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A SUMMARY STATEMENT ON THE INDUSTRIAL SECTOR

SINAI DEVELOPMENT STUDY - PHASE I

PERFORMED FOR THE ADVISORY COMMITTEE FOR RECONSTRUCTION
OF THE MINISTRY OF DEVELOPMENT

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1.0 INTRODUCTION

This optional working paper has been prepared in response to the Ministry's request for a statement on the industrial sector which could be used as a basis for discussion. Being for that purpose, it is not a comprehensive document, but rather a summary designed to briefly outline the pattern and scale of industry presently conceived and to bring out important issues of national policy and development strategy.

All of the data presented herein is preliminary, and there will be numerous changes and adjustments prior to issue of the final draft report. However, this should not alter the overall picture and general assessment.

2.0 NATIONAL POLICIES AND GOALS

Industrial plans for Sinai should be consistent with national trends as well as officially stated policies and goals. The following are among the more important objectives of the Central Government which are applicable to Sinai and vital to its successful development.

- Creation of Productive Employment Opportunity
- Development of Regional Mineral Resources
- Decentralization of Government Functions
- Private Sector Encouragement
- Sound Economic Growth

All of these considerations are operative in Sinai:

- The region has many inhabitants who are underemployed. Employment opportunity is needed for improvement of local living standards and for attracting new settlers.
- Sinai has long been known for its minerals and there are believed to be considerably more commercial deposits in the region than have been discovered to date.
- The special circumstances of Sinai create particular challenges in the public sector which call for accelerated action beyond the normal pace of the existing government structure. Sinai can become the leading wave in effective decentralization through institutional reform and special programs which can increase technical and administrative capability and the scope of executive authority in the local governates.
- Many of the industrial opportunities in Sinai are in the kinds of ventures which the private sector has successfully developed throughout Egypt. Hence much of the development potential will depend upon effective encouragement of private sector activity.
- Sinai is an integral part of Egypt. It's resources should be developed for sustaining contribution to the national economy. Investments in the region should be evaluated in this light, so that Sinai will grow as an asset, not a burden, to the national economy.

3.0 DEVELOPMENT STRATEGY FOR INDUSTRY

The history of Sinai suggests limited potential for settlement and economic development. However, there have been important technical advances and changes in recent times. Among these new factors are:

- Improved techniques in exploration and development in the fields of oil and gas, minerals and ground water
- Dramatic increases in the value of natural resources known or likely to be found in Sinai
- New technology in agriculture, food processing and related transport systems
- Jet age tourism commercial transport and freight movement
- Emergence of Egypt as an industrial nation
- The Egyptian/Israeli Peace Initiative and possibilities for a new gateway economy in Sinai.

These factors create new opportunities for important developments in the region. Following are some suggested elements in a strategy for government intervention to accelerate industrial growth.

3.1 BASIC RESOURCE DEVELOPMENT

3.1.1 Minerals

There are a number of well-studied projects in mining and mineral processing which can make a worthy contribution to the national economy. The principle materials are manganese, kaolin, glass sand and gypsum, all of which, while not sufficiently opportune to attract foreign investment partners, are nevertheless commercially viable. Actually, glass sand and kaolin are already being mined and it is hoped the others can be activated in the near future. The unknown minerals of Sinai may greatly exceed the discoveries of the past, and it is timely to undertake further exploration to determine the true extent of Sinai's mineral deposits.

3.1.2 Agriculture

It is an important national goal to take advantage of all viable possibilities in agriculture. Sinai has abundant land areas where the soils

and topography are suitable for crop production. Present supplies of irrigation water are limited and threatened with depletion; hence, a program for exploratory drilling in the more promising areas has been recommended. Realization of land reclamation potentials in Sinai will open up opportunities for a local agro-industry capable of exporting fresh produce and processed foods and vegetable oils to foreign markets.

3.1.3 Tourism

Tourism, already a major source of foreign exchange earnings in the Egyptian economy, can receive a substantial boost from the careful development of potentials in Sinai. In Sinai itself, this will contribute significant employment opportunity--directly in tourist facilities and indirectly in ancillary industries. Possibly the greatest stimulus to industrial growth resulting from tourism will be the attractions afforded to the commercial traveler. This will encourage new commercial ties and cooperative ventures with foreign interests and be a vital factor in development El Arish.

