JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINISTRY OF TRANSPORT AND COMMUNICATIONS,
THE GOVERNMENT OF THE ARAB REPUBLIC OF EGYPT

THE FEASIBILITY STUDY

ON

A BRIDGE OVER NORTHERN PART OF THE SUEZ CANAL

FINAL REPORT

MAIN REPORT

OCTOBER 1996

PACIFIC CONSULTANTS INTERNATIONAL
CHODAI CO., LTD.

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NOTE

The following exchange rate was adopted through this report:

US$1.00=LE3.4 (February 1996)

PREFACE

In response to a request from the Government of the Arab Republic of Egypt, the Government of Japan decided to conduct a Feasibility Study on A BRIDGE OVER NORTHERN PART OF THE SUEZ CANAL and entrusted the study to the Japan International Cooperation Agency (JICA).

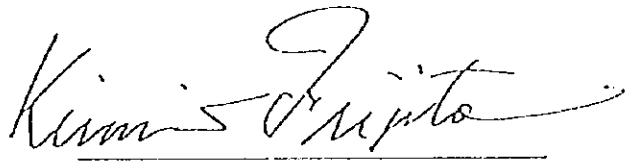
JICA sent a study team to the Republic of Egypt between May 1995 and October 1996. The study team was headed by Mr. Minoru SHIBUYA and composed of members of Pacific Consultants International and Chodai Co., LTD.

The team held discussions with the officials concerned of the Government of the Arab Republic of Egypt, and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Arab Republic of Egypt for their close cooperation extended to the team.

October 1996



Kimio FUJITA
President
Japan International Cooperation Agency

October 1996

Mr. Kimio FUJITA
President
Japan International Cooperation Agency
Tokyo, Japan

Dear Sir,

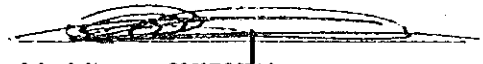
Letter of Transmittal

We are pleased to submit you the report on the Feasibility Study on A Bridge over Northern Part of the Suez Canal. The report contains the advice and suggestions of the authorities concerned of the Government of Japan and your Agency as well as the comments made by the Ministry of Transport, General Authority for Roads and Bridge & Land Transport and the authorities concerned in the Arab Republic of Egypt. The report consists of four volumes; a Executive Summary, a Main Report, a Drawing and an Appendix. This report presents the Feasibility Study on the construction of the Bridge over the Suez Canal at Qantara.

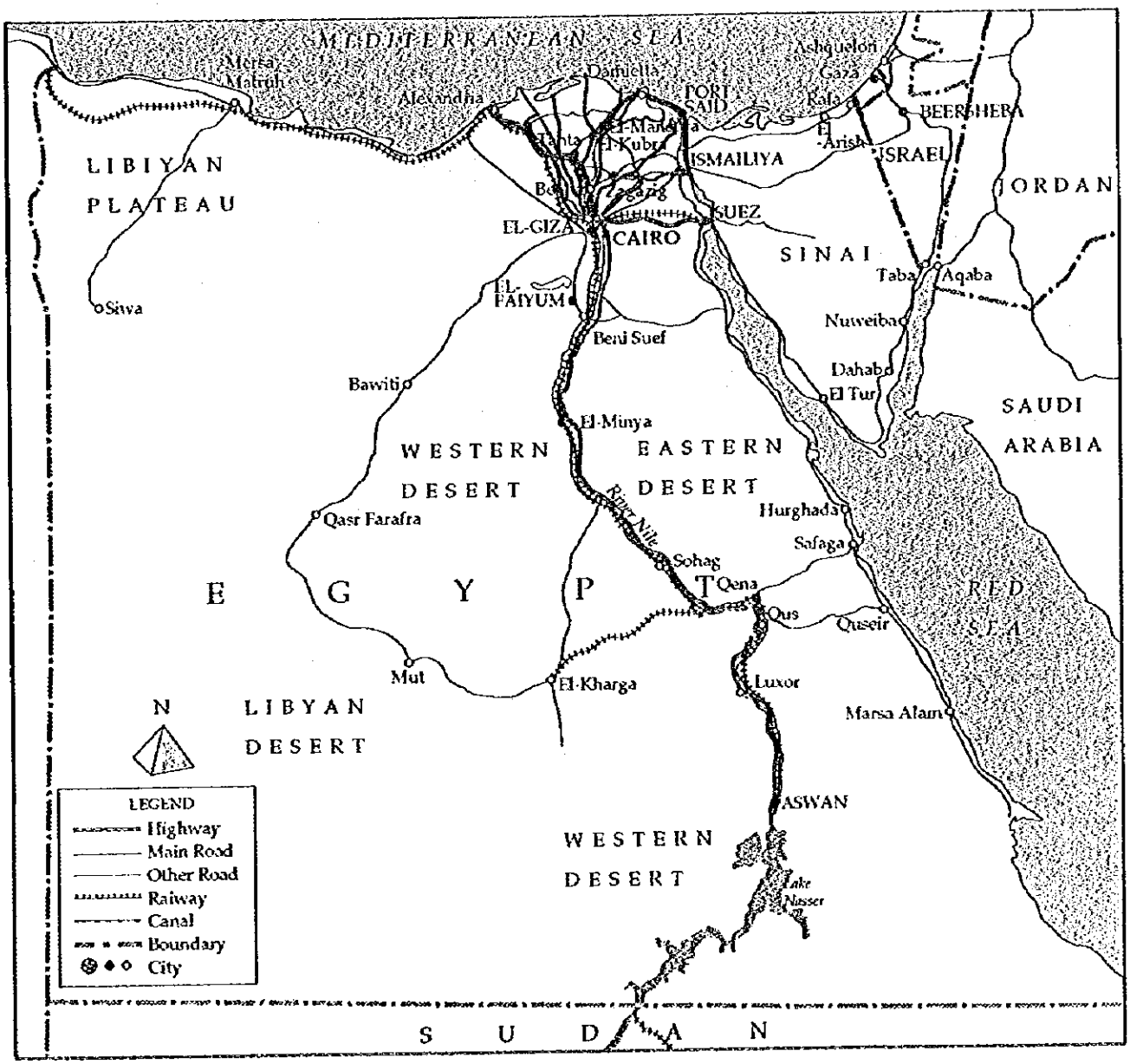
The Sinai Peninsula occupies the North-Eastern quarter of Egypt, and is expected to become the important center of economy, culture and politics with the development of the Sinai Peninsula. We believe that this project will contribute greatly to upgrade the transport system across the area which is presently provided with the Ahmed Hamdi Tunnel and six ferry systems crossing the Suez Canal.

We wish to take this opportunity to express our sincere gratitude to your Agency, the Ministry of Foreign Affairs, the Ministry of Construction and the Ministry of Transport. We also wish to express our deep gratitude to the Ministry of Transport and the Governmental Agencies concerned in the Arab Republic of Egypt, the Japanese Embassy at Egypt for the close cooperation and assistance extended to us during our study. We hope this report will contribute to construct a bridge crossing the Suez Canal at Qantara.

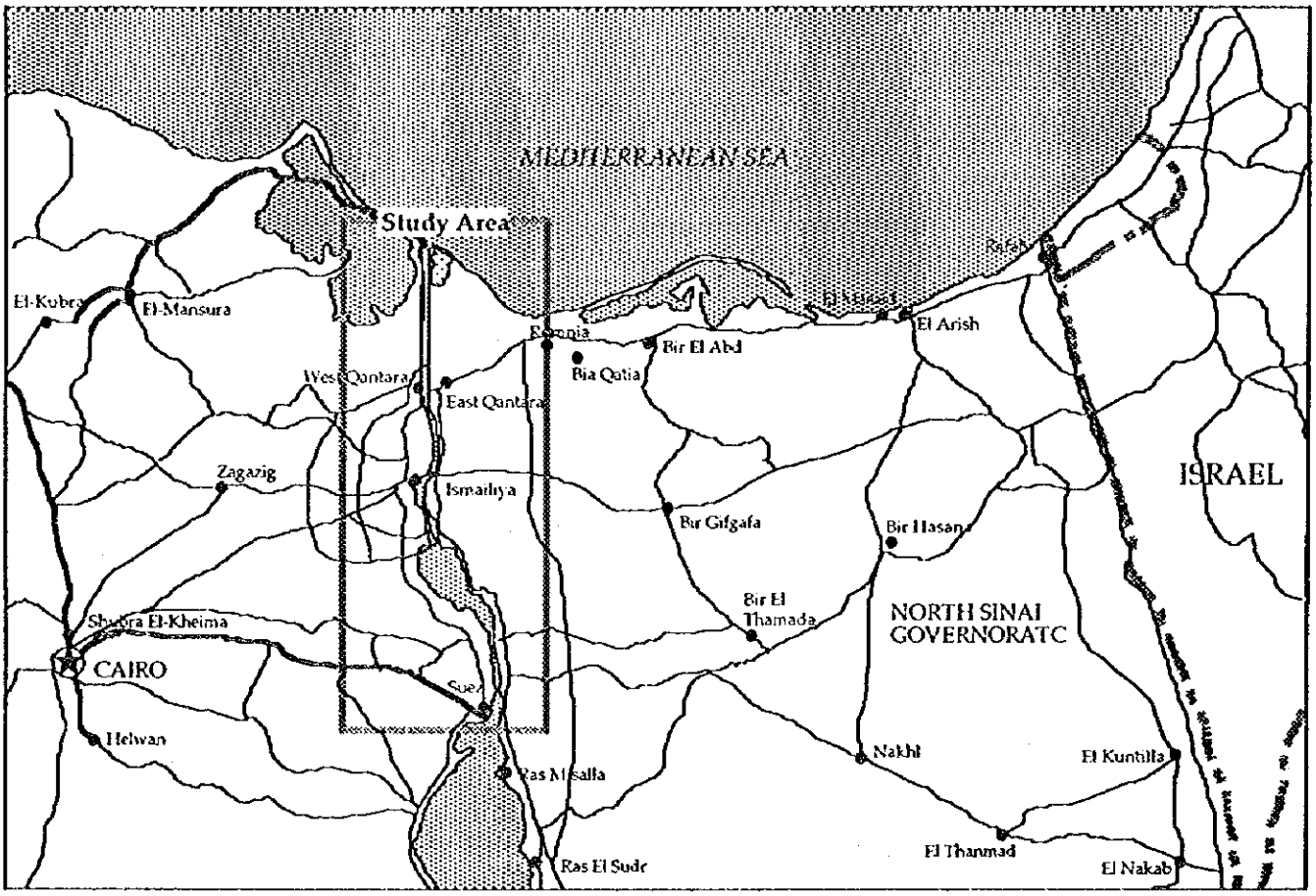
Very truly yours,



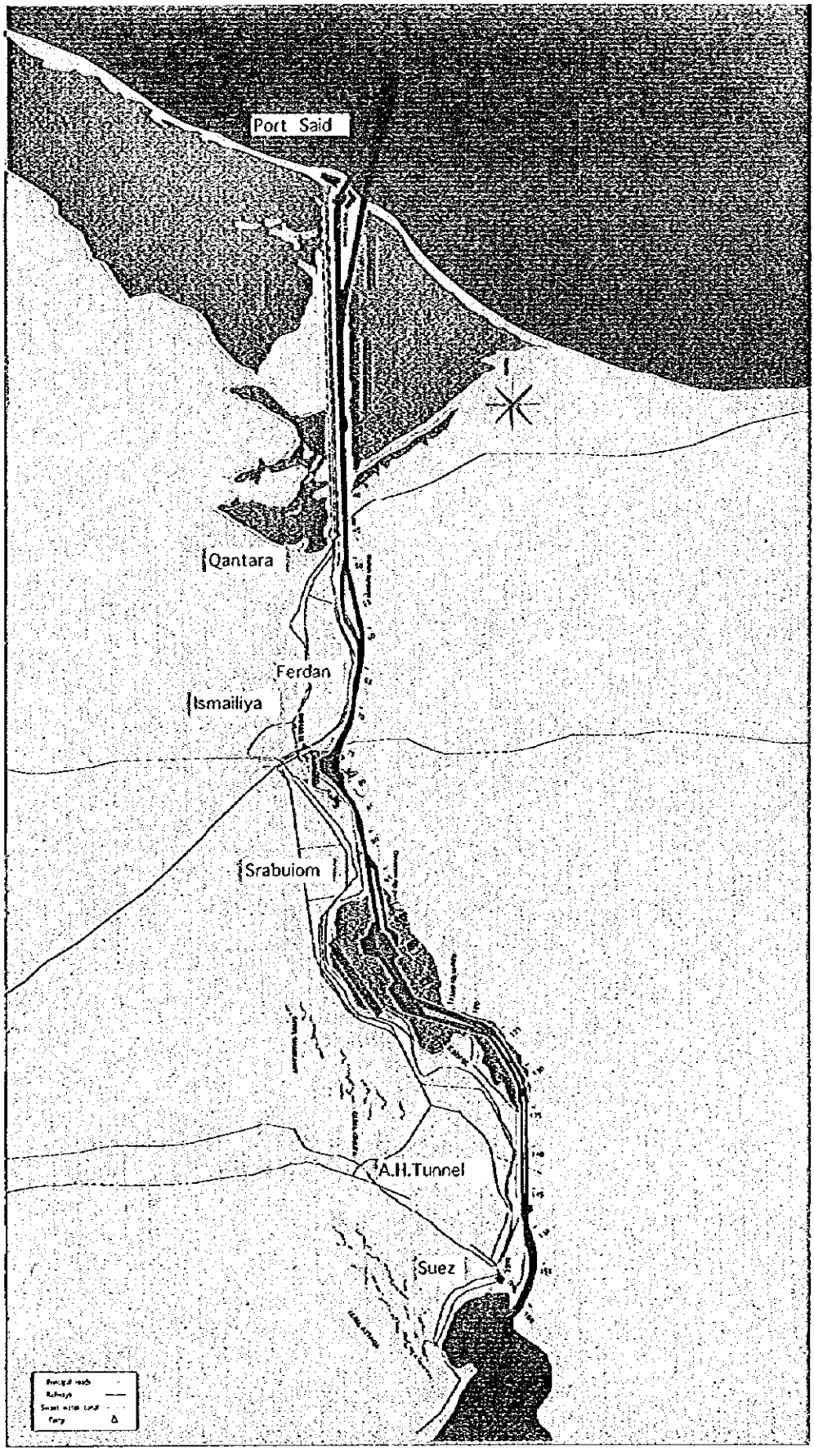
Mr. Minoru SHIBUYA
Team Leader
The Feasibility Study on A Bridge
over Northern Part of the Suez Canal



Location Map



Location Map of Study Area (1)



Location Map of Study Area (2)

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ABBREVIATION

AADT	Annual Average Daily Traffic Volume
CAPMAS	Central Agency for Public Mobilization and Statistics
CFC	Conversion factor for Consumption
DPS	Detailed Plan of the Study
ENR	Egyptian National Railway
ERSAP	Economic Reform and Structural Adjustment Program
FOB	Free on Board
FYP	Five Year Plan
GARBLT	General Authority for Roads and Bridges & Land Transport
GRDP	Gross Regional Domestic Products
GOPP	General Organization for Physical Planning
LN	Logarithmic Number
MOD	Ministry of Development
MOP	Ministry of Planning
MOS	Ministry of State
NPDS	National Project for the Development of Sinai
NRTS	National Road Transportation Master Plan Study
OD (Survey)	Origin Destination (Survey)
SCA	Suez Canal Authority
SCF	Standard Conversion Factor

SDS	**Sinai Development Study**
UNDP	**United Nations Development Program**

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CHAPTER 1

INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 Background of the Study

As a result of the progress of the peace arrangements in the Middle East, the Sinai Peninsula is now becoming an important area for regional development potential. As a gateway to the countries in the Middle East, this eastern side of Egypt will become an even more important location as time goes on.

Accordingly, the Government of the Arab Republic of Egypt (hereinafter referred to as "Egypt"), has started a plan for the Sinai Peninsula to become a principal economic, cultural and political centre, and launched comprehensive development plans for agriculture, mining, industry and tourism.

At the present time the Sinai Peninsula is separated by the Suez Canal from a district which includes the Greater Cairo Municipality to which it is connected by one tunnel and approximately seven ferry crossing over the Canal.

However, the Suez Canal has future plans to not only increase the numbers but also the size of the ships which ply the Canal. Should this happen, the ferry boats which are managing the ever increasing transportation demands would not be able to operate efficiently and there would have to be constraints made on the vessels plying the canal in order to ensure their safety.

In order to solve these future problems, Egypt evolved a plan to connect both sides of the Suez Canal by the construction of a crossing system either over or beneath the Canal.

To achieve this goal, the Government of Egypt requested the Government of Japan to conduct a Feasibility Study on a Bridge over Northern Part of the Suez Canal. In response to this request, the Government of Japan agreed to conduct such a study. Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs on behalf of the Government of Japan, undertook to conduct the Study. JICA sent an advance study team to Egypt, headed by Mr.Hidehiko Kuroda, in January 1995, in order to conclude the practical arrangements as well as the Scope of Work for the study. These were subsequently agreed upon between the General Authority for Roads and Bridges and Land Transport, Ministry of Transport and Communications (hereinafter referred to as "GARBLT"), and JICA.

