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STATUS REPORT ON ALTERNATIVE
DEVELOPMENT STRATEGIES FOR SINAI

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SINAI DEVELOPMENT STUDY - PHASE I

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

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TABLE OF CONTENTS

	Page
- List of Figures	i
1 - Introduction	1
2 - Redefinition of Goals	3
3 - Design of Alternative Strategies	4
4 - Allocation of Project Level Data to Alternative Strategies	6
5 - Summary of Input Requirements of Each Strategy in 2000	8
6 - Population Generated by the Three Strategies	11
7 - Sectoral Components of Each Strategy, by Location and Planning Period	11
7.1 Agriculture	13
7.2 Industry	16
7.3 Tourism	19
8 - Preliminary Assessment of the Strategies	19
9 - Next Steps under Task 11	23

LIST OF FIGURES

Figures	Page
1.1 - Nature and Status of the Strategic Planning Process	2
4.1 - Extract from a Project Coding Sheet	9
5.1 - Summary of Strategy Input Requirements	10
6.1 - Population in the Year 2000	12
7.1 - Total Agricultural Investment for Major Projects by Strategy	14
7.2.1 - Agricultural Investment, Employment, Water and Power Use by Strategy and Planning Period - El Arish	25
7.2.2 - Agricultural Investment, Employment, Water and Power Use by Strategy and Planning Period - El Tor	26
7.2.3 - Agricultural Investment, Employment, Water and Power Use by Strategy and Planning Period - East Bitter Lakes	27
7.2.4 - Agricultural Investment, Employment, Water and Power Use by Strategy and Planning Period - El Qaa	28
7.2.5 - Agricultural Investment, Employment, Water and Power Use by Strategy and Planning Period - Nakh1	29
7.2.6 - Agricultural Investment, Employment, Water and Power Use by Strategy and Planning Period - Northwest	30
7.3 - Agriculture - El Arish	16
7.4 - Industrial Investment by Location Planning Period and Strategy	18
7.5 - Industrial Land Use, Employment, Water and Power Use by Strategy Planning Period and Location	31
7.6 - Industrial Development - El Arish	19
7.7 - Tourism Investment, Employment, Water and Power Use by Strategy, Planning Period and Location	21

1. INTRODUCTION

The purpose of this working paper is to summarize progress made in the design and evaluation of alternative strategies, the main content of the Draft Final Report. Following a review by the client group and team members of Working Paper No. 8, Preliminary Summary of Alternative Development Strategies for Sinai, goals have been re-defined, alternative strategies re-designed, sectoral projects allocated to strategies, and the strategies summarized in terms of their investment, employment, water and power requirements, their location characteristics and impact over time. This paper represents an explicit synthesis of project/sector level and strategy studies.

The nature and status of the strategic planning process is illustrated in the chart overleaf.* The next important analytical task is the land capability analysis, which will relate the demand for resources (the most critical ones being water, soil and labor) in various parts of the Sinai with their supply, measured qualitatively as well as quantitatively.

* Figure 1.1 - Nature and Status of the Strategic Planning Process.

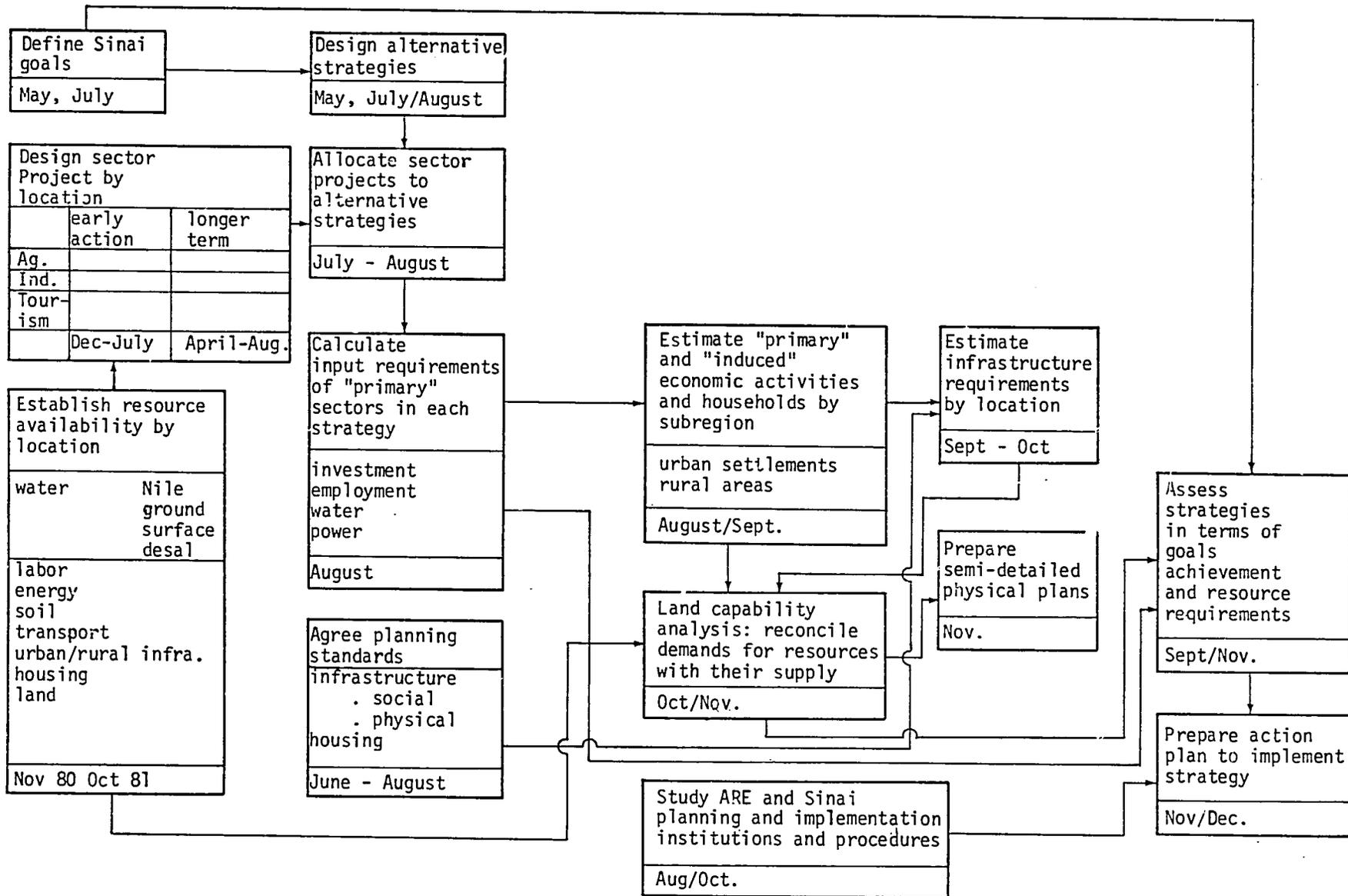


FIGURE 1.1
NATURE AND STATUS OF THE STRATEGIC PLANNING PROCESS

2. REDEFINITION OF GOALS

Working Paper 8 distinguished a series of Sinai objectives:

- o population absorption
- o self sustaining economic growth
- o environmental conservation
- o national and international security
- o new frontier
- o self reliance.