3.2 LABOR INTENSIVE INDUSTRY

The population centers of El Arish and Qantara represent assets for development of labor intensive, light industry in Sinai. Given the limits of local resources, such development represents the principle option and will be sorely needed. The industrial projections for this study will, therefore, include a variety of possible ventures in clothing and accessories, building materials, durable goods and furniture. These products will have ready markets locally and many have potential for markets outside Sinai. Their manufacture is the least difficult to establish financially, as such ventures have a typically low capital/output ratio.

3.3 BROAD INVESTMENT AND MARKET ORIENTATION

Sinai is to be considered an extension of the national community, not a province. While it has little industry, it should be able to attract established companies and entrepreneurs from outside the region to set up branches of their enterprises locally. Such organizations and individuals can establish new ventures with benefit of operating experience and market position, and they are able to bring in key personnel for supervision and management. These factors reduce risk and add to general efficiency and viability, making debt financing more readily obtainable. This concept of direct linkage with existing Egyptian industry should be particularly helpful in generating private sector activity.

New industry in Sinai will be oriented to local markets for the most part initially, but the ultimate success of the new industrial community will depend upon serving markets outside the region. Thus it is important strategy to encourage ventures that can produce goods for other Egyptian markets and for export. The community cannot sustain itself, prosper and expand if it focuses only upon its own local needs.

The location and geographic configuration of Sinai are favorable for outward reaching industrial growth. The coastline of the Gulf of Suez and the Suez Canal will afford ready access to ocean shipping, Egypt proper and the Canal cities in particular. El Arish is a potentially important trading center for commercial ties and joint enterprises with interests in countries to the east. This can grow to broader international ties, abetted by growth of air passenger and freight services. El Arish must be considered pivotal in the development process. It is possible, perhaps probable, that the Canal Zone will become the scene of very large refinery and petrochemical activity on a multi-billion dollar scale, with much of the output directed to international markets. The areas immediately east of the Canal may well prove optimum for such development with the added possibilities of considerable growth in "downstream" manufacturing based on the materials flowing from the major plants.

3.4 RAPID URBANIZATION

Urban growth fosters growth of industry. Concentration of population and commercial activity facilitates exchange of ideas, communications, complementary enterprises and sharing in the costs of infrastructure. The economic growth of Sinai will be quite dependent upon the growth of its cities.

To effectively promote urban growth in Sinai, it will be necessary to develop plans around special priorities and staging. In the present period, the demands of reconstruction are heavy and funds are limited. It is suggested that El Arish, because of its high economic and strategic importance to the region, should receive special, disproportionate attention.

Despite its long history, El Arish today is a young city entering a new period of growth prospects keyed to political/economic developments of national and international scope. Given its beautiful natural setting, strategic location and open, relatively uncongested and unspoiled conditions, there is opportunity at El Arish to create a city that is a fitting emblem of Egyptian progress and the Peace Initiative. It will be important to complete master plans for the city as soon as possible to energize the development process and prevent its natural assets from becoming spoiled or lost to improper land use. This applies particularly to the features of special value to tourism. The development of this sector, with facilities built to high standards and operated accordingly, will be a vital factor in advancing the international commercial importance of the city.

For successful development of El Arish, it will be necessary to strengthen the local capability in planning, public services and finance. The energy, dedication and local familiarity required to meet this challenge effectively is not easily generated in Cairo and other distant points. The Government's policy for decentralized controls will need to be implemented so that local government in Sinai can be more in command of its own destiny.

3.5 TIMELY DEVELOPMENT OF INFRASTRUCTURE

In Egypt today in the growing industrial centers, there are industrial districts of various kinds. These districts provide benefits in convenience and substantial savings in the investment and operating costs of infrastructure through the advantages of shared facilities and economics of scale.

In Sinai, at all locations most suitable for industry, the communities are young in terms of their future growth potential, and there is opportunity to lay out effective land use plans designed to facilitate realization of future goals. Land use plans for existing and future population centers should be prepared at an early date. These should include sufficient land areas for both industrial and related commercial purposes. This will preserve land needed for meeting growth objectives and prevent indiscriminate use, which would be damaging to new industry and tourism particularly.