1.2 Objectives of the Study

The objectives of the Study are:

1) To formulate a plan for a bridge crossing over the northern part of the Suez Canal, and

2) To conduct the technical, economic and financial feasibility study on the bridge construction project.

1.3 Study Area

The study area concentrated on the Northern part of the Suez Canal and the surrounding areas, including access roads. However, the whole country including the Sinai Peninsula has been taken into consideration in order to project future traffic demand for the canal crossing.

1.4 Study Organization and Implementation

(1) This study is divided into four phases as follows:

Phase Ⅰ: Data collection and formulation of the Detailed Plan of Study,

Phase Ⅱ: Traffic projection and formulation of alternative designs for the crossing structure,

Phase Ⅲ: Selection of the best alternative, and

Phase Ⅳ: Preliminary design and evaluation of the project's feasibility.

(2) The Flow Chart for the Study

The flow chart is shown in Fig. 1.1.1, Work Items and Basic Flow Diagram. The chart gives the various classifications of the Study, the submission of reports and their scheduled timing, and a description of the Study performed.

(3) Implementation and Report

The study was conducted in Japan and Egypt from May 1995 to October 1996. Several reports have been submitted to report on the progress of the study. These are the Inception Report (June 1995), DPS (August 1995), Progress Report (January 1996), Interim Report (April 1996), the Draft Final Report (August 1996) and the Final Report (October 1996). The Final Report comprises four volumes:

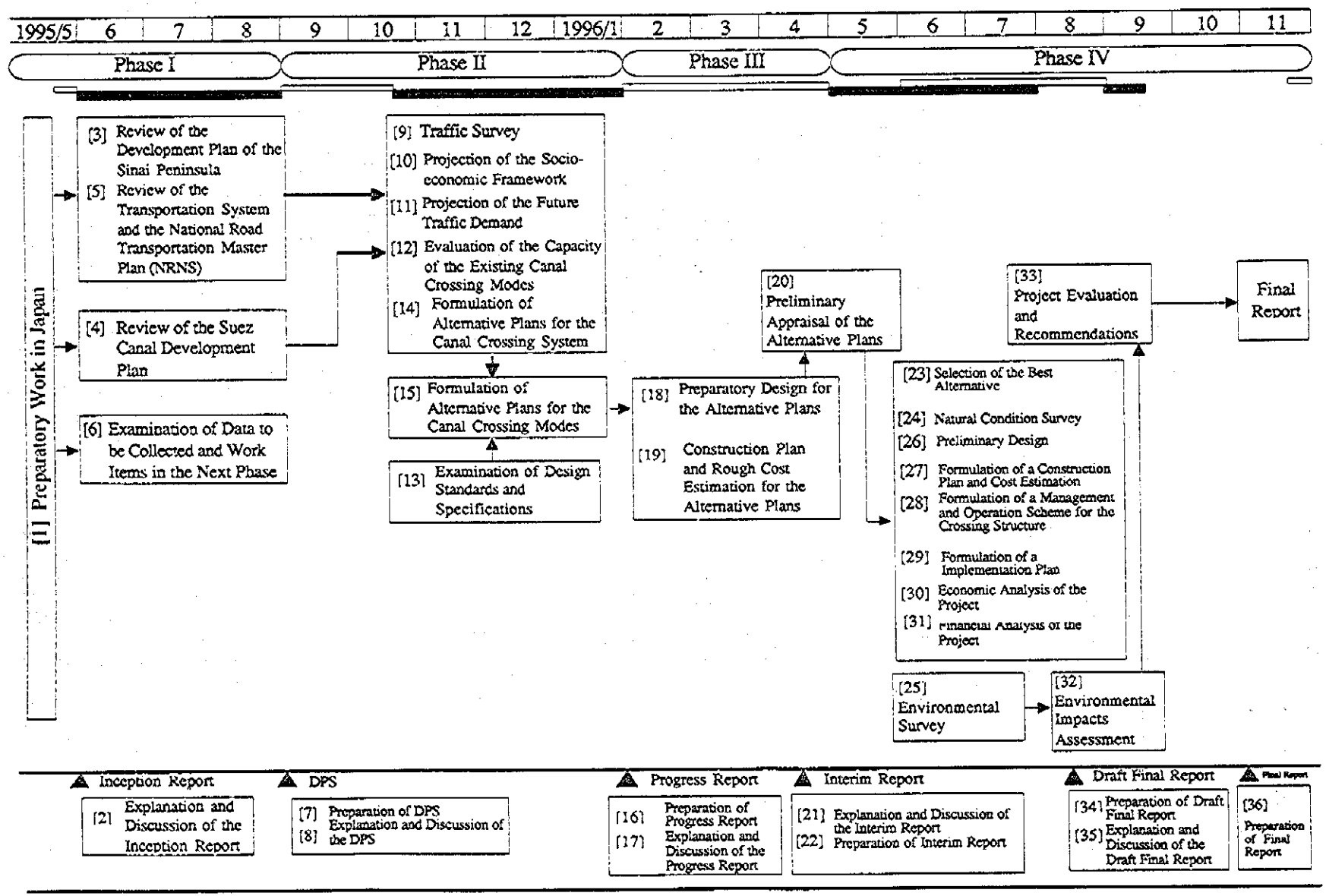


Fig.1.1.1 Work Items and Basic Flow Diagram

Volume 1 : Executive Summary
Volume 2 : Main Text
Volume 3 : Drawings
Volume 4 : Appendix

1.5 Participants of the Study

Participants of the study are :

(1) Egyptian members of the Steering Committee;

1. Ministry of Foreign Affairs

1) Amb. Osama El Oshery	Assistant Minister for Asian Affairs
2) Mr. Amb. El Said Ragab	Assistant Minister for Asian Affairs

2. Ministry of International Cooperation

1) H.E.Amb.Wahib El Miniawy	Advisor to the Minister of State for International Cooperation
2) Mrs. Zahia Abu Zeid	General Director of Asia Department
3) Mr. Mohsen Sadek	Director, Japan Department
4) Mrs. Samoha Barakat	Director, Japan Department
5) Mrs. Dorriya Salem	Economic Researcher

3. Ministry of Transport

1) Eng. Fouad Abd El Aziz Khalil	Chairman of the Board of the General Authority for Roads and Bridges & Land Transport
2) Mr. Sabri Selin	Head of Financial and Administration Department
3) Eng. Mohamed Sharaf	Head of the Central Department for Bridges
4) Eng. Abd El Nasser Mahran	General Director of Bridge Department
5) Eng. Sanyout Welson	Central Department for Bridges (GARBLT)
6) Mr. Onsy Fahim	Transport Planner (GARBLT)
7) Eng. Samir Labib	Advisor
8) Prof. Dr. M. A. El Hawary	Advisor
9) Dr. Eng. Mourad M. Bakhoum	Advisor

10) Eng. Alaa Mostafa	Chairman Office (GARBLT)
11) Mrs. Kamelia A.M.Salama	Transport Planner (GARBLT)

4. Suez Canal Authority

1) Dr. Eng. Isis Kamel	Director of Engineering Department
2) Dr. Mohamed El Ghamry	Head of Planning, Research and Studies
3) Eng. Embaby Ismail	Deputy Director of Engineering Department
4) Eng. Ali Abdel Fattah	Manager of Works, Engineering Department
5) Eng. Mohamed Mossad	Transit Department

5. Ministry of Planning

1) Mr. M.A.Nasr Tantawi	National Investment Bank
2) Dr. Ahmed M. Farahat	Expert of Regional Planning, UN Project, Transport Advisor

6. Ministry of Public Works and Water Resources

1) Eng. Mohamed Nasser	Under Secretary, North Sinai Development Organization

7. Ministry of New Communities

1) Eng. Ali M. Abdel Fattah	Engineering Consultant, Central Development Organization

8. Egyptian Environmental Affairs Agency

1) Eng. Seif El Nasr Youssef	Technical Cooperation Office

(2) Japanese Advisory Committee members;

1)	Mr. R. Takagi	Ministry of Foreign Affairs
2)	Mr. H. Yanagi	Ministry of Foreign Affairs
3)	Mr. Y. Ishikawa	Ministry of Construction
	(Mr. F. Iwai)	
4)	Mr. M. Suzuki	Ministry of Transport
	(Mr. A. Koyama)	
5)	Mr. Y. Kishimoto	Honshu-Shikoku Bridge Authority
6)	Mr. H. Kuroda	Japan International Cooperation Agency (JICA)
7)	Mr. K. Iwaguchi	Japan International Cooperation Agency (JICA)
8)	Mr. H. Abe	Japan International Cooperation Agency (JICA)

(3) Members of Embassy of Japan, JICA Egypt Office and JICA Study Team

Embassy of Japan

1)	Mr. T. Matsumoto	Embassy of Japan (Egypt)
2)	Mr. N. Takaoka	Embassy of Japan (Egypt)
3)	Mr. A. Yahiro	Embassy of Japan (Egypt)
4)	Mr. N. Okibe	Embassy of Japan (Egypt)

JICA Egypt Office

1)	Mr. S. Suzuki	JICA (Egypt)
2)	Mr. H. Naito	JICA (Egypt)
3)	Mr. Y. Tamabayashi	JICA (Egypt)
4)	Mr. Mostafa Hussien	JICA (Egypt)

JICA Study Team

1)	Mr. M. Shibuya	Team Leader
2)	Mr. K. Hioki	Deputy Team Leader, Bridge Engineer
3)	Mr. K. Yasukawa	Deputy Team Leader, Transport Planner
4)	Mr. Y. Nimura	Regional Planner
5)	Mr. Y. Enokido	Traffic Engineer
6)	Mr. Z. Hao Qun	Traffic Surveyor
7)	Mr. H. Mukaichi	Highway Engineer
8)	Mr. M. Fujiki	Canal Planner

9)	Mr. N. Ito	Canal Engineer
10)	Dr. S. Watabe	Structure Engineer
11)	Mr. T. Nemoto	Structure Engineer
12)	Mr. M. Toriyama	Economist
13)	Mr. T. Ooishi	Environmentalist
14)	Mr. K.Honda	Traffic Analysis
15)	Mr. Y. Kajimura	Bridge Design
16)	Mr. Y. Abe	Bridge Design
17)	Mr. Y. Nakamura	Cost Estimation
18)	Mr. N. Harrison	Tunnel Design
19)	Mr. W. Shida	Tunnel Design
20)	Mr. M. Higai	Construction Plan
21)	Mr. T. Shibatani (Mr. N. Daicho)	Natural Condition
22)	Mr. T. Akimoto	Maintenance/Management Plan
23)	Mr. T. Moriya	Environmental Impacts Assessment
24)	Dr. N. Sehsah	Translator
25)	Ms. H. Kobayashi	Coordinator

CHAPTER 2

SOCIO-ECONOMIC CONDITIONS

CHAPTER 2 SOCIO-ECONOMIC CONDITIONS

2.1 Current Socio-Economic Conditions

2.1.1 Social Conditions

(1) Land and Natural Conditions

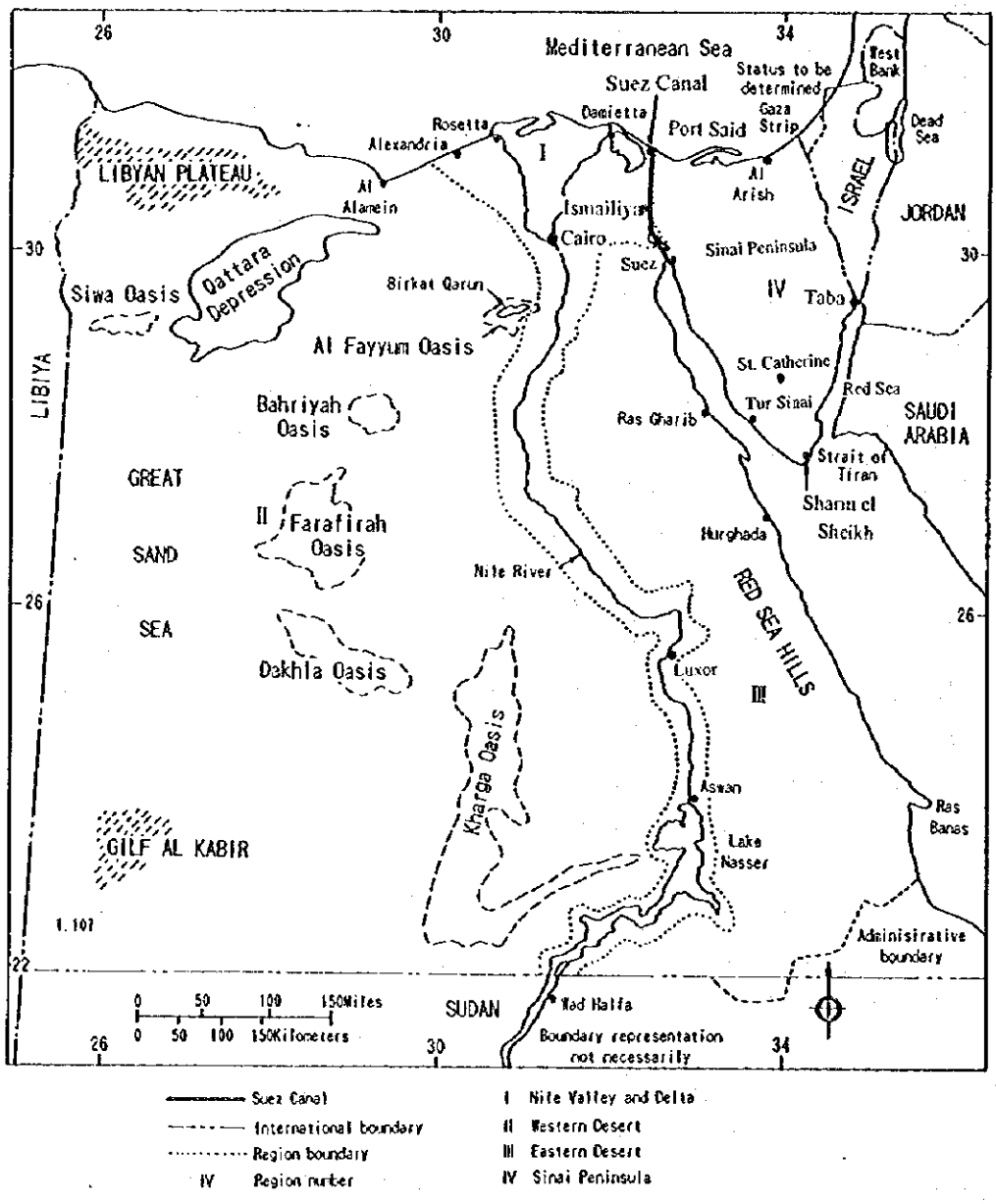
1) Geography and Land

Egypt is located at the North-Eastern corner of the African Continent. Egypt is a square shaped country, which has a North-to-South distance of 1,024 kilometres and East to West distance of 1,240 kilometres. The Suez Canal divides the total land into two parts : the main land and Sinai Peninsula. The main land faces the Mediterranean Sea to the North, the Red Sea to the East, and is bordered to the West by Libya and to the South by Sudan. The North of Sinai Peninsula faces the Mediterranean Sea, and Sinai Peninsula is bordered from the East by Israel and also by Jordan and Saudi Arabia on the other side of Gulf of Aqaba.

Egypt occupies about one million square kilometre, out of which the areas suitable for residence and agriculture are limited only to the Nile Delta and a narrow valley, along the River Nile. The remaining parts are desert land comprising about 96% of the total land area. Sinai is located to the East of the Suez Canal and is covered with desert. It has played the role of commercial and cultural route to the Asian Continent. The Geography of Egypt is depicted in Figure 2.1.1.

2) Climate

Most of Egypt has a dry desert climate with few rainfall. There is a big temperature variation over the year and over a single day. The Egyptian climate features extremely high solar radiation. The coastal zone only the Mediterranean Sea and the land within 10 kilometre from the Mediterranean Sea features a Mediterranean climate with about 500 mm of rainfall annually. The Nile Delta is affected by both the Mediterranean climate and the desert climate. Summer weather prevail from May to September and winter weather prevail from November to March. The highest temperature around the capital Cairo reaches 40°C and the lowest temperature is around 7°C.



Source : JICA Study Report

Fig. 2.1.1 Geography of Egypt

THE FEASIBILITY STUDY ON A BRIDGE OVER NORTHERN PART OF THE SUEZ CANAL

(2) Politics and Administration

1) Politics

Egypt has adopted a constitutional republican form of government. When Egypt became independent from the protectorate in February 1922, it established a constitutional monarchy and later it transformed its government into a constitutional republican after the "Egyptian Revolution" in July 1952. The present form of government is traced back to the constitution of 1971.

The legislation body is a two house system (People Assembly and Shoura Councils). Of its 454 seats, 444 seats are elected by direct election, the other 10 seats are designated by the president. Starting from October 1976, Egypt has developed a multiple party system.

