2	1	1	1	0.4	0.9	0.7	0.9	2.9
Mataria		1	2	3	4	0.02	1.5	2.3	3.0	6.8
Desouk		2	5	8	10	2.8	4.0	7.4	8.4	22.6
Menouf		1	2	2	3	0.04	1.4	2.9	2.4	6.7
Abu Kabir		1	2	3	4	0.1	2.2	3.5	3.1	8.9
Zefta		4	7	9	12	3.6	4.0	7.2	7.3	22.1
Belkas		1	2	3	4	0.2	1.7	2.1	2.9	6.9
Other Urban		29	43	55	69	52.8	29.2	42.4	38.9	163.4
SUB TOTAL		69.2	142	189	256	80.4	114.4	171.6	197.3	573.7
TOTAL DELTA ZONE		90.2	200	269	368	113.3	164.2	243.1	294.0	814.6

TABLE VI-30 (Continued)

<u>NORTH UPPER EGYPT ZONE</u>									
Beni Suef	2	5	6	9	1.6	4.2	5.3	10.5	21.6
Fayoum	4	13	49	28	5.2	23.6	15.9	30.6	75.3
Minia	4	9	12	18	2.9	9.3	14.9	20.1	47.2
SUB TOTAL	10	27	37	55	9.7	37.1	36.1	61.2	144.1
Mallawi	1	3	4	5	0.8	2.1	2.7	5.1	10.7
Other Urban	7	17	23	34	9.6	13.9	16.9	33.1	73.5
TOTAL NORTH UPPER EGYPT	18	47	64	94	20.1	53.1	55.7	99.4	228.3
<u>SOUTH UPPER EGYPT</u>									
Assiut	17	25	37	58	41.1	13.3	53.3	82.9	190.6
Naga Hamadi	11	17	25	39	56.2	9.0	29.1	51.5	145.8
Qena									
Aswan	12	18	27	44	48.7	7.7	43.9	47.5	147.8
SUB TOTAL	40.0	60.0	89.0	141.0	146.0	30.0	126.3	181.9	484.2
Sohag	2.0	4.0	5.0	8.0	0.7	3.8	3.4	8.0	15.9
Luxor	1.0	5.0	7.0	9.0	2.5	9.3	3.4	7.1	22.3
Ikhmim	2.0	3.0	4.0	6.0	1.5	1.6	2.8	5.9	11.8
Gerga	1.0	1.0	2.0	3.0	0.1	1.0	3.0	4.2	8.3
Other Urban	17.0	27.0	36.0	48.0	36.5	18.0	23.7	37.3	115.5
SUB TOTAL	23.0	40.0	54.0	74.0	41.0	33.7	36.3	62.5	173.8
TOTAL SOUTH UPPER EGYPT	63.0	100.0	143.0	215.0	187.3	63.7	162.6	244.4	658.0
<u>REMOTE AREAS</u>									
Matruh	1.0	2.0	3.0	4.0	6.3	1.7	3.3	5.8	17.1
New Valley	2.0	2.0	3.0	5.0	7.2	1.8	4.0	6.6	19.6
Red Sea	2.0	2.0	3.0	5.0	7.6	1.8	3.9	6.4	19.7
Sinai	1.0	1.0	2.0	5.0	1.1	1.8	4.5	12.8	20.2
TOTAL REMOTE AREAS	6.0	7.0	11.0	19.0	22.2	7.1	15.7	31.6	76.6
<u>GRAND TOTAL</u>	870.2	1543.0	2396.0	3663.0	1570.4	1308.1	3591.4	4877.7	11347.6

1 Assumes average number of telephones/line is 1.2 and average telephone density in 2000 of 18.01 lines/100 urban population. The 1980 telephone line base is shown in Table VI-26.

2 Total costs include provisions for trunk network and other telecommunications systems.

SOURCE: NUPS analysis based on Table VI-26.

values vary according to the quality of service being provided. This relative value method measures telecommunications value along the following principles:

- The higher the class of service provided the higher the value. Thus, the ability to dial calls has a higher value than operator service.
- The more stations that can be reached without a toll charge, the higher the value. Thus, service in large metropolitan areas is more valuable to a customer than in a small town.
- The greater the economic benefit of the service, the higher the value. For example, the ability to conduct business over telecommunications networks has a higher economic value than residential service used for social communication.

These relative values of service concepts were built into the telecommunications sector recommendations for changes in tariff structures and are presented below in Table VI-31.

The financial projections resulting from these tariff proposals are shown in Table VI-32. In order to maintain a 12.9 percent average return on ARETO assets over the period, total revenues must increase over the 1985-2000 period at an annual growth rate of 7.1 percent. The bulk of these revenues are projected to come from non-residential subscribers for telecommunications services as the cumulative residential revenues amount to only 6.3 percent of total cumulative revenues. The major sources of these revenues are international revenues and revenues resulting from telegraph, telex, and other non-business non-residential revenue sources. Using the revenue per telephone line requirements shown in Table VI-32, the total revenue and operating expense requirements of the Preferred Strategy telecommunications network were projected for both demand estimates and are shown in Table VI-33. The first, e.g., density standards at telecommunication sector study standards, has a total financial revenue requirement over the 1986-2000 period of L.E. 22.4 billion or L.E. 6.7 billion more than the updated estimates of the sector study. If, however, reduced demand results through reliance on improved technology and more careful pricing, as was shown in the second projection of Preferred Strategy telephone demand, cumulative revenue requirements needed to finance expansion of the system provide for operations expense and allow ARETO an average return on its assets of 12.9 percent are projected to be roughly L.E. 12.4 billion.

## **V. BULK WATER**

### **A. Bulk Water Requirements of the Preferred Strategy**

Bulk water (defined as water requirements which must be "imported" from other regions via pipelines or canals) requirements were reviewed in three of the settlement zones: Greater Cairo, Canal and Remote Areas zones. The analysis was limited to these zones because the other zones have access to either ground water or surface water (usually in the form of Nile water) within their regional boundaries. It should be noted that urban uses do not create major demands for

**TABLE VI-31**  
**RELATIVE VALUE OF TELECOMMUNICATIONS SERVICES**  
**TO CUSTOMERS**

(1978 L.E. PRICES)

TYPE OF CUSTOMER	TYPE OF SERVING CENTRAL OFFICE					
	MANUAL		AUTOMATIC			
			NON-METRO		METRO	
	RELATIVE VALUE *	ANNUAL RATE *	RELATIVE VALUE *	ANNUAL RATE *	RELATIVE VALUE *	ANNUAL RATE *
<b>Business/Government</b>						
Individual Line	167	46.75	192	53.75	242	67.75
PABX Trunk	250	70.00	288	80.65	363	101.65
<b>Residential</b>						
Individual Line	100	28.00	115	32.20	145	40.60
Public Service	66	18.50	75	21.30	98	27.45

\* Relative values and annual rates are those of the sector study. The relative value is based on a base of 100 for the lowest class of service. Rates are based on the base rate for the lowest class of service times the index resulting from the relative values shown.

SOURCE: Telecommunications Sector Study. Financial Plan for ARETO. Volume 7, 1978.

**TABLE VI-32**  
**CUMULATIVE REVENUES AND OPERATING EXPENSE:**  
**ARETO FINANCIAL PROJECTIONS**  
**(L.E. MILLIONS: 1979 PRICES)**

	PERIOD			GROWTH RATE (1986-2000) (%)
	1986-1990	1991-1995	1996-2000	
1. Revenues				
1.1. Domestic Revenues	1,446.8	2,572.3	3,818.1	6.7
- Residential	(194.4)	(326.5)	(469.1)	(6.0)
- Business	(345.7)	(578.2)	(830.1)	(6.0)
- Others <sup>1</sup>	(906.7)	(1,667.6)	(3,457.1)	(9.3)
1.2. International Revenues <sup>2</sup>	1,356.2	2,490.0	3,972.0	7.4
1.3. Total Revenues	2,803.0	5,062.3	7,790.1	7.1
2.0. Total Operations Expense <sup>3</sup>	809.4	1,666.7	3,268.3	9.8
3.0. Net Operating Income	1,993.6	3,395.6	4,521.8	5.0
4.0. Total Revenues/Line (L.E.)	1,309.2	1,633.4	1,738.5	1.9
4.1. Total Domestic Revenues/Line (L.E.)	657.8	830.0	852.1	1.7
5.0. Total Operating Expense/Line (L.E.)	378.5	557.8	729.4	4.5
6.0. Net Income Per Line (L.E.)	1,931.2	1,095.6	1,009.1	-4.2

<sup>1</sup> Include installation revenues, revenues from telex and telegraph services, toll revenues and excess call revenues.

<sup>2</sup> Includes international telephone, telex and telegram revenues.

<sup>3</sup> Excludes depreciation and interest expense.

SOURCE: Telecommunications Sector Study. Financial Plan for ARETO. Volume 7. 1978. Exhibits VI-1-4-5 and NUPS analysis.

**TABLE VI-33**  
**CUMULATIVE REVENUE AND OPERATING**  
**EXPENSE REQUIREMENTS OF PREFERRED STRATEGY**  
**(L.E. MILLIONS 1979 PRICES)**

	<u>PERIOD</u>			<u>TOTAL</u>
	<u>1986-1990</u>	<u>1991-1995</u>	<u>1996-2000</u>	<u>1986-2000</u>
<b><u>I. PREFERRED STRATEGY AT TELECOMMUNICATIONS DENSITY STANDARDS</u></b>				
Total Revenues	3,672.3	7,119.9	11,584.6	22,375.8
(Domestic Revenues)	1,845.1	3,618.8	5,677.5	11,141.4
(International Revenues)	1,827.2	3,501.1	5,907.1	11,234.4
Operations Expense	1,060.3	2,349.8	6,723.6	10,127.7
Net Income	2,612.0	4,775.1	4,861.0	12,248.1
<b><u>II. PREFERRED STRATEGY AT NUPS DENSITY STANDARDS</u></b>				
Total Revenues	2,020.1	3,985.5	6,368.1	12,373.7
(Domestic Revenues)	1,015.0	1,988.7	3,121.2	6,124.9
(International Revenues)	1,005.1	1,996.8	3,246.9	6,248.8
Operating Expense	583.2	1,288.7	2,671.8	4,543.7
Net Income	1,436.9	2,625.1	3,696.3	7,758.8

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SOURCE: NUPS analysis.

imported water. Many of the canal and pipeline projects, particularly those proposed for the Sinai and the North West Coast, are designed to serve agricultural requirements. Thus, the demand for bulkwater in many areas may be much greater than is shown for the NUPS purely urban demand.

#### B. Greater Cairo Zone

In the Greater Cairo Zone, bulk water is required to supply the new towns and satellite cities with water as they are outside the service area of the Greater Cairo Water Utility. The costs of bulk water supplies have been derived from either actual tender cost estimates or master plans. In all cases these expenditures have already been made or will be made during the 1980-1985 period. Thus, the capital requirements for bulk water supplies in the Zone will not affect variations in the total investment costs of the Preferred Strategy. These investment requirements are presented in Table VI-34.

#### C. Canal Settlement Zone

The bulk water requirements of the Canal Zone settlements are now met by the Sweetwater Canal and the Abbassaya Canal. A review of the masterplan requirements for the major settlements of the zone indicates that total projected water demands can be met by these existing canals provided that they are adequately maintained.<sup>33</sup> Since the NUPS Preferred Strategy populations for the major settlements in the zone are similar to those of the master plan projections, no additional investments for bulk water supplies should be necessary.

However, since it is the NUPS understanding that the Ministry of Irrigation intends to construct a pipeline from the Cairo zone to Suez to serve both the city of Suez and the Sinai, its costs were reviewed. Three proposals have been made to the Ministry regarding construction of this line. Each of them has a delivery capacity of 700,000 to 800,000 cubic meters per day. However, there are large variations in their cost estimates. The lowest, consisting of a concrete pipeline has an investment cost of L.E. 93.7 million, while the highest, a steel pipeline, has an estimated cost of L.E. 189.3 million. The Ministry also has proposals to dredge the Sweetwater Canal to expand its carrying capacity by 800,000 cubic meters per day. This cost is in the range of L.E. 27 million. It is the NUPS understanding that the Ministry is engaged in contract negotiations which would lead to construction of the steel pipeline to Suez. However, so far, no detailed plans have been made to extend the line beyond Suez.

Throughout the period, maintenance of the canals serving the zone will be required to maintain adequate flows. However, as urban uses comprise only a portion of the total end use of water -- agricultural and transport users are the largest users of bulk water -- costs of maintenance of the canals were not included in total bulk water operating cost requirements. Similarly, since up to 88 percent of the water to be delivered to Suez by the different pipeline proposals may be designated for irrigation purposes, none of the costs of these proposals was included in urban bulk water investment or operating cost requirements.



TABLE VI-34

BULK WATER INVESTMENT REQUIREMENTS OF THE GREATER CAIRO ZONE

SETTLEMENT	INVESTMENT 1980-1985 (L.E. MILLIONS)	REMARKS
10th of Ramadan	23.2	Pipeline under construction.
Sadat City	N.A.	
El Obour*	N.A.	
El Amal*	N.A.	
6th of October	17.0	Pipeline under construction served by Greater Cairo Water Utility.
15th of May	--	
TOTAL	40.2	

N.A. Not Available.

\* Still in Master Plan preparation stage.

SOURCE: Data from 10th of Ramadan Development Authority and Master Plan of the  
6th of October.

