

ARAB REPUBLIC OF EGYPT  
MINISTRY OF PUBLIC WORKS AND WATER RESOURCES

FEASIBILITY STUDY  
FOR  
REHABILITATION AND IMPROVEMENT OF  
DELIVERY WATER SYSTEM  
ON  
BAHR YUSEF CANAL

APPENDIX

NOVEMBER 1992

JAPAN INTERNATIONAL COOPERATION AGENCY


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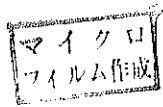
**APPENDIX**

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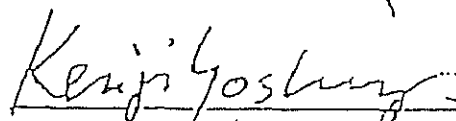


SCOPE OF WORK  
FOR  
THE FEASIBILITY STUDY  
FOR  
REHABILITATION AND IMPROVEMENT OF DELIVERY WATER SYSTEM  
ON  
BAHR YUSEF CANAL  
IN  
THE ARAB REPUBLIC OF EGYPT  
AGREED UPON BETWEEN  
MINISTRY OF PUBLIC WORKS AND WATER RESOURCES  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY

OCTOBER 22 , 1990  
Cairo, EGYPT

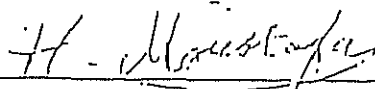


Mr. Ahmed Mazen  
First Undersecretary  
MINISTRY OF PUBLIC WORKS  
AND WATER RESOURCES



Mr. Kenji Yoshinaga  
Leader of the Preliminary  
Survey Team.  
THE JAPAN INTERNATIONAL  
COOPERATION AGENCY

Witnessed by



Mr. Hamed Mostafa  
Undersecretary  
MINISTRY OF  
INTERNATIONAL COOPERATION

## I. INTRODUCTION

In response to the request of the Government of the Arab Republic of Egypt, the Government of Japan has decided to conduct the Feasibility Study for Rehabilitation and Improvement of Delivery Water System on Bahr Yusef Canal (hereinafter referred to as "the Study"), within the framework of the agreement of Technical cooperation between the Government of Japan and the Government of the Arab Republic of Egypt signed on June 15th, 1983 (hereinafter referred to as "the Agreement").

The Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programmes of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Arab Republic of Egypt.

The Ministry of Public Works and Water Resources (hereinafter referred to as "the Ministry") shall act as the counterpart agency to the Japanese Study Team (hereinafter referred to as "the Team") and also coordinate in relation with other relevant organizations for the smooth implementation of the Study.

The present document sets forth the scope of work for the Study.

## II. OBJECTIVE OF THE STUDY

The objective of the Study is to evaluate feasibility for the rehabilitation and improvement of delivery water system on Bahr Yusef Canal in order to improve overall efficiency of water use, thus contributing to the optimum crop production in the area.

## III. OUTLINE OF THE STUDY

### 1. Study area

The Study covers Bahr Yusef Canal and its command area.

### 2. Scope of the Study

The activities of the Study team will be divided into two phases as follows:

#### (1) Phase 1 study:

- a. data collection and review of previous studies
- b. site survey, observation and analysis in the Study area
- c. compilation of data base maps of the canal system
- d. identification of constraints and problems

- e. selection of pilot irrigation block of about two thousand feddan for the study of improvement of water management

(2) Phase II study:

- a. additional data collection, detailed survey and observations
- b. determination of basic items for the rehabilitation and improvement of Bahr Yusef Canal
- c. improvement plan for water management in the pilot irrigation block
- d. feasibility study for rehabilitation and improvement of delivery water system

3. Work plan for the phase I study

The study covers the following items:

- (1) Collection and review of the relevant existing data and information including:

1) Natural condition

- a. topography
- b. meteorology and hydrology
- c. geology and pedology
- d. environment
- e. others

2) Agriculture

- a. Land use and tenure
- b. Cropping pattern and yield
- c. Agro-economy and institution
- d. Rural infrastructure
- e. Others

3) Irrigation and drainage

- a. irrigation and drainage canal system
- b. irrigation and drainage canal facilities
- c. water management
- d. monitoring and control of canal system including communication
- e. operation and maintenance of canal facilities
- f. institution for irrigation and drainage
- g. others

- 4) Socio-economic situation
  - a. village, population, and household
  - b. regional socio-economy and farm household economy
  - c. social and farmers organizations
  - d. governmental organizations related to the project.
  - e. others
  
- (2) Field survey on the items mentioned in 3 (1), 3) above that will be deemed to need further study
  
- (3) Compilation of data base maps using existing 1/25,000 maps
  - a. irrigation and drainage canal system
  - b. irrigation and drainage canal facilities
  - c. areas served by branch canals
  
- (4) Review of previous studies on meska level water management
  
- (5) Identification of constraints and problems
  - a. irrigation and drainage canal system
  - b. irrigation and drainage canal facilities
  - c. control, operation and maintenance
  - d. water management
  - e. others
  
- (6) Selection of pilot irrigation block, of about two thousand feddan for the study of improvement of water management

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#### 4. Work plan for the phase II study

The Study, based on the results of the phase I study, covers the following items:

- (1) Additional data collection, detailed survey and observations
- (2) Determination of basic items for the rehabilitation and improvement of Bahr Yusef Canal
  - a. irrigation and drainage canal system
  - b. irrigation and drainage canal facilities
  - c. water management
  - d. monitoring and control of canal system including communication
  - e. operation and maintenance of canal facilities
  - f. institution for irrigation and drainage
  - g. alternative development plans
  - h. construction materials and equipments
  - i. others
- (3) Formulation of the water management plan in the pilot irrigation block
- (4) Preliminary design of the major structures of the project
- (5) Preparation of the implementation schedule
- (6) Estimation of the project costs and benefits
- (7) Evaluation of the project
- (8) Recommendation

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#### IV. WORK SCHEDULE

The Study will be executed in accordance with the tentative work schedule. (See APPENDIX)

#### V. REPORTS

JICA shall prepare and submit the following reports in English to the Government of the Arab Republic of Egypt :

1. Inception Report.  
Twenty (20) copies at the commencement of the Phase I Study.
2. Progress Report I  
Twenty (20) copies at the end of the field works of the Phase I Study.
3. Interim Report  
Twenty (20) copies at the commencement of the Phase II Study.
4. Progress Report II  
Twenty (20) copies at the end of the field works of the Phase II Study.
5. Draft Final Report.  
Twenty (20) copies within one (1) month after the end of the Phase II Study.  
The Government of the Arab Republic of Egypt shall provide its comments on the Draft Final Report within two (2) months after the submission of the Draft Final Report.
6. Final Report  
Fifty (50) copies within two (2) months after receiving the comments of the Government of the Arab Republic of Egypt on the Draft Final Report.

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VI. UNDERTAKING OF THE GOVERNMENT OF EGYPT

1. Within the framework of the Agreement, the Government of the Arab Republic of Egypt shall take necessary measures to the Team as follows:
  - (1) To permit the members of the Study Team to enter, leave and sojourn in the Arab Republic of Egypt for the duration of their assignment therein, and exempt them from consular fees, (the Agreement Article V 2: (a))
  - (2) To exempt the members of the Study Team from consular fees, customs duties, internal taxes and other charges of a similar nature as well as from the requirement of obtaining import licences and certificate of foreign exchange coverage to be imposed in the Arab Republic of Egypt in respect of the equipment, machinery and materials which they carry with them for the performance of their duties, provided that these equipment, machinery and materials are registered with the authority concerned of the Government of the Arab Republic of Egypt at their initial delivery in the Arab Republic of Egypt. Such equipment, machinery and materials will remain the property of the Government of Japan unless otherwise agreed upon. (the Agreement Article VII. 4)
  - (3) To exempt the members of the Study Team from income taxes and other fiscal charges payable under the legislation of the Arab Republic of Egypt in respect of any emoluments or allowances remitted to them from overseas. (the Agreement Article V. 1. (1). (a))
  - (4) To bear claims, if any arises, against the members of the Study Team resulting from, occurring in the course of; or otherwise connected with, the discharge of their duties except when the two Governments agree that such claims arise from gross negligence or willful misconduct on the part of the members of the Study Team. (the Agreement Article VI.)

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2. To facilitate smooth conduct of the Study, the Ministry shall take necessary measures in cooperation with other relevant organizations:

- (1) To secure permission for entry into private properties of restricted areas for the conduct of the Study within the laws and regulations in force in the Arab Republic of Egypt.
- (2) To secure permission for the Study Team to take all data and documents (including photographs) related to the Study out of Egypt to Japan, within the laws and regulations in force in the Arab Republic of Egypt.
- (3) To provide the medical services as needed. Its expenses will be chargeable on the members of the Study Team.
- (4) To ensure the safety of the members of the Study Team when and as it is required in the course of the Study.

3. The Ministry shall, at its own expense, provide the Study Team with the followings:

- (1) Available data, information, maps, and aerophotographs necessary for and related to the Study.
- (2) Governmental counterpart personnel necessary for the Study.
- (3) Office space with necessary furniture
- (4) Credentials or identification cards

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## VII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures;

1. to dispatch, at its own expense, the Study Team to the Arab Republic of Egypt, and
2. to perform technology transfer to the Egyptian counterpart personnel in the course of the Study.

## VIII. CONSULTATION



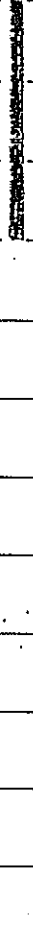
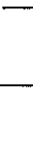
JICA and the Government of the Arab Republic of Egypt shall consult with each other in respect of any matter that may arise from, or in connection with the Study.

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APPENDIX

TEXTATIVE WORK SCHEDULE

		NORTH																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Phase I																							
Phase II																							
Draft Report																							
N. Report																							
IC/R	△																						
P/R(I)	△																						
IT/II	△																						
P/R(II)	△																						
DF/R	△																						
F/R	△																						


IC/R: Inception Report


IT/R: Interim Report

F/R: Final Report

P/R: Progress Report

DF/R: Draft Final Report

 Work in Egypt

 Work in Japan

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Minutes of Meeting  
on  
the Scope of Work  
for  
the Feasibility Study  
for  
the Rehabilitation and Improvement of Delivery Water System  
on  
Bahr Yusuf Canal  
in  
the Arab Republic of Egypt  
agreed upon between  
the Japan International Cooperation Agency  
and  
Ministry of Public Works and Water Resources

October 22 , 1990  
Cairo, EGYPT

*A.M.*

Mr. Ahmed Mazon  
First Undersecretary  
Ministry of Public Works  
and Water Resources

*Kenji Yoshinaga*

Mr. Kenji Yoshinaga  
Leader of Preliminary  
Survey Team  
The Japan International  
Cooperation Agency

In response to the request of the Government of the Arab Republic of Egypt, the Government of Japan decided to dispatch through the Japan International Cooperation Agency (hereinafter referred to as "JICA"), which is responsible for the implementation of technical cooperation of the Government of Japan, the preliminary survey team (hereinafter referred to as "the Team"), for the Feasibility Study for the Rehabilitation and Improvement of Delivery Water System on Bahr Yusef Canal (hereinafter referred to as "the Study"), headed by Mr. Kenji Yoshinaga to the Arab Republic of Egypt from October 14, to October 24, 1990, so as to carry out field reconnaissance, and to discuss and exchange views on the Study with the officials of the Ministry of Public Works and Water Resources (hereinafter referred to as "MPWWR").

Egyptian side and the Team both agreed on the Scope of Work for the Study.

The salient results of the discussions are as follows.

1. Regarding III, 1 of the Scope of Work, the Study will be concentrated on Bahr Yusef Canal with one major branch canal and pilot irrigation block. MPWWR proposed Harika Canal as the major branch canal for the Study.
2. Regarding III, 3 (6) of the Scope of Work, pilot irrigation block will be selected in the area of the tail end of proposed Harika Canal with the minimum area of two thousand feddan.
3. In reference to VI, 2, (2) of the Scope of Work and with the consideration of availing permitted data and documents to a third party, the executing Egyptian Authority will determine the confidentiality of such data and documents, if necessary.
4. In reference to VI, 3 (1) of the Scope of Work, MPWWR explained that available data and information includes reports of previous studies necessary for and related to the Study.

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5. In reference to VII,1 of the Scope of Work, MPWWR requested that the Study Team should provide its own equipment during the Study and that vehicle necessary during the Study should be arranged by JICA at its own expense. The Team will convey those requests by MPWWR to JICA.

6. In reference to VII,2 of the Scope of Work, MPWWR requested that JICA should provide Egyptian counterpart personnel training to be involved in home work of the Study Team in Japan at its own expense. The Team understood the necessity and will convey the request to JICA,

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AGREEMENT ON TECHNICAL COOPERATION  
BETWEEN THE GOVERNMENT OF THE ARAB  
REPUBLIC OF EGYPT AND THE GOVERNMENT OF JAPAN

The Government of the Arab Republic of Egypt and the Government of Japan,

Desiring to strengthen further the friendly relations existing between the two countries by the promotion of technical cooperation, and

Considering mutual benefits derived from promoting the economic and social development of their respective countries,

Have agreed as follows :

Article I

The two Governments will endeavour to promote technical cooperation between the two countries.

Article II

On the basis of this Agreement, the two Governments will enter into separate arrangements in written form to carry out specific technical cooperation programmes to be agreed upon between the two Governments.

Article III

The Government of Japan will, in accordance with the laws and regulations in force in Japan, and under the arrangements referred to in Article II of this Agreement, carry out at its own expense the following forms of technical cooperation :

- (a) receiving Egyptian nationals for technical training in Japan ;
- (b) dispatching Japanese experts (hereinafter referred to as "the Experts") to the Arab Republic of Egypt ;
- (c) dispatching Japanese missions (hereinafter referred to as "the Missions") to the Arab Republic of Egypt to conduct surveys of economic and social development projects of the Arab Republic of Egypt ;



- (d) providing the Government of the Arab Republic of Egypt with equipment, machinery and materials; and
- (e) providing the Government of the Arab Republic of Egypt with other forms of technical cooperation as may be mutually agreed upon between the two Governments.

#### Article IV

In case the Government of Japan dispatches the Experts, the Government of the Arab Republic of Egypt will take at its own expense the following measures:

- (a) to provide office accommodation and other facilities required for the performance of the duties of the Experts;
- (b) to provide the local staff (including Egyptian counterparts to the Experts and, if necessary, adequate interpreters) necessary for the performance of the duties of the Experts;
- (c) to bear expenses for
  - (i) daily transportation to and from their place of work,
  - (ii) their official travels in the Arab Republic of Egypt, and
  - (iii) their official correspondence;and
- (d) to provide such appropriate housing accommodation as the circumstances permit and medical care.

#### Article V

- 1 will:
- (1) The Government of the Arab Republic of Egypt will:
    - (a) exempt the Experts and members of the Missions from income taxes and other fiscal charges payable under the legislation of the Arab Republic of Egypt in respect of any emoluments or allowances remitted to them from overseas; and
    - (b) exempt the Experts and their families from consular fees, customs duties, internal taxes and other charges of a similar nature, payable under the legislation of the Arab Republic of Egypt, as well as from the requirement of obtaining import license

respect of the importation, within six months of their initial arrival, of

- (i) personal and household goods, and
- (ii) one motor vehicle per Expert assigned to stay for at least one year in the Arab Republic of Egypt,

(2) The motor vehicle mentioned above will be subject to payment of customs duties and taxes if it is subsequently sold or transferred within the Arab Republic of Egypt to individuals or organizations not entitled to exemption from such duties and taxes or similar privileges.

2 The Government of the Arab Republic of Egypt will take the following measures:

- (a) to permit the Experts and their families as well as members of the Missions to enter, leave and sojourn in the Arab Republic of Egypt for the duration of their assignment therein, and exempt them from consular fees; and
- (b) to issue to the Experts identification cards to facilitate the performance of the duties of the Experts.

#### Article VI

The Government of the Arab Republic of Egypt will bear claims, if any arises, against the Experts and members of the Missions resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties, except when the two Governments agree that such claims arise from gross negligence or wilful misconduct on the part of the Experts, or members of the Missions.

#### Article VII

1. In case the Government of Japan provides the Government of the Arab Republic of Egypt with equipment, machinery and materials, they will become the property of the Government of the Arab Republic of Egypt upon being delivered c.i.f. at the port of disembarkation to the authorities concerned of the Government of the Arab Republic of Egypt. The equipment, machinery and materials mentioned above will be utilized for the purpose for which they will be provided

2. The Government of the Arab Republic of Egypt will exempt the equipment, machinery and materials referred to in paragraph 1 above from consular fees, customs duties, internal taxes and other charges of a similar nature as well as from the requirement of obtaining import license and certificate of foreign exchange coverage.

3. The expenses for the transportation within the Arab Republic of Egypt of the equipment, machinery and materials referred to in paragraph 1 above will be borne by the Government of the Arab Republic of Egypt.