The constitution declares that the president is the head of the nation, the head of the administrative body and the supreme commander of the military forces. In addition, the president is in a position to have great influence on the legislative agency, the judicial authorities and the mass media.

2) Administration

Egypt is administratively divided into 26 Governorates, however the local governments generally face a limited administrative independence since their budgets are dominated by the subsidies from the central government, and the governors are appointed by the central government.

Each Governorate is composed of several districts. There are 295 districts in the country. At the same level of administration, urban districts are also called cities or kisms. There are 147 urban districts. Rural districts are generally called markaz. The districts are further divided into smaller political units called cities, towns, villages, and hamletes.

The Governorates are also grouped into four types : Urban Governorates, Lower Egypt Governorates, Upper Egypt Governorates and Frontier Governorates. The administrative units are summarized in Table 2.1.1.

Table 2.1.1 Total Area and Population Density by Governorate

Governorates			Population	Area (km2)			Population
No.	Name	City	(thousand)	Total	Inhabited	Uninhabited	Density**
Urban Governorates			**11,165**	**20,806**	**907**	**19,899**	**12,310**
1	Cairo	Cairo	6,894	214	214		32,215
2	Alexandria	Alexandria	3,407	2,679	314	2,365	10,850
3	Port Said	Port Said	463	72	72		6,431
4	Suez	Suez	401	17,841	307	17,534	1,306
Lower Egypt Governorates			**25,140**	**27,723**	**22,183**	**5,540**	**1,133**
5	Damietta	Damietta	888	589	589		1,508
6	Daqahliya	El Mansura	4,181	3,471	3,471		1,205
7	Sharqiya	El Zagazig	4,166	4,180	4,180		997
8	Qalyubiya	Benha	3,013	1,001	1,001		3,010
9	Kafr el Sheikh	Kafr el Sheikh	2,236	3,437	3,437		651
10	Gharbiya	Tanta	3,405	1,942	1,942		1,753
11	Minufiya	Shibin el kom	2,644	1,532	1,532		1,726
12	Beheira	Damanhur	3,935	10,129	4,589	5,540	857
13	Ismailiya	Ismailiya	672	1,442	1,442		466
Upper Egypt Governorates			**21,285**	**96,193**	**12,097**	**84,096**	**1,760**
14	Giza	Giza	4,457	85,154	1,058	84,096	4,213
15	Bani Suef	Bani Suef	1,809	1,321	1,321		1,369
16	Faiyum	El Faiyum	1,964	1,827	1,827		1,075
17	El Minya	El Minya	3,323	2,262	2,262		1,469
18	Asyut	Asyut	2,799	1,553	1,553		1,802
19	Suhag	Suhag	3,021	1,547	1,547		1,953
20	Qena	Qena	2,886	1,851	1,851		1,559
21	Aswan	Aswan	1,026	678	678		1,513
Frontier Governorates			682	853,016		853,016	-
22	Red Sea	Hurghada	113	203,685		203,685	-
23	New Valley	Kharga	135	376,505		376,505	-
24	Matrouh	Matrouh	183	212,112		212,112	-
25	North Sinai	El Arish	251	60,714		60,714	-
26	South Sinai	Tur Sinai					
Total			**58,272**	**997,738**	**35,187**	**962,551**	**1,656**

Source : Statistical Year Book 1995, CAPMAS
: Populations in 1994 are official estimation by CAPMAS

Note : Distribution of the following areas into inhabited and uninhabited are not available
- Frontier Governorates
- Kism el Ameria (Alex. Gov.), Kism Ataqa (SUEZ Gov.),
- Wadi el Natron (Beheira Gov.), El Bahatia Oasis (Giza Gov.)

** : Excluding uninhabited area, Unit : person/km2

(3) Population

The Population census indicated that Egypt's total population in 1986 was 48.3 million. It is estimated that the population increased to about 58.3 million by 1994, reflecting an annual growth rate of about 2.4%. Ninety-nine percent of the population lives along the River Nile and its Delta, out of which 16 million people are living in and around the Cairo city.

Table 2.1.2 and Fig. 2.1.2 show the total population and its distribution to urban and rural. From the table it is clear that more than half of the population are still living in rural area. The population density of Cairo Governorate is high; 32,200 persons per square kilometre, and it is around 1,660 persons per square kilometre in whole country except uninhabited area. (see Table 2.1.1)

Table 2.1.2 Total Population by Year

Year	Population (in thousand)			Structure (%)	
	Total	Urban	Rural	Urban	Rural
1960	26,085	9,965	16,120	38.2	61.8
1966	30,076	12,033	18,043	40.0	60.0
1976	36,627	16,037	20,590	43.8	56.2
1986	48,254	21,216	27,038	44.0	56.0
1994 *	58,272	25,814	32,458	44.3	55.7

Source : Statistical Year Book, CAPMAS and MOP

Note : In 1966, the population of the Frontier Governorates(351,000) include in Rural.

* Data of 1994 are estimation, others are census data.

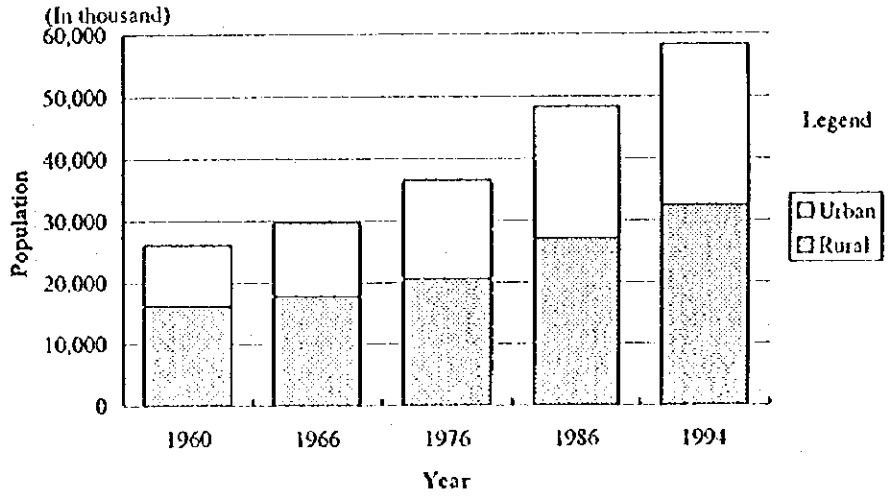


Fig. 2.1.2 Total Population by Year

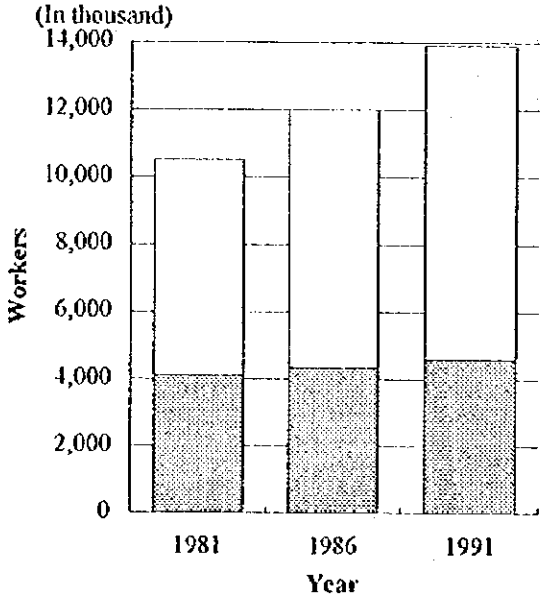
(4) Worker

The statistical data indicated that Egypt's total workers in 1991 was 13.9 million. The agricultural share of the worker is showing a declining tendency. In addition, about 2 to 3 million workers are working outside Egypt. The amount of remittances from overseas workers contributes to improving the balance of payments, but it has also adverse effects, such as brain drain and a shortage in skilled laborers in Egypt.

The unemployment rate up to the early 1980s had been low, since the new worker had been absorbed through the government policy of employment in the government and public sector. However, after abandoning such policy and the start of introducing the market economy the domestic economy could not absorb the excessive supply of worker. In 1991/92, unemployment reached 1.37 million, indicating an unemployment rate of nine(9) percent.

In addition, it is expected that in the course of the structural adjustment programme initiated by the International Monetary Fund (IMF), unskilled labours laid off from the public sector will join the unemployment group which may further aggravate the employment conditions.

Fig. 2.1.3 shows total number of workers by year.



(unit: In thousand)

Year	Total Workers	(Agriculture)	
		Workers	Share
1981	10,522	4,100	39.0%
1986	11,998	4,330	36.1%
1991	13,900	4,588	33.0%

Source : Summary of The Third Five Year Plan (1992/93-96/97), MOP

Agriculture
Others

Fig. 2.1.3 Total Workers

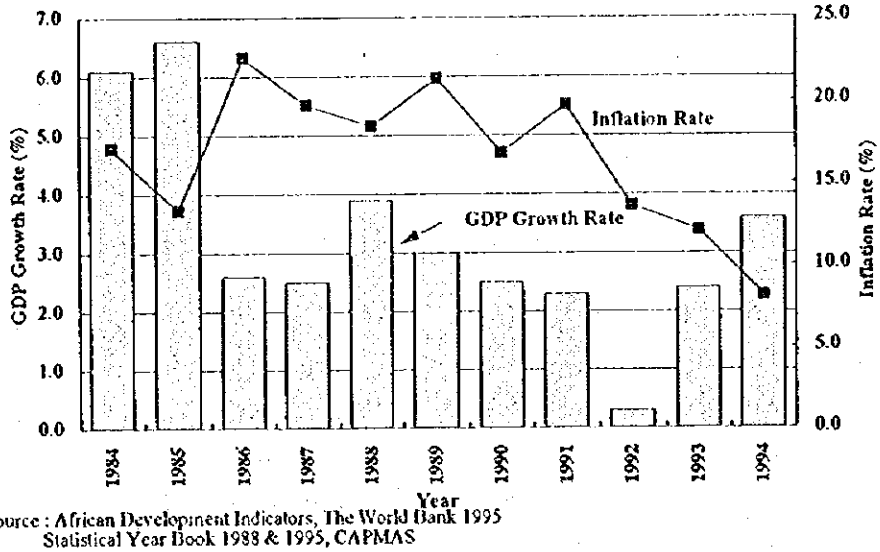
2.1.2 Economic Conditions

(1) General

President Mubarak, who succeeded President Sadat, has kept the open economic policy and has promoted a liberalization of the economy by introducing foreign direct investment and new technology from foreign countries, while keeping the commodity price subsidized. However, this policy has expanded the total amount of subsidies and has resulted in a financial deficit.

At present, Egypt implements the IMF-led economic structural adjustment programme. Implementation has already shifted from the first stage, which aimed at reducing subsidies, introduction of a sales tax, liberalization of interest and foreign exchange rates, to the second stage, which aims at abolishing price controls, liberalization of trade and privatization of the public sector.

With regard to macro-economic conditions, real GDP growth has performed at a high growth trend up to 1985. GDP growth also has performed at a constant growth during 1986 to 1991, but declined to 0.3% in 1992 by the effect of the Gulf crisis. However, GDP growth recovered in 1993 when it recorded 2.4%. The inflation rate of consumer prices recorded over 20% during 1986 to 1991 when commodity price subsidies were decreased. However, consumer price inflation has settled down because of the stability of the exchange rate between the Egyptian Pound and foreign currencies. Fig. 2.1.4 shows GDP growth rate and consumer price inflation rate for the last ten years.



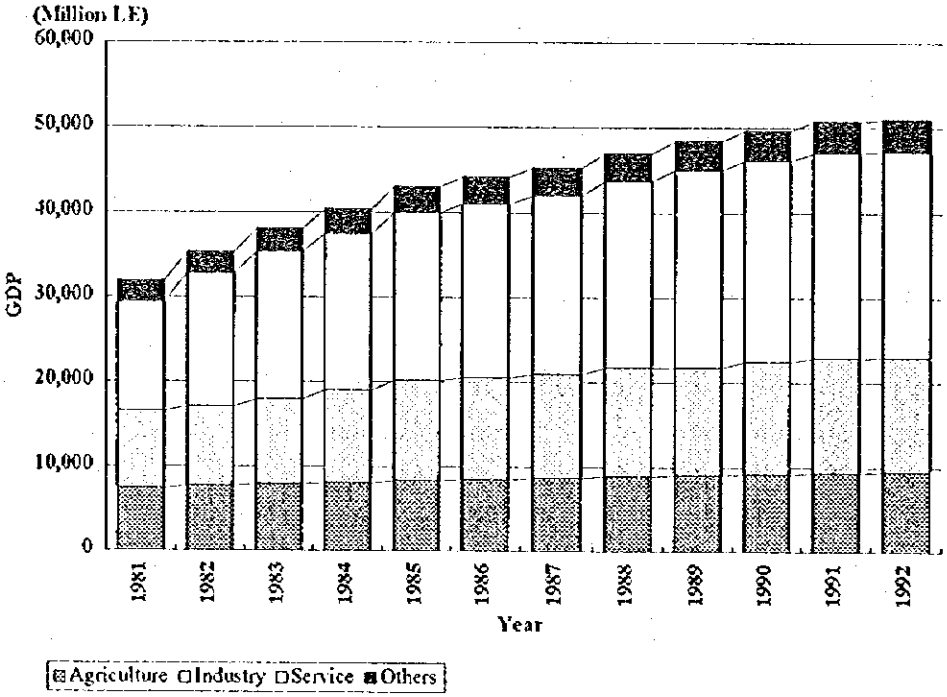
Source : African Development Indicators, The World Bank 1995
Statistical Year Book 1988 & 1995, CAPMAS

Fig. 2.1.4 Macro-Economic Indicators

(2) Gross Domestic Products (GDP)

In the period 1981-1986, the Egyptian economy enjoyed the momentum of "the Oil Boom", and achieved 6.7% average annual increase of GDP. On the other hand, in the Period 1987-1992, the growth rate dropped to 2.4%. Fig. 2.1.5 shows the GDP growth and sectoral composition of the GDP over the years from 1981 to 1992. The agriculture sector was a share of 18.6% of GDP, the industrial sector was 26.5% and the service sector was 47.6% in 1992.

According to the World Bank data, the Egyptian GDP per capita was 660 US dollars in 1993.



Source: World Tables 1994, The World Bank
Note : Constant 1987 price

Fig. 2.1.5 Gross Domestic Product (Real)

Gross Regional Domestic Products (GRDP) are not shown in statistical data. However, GRDP by zone were estimated using MOP's data in the National Road Transport Master Plan Study of 1991 (NRTS). According to that Study, the large concentration of GRDP is in Greater Cairo 28% and in Alexandria 10%. In those two zones the share of the agriculture production is less than 3%, while the share of industrial production is around 30%.

(3) Status of Major Industries

1) Industrial Structure

Until early 1970s Egypt's main economic activity was agriculture. However, this has drastically changed, when Egypt introduced an open door economic policy. This policy induced production of crude oil, which has expanded rapidly as the price of crude oil increased in the 1970s. Also the commercial and financial sectors have recorded high growth rates. These trends were due to diversification of economic activities. The GDP share by major economic sectors proves this change in the sectoral structure of the economy. Agriculture had a share of 28% of total GDP in the 1970s, but its share has declined to less than 20% over the last several years. On the other hand, the share of the manufacturing industry has increased.

2) Agriculture

Agriculture has played a central role in the Egyptian economy in terms of working population, production and foreign exchange earnings. However, total cultivated land is 5.83 million Feddan (around 24,500km2) in 1990. It accounts for only 2.5% of the total land area of Egypt, and it is limited to the area along the River Nile, the Nile Delta area and some oasis.

Major productions are wheat, rice, cotton, sugar cane, corn and vegetables. In 1993, Egypt produced 4.83 million ton of wheat, 4.16 million ton of rice, 1.11 million ton of cotton, 11.71 million ton of sugar cane and 5.04 million ton of corn.

About 40% of the worker is presently engaged in agriculture related activities. In this sense, activation of the agricultural sector is an important policy. The Third Five Year Plan (1992/97) emphasizes agricultural development and plans to reclaim another 1.6 million Feddans for cultivation.

3) Mining and Petroleum

Egypt is one of the oil producing countries in the Middle East. The daily crude oil production was around 900 thousand barrels in 1994. The surplus after domestic consumption is exported (about 400 thousand barrels per day). The income from crude oil exportation is one of the major sources of foreign currency.

Major oil fields exist in the Gulf of Suez, Sinai Peninsula and Western Desert area. The production share of these areas are 70%, 20% and 10%, respectively. It is planned to search for new oil fields and to redevelop existing oil fields in the Gulf of

Suez, the West Sinai and Western Desert to assure reasonable rate of production in the future.

4) Manufacturing

Egypt has experienced industrialization earlier than many other Arab countries and she has developed various kinds of industries. Major industries are textile related and food related industries. Starting from the middle of the 1950s, other industries have expanded and joined the major economic group. Those are material industries such as steel and cement.

Major manufactured goods are refined sugar, cotton yarn, machinery and machine parts, steel, cement and chemical fertilizers.

