D. Trends and Projections

(i) Industry

20. The estimated labor productivity of the industrial sector in Egypt including the petroleum sector is L.E. 13,347 (at 1981/82 prices) in 2005. Assuming that the productivity of the industrial sector in the Study Area is the same as the national average, the GRP of the industrial sector in the Study Area in 2005 is estimated at L.E. 1,783.7 million considering the estimated labor force in the industrial sector of 137,600 persons. Thus, the estimated annual growth rate of the labor force in the industrial sector is 9.1% and that of the GRP of the industrial sector is 15.2%.

21. Industrial development in the Study Area will aim to increase manufactured exports, produce substitutes for imports, promote decentralization of population and industry, utilize local resources, upgrade the industrial structure and encourage industrial investment by the private sector.

22. In order to rectify the growing deficit of the country's balance of payments, a two-pronged approach could be taken in the manufacturing sector: to promote manufactured exports and at the same time to accelerate the production of substitutes for imported goods.

23. In order to promote decentralization of population and industry, it is desirable to introduce into the Study Area those existing industries in Cairo which may need to relocate their production facilities due to such factors as physical limitations for expansion, traffic congestion, and pollution control. Also, industries which are considered labour-intensive should be given high priority to provide more job opportunities.

24. The Study Area and its surroundings is rich in mineral resources such as dolomite, limestone, white sand, gypsum, manganese, kaolin and phosphate. Thus it is appropriate to introduce industries which will utilize these indigenous resources as their main inputs. Also, infrastructures in the Study Area such as roads, railways, ports and harbours, power and water supply, telecommunications and housing should be properly utilized for industrial development.

25. To upgrade the present industrial structure in order to achieve the projected industrial growth, it is desirable to promote basic materials industries and processing and assembly industries. New technologies and process related to recycling of water and energy should be encouraged not only for conservation purposes but also as environmental controls.

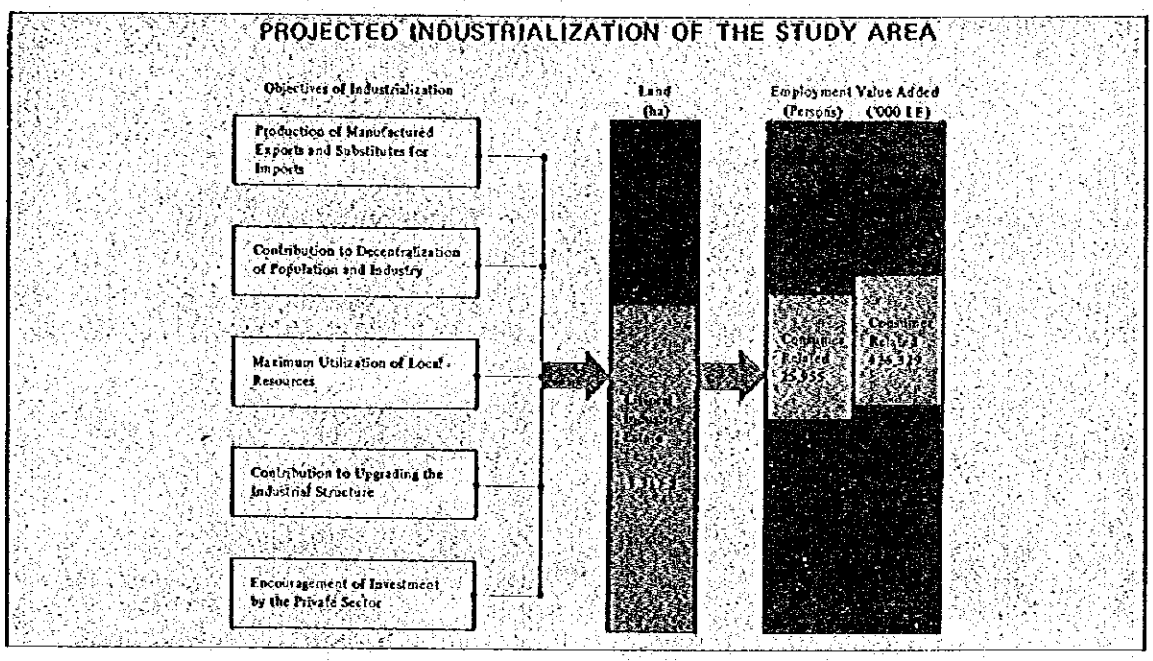
26. The public sector has played a significant role in the past industrial development, but is now facing problems of inefficient operation due to the bureaucratic management system which has resulted in higher costs of production, a lack of sophisticated marketing technology, and other problems. Encouragement of the private sector to play a more active role is a "must" to vitalize the Egyptian economy and make Egyptian products competitive in both domestic and international markets.

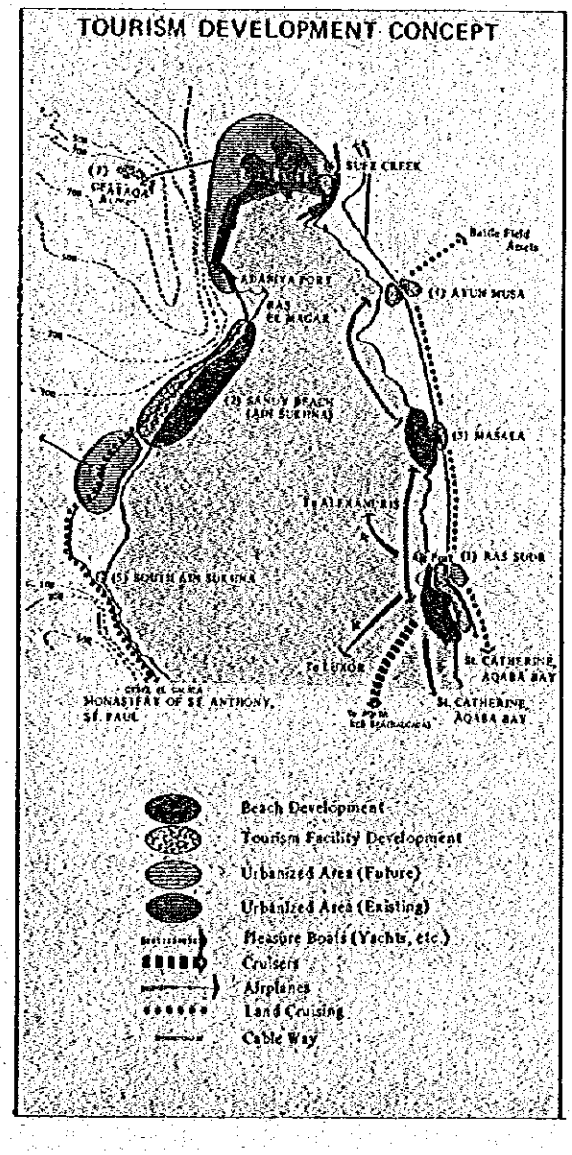
27. Considering the above-mentioned targets, or projections, for industrial output and employment, consumer-related industry (food, textiles, apparel, wood & wood products, furniture, rubber and miscellaneous), basic materials industry (pulp & paper, chemicals, petroleum, non-metalics, iron & steel and non-ferrous metals) and processing & assembly (general machinery, electrical machinery, transportation equipment and precision machinery) are projected to newly employ 26,000 persons, 46,200 persons and 37,300 persons, respectively.

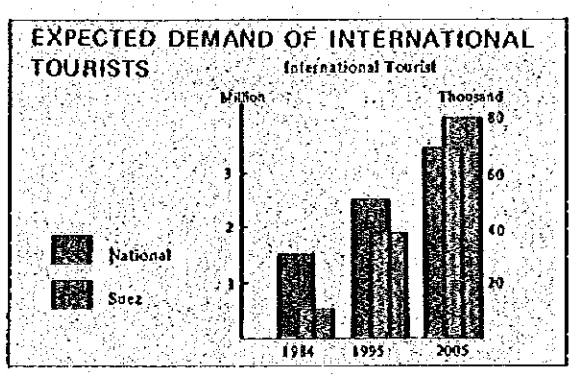
(ii) Tourism Development

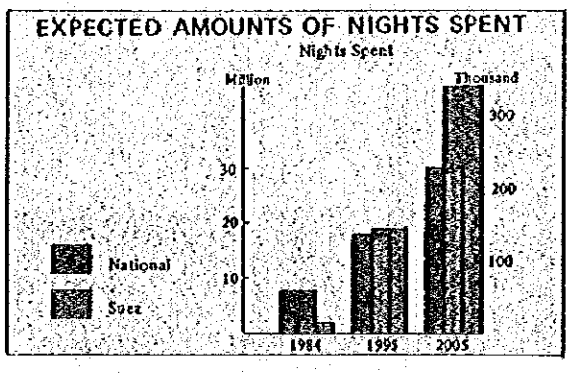
28. The Suez Bay Coastal Area has the potential to become a popular domestic tourist regions. The area can be promoted as a tourist spot by improving the transportation infrastructures which connect Suez with Cairo. The number of domestic tourists is projected to increase with the rising standard of living and increased urbanization. The study area also has the potential to become a spot for international tourists. Although the beaches cannot compete with those along the Red Sea or Aqaba Bay, improving the resort facilities in the Suez area will help to attract some international tourists.

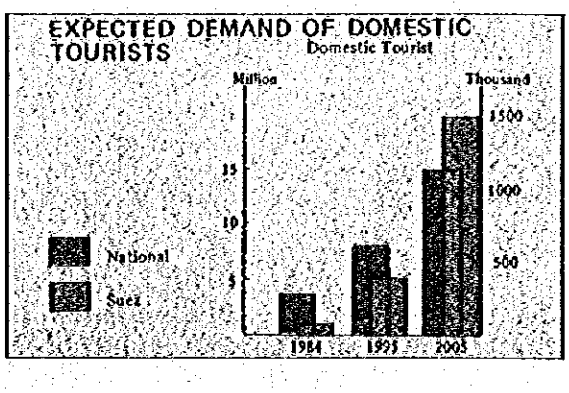
29. Based on the assumption that 5% of the toursits from the Arab countries and 1% of the tourists from other countries visiting Egypt will visit the Study Area, the number of international tourists is estimated as 38,000 and 81,000 in 1995 and 2005, respectively.


PROJECTED INDUSTRIALIZATION OF THE STUDY AREA
Objectives of Industrialization
Production of Manufactured Exports and Substitutes for Imports
Contribution to Decentralization of Population and Industry
Maximum Utilization of Local Resources
Contribution to Upgrading the Industrial Structure
Encouragement of Investment by the Private Sector
Land (ha)
Employment (Persons)
Value Added ('000 LE)


TOURISM DEVELOPMENT CONCEPT
SUEZ CREEK
ADABIYA PORT
(1) AYUN MUSA
(3) MASAKA
(5) SOUTH AIN SUKHNA
(1) RAS SUDR
St. CATHERINE AQABA BAY
MONASTERY OF ST. ANTHONY, St. PAUL
Beach Development
Tourism Facility Development
Urbanized Area (Future)
Urbanized Area (Existing)
Pleasure Boats (Yachts, etc.)
Cruisers
Airplanes
Land Cruising
Cable Way


EXPECTED DEMAND OF INTERNATIONAL TOURISTS
International Tourist
Million
Thousand
National
Suez
1984
1995
2005


EXPECTED AMOUNTS OF NIGHTS SPENT
Nights Spent
Million
Thousand
National
Suez
1984
1995
2005


EXPECTED DEMAND OF DOMESTIC TOURISTS
Domestic Tourist
Million
Thousand
National
Suez
1984
1995
2005

30. Although the Mediterranean coast is likely to maintain its popularity as a domestic holiday resort area, the Suez Bay Coastal Area could attract a large number of domestic holiday makers. The projected number of domestic tourists per annum is 1.1-1.9 million in 2005.

31. Based on the assumption that 5 percent of the urban population will make day trips to the seashore on peak days as suggested in the Suez Canal Regional Tourism Development Plan, 45,000 day-trippers will visit the study area in 2005.

(iii) Urban Development

32. Based on the average size of household in the Suez Governorate, 4.8 persons in 1976, the number of households in the area is estimated as 51.9 thousand in 1985. In the Sinai side of the study area, it is estimated that there are about 9 thousand people and 1.5 thousand households in 1985. Then, the total number of households in the Study Area is estimated as 53.4 thousand in 1985.

33. Based on the assumption that the size of household will decrease to 4 persons in the target year 2005, it is estimated that the total number of households in the Study Area will be 225 thousand in 2005.

34. In 1980, the number of students is 56 thousand. According to the World Bank data for Egyptian primary school enrollment, the average enrollment is 74% in 1978, and the enrollment ratio increased by about 8% from 1960 to 1978. However, the primary school enrollment in urban areas is about 100%.

35. Based on the target enrollment ratio and the population forecast, the number of students in 2005 is estimated as 108,000 for primary school, 54,000 for preparatory school, 15,600 for general secondary schools and 27,600 for technical secondary schools.

(iv) Traffic Demand

36. Cargo passing through the ports in the Study Area in the future can be classified into two broad categories: international cargo from the hinterland of the Ports and cargo which will arise from the newly proposed industrial complex. Bulk petroleum is handled at the petroleum basin in the Port Ibrahim and buoys at the SUMED oil terminal. It has no effect on the handling of other cargo and has, therefore, been excluded from this analysis.

37. The forecast of this study is first made for the year 2000 by critically reviewing and revising ENTS III (including ENTSII) and NPFT figures based on the most recent data and information, primarily from CAPMAS. After comparing the new projections and various past projections, Egyptian foreign trade by commodity group and by import and export for the years 1995 and 2005 is projected based on the socioeconomic forecast presented in this study. The future throughput of the ports in Suez is projected primarily using the shares for each commodity group which are derived from the DPPS projection, as this projection is based on dividing the hinterlands of the ports and computing the least cost transport route from origin to destination for each commodity. For the commodity groups which are not considered in the DPPS projection, shares are estimated considering the NPFT projection and the current shares.

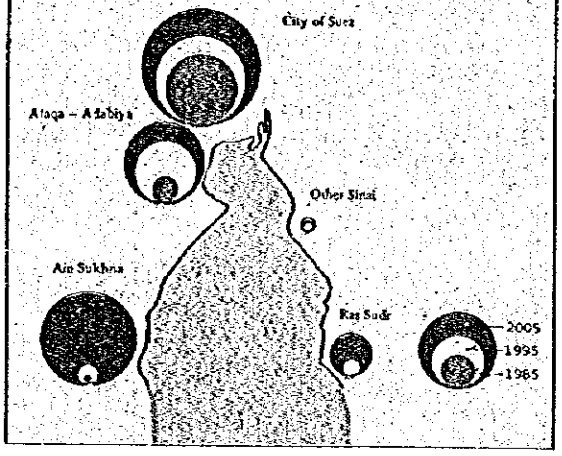
38. In the year 2005, 7,424,000 tons of imports and 763,000 tons of exports are projected; the average annual growth rates are 8.2% and 3.8%, respectively. Cement, which is currently handled at these ports, will no longer be handled in 2005 reflecting new cement production in the Suez Area and higher transport cost than from the Mediterranean ports. Further, we project that coal, which is not currently handled at the Suez ports, will be handled in 2005 as coal imports from Australia will be initiated.

39. A new industrial complex is expected to locate in Suez and new cargoes related to this industrial complex will be handled at ports in Suez in addition to the foreign trade cargoes forecast above. An additional volume of 9,172,000 tons in 2005 will be handled based on the following assumptions.

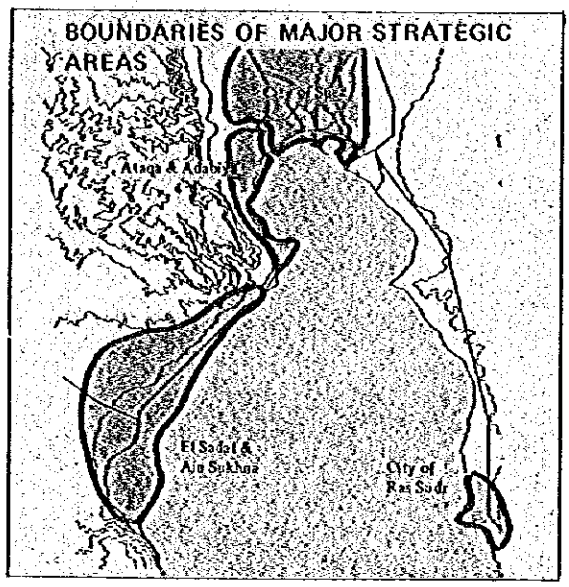
40. **Oil Refinery:** 90% of the crude oil is assumed to be imported at the existing SUMED Ain Sukhna terminal and transported through pipelines to the refinery. 10% of the crude oil is assumed to be transported from domestic oil fields by 3,000 DWT class oil tankers. Output from the refinery will partly be used by the adjacent petrochemical industries and by the iron & steel mill, and rest of the output will be transported through pipelines to other regions.