A number of conditions under which objectives may be best achieved were described:

- o social justice
- o efficient resource management
- o early impact
- o respect for indigenous population
- o support for national development efforts.

The three highest scoring objectives in the weighting exercise were:

- o self sustaining economic growth
- o self reliance
- o population absorption.

The first and third of these tended to be rated similarly by most team members. There were varying opinions on self reliance. By far the most important condition was thought to be efficient resource management, with little variance of opinion.

This argues that economic criteria are upmost in team members minds as they attempted to interpret GOE views.

It was decided to reduce the goals to four main ones:

- a) Population absorption;
- b) Efficient and self sustaining economic growth;
- c) Environmental conservation;
- d) Social justice.

In addition to measuring each alternative action program's achievement of these goals, their performance in terms of critical constraints will be assessed. These resource constraints include:

- a) Water supply;
- b) Skilled human resources;
- c) Investment funds.

They represent supplementary measures of economic efficiency which focus decision-making on the critical resource allocation choices: the diversion of Nile water from the more productive Delta may greatly increase the cost of producing food; wage and salary subsidies may be required to encourage migration to Sinai and keep families there; ideally public as well as private investments should be as productive in Sinai as in the next best alternative applications elsewhere in Egypt.

3. DESIGN OF ALTERNATIVE STRATEGIES

Working Paper 8 defined strategies as actions and activities linked together to achieve sets of goals. It is clear from the preliminary studies as well as discussions with the client group that the two critical goals in terms of potential conflict are population absorption and efficient and self sustaining economic growth. A large population will tend to require large subsidies for water supply and human resources, rendering a high proportion of projects economically inefficient. On the other hand, limiting the selection of projects to those with a high internal rate of return may tend to lead to very little population growth and a failure to come close to publically stated targets.

The principle underlying the design of two of the strategies is an

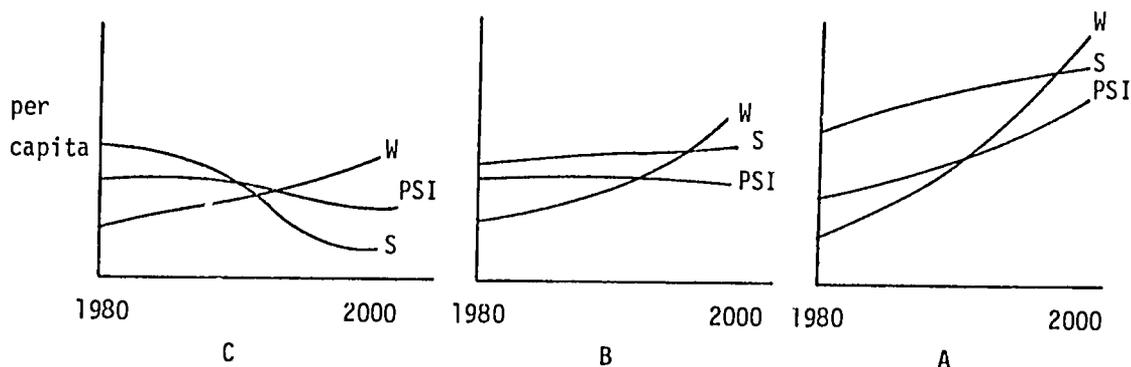
emphasis on one of those goals: Strategy A, maximum population absorption; Strategy C, economic efficiency. The third is a compromise which reduces the emphasis on each of these goals.

A fifth, overriding goal may provide the key to a reasonable balance between these two goals: integrating Sinai into the rest of Egypt. The achievement of such a goal requires a build-up of population in Sinai, the migration of Delta Egyptians to Sinai (a confirmation by "mainstream" Egypt that Sinai is fully part of Egypt), and an economic contribution by Sinai to the rest of Egypt (diminishing rather than growing dependence in terms of trade flows).

The alternative strategies are characterized as follows:

- A: wage and salary subsidies, high level of public investment, substantial Nile diversion and deep drilling for groundwater; to achieve high levels of population absorption.
- B: moderate public sector involvement leading to moderate economic and population growth; each sector at a level of activity between that in A and C.
- C: investment largely based on development of local, natural resources, minimal subsidies; exploitation local, moderate depth water resources and runoff recapture; high degree private sector involvement; to achieve efficient and self sustaining economic growth.

The key constraint variables might tend to follow the trends illustrated in the following diagram:



W = water costs
 PSI = public sector investment
 S = subsidies - wages, food, etc.

4. ALLOCATION OF PROJECT LEVEL DATA TO ALTERNATIVE STRATEGIES

Each of the three primary* sector teams drew up a list of potential Sinai projects on the basis of relaxed resource constraint assumptions: for example, an awareness that water supply is a problem, but not ruling out the possibility of substantial Nile diversion or access to groundwater. The explicit reconciliation of resource availability with sector and population demand will come later in the land capability analysis.

There are 20 agricultural projects ranging from experimentation and extension and upgrading olive production to 150,000 feddan land reclamation in the Northwest. There are about 150 industrial and mining projects, shirt factories to sheet metal products fabrication to a ferro-manganese smelter. In each case, projects could be profitable in and economic and financial sense; the more risky projects might be profitable under favorable circumstances - rapid market development, cheap access to water and power, an easy willingness of Delta Egyptians to move to Sinai. It is likely that all of these projects will and should come on-stream sometime in the foreseeable future, although not by the year 2000.