## D. Remote Areas

### I. The Western Desert

Since 1960, there has been active investigation and development of ground water resources within the New Valley. As the result of these investigations, the fresh water storage within the region has been estimated at 2,300 milliard cubic meters. Currently, nearly 250 million cubic meters per year of water is provided from wells in the oases of Kharga and Dakhla. (See Table VI-37 at the end of this section).

Several studies have been conducted to determine the recharge rate of the aquifers and, thus, the feasible time which wells in the oases could be utilized at different production rates. Some of the studies indicate feasible production periods as short as 50 years. However, other studies are proceeding to determine optimum basin management and use rates to ensure much longer life of the resources.

New Valley urbanization is largely dependent upon stabilizing urban requirements with demand for agricultural practices. However, the total populations projected by the Preferred Strategy could probably be met by ground water resources in the New Valley. Therefore, no estimates of bulk water requirements were made.

### 2. Sinai

The main volume of the Draft Final Report of the Sinai Development Study Phase I (April 1982) recommends that a total of L.E. 104.8 million (presumably in 1982 prices, although the report does not state so) be invested in bulk water supplies for primarily agricultural, tourism and industrial uses. Roughly L.E. 46.8 million of this amount is targeted for the 1982-1985 period and would be spent for a pipeline between El Qantara and El Arish (L.E. 30.4 millions) and a pipeline between the Hamadi Tunnel under the Suez Canal and Abu Rudeis. During the 1986-1990 period it allocates an additional L.E. 58 million for the Sinai portion of the Maadi-Suez City pipeline costs. According to the study, practically all of the investment in new water supplies would be earmarked for agricultural uses if the chemical refinery complex proposed for the East Suez City area is not developed. If the complex is developed, roughly 44 percent of the water produced would be designated for urban uses, the bulk of which would be for the refinery complex.

Alternatively, proposals have been developed for digging canals to supply Nile water from the Suez Canal to the north coastal areas of the Sinai (the El Salaam Canal and the Sahia Canal). In its recommended strategy, the SDS does not support these proposals because of the very high capital costs involved and the likely low returns to agriculture resulting from high water supply costs. In its recommended strategy, the study proposes reclamation of sites close to the East Bitter Lakes (Ismailia region) and the East Suez area based on imported water. In other areas it proposes reclamation based on a combination of groundwater and rain water, i.e., the Rafah Strip, El Arish and El Qaa Plain.

Since the bulk of these costs, if incurred, will be phases for the 1982-1985 period and will result in bulk water supplies earmarked for agriculture uses they have not been included in NUPS purely urban estimates of water requirements. However, if the refinery chemical complex proposed for the East Suez area proves feasible, largely due to the agglomeration economies present in Suez City on the other side of the Canal, additional bulk water supplies will need to be provided to support the complex.

### 3. Red Sea Governorate Bulk Water Requirements

Most urban development within the Red Sea Governorate is expected to rely entirely on imported water from the Nile via pipelines from Qena as is the case now.<sup>34</sup> However, the Red Sea Governorate Regional Plan also recommends a groundwater exploration program which may reduce imported water requirements. The existing pipeline which serves Safaga, Hurgada and Quseir delivers an estimated 2,200 m<sup>3</sup>/day. This capacity is being increased to 8,200 m<sup>3</sup>/day through construction of an additional pipeline from Qena. Two different estimates of the costs of increasing the capacity of the existing bulk water supplies to the Red Sea Governorate were reviewed: costs of the Provincial Water Supplies Project and those of the Red Sea Governorate Regional Master Plan conducted by SATAC. Both have investment costs for lifting water 700 meters over the Red Sea mountain range from Qena to Safaga that are similar. The Provincial Water Supply cost is L.E. 1,375 per m<sup>3</sup>/day while that of the Red Sea Governorate Master Plan is L.E. 1,300 per m<sup>3</sup>/day for similar sized capacity lines (roughly 10,000 m<sup>3</sup>/day). These two estimates also have proposals for extending the Qena/Safaga pipelines to Hurgada and Quseir. Thus, the total costs of serving the urban populations of these three settlements with bulk water are in the range of L.E. 1,823 per m<sup>3</sup>/day. These costs were used to project the bulk water requirements of the Red Sea Governorate for the Preferred Strategy.

Due to the fuel required and the height over which water must be lifted, the current cost of supplying water to users in the Red Sea Governorate is L.E. 0.55/m<sup>3</sup>.<sup>35</sup> This cost is somewhat lower than that suggested by the Red Sea Governorate Regional Master Plan. Its projected total recurrent cost requirement for supplying the Red Sea Governorate with 10,000 m<sup>3</sup>/day of bulk water between Qena and Safaga is L.E. 0.69. This recurrent cost includes amortization of the capital costs of constructing the pipeline at financing terms of 10 percent annual interest over 20 years or L.E. 0.42/m<sup>3</sup>/day.

### 4. Northwest Coast Bulk Water Requirements

Currently the major settlements in the Northwest Coast are served with bulk water supplies from pipelines drawing water from Nile sources. As these supplies are inadequate to meet present demand, Mersa Matrouh is also served by desalination plants and water trains from Alexandria. Both the Provincial Water Supplies Project and the Regional Plan for the Coastal Zone of the Western Desert indicate that average daily supplies are in the region (of 4,000 of 4,800 m<sup>3</sup>/day). However, due to uncertainties in all types of supplies, actual consumption can vary considerably. For example, the four desalination units at Marsa Matrouh are rated at 500 m<sup>3</sup>/day each, but due to persistent operational problems rarely reach 50 percent of their rated capacity.<sup>36</sup> Although limited potential exists for development of ground water and storage of surface water resources, these are not deemed adequate to support large urban populations.<sup>37</sup>

The Regional Plan for the Northwest Coast estimated that domestic consumption of water in urban areas would increase from 150 liters/capita/day to 250 liters/capita/day by the year 2000. However, in Mersa Matrouh, the plan provided for a year 2000 standard of 640 liters/capita/day for a service population of roughly 270,000. This standard, which is higher than the projected master plan standard for Alexandria of 373 l/c/d, resulted from plan assumptions about tourism and other

industrial demand. The plan proposed two alternative methods of supplying bulk water. The first was primarily through construction of a canal, while the second relied on pipelines and desalination plants.

Two other sources of bulk water supplies were reviewed for the Northwest Coast. The first was a proposal by the Provincial Water Supplies project to construct a 32,400 m<sup>3</sup>/day capacity pipeline from Alexandria at an average cost of L.E. 1,282/m<sup>3</sup>/day to serve all urban areas within the Northwest Coast. For the Mersa Matruh portion of the pipelines, an average cost of L.E. 1,129 per m<sup>3</sup>/day of capacity would be required to supply the settlement with roughly 32,000 m<sup>3</sup>/day of bulk water supplies. The second alternative reviewed was further development of desalination plants in Mersa Matruh. Although the Northwest Coast Regional Plan also proposed expansion of desalination plants, the costs of desalination plants for the Red Sea Governorate Regional Master Plan were used to project costs for desalination costs in the Northwest Coast since they are more recent (1980 costs vs. 1976 prices of the Northwest Coast Regional Master Plan). On a capital cost basis, a similar capacity desalination plant would be somewhat less expensive, a plant with a nominal output of 32,500 m<sup>3</sup>/day requires a capital investment of L.E. 953 m<sup>3</sup>/day. However, a comparison of recurrent costs of desalination plants and pipelines suggests that there may be significant variations in costs. These variations in costs largely result from the source of electrical power which is available to operate the desalination plant. For example, if electrical power from petroleum fueled thermal plants is used, and the costs of electrical power are priced at international prices not subsidized prices to reflect the actual costs of operation of the plant to the economy recurrent costs of operating the plant are in the range of L.E. 0.82/m<sup>3</sup>/day. (These estimates of recurrent costs are shown in Table VI-35.)

#### E. Total Investment and Operations (Recurrent) Costs of Bulk Water Supplies

The total costs of bulk water requirements of the Red Sea and Northwest Coast urban settlements were estimated for the Preferred Strategy by projecting total demand for water by five year period using a consumption standard of 167 liters/capita/day. Since total demand can be met through construction of a single pipeline in each case with adequate capacity to serve the entire 1986-2000 period, it was assumed that these costs would be incurred in the 1986-1990 period. (Table VI-36) Until that capacity is fully utilized, there would be some surplus capacity within the pipeline.<sup>38</sup>

We have not included the costs of desalination plants in the costs of water supplies for the Northwest Coast due to uncertainties about the nature of the source of electrical supplies. If indeed, nuclear energy is available, the earliest date that the Northwest Coast could be supplied with electrical energy from nuclear power plants would probably be 1990. If Egypt does not initiate a nuclear energy program, there is considerable question as to whether operation of desalination plants vs. pipelines would be a viable alternative for supplying bulk water to the region. As with other settlements, the costs of treatment of bulk water has been included in intra-urban infrastructure costs and is not shown here.

**TABLE VI-35**  
**COST OF OPERATION OF DESALINATION PLANTS VS. PIPELINES**

	DESALINATION PLANT (35,000 m <sup>3</sup> /d OUTPUT)	PIPELINE (ALEXANDRIA - MERSA MATRUH 32,400 M <sup>3</sup> /d OUTPUT)
<b>1. OUTPUT AND CAPITAL COSTS</b>		
a. Annual Average Output <sup>1</sup>	9,490,000.000 m <sup>3</sup>	11,826,000.000 m <sup>3</sup>
b. Investment Cost (L.E. millions)	31.0	33.6
<b>2. ANNUAL COSTS</b>		
a. Annual Ammorization (LE/m <sup>3</sup> ) <sup>2</sup>	0.437	0.130
b. Operations and Maintenance per Year (LE/m <sup>3</sup> )	0.011	0.050
<b>c. Consumables (LE/m<sup>3</sup>)</b> (Thermal Power Sources)		
Fuel (2.5 plasters/kg)	0.180	
Electricity (4.5 plasters/kwh)	0.177	
Chemicals	0.026	
d. TOTAL (LE/m <sup>3</sup> )	0.831	0.180
<b>3. Nuclear Power Sources</b> (Electricity (1.7 plasters/kwh))		
TOTAL (LE/m <sup>3</sup> )	0.709	

1 Rated at 80 percent of annual output

2 Ammorization at 12 percent annual interest over 20 years.

SOURCE: Red Sea Governorate Regional Plan. Prepared for the Ministry of Development and New Communities by SATEC. 1980. P. The pipeline costs shown are based on a proposed 32,400 m<sup>3</sup>/d pipeline costs of unpublished data of the Provincial Water Supply Project (1979 costs). To be comparable a similar sized desalination plant was costed based on data from the Red Sea Governorate Master Plan.

**TABLE VI-36**  
**BULK WATER REQUIREMENTS OF THE RED SEA AND NORTHWEST COAST**  
**OF MAJOR URBAN SETTLEMENTS OF THE PREFERRED STRATEGY**

PERIOD	TOTAL DEMAND ('000 m <sup>3</sup> /day)	MATRUH	RED SEA	TOTAL CAPITAL INVESTMENT REQUIRED (L.E. MILLIONS)	
				MATRUH <sup>1</sup>	RED SEA <sup>2</sup>
	1985 expected capacity	4.8	8.2	11.5	17.8
<u>1986-1995</u>	Population (000's)	75.0	93.0		
	Total demand <sup>3</sup>	12.5	15.5		
	Deficit	(7.7)	(7.3)		
<u>1991-1995</u>	Population (000's)	82.0	102.0		
	Total Demand <sup>3</sup>	13.7	17.0		
	Deficit	(8.9)	(8.8)		
<u>1996-2000</u>	Population (000's)	90.0	110.0		
	Total Demand <sup>3</sup>	15.0	18.4		
	Deficit	(10.2)	(10.2)		

<sup>1</sup> Based on an average cost of L.E. 1,193/m<sup>3</sup>/d for a pipeline from Nile water sources.

<sup>2</sup> Based on an average cost of L.E. 1,823 to distribute water to the Red Sea Governorate (roughly L.E. 1,300 for a pipeline from Qena to Safaga and approximately L.E. 767/m<sup>3</sup>/d for a line from Safaga to Hurgada and L.E. 1,030/m<sup>3</sup>/d for a line from Safaga to Quseir). The total investment shown assumes that 30 percent of demand would be in Safaga by the year 2000 and that the remainder of the demand would be divided equally between Hurgada and Quseir.

<sup>3</sup> Based on a standard of 167 l/c/d.

SOURCE:

TABLE VI-37

## SUMMARY OF GROUND WATER MODEL STUDIES IN WESTERN DESERT

Area of Study	Model Type	Agency/Date Reference	Method Applied	Simulated Extractions Development Plans (106m <sup>3</sup> /year)	Predicted Pressure Drop at the End of Simulated Time (m)	Simulated Time (years)
Kharga-Dakhia Oases	R-C Analogue Model	Industroproject-Yugoslavia 1968/ (11)	R-C Electrical Analogy	Kharga: 263.17 Dakhia: 467.57	80 56	1968 - 2010
Western Desert	Regional Digital Model	Ezzat, 1976, (12)	ECAP Program	Recharge to sandstone aquifer system: Eastern Desert: 18.92 Sudan Bonder: 193.7 Gulf El-Kebir 449.50		1960 - 1970
Kharga-Dakhia Oases with Abu Tartur phosphate field	Semi-detailed Digital Model	Ezzat, 1976, (12)	ECAP Program	Kharga: 79.49 Dakhia: 153.71 +Abu Tartur 30.00	54 1970 25 25.8	1970 - 2070
Kharga-Dakhia Oases	Detailed Digital Model	F.A.O./1976 (13)	Integrated Finite Difference	Kharga: 156.2 Dakhia: 509.3 Abu Tartur: 30.0	87 30-60 34.39	1975 - 2025
South Qattara Oases Areas (Siwa-Bahariya-Farafra)	Regional Digital Model	Ezzat et al., 1977 (14)	ECAP Program	Siwa: 140.00 Bahariya: 182.00 Farafra: 364.00	60 185 194	1960 - 2010

SOURCE: NUPS Working Paper "Water Resources as Related to Urban Development in Egypt to Year 2000." (Jack Schelliga). July 1981. p. 110 as quoted from various sources.