PROJECTED PATTERN OF URBAN DEVELOPMENT

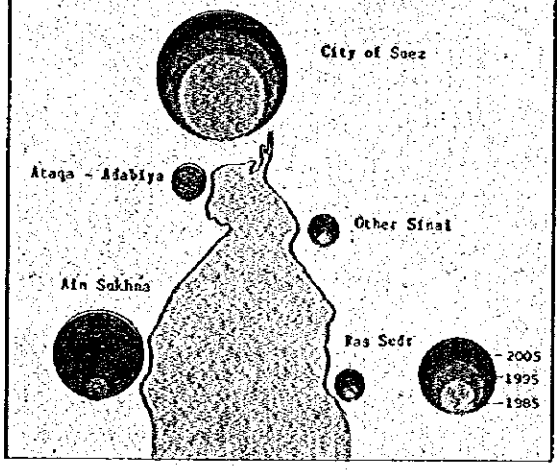
DISTRIBUTION OF EMPLOYMENT



BOUNDARIES OF MAJOR STRATEGIC AREAS



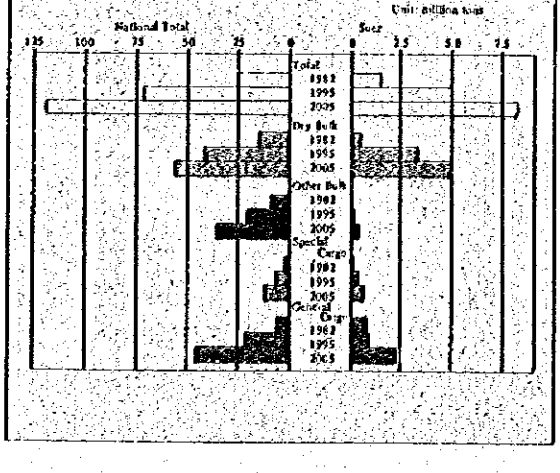
DISTRIBUTION OF POPULATION



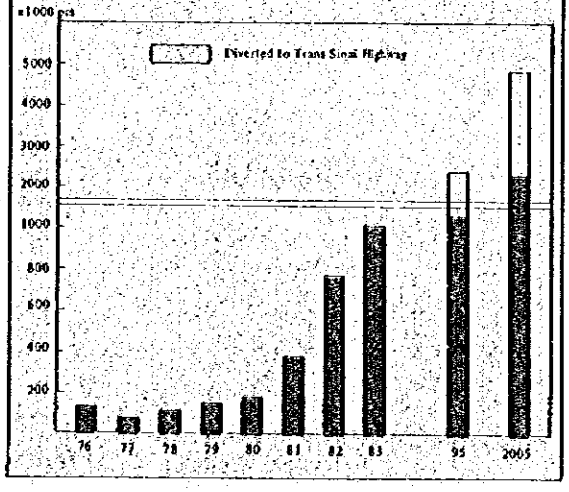
LAND BUDGET IN 2005

LAND USE	NEW AREA(Fa)	RATIO (%)
CENTRE	305	7
RESIDENTIAL	2335	57
COMMUNITY FACILITIES	737	18
OTHERS(OPEN SPACE & ROAD)	732	18
TOTAL	4110	100

FORECAST CARGO THROUGHPUT OF PORTS



FORECAST NUMBER OF PASSENGERS THROUGH PORT IBRAHIM



41. **Petro-Chemical Industry:** Naphtha, fuel oil and heavy oil which are major inputs will be supplied by the adjacent refinery through pipelines. Necessary salt will be transported from Port Said of which 50% will be shipped by railway and 50% by ships through the Suez Canal. Some of the products (218,000 tons) will be exported to East Africa and Arabic countreis through the Red Sea, and the rest will be carried by trucks, railways and ships with respective shares of 70%, 15% and 15%.

42. **Iron & Steel Industry:** Coal and iron ore as raw materials will be imported from Australia by 50,000 DWT class bulk carriers for coal and by 100,000 DWT ore carriers for iron ore. Limestone will be supplied domestically of which 50% will be transported by railway and 50% by ship. Some products (800,000 tons) will be consumed in the Mediterranean region and the rest will be consumed in Cairo and the Delta region. Transport to the Mediteranean region will be by ships of the 3,000 DWT class and transport to other regions will be by truck (80%) and by railway (20%).

43. **Supporting Industries:** Raw materials for the supporting industries and end products will be transported by truck (80%), railway (10%) and ship (10%).

44. The number of passengers through port Ibrahim was 1,022,431 persons in 1983, and this number increased tremendously during past eight years. The forecast number of passengers in 2005 is 2,374,813 persons considering the competitive mode-the Trans-Sinai highway.

45. The total number of pleasure boats in the target year is projected as 1,171 boats and 180 – 240 boats for domestic users and foreign users, respectively.

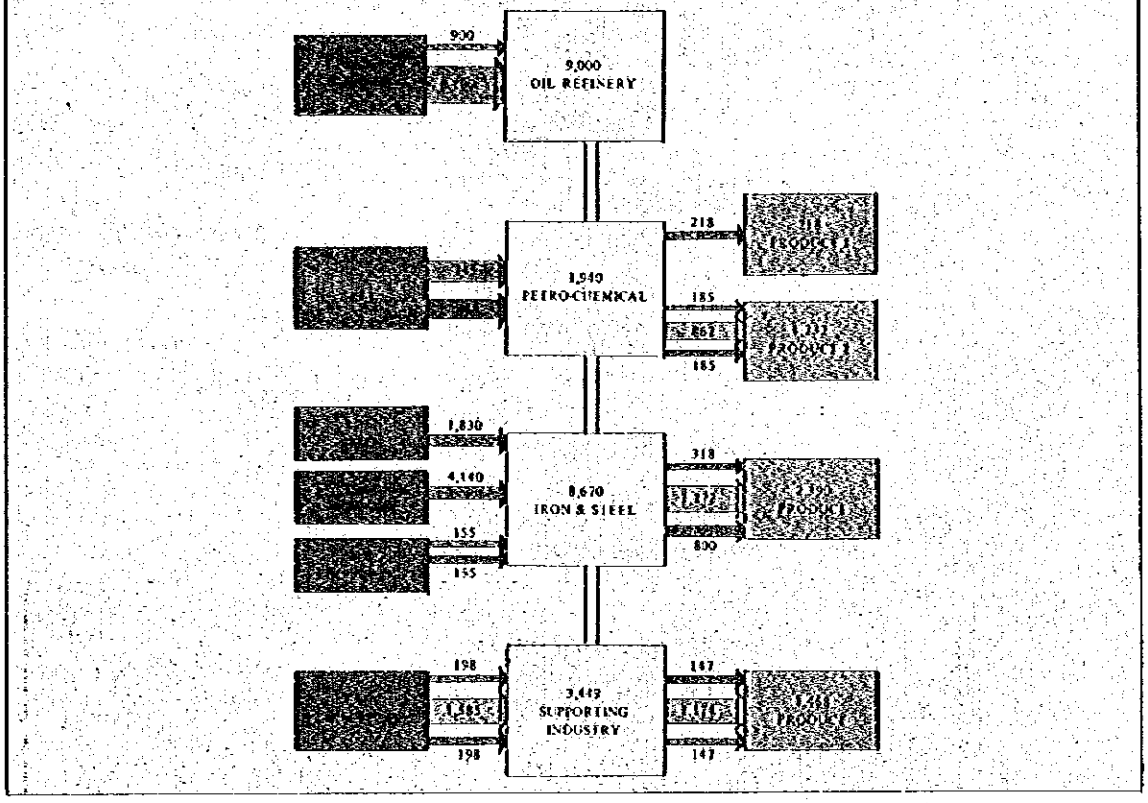
46. The future land transport demand related to the Suez Bay Coastal Area development is comprised of the demands from industrial production, import and export, recreation trips and daily commuters which will all increase along with the growth of industrial and social activities.

47. Total interregional goods transport in 1985 is estimated as 7,100 thousand tons, 1,345 thousand tons and 797 thousand tons for road, railway and pipeline, respectively. By adding newly developed transport demand, the total demand in 2005 is forecast as 30,358 thousand, 5,866 thousand and 8,639 thousand tons per year for road, railway and pipeline, respectively.

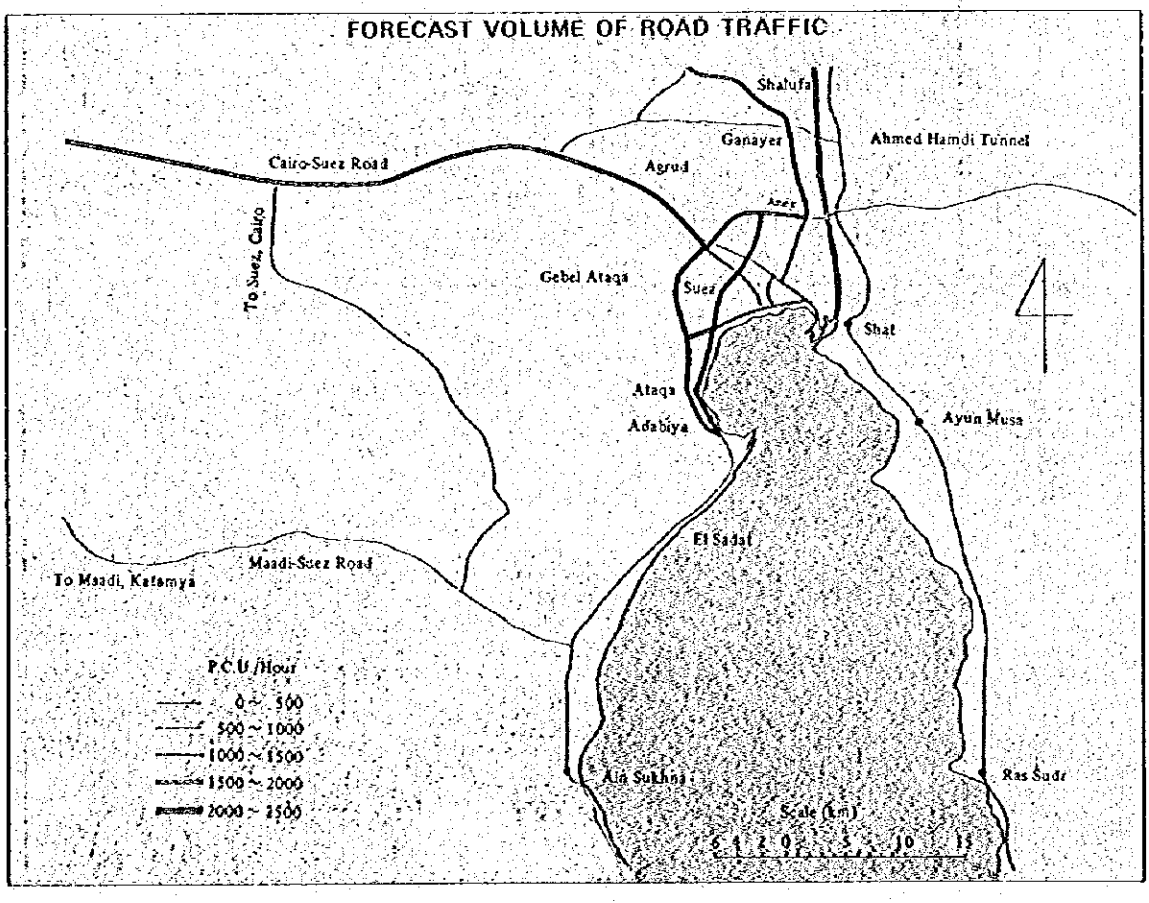
48. A total of 17,040 passengers per day traveled to and from Suez in 1983, and about 77% (13,130 passengers) of the total traveled to the Cairo region. The forecast number of recreation trip makers per peak day is 62,566 persons (45,000 persons are local residents and 17,566 persons are visitors from the Cairo region). Assuming that about 9% (the current share) of the international travelers may use railway and the others will travel by road, and also that each person will make two trips per outing, the transport demands by road and railway are forecast as 31,970 and 3,162 trips per peak day in 2005, respectively. For the daily commuters, 340 thousand trips are forecast during the peak period.

49. Based on the assumption that interregional passenger transport will grow proportionally to the population growth in the area, the forecast passenger trips are 128,175 trips and 12,825 trips per day for road and railway, respectively. Including recreation trip, the total transport demand becomes 160,145 trips and 15,987 trips per day in 2005 for road and railway, respectively.

PROJECTED VOLUME OF CARGO RELATED TO THE PROPOSED INDUSTRIAL COMPLEX



FORECAST VOLUME OF ROAD TRAFFIC



(v) Water Demand

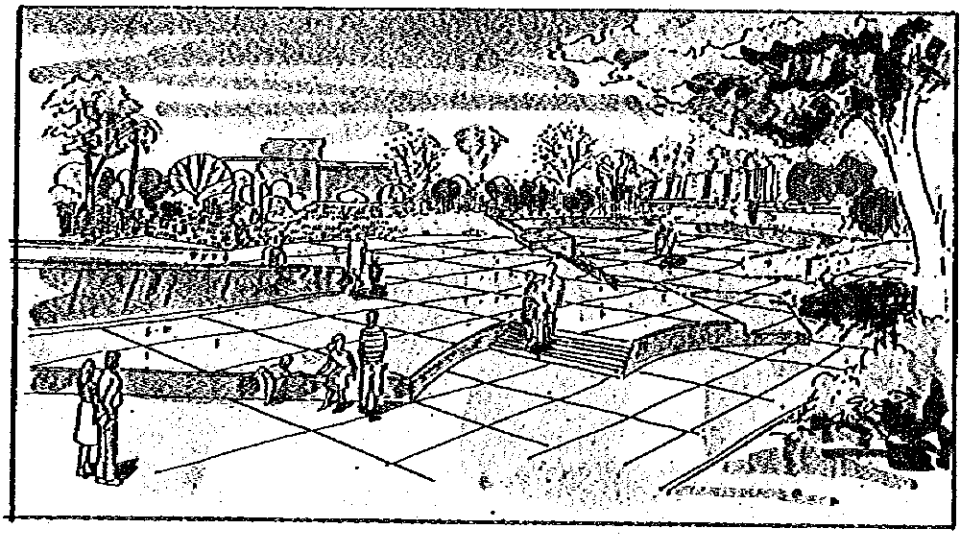
50. The domestic and industrial water consumption in the developed area of Suez City supplied by SCA in 1983/84 was 27.4 million m^3/year in terms of finished water consumption as shown in the Table. The table shows that residential use had the biggest share followed by the use of SCA. During 1975 – 1984, the domestic and industrial demand recorded a sharp increase of 16.6%/year. Three manufacturing companies which are located to the west of the developed area of Suez city are currently taking raw water from either the Suez Sweetwater Canal or the Maghrabi Canal. According to the data provided by GOFI, the total volume of raw water used by these companies is estimated at about 65,000 m^3/day in 1984.

51. Water demand is projected by the categories of domestic, industrial, port and tourism based on available water use records for the Study Area and the expected magnitude of use for each category. The domestic, industrial, port and tourism water demands in the Study Area are projected to reach 90,800 m^3/day, 392,000 m^3/day, 5,000 m^3/day and 29,100 m^3/day in 2005, respectively.

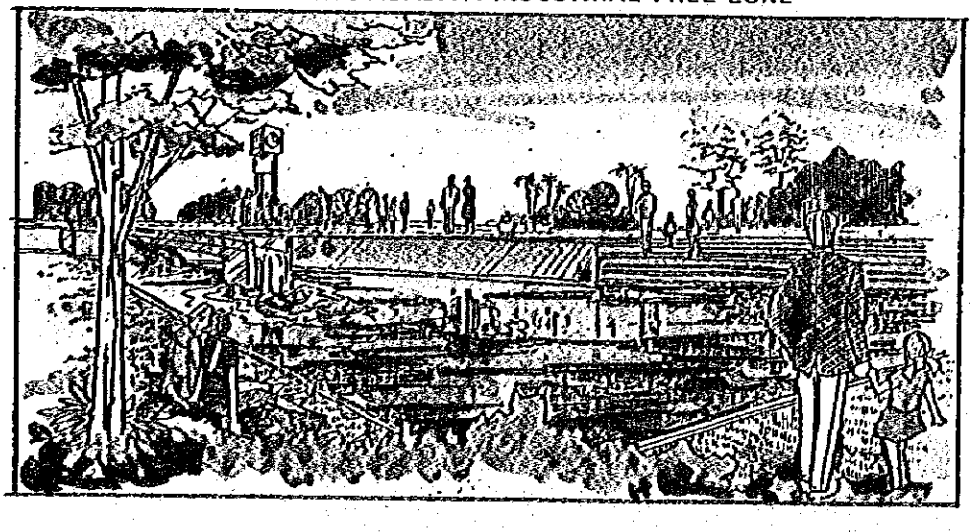
(vi) Power Demand

52. Total power demand comprising domestic, industrial, port and tourism demands in the Study Area will reach 164.2 MW or 673.1 GWh/year in 1995 and 723.5 MW or 3,443.3 GWh/year in 2005. By category, industrial power demand is by far the biggest power user with a share of 80.0% of the total in 2005 followed by domestic demand with an 8.1% share in terms of energy consumption.

CENTER OF THE ATAQA INDUSTRIAL ESTATE



CENTER OF THE ADABIYA INDUSTRIAL FREE ZONE



PROJECTED WATER DEMAND

('000 m^3/day)

Category of Use	1995				2005			
	Pu.**	Pr.**	Total	Share (%)	Pu.**	Pr.**	Total	Share (%)
Domestic	15.6	2.2	17.8	11.3	88.6	2.2	90.8	17.6
Residential	(10.2)	(2.2)	(12.4)	(7.9)	(60.6)	(2.2)	(62.8)	(12.2)
Commercial & Public	(2.9)	–	(2.9)	(1.8)	(19.1)	–	(19.1)	(3.7)
Green Areas	(2.5)	–	(2.5)	(1.6)	(8.9)	–	(8.9)	(1.7)
Industrial	46.2	79.2	125.4	79.9	312.8	79.2	392.0	75.8
Ship	2.3	–	2.3	1.5	5.0	–	5.0	1.0
Tourism	11.4	–	11.4	7.3	29.1	–	29.1	5.6
Total	75.5	81.4	156.9	100.0	435.5	81.4	516.9	100.0

Note: Figures are in terms of average day demand at the intake point.
** Pu. = Public Water Use
** Pr. = Private Water Use

PROJECTED SEWAGE DEMAND

('000 m^3/day)

Category	1995	2005
Domestic	8.3	51.5
Residential	(6.4)	(39.2)
Urban	(1.9)	(12.3)
Industrial	29.8	202.0
Port	0.8	2.6
Tourism	7.4	18.8
Infiltration	4.7	27.5
Total	51.0	302.4

Note: Accumulated discharge in terms of average day discharge
Including the infiltration of groundwater

PROJECTED POWER DEMAND

Category of Use	1995			2005		
	Energy (Gwh/year)	Power (Mw)	Energy Share (%)	Energy (Gwh/year)	Power (Mw)	Energy Share (%)
Domestic	26.5	4.7	4.0	279.0	49.0	8.1
Industrial	460.0	124.8	68.0	2,755.1	597.7	80.0
Port	63.4	11.3	9.4	92.5	16.5	2.7
Tourism	123.2	23.4	18.3	316.7	60.3	9.2
Total	673.1	164.2	100.0	3,443.3	723.5	100.0

III. Master Plan

A. Development Goals

53. Based on the national & regional settings and considering the development potential of the Study Area, the major regional development goals are set as industrialization, integration and internationalization. The objectives of industrialization are as follows.