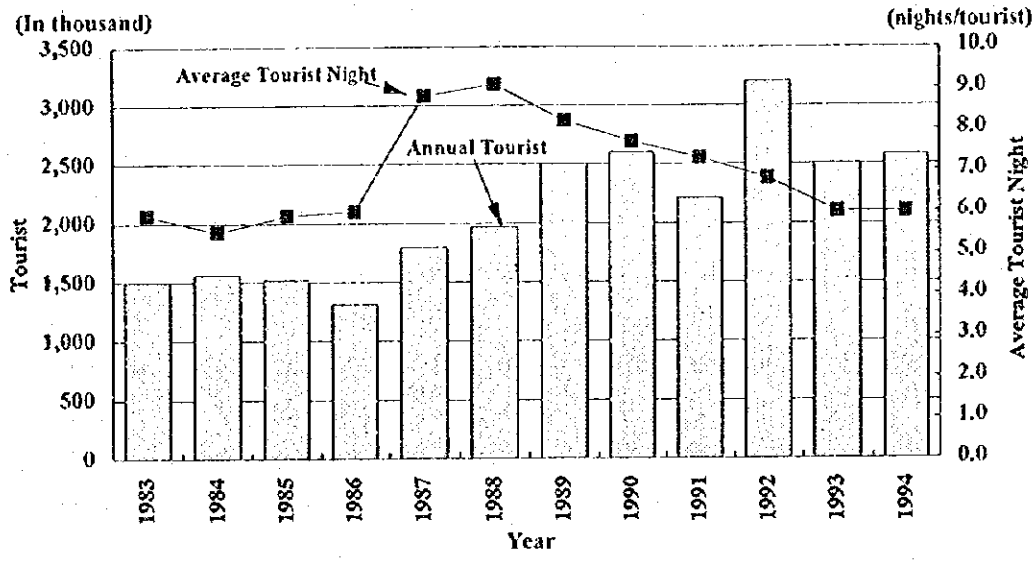
The Third Five Year Plan (1992/97) set the target for the manufacturing industry to play the role of a stirrer to the economic growth during the 1990s. However, the low efficiency of the public sector, which occupies 70% of total manufacturing production, is an obstacle and the improvement of its management requires more efforts.

5) Tourism

Egypt has inherited quite a wealth of tourism resources such as the pyramids and other remains of ancient Egypt beside the Islamic and Coptic monuments. In addition, there are various recreational tourism resources in the coastal areas along the Mediterranean Sea and Red Sea. Marine resorts at the Red Sea and in Sinai Peninsula have world wide popularity.

The number of tourists in 1992 was 3.2 million, and their expenditure in Egypt amounted to 3 billion US dollars. The government has noticed the role and potentiality of tourism and has set a target by year 1997 to welcome 4.5 million tourists from abroad and expand their expenditure to 4 billion US dollars. Fig. 2.1.6 shows the number of annual tourist and average tourist night per tourist.

The total number of hotel rooms in Egypt was 24,000 in 1985. In 1993 the number reached 58,000. Another 20,000 rooms are currently under construction.



Source : Statistical Year Book, CAPMAS

Fig. 2.1.6 Annual Tourist

6) Suez Canal

The Suez Canal links the Mediterranean Sea in the north to the Red Sea in the south with length of 161km. It is one of the important route of international marine transportation. Ships transit the Canal in three convoys daily, two convoys from Port Said to Suez, and one convoy from Suez to Port Said.

Table 2.1.3 shows Suez Canal traffic during the last 6 years. The number of vessels transited the Canal in 1994 was 16.4 thousand and they carried 290 million tons of cargo. The income from the Canal toll recorded about 1.9 billion US dollars.

Table 2.1.3 Suez Canal Traffic

Year	Vessels (Number)	Passengers ('000)	Net Tonnage ('000 Ton)	Cargo ('000 Ton)	Receipts (Mill. US $)
1989	17,628	7.0	373,429	265,819	1,392
1990	17,664	7.5	410,322	271,881	1,585
1991	18,326	8.8	426,449	272,542	1,818
1992	16,629	6.6	369,779	275,027	1,869
1993	17,317	13.9	396,550	296,914	1,967
1994	16,370	15.8	364,487	289,955	1,897

Source : Statistical Year Book 1995, CAPMAS

(4) Fiscal Policy

During the 1980s Egypt has recorded a deficit, which reached more than 20% of GDP. Hence, the government emphasized recovery of the budgetary balance. The government conducted an overall review of expenditure items (including subsidy cuts) with the aim of reducing expenditures and it conducted a thorough tax collection and tax reform in order to increase revenues.

In 1991, new taxes such as an energy tax and a sales tax of 10% were introduced. In addition, a raise of the income tax rate was also executed. These measures contributed to reduce the financial deficit in 1991/92 to about 6.4% of GDP, and it is further expected that it will be reduced to 2.6% by 1993/94. However, the expansions in social services and privatization of the public sector may require further funds which may result in another heavy financial burden on the government.

As for the monetary policy, it should be noted that the money supply has increased in the last few years in order to fill the gap between government expenditure for the economic recovery and the revenue.

Interest rates were also liberalized and they have been almost constant at around 18% for loans in the last few years. Also deposit interest rates are around 10-11% this year. Moreover the government has liberalized the foreign exchange and allowed the exchange of the Egyptian Pound into major international currencies and abolished the fixed exchange rate system since 1991.

(5) International Balance of Payments

1) Foreign Trade

In 1994, the exports recorded L.E. 11.8 billion and the imports recorded L.E. 32.5 billion. The balance of trade between Egypt and foreign countries has a deficit of more than L.E. 20.7 billion. Fig. 2.1.7 shows the balance of trade between Egypt and foreign countries.

Major export commodities of Egypt are petroleum and textile. As for importation, machinery, and mechanical and electrical appliances and agricultural products are the top categories.

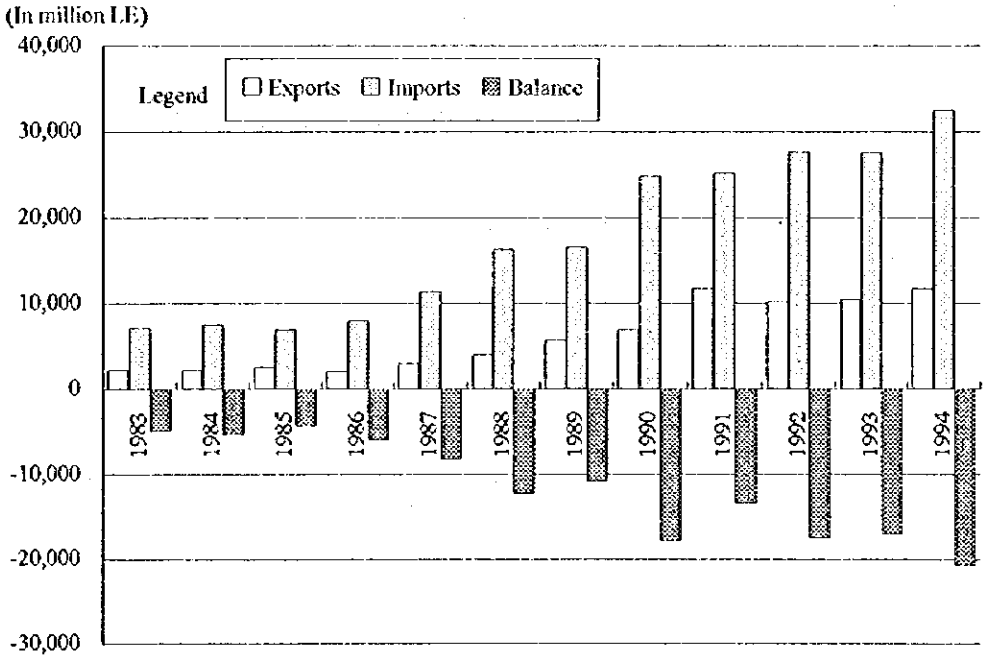
The top five countries of foreign trade in 1992 are tabulated in Table 2.1.4.

Table 2.1.4 Top Five Countries of Foreign Trade in 1992

Sector	1st	2nd	3rd	4th	5th	Total
Exportation	Italy	USA	Spain	France	Singapore	
(Share)	20.6%	8.2%	6.9%	6.2%	5.3%	47.2%
Importation	USA	Germany	Italy	France	Japan	
(Share)	25.4%	10.1%	8.7%	7.0%	4.8%	56.0%

Source : Statistical Year Book, CAPMAS

The trade deficit is attributable to a drastic decline of prices of major export commodities such as crude oil and cotton. One-third of the imports is food, since the domestic agriculture could not have expanded its production to supply sufficient food.



Source : Statistical Year Book, CAPMAS
Note : Current prices, including re-exported

Fig. 2.1.7 Balance of Foreign Trade

2) Balance of Payments

Egypt's balance of payments has the feature as follows:

- Foreign trade makes deficit, and
- Balance of non-trade and transfer items are in the surplus

The non-tradable balance includes mainly remittances from workers abroad, tourists' expenditures and revenues from the Suez Canal. However, these items have not expanded rapidly, since the price of crude oil has stagnated and the volume of shipping transportation through the Suez Canal has leveled. In 1992 a surplus of 4.8 billion US dollars was recorded. However, this is attributable to temporary conditions, such as the cancellation of debts because of the Gulf war, a price hike of crude oil and the influx of public funds.

The government regards the foreign investment as indispensable factor for development. It has revised its investment law in 1989, to give more flexible treatment to foreign investment, by loosening restrictions and the introduction of various incentives. In 1992, the government announced further promotion policies to attract additional foreign investment. These policies will also contribute in the development of Sinai. The trend of international balance is tabulated in Table 2.1.5.

Table 2.1.5 Trend of International Balance

(In million US$)

Items	1980	1985	1986	1987	1988	1989	1990	1991	1992
Trade Balance	-2,960	-6,588	-5,948	-5,688	-6,567	-7,380	-8,296	-7,538	-6,404
Invisible Trade Balance	-268	-143	-404	801	1,924	673	798	1,317	2,191
Current Transfers	2,791	4,619	4,204	4,007	4,104	4,312	4,862	8,625	6,815
Current Revenue	-437	-2,112	-2,148	-880	-539	-2,395	-2,636	2,404	2,602
Capital Revenue	1,135	2,502	2,562	1,626	874	2,251	2,892	3,586	2,196
Change in Reserves	698	390	414	746	335	-141	256	5,990	4,798

Source : IBRD, World Tables 1995

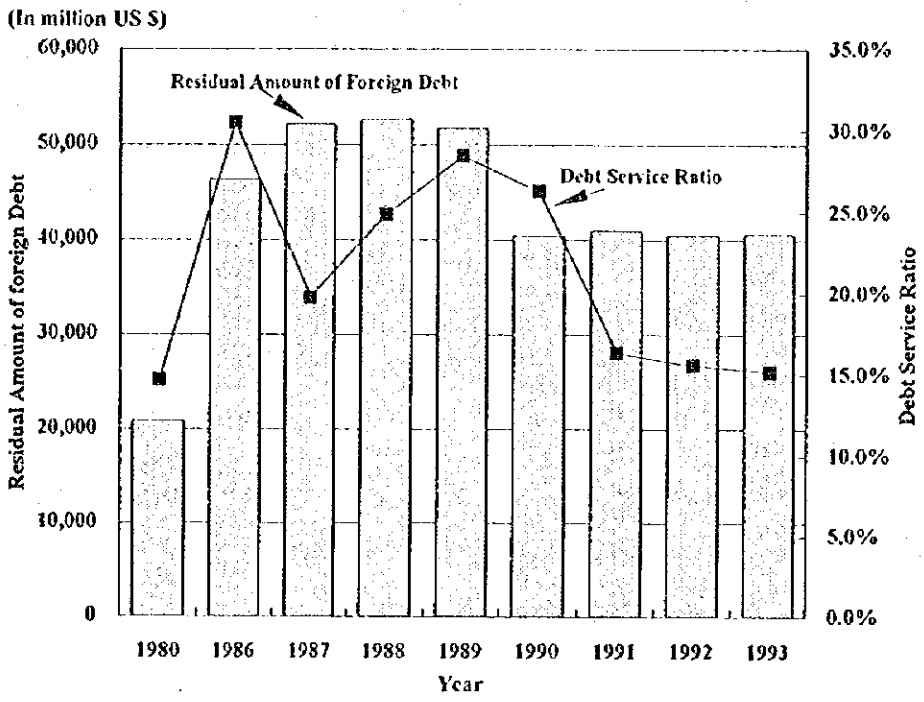
Note : Figures in 1992 : estimate, Invisible Trade Balance : including tourism revenue and Suez Canal revenue
Prices : at current price, Current Transfers : including workers' remittance

(6) Foreign Debt

In 1991 the United States and other four Gulf countries have decided to exempt Egypt of $ 14.8 billions of debt. This attitude spread to other creditor countries. And in May 1991, the Paris Club agreed to reduce Egyptian public debt by 50% in three stages.

The external debt of Egypt has fallen to $ 40 billion in 1990, and from that time until today the amount has been kept at around $ 41 billion. Many of this external debt are long term debts and its major part is government debt. Debts of the private sector have shown a declining trend. The debt service ratio had reached almost 30% in 1989, and since then it has decreased to 15.2% in 1993.

The general trend of foreign debt over the period from 1980 to 1993 is shown in Fig. 2.1.8.



Source : World Debt Tables 1994-1995, World Bank
Note : Prices : at Current Price

Fig. 2.1.8 Trend of Foreign Debt

2.1.3 Car Ownership

The vehicle numbers registered in the Central Police Department in 1994 by Governorate are shown in Table 2.1.6 and Fig. 2.1.9. The total vehicles excluding motor cycle, tractor and temporary cars are 1.67 million. The percentage of passenger car is 58%, taxi 13.2%, bus 2.2% and truck 26.5%.

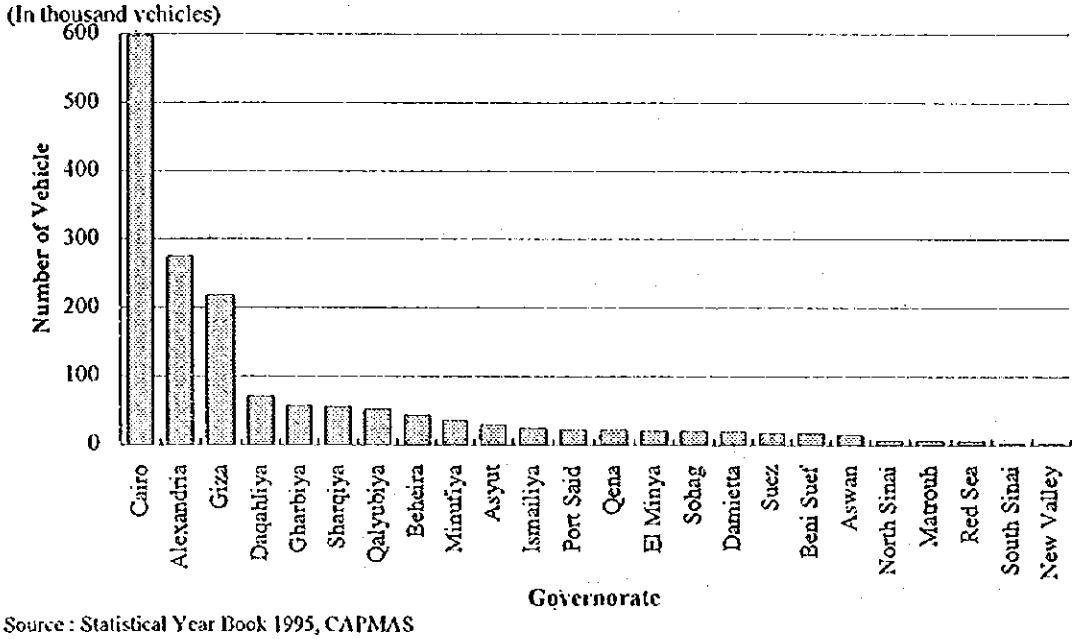
The share of all vehicles registered in Cairo Governorate is 35.8% of the total, and the share of passenger car is 46.3%, while that of truck is 21.0%. The share of the three Governorates of Cairo, Alexandria and Giza reaches 79.2% of passenger car, 46.1% of taxi, 68.1% of bus and 44.3% of truck.

The car ownership is 28.6 vehicles per 1,000 population in the whole Egypt, and that in Cairo is three (3) times higher than the average.