4. The equipment, machinery and materials which the Experts and members of the Missions carry with them for the performance of their duties will remain the property of the Government of Japan unless otherwise agreed upon.

The Experts and members of the Missions will be exempted from consular fees, customs duties, internal taxes and other charges of a similar nature as well as from the requirement of obtaining import licenses and certificate of foreign exchange coverage to be imposed in the Arab Republic of Egypt in respect of the importation of such equipment, machinery and materials provided that these equipment, machinery and materials are registered with the authority concerned of the Government of the Arab Republic of Egypt at their initial delivery in the Arab Republic of Egypt.

#### Article VIII

The Experts and members of the Missions will maintain close contact with the Government of the Arab Republic of Egypt through organizations designated by it.

#### Article IX

1. The Government of the Arab Republic of Egypt agrees that a resident representative and his staff (hereinafter referred to as "the Resident Representative and his Staff") of the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the executing agency for technical cooperation by the Government of Japan, discharge the duties in the Arab Republic of Egypt to be assigned to them by JICA relative to the activities of the technical cooperation

programmes under this Agreement. The number of the staff to be appointed would be agreed upon between the authorities concerned of the two Governments.

2. The Resident Representative and his Staff and their families, not being nationals or permanent residents of the Arab Republic of Egypt, will enjoy the same privileges, exemptions, and benefits as accorded to the Experts and their families in accordance with Article V and paragraph 4 of Article VII.

3. The Resident Representative and his Staff will be exempted from consular fees, customs duties, internal taxes and other charges of a similar nature as well as from the requirement of obtaining import licenses and certificates of foreign exchange coverage, to be imposed in the Arab Republic of Egypt, in respect of equipment, machinery and materials to be brought into the Arab Republic of Egypt for the performance of their official duties.

4. The Resident Representative and his Staff will be exempted from income taxes and other fiscal charges imposed on or in connection with remittance from overseas of expenses for the performance of their official duties.

#### Article X

The Government of the Arab Republic of Egypt and the Government of Japan will consult with each other in respect of any matter that may arise from or in connection with this Agreement.

#### Article XI

1. The provisions of this Agreement will also apply to the specific technical cooperation programmes being carried out between the two Governments prior to the entering into force of this Agreement, and to the Experts and their families, members of the Missions, the Resident Representative and his Staff of JICA and their families staying in the Arab Republic of Egypt, as well as to the equipment, machinery and materials brought into the Arab Republic of Egypt to carry out the said programmes.

2. The termination of this Agreement will neither affect the specific technical cooperation programmes being carried out until the date of the completion of the said programmes,

unless otherwise the two Governments expressly agree, nor affect the privilèges, exemptions and benefits accorded to the Experts and their families, members of the Missions, the Resident Representative and his Staff of JICA and their families staying in the Arab Republic of Egypt for the performance of their duties in connection with the said programmes.

Article XII.

1. This Agreement will enter into force on the date of the receipt by the Government of Japan of the written notification from the Government of the Arab Republic of Egypt of the completion of constitutional procedures for the entry into force of this Agreement.

2. This Agreement will remain in force for a period of one year, and will be automatically renewed every year for another period of one year each, unless either Government has given to the other Government at least six months' written advance notice of its intention to terminate the Agreement.

IN WITNESS WHEREOF the undersigned, duly authorized thereto, have signed this Agreement.

DONE in duplicate in English at Cairo on June 15th, 1983.

For the Government of  
the Arab Republic of Egypt:

Aly Shawky El-Hadidy  
Ambassador,  
Director of Cultural Relations  
and Technical Cooperation  
Department  
Ministry of Foreign Affairs

For the Government of Japan:

Yosuke Nakae  
Ambassador Extraordinary  
and Plenipotentiary of Japan  
to the Arab Republic of Egypt

## A-2 List of Personnel Contacted by the Study Team

### 1. MINISTRY OF PUBLIC WORKS AND WATER RESOURCES (MPWWR)

#### 1.1 IRRIGATION DEPARTMENT ( ID )

Eng. Ahmed Mazen	First Undersecretary Chairman of Irrigation Department (Until 1991)
Eng. Khalil Ibrahim Omar	First Undersecretary Chairman of Irrigation Department (Jan. 1992)
Eng. Gamil Mahmoud	First Undersecretary Chairman of Planning Sector
Eng. Arteen Haleem	First Undersecretary Horizontal Expansion and Project Affairs (1991)
Eng. El Sayed Moh Hassan	First Undersecretary Horizontal Expansion and Project Affairs (1992)
Eng. Salem A.El Ghafar	Undersecretary Irrigation Improvement Project (Until 1991)
Eng. Mohamed Sayed El Safty,	Project Director Irrigation Improvement Project (1992)
Eng. Hasan Shouman	Deputy Director Irrigation Improvement Project
Eng. Enan Abdalla	Director, Technical Office of the Chairman of Irrigation Department (Until 1991)
Eng. Abd El Moneim Shalaby,	Director General Technical Office of Irrigation Department
Eng. Alaa Esmail	Junior Engineer Irrigation Improvement Department
Eng. Mohamed Nadar	First Undersecretary Chairman of Irrigation Sector
Mr. Fawzy Ibrahim	Director Public Relation, Headquarters
Eng. Ibrahim Rouidar	Deputy Director General Kenter Directorate
Eng. Abdel Fattar Ibrahim	El Saadey, Micro-film Section
Eng. Tarek El Sayed	Hydrologist, Computer Room

#### 1.2 MECHANICAL AND ELECTRICITY DEPARTMENT ( MED )

Eng. Gamil Fadl	First Undersecretary Chairman of MED
Eng. Tawadros Guirguis	Head of Project Sector
Eng. Mohamed Ali El Desouky,	General Director Upper Egypt Project
Eng. Kamel Abo El-Seoud	General Director Studies and Specifications
Eng. Hoda Morsy	Deputy General Director Studies and Specifications
Eng. Mustfa Mahmod Yousif	General Director North Upper Egypt Directorate
Eng. Zexab Yusef	Director Technical Office
Eng. Abo El Maged Abdel Monem,	Project Engineer

#### 1.3 DRAINAGE AUTHORITY

Eng. Wael Hussein Abbass	General Director Minia Drainage Project
Eng. Anwer Ried Henein	General Director Beni Suef Drainage project

## 2. MINISTRY OF AGRICULTURE ( MOA )

Dr. Mohamed Abbas	First Undersecretary Agriculture Production
Dr. Hassan Khidr	Undersecretary Agro-Economic Affairs
Dr. Antar	Chairman of Soil Improvement Authority
Mr. Khairy Hafez Hasan	Undersecretary for Directorate
Mr. Ali Abdel Wahab Ali	Undersecretary Egyptian Land Improvement Project (EALIP)
Prof. Baligh Shindi	EALIP
Mr. Adel Faham	Director, Central Agency for Public Mobilization and Statistics (CAPMAS)

## 3. MINIA IRRIGATION DIRECTORATE ( MID )

Eng. Abdel-el-Gamil	First Undersecretary Representative of Minister, Minia
Eng. Mohamed Fathi Seoudy	Undersecretary
Eng. Nabil Fawzi Nashid	General Director Minia Irrigation Improvement Project
Eng. Marcos Misaad	Director of Construction
Eng. Abd El Hakeem	Deputy Director (Until 1991) Minia Irrigation Improvement Project
Eng. Aly Mostafa	Deputy Director Minia Irrigation Improvement Project
Eng. Attef Zakin	General Director Directorate of West Minia (Until 1991)
Eng. Mohamed Abd El Rahman	General Director Directorate of West Minia
Eng. El Orali	General Director Directorate of East Minia
Eng. Naseh Saluman Jaras	Director of West Minia Technical Office
Eng. Hosny Ahmed Gawdat	Deputy Director Directorate of West Minia
Eng. Rizk Mansour	Mechanical Engineer
Eng. William Zaky	Design Engineer Minia Irrigation Improvement Project
Eng. Mohamed Khaled	Junior Engineer Development Department
Eng. Adel Botros Zaici	District East Irrigation East District of Minia
Eng. Hassen G. Ahmed	District West Irrigation District Assuit
Eng. Ahmoud Aly Abd El Razek,	Engineer of West Minia District
Eng. Magdy Jakob	Inspector of Bahr Yusef Canal
Mr. Abo Eleld Ahmed Abo Elela,	Measurement Technician, IIP
Eng. Mostafa Mahmoud	General Director of MED
Eng. Ali Yehia Mohamed	Director, Irrigation Advisory Services (IAS)
Mr. Hamdy Abd El Whabsaid,	Head Chief of Drawers
Mr. Mosua Merai	Head Chief of Drawers, Drainage Directorate
Mr. Osman Mubarek	Edwa District

#### 4. BENI SUEF IRRIGATION DIRECTORATE ( BSID )

Eng. Moawad Ahmed Soliman Undersecretary  
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Eng. Ibrahim Melek Tanas General Director  
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Eng. Ramzy Abdelmalik Ghali General Director  
Horizontal Expansion, BSID  
Eng. Hassan Abbas Mahamoud Inspector  
North Irrigation, BSID  
Eng. Seryed Housien Khalik Operation Sector, BSID  
Eng. Ahmed Senosy Beni Suef Irrigation Directorate

#### 5. FAIYUM IRRIGATION DIRECTORATE ( FID )

Eng. Rizk Girgis Rizk Undersecretary  
Faiyum Irrigation Directorate  
Eng. Samir Ibrahim Shoubair General Director  
Improvement Project, FID  
Eng. Samir Jacoub General Director  
Faiyum Irrigation Directorate  
Eng. Hassan Mohamed Agronomist  
Faiyum Irrigation Directorate

#### 6. GIZA IRRIGATION DIRECTORATE ( GID )

Eng. Onsy Farid Ghattas Undersecretary  
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Eng. Mostafa Nada General Director  
Giza Irrigation Directorate  
Eng. Ezat Moursi Engineer of Water District

#### 7. Agricultural Offices

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Mr. Refaat Ibrahim Barsoom Asst. General Director, Beni Suef  
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Mr. Aly Seeda General Director, Faiyum  
Mr. Esam El Din Aly Director, Faiyum  
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Eng. Hussein Diaa General Director, Giza  
Eng. Rashad Salib Awad Director of Agricultural Affairs  
Sub-minister Office of Agriculture, Minia



Eng. Ali Wardani	Agronomist Sub-minister Office of Agriculture, Minia
Eng. Mohamed M. Awad	Aronimist, Water Research Center, Groundwater Research Institute, Irrigation Dept., Minia
Mr. Hassan Goma Hassan	Agronomist, Irrigation Improvement Project, Minia
Eng. Abdul Rahman Ahmed Abullil	Secretary of Director, Agricultural Management Office, Maghagha, Minia
Eng. Farouk Francis Girgis	Director of Soil Science, Minia

#### 8. AGRICULTURAL RESEARCH CENTER

Dr. Nabil	Director, Soil & Water Research Institute
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## LIST OF JAPANESE GOVERNMENT OFFICIALS IN EGYPT

### 1. EMBASSY OF JAPAN ( EOJ )

Mr. Chusei Yamada	Ambassador
Mr. Yoshikazu Kaneko	Minister
Mr. Atsushi Kobayashi	First Secretary
Mr. Toshio Azuma	First Secretary

### 2. JAPAN INTERNATIONAL COOPERATION AGENCY ( JICA ) IN CAIRO

Mr. Kenji Iwaguchi	Resident Representative
Mr. Hiromasa Kawasoe	Deputy Resident Representative
Mr. Shigeru Okamoto	Assistant Resident Representative
Mr. Naoyuki Kobayashi	Assistant Resident Representative

### 3. EXPERT OF JICA

Mr. Yoshitake Shinbo	Expert Ministry of Public Works and Water Resources
Mr. Osamu Tsuji	Expert General Authority for Rehabilitation Projects and Agricultural Development

### MEMBERS OF ADVISORY COMMITTEE FOR PHASE-I STUDY

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Mr. Shunichi Hosono	O/M of System & Water Management
Mr. Yasumi Kinoshita	Irrigation Facilities & Canal Structures
Mr. Toshihide Shibata	Agriculture & Pedology
Mr. Kensuke Iriya	Agro-economy & Project Evaluation

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Mr. Toshihide Shibata	Agriculture & Pedology
Mr. Kensuke Iriya	Agro-economy & Project Evaluation



**APPENDIX B      SOCIO-ECONOMY**

**B - 1   National Level**

**B - 2   Regional Level**



B - 1 NATIONAL LEVEL

Table B-1-1 Population

(Unit : 1,000 persons)

(Unit : 1,000 persons)

Year	Population	Annual Increase	Governorate	1976	1986	Annual Increase
1965	29,389	- %	Cairo	5,084	6,069	1.79 %
1966	30,188	2.72	Alexandria	2,319	2,927	2.36
1967	30,892	2.33	Port Said	263	401	4.31
1968	31,596	2.28	Suez	194	328	6.39
1969	32,316	2.28	Damietta	557	740	2.88
1970	33,053	2.28	Dakahlia	2,733	3,484	2.46
1971	33,807	2.28	Sharkia	2,621	3,414	2.68
1972	34,578	2.28	Kalyubia	1,674	2,516	4.16
1973	35,366	2.28	Kafr El Sheikh	1,403	1,809	2.52
1974	36,172	2.28	Gharbia	2,294	2,885	2.32
1975	36,997	2.28	Munufia	1,711	2,221	2.64
1976	37,858	2.33	Behera	2,517	3,249	2.59
1977	38,794	2.47	Ismailia	352	545	4.47
1978	39,767	2.51	Giza	2,419	3,725	4.41
1979	40,889	2.82	Beni Suef	1,109	1,449	2.71
1980	41,126	3.03	Faiyum	1,140	1,551	3.13
1971	43,322	2.84	Minia	2,056	2,645	2.55
1982	44,506	2.73	Asyut	1,695	2,216	2.72
1983	45,721	2.73	Suhag	1,925	2,447	2.42
1984	46,990	2.78	Qena	1,705	2,259	2.85
1985	48,349	2.89	Aswan	620	809	2.70
1986	49,863	3.13	Red Sea	56	90	4.86
1987	51,349	2.98	New Valley	85	113	2.89
1988	52,827	2.88	Matruh	113	161	3.60
1989	(54,188*)		Sinai	10	200	34.93
1990	(55,571*)		Total	36,656	50,504	3.26

Source :Mid-year Estimation, Statistical Yearbook, 1991, CAPMAS

Source :Statistical Yearbook, 1991, CAPMAS

Table B-1-2 Labour Force by Industrial Sector

(Unit : 1,000)

Sector	1982/83	1983/84	1984/85	1985/86	1986/87
All Sectors	12,270 (100)	2,877 (100)	11,720 (100)	11,981 (100)	12,256 (100)
(1) Commodity Sectors					
Agriculture	4,286 (35)	4,324 (34)	4,392 (37)	4,295 (36)	4,447 (36)
Industry	1,536	1,613	1,675	1,709	1,732
Petroleum	26	28	29	31	33
Electricity	69	74	75	70	77
Construction	697	753	330	554	564
Sub-total	6,614	6,792	6,501	6,659	6,852
(2) Service Sectors					
Transportation & Communication	461	470	558	574	546
Finance & Trade	1,211	1,247	1,200	1,228	1,236
Housing	178	185	202	213	209
Public Utilities	70	73	70	69	75
Other Services	3,736	4,110	3,190	3,237	3,339
Sub-total	5,656	6,085	5,220	5,321	5,404

Source : Statistical Yearbook, 1991, CAPMAS

Table B-1-3 Government Revenue

(Unit : Million LE)

Items	1986/87	1987/88	1988/89	1989/90	1990/91
General account	11,242	15,105	17,332	20,342	27,845
Administrative sect.	7,161	11,092	12,346	14,700	17,862
Taxes	2,815	4,250	4,689	5,730	7,915
Custom tariff	1,929	3,040	3,200	3,600	3,780
Sales tax	1,722	2,364	3,174	3,920	4,200
Others	695	1,438	1,283	1,450	1,967
Public sect.	4,081	4,013	4,986	5,642	9,983
Oil	1,024	1,094	1,087	781	1,680
Seuz canal				351	1,245
Others	3,057	2,919	3,899	4,510	7,058
Revenue of capital	4,207	3,694	4,851	5,074	4,677
Investment capital account	3,383	2,220	2,462	2,231	2,110
Transfer capital	824	1,474	2,389	2,843	2,567
Total	15,449	18,799	22,183	25,416	32,522

Source : Central Bank of Egypt, Annual Report  
Ministry of Finance

Note : 1986/87 - result, 1987/88, 88/89 - adjusted budget, 1989/90, 90/91 - budget

Table B-1-4 Government Expenditure

(Unit : Million LE)