- o Maximum Use of Resources: Enhance the use of both human and natural resources.
- o Encouragement of Employment: Increase the number of employment opportunities through the location of industries and related urban infrastructures.
- o Improvement of the Quality of Life: Increase the income level of the local workers which, in turn, will improve the quality and variety of services available in the region.

54. The objectives of integration are as follows.

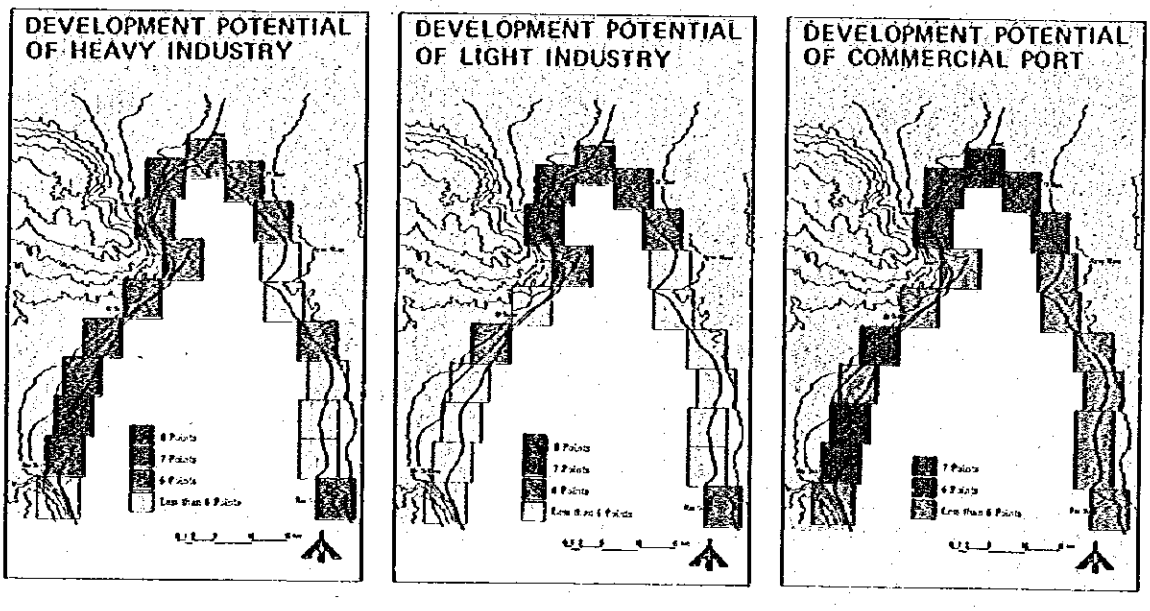
- o Integration of Functions: Integrate the functions and roles of the urban and rural areas.
- o Integration of Systems: Integrate the physical and social systems in the region, especially the various transportation systems.
- o Integration of Locales: Integrate the different locales through improving the communications and transportation networks.

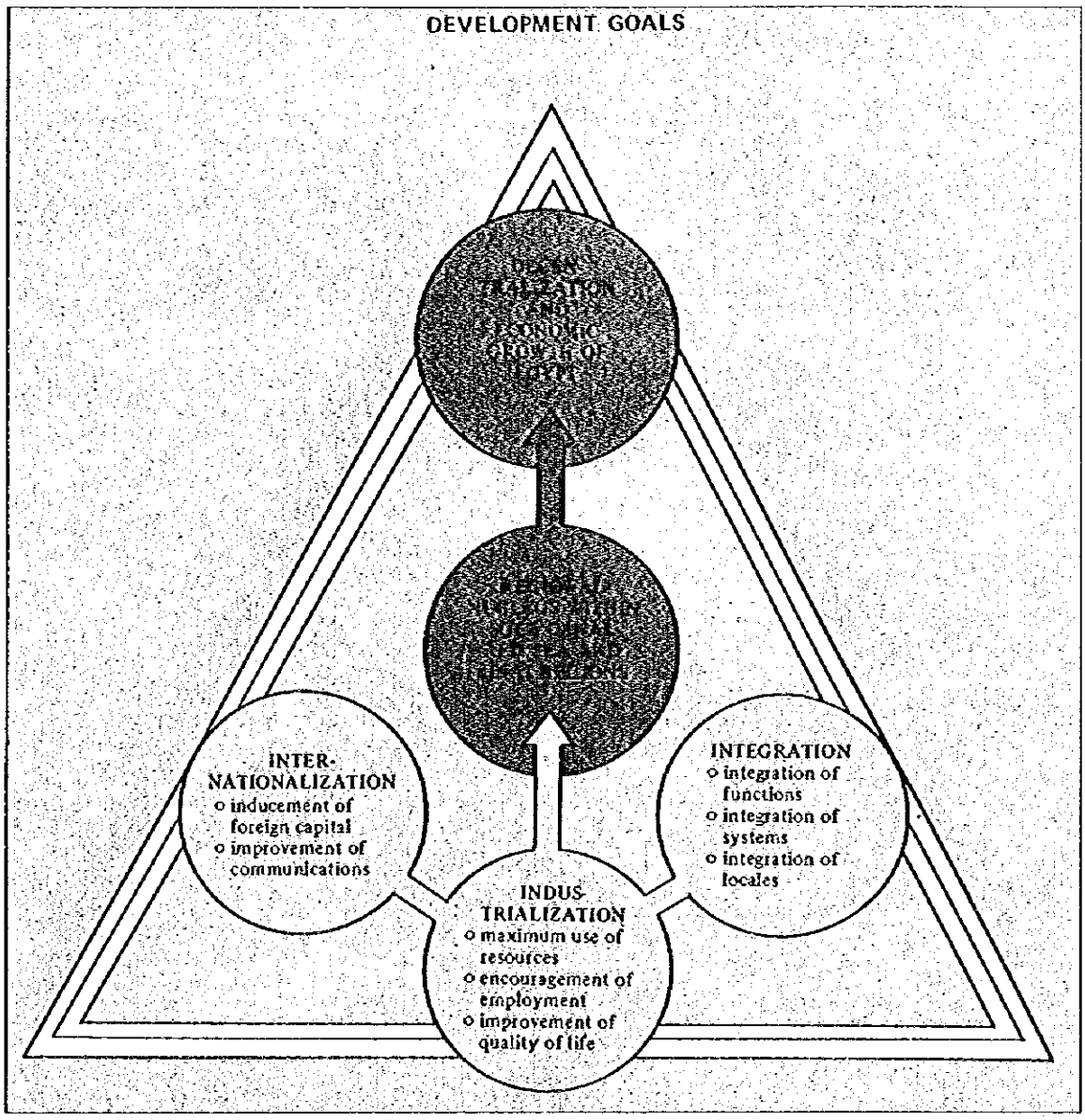
55. The objectives of internationalization are as follows.

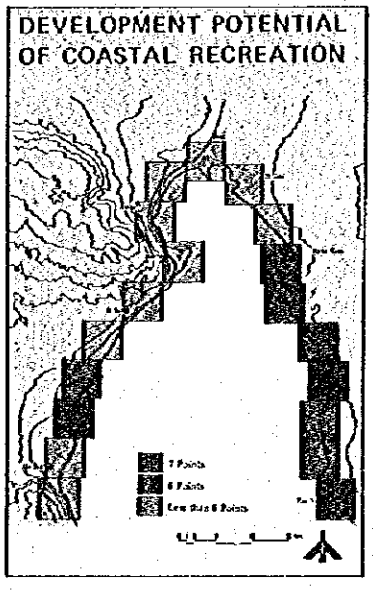
- o Inducement of Foreign Capital: Create industrial zones and free zones which will attract foreign capital and, at the same time, function as a gateway to the East.
- o Improvement of Communications: Improve the international communications systems so that timely information can be obtained from various sources throughout the world.

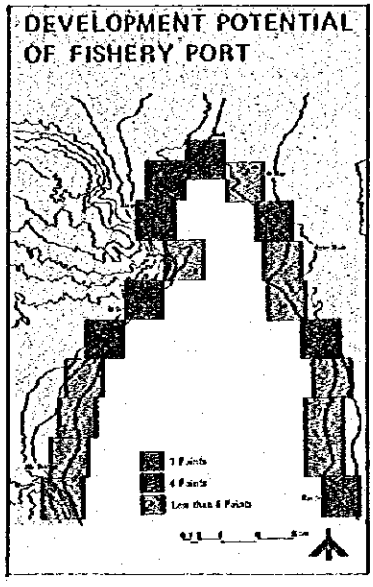
B. Conceptual Plan for the Development

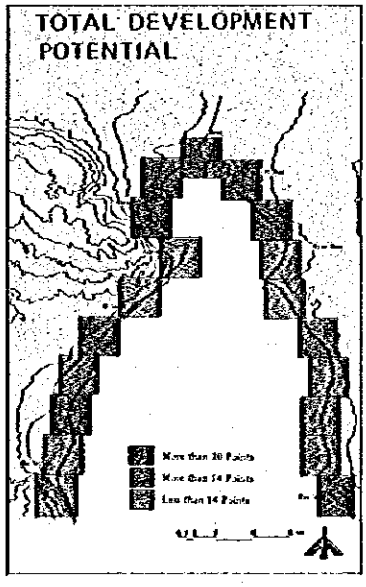
56. The development potential of each part of the Study Area is assessed based on topography, water resources, geological conditions, water quality, potential land use, existing infrastructures and other factors. Then, five zones are identified as the major strategic development areas and the conceptual plan for the development is formulated as follows.




DEVELOPMENT GOALS
INTER-
NATIONALIZATION
o inducement of foreign capital
o improvement of communications
INTEGRATION
o integration of functions
o integration of systems
o integration of locales
INDUS-
TRIALIZATION
o maximum use of resources
o encouragement of employment
o improvement of quality of life


DEVELOPMENT POTENTIAL
OF COASTAL RECREATION


DEVELOPMENT POTENTIAL
OF FISHERY PORT


TOTAL DEVELOPMENT
POTENTIAL

57. **New Suez:** The existing Suez and new Suez areas are currently being developed following the Suez Master Plan. The residential area is rapidly expanding toward the northwest, and light industry will locate in those areas identified under Phase II of the Suez Master Plan. This area is expected to continue to develop in accordance with the Suez Master Plan.

58. **Ataqa-Adabiya:** This area will be developed as an industrial area and free zone which will specialize in export oriented industries utilizing well-developed port facilities. As the available flat land behind Adabiya Port is limited, the Free Zone will expand toward Cape Adabiya. The Ataqa fishery port will be remodeled together with the residential area which will primarily be used by fishery workers and their families. The south waterfront of Cape Adabiya will be utilized for aqua-industry, which will be developed based on the current drift net fishing.

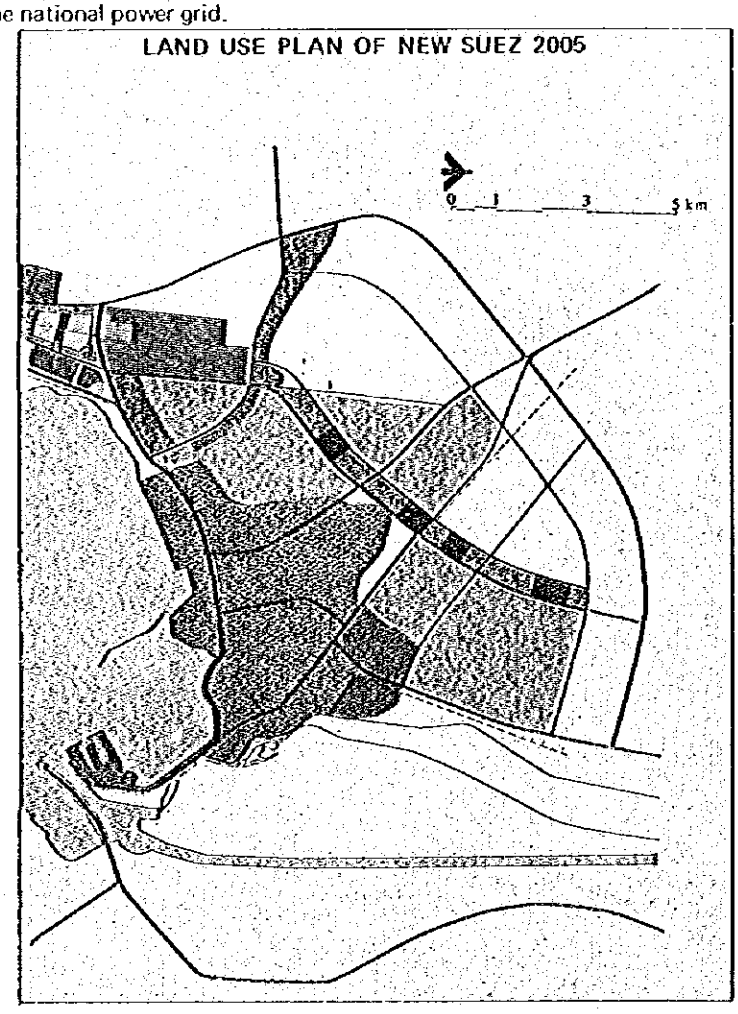
59. **North Ain Sukhna:** This area will be developed as a comprehensive new town. Development efforts will center on basic industries, a large-scale port and a coastal resort with an intermediate-scale marina. The North Ain Aukhna area is expected to become a new growth pole and to influence the development of the other coastal areas around Suez Bay. A new coastal shipping line will connect this area with Safaga, Ras Sudr and the Mediterranean areas.

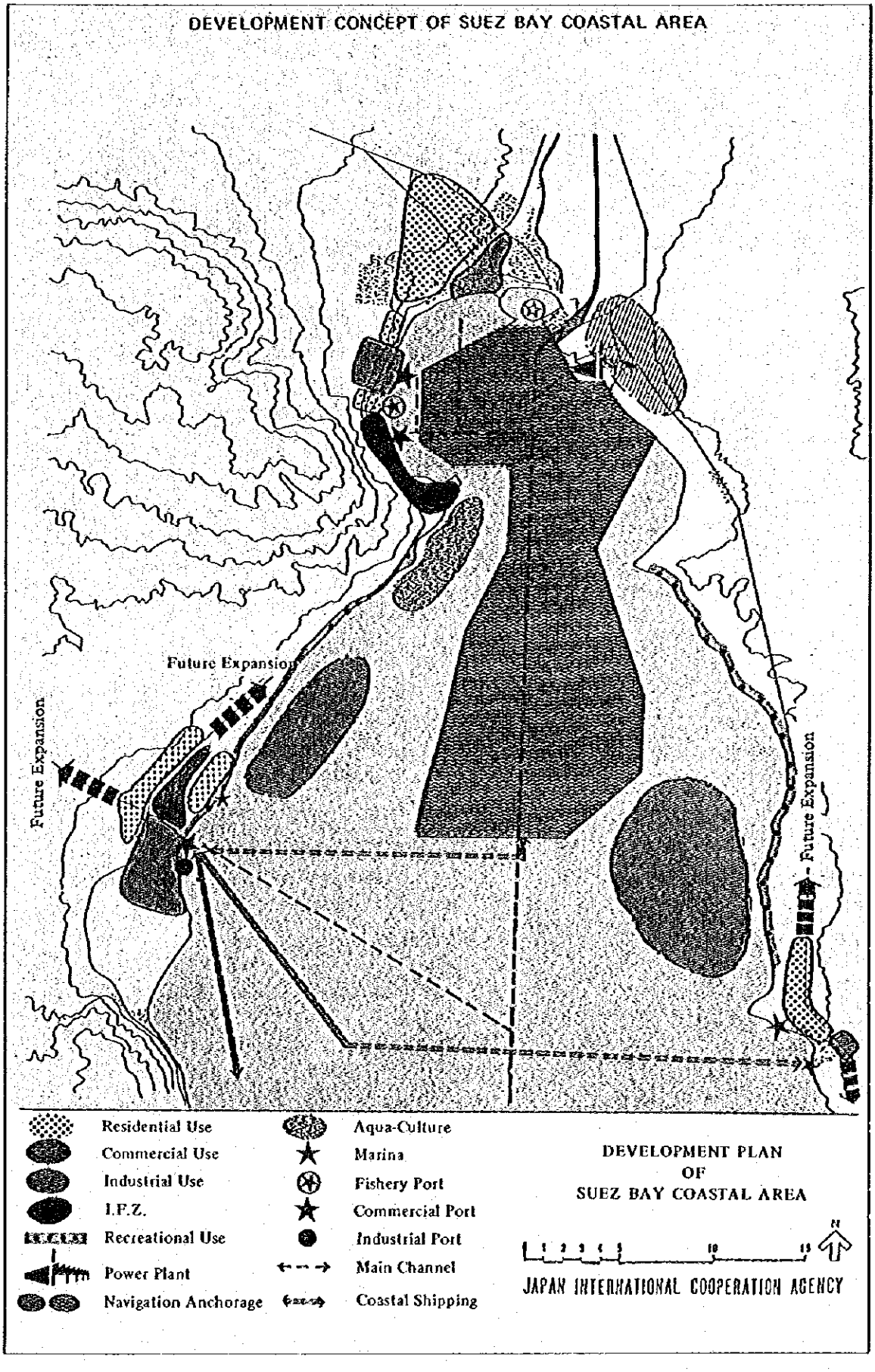
60. **Ras Sudr:** Ras Sudr will be developed as a resort area up to the year 2005. The development of major infrastructures in Ras Sudr is behind the infrastructural development in other areas, but after the year 2005, Ras Sudr is expected to grow into an industrial town which will influence the development of the entire South Sinai.