Table 2.1.6 Vehicle Registration and Ownership in 1994

Governorate	Number of Vehicle (unit : vehicle)					Composi-tion	Population ('000)	Car* Ownership
	P. Car	Taxi	Bus	Truck	Total			
Cairo	448,259	42,835	13,270	92,912	597,276	35.8%	6,894	86.6
Alexandria	168,185	30,646	8,381	67,480	274,692	16.5%	3,407	80.6
Giza	150,500	28,383	3,216	35,906	218,005	13.1%	4,457	48.9
Daqahliya	25,161	16,271	498	28,749	70,679	4.2%	4,181	16.9
Gharbiya	20,761	10,498	1,389	24,624	57,272	3.4%	3,405	16.8
Sharqiya	19,730	8,035	2,019	25,708	55,492	3.3%	4,166	13.3
Qalyubiya	17,435	13,596	1,474	19,770	52,275	3.1%	3,013	17.3
Sub Total	850,031	150,264	30,247	295,149	1,325,691	79.4%	29,523	44.9
Others	118,510	70,706	6,270	147,902	343,388	20.6%	28,787	11.9
Total	968,541	220,970	36,517	443,051	1,669,079	100.0%	58,310	28.6
	58.0%	13.2%	2.2%	26.5%	100.0%			

Source : Statistical Year Book 1995, CAPMAS
: Population data in 1994, MOP
Note : Total vehicles exclude Tractor, Motor cycle, Diplomat, Temporary and Custom's cars
: * unit of car ownership : vehicle per 1,000 people



Source : Statistical Year Book 1995, CAPMAS

Fig. 2.1.9 Number of Vehicles by Governorate

2.2 Development Plan

2.2.1 National Development Plan

The National Development Plan is the basis of the development efforts of the country. In Egypt, nine national development plans including the Third Five Year plan (1992/93-1996/97) have been released since 1961. The past national development plans are summarized in Table 2.2.1. The development strategy of the past national development plan from 1961 to 1982 aimed at industrialization.

Table 2.2.1 The Past National Development Plans

Plan	Term	Outline	
First Five Year Plan	1961 - 1965	Investment	: L.E. 1,580 million (Actual : 96 % in plan)
		Target Growth Rate	7.00%
		Development Strategy	: Break with cotton monoculture, industrialization
		Importance Sector	: Industry, Electricity, Transport/Communication and Agriculture
Second Seven Year Plan	1966 - 1972	Investment	: L.E. 4,150 million
		Development Strategy	: Industry, Electricity, Transport/Communication and Agriculture
		Result	: The plan fell through by finance problem
Third Three Year Plan	1968 - 1970	Target	: Completion of the unfinished projects planned in First Plan
		Result	: The goal was unattainable because of the third Middle-East War
Forth Ten Year Plan	1973 - 1982	Investment	: L.E. 8,400 million
		Target Growth Rate	7.1 % - 7.2 %
		Development Strategy	: Industry, Electricity and Transport/Communication
		Result	: The goal was unattainable because of the forth Middle-East War
Fifth Eighteen Month Plan	1974 Jul. - 1975 Dec.	Investment	: L.E. 1,630 million
		Target Growth Rate	9.00%
		Development Strategy	: Reconstruction after the Middle-East War
			: Restoration of the Suez Canal Zone
Sixth Five Year Plan	1978 - 1982	Investment	: L.E. 11,630 million
		Target Growth Rate	12.00%
		Development Strategy	: Industry, Electricity and Transport/Communication
			: Raising the exportation levels
First Five Year Plan	1982/83 - 1986/87	Investment	: L.E. 35,500 million
		Target Growth Rate	7.90%
		Development Strategy	: Improvement of the productivity in economic sector
			: Impartiality of income distribution
		Result	6.8% growth per annum
Second Five Year Plan	1987/88 - 1991/92	Investment	: L.E. 46,500 million
		Target Growth Rate	5.80%
		Development Strategy	: Expansion of production
			: Increase investment for the conversion of economic structure
			: Expansion of economic cooperation and foreign trade
			: Increase the role of private sector and renovation of public corporation
			: Population control and proper distribution
		Result	3.9% growth per annum

Source : Five Year Plan Reports, MOP

2.2.2 Third Five Year Plan (1992/93 - 1996/97)

(1) Basic Policies of the Plan

The Third Five Year Plan, which has started in July 1992, aims at achieving economic reform and structural adjustment programs for the reactivation of the Egyptian economy. The plan encourages a more market-driven economy to achieve the economic reform.

Population growth control and reduction in the level of unemployment are the most important problems highlighted in the Plan. The four basic objectives of the Plan are:

- To insure more public participation based on democratic principles
- To give more attention to the private sector
- To base development on political stability and on international competition principles, and
- To promote the attraction of Arab capital investment to the country.

Based on the above objectives, the five basic policies of the plan are:

- To promote privatization of economy by enhancing the role of the private sector and its contribution to economic growth
- To prepare equal conditions for economic activities between public and private firms through deregulation and renovation of public corporations
- To enhance the market function and its stability
- To improve the international trade balance and reduce the budget deficit, and
- To develop and maintain the economic and social infrastructure, that is electricity, water supply and drainage systems, education and health and medical service. Balanced regional development and appropriate distribution of production facilities are also to be considered.

(2) Targets of the Plan

The targets of the Plan are as follows :

- To attain average annual economic GDP growth rates of 4.0% for the first year and 5.1% for 1993/94 and the following years. Sectoral annual growth rates are targeted at 4.7%, 5.3% and 5.7% for the service, industrial and public services, respectively

- To reduce the population growth rate to 2-3% per annum

- To expand employment by creating new jobs for 2,450 thousand people

- To expand capital investment to the target of L.E. 154 billion during the five year period. Total investment by the private sector is expected to be L.E. 89.5 billion.

- To reduce the annual average growth rate of imports to 3.5%, while increasing the growth rate of exports at a rate of 14.8%, and

- To expect a L.E. 3.3 billion surplus in the balance of payments in the last year of the planning period, while the deficit of the current account is to be improved by L.E. 0.6 billion during the five year period.

Table 2.2.2 shows the target of the main items.

Table 2.2.2 Target Figures of The Third Five Year Plan

Year / Economic Sector	GDP (In million LE)			Workers (In thousand)			
	1991/92	1996/97	Growth Rate	1991/92	1996/97	Increase Number	Growth Rate
Commodity Sectors	63,511	80,042	4.7%	7,543	8,664	1,122	2.8%
Productive Service Sectors	42,784	55,420	5.3%	2,264	2,839	575	4.6%
Social Service Sector	19,190	25,345	5.7%	4,094	4,947	753	3.9%
Total	125,485	160,807	5.1%	13,901	16,450	2,450	3.4%

Year / Economic Sector	Invest. Expenditures (In million LE)			Composition		
	Public	Private	Total	Public	Private	Total
Commodity Sectors	26,000	51,200	77,200	33.7%	66.3%	100.0%
Productive Service Sectors	13,200	16,900	30,100	43.9%	56.1%	100.0%
Social Service Sector	25,300	21,400	46,700	54.2%	45.8%	100.0%
Total	64,500	89,500	154,000	41.9%	58.1%	100.0%

Source : Summary of The Third Five Year Plan (1992/93-1996/97), MOP 1992

2.2.3 New Towns Development

(1) Background

In Egypt, 99% of population are living along the Nile river and the Delta area. It is small area constituting less than 3% of total area of Egypt. As a result, conditions such as overpopulation, environmental pollution and agriculture land conversion are common in this area.

The government efforts for New Town Policy commenced in the late 1960's by the Greater Cairo Commission. The purpose was to make a progress in agriculture land preservation and to accelerate a decentralization process. The conflict of agriculture land preservation and residential development has been an issue for a long time. The 1968 Regional Plan mapped out four new satellite cities to be developed in desert areas.

In 1982, the "National Urban Policy Study", funded by USAID grant, was completed. The study accepted the government's urban development policies, however it requested a postponement of the independent urban development, and recommended a more practical town development scheme with absorptive capacity for a rapidly expanding population.

In 1992, the government released the New Town Plan, a new design concept. "Twin Cities" are identified in the report for the first time. Its concept is defined as that new towns located in desert areas adjacent to the existing towns, and supported by agglomerated urban functions and facilities of the existing towns. New Towns Plan listed seventeen new towns including the on-going New Towns projects.

(2) New Towns Plan

The government has constructed twelve (12) new towns and planed another five (5) new towns. The total planned area for the seventeen (17) new towns is 2,320km2 including 395km2 urban area (housing area, commercial area and industrial area). This plan targets about 6 million residents. In this plan, the government prepares the infrastructures, job opportunities and social services. Table 2.2.3 shows seventeen cities in the New Towns Plan.

At present, 10 th of Ramadan City functions as a satellite city to Greater Cairo area while it was originally designed to be an independent city. 15 th of May City became a residential town for Helwan, and the city is still expanding now. Sadat

City and 6 th of October City developments are continuing and they are taking an independent city shape.

Table 2.2.3 New Towns

(unit : km2)

No.	City and Area Name	Area Total	Development Area		Green tract of land		Target Population
			Housing	Industry	Area	Share	
1	10th of Ramadan	388.0	42.4	13.7	331.6	85.5%	500,000
2	El Sadat	625.0	35.8	12.2	577.0	92.3%	500,000
3	New Borg El Arab	225.0	41.3	7.0	176.7	78.5%	510,000
4	6th of October	360.0	48.9	14.7	296.4	82.3%	500,000
5	New Damietta	105.0	15.8	2.3	86.9	82.8%	270,000
6	15th of May	27.1	12.2		14.9	55.0%	250,000
7	New Beni Suef	39.9	10.1	3.6	26.2	65.7%	120,000
8	El Aubour	42.0	23.1	3.4	15.5	36.9%	250,000
9	Badr	69.3	12.1	2.9	54.3	78.4%	250,000
10	New Nubaria	38.2	3.8	0.5	33.9	88.7%	50,000
11	New Menia	84.0	5.5	1.2	77.3	92.0%	120,000
12	New El Salheya	19.3	10.8	1.4	7.1	36.8%	100,000
13	El Amal	189.0	12.4	1.9	174.7	92.4%	250,000
14	New Communities around Cairo	84.0	40.0		44.0	52.4%	2,000,000
15	New Asyut	16.8	8.4		8.4	50.0%	115,000
16	New Sohag	3.4	3.4			0.0%	60,000
17	New Aswan	4.2	4.2			0.0%	100,000
Total		2,320.2	330.2	64.8	1,924.9	83.0%	5,945,000

Source : GOPP

2.2.4 Development of Regional/Infrastructure Planning in Egypt

This planning study is now in progress under the control of the Ministry of Planning. The outline of the study, according to the collected data and information from MOP, are summarized as follows. The details are shown in appendix.

(1) Outline of the Study

MOP is now executing the "Regional/Infrastructure Planning" Project. This project is co-financed by the Egyptian Government and UNDP. The actual study began in March 1993, after the preliminary technical assistance study phase.

The project objective is to introduce a spatial element in the course of planning procedure, and consequently correct the spatially biased economic development in Egypt. This entails reinforcing the role of the leading public organization, which has not been improved in the last decades.

This approach coincides with the Economic Reform and Structural Adjustment Programme (ERSAP), and virtually provides a suitable development framework, where representatives from the central government, local government, private sector and grass-roots groups will be able to participate in the revolutionary programme. This also contributes to gradually diverting a purely sectoral planning process to a directive policy oriented system. As a consequence, the geographically biased social, political and economic development patterns and the population distribution will be improved. In order to achieve the maximum use of various resources and the improvement of the environmental problem, it is imperative to consider the investigation results of long-term sectoral and spatial development planning, and the input of the private as well as rural sectors.

Major output directly obtained from the achievement of the project objective will include the following:

- Formulation of National Spatial Strategy;
- Development of Spatial Planning Information System;
- Training of Planning Personnel; and
- Fourth National Plan, 1997-2002, and Regional Plans compatible with the National Plan.

(2) Development Objective

The development objective summarized in the previous outline statement is largely based on the following items :

- The Planning Act of 1973, which defines an authority to integrate a spatial plan into the total planning process.
- The First and Second Five Year Plan of 1982/83 - 86/87 and 1987/88 - 91/92 took into account the population distribution and spatial distribution of economic activities as the major axis of the national development. But the implementation of the plan was never completed, due to the lack of an executing organization.

- The currently authorized Third Five Year Plan, 1992/93 - 1996/97 disclosed an important directive to prepare the national spatial strategy and full-scale regional plans. Through this plan the importance of the spatial development plan was duly emphasized.

- ERSAP, which was jointly prepared by the Government of Egypt and the World Bank promotes the decentralization, local capacity building and successful establishment of private enterprises,

- The Fifth UNDP Country Programme for Egypt 1993-1996, which adopted a strategy to reduce the in-migration from rural to urban areas, promote the decentralization to local authorities, develop human resources, develop capacity of government agencies, discuss a policy to maintain a sustainable development, develop a programme approach to technical aid and/plan a new regional approach by MOP.

(3) Target Population in 2017

As part of the output of the National Spatial Strategy, the target population in 2017 was forecasted by development region and by Governorate. This target population is consistent with the Sinai Development Frame and is to be considered in formulating the Forth Five Year Plan.

The outline of the forecast based on the materials obtained from the Ministry of Planning is as discussed below:

- Total population of Egypt is estimated at 86 million by 2017.

- The development regions which need "out-migration" are Greater Cairo, Delta and North Upper Egypt. The migration estimates is based on the relationships between the target population and the future population estimates forecast by a time series analysis and by region. However, they neglect the relation with the "in-out migration" of the Governorate, which is included in the development region. The scale of the estimated out-migration are 5.3, 3.3 and 0.3 million people from Greater Cairo, Delta and North Upper Egypt, respectively. These are considered to reflect risk degrees affecting reduction of the agricultural land area caused by urbanization pressures.

- Similarly, the regions of required "in-migration" is identified as the Suez Canal Region & Sinai, Alexandria, South Upper Egypt and Asyut. The scale of in-migration are 4.7, 2.0, 1.8 and 0.5 million people, respectively. These estimates

are considered to reflect the potential of future agricultural, industrial or tourism development.

- The National Development Plan aims at migrating about 4.7 million peoples to Suez Canal and Sinai Region. Suez Canal Region, which consists of four governorates (Sharqiya, Port Said, Ismailiya and Suez), is planned to receive 1.9 million migrants, while Sinai Region should receive 2.8 million. Both regions are expected to accept the migrants based on future agricultural development potential.

Inter-regional migration by 2017 is shown in Table 2.2.4 and Fig. 2.2.1.

Table 2.2.4 Inter-Regional Migration by 2017

(unit : In thousand)

Region	1994 (B)		2017			
	Population	Share	Trend (F)	Target (C)		Target-Trend
Greater Cairo	14,364	24.6%	22,492	17,180	20.0%	-5,312
Alexandria	7,525	12.9%	11,111	13,121	15.3%	2,010
Delta	13,354	22.9%	19,367	16,027	18.6%	-3,340
Suez Canal & Sinai	5,953	10.2%	9,036	13,711	15.9%	4,675
North Upper Egypt	7,096	12.2%	10,027	9,726	11.3%	-301
Asyut	2,934	5.0%	4,104	4,559	5.3%	455
South Upper Egypt	7,046	12.1%	9,872	11,685	13.6%	1,813
Total of Egypt	58,272	100.0%	86,009	86,009	100.0%	0

Source : Regional/Infrastructure Planning, MOP

Note: (B) : Official estimations by Central Agency for Public Mobilization & Statistics
(C) : Estimation by United Nations project for regional development & infrastructure
(F) : Total population & population distribution on governorates in the end of the 5-year plans (1997-2002-2007-2012) added by linear interpopulation

Region	Governorate
Greater Cairo	Cairo, Qalyubia, Giza
Alexandria	Alexandria, Matruh, Beheira
Delta	Kafr el Sheikh, Gharbiya, Minufiya, Damietta, Daqahliya
Suez Canal & Sinai	Sharqiya, Port Said, Ismailiya, Suez, North Sinai, South Sinai
North Upper Egypt	El-Minya, Beni Suef, Faiyum
Asyut	Asyut, New Valley
South Upper Egypt	Sohag, Red Sea, Qena, Aswan