At El Arish, it will be timely to go ahead with partial industrial district design as soon as particular zones have been selected and officially designated. It will then be possible to invite applications for parcels in the district at an early date to stimulate private sector activity. Advantages to future operators in such districts will be:

- Locations with good access to transportation arteries and systems
- Convenient nearby sources of support services and supplies
- Freedom from conflict with non-industrial functions and interests in the community
- Ready availability of utility services--electric power, water, waste disposal, communications and access roads
- Services and conveniences for workers, such as public transportation, training and recreation centers, day care and others.

Conditions and possibilities will vary with the community, but the purpose in all cases will be to make it more convenient and less costly to set up manufacturing and related operations at reduced risk. Sinai must organize itself and create incentives if it is to attract new industry. Providing necessary infrastructure in advance--on a reliable, timely and cost-effective basis--is one of the most forceful tools to assist that process.

An important concept for planning in Sinai is the industrial free zone. Free

zones in Egypt at the present time require improvement and additional investment to bring them up to a good physical standard. There is consequently some feeling that more zones should not be added until these remedial steps are completed. However, this should not discourage consideration of free zones in plans for the future.

At the present stage, the principle concern with respect to free zones would appear to be El Arish. With an international airport and a near-border location, ideal for joint-venture activities with Israeli partners, it is desirable to select suitable sites for future free zones now so that conditions will be favorable when the timing is right.

3.6 INSTITUTIONAL AND REGIONAL MANAGEMENT REFORM

Effective development of Sinai will obviously require continuation of government intervention with respect to all important sectors. There is virtually no significant industry in the region at this time except for the oil and gas activities along the Gulf of Suez coast. Projections of possible industrial development proceed into the 1980s from a standing start. A large portion of the projected employment is to be achieved by new private sector enterprises. The necessity of developing public institutions and organizations of special dedication, competence and understanding of the region is clear. This requires local competence in a structure of well-coordinated institutions with clearly delineated functions and well-defined authority.

The strategic importance of Sinai and plans to decentralize government functions should be helpful forces for bringing about useful institutional reforms. Particular objectives should be:

- regional coordination, control and administration of public sector investments
- strengthening of government entities within the region
- promotion of regional growth and private sector encouragement.

4.0 PROJECTIONS OF INDUSTRIAL POTENTIAL

A preliminary industrial profile has been in preparation as part of the Sinai Development Study. This is a projection of specific new enterprises at various locations and times during the 1981-2000 period which are considered logical and desirable, given the conditions such as distribution of population, local resources, policies of the Government and financial institutions and other factors.

Each item in the projection represents a venture in a specified line of manufacturing and production capacity, conceived to be built during a particular 5-year period within the scope of the Study. Capital costs are estimated for each venture in constant 1981 Egyptian Pounds. Estimates are order of magnitude and, where possible, based upon known costs of similar facilities built in Egypt or recently estimated in feasibility studies commissioned by the Government. Some are based upon outside references with rather extended adjustments for time and location factors, which can introduce considerable error. Feasibility of respective ventures is assumed for purposes of this study, but the actual feasibility of individual projects is unconfirmed in most instances.

Selected locations for various enterprises are based upon logistics, population projections for respective settlements and the known and predictable locations of energy, mineral and agricultural resources. Obviously, the accuracy of the forecast becomes more subject to error as the time reference advances into the future. However, regardless of deviations from the real future of Sinai, the value for planning and early action purposes should not be greatly affected.

Included in the data with each projected enterprise are its estimated requirements for land, employees, electric power and water so that supporting infrastructure needs for industrial growth targets in respective settlements and sub-regions of Sinai can be assessed and incorporated into the planning process. While such data is subject to error, being derived in similar manner to cost estimates, it is less subject to distortion in extrapolations and, in the aggregate, should be suitable for the given purposes.

Preparation of this industrial profile for Sinai has been approached with the idea of creating challenging growth targets for the region that will benefit the present and future people of Sinai and strengthen the national economy. Goals established in the projection are intended to be ambitious; however, in the interest of practicality, the projection favors activities already established elsewhere in Egypt. This will assist in making the skills and experience necessary for realization of respective projects more readily available from Egyptian sources. In a projection of this kind, there are many indeterminate factors. Different interpreters will have varying views as to whether the indicated growth targets can be achieved in the given twenty-year period.