61. **North Ayun Musa:** This area will be developed as an industrial region which will support the north Sinai. Development will center on non-littoral industries as it would be difficult to develop a large-scale port in this area because the waterfront is shallow and the waiting zone for Canal shipping is located nearby. In order to maximize the use of Maghara coal, a new power plant is expected to locate in this region which will supply electricity through the national power grid.

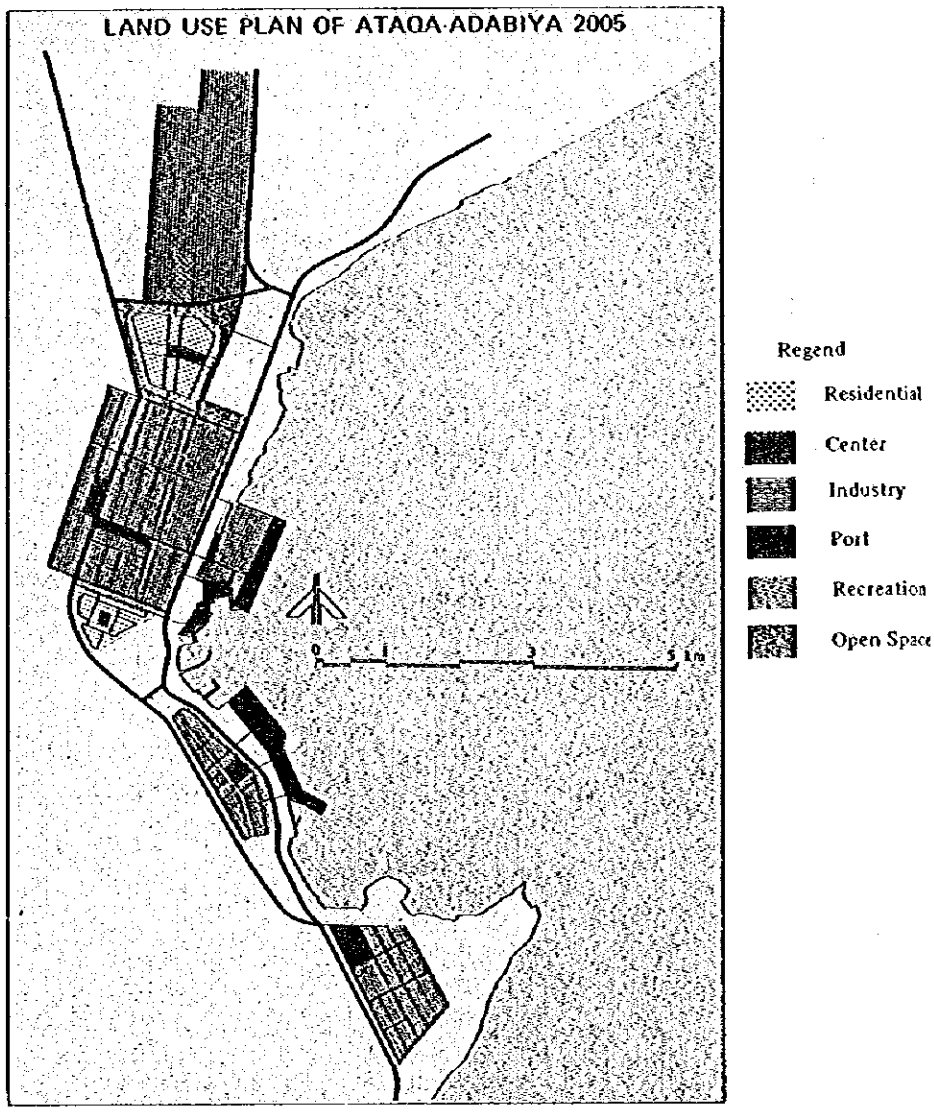
C. Strategic Areas

62. The new Suez area is planned mainly for residential use both for Suez and for the Ataqa-Adabiya area. Considering the urban growth over the planned period, the major structure of the Suez Master Plan is adopted. However, port Ibrahim is proposed for the use of passenger ships exclusively, considering the increase of passenger traffic demand and the rehabilitation plan for this area prepared by the Suez Governorate.

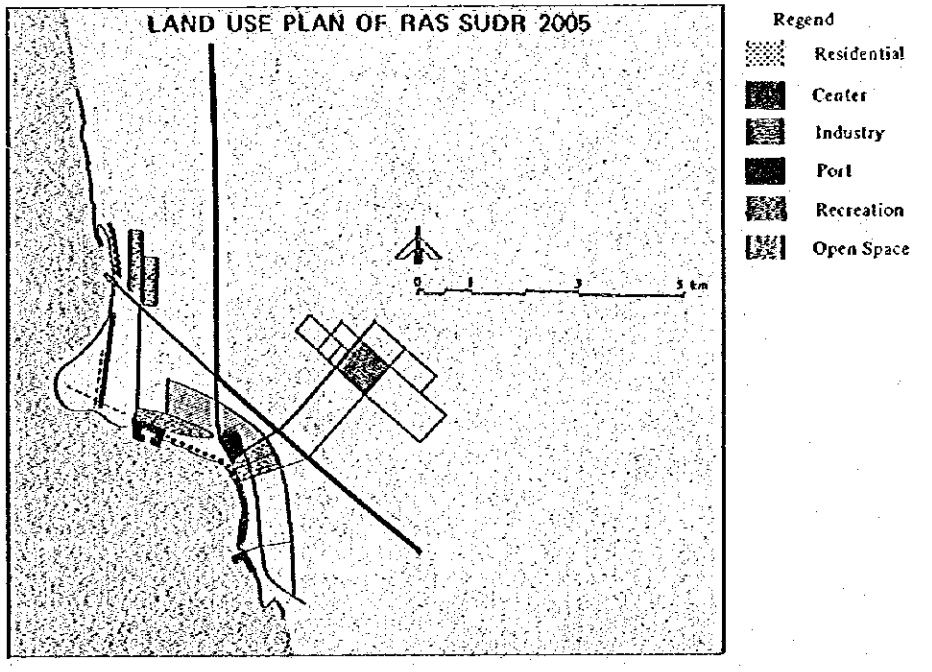



DEVELOPMENT CONCEPT OF SUEZ BAY COASTAL AREA
Future Expansion
Future Expansion
Future Expansion
Residential Use
Commercial Use
Industrial Use
I.P.Z.
Recreational Use
Power Plant
Navigation Anchorage
Aqua-Culture
Marina
Fishery Port
Commercial Port
Industrial Port
Main Channel
Coastal Shipping
DEVELOPMENT PLAN
OF
SUEZ BAY COASTAL AREA
JAPAN INTERNATIONAL COOPERATION AGENCY

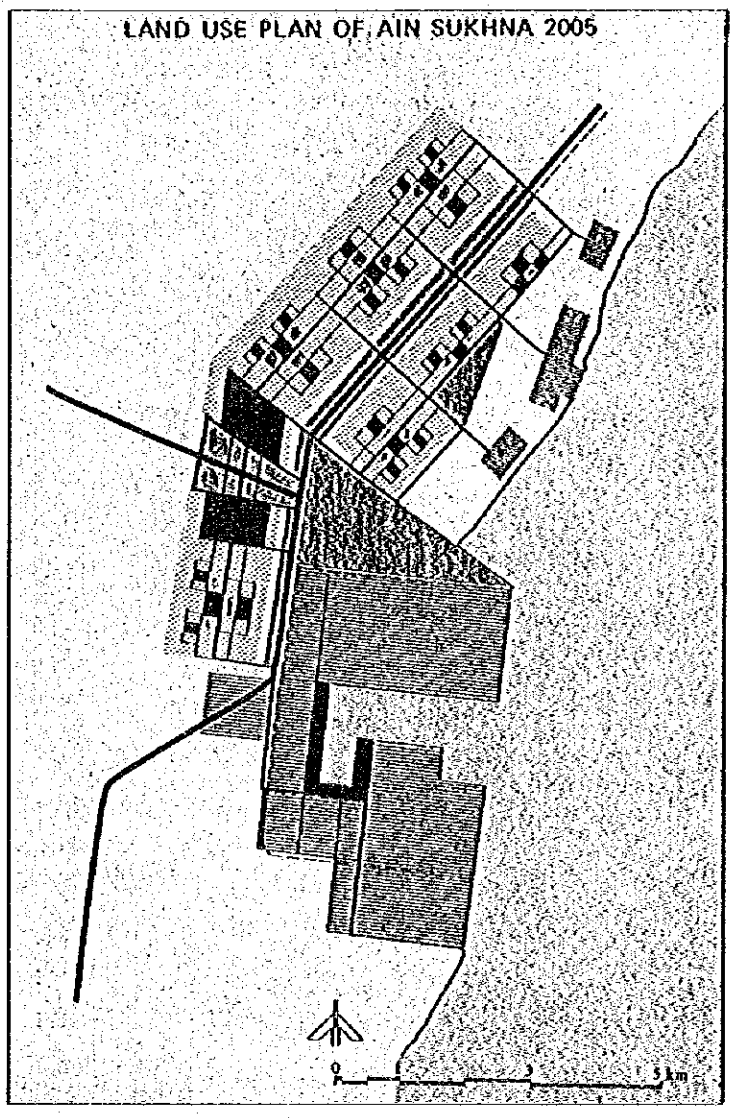
63. As for the Ataqa-Adabiya area, rehabilitation of Adabiya port is assumed to be completed in phase I including 7 general cargo berths by around 1987. After that, 2 special cargo berths and 2 container berths are projected to be constructed together with the industrial free zone behind the wharf. In the Ataqa area, 1 grain terminal with 100,000 tons of grain silos, 2 bulk cargo berths and 2 coal berths are projected, and a food processing industrial complex and basic materials group industries are planned to locate behind this wharf. The 2nd phase of the industrial free zone is projected on Cape Adabiya. A new double carriageway outer road connecting Ataqa-Adabiya with Suez is projected for the smooth traffic flow. The existing naval basin and the SCA quarry are to remain untouched.



65. The Ras Sudr area is mainly planned as a tourism resort center, and a small scale light industrial estate is also planned at the former site of the oil field. An international marina which will accommodate 850 pleasure boats and a domestic trade port with 2 berths -6.5 m in depth is also planned.



64. As for the Ain Sukhna area, a new industrial port with an iron & steel mill, oil refinery, petrochemical industry and other supporting industries is planned. Six general cargo berths and ten domestic trade berths are planned to handle the new products and raw materials and also to cope with the foreign trade demand of Cairo and the upper Egypt regions. In the northern part of the industrial port, a new town with 250 thousand people is planned and along the northern coast tourism and recreational facilities are planned together with a marina which will accommodate 500 boats.



66. By the target year of 2005, all the industrial complexes, free zones and tourism facilities will begin operations. The phased development plan for the development period, 1986/87 to 2005/06, is formulated in a counterclockwise direction around the Bay Area based on the concept of an "Influential Circuit". Namely, investments in the Study Area will be concentrated in one of the five strategic areas for a period five to ten years, and then concentrated in the next strategic area, taking advantage of the positive influences from the previous area's development.

67. The New Area of Suez City will be developed mainly by 1990, and the development of the Ataqa-Adabiya area will be started around 1987. Large-scale industrial development in Ain Sukhna will start around 1995 and the Ras Sudr project will start around 2000.

D. Contribution to the National Goals

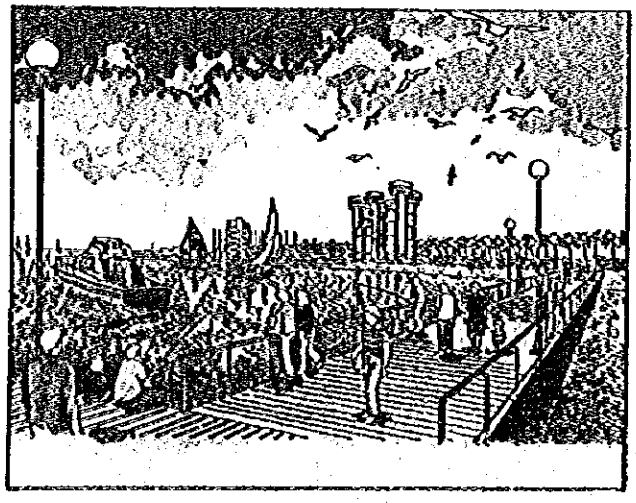
68. One basic notion behind the proposed development plan is the growth pole concept: the idea is that economic activity tends to agglomerate around certain focal points. The polarization flows (commodities, factors, traffic, communications, etc.) gravitate within a sub-region towards the control center (or dominant pole). Regional expansion takes place not so much as a result of cost reductions in existing firms or even an increase in the number of firms in existing industries, but because of interaction between industries at the pole. A growth pole could be created almost anywhere if policy makers were willing to pump in enough resources in the form of public investment in infrastructures and subsidies. But rational choices of growth poles are based on a comparison of different locations as centres of potential growth, selecting those estimated to have the greatest future potential and positive impact on their surrounding areas. If planned growth poles are badly chosen, they may require permanent subsidies to keep them viable. If they are selected wisely, their expansion in the future will be self-generating.

69. As is stated in Paragraphs 7 & 8, the Study Area has a high development potential, especially for industrial and foreign trade-oriented cities. Due to the various geographic and socioeconomic advantages, well-balanced industrialization can be achieved much more easily here than in other regions. Through careful planning, there will be a good relationship between the new industries and those industries which already exist in the region, and the various industries will support each other through the flow of materials, energy, and so forth. The beautiful scenery and the recreational areas along the coastline will also help attract population to the area along with the increased job opportunities. Thus, the development of the Study Area should proceed smoothly, and contribute to the main national goals which are the decentralization of population and industry and the development of stable economic growth through industrialization, internationalization and integration.

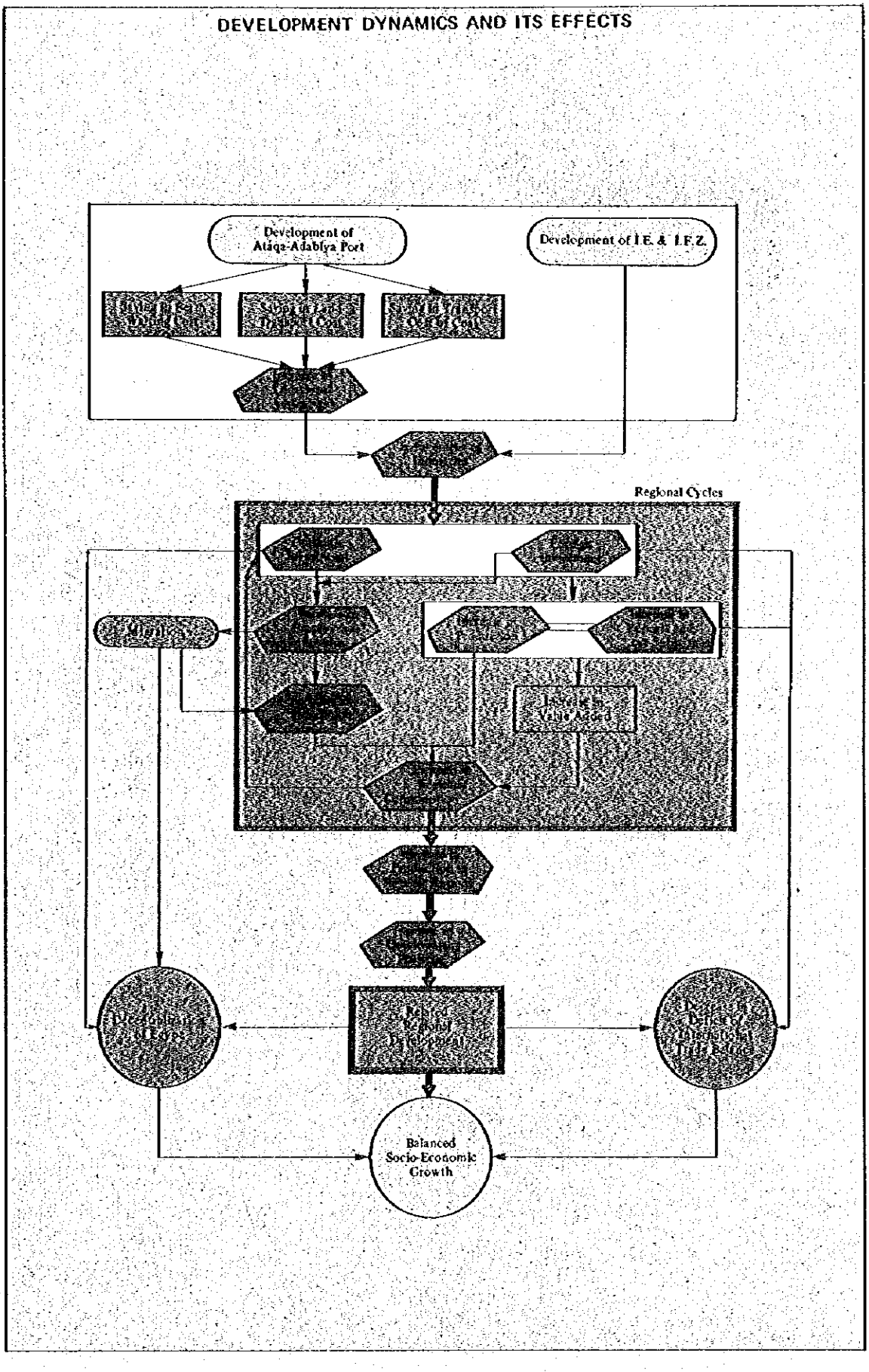
70. Tangible macroscopic benefits are estimated as follows.