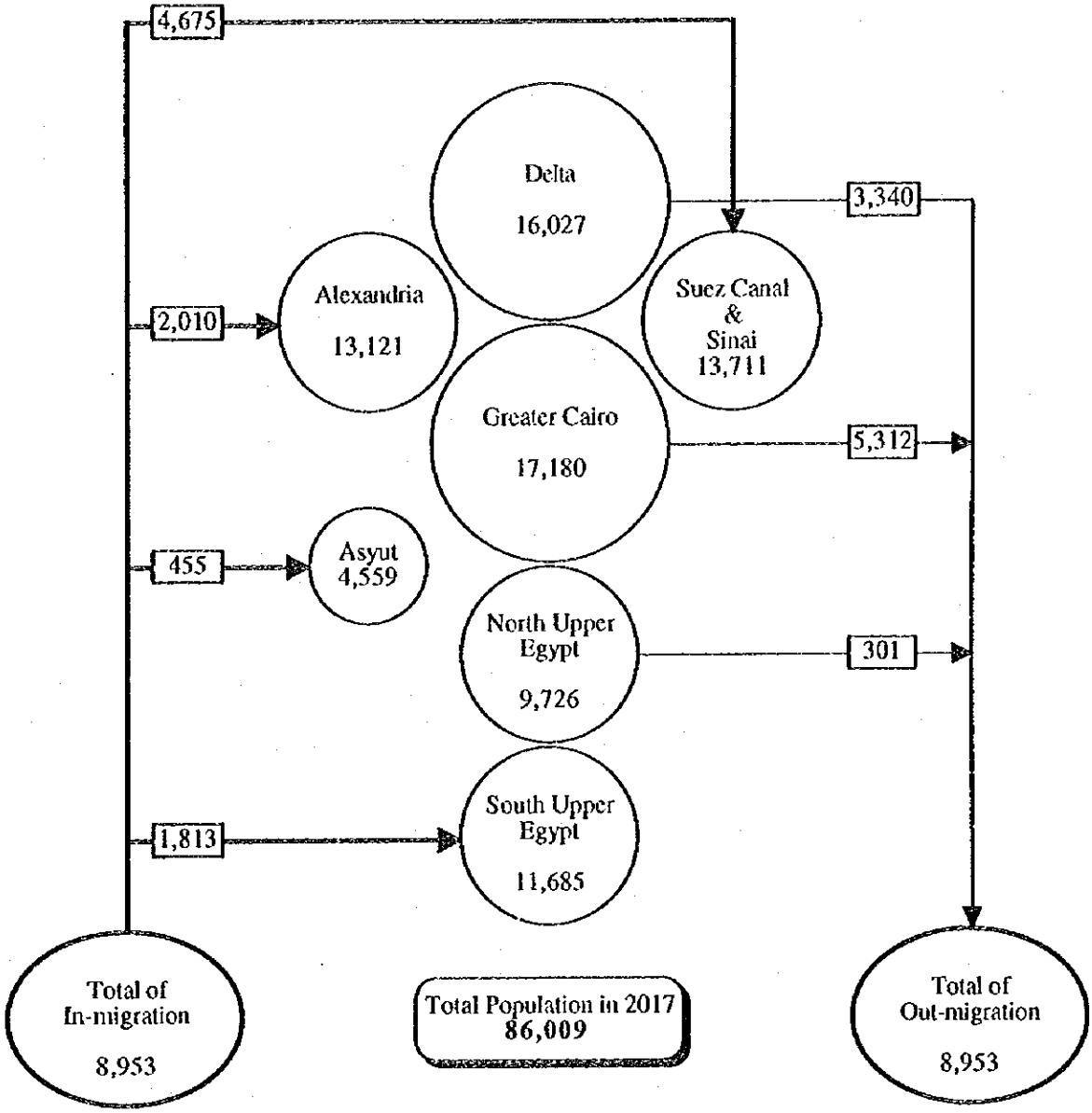


Fig. 2.2.1 Inter-regional Migration by 2017

2.2.5 Sinai Development Planning

(1) Past Trend of Sinai Development Planning

Since 1982, more than ten development studies have been carried out by domestic institutes and foreign agencies in the Sinai Peninsula. The key studies are as follow:

In 1985, "Sinai Development Study Phase I (SDS I)",was carried out by Dames & Moore (USA). Outline of the study is as follow:

- Proposal of a development strategy
- Database development
- The First study to propose conveying Nile water to Sinai.

In 1988, "The Strategy for Development of Sinai" was carried out by Sinai Development Authority, MOD. Outline of the study is as follow:

- Reviewed five strategy maps by sub-region proposed by SDS I.
- Target population was 1.3 million.

In 1993, "Strategy for the Development of Sinai Peninsula Till Year 2015" was carried out by GOPP, MOS for New Urban Communities. Outline of the study is as follow:

- Amended proposal of the Development Strategy by SDS I.
- Target population of the area was two (2) million.

In 1994, "National Project for the Development of Sinai (NPDS)" was prepared by MOP. Outline of the study is as follow:

- "the Central development axis" was not consistent with the proposals of the 1993 study.
- Target population of the study was 3.2 million.

In 1994, "Development of Regional/Infrastructure Planning in Egypt" was prepared by MOP and UNDP. Outline of the study is as follow:

- Drawing up of a 25 years long term development plan

- Drawing up of the Fourth Five-Year Development Plan
- Drawing up of Regional Plan for each region.

(2) Current Condition of Sinai Peninsula

1) Natural and Social Conditions

The Sinai Peninsula is located in the north eastern part of the Egyptian territory. Its area is bounded by the Gulf of Aqaba and Israel to the East, the Gulf of Suez and the Suez Canal to the West and the Mediterranean Sea to north.

The total area of the Sinai Peninsula is around 61 thousand square km, representing around 6% of the total land area of Egypt. As far as the environment and physical aspects are concerned, Sinai is divided into three parts. The first is the southern part which is a solid and rough land structure formed from igneous and metamorphic rocks. The second area is the central part, which is to the north of the aforementioned part, and is known as El Tih and Egma plateau. The third area is the northern part which is a coastal plain along the Mediterranean coast. This area is made up of limestone rocks covered by sand dunes. Location map of the Sinai is shown in Fig. 2.2.2.

The Sinai Peninsula is administratively divided into five Governorates : North Sinai Governorate, South Sinai Governorate, Port Said Governorate, Ismailiya Governorate and Suez Governorate. North Sinai Governorate and South Sinai Governorate are divided into six markazs and eight markazs, respectively.

According to the latest census of 1986, Sinai has a total population of 200 thousand. The estimated figure for 1994 is approximately 290 thousand inhabitants, 250 thousand inhabitants in North Sinai mainly along the Mediterranean Sea, and 40 thousand inhabitants in South Sinai coastal area.

While the population of the North is mainly influenced by political and military factors, economic factors have had their impact on the population of the South, where oil and magnesium fields have attracted labour, mostly from Upper Egypt. In the past few years the development of the tourism industry has also been an influential factor.

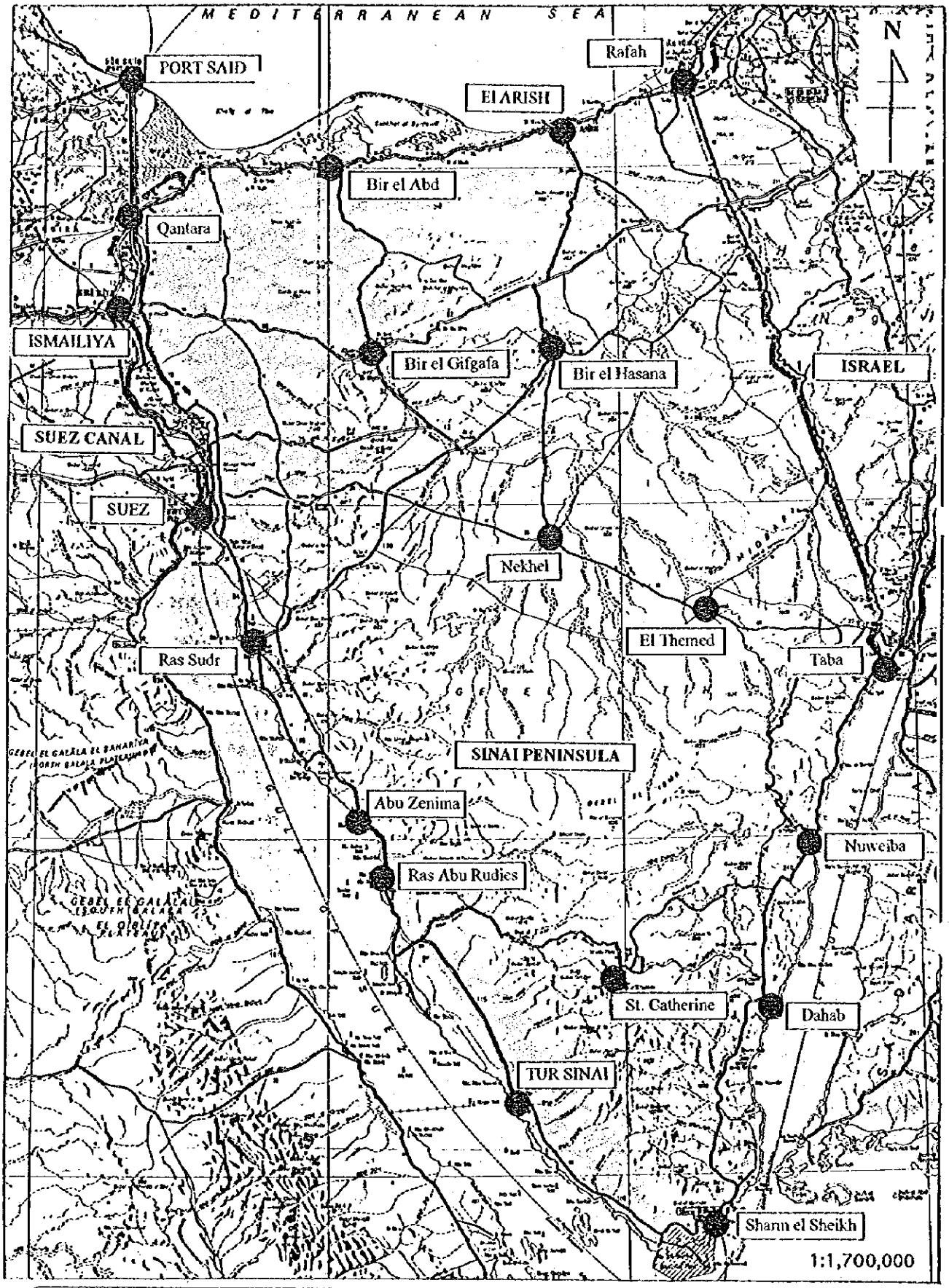


Fig. 2.2.2 Location Map of Sinai

THE FEASIBILITY STUDY ON A BRIDGE OVER NORTHERN PART OF THE SUEZ CANAL

2) Economic Conditions

Sinai has many natural resources such as oil, mining resources, industrial materials and tourist attractions. However, due to the lack of the necessary infrastructures and investment for economic development, only a part of these natural resources is exploited. The basis of economic activity in Sinai are still weak and limited. According to the estimated of GRDP in NRTS, the GRDP of Sinai is L.E. 461 million by 1992 and its share is 0.37% of the GDP of Egypt.

At present, the total investment amount in Sinai is increasing especially in agriculture development in North Sinai area and in tourism development in South Sinai area. With the expansion of investment, the economic activities in Sinai are rapidly increasing.

In Egypt, the Mediterranean coastal area between Marsa Matrouh and Rafah is the only zone using rainfall for agriculture. Many orchards stretch between El Arish and Rafah. Existing agriculture conditions are summarized in Table 2.2.5.

Table 2.2.5 Existing Agriculture conditions in Sinai

Area	Land	Crops	Volume	Livestock
North Sinai	173,500 F	Vege/Fruit	152,000 ton	186,000
	(72,900ha)	Grain	77121 m3	
South Sinai	1,500 F	Vege/Fruit	8,000 ton	78,000
	(600 ha)	Grain	4,059 m3	

Source : NPDS
Note : F : Feddan, Vege. : Vegetable

Industrialization in Sinai Peninsula is progressing slowly. Therefore, the supply of the industrial products depends mainly on the mainland. There are public and private factories in Sinai, and about four thousand workers are employed in industrial projects. Most of the workers are employed in the oil/gas field and mining related activities. Plans for construction of cement factory in North Sinai are under going.

The Sinai Peninsula is blessed with many tourist attractions including historical, religious and ecological/natural features. In spite of Sinai's touristic potentials, tourism is practically limited at present to beach tourism (in addition to the religious tourism in the area of Saint Catherine). Existing conditions of tourism are as follows:

- Summer recreational tourism at El Arish beach in North Sinai. About 80-90% of the hotel occupancy there is by Egyptian visitors.

- Recreational tourism in Ras Missalla, Ras Sudr and Ras Matarma along the Gulf of Suez. The basic trend of tourism in these area is daily and weekend visitors from Cairo and Nile Valley.

- Recreational tourism along the coast of the Gulf of Aqaba (Sharm el Sheikh, Dahab, Nuweiba and Taba). These beaches are remote and attractive to international tourists interested in marine sports and those who are looking for relaxation and tranquillity. The tourism season extends to cover the whole year in these area.

The number of tourist nights in Sinai in 1992/93 were 1.2 million, most of which were spent in South Sinai.

Currently there are 22 hotels and 26 touristic villages in Sinai with an accommodation capacity of 4,568 rooms. 75% of the total capacity concentrate on the Gulf of Aqaba coast, especially 46% of the capacity is at Sharm el Sheikh. The room distribution are shown in Table 2.2.6.

Table 2.2.6 Existing Rooms Distribution in Sinai

(unit : rooms)

Area	Location	Number of rooms	Share (%)	
			Location	Area
North	El Arish	557	12.2%	12.2%
West	Rus Sudr	331	7.3%	
	Tur Sinai	78	1.7%	9.0%
Mountain	St. Catherine	227	5.0%	5.0%
Gulf of Aqaba	Taba	426	9.3%	
	Nuweiba	595	13.0%	
	Dahab	241	5.3%	
	Sharm el Sheikh	2,113	46.3%	73.9%
Total		4,568	100.0%	100.0%

Souce : NPDS

2.2.6 National Project for the Development of Sinai

(1) Background

The Sinai Peninsula is one of the most unique regions in Egypt due to its political location which supports national security at the Eastern border. As a result of the Middle East War, Sinai has been occupied by Israel from 1967 to 1976.

The political and economic importance of the Sinai Peninsula rose rapidly after the historical Middle East peace process in 1994. The government of Egypt pays attention to the potential of establishing a development center in Middle East region, the National Project for the Development of Sinai (NPDS) was prepared in September 1994.

On the regional level, Sinai is an important part of the Suez Canal region which includes, in addition to North Sinai and South Sinai Governorates, the Governorates of Port Said, Suez, Ismailiya and Sharqiya. Therefore, Sinai is an important area on the levels of economic and social development, particularly in the fields of industrialization and links with the international markets.

On the national level, Sinai has a prominent place in the process of national development as part of the comprehensive development framework of sectors and regions of the country in the period from 1994 to 2017.

On the international level, Sinai constitutes an important link within the development framework of the Middle East region, particularly after the completion of the peace process. Sinai is thus a pivotal point in the development of the region.

(2) Basic Policies of the Plan

The development of Sinai is based on three main approaches :

First: Developing Northern and Western Axes, namely El Arish axis and Suez Gulf axis through ;

- Promoting domestic tourism to the Northern-East coast and to the Gulf of Suez, which are considered as one of the most attractive tourism sites.
- Establishing new communities to attract people to Sinai.
- Linking the above mentioned regions to Canal cities by means of railway.

- Development of the available agricultural and mining activities.

- Establishing Free Zones and regional Universities

Second : Developing the Eastern Axis (Aqaba axis), by establishing all facilities required to support and promote the international tourism demand, such as the construction of airport, harbors, docks, desalination plants, power stations and touristic places.

Third : Developing the Middle Axis (Nekhel axis), which includes mainly a specialized institutes, research centers, pilgrimage village, local and international service centers, caravan centers and agricultural industries.

To verify integrated development in Sinai, the main national developing programme should include;

- Upgrading of the main infrastructure network

- Strengthening the links and communications between Sinai and the Nile Valley, Delta, and foreign nations to attract investment in all fields.

(3) Targets of the Plan

The main objective of the NPDS is to create about 800 thousand job opportunities, leading to the settlement of about 2.9 million inhabitants, and increasing the total population of Sinai to 3.2 million by 2017.

Total investment cost for the NPDS is planned at about L.E. 75 billion. It is expected that L.E. 6.4 billion, L.E. 23.6 billion and L.E. 44.7 billion will be invested during the Third Five Year Plan, the Forth Five Year Plan and the remaining planning periods, respectively.

Sectoral investments amount to L.E. 20.8 billion, L.E. 12.3 billion and L.E. 10 billion for housing, agriculture and industry, respectively. Regarding El-Salaam Canal project in agriculture sector, an intensive investment has been made for the construction of canal and related projects. The targets and investment plan of the NPDS are summarized in Table 2.2.7 and Table 2.2.8.

Table 2.2.7 Development of Worker and Population

(In thousand)

Item \ Period	3rd Plan (94/95-96/97)	4th Plan (97/98-01/02)	Subsequent (02/03-16/17)	Total
Worker	60	220	520	800
(A.A.I.)	(20.0)	(44.0)	(34.7)	
Population	230	850	1,820	2,900
(A.A.I.)	(76.7)	(170.0)	(121.3)	

Source : NPDS Note : A.A.I. : Annual Average Increase

Table 2.2.8 Investment Plan of the NPDS

	Sector	Target Population	Investment Schedule (mill. L.E.)			
			3rd Plan	4th Plan	Subsequent	Total
A.	Infrastructure	2,638,600	6,316	22,667	41,895	70,878
1	Agriculture	821,200	1,431	4,422	6,410	12,263
2	Mining and Industrial	1,000,000	500	2,500	7,000	10,000
3	Tourism	338,400	440	2,940	4,800	8,180
4	Housing and Construction	200,000	715	4,700	15,385	20,800
5	Electricity and Power	3,500	600	2,405	3,000	6,005
6	Transport and Storage	16,000	1,000	2,250	2,950	6,200
7	Business and Banking Service	248,000	30	300	500	830
8	Table Water and Sewage	11,500	1,600	3,150	1,850	6,600
B.	Social Services	570,000	98	930	2,772	3,800
9	Educational Services	250,000	32	415	1,203	1,650
10	Health Care Services	120,000	10	115	375	500
11	Religious Service	200,000	50	150	400	600
12	Culture and Information			90	200	290
13	Labour Force		1	9	30	40
14	Manpower Training		1	15	34	50
15	Youth and Sports		1	119	480	600
16	Security		2	8	40	50
17	Judicial		1	9	10	20
	Total	**3,208,600**	**6,414**	**23,597**	**44,667**	**74,678**
	(share)		(8.6)	(31.6)	(59.8)	(100.0)

Source : NPDS
Note : The study team added 45 thousand population to agriculture sector, and added 200 thousand population to housing & construction sector.