*"Primary" is defined as one of the sectors which will be the basis for economic and population growth; the sectors which will induce growth in other supporting sectors such as wholesaling, transportation, retailing, construction, services.

The third of the primary sectors, tourism, does not have a complete set of projects as defined above (i.e. hotels, restaurants, etc.). However, two alternative strategies were developed in Working Paper 10, Strategy for Tourism.

Each project was coded as follows:

- o Title, brief description
- o Start-up year
- o Location
- o Land requirement
- o Employees
- o Power (Kwh/day)
- o Water (m³/day)
- o Investment (total, foreign, local)

Projects were then allocated to one of the three alternative strategies. The allocation principles were as follows:

- a) Projects based upon indigenous, known, local resources tended to be allocated to Strategy C, the one with the lowest rate of growth.
- b) Projects requiring large amounts of imported resources, such as water and labor, tended to be allocated to Strategy A, the one which has highest growth rates and particularly aims at population maximization.
- c) Risky projects, ones with highly uncertain resource availability and markets, tended to be allocated to Strategy A. Projects which have been studied in some depth, and, therefore, have less uncertainty surrounding them, such as some of the mining/minerals processing projects, tended not to be in this category.
- d) Projects upon which others might depend (as it were,

"high development impact" projects) tended to be allocated to Strategy C. Examples include agricultural extension and some minerals projects.

- e) Projects allocated to Strategy B tended to be slightly larger, slightly riskier or due to come on stream later (when population would be higher) than those allocated to Strategy C.
- f) All projects allocated to C are also assumed to be part of Strategies A and B; all projects allocated to B, are also in A.

There is an underlying assumption (particularly with Strategy A), at this stage of the analysis, that all projects could be implemented by 2000; there are assumed to be no institutional or budgetary barriers. The realism of that assumption is, of course, being assessed in a separate study activity, which will provide an important input to the final iteration and the design of an implementation program.

An extract from a project coding sheet, showing in the last column the allocation of projects to strategies, is illustrated in Figure 4.1.

5. SUMMARY OF THE INPUT REQUIREMENTS OF EACH STRATEGY IN 2000

Figure 5.1 estimates the performance of the three main economic activity sectors in the year 2000. It should be noted that infrastructure costs which might be shared with other sectors have been excluded; e.g., airports and roads.

- A: Each sector contributes 6,000 to 7,500 employees. The tourism component is based upon the "evolutionary" strategy of Working Paper 10. Industry (minus mining) and agriculture investment/employment ratios are similar; tourism's is the highest, apart from mining.

FIGURE 4.1

EXTRACT FROM A PROJECT CODING SHEET

PLANT	ANNUAL CAPACITY TONS/UNITS	START-UP YEAR	LOCATION	LAND FEDDANS	EMPLOYEES	POWER KW	WATER M ³ /H	INVESTMENT - LE 1000		STRATEGY
								FOREIGN	LOCAL	
Bedding	20000 U	81-85	Qantara	2	40	50	.5	100	100	C B
	20000 U	91-95	Qantara	2	40	50	.5	100	100	
Metal Furniture	40000 U	81-85	El Arish	2	70	100	1	300	250	C C B B
	40000 U	81-85	Qantara	2	70	100	1	300	250	
	40000 U	86-90	El Arish	2	70	100	1	300	250	
	40000 U	86-90	Qantara	2	70	100	1	300	250	
Metal Ware	400000 U	81-85	El Arish	2	40	50	.5	300	100	C C B B
	400000 U	81-85	Qantara	2	40	50	.5	300	100	
	400000 U	86-90	El Arish	2	40	50	.5	300	100	
	400000 U	86-90	Qantara	2	40	50	.5	300	100	
Solar	2000 U	81-85	El Arish	4	50	50	1	400	100	C B B A
	2000 U	86-90	El Arish	4	50	50	1	400	100	
	2000 U	86-90	Qantara	4	50	50	1	400	100	
	2000 U	91-95	El Tor	4	50	50	1	400	100	

FIGURE 5.1

Summary of Strategy Input Requirements

STRATEGY C

Year 2000

	Employment	Investment (LE m)	Water (m ³ /day)	Power (Kwh/day)
Agriculture	6,280	23	377,460	76,860
Industry and Mining	6,730	255*	14,400	298,920
Tourism**	7,520	73	770	2,120

STRATEGY B

Year 2000

	Employment	Investment (LE m)	Water (m ³ /day)	Power (Kwh/day)
Agriculture	12,190	29	731,950	151,080
Industry and Mining	16,940	336*	26,600	453,840
Tourism**	8,800	85	860	2,480

STRATEGY A

Year 2000

	Employment	Investment (LE m)	Water (m ³ /day)	Power (Kwh/day)
Agriculture	69,980	180	4,480,180	917,530
Industry and Mining	29,080	561*	59,280	768,300
Tourism**	29,600	358	2,030	8,330

* LE 226 m out of each Industry and Mining total is in the mining sector.

** These figures include "warm beach" tourism, which may best be located in Israeli occupied Sinai (currently).

- B: Tourism is at a slightly higher level than in C, agriculture doubling its employment by doubling the amounts of land reclamation in El Qaa and East of Bitter Lakes. Industry triples its employment on the basis of increased manufacturing activity, investment increasing less than proportionately. The dispersed culture/sightseeing tourism of the "evolutionary" strategy has been doubled for moderate tourism.
- C: Agriculture supplies more employment than both the other sectors taken together, although the level of investment is well below industry and tourism. Agriculture's high level of employment is based upon reclamation of 150,000 feddans around the Salaam Canal. Industry's average investment/employee has dropped from LE 37,000 to 19,260 from Strategy C to A, reflecting the higher incidence of manufacturing activity over mining. The tourism figures are taken from Working Paper 10's "Accelerated Strategy".

6. POPULATION GENERATED BY THE THREE STRATEGIES

The year 2000 population under each strategy are estimated in Figure 6.1. These figures include the current population (about 140,000) and the population generated in other employment sectors (e.g., construction, services, retailing).

Strategy C's population is 273,870, a figure slightly above the natural rate of growth. A moderate strategy would support a further 100,000. Strategy A, with large scale reclamation, would generate a population of almost 1 million, if it could be implemented at the rate implied.