- The plan will attract an additional 450 thousand people to the Study Area above the 450 thousand people who will come to the area without the proposed plan. If the future ratio of centralization in Greater Cairo is assumed to be 25%, the population of Greater Cairo will be 18.9 million in 2005. Inducing an additional 450 thousand people to settle in the Study Area will reduce the centralization ratio in Greater Cairo by 0.6%.
- The additional employment under the plan is 234 thousand persons compared to the case without the projects. Thus, the plan will increase the percentage of total Egyptian workers employed in the Suez region by 1% overall, and will increase the percentage of Egyptian industrial workers employed in the region by 2.7%.
- The plan will increase the regional share of GDP by 1.7% which is L.E. 1.8 billion at 1981/82 prices compared with the case without the development project in this plan. The total effect of project on obtaining foreign exchange amounts to L.E. 929 million in 2005 (at 1981/82 prices).
- In addition to these tangible benefits, the development of the Study Area is also expected to improve the growth potential of other nearby regions.

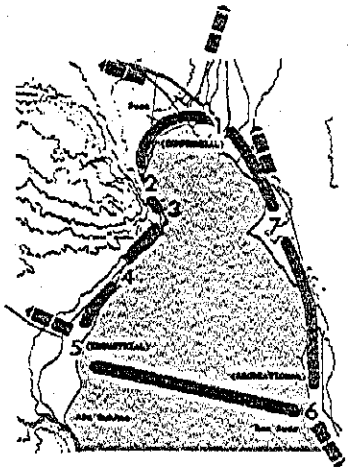
AIN SUKHNA RESORT

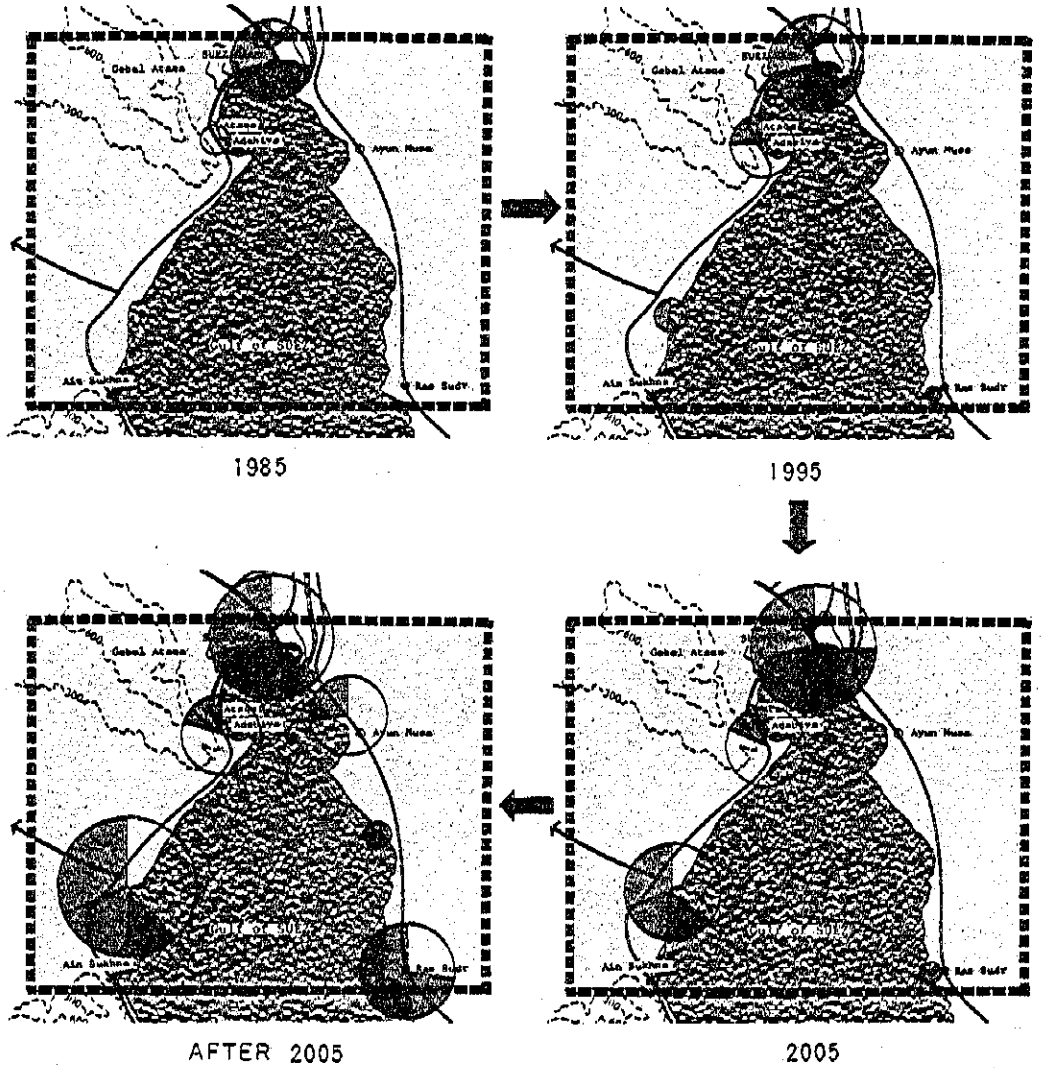


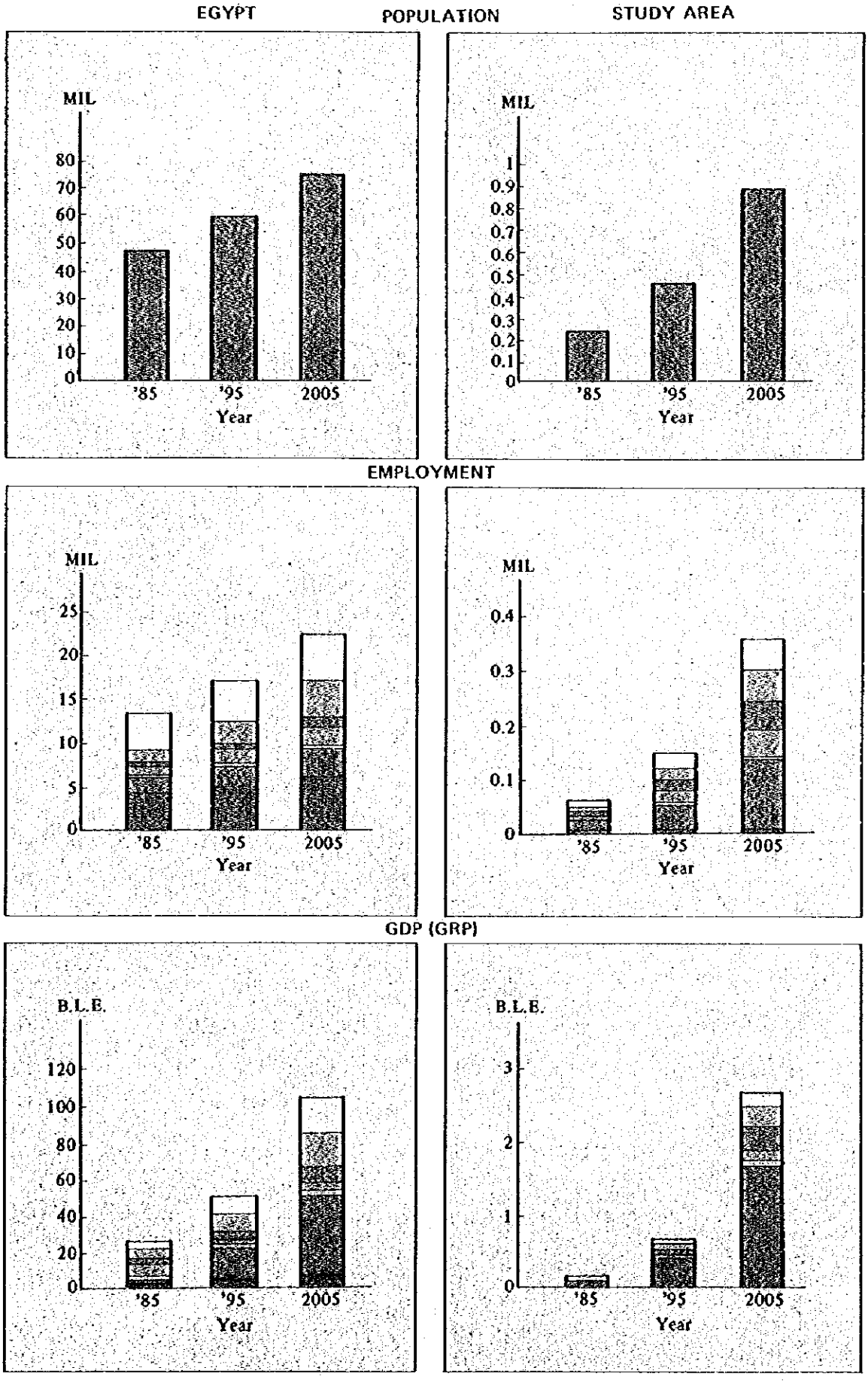
DEVELOPMENT DYNAMICS AND ITS EFFECTS



DEVELOPMENT SCENARIO






EGYPT
POPULATION
STUDY AREA
MIL
80
70
60
50
40
30
20
10
0
'85
'95
2005
Year
MIL
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
'85
'95
2005
Year
EMPLOYMENT
MIL
25
20
15
10
5
0
'85
'95
2005
Year
MIL
0.4
0.3
0.2
0.1
0
'85
'95
2005
Year
GDP (GRP)
B.L.E.
120
100
80
60
40
20
0
'85
'95
2005
Year
B.L.E.
3
2
1
0
'85
'95
2005
Year
Other Services
Commerce & Finance
Transport
Construction
Utility
Industry
Agriculture

E. Effects on Related Regional Development

(i) Suez Canal Region

71. In the Suez Canal Regional Development Plan, the three canal cities of Port Said, Ismailia and Suez are planned to accommodate some 2.8 million persons by the year 2000, each with a different but complementary role in regional development. Port Said is to concentrate on port, warehousing and free trade activities, while Ismailia is to concentrate on a substantial administrative and cultural role. Suez city is to develop port and industrial functions, and is planned to be the largest center. The proposed development along the Suez Bay Coastal area changes the spatial development plan of the Suez Master Plan, especially the possible industrial configuration and its location together with the probable population growth, but retains the principal role of Suez in the regional development and the basic direction of the development of Suez city.

72. In the Suez Master Plan, industrial configuration in the long run is quite vague compared with the identified industries in the short run which presumes a probable employment of only 16,000 in the principal industrial area.

73. Together with the current accumulation of population, which is far behind the planned schedule, the application of the growth pole concept changes the spatial development plan of the Study Area. As a result, the focal area of Ain Sukhna-El Sadat in the Suez Governorate Structural Plan is emphasized in the Study.

(ii) Red Sea Region

74. In the Red Sea Governorate Regional Plan, the four major cities of Ras Gharib, Ghardaka, Safaga and Queseir are planned to accommodate some 100,000 persons each. Productive activities are planned mainly based on the mining sector. Though the industrial sector is planned to provide some 24,000 jobs, constraints on industrial location include water supply, energy supply and market opportunities. Other productive sectors of fishery and tourism are planned to offer some 4,000 jobs each. In economic terms, the new development in Ain Sukhna-El Sadat is likely to conflict with the plans for petrochemicals in Ras Gharib and iron and steel in Safaga. However, the locational advantages for these industries are greatly superior in the Study Area, considering the cost effectiveness of the infrastructures and the market opportunities.

75. Therefore, industrial location in Ras Gharib and Safaga will have to be reconsidered based on a more detailed feasibility study on industrial location. On the other hand, the other planned development in the Red Sea Governorate and the newly planned development will support each other. Mining in the Red Sea Governorate will encourage industrial development in the Study Area and the growth of the industries in the Study Area will become an effective pull for activities in the Red Sea Governorate.

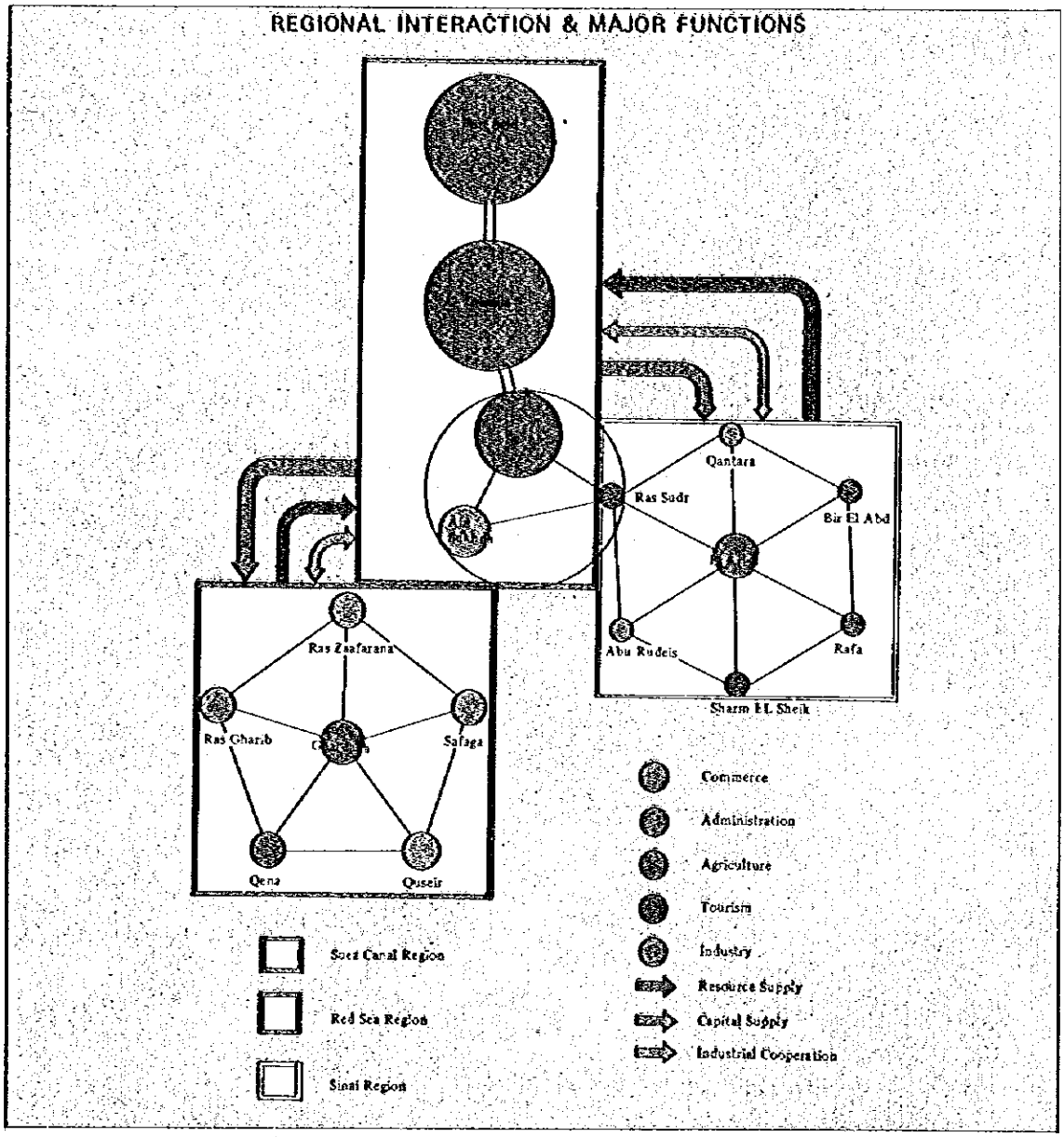
(iii) Sinai Region

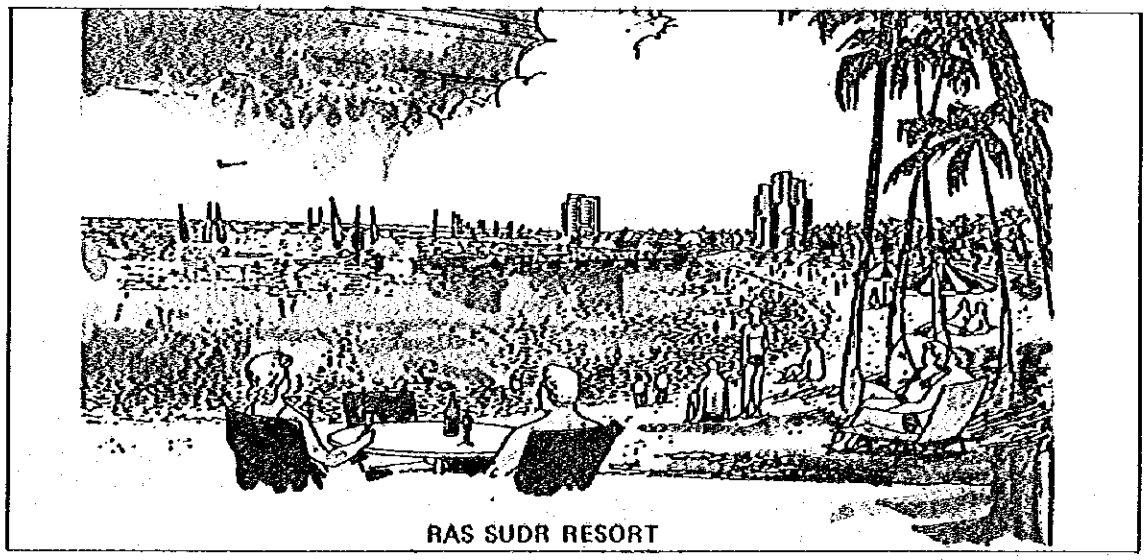
76. Sinai regional development is mainly concentrated on El Arish and El Quantara on the Mediterranean Side of the peninsula through development of labor-intensive light industries and tourism, except for East Suez which is planned to develop petrochemical industries.