4.1 PATTERN OF DEVELOPMENT

Table 4-1 is a simplified presentation of the industrial profile which lists the kinds of projects conceived and their geographical orientation. Further indications as to areas of greatest concentration and the timing and sequence of development is discussed in later sections. The letter coding in this table is to relate the various industries to the alternative development strategies which are presently under consideration. Actually, there is little effect from the differing strategies except in the food and packaging industries which are directly linked to the amount of land reclamation, which is the principle variable in the respective strategies. Other industries will not be so directly affected by varying levels of public investment, since they will involve private and foreign investment capital and development functions extending beyond Sinai itself.

The selection of industries in this profile is influenced primarily by the objectives to employ people more productively and utilize local natural resources to maximum benefit. Hence, we have a combination of labor-intensive, urban-oriented light industry and heavier, capital-intensive industry for adding value to locally extracted raw materials. This combination appears to be optimum for Sinai at this early stage. If successfully implemented, the purposes served will have high development impact and will not require inordinate investment in infrastructure. The profile includes the projects proposed in the Five-Year Plan (1981-85) and reflects patterns of growth occurring elsewhere in Egypt, consistent with the stated development strategy.

4.2 SEQUENCE AND TIMING

The evolution of the plan begins with islands of development with primary linkages to the local markets, local resources and industries outside Sinai. Local support activities providing materials and services will be stimulated immediately. As time passes, intra-regional linkages will evolve in the pattern of new ventures and eventually a well-integrated regional industrial base. This latter stage will begin to emerge late in the plan period.

Stages of development, according to the projected profile, would be generally as follows:

- Early emphasis will be upon development of light industry in El Arish and Qantara and upon activation of the mineral projects in west central Sinai. Growth of light industry will continue throughout the twenty-year period. The rate of growth is expected to exceed that of the local market as a result of successful penetration of markets outside Sinai. The food industry will grow according to the rate of land reclamation which hopefully will be to an extent that will permit substantial production of high value food products for export.
- Heavy industries in the fields of mineral processing, oil refining and chemicals will develop later in the plan period as a result of substantial increases in oil and natural gas production. These developments will be on a major scale--probably involving foreign participation and large exports of chemicals, fertilizers and refined products.

TABLE 4-1 PROJECTED CATEGORIES OF NEW INDUSTRIAL VENTURES AND LOCATIONS IN SINAI OVER TWENTY YEARS 1981-2000

	El Arish	El Qantara	East Bitter Lakes	East Suez	El Sudr	Abi Rudeis	El Qaa	El Tor	Other Locations
I. Food, Beverages, Oils									
Olive Oil	ABC		ABC						Bir El Abd ABC
Pickled Olives	ABC		ABC						
Date Processing	ABC								
Peanut Butter			ABC						
Vegetable Oil			ABC						
Tomato Paste			AB						
Fresh Produce Packing			A				AB		
Fresh Citrus Packing			AB						
Frozen Citrus Concentrate			AB						
Dehydrated Onions			A				A		
Flour Mill	ABC			ABC				ABC	
Bakery	ABC	ABC							
Ice Making		ABC	ABC	ABC	ABC	ABC	ABC	ABC	Bir El Abd ABC, Lake Bardawil ABC
Ice & Cold Storage	ABC		AB				AB	ABC	
Fresh Fish Processing	ABC							ABC	Lake Bardawil ABC, Bit El Abd ABC
Beverages	ABC	ABC		ABC				ABC	
Bee Hive Products	ABC								
Dairy	ABC	ABC						ABC	
II. Clothing and Accessories									
Ready Made Garments	ABC	ABC							
Cloth & Canvas Products	ABC	ABC							
Leather Goods	ABC	ABC			ABC			ABC	
Footwear - Leather, plastic	ABC	ABC			ABC			ABC	
III. Building Materials									
Sand and Aggregates	ABC	ABC		ABC		ABC		ABC	Various
Concrete Products	ABC	ABC		ABC				ABC	
Clay, Brick and Tile	ABC	ABC		ABC				ABC	
Wood Sash and Door	ABC	ABC		ABC				ABC	
Metal Doors and Fittings	ABC	ABC		ABC				ABC	
Steel Fabrications	ABC	ABC		ABC		ABC		ABC	
Sheet Metal Products	ABC	ABC						ABC	
Paint	ABC	ABC						ABC	
IV. Durable Goods, Furniture									
Wood Furniture	ABC	ABC						ABC	
Bedding	ABC	ABC							
Metal/Plastic Furniture	ABC	ABC							
Metal Ware	ABC	ABC							
Solar Heaters	ABC	ABC						ABC	

NOTE: Letter designations refer to alternate development strategies:
(See Sinai Development Study, Working Paper No. 20.)