7. SECTORAL COMPONENTS OF EACH STRATEGY, BY LOCATION AND PLANNING PERIOD

This section summarizes a number of tables which represent

FIGURE 6.1

	<u>POPULATION IN THE YEAR 2000</u>		
	<u>Efficient Acceleration</u>	<u>Moderate</u>	<u>Maximum Population Absorption</u>
Additional Population, Based of the Three Sectors ⁽¹⁾	72,560	134,050	454,757
Total Additional Population, Including other Sectors ⁽²⁾	133,870	247,320	839,040
Total Population, Including current Population ⁽³⁾	273,870	387,320	979,040

- (1) Egypt's 1981 population is estimated at 41 million. Recent Ministry of Planning figures indicate a workforce of 11.6 million. A ratio of 41/11.6 has been used to convert employment into population.
- (2) Agriculture, industry and mining, and tourism have about 54.2 percent of total ARE employment. The same proportion has been assumed for Sinai in this working paper.
- (3) Sinai's current population is estimated to be 140,000.

aggregations of the coded individual project data by:

- o Strategy A, B, C
- o Planning period: 1981-85
1986-90
1991-95
1996-2000
- o Location: main settlement for industry, tourism
main agricultural area
- o Fixed investment
- o Employment
- o Water demand
- o Power demand.

7.1 Agriculture

Figure 7.1 gives total fixed investment. The first five projects - agricultural extension, El Arish reclamation, dairy/beef farms, El Arish controlled environment, and Nakh1 reclamation do not vary substantially from one strategy to another. Two projects are not listed since their investment and additional employment requirements are very small: enhanced olive and date production. The large increase in investment required for Strategy A is based upon substantially more reclamation in El Qaa and East Bitter Lakes and the introduction of reclamation based upon the Salaam Canal.

Figures 7.2.1 to 7.2.6* give investment, employment, water and power demand by strategy and planning period for El Arish, El Tor, East Bitter Lakes, El Qaa, Nakh1 and the Northwest. The employment, water and power demand figures are cumulative from one period to the next: for example, under Strategy A in Figure 7.2.1 (El Arish), agricultural extension will require 12 people in 1981-85, rising to 43 in 1986-90 and 60 in 1991-95. This spatially disaggregated data will be used in the land capability analysis and the preparation of semi-detailed physical plans.

* Figures 7.2.1 - 7.2.6 are at the end of this paper.

TOTAL AGRICULTURAL INVESTMENT
FOR MAJOR PROJECTS* BY STRATEGY
(LE 000)

Strategy	Project	Fixed Investment
Efficient Acceleration (C)	Agric. Expt., Ext.	855
	El Arish recl.	2,520
	Dairy/beef	10
	El Arish contr. env.	145
	Nakh1 recl.	685
	E.B.L. recl.	15,220
	El Qaa recl.	3,400
	El Tor contr. env.	<u>125</u>
	Total	<u>22,960</u>
Moderate (B4)	Agric. Expt., Ext.	2,655
	El Arish recl.	2,520
	Dairy/beef	50
	El Arish contr. env.	500
	Nakh1 recl.	1,370
	E.B.L. recl.	15,220
	El Qaa recl.	6,800
	El Tor contr. env.	<u>125</u>
	Total	<u>29,240</u>
Maximum Population Absorption (A)	Agric. Expt., Ext.	2,655
	El Arish recl.	2,520
	Dairy/beef	50
	El Arish contr. env.	500
	Nakh1 recl.	1,370
	E.B.L. recl.	24,220
	El Qaa recl.	13,600
	El Tor contr. env.	125
	Northwest recl.	<u>135,000</u>
	Total	<u>180,040</u>

* see next page

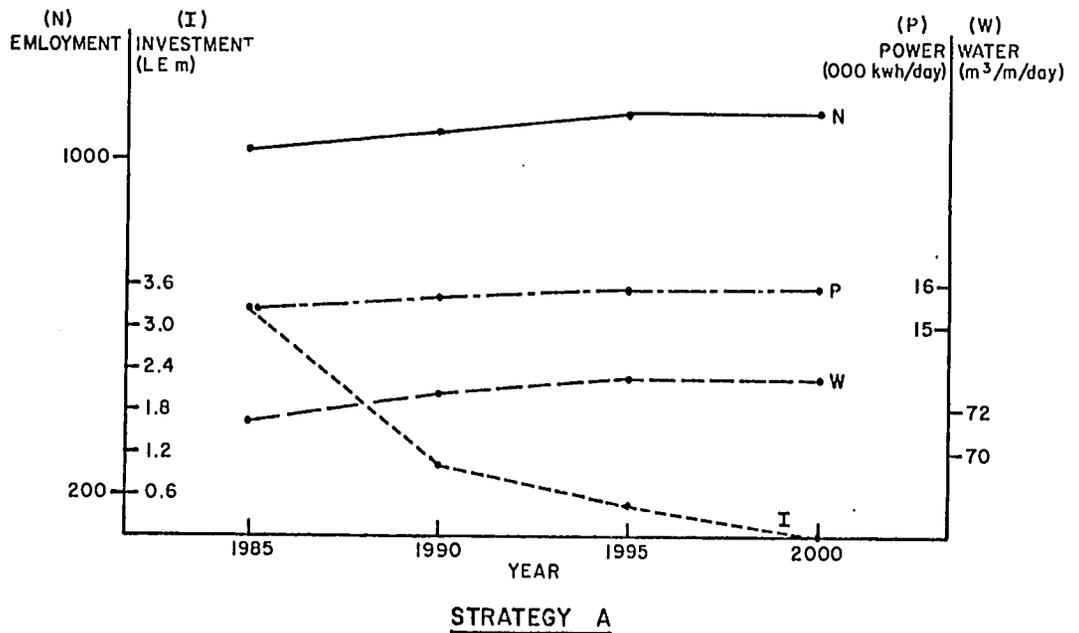
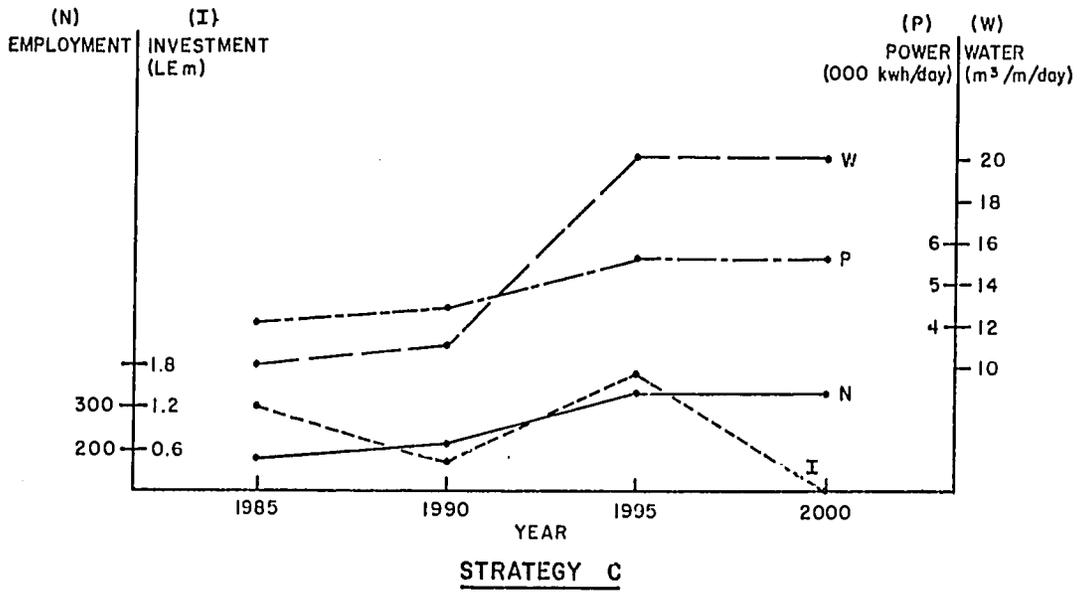
TOTAL AGRICULTURAL INVESTMENT
FOR MAJOR PROJECTS* BY STRATEGY
(LE 000)