Items	1986/87	1987/88	1988/89	1989/90	1990/91
General account	13,137	15,339	17,203	18,749	27,245
Salary	3,691	4,569	5,512	6,250	7,140
Balance of current account	9,446	10,770	11,691	12,499	20,105
Subsidy	1,652	3,256	2,640	2,061	3,579
National defense	3,517	2,090	2,572	2,711	3,133
Debt payment	1,843	2,689	3,083	3,614	6,362
Annuity	955	1,094	1,192	1,511	2,043
Others	1,479	1,694	2,204	2,602	5,988
Investment account	9,024	7,011	8,502	6,350	6,751
Capital transfer	2,369	3,635	4,694	5,207	7,252
Payment for public debt	798	1,946	2,088	2,296	4,259
Others	1,571	1,689	2,606	2,911	2,993
Total	24,530	25,985	30,399	30,306	41,248

Source : Central Bank of Egypt, Annual Report  
Ministry of Finance

Note : 1986/87 - result, 1987/88, 88/89 - adjusted budget, 1989/90, 90/91 - budget



Table B-1-5 Balance of Payment

(Unit: Million US\$)

Items	1986/87	1987/88	1988/89
Balance of trade :	△ 5,688	△ 6,567	△ 7,533
Export	2,264	3,274	2,546
of which, oil	530	951	561
Import	7,952	9,841	10,079
of which, foods	NA	1,424	1,969
Invisible trade balance :	778	1,941	1,836
Revenue	4,016	4,575	5,044
of which, Suez canal	1,148	1,269	1,307
Tourism	380	886	920
Expenditure	3,238	2,634	3,208
of which, debt payment	1,094	785	1,016
Balance of transfer account :	3,986	4,081	4,240
Balance of governmental transfer account	974	697	710
Worker's remittance	3,012	3,384	3,530
Balance of current account	△ 924	△ 545	△ 1,457

Source : Central Bank of Egypt, Annual Report

Table B-1-6 Balance of Trade

(Unit : 1,000LE)

Sector	1983	1984	1985	1986	1987	1988	1989	1990*
Exports	2,260,295	2,197,933	2,599,941	2,053,959	3,046,010	3,994,436	5,734,726	6,953,762
Imports	7,192,657	7,536,068	6,973,061	8,051,432	11,357,832	16,308,672	16,623,623	24,823,240
Surplus or Deficit	-4,942,362	-5,338,135	-4,373,120	-8,311,827	-8,311,827	-12,314,136	-10,888,897	-17,869,478

Source : Statistical Yearbook, 1991, CAPMAS

Note : Preliminary Figures

Table B-1-7 Development of GNP at Current Price

(Unit : Million LE)

Items	1982/83	1983/84	1984/85	1985/86	1986/87
Gross National Product :					
All income	26,989.7	33,251.2	38,298.8	41,966.0	50,511.5
GDP	25,772.5	31,246.5	36,617.9	40,819.7	47,743.8
Net revenue from the rest of the year	1,217.2	2,004.7	1,680.7	1,176.3	2,767.7
Consumption and Saving :					
Consumption					
All Consumption	21,588.2	27,605.5	31,772.2	33,669.1	40,803.3
Individual Consumption	17,398.1	22,648.1	26,074.4	27,634.1	34,172.3
Collective Consumption	4,160.1	4,957.4	5,697.8	6,035.0	6,631.0
Saving	5,431.5	5,645.7	6,526.4	8,326.9	9,708.1

Source : Statistical Yearbook, 1991, CAPMAS

Table B-1-8 GDP by Sector in 1986/87 Price

(Unit : Million LE)

Sector	1986 / 87		1987 / 88		1988 / 89		Remarks
Agriculture	8,640	21.2	8,930	20.6	9,141	20.1	
Mining & Quarring	6,933	17.0	7,435	17.2	7,986	17.6	
Oil & Its Products	1,690	4.1	1,799	4.2	1,785	3.9	
Electricity	518	1.3	559	1.3	600	1.3	
Construction	1,989	4.8	2,145	5.0	2,256	5.0	
Transportation & Communication	3,756	9.2	3,996	9.2	4,279	9.4	
Financing Services	9,646	23.6	10,151	23.5	10,630	23.4	
Tourism	399	1.0	533	1.2	571	1.3	
Housing & Public Services	820	2.0	898	2.1	983	2.2	
Personal Services	1,842	4.5	1,930	4.5	2,018	4.4	
Governmental Services	4,599	11.3	4,874	11.3	5,170	11.4	
Total	40,832	100.0	43,250	100.0	45,419	100.0	

Source : Central Bank of Egypt, Annual Report

Table B-1-9 External Debt

(Unit : Million US\$)

Items	1984	1985	1986	1987	1988
Remainder of debt	34,883	40,067	44,160	49,890	49,970
Long-term debt	29,024	33,780	37,161	43,361	43,259
of which, bilateral debt	19,976	23,361	25,800	31,376	32,389
multilateral debt	3,465	3,895	4,632	4,880	4,740
private warrant	5,033	5,774	6,051	6,007	4,998
non-private warrant	550	750	947	1,098	1,131
IMF credit	206	184	144	262	190
Short-term debt	5,653	6,103	6,855	6,267	6,522
Money flow					
Disbursement	3,355	3,721	2,005	1,828	1,647
Payment for principal	1,486	1,573	1,432	925	909
Net flow	1,869	2,148	573	903	737
Payment for interest	1,612	1,456	1,553	883	1,044
Net transfer	257	691	△ 979	20	△ 307
Total of payment for debt	3,098	3,029	2,984	1,808	1,954
Arrears in long-term debt	874	1,137	2,065	1,798	2,122
Debt ratio (%)					
Debt / Export	259	302	377	458	401
Debt / GNP	122	128	158	151	143
Debt payment / Export	23	23	25	16	16
Confessional money / Total debt	34	32	32	35	36

Source : Debt table, 1989~1990, World Bank

Figure B-1-1 Major Destination Countries of Exports

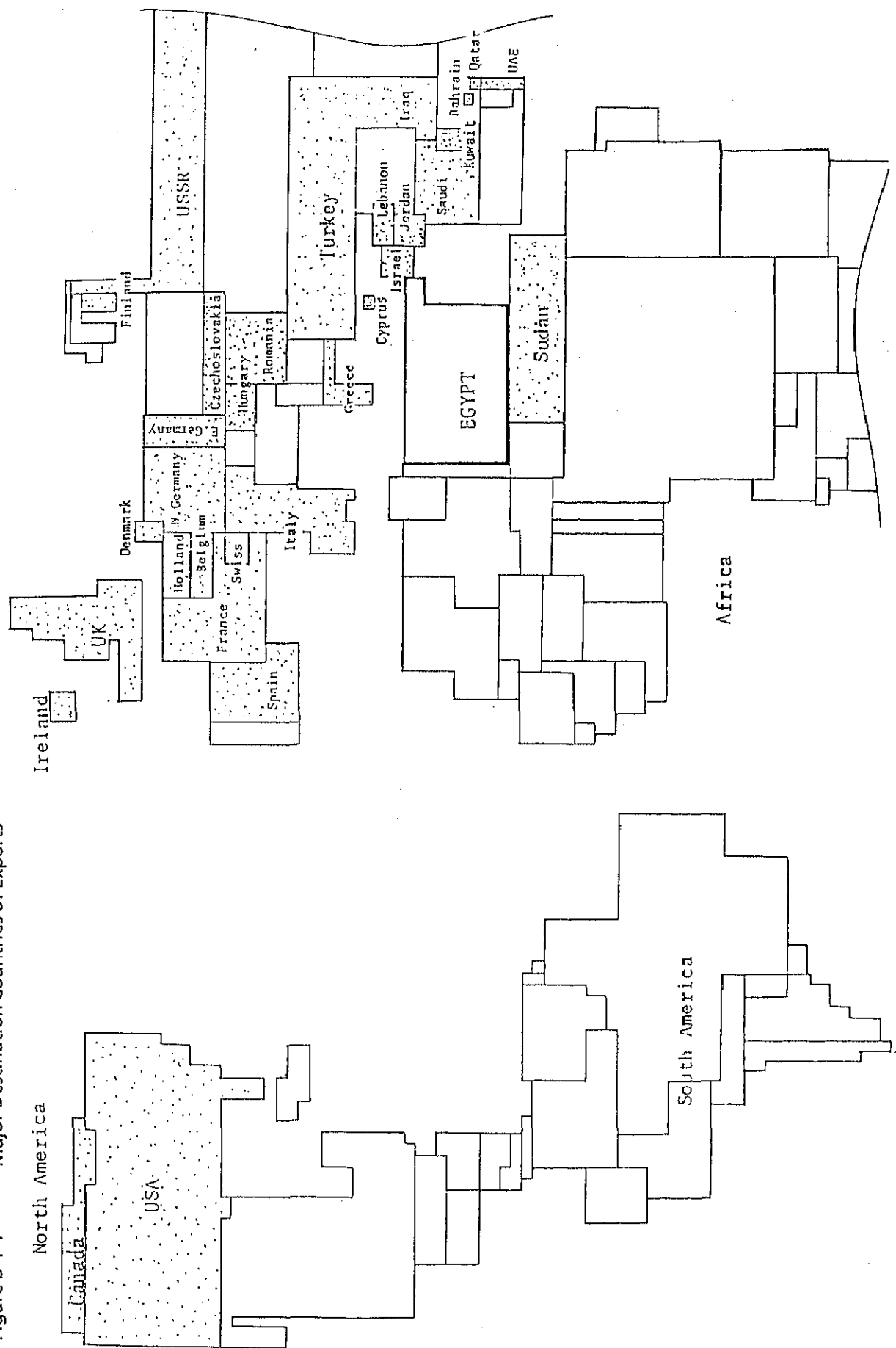


Table B-1-10 Export of Principal Commodities

(Unit : 1,000 LE)

	1983	1984	1985	1986	1987	1988	1989	1990*
<b>Petroleum</b>								
Petroleum oil, crude	1,070,660	1,030,511	1,402,039	698,009	786,199	867,849	1,212,824	1,289,975
Petroleum shale oils other than crude	98,516	81,229	130,569	39,807	96,584	194,487	286,691	496,386
Sub - total	1,169,176 (52.0)	1,111,740 (50.5)	1,532,608 (58.9)	737,816 (35.9)	882,783 (29.0)	1,062,336 (26.6)	1,499,515 (26.1)	1,786,361 (25.7)
<b>Cotton</b>								
Cotton, raw	308,775	340,062	298,984	308,441	272,129	318,579	594,161	562,213
Cotton yarn	137,142	154,350	154,555	223,534	661,438	705,977	990,215	1,045,820
Cotton fabric	28,311	37,701	28,228	65,600	141,505	116,809	176,535	219,676
Sub - total	474,288 (21.0)	532,113 (24.2)	481,767 (18.5)	597,575 (29.1)	1,065,072 (35.0)	1,140,365 (28.5)	1,760,911 (30.7)	1,827,709 (26.3)
<b>Clothing, manufactured</b>								
	12,596	18,188	17,822	26,507	70,215	143,230	169,801	465,199
<b>Unalloyed aluminium</b>								
	5,823	1,753	-	41	-	873	7,514	115
<b>Aluminium bars, rods, angle shapes, &amp; sections</b>								
	61,064	90,757	103,034	114,234	236,602	468,476	513,258	534,209
<b>Agricultural products</b>								
Sugarcane, refined	5,572	-	8	21	-	-	7,254	1,415
Oranges	50,660	53,473	60,565	30,893	104,634	73,097	154,542	148,302
Rice	4,955	15,761	3,779	11,262	27,752	19,079	16,352	49,128
Potatoes	21,436	25,569	18,876	15,337	36,304	59,349	58,225	67,755
Sub - total	82,623 (3.7)	94,803 (4.3)	83,228 (3.2)	57,513 (2.8)	168,690 (5.5)	151,525 (3.8)	236,373 (4.1)	266,600 (3.8)
Total	1,792,914 (79.7)	1,849,354 (84.1)	2,218,459 (85.3)	1,533,686 (74.4)	2,423,362 (80.0)	2,966,805 (74.2)	4,187,372 (73.0)	4,880,193 (70.2)
Total Amount of Export	2,250,295 (100.0)	2,197,933 (100.0)	2,599,941 (100.0)	2,053,959 (100.0)	3,046,010 (100.0)	3,994,436 (100.0)	5,734,726 (100.0)	6,953,762 (100.0)

Source : Statistical Yearbook, 1991, CAPMAS

Note : Preliminary Figures

Table B-1-11 Import of Principal Commodities

(Unit : 1,000 LE)

	1982	1983	1984	1985	1986	1987	1988	1989	1990*
<b>Agricultural Products</b>									
Wheat	492,235	347,638	375,865	342,518	463,668	571,952	825,123	1,307,688	2,128,533
Wheat flour	192,187 (10.7)	205,588 (7.7)	271,909 (8.6)	213,297 (8.0)	181,327 (8.1)	229,419 (7.0)	270,812 (7.2)	443,906 (10.6)	621,050 (11.1)
Maize	210,101	142,034	174,186	145,162	135,843	231,856	265,261	423,667	513,660
Meat Chilled or Frozen	167,023	97,326	193,478	175,636	217,364	349,337	459,715	439,612	563,593
Dairy Products	117,938	158,718	165,742	170,502	158,641	300,818	400,272	358,966	553,970
Sugar Refined	98,302	54,670	54,998	43,782	116,627	163,108	285,086	319,344	654,304
Sub - Total	1,267,081 (19.9)	1,005,974 (14.0)	1,236,178 (16.4)	1,090,897 (15.6)	1,273,470 (15.8)	1,846,490 (16.2)	2,506,269 (16.4)	3,293,183 (19.8)	5,035,110 (20.3)
<b>Others</b>									
Motor Vehicles for Transport of Goods	168,696	190,729	253,863	104,607	46,167	43,002	157,149	53,716	80,294
Automobiles	177,233	215,335	197,494	72,889	62,477	108,332	149,307	169,917	272,894
Parts for Motor Vehicles & Tractors	165,271	199,387	186,039	154,872	173,217	268,704	360,558	278,293	462,917
Bars & Rods Building Iron	172,193	180,020	225,725	360,142	392,181	259,844	316,695	396,409	411,703
Excavating Loring & Excrating Machinery	132,673	109,482	81,830	103,629	137,539	110,682	116,290	130,526	178,655
Organic & Inorganic Chemicals	122,307	138,212	190,117	182,255	215,696	351,708	624,100	593,804	310,159
Cement	250,129	321,489	312,375	328,616	338,407	283,407	224,118	49,930	35,341
Sub - Total	1,189,207 (18.7)	1,354,654 (18.8)	1,447,443 (19.2)	1,307,010 (18.7)	1,365,584 (17.0)	1,425,679 (12.6)	1,948,217 (12.7)	1,672,595 (10.1)	1,751,963 (7.1)
Total	2,456,288 (38.7)	2,360,628 (32.8)	2,683,621 (35.6)	2,397,907 (34.4)	2,639,054 (32.8)	3,272,169 (28.2)	4,454,486 (29.1)	4,965,778 (29.9)	6,787,073 (27.3)
Total Amount of Import	6,354,517 (100.0)	7,192,658 (100.0)	7,536,068 (100.0)	6,973,061 (100.0)	8,051,432 (100.0)	11,357,837 (100.0)	15,308,572 (100.0)	16,623,623 (100.0)	24,823,240 (100.0)

Source : Statistical Yearbook, 1991, CAPMAS

Note : Preliminary Figures

Table B-1-12 Major Destination Countries of Exports

(Unit V:1,000LE Q:tons)