A - Maximum Population Absorption
B - Moderate Growth
C - Efficient Acceleration

Continued on next page.

TABLE 4-1 Continued

	El Arish	El Qantara	East Bitter Lakes	East Suez	El Sudr	Abu Rudeis	El Qaa	El Tor	Other Locations
V. Packaging Products									Umm Bugma ABC Abu Zenima ABC El Khabouba ABC Ras Malaab ABC
Glass Containers						ABC			
Metal Containers			AB				A		
Corrugated Containers			AB				AB		
Coated Paper Containers			AB						
VI. Mining & Mineral Processing									
Manganese Mine									
Ferro-Manganese Smelter									
Glass, Sand Mine						ABC			
Kaolin Mine									
Gypsum Mine & Calcining									
Flat Glass						ABC			
VII. Refinery and Chemical									
Oil Refining				ABC					
Petrochemicals				ABC					
Fertilizers				ABC					

4.3 CAPITAL REQUIREMENTS

Tables 4-2 and 4-3 present a summary of the Industrial Profile for the periods 1981-85 and 1981-2000, respectively. Listed are the principle categories of industry foreseen and the scale of development they represent in terms of investment capital and direct employment. A striking consideration in evaluating this profile is the potential role of the private sector, which would be expected to play a dominant role in the first four categories listed. In Table 4-3, for the full period 1981-2000, these four categories represent:

- 80% of potential industrial employment versus
- 22% of potential investment capital requirements.

This suggests that a substantial boost to resettlement and productive employment in Sinai can be achieved by mounting effective efforts to attract and support a vigorous private sector in the region, especially at El Arish.

The data in Table 4-3 for the period 1981-85 indicates that active programs will be called for in all categories excepting refinery and chemical products, which will be dependent upon future oil and natural gas discoveries in the Gulf of Suez and Canal areas. The importance of private sector motivation will apply in this early period as well, and supporting programs for this purpose should be established as soon as possible.

TABLE 4-2
 PROJECTED INDUSTRIAL EMPLOYMENT AND INVESTMENT
 1981-1985

Industrial Category	Employment	Investment LE 000	
		Foreign	Local
Food, Beverages, Oils	665	11550	8700
Clothing and Accessories	750	2780	1370
Building Materials	790	4300	3550
Durable Goods, Furniture	590	2600	1600
Mining and Mineral Processing	960	40000	16500
Refinery and Chemical	-	-	-
TOTAL	3755	61230	31720

TABLE 4-3
 PROJECTED INDUSTRIAL EMPLOYMENT AND INVESTMENT
 1981-2000

Industrial Category	Employment	Investment LE 000	
		Foreign	Local
Food, Beverages, Oils	4020	73620	46980
Clothing and Accessories	13690	45260	23640
Building Materials	2395	12480	10460
Durable Goods, Furniture	1480	6700	3900
Mining and Mineral Processing	4060	150000	76500
Refinery and Chemical	1000	386000	167000
TOTAL	26645	674060	328480

4.4 REGIONAL IMPACT OF PROJECTED INDUSTRY

Tables 4-4 through 4-7 summarize the impact which the projected industry will have upon various communities and settlements if development proceeds at the assumed rate. The purpose of the data in these tables is to assist planners in anticipating infrastructure requirements in the respective population centers imposed directly and indirectly by the projected industrial growth, if successfully realized. The data will be affected by adjustments in the industrial profile which are currently in progress and will be incorporated in the Final Draft Report. However, this will not significantly affect the overall picture of regional impacts as reflected here. Data in these tables would apply in general magnitude to any of the three development strategies under discussion.

4.4.1 Employment

The data in Table 4-4 illustrate that El Arish and El Qantara will be particularly important areas with respect to development of employment opportunities. This applies in the early phases and throughout the plan period by virtue of existing and anticipated population at these locations. Employment at locations designated as "Other" is accounted for primarily by the mining projects of West Sinai, which are currently in early stages of development, and the Maghara coal mine project, which is assumed to begin operations between 1986 and 1990. The bulk of employment in other locations would be generated after 1990 with maturing of agricultural development in the East of Bitter Lakes and El Qaa regions and with possible further development of major scale in oil and natural gas activities. The latter are conceived as the basis of prospective large projects in the Abu Rudeis vicinity (flat glass and refractories) and the Canal Zone--possibly at East Suez--(refinery and chemical activities).