77. As for the south Sinai region, major employment is planned to be based on small-scale industries and tourism development along the Gulf coast and near St. Catherine.

78. Petrochemical industries are planned to develop in the East Suez area, considering the possible development of industry within the Canal Zone and the completion of the Ahamed Hamdi Tunnel connecting Sinai and Suez. However, considering the limited water resources and the topographic features of the east bank of the bay which are unfavorable for the construction of the deep seaport necessary for importation and exportation of raw materials and products, this planned development cannot compete with the development in the Ain Sukhna-El Sadat Area planned in this study.

79. However, the new development will accelerate the development of the South Sinai Area creating a great demand for regional tourism and also a market for related industries, and the construction of infrastructures will become more cost effective through the scale merit of the new development. In this sense, the early development of the Study Area can be said to be the necessary trigger to make the development of the South Sinai possible.





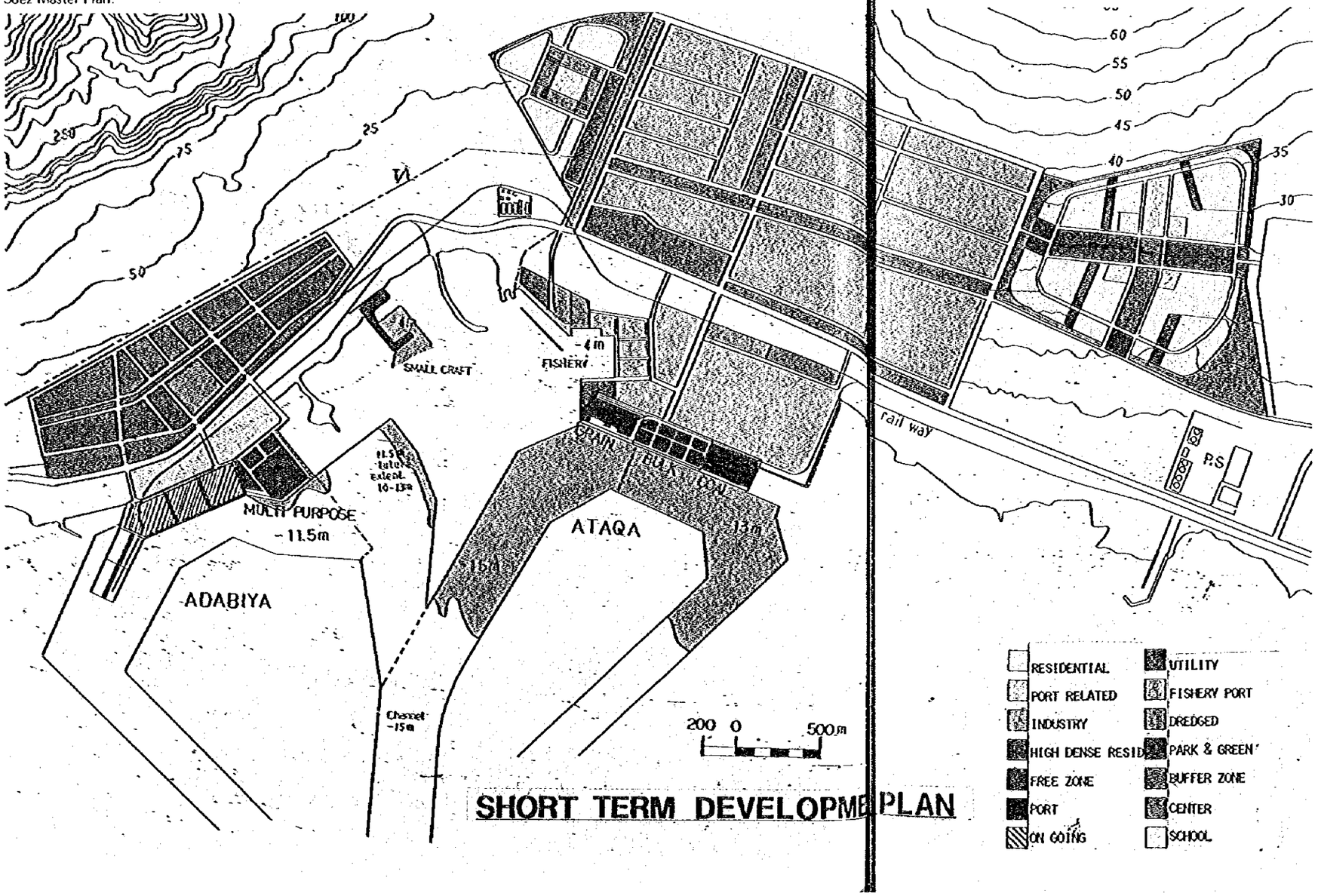
RAS SUDR RESORT

IV. Short-Term Development Plan and the Project

A. Objectives

80. Short-term development is concentrated on the Ataqa-Adabiya Area from the view point of effective utilization of existing infrastructures and the growing power of existing Suez, and also to providing job opportunities which might be difficult to create through the industries suggested in the Suez Master Plan.

81. The main objective of the short-term projects (hereinafter the Project) is to provide an adequate capacity for the Suez Ports to handle the projected traffic demand until 1995. Another objective of the Project is to provide adequate industrial estates and free zones for the introduction of both domestic and foreign industries.



SHORT TERM DEVELOPMENT PLAN

B. Project Scope

82. The proposed Project includes the following main components:

(i) Adabiya Commercial Port

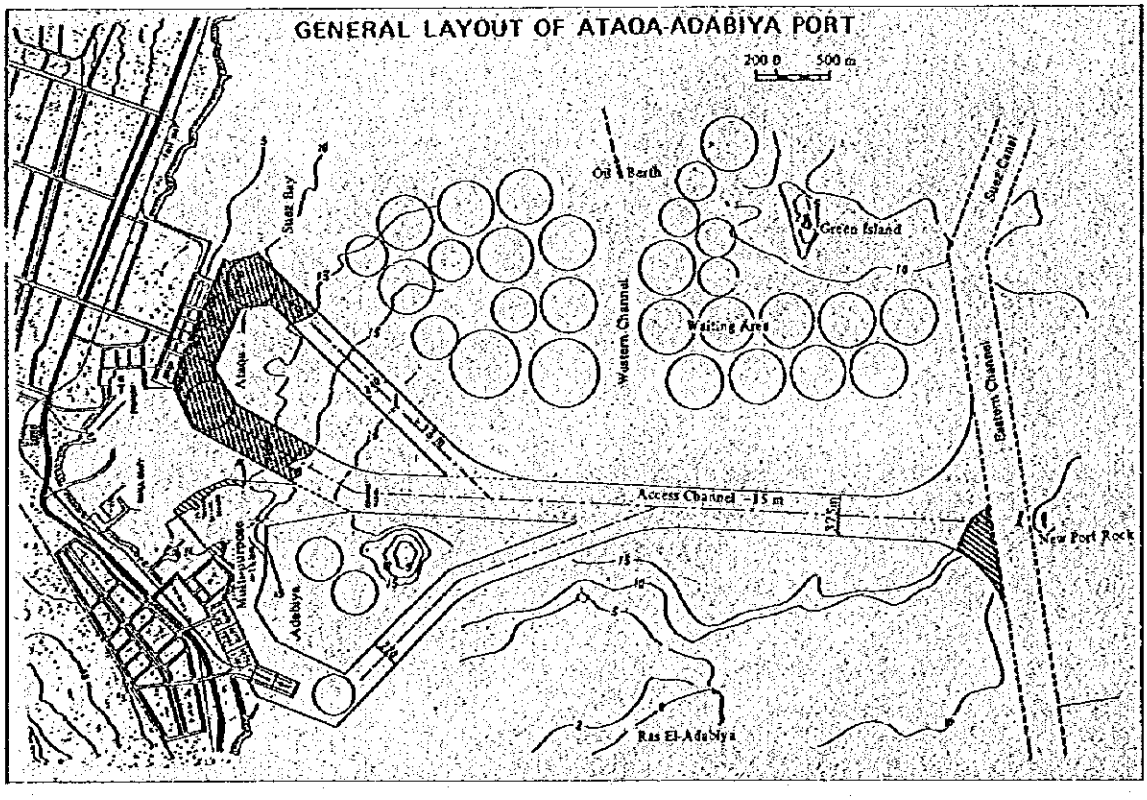
83. This comprises the construction of a two-berth multi-purpose wharf which will partly handle special cargo (iron & steel products, timber) and containers. Due to the physical characteristics of the selected site and available materials and construction equipment, the wharf (420 m long) will consist of reinforced concrete caisons and will be able to accomodate container vessels which will handle cargoes using their own gear. The wharf will be 350 m wide to handle containers, and it will serve special cargo ships in the future. The depth of the water alongside the wharf will be 11.9 m below Mean Law Water Level at Spring Tide (MLSW).

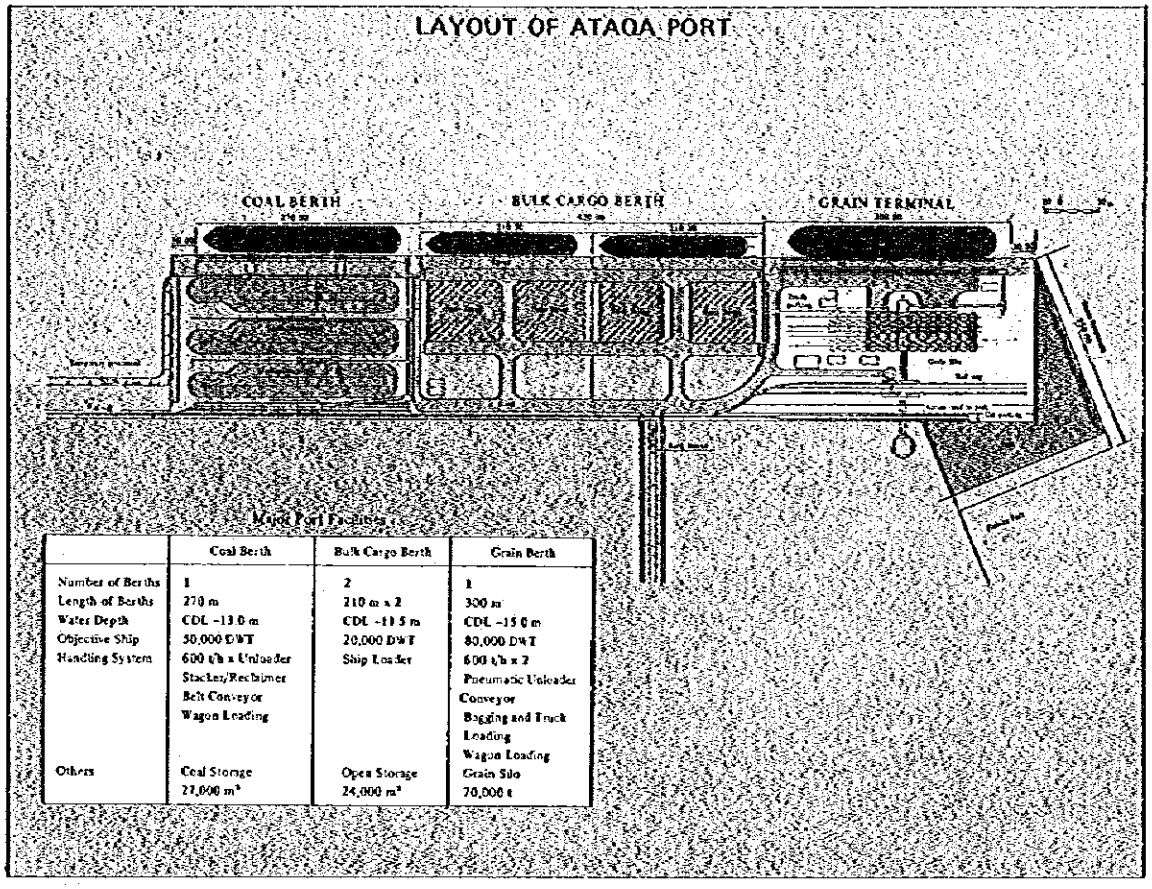
(ii) Ataqa Commercial Port

84. This comprises the construction of a 300 m grain berth with an alongside depth of 15.4 m below MLWS and with grain silos of 70,000 tons which will be expanded to 100,000 tons in the future. The grain wharf will be capable of accommodating one grain carrier of up to 80,000 DWT. The Project also includes a 420 m bulk cargo wharf with an alongside depth of 11.9 m below MLWS capable of accommodating two bulk carriers of up to 20,000 DWT, a 270 m coal berth with an alongside depth of 13.4 m below MLWS capable of accommodating one coal vessel of up to 50,000 DWT, and other necessary terminal facilities. The wharf (1,050 m long and 15 ~ 25.5 m wide) will consist of reinforced concrete caisons. The northern and southern extremities of the wharf will be protected by revetments. Other facilities will include two pneumatic unloaders (600 t/h each), two belt conveyors (660 t/h each) and various equipment attached to the silos for the grain terminal, two unloaders (500 t/h each) and 2 stacker-reclaimers (1,200 – 1,100 t/h each) for the coal berth, administration buildings and equipment maintenance buildings. A 300 m pier for small craft with an alongside depth of 4.4 m below MLSW is also included.

(iii) Ataqa Fishery Port

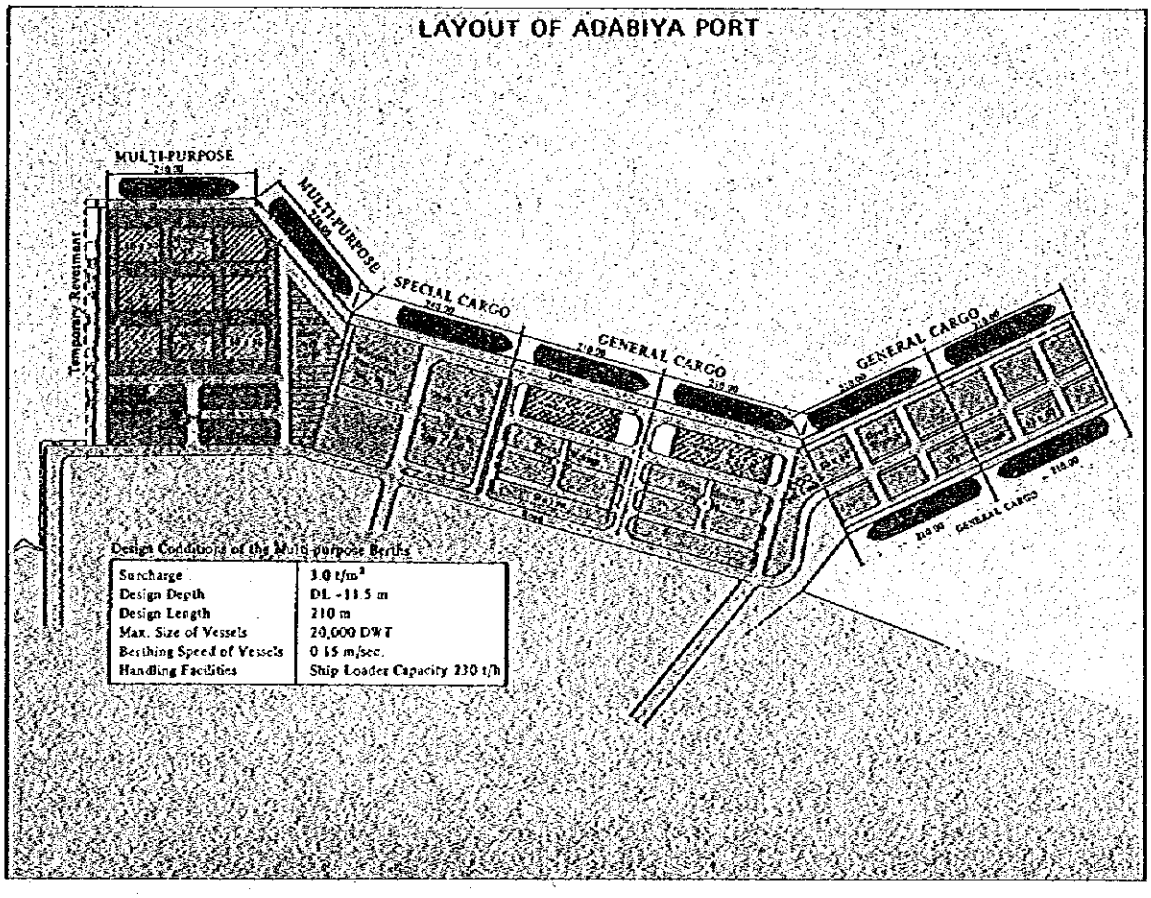
85. This comprises the construction of a 210 m fish landing and preparation wharf, a 180 m mooring berth with an alongside depth of 4.4 m below MWLS, one 70 m slipway and other necessary facilities. The wharf (210 m long and 15 m wide) will consist of reinforced concrete blocks. Other facilities will include a transit shed of 2,400 m^2 and an administration building.