Crops	Year	1st		2nd		3rd		4th		5th						
		Country	V	Q	Country	V	Q	Country	V	Q	Country	V	Q			
Sheep	1984															
	85															
	86															
	87	Saudi	107	32												
Goat	1984	Saudi	5,602	1,874												
	85	*	3,974	1,629	USSR	21	-									
	86	*	2,804	1,080	UAE	37	190									
	87	*	3,379	866	*	458	122									
White Cheese	1984	Kuwait	42	15	Saudi	39	16	UAE	37	15	Qatar	14	6	FSS	8	4
	85	Saudi	380	252	UAE	74	32	Kuwait	63	35	*	35	21			
	86	*	1,154	550	Kuwait	330	147	UAE	85	45	*	53	29			
87	*	1,375	463	*	337	114	*	244	74	*	38	11				
Fresh Tomato	1984	Saudi	1,379	6,270	Kuwait	455	2,132	Qatar	46	199	Bahrain	37	179	UAE	33	145
	85	*	1,971	11,659	*	310	1,368	UAE	104	444	Qatar	68	278	Bahrain	26	125
	86	*	3,021	13,937	*	433	1,932	Qatar	114	429	Bahrain	113	469	Lebanon	34	158
	87	*	5,707	17,057	*	1,080	3,676	*	200	647	UAE	104	332	Bahrain	104	346
Fresh Potato	1984	UK	15,278	74,087	Lebanon	4,209	22,969	Saudi	2,959	17,396	Jordan	780	4,664	Holland	724	4,662
	85	*	9,950	64,566	Saudi	4,156	28,096	Lebanon	2,176	16,567	Kuwait	1,281	9,707	UAE	408	3,244
	86															
87	UK	22,208	64,336	Saudi	8,014	33,783	Lebanon	3,155	13,753	Kuwait	1,123	4,400	UAE	398	1,894	
Fresh Onion	1984	USSR	2,105	9,244	Italy	724	3,389	France	515	1,932	Lebanon	391	1,909	Saudi	75	405
	85	*	3,650	12,765	*	557	3,278	Lebanon	483	2,129	France	413	2,439	*	203	1,010
	86	*	2,957	11,900	*	759	4,326	France	533	2,817	Holland	158	821	Lebanon	87	520
	87	*	11,915	15,952	France	1,921	6,298	Saudi	1,719	4,453	Italy	1,288	3,073	Kuwait	282	872
Fresh Haricot	1984	Holland	1,871	5,829	Saudi	707	2,875	UAE	235	945	Kuwait	146	587			
	85	*	936	3,402	*	784	3,249	*	229	934	*	97	392			
	86	*	2,851	8,494	*	1,100	3,152	*	458	1,302	*	185	486			
	87	*	3,372	7,181	*	524	1,174	*	255	628	Swiss	161	299			
Fresh String Bean	1984	Kuwait	93	231	Saudi	86	229	UAE	27	71	Lebanon	12	34	Qatar	8	21
	85	Saudi	71	289	Kuwait	67	286	*	25	100	*	11	36	*	5	19
	86	Kuwait	61	224	Saudi	54	205	*	27	105	*	13	48	*	7	26
	87	*	97	205	*	56	125	*	47	96	Qatar	10	21	UK	5	10
Fresh Cucumber	1984	Kuwait	24	101	Bahrain	15	68	Saudi	13	68	UAE	11	51	Qatar	10	43
	85	Bahrain	7	33	Kuwait	7	26	*	7	28	*	3	18	UK	2	11
	86	Saudi	10	17	UK	5	18	Bahrain	5	14						
	87	UK	16	20	W.Germany	14	22	*	5	6	Denmark	5	6			
Fresh Squash	1984	Saudi	43	191	Kuwait	15	78	UAE	13	62	UK	9	40	FSS	2	10
	85	Kuwait	23	93	UK	19	81	Saudi	13	59	UAE	6	25			
	86	UK	49	191	Kuwait	14	54	*	10	37	*	2	10	FSS	2	6
	87	*	85	201	*	28	69	*	10	27	W.Germany	3	8	*	2	5
Fresh Eggplant	1984	Saudi	40	157	Kuwait	19	70	UAE	4	12	Bahrain	3	16	Qatar	3	14
	85	*	34	138	*	19	71	*	4	19	Qatar	3	14	FSS	2	7
	86	*	41	116	*	29	85	*	11	30	*	9	28	Bahrain	4	13
	87	*	24	52	*	17	35	Qatar	5	10	UAE	5	11	Lebanon	3	9
Fresh Okra	1984	Kuwait	29	90	UAE	7	6	Saudi	5	15	Qatar	5	10	FSS	1	2
	85	*	15	43	Saudi	4	10	FSS	1	1						
	86	*	64	70	UK	16	20	Saudi								
	87	*	38	36	Saudi	24	14	UK	11	9						
Fresh Pepper	1984	Saudi	148	584	France	12	29	Italy	4	9	Bahrain	3	9	FSS	3	4
	85	*	109	407	*	11	40	Spain	11	16						
	86	*	146	359	Kuwait	5	16	UK	3	8	Swiss	2	8			
	87	Kuwait	30	49	Saudi	28	45	USA	13	12	W.Germany	8	13			
Dried Onion	1984	UK	3,576	3,318	W.Germany	793	767	Holland	633	581	Cyprus	181	168	Lebanon	139	115
	85	*	2,826	2,998	*	916	974	*	375	426	Cuba	236	247	Belguim	176	205
	86	*	2,379	2,271	*	1,487	1,411	*	666	825	Belguim	190	214	Japan	98	104
	87	W.Germany	3,697	1,620	UK	2,805	1,257	*	1,544	764	USSR	793	850	Belguim	318	206
Dried Garlic	1984	UK	35	34	Belguim	15	14	Holland	3	2	Swiss	3	3			
	85	*	225	281	France	66	90	*	10	10	USA	4	5			
	86	*	125	135	Italy	13	7	Saudi	8	5						
	87	*	206	118	UAE	14	16	Denmark	13	6	Italy	12	10			
Fresh Garlic	1984	USSR	1,350	3,000	Saudi	464	1,069	Lebanon	111	278	Sudan	106	254	Kuwait	90	215
	85	Saudi	297	772	Kuwait	73	187	Italy	87	180	*	58	140	Lebanon	4	119
	86	*	283	452	Italy	119	218	Lebanon	79	145	Kuwait	77	150	France	76	100
	87	*	519	707	Lebanon	262	323	France	181	347	Italy	162	238	Greece	124	104

(Unit V:1,000 LE Q:tons)

Crops	Year	1st		2nd			3rd			4th			5th			
		Country	V	Q	Country	V	Q	Country	V	Q	Country	V	Q	Country	V	Q
Dried Okra	1984															
	85	Swiss	8	8												
	86															
	87	Kuwait	8	5	Saudi	2	1									
Dried Haricot	1984	Lebanon	21	50	FSS	1	1	Jordan		1						
	85	FSS	1	1												
	86	Jordan	118	119	France	61	45	Saudi	17	18	Sudan	15	16			
	87	Saudi	500	393	*	274	200	Turkey	233	270	UAE	62	47	Jordan	19	20
Guava	1984	Saudi	404	1,255	Kuwait	120	387	UAE	33	105	Qatar	25	77	Lebanon	11	26
	85	*	448	1,440	*	82	343	*	44	161	*	18	53			
	86	*	580	1,309	*	328	684	*	133	390	*	73	127	UK	27	53
	87	*	550	1,117	*	192	370	*	66	155	*	36	70	*	27	46
Orange	1984	USSR	32,898	102,627	Saudi	10,919	34,063	Czecho	5,997	12,694	W.Germany	1,353	3,260	UK	755	3,466
	85	*	34,200	95,943	*	12,073	37,644	E.Germany	8,987	16,341	Czecho	2,709	11,439	W.Germany	772	2,760
	86	*	15,684	23,396	*	11,031	38,399	Czecho	2,833	9,215	Romania	617	2,103	Sudan	379	890
	87	*	76,566	66,496	*	17,680	27,975	*	6,669	9,082	Canada	839	909	Belgium	513	919
Mandarin	1984	Saudi	3	9	FSS	2	5	Kuwait	1	2						
	85	Kuwait	4	16	Sudan	4	47	Saudi	3	15	FSS	2	5			
	86	Sudan	13	41	Saudi	7	31									
	87	USSR	43,301	43,883	E.Germany	10,239	12,027	Finland	60	180						
Fresh Fig	1984															
	85	Kuwait	0.06	0.05												
	86	*	1.10	1.70	Qatar	0.30	0.50									
	87	Saudi	0.50	0.50												
Fresh Apple	1984															
	85	UAE	0.06	0.02												
	86	Kuwait	0.20	0.08												
	87															
Pomegra- nate	1984	Saudi	210	583	Kuwait	78	209	Qatar	30	92	UAE	21	60	Sudan	9	25
	85	*	191	680	*	41	140	*	16	47	*	15	51			
	86	*	256	671	*	112	240	*	31	66	UK	19	44	France	17	31
	87	*	383	784	*	76	129	UK	27	40	Qatar	14	23	Lebanon	11	20
Water Melon	1984	Saudi	3,775	13,830	Kuwait	1,089	4,307	Lebanon	878	2,801	Qatar	176	780	UAE	115	421
	85	*	3,207	13,056	*	1,019	3,350	Qatar	208	783	Bahrain	52	186	*	52	196
	86	*	4,698	13,311	*	1,911	5,103	Swiss	420	381	Qatar	297	803	Lebanon	145	366
	87	*	4,192	8,138	*	1,288	2,453	Qatar	286	543	France	106	136	Greece	97	151
Hushed Rice	1984	E.Germany	3,147	15,970	Jordan	2,461	9,823	Czecho	1,736	7,000	Sudan	1,252	6,400	Saudi	840	2,100
	85	Czecho	1,857	7,200	Jordan	589	2,500	E.Germany	464	2,000	UAE	233	877	Jordan	206	786
	86	Sudan	5,471	15,979	Czecho	2,796	12,016	Jordan	1,845	7,563	Saudi	428	1,550	E.Germany	295	1,400
	87	Italy	12,277	46,131	Jordan	4,929	19,284	Czecho	4,462	16,275	Iraq	1,998	4,200	Turkey	1,392	4,991
Groundnut in Shell	1984	Italy	606	992	Holland	434	1,146	France	393	429	Saudi	318	512	Spain	105	157
	85	Saudi	386	725	Jordan	311	578	Hungary	79	135	Italy	41	84			
	86	Holland	1,232	2,527	Italy	218	313	Saudi	214	294	Hungary	81	166			47
	87	Yugoslavia	353	226	Saudi	282	227	Italy	74	83	Hungary	73	10	Lebanon	54	
Dates	1984	Lebanon	167	421	Saudi	28	82	Kuwait	27	75	UAE	12	38	Qatar	7	17
	85	*	67	94	*	42	151	*	41	158	*	11	34	*	8	24
	86	Saudi	109	144	Kuwait	92	202	UAE	68	108	Lebanon	57	151	UK	49	106
	87	USSR	943	699	Saudi	88	207	Kuwait	84	146	Finland	56	192	*	45	58
Fresh Strawberry	1984	Saudi	53	46	Kuwait	9	7	Qatar	6	4	France	2	2	FSS	2	1
	85	*	13	21	Qatar	6	9	Kuwait	3	4	UAE	3	5	UK	1	2
	86	*	47	90	*	7	10	UAE	2	2	France	1	2	Kuwait	1	2
	87	Qatar	5	7	Saudi	3	4	Holland	3	2	UAE	2	2	*	2	2

Source : Foreign Trade Computer Center, CAPMAS

Note : FSS : Foreign Ship Supply  
V : Value (1,000 LE)  
Q : Quantity (tons)

Table B-1-13 Index of Wholesale Prices by Item

Sector	(1965/66 = 100)							
	1965/66	1984	1985	1986	1987	1988	1989	1990
All Items	100.0	430.9	487.8	572.1	650.2	820.9	1,044.9	1,220.3
Correction Coefficient	10.63	2.83	2.50	2.13	1.88	1.48	1.17	1.00
Agricultural Crops	100.0	561.1	657.7	829.4	876.1	1,023.3	1,421.9	1,581.7
Correction Coefficient	15.82	2.82	2.40	1.91	1.81	1.55	1.11	1.00
Poultry and Fish	100.0	747.4	811.4	864.4	995.3	1,241.9	1,441.9	1,628.4
Inedible Animal Products	100.0	471.6	507.5	541.6	579.2	803.4	1,161.2	1,405.9
Foodstuff and Beverages	100.0	552.0	587.4	642.0	767.2	971.3	1,175.8	1,417.7
Tobacco and Related Products	100.0	168.0	206.0	249.0	257.0	340.3	426.1	515.1
Yarn, Textile and Under Garment	100.0	266.7	301.6	354.6	443.0	644.6	783.7	983.3
Hides Tanned	100.0	265.4	343.2	415.8	512.8	699.4	1,063.3	1,104.1
Household Appliances	100.0	186.3	210.4	222.1	240.1	294.7	346.2	452.1
Petroleum and Fuel	100.0	284.2	352.2	414.1	524.6	706.3	800.9	947.1
Wood	100.0	503.7	560.9	606.1	886.7	1,044.2	1,444.0	1,650.3
Paper	100.0	490.6	613.3	645.2	530.4	1,249.8	1,526.3	1,678.8
Construction Material	100.0	616.7	690.1	744.6	570.5	907.5	1,081.4	1,247.1
Medicine	100.0	211.7	211.7	310.4	771.2	411.9	468.1	494.5
Chemical Material	100.0	234.6	244.3	257.3	344.4	388.9	479.8	585.9
Metal, and Related Products	100.0	408.1	448.6	458.5	468.2	607.8	802.4	1,005.7
Machinery and Implements	100.0	266.1	290.9	321.9	489.1	450.5	525.9	609.5
Transportation Equipment	100.0	361.0	399.7	486.6	338.7	609.8	849.4	975.0

Source : Statistical Yearbook, 1991, CAPMAS

Table B-1-14 Index of Consumer Prices

1. Urban Areas

Items	1966/67	1984	1985	1986	1987	1988	1989	1990*
All Items	100.0	469.9	532.4	652.5	781.0	918.9	1,114.5	1,301.3
Furniture and Durables	100.0	328.3	346.9	352.4	390.4	668.1	765.8	931.2
Food and Beverages	100.0	605.9	587.3	856.3	1,051.1	1,267.7	1,581.0	1,839.8
Services	100.0	522.4	632.5	840.1	1,015.6	1,173.8	1,329.6	1,558.3
Housing	100.0	119.2	122.5	126.1	131.5	134.8	141.7	165.1
Transportation and Communication	100.0	316.8	316.8	364.2	386.4	440.5	533.8	664.5
Clothing	100.0	478.2	550.3	626.7	662.7	780.4	897.0	1,064.2
Personal Expenses	100.0	287.1	318.2	329.3	423.7	421.3	500.0	561.7

2. Rural Areas

Items	1966/67	1984	1985	1986	1987	1988	1989	1990
All Items	100.0	545.4	609.2	747.8	848.1	1,023.3	1,265.3	1,478.7
Furniture and Durables	100.0	593.8	626.4	721.8	808.8	1,402.2	1,700.0	1,967.3
Food and Beverages	100.0	641.9	718.4	877.1	977.7	1,202.9	1,551.3	1,822.5
Services	100.0	561.6	632.7	841.3	982.6	1,130.8	1,299.2	1,568.8
Housing	100.0	142.0	142.8	161.8	224.4	206.6	212.5	245.5
Transportation and Communication	100.0	200.0	200.0	300.0	300.0	350.7	449.7	570.3
Clothing	100.0	670.4	752.0	966.8	1,139.5	1,304.5	1,574.3	1,717.7
Personal Expenses	100.0	194.9	218.6	248.8	293.6	310.7	355.7	405.6

Source : Statistical Yearbook, 1991, CAPMAS

Note : Preliminary Figures

Table B-1-15 Public Sector Investment

(Unit : Billion LE)

Economic Sectors	First Five-Year Plan		Second Five-Year Plan	
	Value	%	Value	%
<b>Commodity Sectors</b>	<b>13.0</b>	<b>47.8</b>	<b>14.6</b>	<b>52.4</b>
Agriculture	0.8	2.8	0.9	3.1
Irrigation & Drainage	1.4	5.1	1.4	5.1
Industry & Mining	6.1	22.3	5.8	20.8
Petroleum	1.4	5.1	1.1	4.9
Electricity	2.6	9.7	4.8	17.1
Construction	0.7	2.8	0.6	2.3
<b>Production Services Sectors</b>	<b>8.4</b>	<b>30.9</b>	<b>5.5</b>	<b>19.9</b>
Transports, Communication & Storage	7.2	26.6	4.7	16.9
Suez Canal	0.4	1.4	0.3	0.9
Commerce	0.4	1.6	0.2	0.8
Finance & Insurance	0.1	0.3	0.1	0.5
Tourism	0.3	1.0	0.2	0.8
<b>Social Infrastructure Sectors</b>	<b>5.2</b>	<b>19.2</b>	<b>7.7</b>	<b>27.7</b>
Housing	0.3	1.0	0.2	0.6
Public Utilities	2.9	10.7	4.0	14.4
Education	0.7	2.7	1.6	5.9
Health	0.5	1.7	0.8	2.9
Other Social Services	0.8	3.1	1.1	3.9
<b>Total</b>	<b>26.6</b>	<b>97.9</b>	<b>27.8</b>	<b>100.0</b>
Investment expenditure & Unallocated Reserve	0.5	2.1	0.7	-
<b>Grand Total</b>	<b>27.1</b>	<b>100.0</b>	<b>28.5</b>	<b>-</b>

Source : Summary of the Second Five-Year Plan (1987/88~1991/92)

Table B-1-16 Areas Targeted for the Most Important Crops

(Unit : 1,000 fed., 1,000 tons)