(4) Sectoral Development Plan

The NPDS consists of several sectoral development plans. Agriculture, Mining & Industrial and Tourism are the major development sectors of the NPDS. The development map is shown in Fig. 2.2.3.

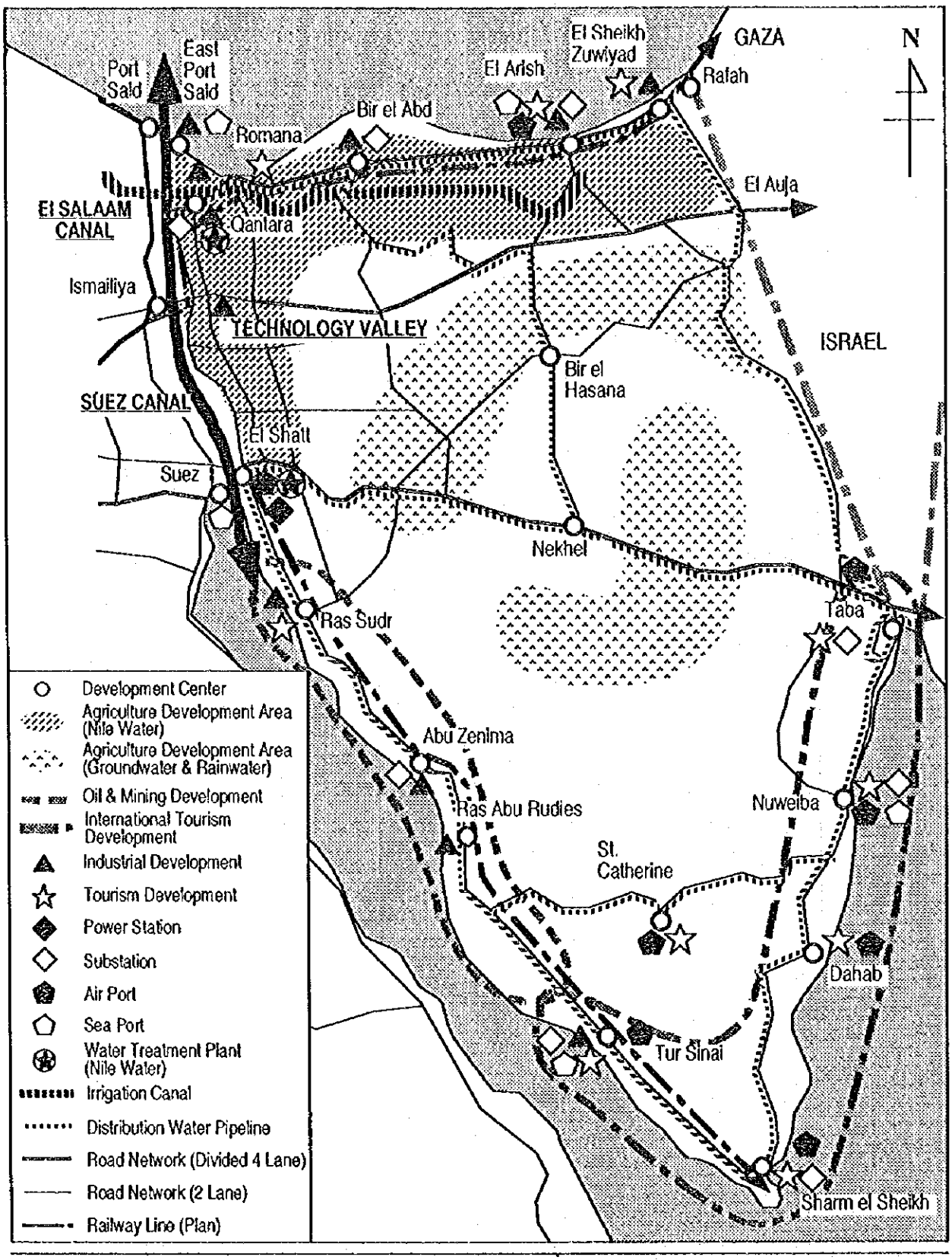


Fig. 2.2.3 Sinai Project Map

2.2.7 Review of Sinai Development Plan

(1) Review on Adjustment among Sectors

1) Overall Development Plan

As is mentioned in the section 2.2.6, the implementation of the NPDS has started since 1994. The overall socio-economic framework of the NPDS is tabulated in Table 2.2.9.

Table 2.2.9 Socio-economic Framework by Sector in 2017

(unit : In thousand)

Item / Sector	Population		Worker	
	Number	Share	Number	Share
Agriculture*	821.2	25.6%	165.0	21.0%
Mining and Industry	1,000.0	31.2%	250.0	31.8%
Tourism	338.4	10.5%	112.8	14.3%
Housing and construction*	200.0	6.2%	50.0	6.4%
Electricity	3.5	0.1%	0.7	0.1%
Transportation	16.0	0.5%	4.0	0.5%
Buisness and Finance	248.0	7.7%	62.0	7.9%
Potable water and Sewage	11.5	0.4%	2.3	0.3%
Education	250.0	7.8%	60.0	7.6%
Health Service	120.0	3.7%	30.1	3.8%
Other Social Service	200.0	6.2%	50.0	6.4%
Total	3,208.6	100.0%	786.9	100.0%

Source : NPDS

Note : Above figures are original data on NPDS.

* Figures are revised by the Study team in light of the review of the sectoral development plan.

This table shows that agricultural, mining and industry, and tourism sectors are the major development sectors of the NPDS with a large share of support population (67%). The following sections discuss some issues and constraints about among these three sectors.

Table 2.2.10 shows a comparison of planning units between the whole of Egypt and the NPDS.

Table 2.2.10 Comparison of Planning Unit

Index	Whole Country	Sinai Dev. Plan	Remarks	Source and Year
(1) Population and Household				
Average size of family	4.90	4.00	persons/household	Census, 1986
Structures of work force	100.0	100.0	(%)	Census, 1986
- Agriculture	37.6	20.6		
- Mining and industry	12.6	31.2		
- Electricity, Gas and Water	0.7	0.4		
- Construction	6.7	6.3*		* Study team add 50 thousand
- Tourism, Commerce and Finance	8.8	21.9		worker to construction sector
- Transport and Social services	26.8	17.3		
- Others	6.7	2.3		
(2) Agriculture				
Number of worker per area	0.67	0.20	person/Feddan	Statistical year book, 1990
Volume of irrigation water per area	8.0	7.5	mil. m3/'000 Feddan	MOPW & WR
Annual land reclamation area	65		000 Feddan/year	Statistical year book
(3) Industry				
Number of worker per area			persons/ha	The urgent development plan
- Ordinary industrial area	64		Ataqa, Suez	of the Suez bay coastal area
- Free zone area	200		Adabiya, Suez	development, 1993 (JICA)
Water demand per worker, per day			litre/person	
- Ordinary industrial area	1,850		Ataqa, Suez	
- Free zone area	550		Adabiya, Suez	
(4) Potable water and Sewage				MOP, 1992
Potable water per person	200	191	litre/person/day	
Sewage volume per person	125	153		
(5) Electricity				EEA
Capacity of Generating			watt/person	
- 1993	217	603		
- 2000	286			
- 2017		472		
(6) Water supply plan for Suez Canal area and Sinai Peninsula				MOPW & WR
Ismailiya Canal	8.5-11 mil. tons/day		3.1- 4.0 bil. tons/year	
Suez Sweetwater Canal	2.6 mil. tons/day		0.95 bil. tons/year	
El Salam Canal	12.2 mil. tons/day		4.46 bil. tons/year	3 bil. tons/year to Sinai
- Nile River (Damietta Br.)	5.8 mil. tons/day		2.11 bil. tons/year	
- Lower El Sarw Drain	1.2 mil. tons/day		0.44 bil. tons/year	
- Bahr Hadous Drain	5.2 mil. tons/day		1.90 bil. tons/year	
After completion of the Upper Nile Project			Additional increase volume 2.0 bill./tons/year	Irrigation water for the development of 250,000 Feddan

2) Agriculture Development

a. Progress and Prospects

The contents of the agricultural development by sub sector are tabulated in Table 2.2.11.

Table 2.2.11 Agricultural Development

(In thousand)

Project	Target	Project Period	Population	Worker
1. Land Reclamation by Nile Water				
- El Salam Canal	400,000 F	1994 - 2007	400.0	80.0
- East Suez Canal (1)	57,000 F	1994 - 2007	57.0	11.4
- East Suez Canal (2)	250,000 F	2002 - 2012	250.0	50.0
2. Land Reclamation by Local Water Resources				
- North Sinai by ground water	7,000 F	1997 - 2007	7.0	1.4
- South Sinai by ground water	8,000 F	1997 - 2007	8.0	1.6
- Using Runoff Water	50,000F	1997 - 2007	12.5	2.5
3. Pasture and Fodder Development				
- Pasture land development	300,000 F	1997 - 2012	15.0	3.0
- Cooperative societies	15	1997 - 2007	1.5	0.3
- Range and sheep research center	1	1997 - 2007	0.4	0.1
4. Live Stock and Poultry Production				
- Sheep	150,000	1997 - 2007	5.0	1.0
- Cattle*	250,000	2002 - 2017	50.0	10.0
- Poultry		2002 - 2017	4.8	1.2
5. Fish Production			8.0	2.0
- Al Bardawil Lake		1994 - 2007		
- Mediterranean Sea		1994 - 2012		
- Aqaba gulf and Suez gulf		1997 - 2007		
6. Agricultural Marketing	5	2002 - 2007	2.0	0.5
Total			821.2	165.0

Source : NPDS
Note : * Population are adjustedby the Study Team
F: Feddan (=0.42ha)

Agriculture development plan aims to be more than 800 thousand inhabitants and 165 thousand job opportunities.

From the view point of population and workers, land reclamation based on Nile water occupies a large share of more than 85%. It can be said that this agricultural development depends on both the El Salaam Canal project and the East Suez Canal Area Development project. The El Salaam Canal project is currently under implementation and some parts of the canal has been completed showing noticeable progress.

b. Propriety of Planning Ingredients

From the view point of planning unit, the number of workers and water consumption per Feddan for the Sinai Development Project look reasonable to compare with the whole of Egypt.

Egypt has much experience of large scale of land reclamation for agriculture. Since 1952, total area of 2.7 million Feddan of agriculture land have been reclaimed in Egypt. Average reclaimed area is 65 thousand Feddan per year.

3) Mining and Industrial Development

a. Progress and Prospects

The total amount of the targeted investments for the industrial sector are estimated L.E. 10 billion. Total number of worker in the industry and mining sector is estimated 250 thousand workers.

Considering the industrial development plan in Sinai, it seems that the planning is not as concrete as other sectors. For instance, the following uncertainty can be noticed in the industrial development of the Sinai development project.

- The total number of workers by sector are decided as a total future economic framework for Sinai. However, the exact locations, development scale and schedule for major industrial development projects are not clearly decided.

- The Technology Valley plan prepared by the Cabinet Information and Decision Support Centre allocates about 16,000 Feddan and 60,000 permanent workers for this project. However, this area of 16,000 Feddan has not been included in the original NPDS issued in 1994.

- Planning units as the number of workers per area and water consumption per area or worker cannot be shown or cannot be estimated due to lack of overall common planning framework at present.

Furthermore, the total number of the population of the industrial sector shows rather large number as one million inhabitants, almost one third of the total future population without much details about the industries which will support such large population.

These facts show that the development of the industrial sector, especially the manufacturing industrial development, might become the cause of delay of the overall development while the mining industry looks more promising.

Table 2.2.12 shows the investment plan and number of workers by industrial sector.

Table 2.2.12 Industrial Development Plan

Project	3rd Plan (94/95-96/97)	4th Plan (97/98-01/02)	Subsequent (02/03-16/17)	Total
1. Investment Plan	Investment Amount (Mill. L.E.)			
- Extraction industries	100	500	1,400	2,000
- Mineral industries	50	270	1,180	1,500
- Chemical industries		330	1,670	2,000
- Mechanical industries		100	400	500
- Textile and Weaving industries		50	150	200
- Food industries	100	200	500	800
- Construction material industries	200	500	1,300	2,000
- Other industries	50	450	500	1,000
Total	500	2,400	7,100	10,000
2. Worker by Industrial Sector	Generated Worker ('000)			
- Extraction industries	2.50	12.50	35.00	50.00
- Mineral industries	1.25	6.75	29.50	37.50
- Chemical industries		8.25	41.75	50.00
- Mechanical industries		2.50	10.00	12.50
- Textile and Weaving industries		1.25	3.75	5.00
- Food industries	2.50	5.00	12.50	20.00
- Construction material industries	5.00	12.50	32.50	50.00
- Other industries	1.25	11.25	12.50	25.00
Total	12.50	60.00	177.50	250.00

Source : NPDS

b. Propriety of Planning Ingredients

Mining and industry sector is one of main development sectors in Sinai development. Sinai is an area rich in a large quantity, quality and variety of mineral resources. In this point, it can be said that Sinai has great industrial development potential.

However, industrial development plans in NPDS are including unclear or uncertain points. It is needed to conduct more studies to make clear the uncertain points.

The minimum development scale in mining and industrial sector is estimated based on the projects having the framework in the NPDS. As the result of estimation, total number of worker will be 60 thousand workers by 2017. Table 2.2.13 shows minimum development scale of mining and industrial sector by 2017.

Table 2.2.13 Minimum Development Scale by 2017

Industrial Sector	Number of Workers	Number of Population
Mining industries	9,500	38,000
Construction materials industries	15,500	62,000
Chemical industries	10,500	42,000
Food industries	12,500	50,000
Mineral industries	4,000	16,000
Small industries	8,000	32,000
Total	60,000	240,000

Note : Study team estimate based on the NPDS

4) Tourism Development

a. Progress and Prospect

The tourism development is expected to be one of the possible successful industries in Sinai. Table 2.2.14 shows the existing tourism condition of Egypt and Sinai. Total number of tourist for the whole of Egypt were 3.2 million in 1992. More than 400 thousand tourists have visited Sinai and stayed 3 nights on average. Regarding to accommodation facilities, there are about 4,600 rooms in Sinai and 90% of that capacity is concentrated in south Sinai. (see Table 2.2.6)

Sinai enjoys a wide range of tourism attractions, and it has a high potential for more tourism development. The number of tourists has been increasing along with the expansions of tourism development.

Table 2.2.14 Existing Condition of Tourism in 1992

Item	Egypt	Sinai	Share of Sinai (%)	North Sinai	South Sinai
(1) Number of rooms	61,993	4,568	7.4	557	4,011
(2) Number of tourist ('000)	3,207	414	12.9	57	357
(3) Number of tourist nights ('000)	21,836	1,200	5.5	200	1,000
(4) Average tourist nights	6.8	2.9		3.5	2.8
(5) Total capacity ('000)	22,627	1,667	7.4	203	1,464
(6) Occupancy rate by room (%)	56.8	42.3		58.0	40.0

Source: Statistical Year Book 1994, CAPMAS , Sinai - NPDS
Note: (4) Average tourist nights = (3)/(2)
(5) Total capacity of room nights = (1)x365 day
(6) Occupancy rate by room = (3)/1.7/(5)

b. Planning Ingredients

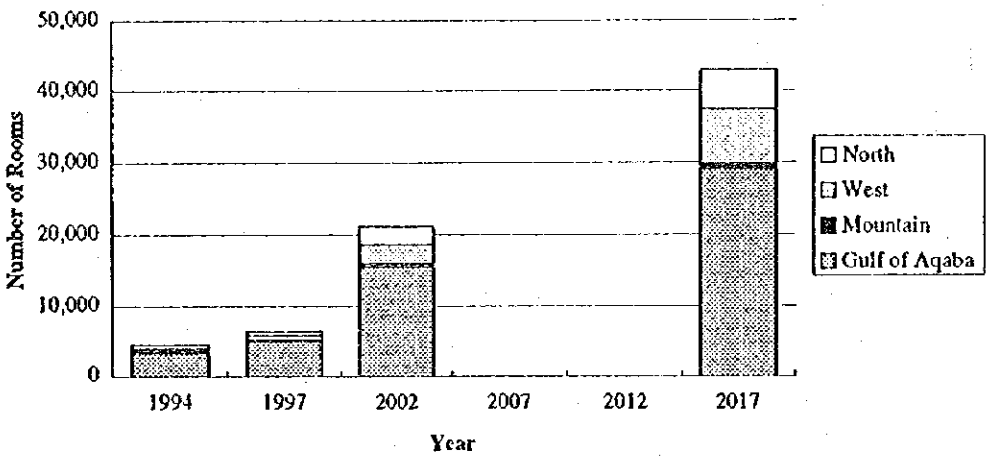
Table 2.2.15 and Fig. 2.2.4 show the number of rooms and number of workers in the future plan. Total number of rooms will reach about 43 thousand rooms by 2017. The number of workers will increase to about 113 thousand workers.