Major Port Facilities

	Coal Berth	Bulk Cargo Berth	Grain Berth
Number of Berths	1	2	1
Length of Berths	270 m	210 m x 2	300 m
Water Depth	CDL -13.0 m	CDL -11.5 m	CDL -15.0 m
Objective Ship	50,000 DWT	20,000 DWT	80,000 DWT
Handling System	600 t/h x Unloader Stacker/Reclaimer Belt Conveyor Wagon Loading	Ship Loader	600 t/h x 2 Pneumatic Unloader Conveyor Bagging and Truck Loading Wagon Loading
Others	Coal Storage 27,000 m³	Open Storage 24,000 m²	Grain Silo 70,000 t

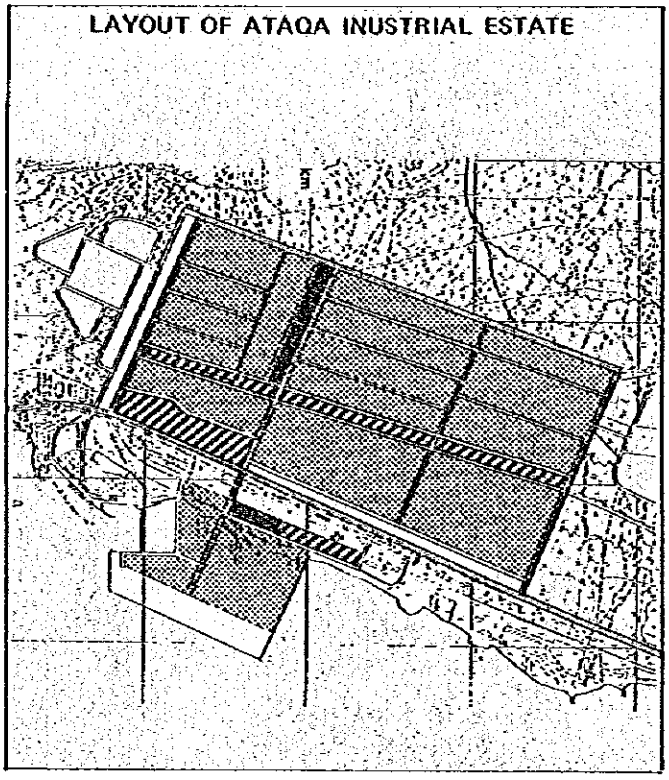


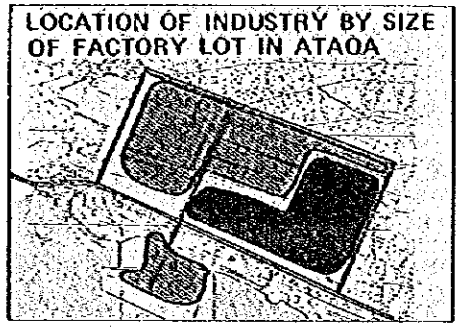
Design Conditions of the Multi-purpose Berths

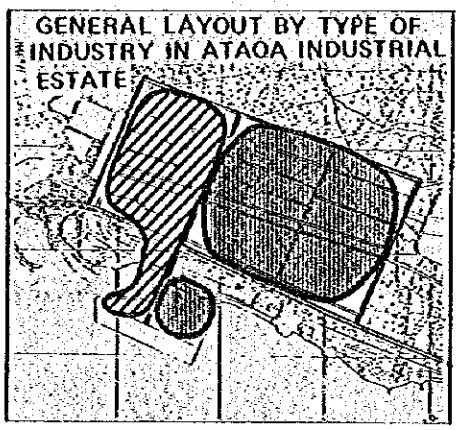
Surcharge	3.0 t/m²
Design Depth	DL -11.5 m
Design Length	210 m
Max. Size of Vessels	20,000 DWT
Berthing Speed of Vessels	0.15 m/sec.
Handling Facilities	Ship Loader Capacity 230 t/h

(iv) Ataqa Industrial Estate

86. This comprises preparation of a 400 ha site including centerbruildings (7,150 m^2), drainage (8.5 km), 18 m wide road (12,900 m), 21 m wide road (6,600 m), water supply (47.2 km), sewerage (21.8 km) and 20 electricity substations.

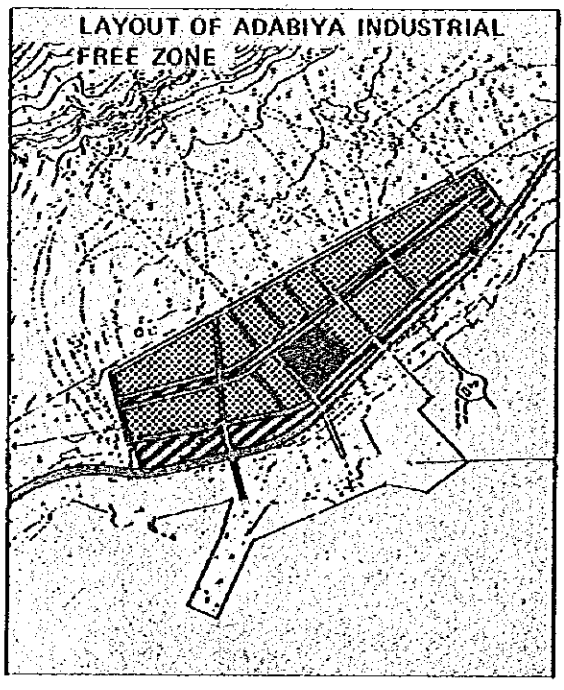


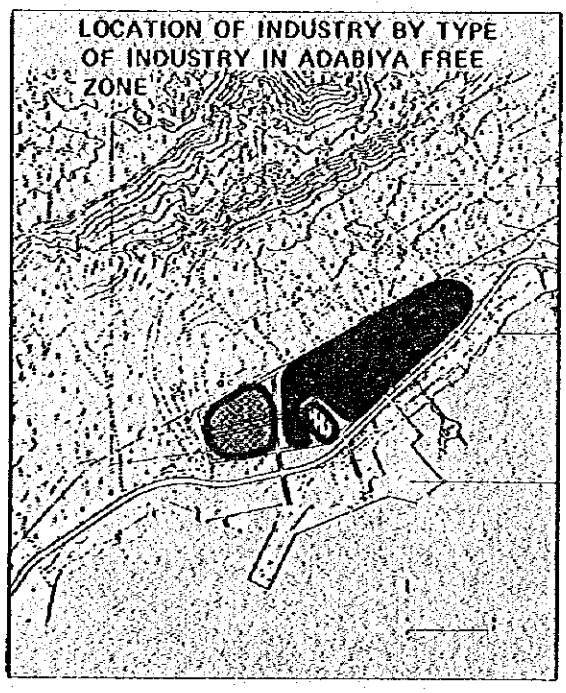




(v) Adabiya Free Zone

87. This comprises the site preparation of a 82 ha industrial estate including 1,500 m of road 18 m in width, 8,400 m of road 21 m in width, a center building (4,550 m^2), drainage pipes (3 km), water supply (13.0 km), sewerage (6.0 km) and 10 electricity substations.





(vi) Roads and Railways

88. The road development of the Project consists of;

1 Addition of a 7.5 m wide carriageway 10.3 km in length in the section between Suez and Adabiya port. With this development, the coastal road between Suez and Adabiya will become a dual carriageway road and serve as a trunk roads for the industrial and port development.

2 Provision of 2-lane roads 8.9 km in length as trunk roads in the industrial zone in Ataqa and also as access roads to Ataqa port.

3 Provision of 2-lane roads 2.2 km in length as trunk roads in the industrial zone in Adabiya and Adabiya port. The roads will function as the linkage between the industrial zone and the port area.

The rail development of the Project consists of;

1 Restoration of the 8.5 km long track between Suez and Ataqa port, which will accommodate 26 trains per day.

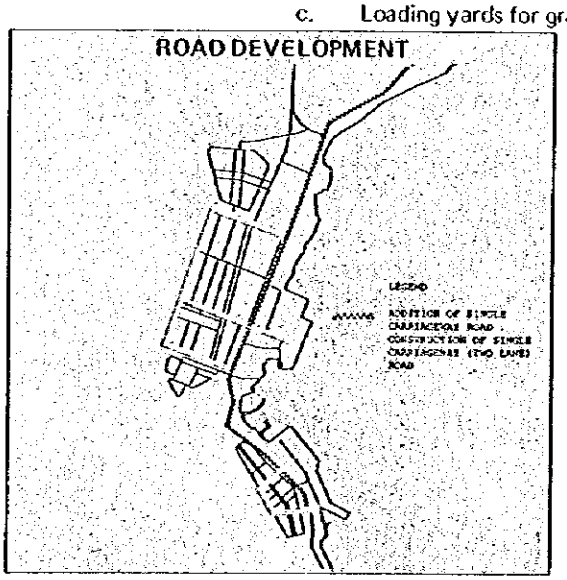
2 Provision of a signal control system in the above section.

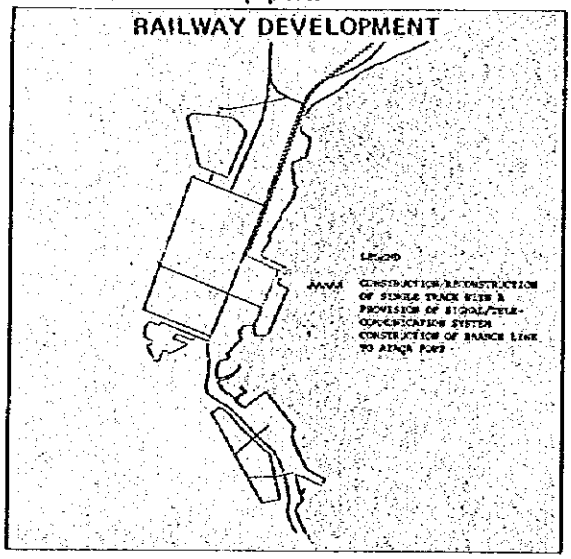
3 Ataqa port rail system development, which includes:

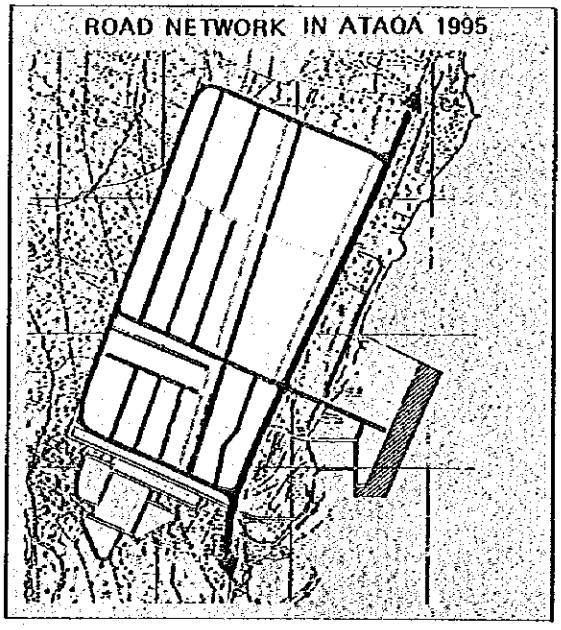
a. 3 branch lines to Ataqa port.

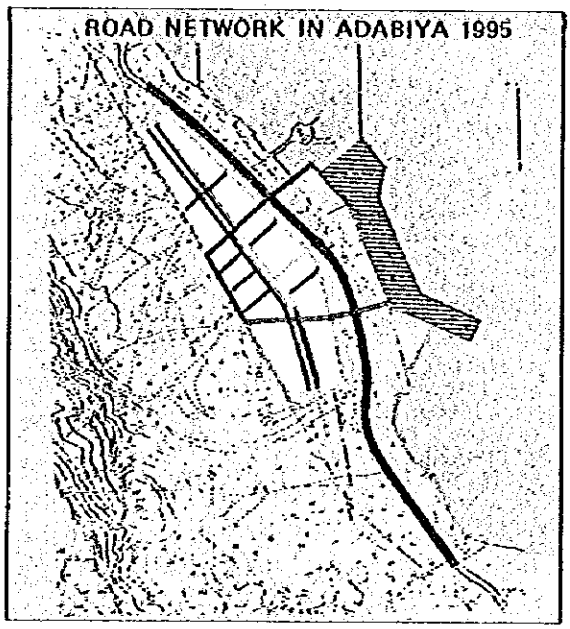
b. Shunting yards with four 400 m fingers for train composition.

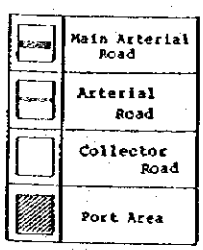
c. Loading yards for grain and coal/coke in Ataqa port.











(vii) Water Supply, Sewage Disposal and Power Supplies

9. The water supply system includes a treatment plant with a capacity of 88,000 m^3/day long the Suez Sweetwater Canal about 3.0 km north of the existing plant, and the expansion of the capacity f the existing Suez treatment plant, by 21,000 m^3/day. The treatment process will be chlorination and eutralization, flocculation, sedimentation and filtration. The water system also includes water transmission ains 23.1 km in length from the treatment plant to the Ataqa-Adabiya area and also two distribution asins for the Ataqa Industrial Estate (13,400 m^2 and 14,100 m^3) and for the Adabiya Industrial Free Zone 3,400 m^2 and 940 m^3). The sewage disposal system comprises two treatment plants: 50,200 m^3/day or the Ataqa Industrial Estate and 3,300 m^3/day for the Adabiya Industrial Free Zone as well as the ewerage noted in Para 86 and 87. The electric power will be supplied by the Ataqa station through trans- ission lines. Two primary substations will be constructed with two 220/60 KV transformers with a capacity f 70 MVA each and three 66/11 KV transformers with a total capacity of 81 MVA. The existing trans- ission lines which pass aslant the planned Ataqa Industrial Estate for about 5 km will be realigned so that ney will not obstruct the proposed land use in the area.

C. Cost Estimates

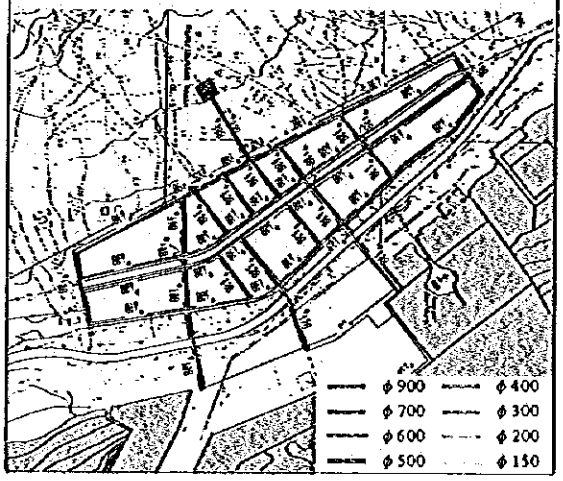
0. The total construction cost of the Project is estimated at L.E. 375 million of which L.E. 33.5 million (62 percent) is the foreign currency cost and L.E. 141.5 million is the local currency cost. ost estimates for the Project are based on the layout plans and preliminary design work. Base estimates ere prepared using the prices in July, 1985. Cost estimates include a provision of 10 percent for physical ontingencies and exclude any contingency for price fluctuations. A summary of the project cost estimates given in the table;

Table 4. Construction Cost Estimates

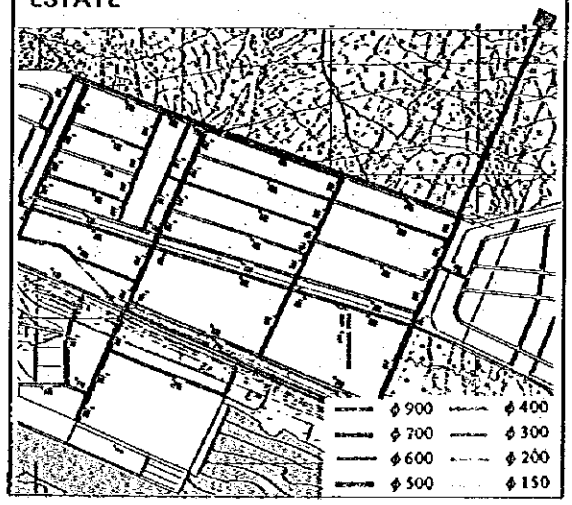
	Foreign Cost (L.E. '000)	Local Cost (L.E. '000)	Total Cost (L.E. '000)	% Foreign Cost
I. Base Cost				
A. Civil Works				
1. Site Preparation	0	17,400	17,400	0
2. Dredging & Reclamation	21,500	2,700	24,200	89
3. Quaywalls/Revetment	23,300	29,300	52,600	44
4. Railway & Road/pavement	200	16,600	16,800	1
5. Water supply/Sewerage	12,600	18,400	31,000	41
6. Electricity	10,200	5,600	15,800	65
7. Buildings	4,700	12,700	17,400	27
8. Yards/Grain Silo Bins	9,200	7,700	16,900	54
9. Other Port Facilities	1,000	600	1,600	63
Total A.	82,700	111,000	193,700	43
B. Capital Goods				
1. Grain Handling Equipment	21,800	2,700	24,500	89
2. Coal Handling Equipment	35,800	1,600	37,400	96
3. Mechanical & Electrical Equipment for Water Treatment Plant	9,000	2,000	11,000	82
4. Ditto, but for Sewar Plant	18,900	2,900	21,800	87
5. Substation Equipment	30,800	2,900	33,700	94
Total B.	116,300	12,100	128,400	91
C. Engineering Services				
1. Design & Tender Document.	4,700	2,600	7,300	64
2. Training	1,800	600	2,400	75
3. Implementation Supervision	8,100	2,900	11,000	74
Total C.	14,600	6,100	20,700	71
SUB-TOTAL	213,600	129,200	342,800	62
II. Contingency				
A. Physical Contingency	19,900	12,300	32,200	62
TOTAL	233,500	141,500	375,000	62

Construction cost estimates are based on an exchange rate of $1 = L.E. 1.35, and July of 1985 prices.
Duties and Taxes for Capital Goods described ITEM. I. B. and for dredger and floating equipment to be re-exported are excluded from cost estimates.