Crops	Expected (1986/87)		Target (1991/92)		Annual Growth (%)	
	Planted		Planted		Planted	
	Areas	Production	Areas	Production	Areas	Production
Wheat	1,294	2,188	1,540	3,120	3.5	7.3
Barley	170	193	175	215	0.6	2.2
Maize	1,632	3,206	2,562	6,291	9.4	14.4
Fine Maize	403	639	100	161	24.4	3.0
Rice	1,144	2,667	1,139	3,257	0.1	4.1
Fava Beans	336	364	370	451	2.0	4.4
Lentils	27	19	105	77	31.2	32.3
Other Legumes	74	56	79	63	1.3	2.4
Cotton	1,056	1,097	1,180	1,413	2.2	5.2
Flax	45	130	46	139	0.4	1.3
Groundnuts	38	26	55	50	7.7	14.0
Sesame	29	12	45	20	9.1	10.8
Soybeans	115	137	160	198	6.8	7.6
Sugarcane	280	10,358	267	1,161	1.0	1.5
Sugarbeet	52	835	58	1,023	2.2	4.1
Vegetable	1,405	11,936	1,177	11,236	3.5	0.5
Onions	54	744	82	1,153	8.7	9.3
Permanent Clover	2,102	NA	998	NA	3.6	NA
Feed Clover	1,000	NA	301	NA	0.4	NA
Other Fodder	267	NA	700	NA	1.6	NA
Fruit	50	3,163	60	4,450	5.2	7.1
Dairy	-	2,475	-	2,820	-	2.5
Meat(Livestock)	-	406	-	470	-	2.9
Meat(Poultry)	-	223	-	281	-	4.7
Eggs	-	143	-	175	-	4.1
Fish	-	236	-	350	-	8.2

Source : Second Five-Year Plan



Table B-1-17 Quantitative Foods Balance

(Unit: %)

Crops	1986/87		1987/88		1991/92	
	Domestic	Import	Domestic	Import	Domestic	Import
Wheat	31.0	69.0	33.0	67.0	43.0	57.0
Barley	97.0	3.0	100.0	0.0	100.0	0.0
Maize	63.0	37.0	75.5	24.5	90.0	10.0
Rice	100.0	0.0	100.0	0.0	100.0	0.0
Lentil	25.0	75.0	27.0	73.0	88.0	12.0
Cotton	100.0	0.0	100.0	0.0	100.0	0.0
Groundnuts	100.0	0.0	100.0	0.0	100.0	0.0
Sesame	37.0	63.0	38.0	62.0	49.0	51.0
Sunflower	100.0	0.0	100.0	0.0	100.0	0.0
Soybeans	100.0	0.0	100.0	0.0	100.0	0.0
Sugarcane	100.0	0.0	100.0	0.0	100.0	0.0
Sugarbeet	100.0	0.0	100.0	0.0	100.0	0.0
Fresh Vegetables	100.0	0.0	100.0	0.0	100.0	0.0
Onions	100.0	0.0	100.0	0.0	100.0	0.0
Fruit/Dates	100.0	0.0	100.0	0.0	100.0	0.0
Fresh Milk	100.0	0.0	100.0	0.0	100.0	0.0
Fish	75.0	25.0	77.0	23.0	85.0	15.0
Meat(Red/White)	75.0	25.0	74.0	26.0	70.0	30.0
Dairy Products	76.0	24.0	79.0	21.0	84.0	16.0
Refined Sugar	58.0	42.0	58.0	42.0	60.0	41.0
Edible Oil	24.0	76.0	25.0	75.0	28.0	72.0

Source : Second Five-Year Plan

Table B-1-18 Cultivable Land and Planted Area in Egypt

(Unit : 1,000 feddan)

Year	Cultivable Land	Planted Area	Cropping Intensity
1970	5,665	10,747	189.7%
1971	5,653	10,741	190.0
1972	5,682	10,832	190.6
1973	5,717	10,927	191.1
1974	5,736	11,028	192.3
1975	5,797	11,164	192.6
1976	5,799	11,199	193.1
1977	5,795	11,111	191.7
1978	5,804	11,142	192.0
1979	5,817	11,235	193.1
1980	5,865	11,130	189.8
1981	5,880	11,260	191.5
1982	5,834	11,167	191.4
1983	5,846	11,139	190.5
1984	5,830	11,027	189.1
1985	5,979	11,175	186.9
1986	6,004	11,137	185.5
1987	5,972	11,127	186.3
1988	6,102	11,234	182.6
1989	6,120	11,339	185.3

Source : MALR

Table B-1-19 Planted Area by Season

(Unit : 1,000 fed)

Sector	1952	1982	1983	1984	1985	1986	1987	1988	1989	1989/1982
Winter Crops	4,364	4,963	4,983	4,945	5,038	4,944	5,098	5,050	5,270	1.062
Summer Crops	3,026	5,007	4,830	4,818	4,845	4,799	4,842	4,919	4,984	0.995
Nile Crops	1,824	821	880	845	880	890	863	882	864	1.052
Orchards	94	390	404	435	457	593	616	646	655	1.679
Total	9,308	11,181	11,097	11,043	11,220	11,226	11,419	11,497	11,773	1.053

Source : Statistical Yearbook, 1991, CAPMAS

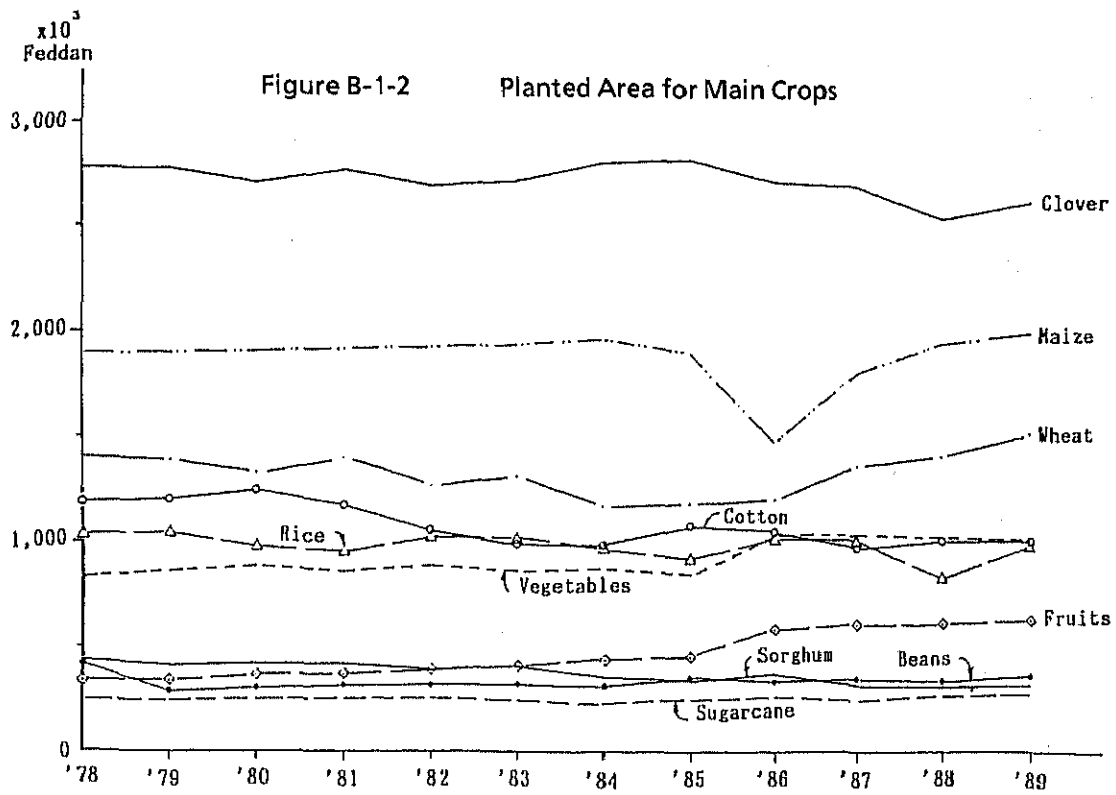
Table B-1-20 Production of Main Crops

(Unit : 1,000 tons)

Sector	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990*
Maize	3,117	2,938	3,231	3,308	3,347	3,509	3,698	3,699	3,608	3,619	4,088	4,529	4,798
Rice	2,351	2,511	2,384	2,236	2,441	2,442	2,236	2,311	2,445	2,279	2,132	2,679	3,353
Wheat	1,933	1,856	1,796	1,938	2,017	1,996	1,815	1,872	1,928	2,721	2,838	3,182	4,266
Raw Cotton	1,188	1,288	1,408	1,326	1,211	1,069	1,049	1,191	1,120	981	882	820	838
Main Vegetables	6,205	6,757	6,690	6,830	6,981	7,040	7,322	8,352	9,530	9,964	9,074	8,444	8,717
Sorghum	681	635	635	653	596	621	561	547	606	551	586	585	628
Beans	231	236	213	208	260	295	271	302	448	499	362	460	451
Sugarcane	8,296	8,791	8,618	8,805	8,740	8,424	8,633	9,429	9,684	8,242	10,795	11,213	11,144
Fruits	2,084	3,373	2,282	2,173	2,862	3,020	2,903	2,961	3,281	3,667	3,585	4,127	NA

Source : Statistical Yearbook, 1991, CAPMAS

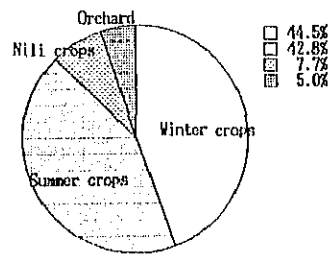
Note : Preliminary Figures



**Figure B-1-3 Proportion of the Planted Area for Crops in Egypt**

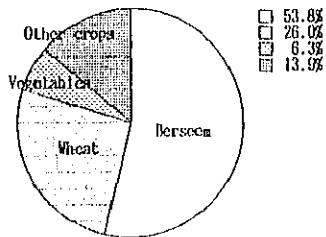
**1. Planted Area (1,000 fed)  
average from 1984-1989**

Winter crop	5,057	(44.5 %)
Summer crops	4,868	(42.8)
Nili crops	871	(7.7)
Orchard	587	(5.0)
<b>Total</b>	<b>11,363</b>	<b>(100.0)</b>



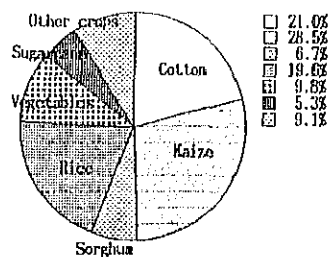
**2. Winter Crops**

Berseem	2,719	(53.8)
Wheat	1,316	(26.0)
Vegetables	321	(6.3)
Other crops	701	(13.9)
<b>Total</b>	<b>5,057</b>	<b>(100.0)</b>



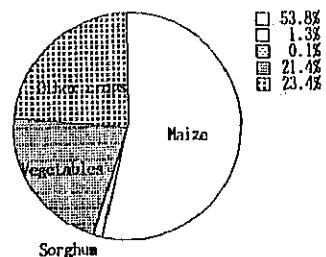
**3. Summer Crops**

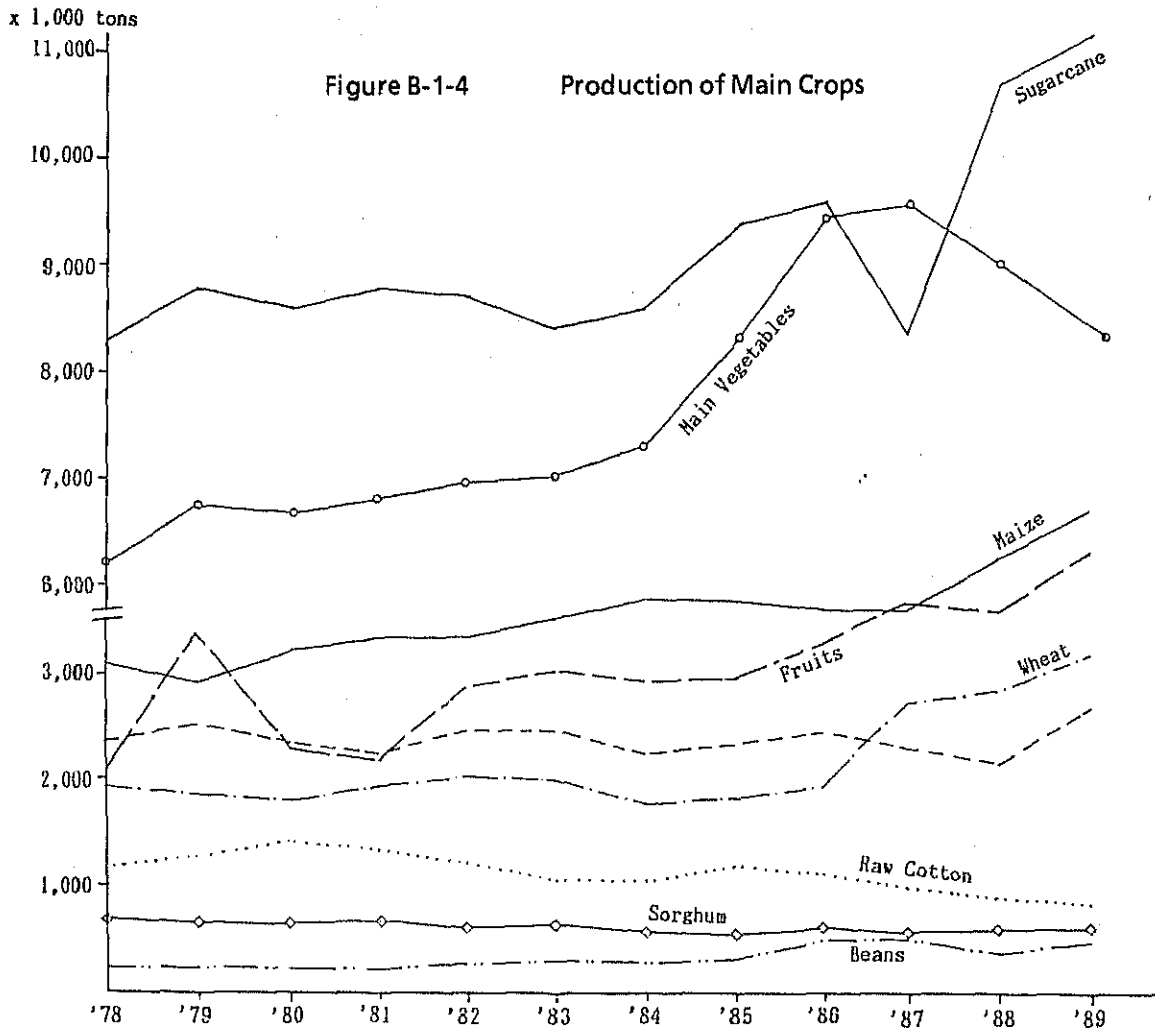
Cotton	1,020	(21.0)
Maize	1,389	(28.5)
Sorghum	325	(6.7)
Rice	953	(19.6)
Vegetables	479	(9.8)
Sugarcane	258	(5.3)
Other crops	444	(9.1)
<b>Total</b>	<b>4,868</b>	<b>(100.0)</b>



**4. Nili Crops**

Maize	469	(53.8)
Sorghum	11	(1.3)
Rice	1	(0.1)
Vegetables	186	(21.4)
Other crops	204	(23.4)
<b>Total</b>	<b>871</b>	<b>(100.0)</b>

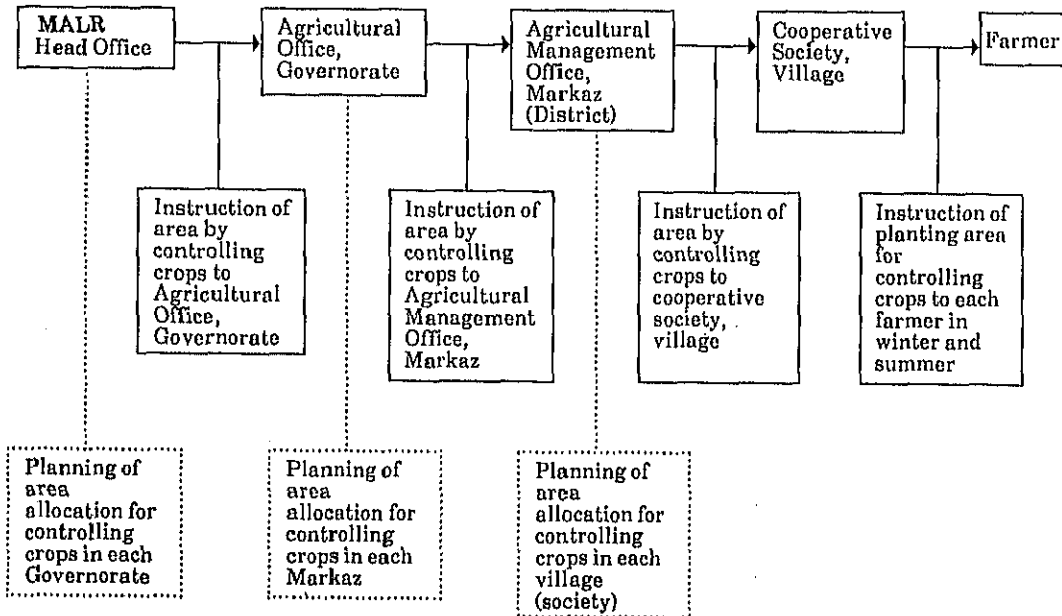




**Figure B-1-5 Crop Control System (as of May 1991)**

1. Controlling crops : cotton, wheat, broad beans, onion, garlic, vegetables, maize, soybean, sesame, groundnuts, sugarcane