4.4.2 Industrial Land Requirements

Table 4-5 shows the land area requirements of the total industrial projection. A particular advantage in Sinai is the existence of considerable open, unoccupied land at this time in all locations conceived to have important industrial potential. Compared to the amount of land area that is

TABLE 4-4

INDUSTRIAL EMPLOYMENT

PERIOD:	1981-85	86-90	91-95	96-2000	TOTAL
AREA:					
El Arish	1555	3210	2075	3705	10545
El Qantara	905	890	2885	550	5230
E. Bitter Lakes	20	100	500	715	1335
East Suez	-	-	1380	780	2160
El Sudr	75	-	330	230	635
Abu Rudeis	90	-	2125	-	2215
El Qaa	-	25	105	685	815
El Tor	115	145	900	225	1385
Other	995	1135	115	80	2325
TOTAL	3755	5505	10415	6970	26645

TABLE 4-5
INDUSTRIAL LAND REQUIREMENTS
Feddans

PERIOD:	1981-85	86-90	91-95	96-2000	TOTAL
AREA:					
El Arish	59	62	37	53	211
El Qantara	34	25	40	10	109
E. Bitter Lakes	3	9	37	36	85
East Suez	-	-	556	6	562
El Sudr	4	-	4	4	12
Abu Rudeis	-	-	82	-	82
El Qaa	-	2	9	45	56
El Tor	6	7	31	4	48
Other	6	6	6	4	22
TOTAL	112	111	802	162	1187

apparently available, the requirements indicated in this projection are quite small. This should make it possible at all the indicated locations to establish land use plans with adequate zoning for industry. Since the areas indicated in the table apply only to new manufacturing ventures, it will be prudent to provide for considerably larger industrial zones than indicated in this data to assure that adequate land is reserved. This will allow space for other commercial uses commonly located in industrial districts and for the possibility that the present projections are too conservative. It should also be recognized that growth will continue beyond the year 2000--another reason for taking a liberal position in zoning for the future. It is recommended that, in the respective settlement areas, land use plans provide for four to five times the areas specified in Table 4-5.

4.4.3 Industrial Electric Power Requirements

The industries selected in this projection as suitable for the next twenty years in Sinai are not heavy electric power consumers on the whole. It follows that the economics of the power supply will not be particularly critical, nor will there be demand for disproportionately heavy outlays of investment capital for major electric power systems. Table 4-6 shows the electric power requirements of projected new industry in terms of connected load.

In the principle centers, El Arish and El Qantara, light industry will prevail and electric power requirements are little more than one kilowatt per employee. In the period 1981-85, there are two potential consumers of note --the ferromanganese smelter at Abu Zenima (15,000 kilowatts) and the gypsum plant at Ras Malaab (3,600 kilowatts). Since the smelter represents a fairly substantial requirement, it will almost surely pay to use the natural gas energy available in the Abu Rudeis region to generate the necessary power. There are several alternatives for this which, depending on final study and determination, would mean generating power at Abu Rudeis and transmitting to Abu Zenima or pipelining gas to Abu Zenima for generation of power locally there, as was planned earlier and actually installed prior to the Israeli occupation.

Power from this general area might be transmitted further north to Ras

TABLE 4-6
INDUSTRIAL ELECTRIC POWER REQUIREMENTS
Kilowatts

PERIOD:	1981-85	86-90	91-95	96-2000	TOTAL
AREA:					
El Arish	2305	3750	2330	4340	12725
El Qantara	1335	915	3030	620	5900
El Bitter Lakes	60	650	1020	960	2690
East Suez	-	-	32290	270	32560
El Sudr	380	-	390	250	1020
Abu Rudeis	-	-	14300	-	14300
El Qaa	-	300	480	1115	1895
El Tor	630	445	1210	250	2535
Other	19020	4380	400	80	23880
TOTAL	23730	10440	55450	7885	97505

Malaab to supply the gypsum plant. The distance is only 50 kilometers or so from Abu Zenima, and it seems a practical possibility. Proper assessment of the alternatives for best use of the fossil fuel supplies in Sinai cannot be made on the basis of factors in Sinai alone. These issues can be satisfactorily resolved only by careful study in a full national context in cooperation with the Ministries of Petroleum and Electricity to assure the necessary integration with planning of their respective agencies.