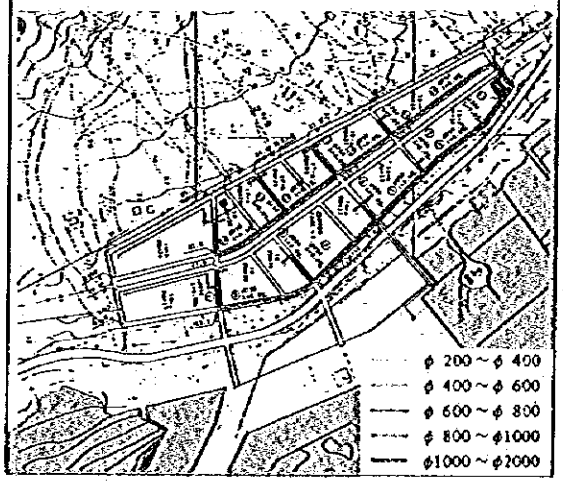
LAYOUT PLAN FOR WATER DISTRIBUTION SYSTEM FOR ADABIYA INDUSTRIAL FREE ZONE



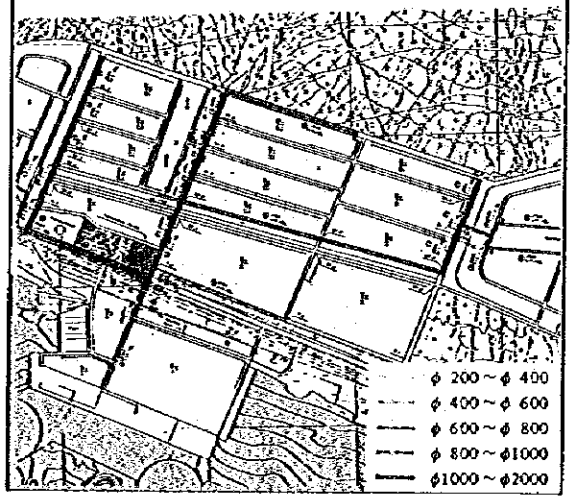
LAYOUT PLAN FOR WATER DISTRIBUTION SYSTEM FOR ATAQA INDUSTRIAL ESTATE



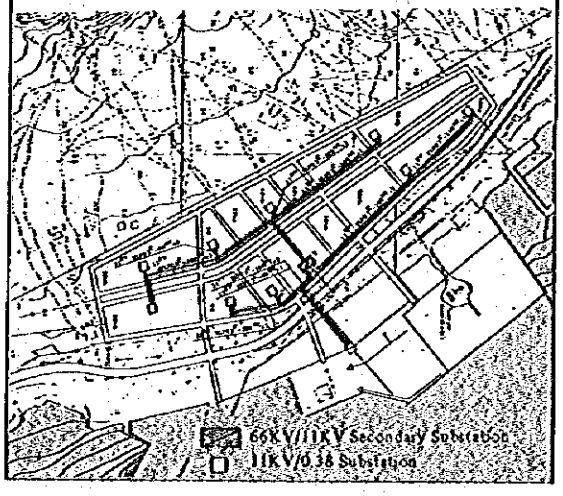
SEWER NETWORK IN ADABIYA FREE ZONE



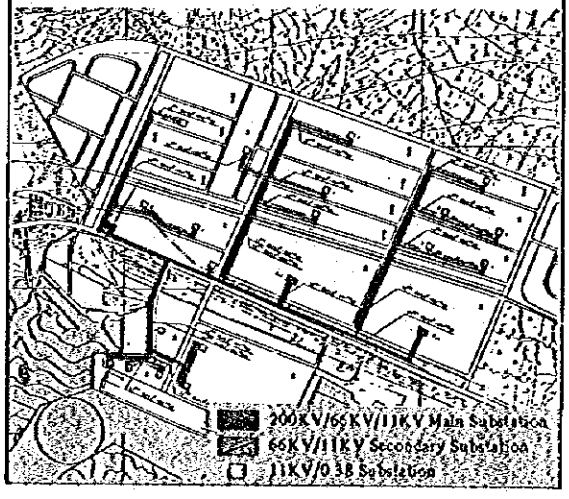
SEWER NETWORK IN ATAQA INDUSTRIAL ESTATE



PRIMARY DISTRIBUTION SYSTEM FOR POWER SUPPLY IN ATAQA INDUSTRIAL ESTATE



PRIMARY DISTRIBUTION SYSTEM FOR POWER SUPPLY FOR ADABIYA FREE ZONE



D. Implementation Arrangements

(i) The Executing Agency

91. The proposed project consists of various infrastructures which are currently managed and operated by different authorities or agencies. In order to lead the project to success, effective and efficient management and operations under a newly-established appropriate institutional framework is necessary.

92. After appraising the existing institutional framework, an institutional framework with the Suez Bay Coastal Area Development Authority (SBDA) as the central organ is recommended to be newly established as shown in the figure.

93. The responsibilities of the SBDA are proposed as follows:

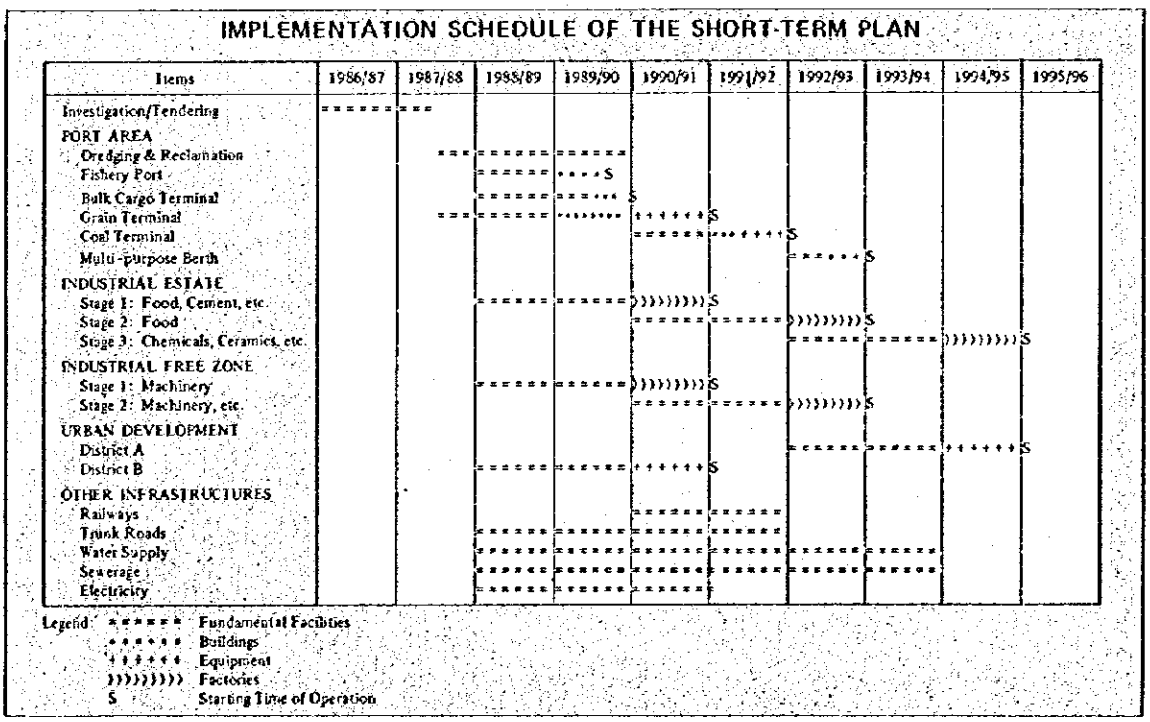
- o Fund raising
- o Land acquisition
- o Determination of the construction schedule
- o Research, planning and sales activities for the promotion of the port, industrial estate and industrial free zone
- o Management and operation of the facilities
- o Port service sales
- o Maintenance and repairs of the facilities and equipment

94. For smooth decision making on the plan, a steering committee consisting of high officials from all the relevant organs should also be organized.

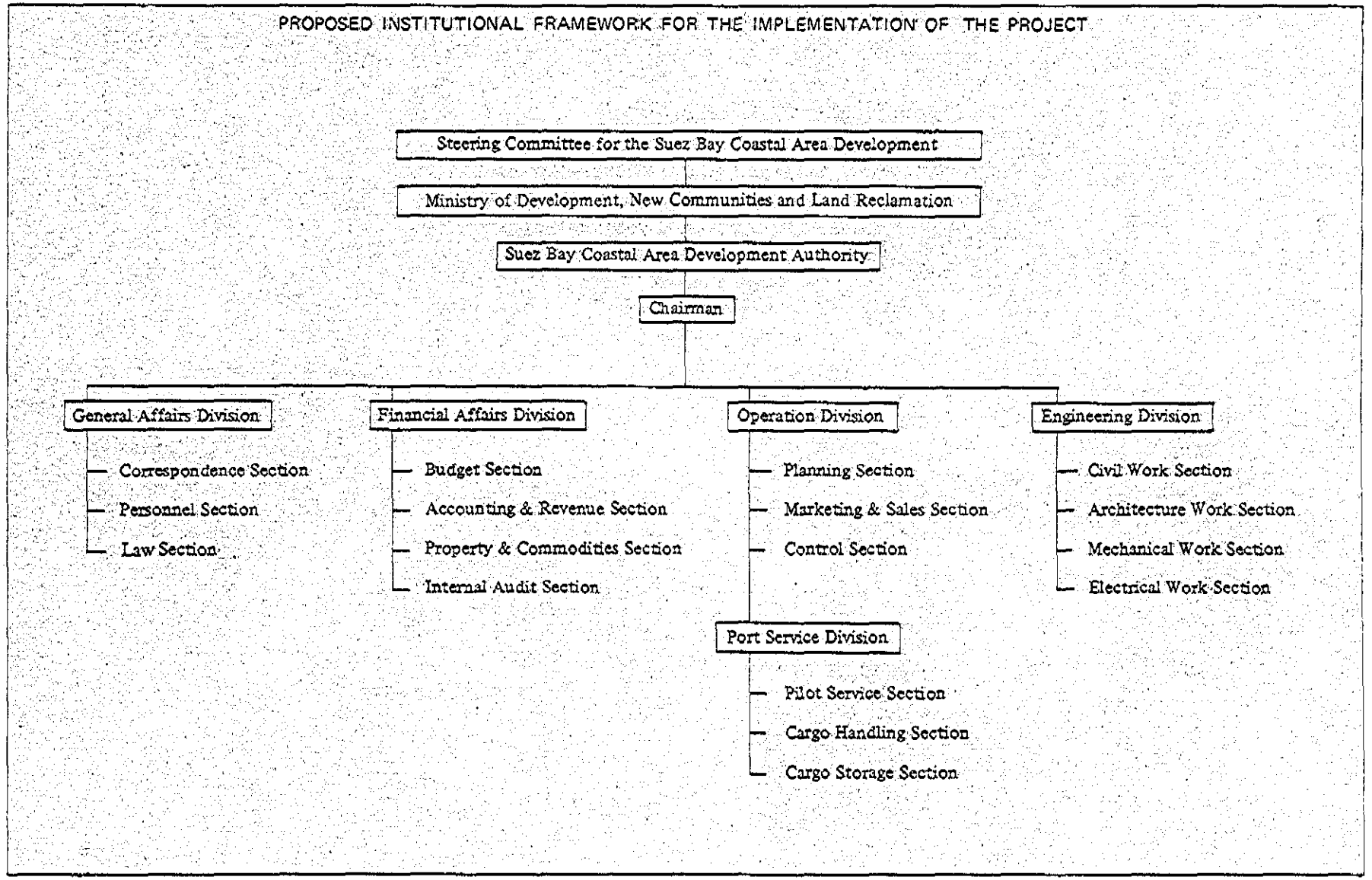
(ii) Implementation Schedule

95. The Project will be implemented over an eight years period beginning in fiscal year 1986/87, subject to the technical capacity of execution and possible annual disbursements. In order to avoid the risks arising from excessively early implementation of the industrial estate and industrial free zone, the implementation schedule for these infrastructures is divided into three and two stages, respectively.

96. Site surveys including necessary investigation of design condition, detailed design and tendering will take one and a half years. Consulting services will include site serveys and investigations, detailed design, preparation of tender documents and construction supervision.



PROPOSED INSTITUTIONAL FRAMEWORK FOR THE IMPLEMENTATION OF THE PROJECT



V. Economic Evaluation

A. General

97. The purpose of the economic evaluation is to appraise the economic feasibility of the Project of the Short-term Development Plan explained in Para 82 ~ 89 from the viewpoint of the national economy. The economic internal rate of return (EIRR) of the project based on cost-benefit analysis is used to appraise the feasibility of the Project.

98. The Project will contribute to the Government's objective of promoting exports by improving Egypt's shipping and port facilities and by promoting export-oriented industries. It will also contribute to the objective of rapid industrialization and decentralization by establishing industrial estate and improving locational advantages through construction of port facilities, particularly the grain terminal and the multipurpose berth for containers.

B. Benefits and Beneficiaries

99. The economic benefits of the Project have been quantified on the basis of a "with" and "without" the Project comparison. The liberalization of the external trade and payment system coupled with the recent rapid economic growth have created serious bottlenecks in the country's ports. These trends are expected to continue in the foreseeable future. Given a moderately optimistic outlook for industrialization, the GDP growth will continue to be rapid, averaging about 7% per year. Continued economic development and diversification of the economy will mean further pressures on the available port capacity.

100. The recently adopted National Port Plan formulated within the framework of the National Transport Study is designed to provide long-term solutions to the main bottleneck in the transport system; namely, the ports. The projects included in the plan will enable Egypt to eliminate severe congestion existing at all ports and also to meet effectively the requirements of the expected growth in traffic. The plan will achieve additional cost savings in cargo handling and ocean transport through rehabilitation of old and long-neglected port facilities which are largely obsolete and unsuitable for modern shipping technology. The proposed project at Dikheila which is included in the port plan as a priority project, the new development at Damietta and, to some extent, Port Said will serve Egypt's commerce within the Mediterranean. The total planned capacity, assuming that all the proposed projects are implemented as scheduled in the plan, will be fully utilized by about 1992. Similarly, the planned rehabilitation works at the Red Sea Ports, i.e., the Ports of Suez and Safaga will meet to some extent to the requirements of the Far-East trade.

101. The rapid industrialization will require new locations where port facilities and effective land use can be provided at the least cost. Without the Project, it will be difficult to find areas where the new industries can locate only through private sector investment. The new industries require improved infrastructures and higher amenity.

102. The quantifiable economic benefits of the Project consist of:

(a) Savings in Berth Waiting Costs

103. Without the Project, all the cargo except for coal will be handled mixed at the existing 7 berths including the berths to be constructed by 1986/87 under the current rehabilitation plan. A maximum berth occupancy rate of 0.9 is presumed. In the "with" case, larger vessels will be able to berth and cargo handling efficiency will be improved markedly especially for grain carriers. Total savings in berth waiting time during the project life will amount to 1,576.5 days.

104. Savings in ship waiting time should be retained by Egypt either in the form of reduced demurrage charges on chartered trade or as an elimination of congestion surchages for liner operations.

In the economic rate of return calculation, only about 80% of these savings are assumed to accure to Egypt assuming 100% of the savings in the trade handled by Egyptian owned vessels (accounting for about 15% of total traffic), 100% of the savings in Charter trade (50% of total traffic), and 50% of the savings for the remaining liner shipping.

(b) Savings in Land Transportation Cost

105. It is assumed that the difference in cargo volume between the "With" case and the "Without" case is handled at Alexandria. Therefore, the benefit is calculated as the difference in land transportation cost between Suez-origin/destination and Alexandria-origin/destination. Furthermore, it is assumed that the waiting costs of ships in Alexandria and in Suez are equivalent, and the maritime transportation cost from Suez to Alexandria is neglected. This assumption seems to be somewhat conservative considering the present congestion at Alexandria Port.

(c) Savings in Transportation Cost for Coal

106. Without the Project, the trade pattern of coal is set as the current situation of importing from Eastern Europe by conventional bulk carriers. With the Project, coal is imported from Australia by 50,000 DWT bulk carriers. In this study, the savings in the transportation cost of coal are calculated based on the difference in maritime transportation cost, since the difference in the inland transportation cost between the "With" case and "Without" case is considered to be negligibly small.

(d) Increase in Value Added Arising from the IE and IFZ

107. The value added of each industry expected to locate in the IE and IFZ is estimated considering its value added ratio. Since in this study only investment in the infrastructures excluding buildings, plants and machines is considered, the net benefits are calculated as 17.9% of the total value added of the industries, considering the contribution of the infrastructures to the production, based on the Japanese experience at Kashima where a new industrial port and industrial estate have been successfully developed. This benefit is shared by the Port sector and the IE & IFZ sector, according to the contribution of investment in the infrastructures in each sector.

(e) Increase in Value Added from the Fishery Port

108. The increase of the GDP of the agricultural sector caused by the increased employment is counted as the net benefit.

C. Economic Internal Rate of Return

109. Based on the foregoing analysis, the Economic Internal Rate of Return (EIRR) was estimated to be 13.9 percent. Various tests were performed to determine the sensitivity of this return to changes in basic assumptions. The results are shown below:

	Port	IE & IFZ	Total
Base Case	15.3	10.9	13.6
Cost Increase by 10%	13.8	9.5	12.1
Cost Increase by 20%	12.4	8.2	10.8
Benefit Decrease by 10%	13.6	9.3	12.0
Benefit Decrease by 20%	11.8	7.7	10.2

110. The EIRR shows that the Project remains viable even in cases were the construction cost increases by 10% or the expected benefit decreases by 10%. However, the Project might be risky if the expected construction cost increases by 20% or the expected benefit decreases by 20%. Therefore, it is necessary to ensure that the construction cost remains as cheap as possible and that the expected benefits are realized without delay.