(Contd.)

* These refer to the projects in or near the main settlements, with the exception of Agricultural Experimentation and Extension projects which also relate to the rest of Sinai. These same projects feature in the project by location and planning period table.

El Arish is the center with the greatest variety of agricultural activity. Investment and the build-up of employment, water and power use are illustrated in Figure 7.3

Figure 7.3
AGRICULTURE - EL ARISH



Similar curves could be drawn for each agricultural area based on Figures 7.2.1 to 7.2.6. With Strategy C, levels of activity build up gradually as 1995 is approached, then level out. In contrast, Strategy A starts with a high level of investment (5 times C's) and at an early stage is characterized by high levels of activity.

7.2 Industry

Figure 7.4 gives the phasing of investment by planning period and location. The growing demand for land, labor, water and power in El Arish and El Tor (the capitals of North and South Sinai) are shown in Figure 7.5.*

As with agriculture, these variables are plotted for El Arish in Figure 7.6 overleaf. There is a relatively high initial investment in Strategy C, with very slow employment, water and power demand growth. There is a consistently high level of investment in Strategy A, with rapidly growing factor demands throughout the 20 year planning horizon.

Similar data have been prepared for:

- o East Bitter Lakes
- o Qantara
- o East Suez
- o Abu Rudeis/El Qaa
- o Ras Sudr
- o Baradawil/Bir el Abd
- o Abu Zenima
- o El Khabouba
- o Ras Malaab
- o Maghara

* This figure is at the end of the paper.

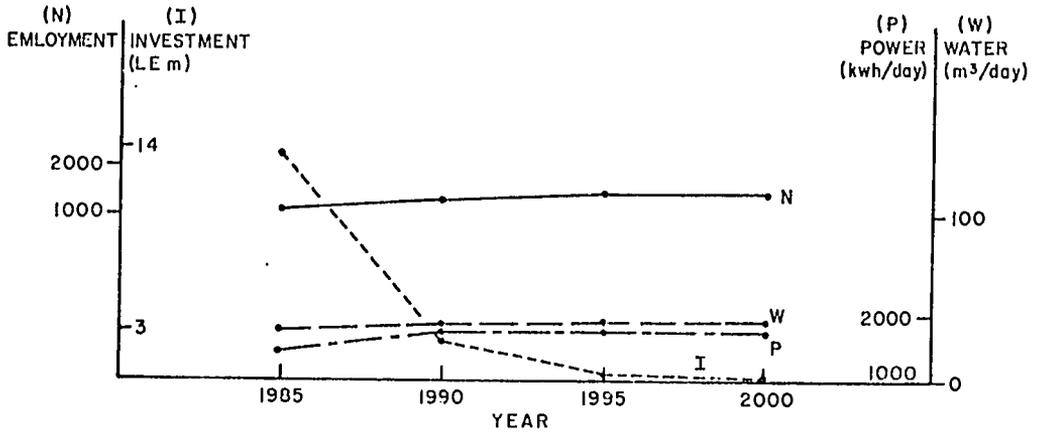
Figure 7.4
Industrial Investment by Location,
Planning Period and Strategy
(LE 000)

Strategy	Location	1981-85	1986-90	1991-95	1996-2000
Efficient Acceler- ation (C)	East B.L.	2,000	0	500	0
	El Arish	13,900	2,700	500	0
	Abu Zenima	30,000	0	0	0
	E. Suez	0	0	0	0
	E. Qantara	5,700	0	0	0
	Bardawil/Bir el Abd	400	0	0	0
	Sudr	200	0	0	0
	El Tor	200	0	0	0
	Abu Rudeis/El Qaa	2,000	0	11,000	0
	Others	19,500	61,200	900	1,200
Moderate (B4)	East B.L.	2,000	4,100	12,000	3,170
	El Arish	19,550	20,890	2,545	2,250
	Abu Zenima	30,000	0	0	0
	E. Suez	0	0	1,200	5,000
	E. Qantara	7,950	6,350	1,425	0
	Bardawil/Bir el Abd	1,150	750	200	0
	Sudr	1,250	0	700	0
	El Tor	3,750	1,600	3,150	0
	Abu Rudeis/El Qaa	2,000	750	1,500	0
	Others	25,500	63,000	900	1,200
Maximum Population Absorption (A)	East B.L.	2,000	6,600	17,000	11,070
	El Arish	19,550	20,890	12,295	20,700
	Abu Zenima	30,000	0	0	0
	E. Suez	0	0	132,680	6,600
	E. Qantara	7,950	6,350	14,425	2,900
	Bardawil/Bir el Abd	1,150	750	950	0
	Sudr	1,250	0	1,900	1,225
	El Tor	3,750	1,600	9,400	1,225
	Abu Rudeis/El Qaa	2,000	750	20,200	19,100
	Others	25,500	63,000	900	1,200