## NOTES

### CHAPTER VI

#### INTRA-URBAN INN INFRASTRUCTURE <sup>LE</sup>

<sup>1</sup> NEDECO data organized by "Markas" was converted to the NUPS distribution in order to assure comparability. There were, however, several differences that could not be reconciled (Table VI-4) but no basic conclusions are being altered due to these unreconciled differences.

<sup>2</sup> Egypt National Transport Study, Phase II, Draft Final Report -- 1981, Annex IV, Table 4.25, page 4.38.

<sup>3</sup> In order to re-evaluate the NTS for these impacts, a complete review would have to be undertaken that would involve: (1) identification of NTS or non-NTS road segments likely to be affected by either more or less increase in traffic than forecast by NTS, (2) for those segments in the NTS inventory, evaluate the effect on traffic growth and projected V/C ratios and capacity, (3) appraisal of change in investments required (e.g., fewer lanes, widening vs. rehabilitation only, paving, etc.), (4) for segments of road not covered by the NTS (but affected by the NUPS Preferred Strategy) appraise investment needs (engineering appraisal of road and estimated costs and economic feasibility). Such an effort goes well beyond the scope of the NUPS effort.

<sup>4</sup> *Ibid.*, Chapter 9, pages 9.8 ff.

<sup>5</sup> *Ibid.*, Chapter 10, page 10.2 ff, esp. page 10.4.

<sup>6</sup> The Phase II NTS Study cites three aspects that would need to be considered for a proposed toll road solution: (1) the semi-urban distributory road system at the Cairo and Alexandria ends (largely determining the urban catchment areas of the road), (2) the specific alignment alternatives (which will impact, the development of the intermediate areas, i.e., the Delta), (3) the number of entry and access points (affecting toll collection costs). (See Phase II NTS, Annex IC, par. 7.5, page 7.12.) A key issue not discussed by the NTS is the diversion impact at various toll rates and for different types of toll systems (open or closed). Access represents an important economic benefit that must be traded off to maintain service levels. In addition, degree of access will affect development along the alignment, and clearly national urban development objectives would be impacted and must be considered.

<sup>7</sup> These capital costs should be treated as very rough approximations. The NTS data on individual elements of the proposed networks were insufficiently detailed for the NUPS Team to make a detailed network analysis of the Preferred Strategy. Consequently, overall parameters derived from the NTS data are used in these estimates.



- 8 The detailed calculations from the NTS origin and destination tables are shown in Table VI-10.
- 9 This rate is calculated as the rate required to go from NTS's 1979 operating cost estimate to the year 2000 operating costs estimate. That is, the annual rate of growth in operating costs is different from the NTS cost because of different population distributions.
- 10 U.S. Department of Energy, Joint Egypt/United States Report on Egypt/United States Cooperative Energy Assessment, Main Report, April 1979.
- 11 These power statistics exclude small generation plants not connected to the Unified Power Grid, but include Port Said plants.
- 12 Power Sector Statistical Data, 1969-1979, from the Egyptian Electrical Authority, April 1980.
- 13 Unpublished Statistics of the Egyptian Electricity Authority, "Actual and Forecast Sales by Consumer Categories 1978-2000," April 1986.
- 14 Sanderson and Porter, Power Sector Survey. Phase 1. Diagnostic Report and System Planning, prepared for the International Bank for Reconstruction and Development and the Ministry of Electricity and Energy, 1977.
- 15 The U.S. Department of Energy in conjunction with officials from the Ministry of Electricity and Energy, the Ministry of Planning and the National Planning Institute conducted an energy assessment of Egypt's present and future energy requirements in 1979 (U.S. Department of Energy, Joint Egypt/United States Report on Egypt/United States Cooperative Energy Assessment, Executive Summary, Main Report and Appendices, April 1979.) This joint Egyptian/American assessment concluded that although the projected growth rate for electricity demand is greater than total energy demand (9.91 percent vs. 5.3 percent per year), the total for energy, including electrical energy, can be met through conventional fuels using conventional technologies through the year 2000. The assessment did point out that Egypt's projected reliance on electrical energy is greater than many developed countries (notably France and the United States). However, they found EEA's projections consistent with overall energy projections and with likely energy demands required by projected GDP growth rates. The EEA forecasts used for costing power requirements for the Preferred Strategy vary somewhat from forecasts used in the energy assessment but do not differ substantially from either the Power Sector Survey or with a projection conducted by Aoki Consultants (to the EEA) which used assumed and achievable energy/GNP ratios as a basis for electricity load projections (these are available from the EEA).
- 16 Although more disaggregated settlement level power statistics were requested from the Ministry of Electricity and Power and the EEA, these were not supplied to the project. Thus, zonal statistics were used in NUPS projections. These zonal statistics conform to the statistics of the EEA transmission zones for which some information was provided.
- 17 Although income elasticities were not used directly in distribution of power consumption because EEA aggregate demand projections were used without

modification, it is useful to compare the income elasticities of the projections with international projections resulting from current high energy costs. The EEA income elasticities range from 1.22 between 1980-1985, 1.13 between 1986-1990, 1.08 between 1991-1995 and 1.02 to the year 2000. By way of comparison, international energy projections recommend using elasticities of 1.10 for middle income countries (including Egypt) for projections up to 1985, and a range of elasticities of 1.0 to 1.05 thereafter. (See Workshop on Alternative Energy Strategies (WAES), *Energy: General Prospects 1985-2000*, McGraw Hill, N.Y. 1977.) While the EEA projections are somewhat higher than WAES recommended elasticities, in earlier periods they reflect higher elasticities experienced in Egypt between 1970-1975, 1.30.

18 Total 1980 hydroelectric capacity is 1,645 MW. This is projected to increase by 561 MW by increasing capacity at Aswan and developing smaller plants in other locations in Upper Egypt.

19 The Bechtel Energy Supply Planning Model was developed to estimate power plant requirements in the United States. It has since been used to project power plant requirements (manpower, construction inputs, capital and operating costs and operating inputs) in several developing countries. Details of the model can be found in Appendix 13 of the Joint Egypt/United States Energy Assessment.

20 Power Sector Survey, Arab Republic of Egypt, Phase 1. Diagnostic Report and System Planning, prepared by Sanderson and Porter, Inc. for the International Bank for Reconstruction and Development and the Ministry of Power and Electricity, November 1977.

21 Op. cit. Joint Egypt/United States Energy Assessment. Annex E.

22 In a financial sense, the electrical power sector largely operates without subsidies in that the general policy is to charge users the financial costs of power generation. The EEA's two largest consumers, the Kima Fertilizer Plant in Aswan and the Aluminum complex at Naga Hamadi, however, are exceptions as they are charged tariffs which are substantially lower than EEA's cost of supply of roughly, 5.07 millimeses/KWh (55 and 66 percent, respectively.) However, the sector enjoys large economic subsidies due to the pricing of petroleum products in Egypt well below international prices. For example, EEA purchased fuel for operation of thermal plants at L.E. 7.50 per ton in 1979 while the international price was L.E. 122 per ton at the end of the year. Thus, at international prices, the average economic cost of power generation in Egypt would have been approximately 21 millimeses/KWh in 1979.

23 BAB 1 refers to the first section of the National Budget which covers salaries, while BAB 2, the second section, covers intermediate inputs, maintenance and other current expenses.

24 Full assessment of the impacts on the economy of hydroelectric power generation and detailed technical appraisal of existing plant and operations which would be required to assess the exact economic costs of hydroelectric power generation would require specialized study outside the scope of this study.

25 Relatively little experience exists about the types and sizes of incentives needed to attract labor to remote areas. However, in a recent salary survey of

construction companies and petroleum companies operating in the Red Sea, it was found that these companies offer Egyptian personnel incentives and bonuses amounting 100 percent of base salaries to compensate their workers for harder working conditions found in the Red Sea Governorate. Discussions with personnel of the Aswan High Dam Authority indicate that the combination of hardship incentives, housing and travel allowances can increase their salaries by as much as 87 percent over the amounts that they would receive if they were located in Cairo.

26 Since the distribution companies were only established in 1979 and electricity statistics for the budget year 1980/1981 are not available, estimates of only one period were made.

27 Appendix 13, Joint Egypt/United States Report on Egypt/United States Cooperative Energy Assessment, U.S. Department of Energy, 1979.

28 World Bank, A.R.E. -- Statistical Appendices, pp. 22, 24, 1978.

29 World Bank Development Policy Staff, Prospects for Developing Countries 1978-1985, November 1977, Washington, D.C. as quoted by Joint Egypt/United States Report on Egypt/United States Cooperative Energy Assessment, Volume 1, pp. G18-G23.

30 The earlier telecommunications capital cost estimates of the First and Second Round Alternatives were derived by dividing the telephone demand projected by the telecommunications sector study by the year 2000 NUPS urban population. This results in a telephone line density of 12.43 (124.25 lines per 1,000 urban population as presented in the First and Second Round Alternatives) at an average per capita cost of L.E. 328.65. Through straight line interpolation, if these standards were reduced to a telephone density of 9.5 lines per 100 urban population (a 1.3 reduction), per capita costs would be reduced to L.E. 252. These costs were used to project the telecommunications costs of the Preferred Strategy at standards which are comparable to the standards used to project costs for the other settlement alternatives studied.

31 Since practically all telecommunications facilities are located in urban places, we have shown densities in terms of urban populations. However, when the telecommunications sector study made its demand projections, it used total population even though it also projected that most of that demand would be located in urban places. These resulted in the following telephone densities: 1980, 1.00 telephone lines per 100 population and 2000, 8.65 telephone lines per 100 population.

32 The L.E. 12.1 billion capital investment program shown in Table VI-26 is quoted directly from the telecommunications sector study. When this capital investment program is updated to 1979 prices, the program is estimated to cost L.E. 16.0 billion.

33 NUPS Working Paper, "Water Resources as Related to Urban Development in Egypt to Year 2000" (Jack Scheliga), July 1981, pp. 47-49.

34 Studies of groundwater resources within the Red Sea Governorate may reveal other resources of bulk water supplies but to date, these have not been conducted. Ras Gharib presently is served by groundwater supplies, however, the Governorate

indicates that this resource is increasingly becoming a problem as the water is becoming saline. Other proposals for pipelines to serve the Red Sea have been advanced such as a line from Suez, but detailed feasibility studies of these proposals have not been conducted.

35 Planning Department of the Red Sea Governorate.

36 Regional Plan for the Coastal Zone of the Western Desert, Final Report, Volume IV, prepared for the Ministry of Housing and Reconstruction by ILACO, August 1976, pp. 1-2 of Annex 9.

37 NUPS Working Paper, "Water Resources as Related to Urban Development in Egypt to Year 2000" (Jack Scheliga), 1981, pp. 27-34.

38 The capacities shown here are not the total water requirements of the northwest coast, as rural areas must also be served by imported water. However, as determining rural populations is outside the scope of NUPS, no estimates of their bulk water requirements were made.

**CHAPTER VII**

**ADMINISTRATION OF THE PREFERRED ALTERNATIVE**

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## CHAPTER VII

### ADMINISTRATION OF THE PREFERRED ALTERNATIVE

#### I. INTRODUCTION

The recommended strategy requires a major administrative effort at national, governorate and local level. At the same time, it is designed to pose requirements which are feasible, given the political will to adopt and implement a national urban policy -- that is, to follow an explicit strategy for managing urban growth in Egypt.

There are, of course, many administrative and legal difficulties which must be addressed in order to implement a national urban policy; most important of these are:

- The development of a stronger planning capacity at all levels which will require a longer-term planning horizon and greater availability and broader dissemination of the data required for effective development planning and administration.
- Improvement in coordination between ministries which is made difficult by the hierarchical nature of the communication system that discourages cross-communication between equals at middle-management levels and by the proliferation of ministries.
- Clarification of the authority relationships between national ministries and the local government structure in order to effectively implement recent local government laws and reduce the need for such frequent amendments that future planning is difficult.
- Definition of effective roles for local government in the budgeting process and identification of a source or sources of local government finance that can form a reliable base for local planning and exercise of local responsibility.
- Improvement in the efficiency of government bureaucracy at all levels, which is made difficult by low rates of pay, lack of work incentives, overstaffing, inability to fire unproductive staff members, and frequent turnover at senior government levels.
- Increased emphasis on implementation rather than legalism which has led to the view that passage of a law solves a problem and a lack of enforcement of development control policies at all levels.
- Improvement in the legal framework for physical planning, much of which would be accomplished by the passage of the 1981 Physical Planning Law.
- Development of criteria for differentiation with regard to functions and financial resources among villages, towns, different sized cities and metropolitan areas larger than individual governorates.

These basic issues will be discussed and general recommendations made for administration of the national urban policy under four major headings:

- The national government structure.
- The local government structure.
- The system of land development controls and planning, including protection of arable land and industrial location policy.
- Administration of major metropolitan areas and centers for growth management in the Delta.

## II. THE NATIONAL GOVERNMENT STRUCTURE IN EGYPT

The National Urban Policy Study is not meant as a study of national government administration in Egypt. Thus, it is only concerned with those types of actions that would directly effect the implementation of a national urban policy. However, several general types of reforms are required in addition to changes specifically related to the management of urban development.