2. Flow of instruction



## B-2 REGIONAL LEVEL

Table B-2-1 Social and Economic Conditions in Governorates Concerned to the Project

Items		Minia	Beni Suef	Faiyum	Giza	Source
(1)	Total Land (km <sup>2</sup> )	2,261	4,855	1,812	13,206	Survey Authority
(2)	Cultivable Land (fed)-1990	470,375	263,223	343,866	184,707	Survey Authority
(3)	Ratio of Cultivable Land (%)	87.6	84.4	81.4	78.4	Survey Authority
(4)	Irrigated Area by Bahr Yusef Canal (gross-fed)	147,100	73,145	401,589	148,300	MPWWR
(5)	No. of District	9	8	5	7	Survey Authority
(6)	No. of village	338	218	157	156	CAPMAS
(7)	Population (1976) × 1,000	2,056	1,109	1,140	2,419	CAPMAS
(8)	Population(1986) Urban	549	362	359	2,126	CAPMAS
	× 1,000 Rural	2,099	1,081	1,185	1,574	
	<u>Total</u>	<u>2,648</u>	<u>1,443</u>	<u>1,544</u>	<u>3,700</u>	
(9)	Annual Increase of Population (%)	2.56	2.67	3.08	4.34	
(10)	Population Density (persons/km <sup>2</sup> ) (8)/(1)	1,171	297	852	280	
(11)	Population Aged More Than 6 Years Working for Agricultural Sector/ Total Population Economically Active	433,785/	219,765/	255,940/	192,800/	CAPMAS
		664,206	360,330	405,725	956,476	
(12)	No. of Household(1986) Urban	117,854	72,791	71,303	473,336	CAPMAS
	Rural	425,085	208,401	220,103	308,186	
	<u>Total</u>	<u>542,939</u>	<u>281,192</u>	<u>291,411</u>	<u>781,522</u>	
(13)	Average Family Size (8) /(12) Urban	4.7	5.0	5.0	4.5	
	(person) Rural	4.9	5.2	5.4	5.1	
	<u>Gov. average</u>	<u>4.9</u>	<u>5.1</u>	<u>5.3</u>	<u>4.7</u>	
(14)	No. of Farm Household (1990)	265,029	150,090	125,848	108,403	Gov. Agri-Office
(15)	Averaged Farm Labour per Farm Household (person)	1.6	1.5	2.0	1.8	
(16)	Population in Farm Household (1,000)	1,303	765	666	509	Estimation
(17)	No. of Farm Household by Farm Size Less than 1 feddan	146,424	74,893	58,254	52,793	Gov. Agri-Office
	1~5 feddans	109,603	68,636	55,326	51,920	
	5~10 feddans	7,540	5,190	8,370	2,510	
	More than 10 feddans	2,462	1,371	3,898	1,180	
	<u>Total</u>	<u>266,029</u>	<u>150,090</u>	<u>125,848</u>	<u>108,403</u>	
(18)	Average Farm Size (fed/farm household)	1.38	1.58	2.45	1.43	Agri-office
(19)	Total Planted Area (fed)-1985~1989					MOA
	Winter Crops	338,026	192,589	250,052	137,888	
	Summer Crops	249,764	107,062	147,561	142,301	
	Nili Crops	58,096	94,631	107,881	77,057	
	Perennial Crops	136,704	66,182	63,530	39,379	
	Short Berseem	27,763	30,386	30,129	13,791	
	<u>Total</u>	<u>810,353</u>	<u>490,850</u>	<u>599,153</u>	<u>410,416</u>	
(20)	Cropping Intensity (%)	169	171	179	215	Gov. Agri-Office
(21)	10 Major Crops Based on Planted Area (1989)					MOA
	1 Maize	Maize	Maize	Berseem	Vegetables	
	2 Berseem	Berseem	Berseem	Vegetables	Maize	
	3 Wheat	Wheat	Wheat	Maize	Berseem	
	4 Broadbeans	Cotton	Wheat	Wheat	Green Fodder	
	5 Cotton	Broadbeans	Cotton	Cotton	Fruits	
	6 Soybeans	Vegetables	Sorghum	Sorghum	Wheat	
	7 Vegetables	Soybeans	Broadbeans	Broadbeans	Onion	
	8 Sugarcane	Aromatic Pl.	Green Fodder	Green Fodder	Groundnuts	
	9 Fruits	Fruits	Fruits	Fruits	Sugarcane	
10 Aromatic Pl.	Onion	Aromatic Pl.	Aromatic Pl.	Sorghum		
(22)	No. of Livestock (head) Cattle	264,963	275,938	245,160	382,224	Gov. Agri-office
	Sheep	197,915	129,538	130,366	187,540	
	Goat	260,065	68,590	57,011	241,866	
	Camel	8,884	3,903	6,953	NA	

Items	Minia	Beni Suef	Faiyum	Giza	Source
(23) No. of Agricultural Machinery (1986/87)					CAPMAS
Tractor	3,625	1,626	1,702	1,380	
(Fed./Tractor)	(130)	(162)	(202)	(134)	
Water Pump	485	1,130	60	307	
(Fed./Pump)	(1,104)	(233)	(5,731)	(602)	
Thresher-public & Governmental	238	76	27	6	
(Fed./Thresher)	(1,976)	(3,463)	(12,735)	(30,785)	
Sprayer-Governmental only	2,132	887	77	89	
(Fed./Sprayer)	(221)	(297)	(4,466)	(2,076)	Gov. Agri-office
(24) No. of Cooperative					
Local Cooperative Society	341	221	163	157	
Local Land Reform Society	408	249	201	16	
Local Agrarian Reform Society	63	22	32	15	
Marketing Society	-	1	1	1	
Livestock Society	-	6	3	41	
Others	10	2	-	2	
<u>Total</u>	<u>822</u>	<u>501</u>	<u>400</u>	<u>232</u>	
(25) Agrarian Reform					
Area Distributed (fed)	66,353	27,409	37,097	8,796	CAPMAS
No. of Beneficial Family	40,945	17,673	15,937	5,882	
Average Farm Size (fed)	1.62	1.55	2.33	1.50	
(26) Ratio of Village with Electricity (%) -1988/89	100%	100%	100%	98%	CAPMAS
	(338/338)	(218/218)	(157/157)	(163/156)	
(27) No. of Hospital					
Urban	11	9	15	43	Population %
Rural	3	1	3	1	Housing Census
(28) Length of Highway and Desert Roads(km)-1988/89					CAPMAS
Highway	922.0	777.0	752.5	1,364.8	
Desert Road	812.0	496.0	742.5	222.2	
<u>Total</u>	<u>1,734.0</u>	<u>1,273.0</u>	<u>1,496.0</u>	<u>1,587.0</u>	
(km/km <sup>2</sup> )-(28)/(1)	0.77	0.26	0.83	0.12	
(29) Average Net Income per Farm Household(LE/year)	1,790	2,110	3,190	4,484	CAPMAS

Table B-2-2 Proportion of Agricultural Production in Value (1985)

(Unit : 1,000LE)

	GPV *	Winter Crops	Summer Crops	Nili Crops	Vegetables	Fruits
North Egypt	6,746,149 (62.5)	1,538,251 (63.2)	1,328,351 (60.3)	76,984 (38.4)	887,009 (63.7)	570,078 (59.0)
Middle Egypt						
Giza	568,352 (5.3)	51,059 (2.1)	45,826 (2.1)	13,501 (6.7)	180,821 (13.0)	91,167 (9.4)
Beni Suef	413,238 (3.8)	108,633 (4.5)	78,403 (3.6)	35,097 (17.5)	59,005 (4.2)	26,786 (2.8)
Faiyum	539,923 (5.0)	140,954 (5.8)	65,530 (3.0)	16,385 (8.2)	140,187 (10.1)	74,180 (7.7)
Minia	637,704 (5.0)	174,938 (7.2)	168,333 (7.7)	29,451 (14.7)	34,696 (2.5)	68,572 (7.1)
Upper Egypt	1,739,315 (16.1)	419,798 (17.2)	513,199 (23.3)	28,972 (14.5)	90,802 (6.5)	135,004 (14.1)
Frontier Gov.	105,069 (1.0)	0	0	0	0	0
Wood, others	39,731 (0.4)	0	0	0	0	0
<u>Total</u>	<u>10,789,481 (100)</u>	<u>2,433,633 (100)</u>	<u>2,199,642 (100)</u>	<u>200,390 (100)</u>	<u>1,392,520 (100)</u>	<u>965,789 (100)</u>

Source : CAPMAS

Note : GPV; Gross production value

Table B-2-3 Proportion of Major Crop's Production in Value (1985)

(Unit : 1,000LE)

	Wheat	Berseem	Cotton	Sugarcane	Maize *	Paddy
North Egypt	173,933 (54.8)	1,032,959 (69.0)	510,764 (71.8)	8,239 (3.5)	426,877 (59.0)	279,009 (99.0)
Middle Egypt						
Giza	2,923 (0.9)	41,929 (2.8)	8 (0.0)	805 (0.3)	39,758 (5.5)	-
Beni Suef	14,742 (4.6)	56,629 (3.8)	35,586 (5.0)	645 (0.3)	57,221 (7.9)	-
Fayoum	13,952 (4.4)	88,895 (5.9)	22,156 (3.1)	271 (0.1)	27,897 (3.9)	2,848 (1.0)
Minya	25,227 (8.0)	90,053 (6.0)	52,114 (7.3)	24,098 (10.3)	83,806 (11.5)	-
Upper Egypt	86,498 (27.3)	188,916 (12.5)	90,951 (12.8)	200,293 (85.5)	88,397 (12.2)	-
Frontier Gov.	0	0	0	0	0	0
<b>Total</b>	<b>317,275 (100)</b>	<b>1,497,381 (100)</b>	<b>711,579 (100)</b>	<b>234,351 (100)</b>	<b>722,956 (100)</b>	<b>281,857 (100)</b>

Source : CAPMAS

Note : Including summer and Vile maize

Table B-2-4 Planted Area by Governorate

(Unit : feddan)

	1985						
	Winter Crops	Perennial Crops	Total Cultivable Land	Summer Crops	Nili Crops	Short Berseem	Total
North Egypt	2,606,323 (62.2)	1,092,411 (61.1)	3,697,734 (61.8)	2,360,519 (67.6)	346,447 (44.1)	709,343 (77.3)	7,114,043 (63.6)
Middle Egypt	899,233 (21.4)	296,628 (16.6)	1,195,861 (20.0)	609,284 (17.4)	343,258 (43.8)	126,166 (13.7)	2,274,569 (20.4)
Giza	137,475 (3.3)	32,995 (1.8)	170,470 (2.9)	145,654 (4.2)	60,924 (7.8)	14,119 (1.5)	391,167 (3.5)
Beni Suef	188,749 (4.5)	67,600 (3.8)	258,349 (4.3)	102,218 (2.9)	99,683 (12.7)	33,817 (3.7)	492,067 (4.4)
Fayoum	257,680 (6.1)	61,823 (3.5)	319,503 (5.3)	143,263 (4.1)	105,140 (13.4)	30,229 (3.3)	598,135 (5.4)
Minya	315,329 (7.5)	134,210 (7.5)	449,539 (7.5)	218,149 (6.2)	77,511 (9.9)	48,001 (5.2)	793,200 (7.1)
Upper Egypt	686,799 (16.4)	398,574 (22.3)	1,085,373 (18.2)	523,430 (15.0)	95,008 (12.1)	82,306 (9.0)	1,786,117 (16.0)
Whole Egypt	4,191,355 (100.0)	1,787,613 (100.0)	5,978,968 (100.0)	3,493,233 (100.0)	784,713 (100.0)	917,815 (100.0)	11,174,792 (100.0)
	1986						
North Egypt	2,554,487 (61.4)	1,130,998 (61.4)	3,685,485 (61.3)	2,360,519 (67.6)	346,447 (42.3)	673,192 (77.4)	7,025,885 (63.1)
Middle Egypt	942,528 (22.7)	309,827 (16.7)	1,252,355 (20.9)	598,610 (17.3)	373,474 (46.9)	107,098 (12.3)	2,331,537 (20.9)
Giza	147,234 (3.5)	39,252 (2.1)	186,486 (3.1)	146,405 (4.2)	85,645 (10.7)	15,749 (1.8)	434,285 (3.9)
Beni Suef	202,159 (4.9)	67,252 (3.6)	269,711 (4.5)	81,593 (2.4)	110,238 (13.9)	31,512 (3.6)	493,054 (4.4)
Fayoum	253,327 (6.1)	64,360 (3.5)	317,687 (5.3)	128,971 (3.7)	121,710 (15.3)	41,584 (4.8)	609,952 (5.5)
Minya	339,508 (8.2)	138,963 (7.5)	478,471 (7.5)	241,641 (7.0)	55,881 (7.0)	18,253 (2.1)	794,248 (7.1)
Upper Egypt	660,979 (15.9)	405,011 (21.9)	1,085,373 (17.8)	537,222 (15.5)	86,060 (10.8)	89,991 (10.3)	1,779,263 (16.0)
Whole Egypt	4,157,974 (100.0)	1,845,836 (100.0)	6,003,810 (100.0)	3,487,654 (100.0)	784,713 (100.0)	870,281 (100.0)	11,136,685

(Unit : feddan)

1987

	Winter Crops	Perennial Crops	Total Cultivable Land	Summer Crops	Nili Crops	Short Berseem	Total
North Egypt	2,585,323 (61.8)	1,092,411 (631.1)	3,674,589 (61.6)	2,394,834 (66.4)	343,155 (44.1)	709,343 (77.3)	7,051,984 (83.6)
Middle Egypt	915,951 (22.0)	296,628 (16.6)	1,212,706 (20.2)	676,306 (18.8)	304,773 (43.8)	101,451 (13.7)	2,295,236 (20.4)
Giza	141,461 (3.4)	32,995 (1.8)	181,010 (3.0)	139,430 (3.9)	75,686 (7.8)	12,384 (1.5)	408,960 (3.5)
Beni Suef	195,570 (4.7)	62,719 (3.5)	258,289 (4.3)	111,003 (3.1)	91,427 (12.7)	31,769 (3.7)	492,488 (4.4)
Fayoum	249,269 (6.0)	63,012 (3.5)	312,281 (5.2)	157,337 (4.4)	93,574 (13.4)	29,559 (3.3)	592,751 (5.4)
Minya	329,651 (7.9)	131,475 (7.3)	461,126 (7.7)	268,536 (7.4)	44,086 (9.9)	27,289 (5.2)	801,037 (7.1)
Upper Egypt	675,410 (16.2)	409,713 (22.8)	1,085,123 (18.2)	535,162 (14.8)	95,935 (12.1)	73,509 (9.0)	1,779,729 (16.0)
Whole Egypt	4,176,684 (100.0)	1,795,734 (100.0)	5,972,418 (100.0)	3,606,302 (100.0)	733,863 (100.0)	814,366 (100.0)	11,126,949 (100.0)

1988

North Egypt	2,618,090 (61.8)	1,131,070 (60.9)	3,749,160 (61.4)	2,372,791 (65.8)	307,281 (42.0)	639,756 (80.4)	7,068,988 (62.9)
Middle Egypt	932,232 (21.9)	311,490 (16.8)	1,243,722 (20.4)	682,031 (18.9)	328,340 (44.6)	87,569 (11.2)	2,341,662 (20.9)
Giza	141,238 (3.3)	42,466 (2.3)	183,704 (3.0)	141,141 (3.9)	75,535 (10.3)	14,000 (1.8)	414,380 (3.7)
Beni Suef	188,036 (4.4)	65,300 (3.5)	253,336 (4.2)	110,731 (3.1)	90,808 (12.3)	26,691 (3.4)	481,566 (4.3)
Fayoum	241,620 (5.7)	65,040 (3.5)	306,660 (5.0)	158,933 (4.4)	105,223 (14.3)	25,876 (3.3)	596,692 (5.3)
Minya	361,338 (8.5)	138,684 (7.5)	500,022 (8.2)	271,226 (7.5)	56,774 (7.7)	21,002 (2.7)	849,024 (7.6)
Upper Egypt	693,103 (16.3)	416,080 (22.3)	1,109,183 (17.8)	553,629 (15.3)	98,702 (13.4)	62,457 (7.9)	1,823,971 (16.2)
Whole Egypt	4,243,425 (100.0)	1,858,640 (100.0)	6,102,065 (100.0)	3,608,451 (100.0)	734,323 (100.0)	789,782 (100.0)	11,234,621 (100.0)