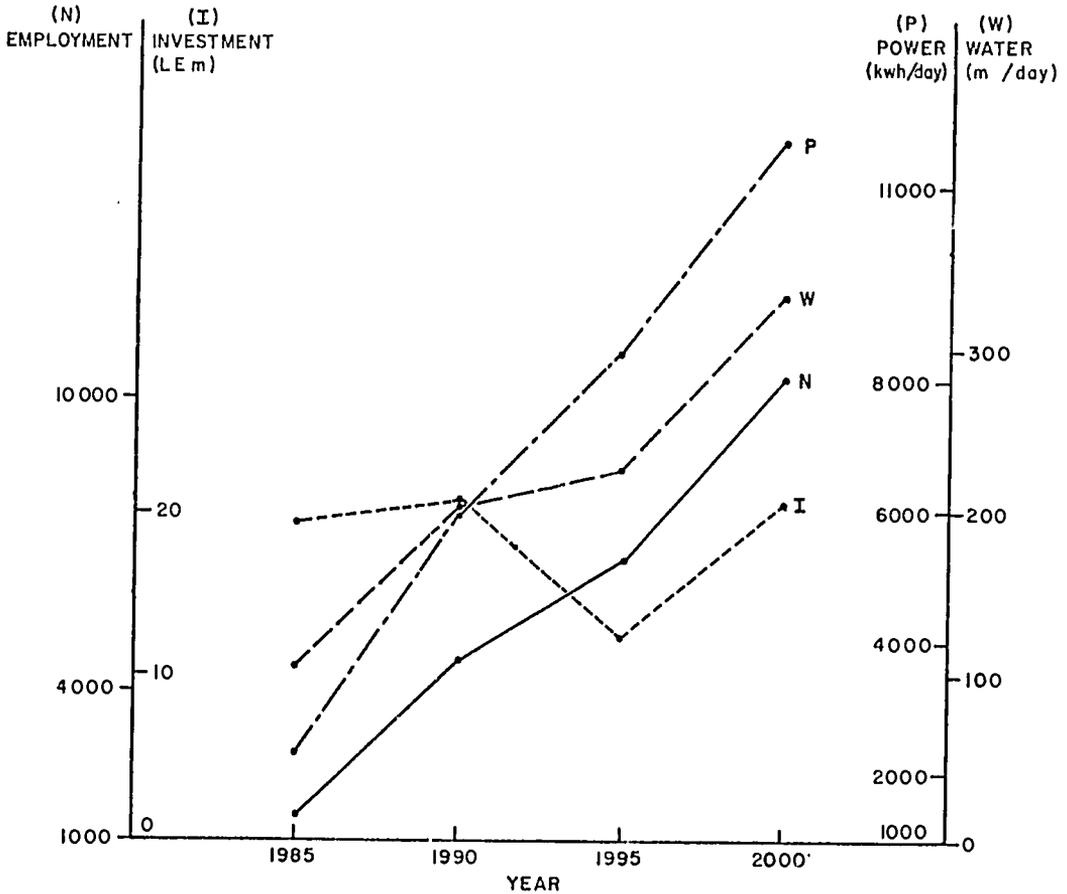
* excludes 400,000 oil refinery

Figure 7.6

INDUSTRIAL DEVELOPMENT - EL ARISH



STRATEGY C



STRATEGY A

7.3 Tourism

The tourism figures are based upon Working Paper 10. Investment, employment, water and power demand estimates for El Arish are given in Figure 7.7. El Arish is the only part of the Phase I Intensive Project Area likely to be greatly impacted by the tourism strategies. The assumptions behind these estimates are summarized at the foot of Figure 7.7.

Tourism employment grows slowly at an almost constant rate under Strategy C. The 1985 level of employment for Strategy A is seven times the Strategy C level for that year. There is particularly rapid population growth between the second and third periods, 1986-95.

8. PRELIMINARY ASSESSMENT OF THE STRATEGIES

Strategy performance is summarized below:

<u>GOAL</u>	<u>A</u>	<u>STRATEGY B</u>	<u>C</u>
Population absorption			
o total population	980,000	390,000	270,000
o I/N (primary sectors**), LE	8,540	11,860	17,160 (6,110*)
Self sustaining and effi- cient economic growth			
o total investment, LEm	1,099	450	351(125*)
o water demand/N(primary), m ³ /day	35	20	19
o power demand/N(primary), kwh/day	13	16	18
o total water demand, mill.m ³ /day	4.5	0.8	0.4
o total power demand, m.kwh/day	1.7	0.6	0.4
o total employment (primary)	129,000	38,000	20,000

* Excluding mining sector

** Primary sectors refer to agriculture, industry and tourism.

FIGURE 7.7
TOURISM INVESTMENT, EMPLOYMENT, WATER AND POWER USE BY STRATEGY,
PLANNING PERIOD, AND LOCATION

STRATEGY	PROJECT	1981-85				1986-90				1991-95				1996-2000			
		I*	N	W	P	I	N	W	P	I	N	W	P	I	N	W	P
Efficient Acceleration (C)	El Arish (1)	5.2	620	42.8	17.4	10.4	1,240	85.6	347	7.3	2,120	146.3	594	5.7	2,800	193.2	784
Moderate (B4)	El Arish (3)	7.3	870	60.0	244	14.6	1,740	120.1	487	10.7	3,020	208.4	846	8.2	4,000	276.0	1,120
Maximum Population Absorption (A)	El Arish (2)	35.2	4,220	291.2	1,182	70.4	8,440	582.4	2,363	87.3	18,920	1,305.5	5,298	45.7	24,400	1,683.6	6,720

I - Fixed Capital Investment Made in the Stated Planning Period
 N - Employment (Person Years)
 W - Water Used, M³/Day
 P - Power Used, KWH/Day

- (1) Half of Sinai's total "cultural/sightseeing" tourism plus all of "land bridge."
- (2) "Mediterranean" tourism.
- (3) Double the "cultural/sightseeing" tourism of "Efficient Acceleration".
- (4) The 1981-84 figures are in each case 1/2 (1986-90) figure.
- (5) All estimates in W.P. 10 have been delayed by one period, e.g. the 2000 figures are W.P. 10's 1995 figures.
- (6) Water demand assumptions: 0.2 m³/capita/day; 1.37 persons/room/day; 4 employees for each room. Thus employees (N) can be used to estimate water demand (W).