- A. Strengthening of the Planning Process and its Implementation at the National Level Through the Offices of the Deputy Prime Ministers for Economic and Financial Affairs and the Ministers for Economic and Financial Affairs and the Ministers of Planning and Economics and Finance or an equivalent office.

Egypt's present national planning process suffers from a lack of coordination between agencies and a lack of supervision and monitoring of implementation of approved plans. This is true despite the permanent ministerial committees formed by the Council of Ministers and the regular cabinet meetings which allow the various Ministers to be aware of overall public policies.

With regard to the implementation of national urban development policy, the Deputy Prime Minister for Economic and Financial Affairs and Ministers of Planning and Economics are in a critical position to coordinate economic and physical planning policies and supervise their implementation, as well as to integrate the planning and budgeting functions for both the national and local government levels.

The structure described here was operational until the change in government which occurred January 4, 1982. During the previous government, the Deputy Prime Minister for Economic and Financial Affairs was also Minister of Economy, Finance and Planning. Under the government formed after January 4, 1982, these ministerial portfolios were divided among separate ministers. While ministerial portfolios have changed, organizationally the pre-January 4, 1982, structure provided a good location for assigning the overall responsibility for overall urban development policy guidance since it was at a high enough level to oversee the actions of other ministries responsible for sectoral development as well as resource planning and allocation. While it may not be feasible or even desirable to combine these ministries under a single ministerial portfolio, an Office of Urban Policy

Affairs should be established under the Prime Minister or a Deputy Prime Minister for Economic and Financial Affairs which would have the responsibility for urban policy development and monitoring. Further to carry out this responsibility, such an office should combine responsibility for overall economic policy, public resource generation and planning either directly as in the previous arrangement or through establishment of a coordinating committee chaired by the Deputy Prime Minister and consisting of the Ministers of Economy, Finance and Planning. This office would coordinate closely with the Ministerial Committee for Economic Affairs as is described below. Such an office might be charged with broader development policy affairs, but for the purposes of this study we have limited its function to urban policy affairs.

It is only through the Prime Minister's office that there appears to be sufficient authority to insure that civil servants at the respective ministries implement decisions made at the levels above them. It is only at that level that there can be effective coordination in planning between the ministries previously directly under the control of that Deputy Prime Minister and the Ministries of Development and Industry, as well as between the latter two ministries themselves.

The Prime Minister now has a secretariat but its officials serve more as a record/keeping operation than as a unit for the implementation of cabinet decisions. This unit should be strengthened, preferably operating through the Deputy Prime Minister mentioned, to perform a real implementation, monitoring and evaluation function. Its officials must have sufficient influence with the ministries to see that tasks are implemented and targets met. In addition, the unit should assist the ministries, if necessary, and recommend ways by which specific tasks can be implemented.<sup>2</sup>

The office would monitor, on a monthly or quarterly basis, the activities of the various Ministries in their development activities. Miles of road completed, feddans reclaimed, houses built, industrial output achieved, etc., can all be measured against targets established. When there is a shortfall on the schedule, the Office of the Deputy Prime Minister can be called upon to find out why the projects are behind schedule and help speed up the project if that is possible. It would be most effective if a similar unit were established in each ministry with development activities to be responsible for passing on information from the field to the Deputy Prime Minister's office. In this way, each Ministry would be responsible for supervising its own departments in terms of their productivity with regard to development activities.

This office of Urban Policy Affairs in the Deputy Prime Minister's office must work closely with the new National Investment Bank,<sup>3</sup> which is responsible for the financing of projects in the state general plan for Economic and Social Development and is formally attached to the Ministry of Planning. In effect, the unit would perform implementation and monitoring functions for that Bank.

#### B. Better Formal Coordination Among Ministries Important to the Effective Implementation of a National Urban Policy

Closely related to the above is the need for better coordination between the ministries most directly involved with the effective implementation of a national urban policy -- the Ministry of Development and its attendant Ministries of Housing



and Land Reclamation, the Ministry of Industry, the Ministry of Agriculture (preservation of arable land).

At present, the Cabinet is divided into four ministerial committees: for Economic Affairs, for Production, for Services and for Legislative Affairs. However, none of these committees contain all of the actors required to carry out an effective urban policy. The Ministerial Committee for Services contains the Minister of Development, the Minister for Education, the Minister for Health, the Minister for Manpower and the Ministry of Social Affairs and is chaired by the Minister of the Interior. The Ministerial Committee for Economic Affairs is chaired by the Deputy Prime Minister for Economic and Financial Affairs. It contains the Ministers of Planning, Economics, Finance, Agriculture, Tourism, Industry and Supply and the Governor of the Central Bank. However, it does not contain the Minister of Development nor some of the important service sector ministries.

An effective urban policy will require that, at a minimum, the Minister of Development sit upon the Ministerial Committee for Economic Affairs which would also then be concerned with urban policy. A better approach would be to appoint another Ministerial Committee or a coordinating committee between the present Ministerial Committees for Services and for Economic Affairs which would be specifically concerned with Urban Policy and which would have as members all of the Ministers mentioned in the preceding paragraph.

#### C. Better Coordination of Policy Planning, Programming and Budgeting

The present system of policy planning, programming and budgeting has not functioned well, especially with regard to the spatial implications of a national urban policy. Investment decisions in regard to industry and housing have not been made so as to carry out effective policies with regard to priority growth centers. The budget system has stressed the traditional budget functions of control and accountability rather than using the budget as an instrument for project evaluation, program monitoring and resource allocation. Its major emphasis has been toward objects of expenditures (salaries, office supplies) and organizational responsibility for expenditures (identifying the appropriate level of accountability for each type of disbursement), rather than the evaluation of alternative activities.

What is required is a system that sets priorities for the allocation of monies for investment while taking into consideration the requirements of location, especially the siting of basic physical infrastructure (water, sewer, electricity, roads) and the location of housing and industrial projects. A major step in this direction would be viewing budgeting as a planning and programming tool. Thus, the capital investment budget should be combined with the other two budgets so projects are considered as a whole and fitted into the national plan. A proposed procedure is set out in the discussion concerning the Delta Region below.

#### D. Reform of Disfunctional Personnel Policies

The bureaucracy in Egypt is presently overstuffed, underpaid and undertrained. In January 1980, the Central Agency for Organizational and Administration reported that almost 2.9 million persons or 27 percent of the total employment of Egypt of 10,821,000 was in the public sector (Ministries -- 275,000; local government -- 1.1 million, general authorities -- 453,000, and public sector

companies -- 1.1 million).<sup>4</sup> This overstaffing has resulted in duplication of efforts and poor work habits which have decreased productivity.

In addition, the civil service system in Egypt has suffered in recent years from successive changes, which have contributed to a state of inability to act systematically. The most recent Civil Service Law (Law No. 47 of 1978) has devolved powers and authorities in personnel affairs to the management of the concerned organization or unit. However, neither that unit nor anyone else has power over promotion or dismissal of employees. Promotion is closely tied to seniority and dismissal is virtually impossible. The problem of supervision and control over personnel becomes extremely difficult under such circumstances. There exists a clear disparity between policies and procedures governing personnel affairs, on the one hand, and personnel management in practice, on the other. For example, performance appraisal for promotion and participation by workers in personnel management are specified in the civil service legislation but not yet carried out in practice.

Further, the salary schedule is very low and out of touch with reality. Therefore, many high level government servants spend a large part of their time on outside activities and their government job suffers. There is a significant tendency in Egypt to move out of the civil service into private enterprise, both in the country and in the Arab oil-rich countries. This has a good effect on the economy as a whole but a negative short-term impact on public administration. Thus, there is a clear need to increase salaries, relate promotion to merit and reduce over-staffing.

As a last element, there are two government agencies that are concerned with government personnel and training matters -- the Central Agency for Organization and Administration and the Ministry of Manpower and Training. The Central Agency is responsible for the application of the civil service law -- particularly job classification and training -- while the Ministry is concerned with recruitment and placement into the public service and with vocational training. This overlapping of functions has meant that college graduates, for example, have often been placed without regard to the job and the quality of the staff. Consideration should be given to the combining of these two agencies.

In addition, Egypt needs to improve its training programs for public servants. In March 1981 the Sadat Academy of Administrative Sciences was established to take over the functions of the National Institute of Management Development. Since the Academy is located directly in the office of the Prime Minister, it should be an ideal institution to train high level civil servants. However, at the moment it appears that it will concentrate on offering courses at the undergraduate level in hotel administration, banking administration and computer science. These courses are necessary, but not as necessary as the training of senior and middle management executives in both general and specialized courses. The Academy program should be studied carefully with a view to returning to a structure that separates out courses in public administration, local government and higher management. The High Executive Training Program of the Central Agency for Organization and Administration should be merged with the Academy to centralize such functions and provide increased status. An effective training program is essential to the success of any national development policy, especially a national urban policy. The Sadat Academy offers a chance to make that goal a reality.

### E. Summary

Thus, at the national government level the effective implementation of a national urban policy requires better coordinated policy planning and implementation of the plans that are adopted. Such coordination also requires better coordination between planning, programming and budgeting to set priorities for investment that are spatially as well as sectorally oriented. In particular, the general problems implementation require a special unit concerned with implementation and monitoring of development projects located in the office of the Prime Minister and the establishment of a Ministerial Committee whose membership includes all of the primary actors in the urban development process. Finally, the problems of personnel management should be addressed through more emphasis on merit promotion, better pay, better training programs and better coordination among ministries. These policies must be implemented if it is to be possible to successfully execute a national urban policy.

## III. LOCAL GOVERNMENT STRUCTURE IN EGYPT

The recommendations made above regarding national government structure would also affect local government in Egypt, especially those regarding personnel, and the planning, programming and budgeting process. However, there are a number of other specific points regarding the administration of a national urban policy by local government that must be mentioned.

Local government in Egypt is in a period of transition.<sup>5</sup> Both Law No. 52 of 1975 and Law No. 43 of 1979 provided important new powers to local governments at the governorate level and below with regard to the approval of land disposal, locations for residential and industrial projects, control over public utility projects and appointment and control over government employees located at the local levels. The governor has been given the status of a Minister and that of representative of the President within his jurisdiction. However, there are many points upon which it is still not clear what is the respective power of the governor and a ministerial representative in the governorate. One such issue is discussed below with regard to the question of the preservation of arable land.

In addition, effective decentralization of responsibility can only come with effective financial autonomy either through significant sources of revenue that are collected as well as spent at the local level, or through block grants to the local level to be spent as the local government sees fit. Effective decentralization would also require more control of budgets at the local government level than now exists.

There are five specific areas in which local government should be strengthened if they are to carry out their roles of planning, execution and enforcement with regard to land development controls and sectoral developments projects as discussed in section IV below. These changes are required for the implementation of an effective decentralization process as envisaged in the Local Government Laws and for the efficient implementation of the national urban policy. These areas are:

- Strengthening the power of the governor and strengthening governorate physical planning capacity.
- Increasing participation by the Local Popular Councils.
- Increasing financial resources at each level of local government, possibly through local government block grants.
- Creating a significant local role in the budgeting process.
- Increasing the attractiveness of government service at the local government level.

Further, the whole system of local government should be reconsidered with regard to the needs of specific types of cities, particularly metropolitan areas and growth centers. An initial effort in this direction will be made in the final part of this chapter.

#### A. Strengthening the Power of the Governor

Law No. 43 of 1979 gave the governor the status of a Minister and of the representative of the President within his jurisdiction. He, thus, has administrative control over most central ministry personnel in the governorate, including the ability to request their transfer. These powers were further specified in new Article 27 C, added by amending Law No. 50 of 1981, to allow him to give his opinion regarding promotions, demand investigations and impose penalties for misconduct, even with regard to promotions, demand investigations and impose penalties for misconduct, even with regard to national utilities and those of a special nature. That law also formalized consultation between ministers and governor, and between the Governorate Local Popular Council and the members of the People's Assembly and the Shura Council from the governorate to discuss the economic development of the governorate.

However, there is still uncertainty regarding some functions, including the question of enforcement of preservation of arable land. As noted in Section IV below concerned with planning and development controls, enforcement is probably best carried out at the governorate level with policy made by coordination between the governor and the concerned national ministries for such urban development functions as preservation of arable land, industrial location, the preparation of plans, and the provision of basic infrastructure. Subdivision approvals and disposal of state-owned land are clearly governorate functions. If the governor is to perform these functions, however, the governorate will need additional staffing. It is especially important that there be a strong physical planning at the governorate level.

#### B. Increasing Participation By The Local Popular Councils

Law No. 52 of 1975 provides for directly elected Local Popular Councils at the village, town, *markaz* (district) and governorate levels, replacing indirect election through the one party system. In addition, that law provided a better delineation of the powers and functions of the Local Popular Councils vis-a-vis the governor, the district, and the town and village heads. These provisions were continued under Law

No. 43 of 1979, although the right of council members to question such executives was cut back. (Amending) Law No. 50 of 1981 increased participation by Local Popular Councils to the extent that they gained new rights to question governors and chairmen of local units, as well as heads of Executive Departments and Public Agencies. They also were given somewhat expanded powers to approve of disposal of property under their jurisdiction, to establish boundaries of industrial zones and to approve larger loans for necessary productive or investment projects. However, the restriction of election of members of these councils solely from party lists is not likely to foster the independence necessary if policy views are to be presented so as to make decentralization successful and to implement a successful national urban policy.