4.4.4 Industrial Water Requirements

The industry projected for Sinai will not impose much burden on the region's limited water resources (Table 4-7). The only substantial demand would be in the possible major refinery and chemical operations of the later years. These, which are considered a likely possibility by 1991-95, are expected to be located in the Canal Zone where Nile River water could presumably be made available without undue strain on local supplies. The industrial requirements in all areas will tend to be small in comparison to planned consumption for irrigation.

4.4.5 Environmental Factors

The industrial developments conceived in Sinai should not create any difficult problems in the physical environment. Given the timing of these projections, all of the activity of the first ten years that occurs in or near centers of population will be light industry in which problems of effluents and other disturbances will be minimal. In fact, such development, properly organized in well-planned districts, can be quite attractive and enhance the local environment, both physically and socially.

The mining and mineral processing activities at Abu Zenima and Ras Malaab will generate some air pollution; however, these plants will be at relatively isolated locations and with careful site selection and separation from family housing, there should be little problem.

The developments foreseen later in the refinery and chemical fields would presumably be very large installations and, depending upon location factors, more likely to create air pollution and waste disposal problems

TABLE 4-7

INDUSTRIAL WATER REQUIREMENTS
Cubic Meters per Hour

PERIOD:	1981-85	86-90	91-95	96-2000	TOTAL
AREA:					
El Arish	106.5	97	24	103	330.5
El Qantara	89	12.5	17.5	6	125
E. Bitter Lakes	0.5	72.5	61.5	145	279.5
East Suez	-	-	1531.5	7	1538.5
El Sudr	74	-	2	2	78
Abu Rudeis	-	-	104	-	104
El Qaa	-	70	74.5	80	224.5
El Tor	75.5	73.5	16.5	2	167.5
Other	107	80	78	8	273
TOTAL	452.5	405.5	1909.5	353	3120.5

that could adversely affect local living conditions in the general area. When such facilities are considered, fairly comprehensive environmental studies will doubtless be advisable. It would be assumed that special sites and areas important to tourism will be identified and set aside very early in the planning period, in order to prevent their being spoiled by conflicting industrial activity.

5.0 EARLY ACTION PROGRAMS

5.1 MINERALS IN WEST SINAI

There are a number of mining and mineral processing projects already under development in West Sinai by Sinai Manganese Company which include a manganese mine, ferromanganese smelter, glass sand mine, kaolin mine and gypsum mine and calciner. Owing to the location factor, it is not anticipated that forward integration of these activities will take place in the immediate area for some time, but it does appear that these basic projects will all go forward.

When the decision is made to proceed with the ferromanganese smelter, a study should be undertaken to determine best options for establishing electric power in the general area of Abu Rudeis or Abu Zenima, using the locally available natural gas. This study should include analysis of future development prospects for the local area and South Sinai and propose system specifications accordingly. These mineral developments are not expected to have great impact on human settlement in West Sinai, as these activities tend to operate in isolation with general self-sufficiency and small numbers of employees.

5.2 AGRO-BUSINESS

At El Arish, there appear to be immediate opportunities to improve returns from locally grown olives and dates. With extension activities, it should be possible to increase olive production and build more capacity for production of olive oil and pickled olives of improved quality. Oil production should be sufficient to warrant an ancillary operation to produce soap from

the non-food grade portions of the oil for added value. Also, at El Arish or elsewhere in North Sinai, one or more facilities can be set up to collect, classify, ripen and package dates for marketing profitably outside the region. Both of these projects should be the objects of feasibility studies as soon as possible to determine optimum location of facilities, plant specifications and organizational plans in each instance. Other opportunities for important new developments in agro-business will come later, depending upon progress in land reclamation--particularly in the East of Bitter Lakes and El Qaa regions. The Rafah Strip, with its 15,000 feddans, will probably have significant early impact on food processing in El Arish, but this has not been evaluated in the present circumstances.