- (7) Power demand assumptions: 300 KWH/day/visitor = 0.28 KWH/day/employee.
- (8) Employment (N) is direct and indirect, taken from W.P. 10.

* 120(N) = LEI(I), with I being only hotel investment

<u>GOAL</u> (cont'd)	<u>STRATEGY</u>		
	<u>A</u>	<u>B</u>	<u>C</u>
Social justice	Much income in Sinai; possibly destructive of Bedouin way of life	Many employment opportunities for indigenous population; some scale economics for social & physical infrastructure	Danger of failing to keep pace with natural pop. growth, no great gains by indigenous population
Environmental conservation	Considerable pressure on ecological balance	Increasing pressure on ground-water, flora and therefore fauna	Minimal impact, although some threat from high industry/mining proportion

Each of the series of estimates rises from Strategy C to Strategy A, with two exceptions: investment/employee and power use/employee are lower in A than in C because of the proportionately high contribution of the capital and power intensive mining sector in Strategy C. Agricultural investment/employee is low, agriculture being the dominant employment sector in A.

The total investment in the three primary sectors in Strategy C is a huge LE 1.1 billion over the 20 year period, or LE 55 million per annum. There would also have to be considerable infrastructure investment (this will be estimated for each strategy in October). The ARE 1980/81 fixed investment is LE 4.0 billion, with LE 1.1 billion in agriculture, industry and mining. Sinai, currently has about 0.3 percent of Egypt's population. That proportion of LE 1.1 billion is LE 2.7 million. Strategy C requires LE 18 million per annum, which is still well above the current population share. That is not to say that even the modest strategy implies Sinai receiving a disproportionate share of nation investment - previous neglect may mean that Sinai "deserves" such a share. However, considerably more investment for the primary/income generating sectors than the national/per capita average under any of the alternative strategies presented here.

These three sectors' water demands by the year 2000 under Strategy A are very high, 90 percent coming from agriculture. The total amount of water available to Egypt in 2000 is unlikely to exceed 80 billion m³, or 220 million m³/day. Strategy A demands 2 percent of that total for these three sectors alone, much at a considerable distance from the Nile and, therefore, at a high cost. With population of 980,000 under Strategy A, Sinai would only have about 1.4 percent of Egypt's population in 2000. The water demands per employee of Strategies B and C are almost half of those of Strategy A.

9. NEXT STEPS UNDER TASK II

- 9.1 Review of this working paper by the client group and the study team (early October).
- 9.2 Reworking sectoral priorities and possible reallocation of projects to alternative strategies (late October).
- 9.3 On basis of primary employment by location, calculate induced employment and then total population. On basis of population/location and planning standards estimate domestic infrastructure and housing requirements (early October).
- 9.4 Calculate economic activity infrastructure demand for within-location and between-location activities (October).
- 9.5 From 8.3 and 8.4 prepare schedule showing demand for water (by quality) in each location (mid-October).
- 9.6 Prepare supply of water schedules for each location (including agricultural areas): cost/quantity/quality functions based on Nile diversion, groundwater and surface runoff recapture (August-October).

- 9.7 Carry out returns to water analysis for agriculture. (Sept.-October).
- 9.8 Bring together information on demand for and supply of water. Possibly re-prioritize sector priorities in light of water availability, including cost (late October).
- 9.9 Complete the land capability analysis - relating supply of resources (water, soil, land, energy) to demand for resources (economic and household activities) data (early November).
- 9.10 On the basis of land capability analysis and strategy design, prepare semi-detailed physical plans (November).
- 9.11 Report upon and review current government (line ministry, Ministry of Development, governorate, and Ministry of Planning) budgetary and project selection procedures, particularly as they relate to Sinai. Identify current and potential future implementation problems. Relate to implementation implications of the three strategies (Sept.-October).
- 9.12 Agree outline Final Report (end September).
- 9.13 Finalize strategy revisions (early November). Review with client group.
- 9.14 Begin writing sectoral (topic paper) contributions to the final report (Sept.-October).
- 9.15 Begin writing main Final Report (mid-November).

FIGURE 7.2.1

AGRICULTURAL INVESTMENT, EMPLOYMENT, WATER AND POWER USE
BY STRATEGY AND PLANNING PERIOD

LOCATION: El Arish

STRATEGY	PROJECT	1981-85				1986-90				1991-95				1996-2000			
		I	N	W	P	I	N	W	P	I	N	W	P	I	N	W	P
Efficient	Agric. Expt., Ext.	270	12	492	84	500	21	861	147	0	21	861	147	0	21	861	147
Acceleration	Enhanced Olive	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(C)	Vegetables	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Land reclamation	820	131	10,218	1,310	0	131	10,218	1,310	1,700	274	21,372	2,740	0	274	21,372	2,740
	Dairy/Beef	10	14	14	210	0	14	14	210	0	14	14	210	0	14	14	210
	Controlled Env.	145	35	18	2,485	0	35	18	2,485	0	35	18	2,485	0	35	18	2,485
	TOTAL	1,245	192	10,742	4,089	500	201	11,111	4,152	1,700	344	22,265	5,582	0	344	22,265	5,582
Moderate																	
(B)	Agric. Expt., Ext.	270	12	492	84	500	21	861	147	500	60	2,460	420	500	60	2,460	420
	Enhanced Olive	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vegetables	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Land reclamation	820	131	10,218	1,310	1,700	274	21,372	2,760	0	274	21,372	2,740	0	274	21,372	2,740
	Dairy/Beef	10	14	14	210	15	15	15	225	25	50	50	750	0	50	50	750
	Controlled Env.	500	84	42	5,964	0	84	42	5,964	0	84	42	5,964	0	84	42	5,964
	TOTAL	1,600	241	10,766	7,558	2,215	394	22,290	9,078	525	468	23,924	9,874	500	468	23,924	9,874
Maximum	Agric. Expt., Ext.	270	12	492	84	1,000	43	1,763	301	500	60	2,460	420	0	60	2,460	420
Population	Enhanced Olive	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Absorption	Vegetables	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(A)	Land reclamation	2,520	911	71,058	9,110	0	911	71,058	9,110	0	911	71,058	9,110	0	911	71,058	9,110
	MPA dairy/beef	25	25	25	375	25	50	50	375	0	50	50	375	0	50	50	375
	Controlled env.	500	84	42	5,964	0	84	42	5,964	0	84	42	5,964	0	84	42	5,964
	TOTAL	3,315	1,032	71,617	15,533	1,025	1,088	72,913	15,750	500	1,105	73,610	15,869	0	1,105	73,610	15,869