What is required is increasing participation by the local councils at the city and urban quarter level in the formulation of budgets and the expenditure of funds for urban services in the area under their jurisdiction. This process of increased local participation in the budgeting of funds for urban services will have to be closely coordinated with and monitored by the governorate office of the Ministry of Planning. One possibility would be a general block grant of monies to the urban quarter level to be used for maintenance and repair of urban services, such expenditures to be decided upon by that local council. In that way, the level of government concerned with the maintenance of basic urban services would be given the funding to carry out such maintenance, as well as small-scale to medium-scale development projects.

#### C. Increased Financial Resources at Each Level of Local Government: Local Government Block Grants

Decentralization of authority cannot become a reality without decentralization of budgeting and of authority to make expenditures. Generally, the latter authority requires locally collected or controlled revenues. The 1960 Local Government Law (Law No. 124 of 1960) provided specific revenue sources at the governorate, district, town and village levels. However, these sources provide a small part of local budgets, except in a few specific instances. Most monies continue to be provided in the form of grants-in-aid from the central government. In addition, most of the major sources of revenue at the governorate level are joint revenues, shared with the national government. Thus, all governorates received 50 percent of the special add-on tax placed on top of all import and export taxes, the tax on movable properties (stocks, bonds, etc.), and the industrial and commercial profits tax while the other 50 percent of monies collected from those taxes go to the General Secretariat of Local Government to be allocated for special development projects in all governorates. Eighty percent of the money from these taxes is raised in the five governorates of Cairo, Alexandria, Port Said, Suez and Aswan which increases inequities with regard to encouraging decentralization of urban population. However, even with these sources of revenue, Cairo Governorate generates less than 20 percent of its own budget annually.

The other major sources of local revenue at the governorate level are one-quarter of the land, building and additional taxes and revenues from utilities controlled at the governorate level. Law No. 52 of 1975 permitted the establishment of accounts for local services and development to be funded primarily with profits from development projects financed by these special funds. Law No. 43 of 1979 provided for the establishment of the special fund for land reclamation (to be financed by revenue from sale of cultivated or reclaimed land) and the special fund to finance economic housing projects. Neither of these funds has yet become significant.

At the town and village levels the land tax remains the principal source of local revenue (the 75 percent of that tax that does not go to the governorate). The town also collects the tax on buildings, the entertainment taxes, the rent tax, and the revenues from the rent of state property and from local public utilities. The various land, building and rent taxes would yield significant revenue if they were not imposed based upon an artificial assessment value resulting from rent control.

Each of these levels and the district level may also establish accounts for local services and projects. However, the problem of the source of sufficient initial monies to make such funds effective has not yet been solved. At the district level the only non-governmental revenue source is revenues from district-run utilities and from investments.

It is difficult to recommend specific changes in tax and fee revenues which would provide significant sources of revenue at the governorate, city and urban quarter level. The problem is well-illustrated by the fact that only 5 percent of total government revenues in 1978 and 1979 were from local government sources.<sup>6</sup> The World Bank has estimated that the national government subsidized 82 percent of the budgets of the governorates in 1979.<sup>7</sup> Thus, the magnitude of the situation is such that it would seem preferable to consider a form of non-attached block grant subsidy to the governorate and perhaps to lower levels of government as well. This subsidy could be based upon population, but also upon other available sources of income (the add-on taxes) and level of income of the population. Such a subsidy should be a specified percentage of the total revenue allocated to the budget. It should be increased as local revenue increases initially so that local governments have an incentive to improve their revenue collections. A portion of this block grant might be required to be used for building up a strong planning and finance staff at the local level, with early emphasis on improving revenue collections, if possible. The NUPS study has not prepared a detailed recommendation in this field but believes that this approach fits better with the hierarchical nature of Egypt than would a proposal to shift tax sources to the local government.

One possible exception is the real estate tax of which only 50 percent now goes to the governorate. However, the amount of such taxes collected will not become significant until either rent control is alleviated or a real estate tax based upon market value and shared between the owner and tenant is implemented.

#### D. The Need for a Significant Local Role in the Budgeting Process

Closely tied to the lack of local financial sources is the weak role played by local governments in the budgeting process. Draft budgets are prepared by the executive and approved by the Local Popular Council at the town, village and district level. Such budgets are then incorporated into a draft governorate budget which is similarly approved. These budgets, however, are based upon rough estimates of what each ministry has allocated for each level. Thus, each section of the governorate-approved draft budget goes back to its respective ministry and final negotiations then take place between the various ministries and the Ministry of Finance at which time almost all projects added by the local councils are deleted. Final consultation is then held between the Minister of Finance and the concerned governor (prior to passage of Law No. 50 of 1981 also with the Minister of Local Government and the Council of Governors), with final approval by the People's Assembly. The final decision is then communicated by the Ministry of Finance to the governorate Department of Finance and so on down the hierarchy.

The budgetary process in Egypt, as noted previously, is in a state of transition toward greater decentralization and it is hoped that the increased authority of the governor under Law No. 43 of 1979 and approved by Law No. 50 of 1981 will provide more local control over budgets. What is required, in the long run, for a successful decentralization strategy is a more autonomous budget and financing structure in which increasing efficiency of government expenditures at the local level will provide more revenues for local use and in which more effective exploitation of local revenue sources will provide more monies for local projects. The present system of financing and budgeting does not encourage such efficiency.

In the short run, consideration should be given to the setting aside of block grants to governorates and cities which can be used for whatever purposes are required by the local government, as long as the uses are consistent with economic and physical planning. In addition, as noted above, the budget must be interpreted so that it will concern itself more clearly with the goals that are to be achieved, (i.e., program budgeting and/or performance budgeting could be such a mechanism) rather than with the things and services to be provided. Investment must not be artificially separated from salaries and equipment. It may, thus, be tied in more closely also with the question of the physical location of development projects discussed in the next section. These kinds of objectives can only be reached if there is some autonomy at the local level with regard to expenditures, particularly investment expenditures.

#### E. Increasing the Attractiveness of Government Service at the Governorate Level

Public administrators in Egypt are reluctant to live in small towns and villages. They perceive such an assignment as a sacrifice of amenities and opportunities. In the past the government has reinforced these attitudes by posting civil servants to Qena and Aswan, for example, as a punishment for poor performance or a sign of disfavor. The turnover of civil servants outside of Cairo is even greater than that for the government as a whole. Also apparent is the large differentiation in backgrounds of key local government officials.

What is required is an emphasis upon minimum training for all local government officials and special salary and retirement benefits to attract the best persons to leadership positions. There must also be greater strides toward real decentralization -- the power over personnel hiring and advancement and job classification must be moved to the Governorate level and below. Law No. 124 of 1960 stated that most national government personnel would be moved to the regions within five years. It is now 20 years later. Real efforts in this direction must begin if decentralization is to become a major force in Egypt and if the national urban policy described above is to be effectively carried out.

#### IV. A SYSTEM OF PLANNING AND LAND DEVELOPMENT CONTROLS

The First Round Alternatives and several working papers by the NUPS teams<sup>8</sup> have described the present lack of an effective system of planning and land development controls in Egypt and the scattered and disorganized development of activities in the urban centers of Egypt. Few new subdivisions, with the exception of those built by government agencies, now receive official approval. A large proportion of housing is being built without receiving building permits and some of the housing receiving such a permit is being built upon arable land where building is prohibited by law. Finally, the location of government buildings and industry is being made without reference to planned development for a physical area as a whole.

The 1981 Physical Planning Law would establish the necessary planning framework for development by providing for the mandatory preparation of master plans for cities and villages. As discussed in Chapter IV, NUPS recommends the immediate development of physical planning data and analysis for the Delta Cities along the lines of our Illustrative Development Project work, prior to the development of complete master plans. All subdivision and building permit approvals in cities and urban parts of villages would have to be consistent with master plans once developed.<sup>9</sup> Detailed plans would be prepared by the local unit (city/village) following the approval of the master plan. The development of the master plans would be done with the assistance of the national General Organization for Physical Planning (GOPP) and the relevant governorate Department of Housing and Development. Industrial activities would be placed in industrial zones which would have to be in conformity with master plans and detailed plans. Building permits would be issued only when the project and the location were in conformity with approved plans.

In addition, the 1981 Physical Planning Law would eliminate some of the specific standards regarding subdivisions found in Law No. 52 of 1940, although it keeps a maximum percentage of land for public uses (50 percent), a minimum width of streets and a maximum building/plot ratio. More importantly, exemptions could be made with regard to any of these standards or the standards regarding building permits, for either a specific area or a specific building (Articles 65, 66).<sup>10</sup> This flexibility, not present in the existing law, would allow for the setting of different standards for subdivisions and buildings both within different parts of the same city and in different cities in Egypt. Further, the law has specific sections dealing with urban renewal (Articles 37-42) and the central business district (CBD) (Articles 27-31).

The 1981 Physical Planning Law has a more broad-ranging group of control measures regarding subdivisions than the previous law. It also tightens already existing measures in this area. Thus, the developer may not advertise his subdivision until a copy of the official approval has been submitted to the local Department of Land Registration and until he has provided or guaranteed payment for basic public utilities. (The latter is a new provision.) Subdivision approval



must be included in all contracts of sale or rent, or they are void. As an addition to existing law, the new law states specifically that the conditions stated in the subdivision approval must be stated upon transfer of property by inheritance. Also, the Local Popular Council may require that a subdivision include some adjacent lands to that of the person seeking subdivision approval if such 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 19). Finally, the Minister of Development, after consultation with the governor and the approval of the city/village Local Popular Council, can modify the conditions regarding subdivisions granted approval in the past (Article 26).

A third set of provisions would allow for restrictions on subdivision approvals. The governor, with the approval of the city/village, can stop approval of subdivisions in a particular town or quarter for a period of two years, with a maximum extension for another two years (Article 20). The governor may also exclude certain parts of a town or village from subdivision for specific time periods based upon lack of capacity of existing public utilities and other reasons (Article 19). This prohibition can be removed if the developer provides such utilities at his own expense. Further, stages of development can be established for a town and subdivision approval denied in certain areas for certain periods based upon considerations of control of population and building density, potential to provide public utilities and conservation of agricultural land (Article 18). Such a staged plan requires the approval of the Minister of Development.

Finally, the penalties for violations of the above provisions have been greatly strengthened as compared to previous laws and to the previous drafts of the 1981 Physical Planning Law. Penalties for dealing with property before subdivision approval are increased to imprisonment for a period of from five to ten years and a fine of not less than L.E. 10,000 (Article 68) (as compared to a maximum fine of L.E. 10 under Law No. 52 of 1940 and of L.E. 2,000 under the 1977 version of this proposed law).<sup>11</sup> Penalties for intentional violations have the same possible imprisonment period but a minimum fine of L.E. 50,000 (Article 69). Such fines may be doubled if not paid within the time required (Article 69). Perhaps more important, these fines may be collected through administrative procedures rather than requiring a court order (Article 68).

Thus, the 1981 Physical Planning Law would provide a good general legal framework for planning in Egypt. It has good control and enforcement provisions and sufficient flexibility with regard to the setting of different standards to fit differing situations between cities and within cities. However, there are still several modifications which would make it an even stronger piece of legislation:

A. An Express Statement that New Urban Communities Come Under the Provisions of the Physical Planning Law

It is not now explicit that the new urban communities that are registered by the New Urban Communities Authority under Law No. 59 1979 would have to follow the procedures of the 1981 Physical Planning Law. That result must be achieved if there is to be real planning coordination at the national and governorate levels in Egypt.

B. A Requirement that Building Occur within a Certain Period After Subdivision Approval

Consideration should be given to automatic revocation of subdivision approval if land is not built upon within a prescribed period, for example three years. If the land is state land that was sold to a developer, then the land should be taken back by the state if not built upon in that period. There is a precedent for this approach. The Nasr City Company has a clause in its basic sales contract allowing cancellation of the sale and the taking back of the land if a ground floor is not built within three years. Unfortunately, that provision is not enforced.

C. Elimination of the Requirement that all Drawings for a Subdivision must be Approved by a Certified Architect

This provision will increase the costs of compliance with subdivision and building regulations, especially for low income housing, and will further encourage non-compliance. Review of the drawings by the local planning unit itself should be sufficient.

D. Provision of an Escalator Clause for the Fines Stated as Penalties so that the Amount Remains a Significant Deterrent after a Five or Ten Year Period

It is recommended that the maximum fine for violations of planning, subdivision and building requirements increase by a fixed percentage annually (perhaps 10 percent), rather than there being a specified review after a period of three to five years. The latter process has not proved successful in Egypt in the assessment of real properties for property tax purposes or in the setting of construction costs for rent control purposes. The problem of insignificant fines has shown itself to be a real one in this area with regard to the deterrence of violations.

E. A More Explicit Procedure for Determining Urban Boundaries of Settlements Needs to be Stated so that Necessary Boundary Changes Can Occur in an Orderly Manner.

Articles 1 through 6 of the Physical Planning Law provide the basis for the establishment of master plans for settlements and require that these master plans be updated every five years to accommodate changes in economic, social and building conditions. However, the law falls short of establishing a procedure whereby urban boundaries can be modified if necessary to bring additional land under the control of local government to either provide new expansion areas or to control illegal development. During the NUPS Illustrative Development Project of Tanta, it was found that local governorate planning units had prepared master plans in 1958 and updated them in 1970. In the early master plan, new boundaries were proposed for Tanta which would have included fast developing peripheral areas within Tanta's urban boundaries. However, these boundary changes have never been approved by the Ministry of Agriculture. Thus, despite master planning efforts, the old, out-of-date 1942 boundaries still prevail frustrating planning efforts to control Tanta's development. If the master planning efforts proposed by the Physical Planning Law are to be effective, a procedure must be developed to enable governorate planning offices to change urban boundaries when necessary. As is suggested by the law, the approval of boundary changes could be made by the governor with advice of the GOPP and concurrence with Local Popular Councils.