It is to be noticed that careful development approach and the necessary countermeasures have to be taken to preserve the environmental conditions from the negative impacts of rapid tourism development. This also means the development progress might become slow than that of the NPDS.

Table 2.2.15 Tourism Development Plan

Area	Location	Number of rooms (unit : rooms)				
		1994	1997	2002	2017	Share
North	Romana			500	2,000	
	El Arish	557	557	2,057	3,557	12.9%
West	Ras Sudr	331	551	2,051	6,551	
	Tur Sinai	78	78	578	1,078	17.8%
Mountain	St. Catherine	227	227	475	727	1.7%
Gulf of Aqaba	Taba	426	506	4,506	10,506	
	Nuweiba	595	595	2,595	4,595	
	Dahab	241	241	1,741	4,241	
	Sharm el Sheikh	2,113	3,713	6,713	9,713	67.6%
Total Rooms	(Number)	4,568	6,468	21,216	42,968	100.0%
	(Average Annual Growth Rate)		12.3%	26.8%	4.8%	
Total Workers	(Number)	12,000	17,000	55,700	112,800	

Souce : NPDS



Source : NPDS

Fig. 2.2.4 Hotel Rooms by Development Area

5) Major Infrastructure Development

a. Water Resources

Since water resources for the agricultural development has already been mentioned above section, the potable water supply is the main subject of this section.

The existing conditions tabulated in Table 2.2.16 indicate that the present balance between water demand and the capacity of the facilities of water supply is negative in North Sinai, and this shortage in the capacity is mainly supplemented by groundwater. Potable water supply by pipeline covers 68% of demand in North Sinai. Also potable water supply by pipeline and desalinated facilities covers 97.5% in South Sinai.

Potable water is main factor in settling population in Sinai. The Nile is presently considered the main source of potable water in the peninsula. Water reaches El Arish from Qantara via a pipeline of 700 mm in diameter. Also water reaches Tur Sinai in South Sinai from Suez via another pipeline of 600 mm in diameter. Presently, the southern line is being extended to Sharm el Sheikh. The central line from El Shatt to Taba via Nekkel also is under construction.

Table 2.2.16 also indicates the shortage in the capacity of sewage utilities in peninsula. Existing capacity of sewage utilities covers 5% of demand only.

Table 2.2.16 Balance of Current Water Supply

(unit : m3/day)

Item	Demand	Capacity	Balance
Potable Water	45,840	18,200	-27,640
- North Sinai	40,200	12,700	-27,500
- South Sinai	5,640	5,500	-140
Sewage Utility	36,670	2,000	-34,670
- North Sinai	32,160	0	-32,160
- South Sinai	4,510	2,000	-2,510

Source : NPDS

The plan of potable water supply is shown in Table 2.2.17. The share of the groundwater will decrease in the future based on the success of water supply from Nile River through the Ismailiya Canal. According to this plan, the volume to be supplied per person reaches 204 liter/day which is just the same as the prevailing volume per person for the whole of Egypt.

Table 2.2.17 Water Supply Plan

Item	Planned supply Volume ('000m3/day)				(liter/person)	('000)
	Existing	3rd plan	Subsequent	Total	Supply Volume	Serviced Population
Potable Water	93.4	142.1	417.0	652.5	204	3,416
- Groundwater	35.5	4.0	12.0	51.5		
- Nile Water	53.0	129.6	310.0	492.6		
- Desalinated Water	4.9	8.5	95.0	108.4		
Sewage	121.0	325.0	154.0	600.0	187	3,922

Source : NPDS

Note : Egypt 1992 : Potable Water 11,367,000 m3/day 202 liter/person/day
Sewage 6,982,000 m3/day 124 liter/person/day
Population 56,192,000

b. Electric Power

Table 2.2.18 shows the plan of electric and energy sector. According to this plan, an electric power plant of 600 MW in Moses Springs is expected to enter the service at the beginning of the Fourth Five Year Plan and an additional 600 MW will be furnished as phase 2 of the same electric power plant. Distribution network system seems well planned at this stage and some parts are under construction at present.

Table 2.2.18 Electric and Energy Development

Project	Scale	Project Period	Investment (Million L.E.)			
			3rd Plan	4th Plan	Subsequent	Total
1. Urgent improvement projects	142MW	1994-1996	230			230
North Sinai			67			67
- Generation Stations	64MW		3			3
- Networks			65			65
South Sinai			163			163
- Generation Stations	79MW		123			123
- Networks (including to Taba)			40			40
2. Supply to 125,000 feddan			370			370
3. The 4th Five Year Plan		1997-2002		2,032		2,032
- Moses Springs Station	600MW			1,700		1,700
- Substations in Tur Sinai & Ras Abu Rudies	2			160		160
- Networks from Moses Spring-Tur Sinai-Sharm el Sheikh	340Km			153		153
- Distribution boards in El Tur & Ras Abu Rudies	4			8		8
- 22Kv Cables	10Km			5		5
- Network lines	50Km			4		4
- Substations in Kiosks	20			2		2
4. Supply to 140,000 Feddan		1997-2002		304		304
5. Supply to apart of 135,000 Feddan		1997-2002		69		69
6. Subsequent Five Year Plan to 2017		2002-2017			3,000	3,000
- Moses Springs Station Phase 2	600MW				2,000	2,000
- Others					1,000	1,000
Total			600	2,405	3,000	6,005

Source : NPDS

c. Social Services

Social service is one of the important factors in settling population in Sinai. Table 2.2.19 shows the number of workers of social service per 100 thousand inhabitants (hereinafter called as social service ratio) compared to that of the whole Egypt. From this table, a little bit low social service ratio in Sinai can be observed.

Table 2.2.19 Social Service Ratio

(persons)

Area & Year		Total population	Number of worker in social service sector	Number of social service worker per 100,000 inhabitants	Service Ratio
Egypt in 1986	Urban	21,251,000	1,699,000	7,995	1.48
	Rural	27,039,000	916,000	3,388	0.63
	Total	48,290,000	2,615,000	5,415	1.00
Sinai in 2017	Total	3,200,000	140,100	4,378	0.81

Source : Statistical Year Book 1994 CAPMAS, and NPDS

Note: Social service sector : Community, Social and Personal services

d. Transportation

Generally, transportation and communication facilities are important and basic infrastructures for social and economic activities. In Sinai peninsula, these facilities are developed on the plan step by step. For instance, there are a total of 5,556 km of paved roads, several seaports and airports in Sinai.

However, existing transportation facilities lack the quantity and the quality to support the full scale development of Sinai. Investment schedule of the transport plans is shown in Table 2.2.20. Rather high investment share on railway can be observed. This indicates that the Egyptian government intends to stress on the railway plan in Sinai, though there exists no railway facilities at present.

Table 2.2.20 Investment Schedule of Transport Sector

(unit : mill. L.E.) (%)

Sector Division	3rd Plan	4th Plan	Subsequent	Total	Share
Roads	200	800	500	1,500	24.2
Bridges, Tunnels and Canal Transport	100	300	450	850 *	13.7
Seaports	250	350	-	600	9.7
Airports	150	150	-	300	4.8
Railways	200	200	1,450	1,850	29.8
Storage		50	50	100	1.6
Communications	100	400	500	1,000	16.1
Total	1,000	2,250	2,950	6,200	100.0

Source : NPDS

Note : * This does not include the causeway with Saudi Arabia

In the mean time, the following Suez Canal crossing structures are listed in the NPDS.

i. Construction of a bridge over the Suez Canal at Ferdan (or any other location recommended by relevant studies) for road transport, consisting of four lanes, 70 m height, at an estimated cost of L.E. 350 million.

ii. Construction of a tunnel at Ismailiya for both vehicles and railway, at a cost of L.E. 450 million.

iii. Constructing of temporary floating bridges for peak periods.

iv. Completion of work on upgrading A. H. Tunnel.

Considering these plans, it can be seen that the crossing structure of the current study corresponds to that of (i). On the other hand, a railway bridge which is now planned by Egyptian National Railway as a swing type bridge at Ferdan seems to correspond to item (ii) above.

6) Investment

Total amount of L.E. 74.6 billion are proposed for the implementation of Sinai development until 2017. It is expected that L.E. 6.4 billion, L.E. 23.5 billion and L.E. 44.7 billion will be invested during the Third Five Year Plan (FYP), Forth FYP (97/98-01/02) and the remaining planning periods, respectively. This amount is estimated to be around 10% of the total national investment expenditure in Forth FYP (97/98-01/02). Investment schedule by sector and by FYP are summarised in Table 2.2.21.

Table 2.2.21 Investment Plan

(In million L.E.)

Sector	3rd Plan (92/93-96/97)			4th Plan (97/98-01/02)			Subsequent	Sinai
	Egypt	Sinai	Share	Egypt	Sinai	Share	Sinai	Total
Agriculture	13,900	1,431	10.3%	23,000	4,422	19.2%	6,410	12,263
Mining and Industrial	43,000	500	1.2%	80,000	2,500	3.1%	7,000	10,000
Tourism	5,700	440	7.7%	7,500	2,940	39.2%	4,800	8,180
Housing and Utilities	31,400	2,315	7.4%	39,000	7,850	20.1%	17,235	27,400
Electricity and Power	17,700	600	3.4%	28,000	2,405	8.6%	3,000	6,005
Transport and Storage	20,000	1,000	5.0%	30,000	2,250	7.5%	2,950	6,200
Business and Finance	3,900	30	0.8%	5,000	300	6.0%	500	830
Suez Canal	500		0.0%	3,500		0.0%		0
Social Services	17,900	98	0.5%	26,000	930	3.6%	2,772	3,800
Total	154,000	6,414	4.2%	242,000	23,597	9.8%	44,667	74,678

Source : MOP data

Note : 91/92 prices Egypt in 3rd Plan : Public Sector 64,900 million LE, Private Sector 89,100 million LE
Sinai in 3rd Plan : Investment expenditure covers three years from 94/95 to 96/97

(2) Development Scenario

1) Major Constraints

Considering the current Sinai development plan, the following points can be stressed:

a. With regard to agricultural development, a rather stable progress of the implementation of El Salaam Canal Project can be observed at present. It seems that Egypt has enough experience about land reclamation projects which gives the agricultural development plan a more realistic prospect.

El Salaam Canal project is a key development project for North Sinai. The project is divided into two phases as follows:

- Phase I : Developing at west of the Suez Canal by reclaiming 220,000 feddans. This phase is already completely finished.

- Phase II: Developing at east of the Suez Canal by reclaiming 400,000 feddans. This phase is under construction. Two tunnels for water supply were passed under the Suez Canal at km. 27.800 and two tunnels are under construction.(each one is 775m in length and 5.1m in internal diameter). Irrigation and drainage network also are under construction from the east of Suez Canal to El Arish in the schedule.

b. Concerning industrial development, the success of Technology Valley project will become a key factor in the overall industrial development.

c. Environmental conservation seems one of the key issues of tourism development in Sinai due to the fact that marine resorts are the major component for this development. In this context, it is important that tourism development keeps the balance of development speed with related projects as water supply and sewage utilities projects, electricity project, transportation development projects and social service development.

d. According to the investment, continual budget expenditure needs on the investment plan to the full scale development in Sinai.

2) Development Cases

Depending on the factors mentioned above, the following three development cases are taken into consideration and alternatives of the socio-economic framework is set for traffic demand projection.

a. Case 1

This case is a case in accordance with the future population of 3.2 million people as indicated in the NPDS as a full scale development case by 2017.

b. Case 2

This case is a case in accordance with the future population of 2.1 million people with progress under budgetary constraints, changes of surrounding economic conditions

and others. The socio-economic framework of the case 2 is comprised based on the following conditions.

- In agriculture sector, land reclamation of 250,000 Feddan at east side of Suez Canal will not be implemented.
- In mining sector, 50% will be implemented by 2017.
- In industrial sector, 16,000 Feddan development plan of technology valley with 50% will be implemented by 2017, and 70% of other development plans will be implemented.
- In tourism sector, number of rooms will be 30,000 by 2017.

c. Revised Case 3

The socio-economic framework of the revised case 3 is comprised based on the following conditions.

- Only the projects clearly listed on the National Project for Development of Sinai are counted.
- With respect to uncertain projects or unlisted projects on NPDS, the socio-economic framework is estimated based on an average past growth rate of that sector in Egypt.

The socio-economic framework of the revised case 3 estimated by an assumption mentioned above is recognized as an absolute minimum case due to the fact that the socio-economic framework will be attained under any conditions that even some constrains becomes critical. Future population of this case is estimated 1.5 million people by 2017. The progress of development by sector by 2017 is assumed as follow :

- In agriculture sector, same conditions as case 2.
- In mining sector, 20% will be implemented by 2017.
- In industrial sector, 25% will be implemented by 2017.
- In tourism sector, same conditions as case 2.

As for the above three development cases, the number of population by 2017 are shown in Table 2.2.22 and Fig. 2.2.5.

Table 2.2.22 Future Population by Case

(unit : '000 persons)

Sector	Target	Possibility of	Case 1		Case 2		Revised Case 3	
	Population	development	Population	Achieve.	Population	Achieve.	Population	Achieve.
Agriculture	821.2	* * * * * *	821.2	100.0%	552.0	67.2%	552.0	67.2%
Mining and Industry	1,000.0	* *	1,000.0	100.0%	611.4	61.1%	240.0	24.0%
Tourism	338.4	* * * *	338.4	100.0%	236.2	69.8%	236.2	69.8%
Sub Total	2,159.6		2,159.6	100.0%	1,399.6	64.8%	1,028.2	47.6%
Housing/Construction *	200.0	Depend on	200.0	100.0%	125.0	62.5%	94.0	47.0%
Electricity	3.5	the condition	3.5	100.0%	3.0	85.7%	1.8	51.4%
Transportation	16.0	of above 3	16.0	100.0%	10.0	62.5%	7.6	47.5%
Business and finance	248.0	sectors	248.0	100.0%	154.8	62.4%	116.3	46.9%
P. Water and Sewage	11.5		11.5	100.0%	11.5	100.0%	5.0	43.5%
Education	250.0		250.0	100.0%	156.2	62.5%	118.4	47.4%
Health Service	120.0		120.0	100.0%	75.0	62.5%	56.4	47.0%
Other social Services	200.0		200.0	100.0%	125.0	62.5%	94.0	47.0%
Sub Total	1,049.0		1,049.0	100.0%	660.5	63.0%	493.5	47.0%
Total	3,208.6		3,208.6	100.0%	2,060.1	64.2%	1,521.7	47.4%

Source : NPDS

Note : Number of population in housing and construction sector are revised by Study Team.

Case 1 : Full scale

Case 2 : In agriculture sector, land reclamation of 250,000 Feddan in east side of Suez Canal will not be implemented.
In mining sector, 50% will be implemented by 2017.
In industrial sector, 16,000 Feddan development plan of technology valley with 50% will be implemented by 2017, and 70% of other development plans will be implemented.
In tourism sector, number of rooms will be 30,000 by 2017.

Revised Case 3 : In agriculture sector, land reclamation of 250,000 Feddan in east side of Suez Canal will not be implemented.
In mining sector, 20% will be implemented by 2017.
In industrial sector, 25% will be implemented by 2017
In tourism sector, number of rooms will be 30,000 by 2017.

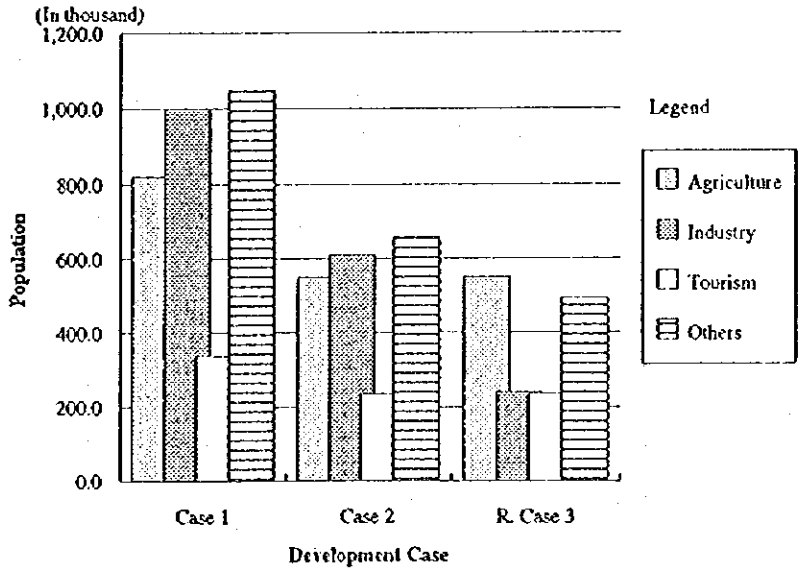


Fig. 2.2.5 Future Population by Main Sector