1989

	Winter Crops	Perennial Crops	Total Cultivable Land	Summer Crops	Nili Crops	Short Berseem	Total
North Egypt	2,654,097 (62.1)	1,118,156 (60.4)	3,772,253 (61.6)	2,424,375 (66.0)	303,360 (40.7)	654,165 (81.7)	7,154,153 (63.0)
Middle Egypt	902,833 (21.2)	314,180 (17.0)	1,217,013 (19.9)	667,210 (18.2)	338,485 (45.2)	88,068 (10.9)	2,310,776 (20.5)
Giza	122,033 (2.9)	42,635 (2.3)	164,668 (2.7)	138,877 (3.8)	87,496 (11.7)	12,254 (1.5)	403,295 (3.6)
Beni Suef	188,133 (4.4)	67,940 (3.7)	256,073 (4.2)	129,767 (3.5)	80,999 (10.8)	28,145 (3.5)	494,984 (4.4)
Fayoum	248,363 (5.8)	63,416 (3.4)	311,779 (5.1)	149,299 (4.1)	113,760 (15.2)	23,397 (2.9)	598,235 (5.3)
Minya	344,304 (8.1)	140,189 (7.6)	484,493 (7.9)	249,267 (6.8)	56,230 (7.5)	24,272 (53.0)	814,262 (7.2)
Upper Egypt	711,035 (16.7)	419,380 (22.6)	1,130,415 (18.5)	578,577 (15.8)	105,308 (7.5)	59,431 (7.4)	1,873,731 (16.5)
Whole Egypt	4,267,965 (100.0)	1,861,716 (100.0)	6,119,681 (100.0)	3,670,162 (100.0)	747,153 (100.0)	801,664 (100.0)	11,338,660 (100.0)



Table B-2-5 Total Population (over 6 years) in Governorates by Economic Activity and Sex

GOV	SEX	Economic Activity (Major Groups) *											Total	Economically Active	Not Economically Active	Total	
		Agriculture, Hunting, Fishing	Mining, Quarrying	Manufacturing	Electricity, Gas, Water	Construction	Hotels	Commerce, Restaurants, Hotels	Transport, Storage, Communication	Financing, Insurance	Community, Personal Services	Activities not Adequately Described					
Minia	M	22,671	345	15,410	1,373	9,089	14,250	9,888	2,421	40,198	3,312	118,967	114,088	233,045			
	F	416	19	458	87	100	931	267	553	17,018	550	20,399	197,624	218,023			
	T	23,087	364	15,868	1,460	9,189	15,181	10,155	2,974	57,216	3,862	139,366	311,712	451,068			
	M	404,444	642	11,438	1,267	6,154	12,215	10,139	2,038	50,983	10,673	509,993	319,174	829,167			
	F	6,254	27	299	13	32	711	49	112	4,903	2,457	14,857	778,908	793,765			
	T	410,698	669	11,737	1,280	6,186	12,926	10,188	2,150	55,886	13,130	524,850	1,098,082	1,622,932			
Beni Suef	M	427,115	987	26,848	2,640	15,243	26,465	20,027	4,459	91,181	13,985	628,950	433,262	1,062,212			
	F	6,670	46	757	100	132	1,642	316	665	21,921	3,007	36,256	976,532	1,011,788			
	T	433,785	1,033	27,605	2,740	15,375	28,107	20,343	5,124	113,102	16,992	664,206	1,409,794	2,074,000			
	M	23,515	98	7,987	630	6,302	8,547	5,332	1,833	24,823	1,852	80,922	69,567	150,489			
	F	549	19	256	42	88	545	278	457	11,253	201	13,688	131,096	144,784			
	T	24,067	117	8,243	672	6,390	9,092	5,610	2,290	36,076	2,053	94,610	200,663	295,273			
Faiyum	M	192,475	346	8,342	726	9,950	6,446	4,971	1,274	29,458	40,87	258,075	169,438	427,513			
	F	3,223	26	207	4	27	448	36	66	2,985	623	7,645	405,973	413,618			
	T	195,698	372	8,549	730	9,977	6,894	5,007	1,340	32,443	4,710	265,720	575,411	841,131			
	M	215,993	444	16,329	1,356	16,252	14,993	10,303	3,107	54,281	5,939	338,997	239,005	578,002			
	F	3,772	45	463	46	115	993	314	523	14,238	824	21,333	537,069	558,402			
	T	219,765	489	16,792	1,402	16,367	15,986	10,617	3,630	68,519	6,763	360,330	276,074	636,404			
Giza	M	24,067	126	11,038	645	7,693	9,026	5,841	1,546	22,528	1,304	83,614	65,795	149,409			
	F	301	10	340	50	49	738	226	393	10,220	131	12,458	127,420	139,878			
	T	24,368	136	11,378	695	7,742	9,764	5,857	1,939	32,748	1,435	96,072	193,215	289,287			
	M	228,948	272	11,491	885	10,117	7,958	6,353	1,161	28,466	5,949	301,600	168,920	470,520			
	F	2,624	17	284	11	25	485	28	78	3,706	795	8,053	425,923	433,976			
	T	231,572	289	11,775	896	10,142	8,443	6,381	1,239	32,172	6,744	309,653	594,843	904,496			
Giza	M	253,015	398	22,529	1,530	17,810	16,984	11,994	2,707	50,994	7,253	385,214	234,715	619,929			
	F	2,925	27	624	61	74	1,223	254	471	13,926	926	20,511	553,343	573,854			
	T	255,940	425	23,153	1,591	17,884	18,207	12,248	3,178	64,920	8,179	405,725	788,058	1,193,783			
	M	30,526	2,577	96,681	4,741	74,093	68,718	37,785	21,333	123,768	24,853	485,075	413,908	898,983			
	F	760	271	9,846	577	1,589	6,916	2,606	5,334	53,790	2,958	84,647	768,018	852,665			
	T	31,286	2,848	106,527	5,318	75,682	75,634	40,391	26,667	177,558	27,811	569,722	1,181,926	1,751,641			
Giza	M	159,005	830	59,956	3,013	39,438	25,487	20,014	3,479	42,356	17,886	371,466	258,935	630,401			
	F	2,509	80	1,546	155	253	1,394	398	480	6,661	1,832	15,288	563,265	578,554			
	T	161,514	890	61,504	3,168	39,691	26,881	20,412	3,959	49,017	19,718	386,754	382,201	1,208,955			
	M	189,531	3,407	156,639	7,754	113,531	94,205	57,799	24,812	166,124	42,739	856,541	672,843	1,529,384			
	F	3,269	331	11,392	732	1,842	8,310	3,004	5,814	60,451	4,790	99,935	1,331,284	1,431,219			
	T	192,800	3,738	168,031	8,486	115,373	102,515	60,803	30,626	226,575	47,529	956,476	2,004,127	2,950,603			

NA=NOT ECONOMICALLY ACTIVE

Source : CAPMAS, 1986

Figure B-2-2 Proportion of Agricultural Production in Value (1985)

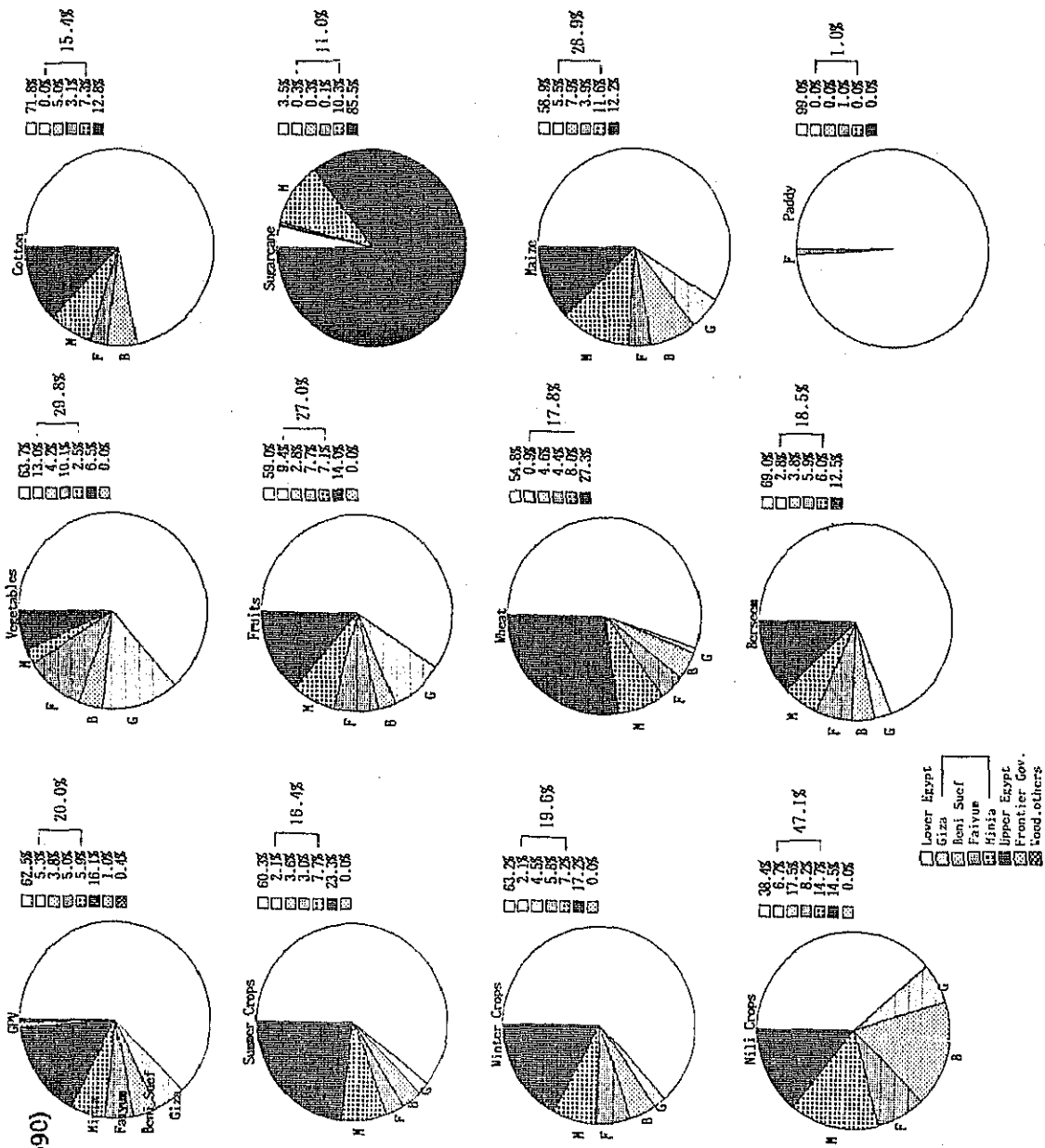


Figure B-2-1

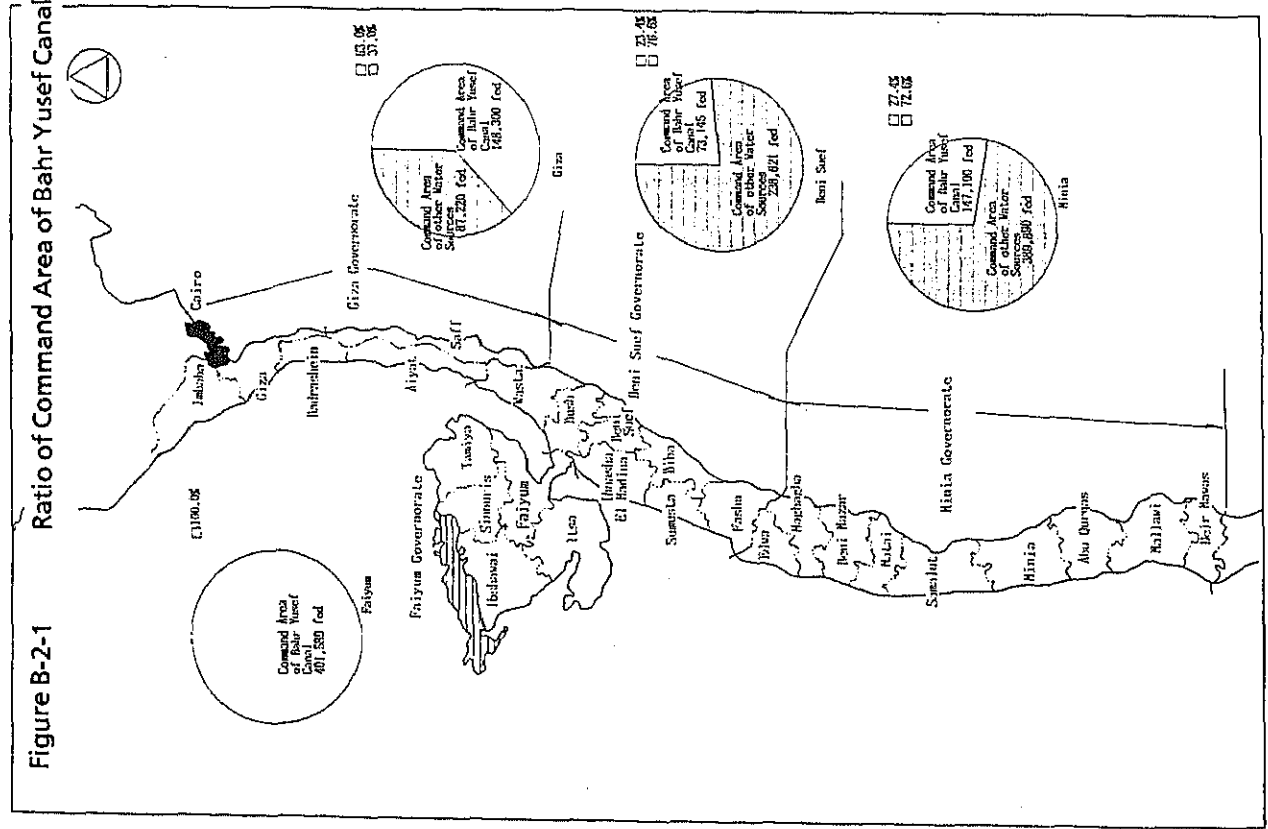




Figure B-2-6 Land Holding and Average Farm Size (1990)