During the approval process (which the planning law proposes occur every five years), a coordinating committee composed of the governorate physical planning staff, local council staff, the Ministry of Agriculture's governorate representative and a representative from the GOPP should be set up to actually determine the new boundaries.

The passage of the 1981 Planning Law, however, will only provide an adequate legal framework for planning and development control, such as does not exist at present. It will be required to enforce the provisions of such a law and ensure that the enforcement of the Physical Planning Law is coordinated with the enforcement of the conditions regarding the use of arable land and the law regarding building permissions. It will be especially important that decisions regarding industrial location and investment, in which the Ministry of Industry plays a large role, are coordinated with the overall plan for development of an area. It will also be required that planning for the Cairo and Alexandria metropolitan areas is coordinated with the planning of the new towns and satellite cities.

The basic principle involved in the enforcement of planning and development controls should be that selective enforcement in priority areas, making maximum effective use of the minimum number of staff, is more likely to be successful than efforts at blanket enforcements. What is required is a restricted system of targeted priorities for industrial location, housing location and new subdivision location, and for the control of arable land. At present, incentives for development and restrictions against development are not area specific but cover too many locations to be effectively enforced. Thus, the value of the incentives is 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. Such priority areas would be based upon master planning and regional planning and upon priorities set for economic investments. The effort would be tied to the coordination of the system of inducements and restrictions to the provision of critical infrastructure, especially of water sewerage, electricity and public roads.

The following is how such a policy might operate with regard to the three major issues of development control in Egypt:

- Preservation of priority agricultural land.
- An effective industrial location policy.
- An effective housing location policy.
- Environmental Control.

#### I. Preservation of Priority Agricultural Land

##### a. Present Conditions

The NUPS Study has already described in detail the problem of the loss of arable land in Egypt, especially over the last decade, and the legal and administrative procedures that have been instituted to attempt to halt building upon agricultural land,<sup>12</sup> particularly the provisions of Law No. 59 of 1973, as amended by Law No. 59 of 1978, and as amending Basic Agricultural Law No. 53 of 1966. That law 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 their owners, 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. The law also prohibits 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. Law No. 59 of 1978 extended this 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. That prohibition has already resulted in the cancellation of several proposed projects being planned in Giza Governorate.<sup>13</sup>

Unfortunately, these provisions have not been enforced widely in practice. 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 Local Government Law No. 43 of 1979 with its emphasis upon decentralization of authority. Articles 25 and 26 of Law No. 43 of 1979 states that a governor shall be treated as a Minister and as the representative of the President in his governorate. Recently, the First Deputy Prime Minister issued a decree that all decisions regarding the granting of exceptions for building upon agricultural land should be approved by his office, rather than by the governor. However, such a procedure evades the issue of who is to act at the governorate level. It also probably makes it more difficult for any exceptions to be approved and, thus, in practice may contribute to ignoring of the law.

#### b. Definition of Priority Agricultural Land

The critical point that emerges from a review of the implementation of this legislation is that such a prohibition cannot be effectively enforced on all arable land outside of urban areas. A definition of "priority agricultural land" is required. This definition must be related to the setting of priority areas for industrial location and for housing location and the ability of local officials to enforce restrictions on building in specific locations. Not all fertile agricultural land can be protected. Its protection will depend upon its location and upon the strength of the competing land uses. Thus, agricultural land located in the path of urban development, such as much of the land near the city of Giza, probably cannot be protected under any situation. It is more important that such land be planned well for future urban development than that vain efforts be made to protect its agricultural use. At the same time, every attempt should be made to protect Class I and II agricultural land, wherever possible, and to direct urban development toward less valuable agricultural land when it cannot be placed completely upon desert land. The Tanta and Qena/Naga Hamadi Illustrative Development Projects and the Cairo and Alexandria Concept Plans make recommendations regarding specific priority areas for

further urban development and for agricultural preservation making use of the above principle.

c. Establishment of Priority Agricultural Zones by District (*Markaz*) for Enforcement of Restrictions

The definition of "priority agricultural land" in general must be followed by the designation of "priority agriculture zones" in which restrictions would be enforced. Such a classification should be oriented toward the *markaz* level since adequate data appears to be often collected at that 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.

It is an open question whether such zones should be established within urban areas. Some of the richest agricultural land in Egypt is located within city boundaries.<sup>14</sup> However, such land is very difficult to protect from the forces of urban development and the protection of such uses would probably require a change in the present tax laws which classify all land within urban areas differently from land in agricultural areas.

d. Strengthening of Enforcement Procedures

Even selective enforcement of the provisions prohibiting building upon agricultural land would require the strengthening of present enforcement procedures. The following changes would assist in that effort:

- Place enforcement responsibility at the governorate level but with planning and approval responsibility in the hands of a joint national-governorate committee.

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 1981 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.

In addition, the governor is in control of the enforcement apparatus within his jurisdiction. A part of the problem in the past has been that a complaint against a violation has been issued by the Minister of Agriculture, rather than by a Local Popular Council. The local people have resented the intrusion of this national government body into what is considered a local affair.

However, the question of enforcement can be separated from the question of policymaking and the granting of exceptions. Policy guidelines should be set at the national level to achieve uniformity throughout the country. For the same reason, the designation of specific agricultural zones should receive approval by

the Ministry of Agriculture. Further, decisions upon exceptions to that policy in designated priority zones should be made with input both from the national government (most importantly, the Ministry of Agriculture) and the governorate. The governorate level committee headed by a representative to the First Under Secretary of Agriculture and with representatives from the Ministries of Housing and Irrigation might be expanded to include representatives of the governor. In cases where these lower level officials do not agree, the final decision could be made by the Higher Committee at the national level headed by the First Under Secretary of Agriculture with representation from the Ministries of Planning, Housing and Irrigation. However, all such decisions should also have the approval of the governor concerned to ensure their active enforcement.

- 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.

- 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.

- 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. An Effective Industrial Location Policy (See also Chapter V)

### a. Present Situation

The same policy of the establishment of priority areas should be followed with regard to controlling the location of industry. At present, industry is expected to be located in industrial zones designated by the governorates under Articles 110-112 of Local Government Law No. 43 of 1979 and Law No. 28 of 1949. The governorate has the responsibility for selecting locations of new factories inside its boundaries, provided that the necessary approvals have been granted by the Ministry of Industry and that all required public utilities have already been established. It determines the boundaries of the industrial zones and forms the industrial services committees that are to operate within these zones. 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 the designated zones. A second type of designated industrial location is the free zones and the new urban communities which were granted incentives to lure investors under Law No. 43 of 1974 and Law No. 59 of 1979, respectively.

However, 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 need of the governorates to provide income and employment within their boundaries, the lack of an adequate physical planning framework to provide guidance to the location of different types of industries and to coordinate the actions of the Ministry of Industry with other ministries and with the governorates, and the lack of personnel and authority for enforcement at the governorate level and below all contribute to the present state of affairs. Similarly, Law No. 53 of 1978 prohibiting the location of industry, other than agro-industry, on agricultural land has not been successfully enforced, although as noted above, it has stopped some large-scale projects in Giza Governorate.

b. Designation of Preferred Industrial Locations by Type of Industry; Designation of Industrial Zones within Urban Areas

As in the case of the preservation of arable land, the principal need is for the designation of preferred industrial locations by type of industry in Egypt and then for the designation of specific zones for industrial activities within urban areas based upon the preferred industrial locations set by national economic policy.<sup>15</sup> To date, economic planners in Egypt have set preferred levels of investment by type of economic activity and have allocated those monies by governorate. However, they have not made special efforts to set such industry in the place within the city or governorate where it is best located with regard to the future development of that jurisdiction as a whole. This is partly due to the absence of a Physical Planning Law and, thus, the lack of master plans and detailed plans for such areas. It is also due to the rush to accept any kind of industry at almost any cost. This situation must change if industry is to be located so that it is most effective with regard to future urban development as a whole.

What is required is an industrial development plan which designates specific towns as priority industrial areas, based upon type of industry. The investment incentives accorded to free zones and new communities would also be granted to such towns. Within such towns specific industrial zones would be designated. In other towns existing industrial zones would remain where industry is already located but without the above incentives. Investment could be taxed in the core of the Cairo metropolitan area and other areas where its location should be discouraged, but no absolute moratorium should be imposed. Other countries, notably Korea, have been successful with a taxing policy which has a different tax rate for industry located in different cities in the country. This system could be tried in Egypt but the overall situation for attracting investment is not so high that it is likely to work unless the rates are very carefully calibrated. An incentives system seems better suited to the investment climate here.

c. 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 does not want industrial development within its boundaries, in any case.

The establishment of an industrial development plan must also include penalties for enforcement, and such enforcement should be at the governorate level. That 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 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.

The enforcement penalties provided in the 1981 Planning Law would also be available for industries located in violation of a master plan. Thus, the passage of that law is important not only for the coordination of planning but also for the enforcement of orderly planning and development.

### 3. An Effective Housing Location Policy

#### a. Present Situation

The third important component of an effective system of land development controls and the ordering future urban development is an effective housing location policy. The part of Chapter V on shelter policy reviews the present situation. Most of the housing being constructed annually is constructed without a building permit on land that has not been granted subdivision approval and without conforming to any type of master plan for development. The costs of obtaining building permits are very high and have discouraged people from getting them.<sup>16</sup> The standards for building required are also high. Buildings continue to go up on agricultural land without permits in areas such as Qena and Tanta due to lack of coordination between the city department issuing the building permits and the Ministry of Agriculture officials who administer the granting of exceptions to the prohibition against such building.

Building goes up on agricultural land without permits because water is available there and the penalties for violation are small in relation to the value of the building.<sup>17</sup> Almost no subdivision approvals have been granted over the last 20 years in most of the cities of Egypt. These provisions have been ignored because of the lack of planning which would allow a city official to quickly make a judgment about the location of a specific development. The absence of such planning has meant that few efforts have been made to control new subdivisions, both those of phased development and those constructed for housing cooperatives. What little controlled development has been done has largely been in the Cairo and Alexandria areas through the public sector housing and development companies.

### 4. An Effective Set of Environmental Controls

The arable land issue as it relates to the environment has already been discussed, however, there is another set of environmental issues affecting the health



and well being of both urban and rural people which need to be identified and for which a policy needs to be established. Among these issues are air and water quality, preservation of important historic and cultural areas, preservation and development of urban recreational area, and improvement of urban amenities generally. Presently, responsibility for environmental issues is divided among several ministries, agencies and the governorates. What is needed is a single environmental policy statement which identifies environmental objectives to be reached, develops environmental standards and controls for maintaining those standards and clearly identifies agencies responsible for enforcing those standards.

Once this policy is set, legislation should be developed which would identify an agency or agencies responsible for setting environmental standards and controls and for enforcing them. A portion of the study of environmental policy should be to determine if existing agencies can or should continue to have responsibility for environmental control or if a new agency should be created to have overall responsibility for environmental issues. While the legislation should broadly indicate environmental issues where standards need to be established, it should not set the standards themselves. This should be done by the environmental agency or agencies responsible for developing the standards. The legislation should, however, require periodic review of the standards to ensure that they are meeting environmental policy objectives and should establish a procedure for changing those standards to make them more effective.

In setting environmental policy, it will be important to coordinate it within the broader context of national urban policy. The two should not have conflicting objectives. Further, when setting environmental standards, the experience in other countries should be reviewed to determine the likely effectiveness of the proposed standards. Also, when establishing the standards the costs of achieving those standards should be clearly measured against benefits of achieving those standards. It may well be determined that the costs of one particular set of standards may outweigh their benefits and another set of standards would be more appropriate. Finally, in setting environmental standards, they should be viewed as a means of not only implementing environmental policy, but of also achieving the objectives of national urban policy. Particular attention should be given to alleviating those aspects of environmental distress associated with large population concentrations. As emphasized elsewhere in this report (See Appendix II-A), there is a serious tradeoff to be made which results from the fact that both urban benefited (in terms of output, income, and service levels) and urban diseconomies and disamenities pollution, congestion, health problems increase with city size. The policy choice may involve accepting the size to get higher growth and the utilization of the growth surplus to reduce disamenities or their effects.

#### b. Recommendations

##### ● Housing Location According to a Master Plan.

The control of housing development is a very difficult process. The vigorous informal building sector in Egypt has meant that despite occasional shortages of construction materials and lack of formal housing credit, building is being done. However, such building is occurring in a disorderly fashion, related particularly to the location of basic physical infrastructure. What is required is a master plan that would designate specific areas of a city for housing, and then

particular areas where standards are targetted to the affordability of different income groups. This designation of areas should be tied to specific building and sub-division conditions for that area. As noted previously, the 1981 Physical Planning Law would allow for such differences in those types of standards both within cities and among cities. The present building law (Law No. 106 of 1976) and the present subdivision law (Law No. 52 of 1940) do not appear to have that flexibility. Proposed projects by cooperative government agencies and private companies could then be tied to a general set of priorities for housing location.

- The Provision of Serviced Urban Land for Housing by a Land Development Agency

In practice, it is easier to control housing location if the supply of urban land is being increased. An institutional structure is required that will provide such land to be used by public and private bodies for housing. Such an agency can also help to control the use of public land. Presently, there is no real coordination of the use of public land in Egypt as such land is under the control of a number of ministries and authorities (the Military, *Awqaf*, the Ministry of Development, the New Urban Communities Authority) as well as of the governorates. The latter have the general power to sell state-domain land within their jurisdiction. The sale and use of such public land in the past has been on a project-by-project basis, which has led to inconsistent and conflicting land uses.