Legend:

I - Fixed Capital Investment Made in the Stated Planning Period
 N - Employment (Person Years)
 W - Water Used, M³/Day
 P - Power Used, KWH/Day

FIGURE 7.2.2

AGRICULTURAL INVESTMENT, EMPLOYMENT, WATER AND POWER USE
BY STRATEGY AND PLANNING PERIOD

LOCATION: El Tor

STRATEGY	PROJECT	1981-85				1986-90				1991-95				1996-2000			
		I	N	W	P	I	N	W	P	I	N	W	P	I	N	W	P
Efficient																	
Acceleration	Controlled																
(C)	environment	-	-	-	-	125	3	2	650	-	3	2	650	0	3	2	650
Voderate																	
(B)	Controlled																
	environment	-	-	-	-	125	3	2	650	-	3	2	650	-	3	2	650
Maximum																	
Population	Controlled																
Absorption	environment	125	3	2	650	0	3	2	650	0	3	2	650	-	3	2	650
(A)																	

Legend:

- I - Fixed Capital Investment Made in the Stated Planning Period
- N - Employment (Person Years)
- W - Water Used M³/Day
- P - Power Used KWh/Day

FIGURE 7.2.3

AGRICULTURAL INVESTMENT, EMPLOYMENT, WATER AND POWER USE
BY STRATEGY AND PLANNING PERIOD

LOCATION: East Bitter Lakes

STRATEGY	PROJECT	1981-85				1986-90				1991-95				1996-2000			
		I	N	W	P	I	N	W	P	I	N	W	P	I	N	W	P
Efficient																	
Acceleration																	
(C)	Land reclamation	10,000	-	-	-	6,220	3,370	219,000	45,420	-	3,370	219,000	45,420	-	3,370	219,000	42,420
Moderate																	
(B4)	Land reclamation	10,000	-	-	-	15,220	6,740	438,000	90,840	-	6,470	438,000	90,340	-	6,740	438,000	90,840
Maximum																	
Population	Land reclamation	10,000	-	-	-	15,220	6,760	438,000	90,840	9,000	10,110	675,000	136,260	-	10,110	657,000	136,260
Absorption																	
(A)																	

LEGEND

- I - FIXED CAPITAL INVESTMENT MADE IN THE STATED PLANNING PERIOD
- N - EMPLOYMENT (PERSON YEARS)
- W - WATER USED, M³/DAY
- P - POWER USED, KWH/DAY

FIGURE 7.2.4
AGRICULTURAL INVESTMENT, EMPLOYMENT, WATER AND POWER USE
BY STRATEGY AND PLANNING PERIOD

LOCATION: El Qaa

STRATEGY	PROJECT	1981-85				1986-90				1991-95				1996-2000				
		I	N	W	P	I	N	W	P	I	N	W	P	I	N	W	P	
Efficient																		
Acceleration (C)	Land reclamation					3,400	1,685	96,000	17,180	-	1,685	96,000	17,180	-	1,685	96,000	17,180	
Moderate (B4)	Land reclamation					3,400	1,685	96,000	17,180	-	3,370	192,000	34,760	-	3,370	192,000	34,360	
Maximum Absorption (A)	Land reclamation	3,400	1,685	96,000	17,180	3,400	3,370	192,000	34,360	3,400	5,085	288,000	51,540	3,400	6,740	385,000	68,720	

LEGEND

- I - FIXED CAPITAL INVESTMENT MADE IN THE STATED PLANNING PERIOD
- N - EMPLOYMENT (PERSON YEARS)
- W - WATER USED, M³/DAY
- P - POWER USED, KWH/DAY

FIGURE 7.2.5
 AGRICULTURAL INVESTMENT, EMPLOYMENT, WATER AND POWER USE
 BY STRATEGY AND PLANNING PERIOD

LOCATION: Nakh1

STRATEGY	PROJECT	1981-85				1986-90				1991-95				1996-2000				
		I	N	W	P	I	N	W	P	I	N	W	P	I	N	W	P	
Efficient																		
Acceleration																		
(C)	Land reclamation									685	387	19,000	3,436	-	387	19,000	3,436	
Moderate																		
(B4)	Land reclamation									685	387	19,000	3,436	685	773	38,000	6,872	
Maximum																		
Population	Land reclamation	1,370	773	38,000	6,872	0	773	19,000	6,872	0	773	19,000	6,872	0	773	19,000	6,872	
Absorption																		
(A)																		

LEGEND

- I - Fixed capital investment made in the stated planning period
- N - Employment (Person Years)
- W - Water used, M³/Day
- P - Power used, Kwh/Day

FIGURE 7.5
INDUSTRIAL LAND USE, EMPLOYMENT, WATER AND POWER USE BY STRATEGY
PLANNING PERIOD AND LOCATION

STRATEGY	PROJECT	1981-85				1986-90				1991-95				1996-2000			
		L	N	W	P	L	N	W	P	L	N	W	P	L	N	W	P
Efficient	El Arish	49	1,210	31	1,435	54	1,360	33	1,635	57	1,400	37	1,735	57	1,400	37	1,735
Acceleration (C)	El Tor	1	30	2	40	1	30	2	40	1	30	2	40	1	30	2	40
Moderate (B4)	El Arish	59	1,555	107	2,305	141	4,615	204	5,855	152	4,980	212	6,385	157	5,070	223	6,535
	El Tor	6	115	76	630	13	260	154	1,075	34	710	164	1,135	34	710	164	1,135
Maximum Population Absorption (A)	El Arish	51	1,555	107	2,305	141	4,615	204	6,055	178	6,690	228	8,385	231	10,395	331	11,725
	El Tor	6	115	76	630	13	260	154	1,075	44	1,160	171	2,285	68	1,385	173	2,535

L - Land Requirement, Feddans
N - Employment (Person Years)
W - Water Used, M³/Day
P - Power Used, KWH/Day