There are quite a number of planned public projects in the food category, some of which are being implemented now. They are for food security, involving such things as ice plants, cold storage facilities, flour mills and bakeries. The details of study underlying these plans are not presently clear, but there is little reason to question the benefits to be realized, if the scale of the various installations is appropriate to local needs. Ice plants and process facilities at places like El Tor, El Sudr and Lake Bardawil are consistent with analysis made of fishing industry conditions made during this study.

5.3 LABOR INTENSIVE LIGHT INDUSTRY

All of the early action projects referenced above are conceived as direct public sector activities. The remaining fields cited in our projections--clothing and accessories, building materials, durable goods and furniture--are considered prospects for the private sector. However, certain government actions are vital to their development and should be undertaken as soon as possible.

The focus of early action should be at El Arish, which has the greatest early potential. El Arish should complete a land use plan with industrial zoning as soon as possible. It should then prepare terms and specifications for an industrial district and enact these in law so that prospective occupants can be reliably informed and effectively solicited. The initial pro-

gram should be as simple as possible, involving no public facilities other than land parcels in appropriate sizes, road accesses and utility services --power, telephone and water. Additional facilities can be negotiable.

As soon as the details have been determined, a program of promotion should be initiated. This should be directed to top officials of established companies in the fields outlined in the industrial projections for El Arish. Some contacts would be advisable while plans are being formulated, in order to identify key questions, problems, and useful ideas. The promotional effort will be most effective if it takes the form of personal contacts and survey work by well-informed, qualified representatives of the North Sinai Governorate. Similar programs of appropriate scale and timing should be extended to other settlements, such as El Qantara, El Sudr, Abu Rudeis and El Tor.

5.4 FINANCING SERVICES

In Sinai, much of the future prospect for a productive population will depend upon developing activity in labor intensive industry, which strongly implies a vital, enterprising private sector. This will require financing resources in the form of extended term loans and venture capital. It also suggests financing as a promotional tool to attract industry to Sinai, because private sector financing in Egypt is generally difficult.

El Arish is a particularly important location in this regard. It is the main urban center of Sinai, where human resources are present and most likely to increase. Being remote from other urban centers, it needs to have its own local financial institutions to help get new enterprises started and to grow along with them. Projections for industrial financing at El Arish from the present to 1985 indicate possible order of magnitude investment capital requirements of LE 11 million in foreign and LE 8 million in local currencies. Most of this will be needed by small private sector companies without benefit of a foreign partner to share in the investment.

A private investment encouragement fund (PIEF) to assist projects in Sinai

would probably help this situation. This concept, under development by USAID, calls for establishing a foreign currency fund for lending to the private sector through local banks such as the Development Industrial Bank. Lending would be administered under prescribed standards for assessment for feasibility and risk. It is suggested that a special PIEF could also be established at El Arish by the Egyptian Central Bank in local currency. This would complement the foreign program and add to its effectiveness.

To be of benefit, loan funds have to be utilized; and this will be aided by attracting qualified loan applicants--another reason to concentrate upon effective solicitation of established companies at the outset. There are also various policies which could be instituted to liberalize terms and improve the pace of development.

5.5 REGIONAL GOVERNMENT

In Egypt at the present time, basic enactments of law and organization are in place that should transfer much of the planning functions to the individual governorates and regional groupings thereof. This has not resulted in much change in the active situation, however, because it has not been possible to transfer budgetary authority and investment decision-making from the central agencies. Not only does such authority remain in the General Government; it receives plans and proposals from the Governorates in a fragmented form which confuses the process at all levels and leads to delays and inconsistencies.

There are many problems in the governmental workings which are of national character, obviously difficult to resolve and certainly beyond the scope of the Sinai Development Study. But it is evident that the present working arrangements, as they affect Sinai, will lead to costly delays and lost opportunities for the region, if some special measures are not taken.

The problem is one of management and organization. There needs to be a new regional entity with clearly defined authority over projects in the region and control over all functions so that its programs year-to-year are fully

coordinated, with planned events occurring on schedule and in proper sequence. Such performance capabilities can hardly be realized under the present government structure.

The present discussions concerning a possible regional authority to control the planning and administration of public projects in the region are constructive and could lead to useful reforms. In the interim, while this is in progress and continues in abeyance, it will be prudent to develop programs for direct assistance to the governorates which can be implemented under the present structure, pending further developments in governing the region.