One possible answer is a Land Development Agency such as have been successfully used in Sweden and the Netherlands.<sup>18</sup> Such an agency would have three major functions:

- To acquire land by purchase, gift, exchange, expropriation or by allocation from the government.
- To control the development on such lands.
- To sell or lease developed plots for housing and other uses. (If plots are leased, the agency would be responsible for their administration and for enforcing building and other restrictions placed upon the plots.)

Such agencies have been established at the governorate level in Ismailia and Suez and have been considered for the Cairo metropolitan area. They could either be an agency of the governorate or national government or a public sector corporation. The latter approach 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.

For either type of organization it would be best to have specific legislation exempting such bodies from many of the restrictions on public sector companies, such as restrictions on scale of wages and the requirement that almost all profits be returned annually to the national Treasury. Such a requirement would

make a self-financing operation almost impossible (See Public Law No. 60 of 1971, as amended.) Presently, the development agencies have been exempted from the requirements of returning profits to the central Treasury. However, these exemptions are not sanctioned explicitly by law.

Such Land Development Agencies would have major problems in implementation due to the lack of sufficient trained personnel to carry out projects either through the Agency itself or by public or private sector companies. However, the concept deserves serious consideration as one means of providing serviced urban land. If such land is not provided, it will be much more difficult to control location of new housing.

- Control of Housing Location and Land Speculation Through Taxation

In the past several years, Egypt has added a vacant land tax (Law No. 34 of 1978) and a transactions tax on the sale of land, although the implementation of the vacant land tax is clouded by a Supreme Court decision ruling against its validity. These types of taxes should prove of some benefit in controlling land speculation and, thus, helping to order housing location, although the 2 percent rate for the vacant land tax may be too low to be an effective deterrent given present rates of return.<sup>19</sup> However, the main ordering force would have to be a stronger system of real property taxation. Such a system is presently hampered by rent control. What should be considered is a system of property taxation based upon an assessment at market value with the tax split between the landlord and the tenant, along the same lines as maintenance and repair costs are divided according to the latest Landlord-Tenant Law (Law No. 136 of 1981).<sup>20</sup> Based upon age of the building. The distribution of the tax might also be based on length of tenancy, cost of construction and other factors that would provide greater equity. It is difficult to escape from rent control. However, it is also necessary to have a strong property tax to provide for the efficient use of urban land.

Such a tax system is also vital for the financial condition of local governments. For these reasons, a method of distribution of payment between the owner and tenant should be actively considered.

- Control of Housing Location Through the Use of Betterment Taxes

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 determined by the Council of Ministers. Such charges are means of providing for the payment of infrastructures required for housing and, thus, to finance developments. In Egypt, this law has been almost exclusively used to pay compensation where expropriation is required in road widening projects. In addition, the charge is not paid at the time of the improvement but only at the time of transfer of property ownership. Such a law can be an effective means of paying for all types of infrastructure projects required to extend urban development to new areas. It lessens the financing burden on the national government for such services and should be actively used, especially for middle income and luxurious housing developments, including most cooperative developments. However, a large proportion of the charge would have to be recaptured at the time that the improvement is made.

## V. ADMINISTRATION OF THE DELTA: EFFECTIVE REGIONAL PLANNING

### A. Present Situation

The management of the Delta over the next 20 years is one of the most critical problems facing Egypt and a necessary requirement for a successful urban policy. It is from the Delta that the vast majority of the migrants to Cairo and Alexandria originate. Over 65 percent of the migrants to the urban governorates reported in the 1976 Census came from the Delta. It is the Delta that contains most of the arable land in the country and, thus, is the major factor regarding future internal food supply. This abundance of arable land also means that the Delta is a likely site for agro-processing industries. The Delta can also be used as a model for the development of regional planning in Egypt, particularly for regional planning for areas other than the Cairo and Alexandria metropolitan areas and the Canal Zone.

At present, the Delta shows the past deficiencies in physical and economic planning and the enforcement of existing controls regarding the siting of industry and housing and the preservation of priority arable land. As indicated in the Tanta Illustrative Development Project, and also evident from inspection of the other major cities in the area, prime agricultural land is being used up at a rapid rate for housing and industry and for the provision of roads without plans to guide development. Scattered development is the rule, rather than the exception, and much of this scattered development is a result of decisions made by national ministries in Cairo without much consultation with the governorate or lower level local government concerned. Five Delta governorates are covered by one economic regional planning agency headquartered in Tanta. This agency is in an early state of development. Effective working relationships with other government ministries and the five involved governorates are still being established. One drawback to effective Delta-wide planning is that the authority includes only five governorates of the Delta with the other three governorates scattered among three other planning regions -- Sharkia with the Canal Zone, Beheira with Alexandria and Qalyubia with Cairo.

Further, planning, control of development, and the coordination to carry out different sets of specific planning decisions are undertaken at various levels of government. Thus, the granting of building permits is handled at the city or district level and the granting of subdivision permission at the governorate level, while the granting of exemptions for the use of arable land is now handled by the First Deputy Prime Minister, after an intermural jurisdictional battle between the governor and the Minister of Agriculture. Permits for industrial locations are granted by the Ministry of Industry with perfunctory review by the governor. Planning and implementation of basic infrastructure -- water, sewerage and drainage, electricity, mass transport -- are also made by the relevant national ministries, with only some participation by the governor. Thus, the legal status of the governor as a Minister and representative of the President within his governorate under Law No. 43 of 1979, has yet to be effectively implemented. This situation is true throughout the country but is seen most in the Delta governorates which have fairly large populations but without the special status accorded Cairo, Alexandria and the

Canal Cities in the allocation of national government attention and funds. The early stage of staff development means also that the governor will not be able to fully carry out his legal authority in the near future. Administrative and technical areas must be strengthened in order to improve the functioning of the governor's office.

## B. Recommendations

With regard to the successful execution of a national urban policy in the Delta, it will be necessary to carry out a number of administrative steps:

### 1. Formal Recognition of the Delta as a Region Which Should be Treated as an Entity for Planning Purposes

One consequence of the national urban policy study is the need for a very small number of planning areas with specific requirements for development. The division of Egypt into the Cairo and Alexandria metropolitan areas, the Canal Cities, the Remote Areas, Northern Upper Egypt, Southern Upper Egypt, and the Delta provides the policymaker with a finite number of areas each with a different set of problems. In this context, the Delta represents the heavily populated agricultural heartland between the two major metropolitan areas with the key problems of preservation of arable land and the provision of some additional non-farm employment to supplement large-scale migration to the metropolitan areas. Thus, major decisions regarding agricultural and industrial policy and the supplying of basic infrastructure should be considered for the eight governorates as a whole, including Sharkia, Beheira and Qalyubia. Qalyubia Governorate is also an integral part of the Cairo metropolitan area and, thus, should be considered as a part of that region also. Similarly, Beheira Governorate should be considered as a part of the Alexandria region as well as a part of the Delta region. This overlapping of definition of the region is messy but reflects the economic and planning realities. The problem of definition of the Delta region is critical with regard to urban growth as some of the best agricultural land and sites for agro-processing industries in the region lie in the three governorates mentioned above.

### 2. Establishment of Formal Coordination Procedures for the Delta Regarding Economic Planning and Physical Planning

The critical status of the Delta makes it a good place to establish a model system for the formal coordination of economic planning and physical planning, following the recognition of its legal status as a planning region. The shape of such coordination procedures is one of the most critical decisions facing Egypt in the establishment of a future urban development policy. The Delta is an ideal place to experiment with such possibilities as the governorates are more populous and developed than those in the rest of the country, excluding the metropolitan areas and, thus, more ready for some form of decentralization.

A necessary first step is the establishment of a more effective system of planning. A Development Plan is required for the region which not only allocates investment on a priority basis but also designates priority sites by type of investment within the Region. These priorities would be related to the national policy with regard to priority sites for specific types of investment. The presently economic policy is not concrete enough with regard to location. This is clearly

illuminated in the case of the Delta (See Tanta Illustrative Development Project). The economic planning could be on a five year basis, as at present, with its most important component being project budgeting and annual budgeting.

Such economic planning with a locational component must rely upon, and be integrated with, long term master plans and detailed plans. Such plans would preferably be developed within the legal framework of the new Physical Planning Law. At present, Delta cities do not have up-to-date functioning master plans. If the Delta region is recognized as a priority for urban management, then the GOPP would have to work together with the governorate and cities to produce such plans for the governorate capitals and other large Delta cities, especially Mahalla El Kubra and Kafr El Dawar. Such plans must be produced over the next several years. They need not be detailed but merely need to show priority areas for future development for housing and industry and priority areas for the preservation of arable land. Such a plan has been recommended for guiding the development in Tanta. (See Tanta Illustrative Development Project.)<sup>21</sup>

Once physical master plans have been produced for the large cities, an effective formal coordination mechanism can be established between economic planning and physical planning. The most important administrative levers to influence development are the siting of basic physical infrastructure (water, sewer, electricity, roads), the siting of industry, the siting of housing and priority areas for the granting of building permits, and the setting of priority areas for the preservation of arable land.

This coordination system will need a strong national component. It does not appear presently possible in Egypt to fully decentralize the implementation of all economic and physical decisions to the governorate level, nor is such decentralization necessarily wise with regard to industrial location, the preservation of arable land and the siting of major inter-urban infrastructural investments. With regard to the setting of policy, the governorate should have a major role but always within the context of more general national policy guidelines.

The recommended model for coordinated planning, to be tested in the Delta Region, is as follows:

a. The proposed Office of Urban Policy Affairs of the Deputy Prime Minister for Economic and Financial Affairs, working through the Delta Planning Authority, would be responsible for the development of the regional economic plan. As at present, the Ministry of Planning gathers various proposed projects from the national ministries and from the various levels of local government through the governorates. These projects must be shown to be in conformity with master plans and national priorities for industrial location, preservation of arable land, etc.

The lists of projects are then considered by a Delta Regional Planning Council, consisting of the concerned governors and the most important development ministries. The formal approval of this Council would be required for the annual list of priority projects for the Region and for the Region's Five Year Plan. The final approved list would then be sent up to the Deputy Prime Minister and the concerned Ministerial Committees for final approval as part of the national plan and budget by the Ministry of Finance.

The concerned officials of the Ministry of Finance would not have final approval of this budget, but it would have to be countersigned by the Deputy Prime Minister as also being consistent with economic planning and physical planning objectives.

b. Certain amounts of central government monies would be set aside as block grants for investment projects at each local government level -- governorate, city/village, district. Such monies would not require approval above the level of the governorate except where they conflicted with other projects. These monies might be restricted to use for basic public services. They would be a first step toward budget responsibility for local government and would be one means of alleviating the problem that few investment projects recommended by levels of government below the governorate now get into the final annual budget.

c. Each approved project would have to have a brief description and rationale for exactly how it fits into the physical development plan for the city, village or district where it is located and how it is linked to other projects. That level of government would be able to object to this rationale before the Delta Regional Planning Council.

d. The budget at each level would be integrated on a project and activity basis, not merely as salaries, operational costs and investment. Thus, maintenance costs would have to be considered in investment decisions. The activities would be specified in the Delta Regional Plan.

This kind of a system would not radically differ from the present way of doing things except to force formal coordination and to allow some autonomy to local government units to execute their own master plan. It should help to escape the present situation where the Ministry of Planning seems only to collect the programs of other ministries, rather than imposing priorities upon them, and where the Ministry of Finance approves budgets without much attention to priorities of physical planning. It should also force attention to priorities of performance budgeting -- asking how a project fits with the national and regional plans and implements a particular goal of those plans. To be carried out successfully in the Delta Region it will require a greater number of planning staff at the governorate level. It is upon that level that ever greater reliance than at present will be made to coordinate plans and budget proposals from below.

### 3. Establishment of Formal Coordination Procedures for the Implementation of Development Planning

As important as the coordination is at the planning level, participation and coordination at the enforcement level for physical planning controls are required for the effective execution of planning policies. Once priorities for development have been set at the Delta regional level with regard to location, such priorities must be enforced with primary responsibility at the governorate level through the existing planning and engineering offices in close coordination with the local representative of the Ministry of Development for the governorate. Subdivision permissions should be granted only for areas approved under a master plan. Exceptions for large scale developments (say over 50 units for housing) should be considered by the Delta Regional Planning Council in cooperation with the appropriate national ministry. Building permits would continue to be issued at the city level but only for designated housing areas and prohibited in priority agricultural areas for other than

homes for farmers themselves and for necessary farm buildings. At present, all buildings on agricultural land without special permission are excluded with the result that no permissions are sought and building proceeds in an indiscriminate and disorderly fashion.

What is required in all of these cases is selective enforcement for priority areas, with primary responsibility at the governorate level. This seems possibly achievable given present staffing conditions. Thus, physical planning controls would be basically enforced at the governorate level under guidelines set for the regional level of the Delta by the coordination of the national government and the governorates concerned. The principal national government actor would be the Ministry of Development with important roles played by the Ministries of Planning, Industry and Agriculture. Some specific recommendations for areas for priority for housing and industrial location and protected agricultural status for Tanta have been made in the Tanta Illustrative Development Plan. That plan specifies types of industry and housing for specific areas of the city and recommends that the Tanta City center be redeveloped appropriate with its role as a regional service center and a selected special emphasis center for the Delta over the next 20 year period. Tanta, then, could serve as the first test for implementation of physical planning controls in the Delta.

## **VI. THE ADMINISTRATION OF THE CAIRO AND ALEXANDRIA METROPOLITAN AREAS**

### **A. Present Situation**

The Cairo and Alexandria metropolitan areas present special problems of administration of growth, both because of their size and the fact that their urban areas encompass parts of more than one governorate. Further, approximately 60 percent of the projected urban growth over the next 20 years will occur in these metropolitan areas. Thus, the management of these areas must be a primary concern for the successful execution of a national urban policy.

At present, both of these metropolitan areas suffer from the lack of an effective coordinating body to plan for the entire urban area and from fragmentation of government functions between a number of governmental agencies and semi-governmental bodies, such as the public sector housing and land development companies.

The Cairo metropolitan area consists of the Cairo Governorate and parts of the Giza and Qalyubia Governorates. In the past, efforts were made to provide for effective regional planning but at present no effective organization exists to coordinate development efforts in the metropolitan area. The Greater Cairo Planning Commission provided such an institutional focus between 1965 and 1973. However, since its dissolution coordination has been only on an informal basis, despite the provision for a Greater Cairo Regional Planning Agency as one of eight planning regions under the Local Government Law No. 43 of 1979. In addition, there are four metropolitan-wide special-purpose authorities that provide basic services: the



Greater Cairo Public Transport Authority, the Greater Cairo Water Supply Authority, the Greater Cairo Sewerage and Sanitary Drainage Authority, and the Greater Cairo Electricity Supply Company. These authorities started as semi-autonomous organizations. However, changes in the authority of the governorates under the various Local Government Laws since 1975 have placed them, to some degree, under the supervision of the governors concerned. Thus, the Greater Cairo Sewerage and Sanitary Authority has a board of directors consisting of 13 members, 6 selected by the Cairo Governor (one as a governorate representative) and one each selected by the Governors of Giza and Qalyubia. Any of the governors can call a meeting of the board and the Governor of Cairo will preside at any meeting which he attends. In addition, all decisions of the Board must be approved by the Governor of Cairo.

However, there is no metropolitan-wide organization for physical or economic planning. The Master Plan developed by the Greater Cairo Planning Commission has not been actively enforced, partly due to the lack of a national physical planning law to provide an adequate legal basis. In addition, the fragmentation of authority for development has exacerbated the process. Large scale development projects in Nasr City, Maadi, and Heliopolis are under the authority of separate public housing and land development companies which are independent of the Cairo Governorate, although the Governor of Cairo serves as Chairman of the Board of the Nasr City Company. This semi-independent status has led to problems of coordination with directorates of the Governorate. Further, the development of the new cities and satellite cities is under the control of the New Urban Communities Authority, whose board does not include representation from the governorates. Finally, the semi-autonomous status of the four public infrastructure authorities mentioned above has meant that water, sewerage, transport and electricity plans have been made independently of each other although the execution of such plans is clearly interrelated. In addition, their service areas are not exactly overlapping. Thus, functional fragmentation remains a major problem in the Cairo metropolitan area.

The second problem area is that of structural fragmentation. The present government structure of the Cairo metropolitan area no longer reflects the characteristics of its population. Thus, the city of Cairo has the powers of both a governorate and a city, while the two other major urban centers of Giza city and Shoubra El Kheima city have only the powers of a city. Further, the territorial division and powers of the lower units (urban quarters) are not sufficient. The present such subdivisions do not reflect historic, socio-economic and physical characteristics of the sites. Thus, Maadi and Helwan, two very different communities, are joined in the same urban quarter. Their needs are very different and it is difficult to encourage citizen participation in local government in such a situation. In addition, the urban quarters and districts have yet to be given sufficient powers and responsibilities to operate as effective units of local government. They are responsible for carrying out a number of important municipal functions -- issuing of building permits and licensing of shops, public cleanliness, maintenance of roads, public parks and government buildings, and enforcement of laws regulating entertainment. However, they do not have any independent financial or taxing authority and very little ability to influence the provision of basic services such as water supply and drainage, garbage collection and mass transportation supplied to their areas. In addition, the city of Shoubra El Kheima does not yet have any urban quarters.

Alexandria metropolitan area faces similar problems, although on a lesser scale. Its urban area now encompasses parts of the Beheira and Matruh Governorates, as well

as the Alexandria Governorate. However, there is no effective regional planning agency for the area and less informal cooperation between governorates than in Cairo.<sup>22</sup> The planning of New Ameriya City, located in Matruh Governorate, is not being considered by the Alexandria Governorate in its decisions regarding land use in areas between that new town and the city of Alexandria. Alexandria also has special purpose authorities for water, sewage and transport, as well as public land development companies which add to the problems of coordination of urban development.

The structural fragmentation problems in Alexandria appear to be less than those in Cairo, partly due to a lower number of immigrants which has meant that the urban quarters have not changed their composition to the same extent. Further, the chairmen of the urban quarters in Alexandria are given more responsibility by the Governorate to carry out day-to-day operations and to supervise construction works than is true in Cairo.<sup>23</sup> However, the same problems remain of lack of autonomy and of power to finance services than the urban quarter is responsible for carrying out. With regard to the hierarchy of governorates, Alexandria does not have other large urban centers located in its metropolitan area as does Cairo. Thus, the differences in resources are not so evident as in the Cairo metropolitan area.

#### B. Recommendations

To deal with the problem of functional fragmentation it is necessary both to strengthen the local units of government at the governorate level and below and to provide for a metropolitan entity to coordinate planning and development activities in Greater Cairo and Greater Alexandria. The set of recommendations regarding the strengthening of local units of government are similar for Cairo and Alexandria as for other governorates and have been discussed above in more detail in the section concerning the management of growth centers. However, the problem of metropolitan government is one that is unique to Cairo and Alexandria.

A metropolitan agency for Cairo and Alexandria should be specifically limited in scope so as not to impinge too strongly upon the basic local government structure of Egypt which is centered on the governorate. However, it would have to play a major role in any system for effectively controlling development. Planning and development controls are only effective if they are consistent for an entire urban area. In addition, physical plans themselves should be prepared and adopted at a metropolitan level to provide rationality in preferred locations for housing and industry while discouraging development in particular areas for reasons of protection of arable land and environmental policy. Thus, permissions for industrial location and the location of large-scale housing developments (over 20 units) should be approved at the metropolitan level. Master plans would also be approved at that level as well as detailed plans. It is at this level that a land development agency would most effectively operate, or at least this would be the level for the setting of policy and for coordination of land development implementation efforts.

Further, the metropolitan agency would be responsible for the planning and approval of basic infrastructure projects, especially for water, sewage and drainage, mass transportation and electricity. It would also be responsible for such environmental concerns as air pollution. These functions are now handled by the semi-autonomous public authorities which do not coordinate among themselves. It would be better if such functions were handled by one agency, which would also

provide that the functions are carried out for the same service areas rather than varying service areas, as at present.

This metropolitan body should be a policy-making and planning agency rather than an implementing agency. It would not have separate taxing powers and only a small staff. It would rely upon the governorates and cities for enforcement of its policies. Its Board of Directors would consist of representatives of the governorates concerned, as well as representatives of the cities, villages and districts whose boundaries are within the designated urban area. The Board might also consist of representatives of the various national ministries concerned, as did the Greater Cairo Planning Commission. Such membership would provide a direct formal channel to the ministries concerned with basic infrastructure projects. However, it would also weight the membership of the Board toward central government agencies and, thus, away from the effective implementation of a decentralization policy. For that reason, it would be preferable to keep the metropolitan body as an agency of the governorates concerned rather than an agency of the national government.

The boundaries of the metropolitan regions should be changed over time, reflecting changes in location of urban population. The initial boundary of the Cairo metropolitan area would be the entire Governorate of Cairo, plus the cities of Giza and Shoubra El Kheima and the new towns of 10th of Ramadan, 6th of October, 15th of May, El Amal and El Obour. The initial boundary of the Alexandria metropolitan area would be the entire Alexandria Governorate, part of West Alexandria, New Ameriyah City the city of Kafr El Dawar and possibly Idku. The boundaries would include basically urban populations. It might be possible to get better control over the use of arable land with expanded boundaries that include rural areas. However, it is more likely that the provision of basic infrastructure services to or near to such designated areas would encourage development without providing control.

The need for such a metropolitan coordinating agency is most urgent in Cairo, although the Alexandria region also has tremendous problems of coordination of developments as indicated in the Alexandria Concept Plan.

## NOTES

### CHAPTER VII ADMINISTRATION OF THE PREFERRED ALTERNATIVE

<sup>1</sup> The Deputy Prime Minister for Economic and Financial Affairs was recently replaced (January 4, 1982).

<sup>2</sup> A reorganized Central Agency for Organization and Administration might also be able to carry out this implementation function as its head holds the rank of Minister. It should be noted that the previous Cabinet formed in 1975 did include a Minister of State for Administrative Development and a Minister of State for Control and Follow-up.

<sup>3</sup> Law No. 119 of 1980.

<sup>4</sup> See Sobhi Moharram, Albert Gorvine, F. ElKhatib, Organization of the Government of Egypt: Administrative Framework in a National Urban Policy (Cairo: National Urban Policy Study, February 1981), Figure 11, p. 30.

<sup>5</sup> There have been three major local government laws or amending laws in the last six years: Law No. 52 of 1975, Law No. 43 of 1979 and (Amending) Law No. 50 of 1981. See Sobhi Moharram and Albert Gorvine, Decentralization in Egypt. Law and Practice (Cairo National Urban Policy Study, October 1980) for a description of the first two of these laws and of their predecessor, Law No. 124 of 1960.

<sup>6</sup> See J. Jaffe, The Public Financing Aspects of NUPS (NUPS, October 1981), Table 2, p. 3, with data taken from the Ministry of Finance as reported in IMF, Arab Republic of Egypt: Recent Economic Developments (January 16, 1981), p. 76.

<sup>7</sup> IBRD, Arab Republic of Egypt, National Urban Sector Report (draft) (February 1981), Table 2.2.

<sup>8</sup> See Samuel A. Sherer, Legislative means of Regulating Urban Development in the Arab Republic of Egypt: Current Situation, Recommendations for Change and Comparison with Other Countries (NUPS, May 1981); Samuel A. Sherer, Industry: Controls and Incentives for Development in the Context of a National Urban Policy (NUPS, April 1981); Wesley Weidemann, The Agricultural Resource Base: Status and Expectations (NUPS, December 1980); and Samuel A. Sherer, The Protection of Agricultural Land: A Legal and Administrative Discussion (NUPS, March 1981.)

<sup>9</sup> The present draft of the 1981 Planning Law gets rid of the exception contained in a previous draft by which subdivisions that did not include modernized roads were

excluded from the statute, as well as the exceptions in Law No. 52 of 1946 for areas where all plots are not directly located upon an existing road, for areas where no new roads are created, and for Heliopolis and other subdivisions which are provided with their own special regulations. Thus, the latest draft covers all subdivisions. However, subdivisions which are not created for the purpose of construction and do not require the opening of new streets need be approved only by the local planning unit and not also by the Local People's Council (Article 7).

10 Specific notations of articles in the 1981 Physical Planning Law are to the version approved by the Housing Committee of the People's Assembly in August 1981.

11 Thus, the discussion of penalties found in the First Round Alternatives must be updated, as above.

12 See Wesley Weidemann, The Agricultural Resource Base: Status and Expectations (NUPS, December 1980); Wesley Weidemann, New Directions in Agricultural Policy: Relations to Industrial and Urban Development (NUPS, August 1981); and Samuel A. Sherer, The Protection of Agricultural Land: A Legal and Administrative Discussion (NUPS, March 1981). See also the Cairo and Alexandria Concept Plans and the Tanta and Qena/Naga Hamadi Illustrative Development Project.

13 A number of strong provisions regarding the use of arable land for urban development are also 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 fact, this latter provision extends the prohibitions of Law No. 59 of 1973 to land under the control of this authority.

14 Approximately 35 percent of the land within the boundaries of the city of Tanta is agricultural land. See Tanta Illustrative Development Project.

15 This is not to ignore the difficulties of an institutional nature, among others including a banking system not geared toward financing the risky ventures of entrepreneurs, difficulties in obtaining necessary government permits, and problems in getting goods into the country, that bedevil the development of industry in Egypt (see IFC, Report and Recommendations on Development of Capital Markets in Egypt Washington, January 1981), nor the lack of effective support for small-scale enterprises (see World Bank, Survey of Small-Scale Industry in the Arab Republic of Egypt, (Washington, December 1977).

16 However, it should be noted that the most recent Landlord-Tenant Law took a step in the right direction by repealing Part 1 of Law No. 106 of 1973 which required committee approval for all buildings of cost of L.E. 5,000. The requirement of repairs for luxurious buildings only Law No. 136 of 1981, Article 12.

17 See Tanta and Qena Illustrative Development Project and Abt Associates, Informal Housing in Egypt (USAID, November 1981).

18 A more detailed discussion of the possibilities for a Land Development Agency is found in S. Sherer, Legislative Means of Regulating Urban Development in the Arab Republic of Egypt: Current Situation, Recommendations for Usage and Comparison with other Countries (NUPS, May 1981), pp. 46-52.

19 See extended discussion in Joint Housing Team, Urban Land Use in Egypt, Appendix, pp. 74-75, which suggests a rate of at least 3-4 percent annually.

20 Law No. 136 of 1981, Article 9.

21 Aerial mapping would be an enormous aid in the production of such plans and for subsequent detailed plans and site plans for specific infrastructure projects. It is also a necessary basis for improved land registration and property taxation and for the design of urban renewal. Most cities only have maps dating from the 1920's.

22 See NUPS, Alexandria Concept Plan.

23 See Foda, et al., Financial and Management Analysis Report of Local Government Units (USAID, June 1981).