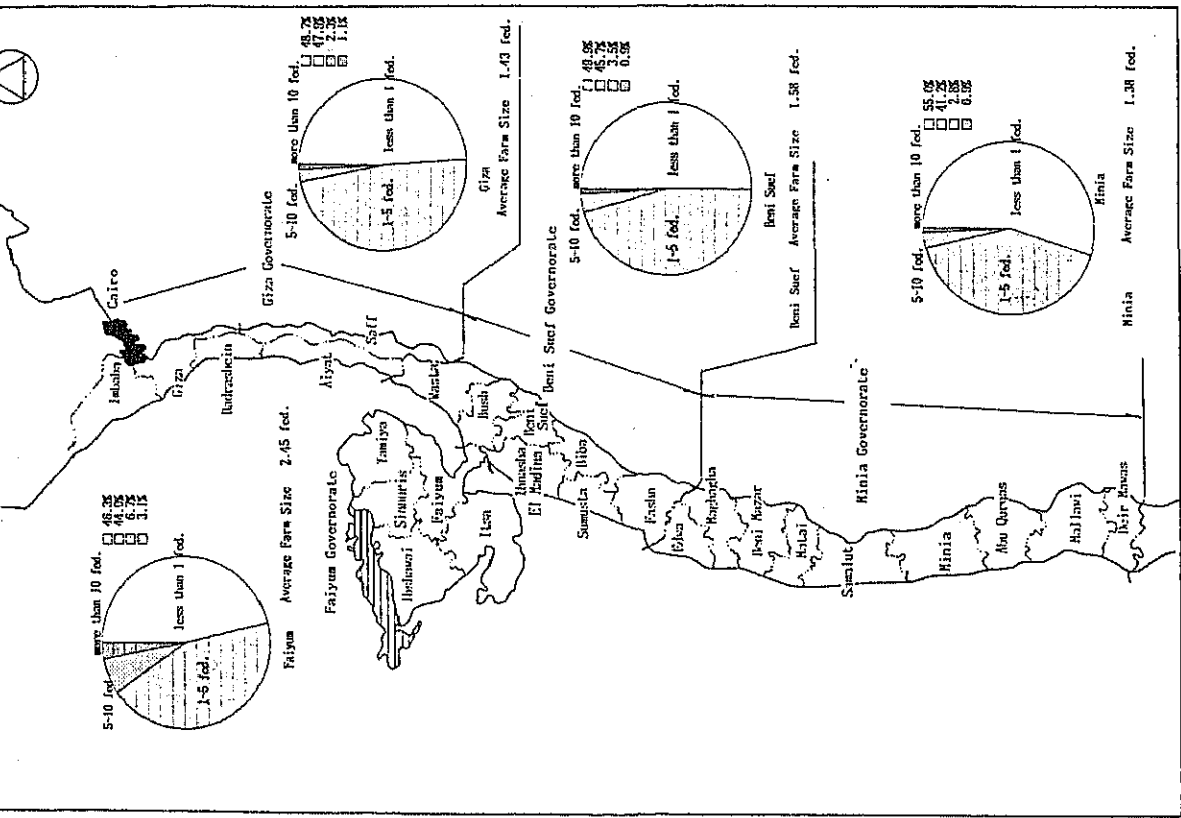
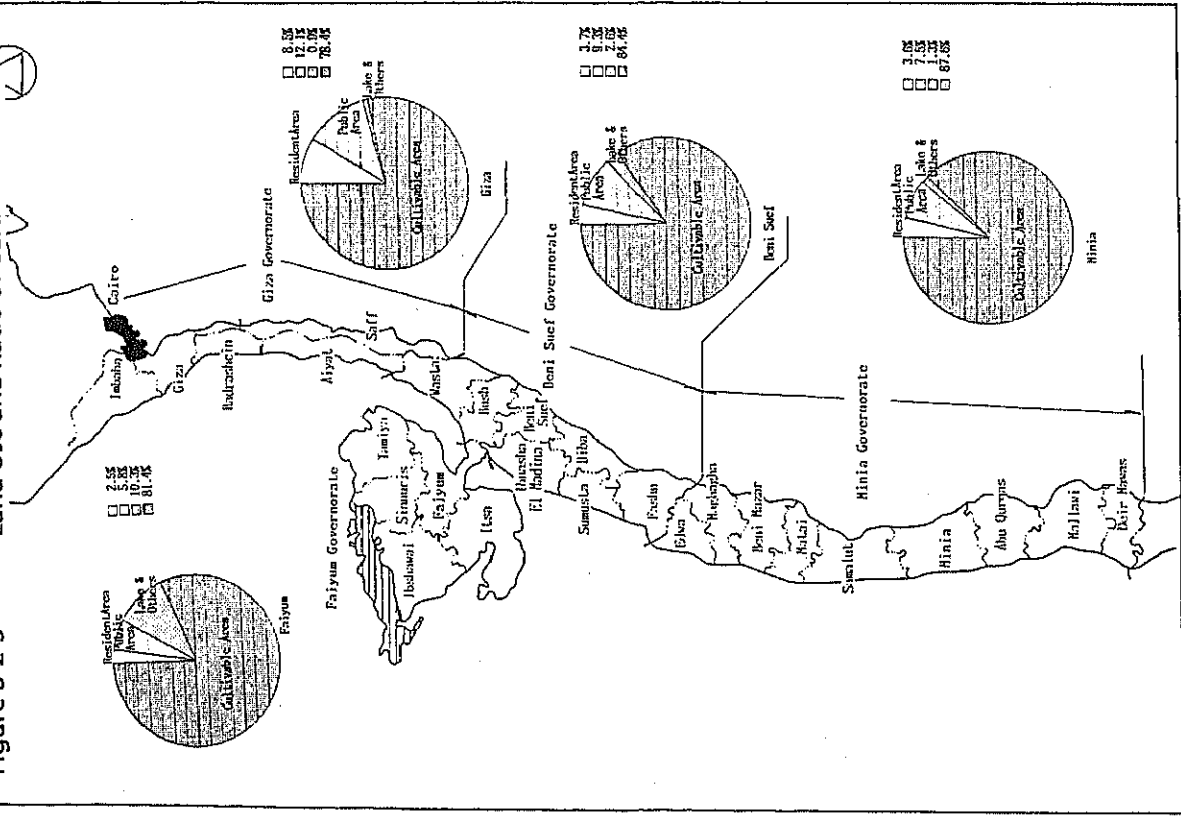
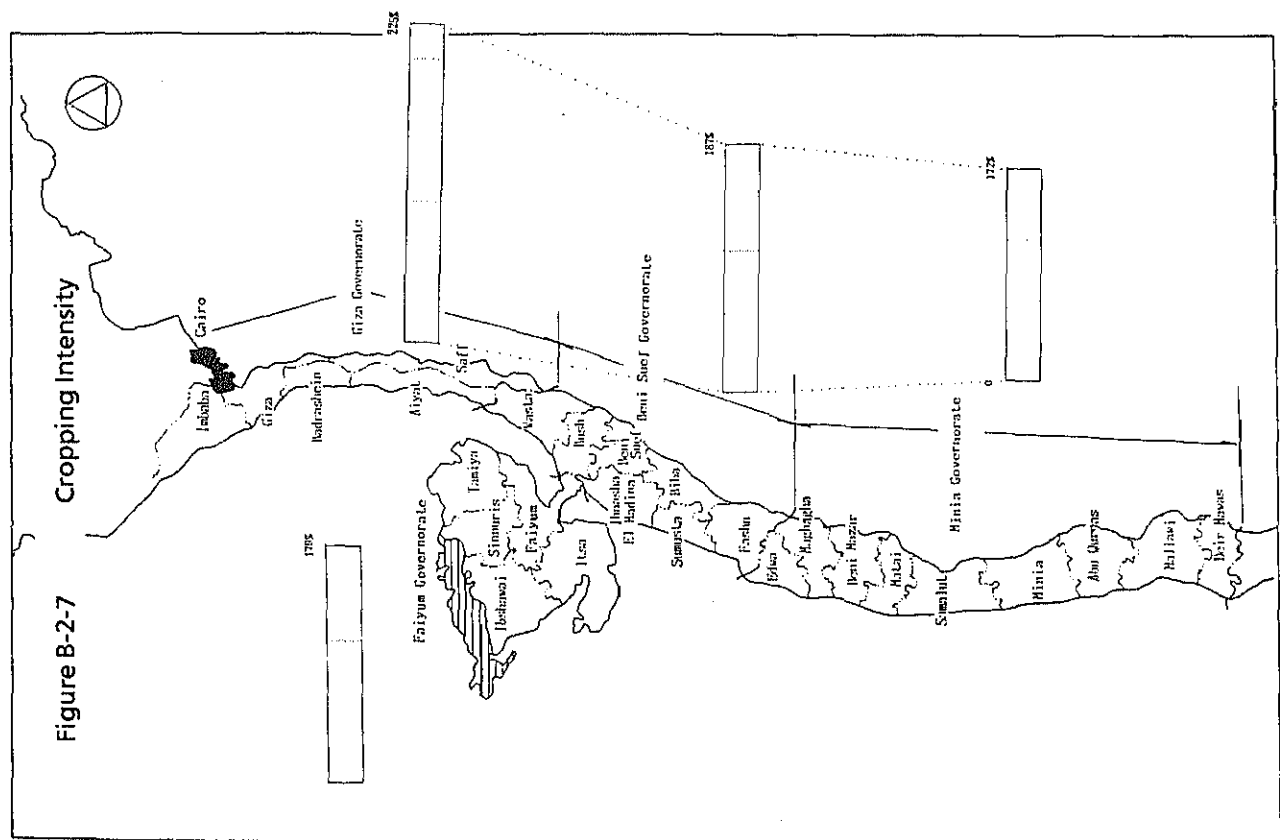
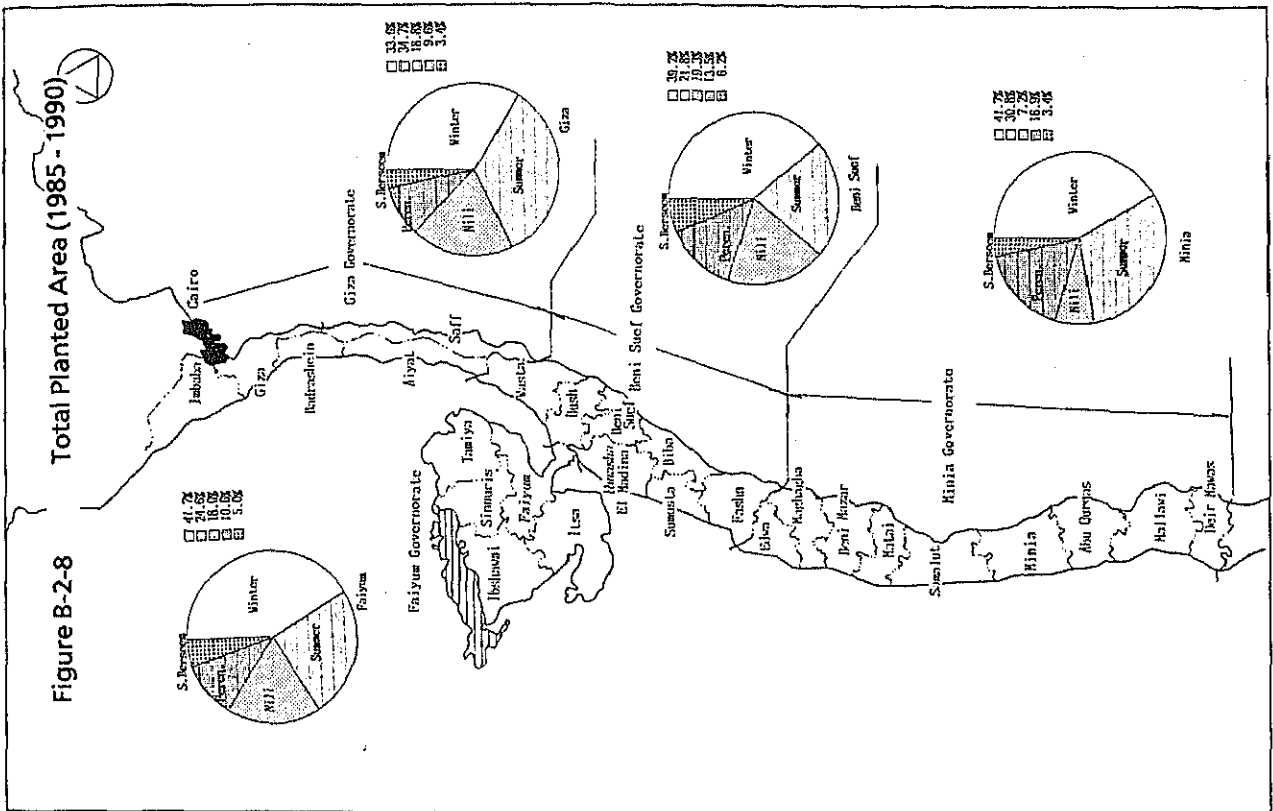
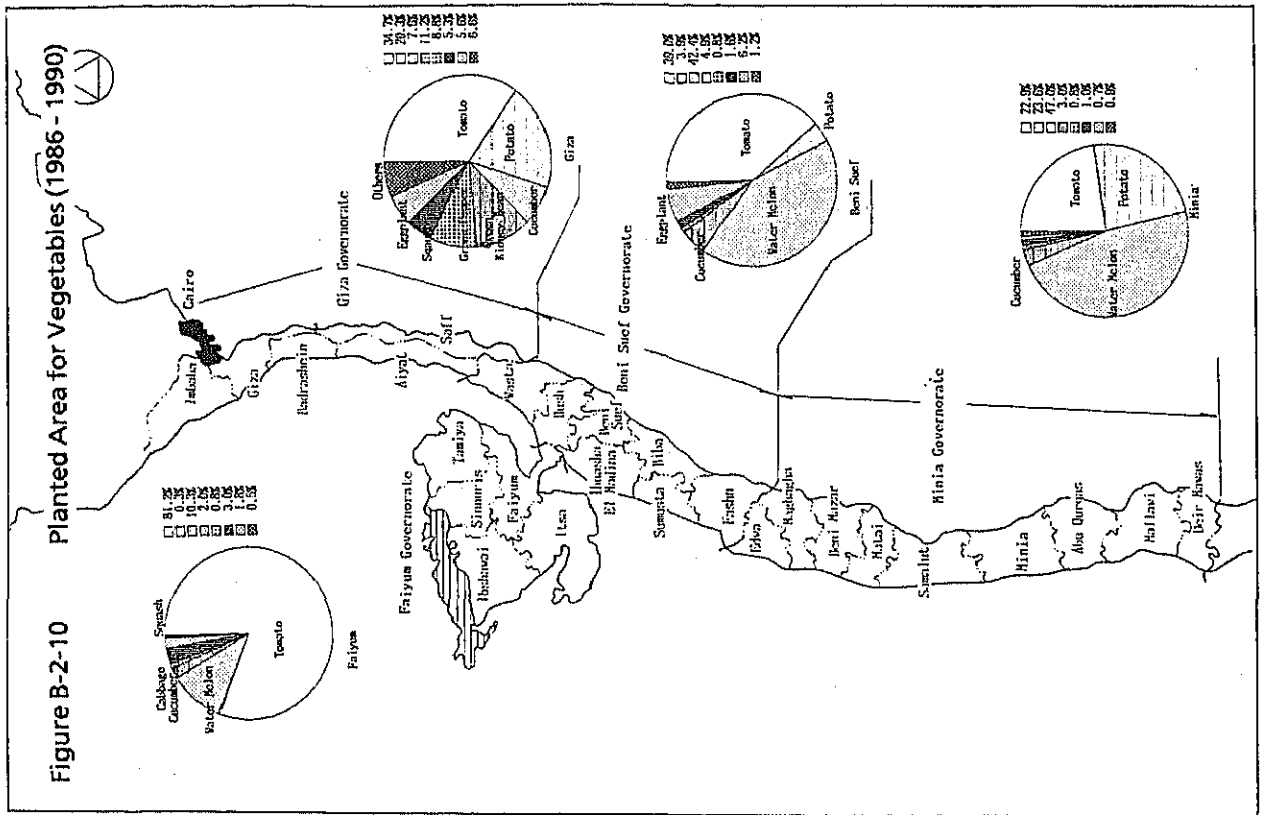
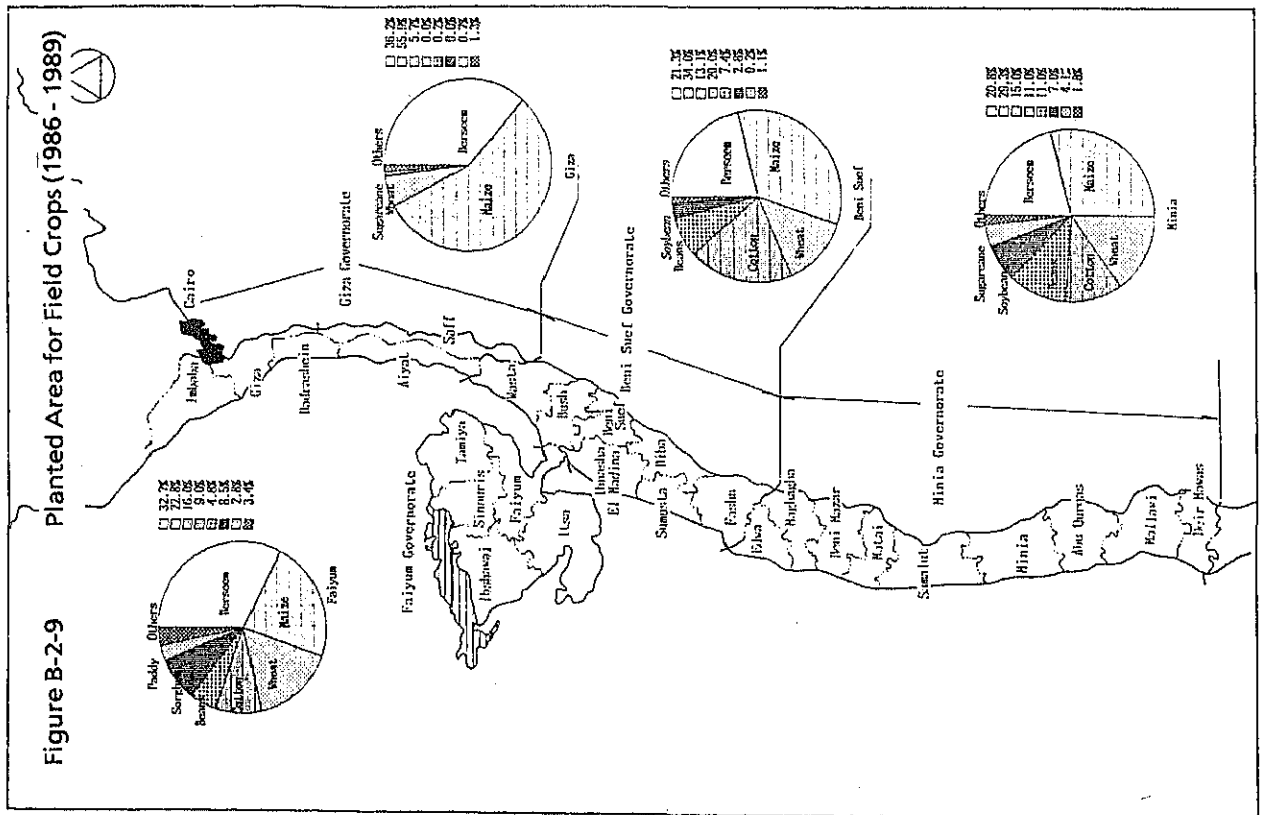
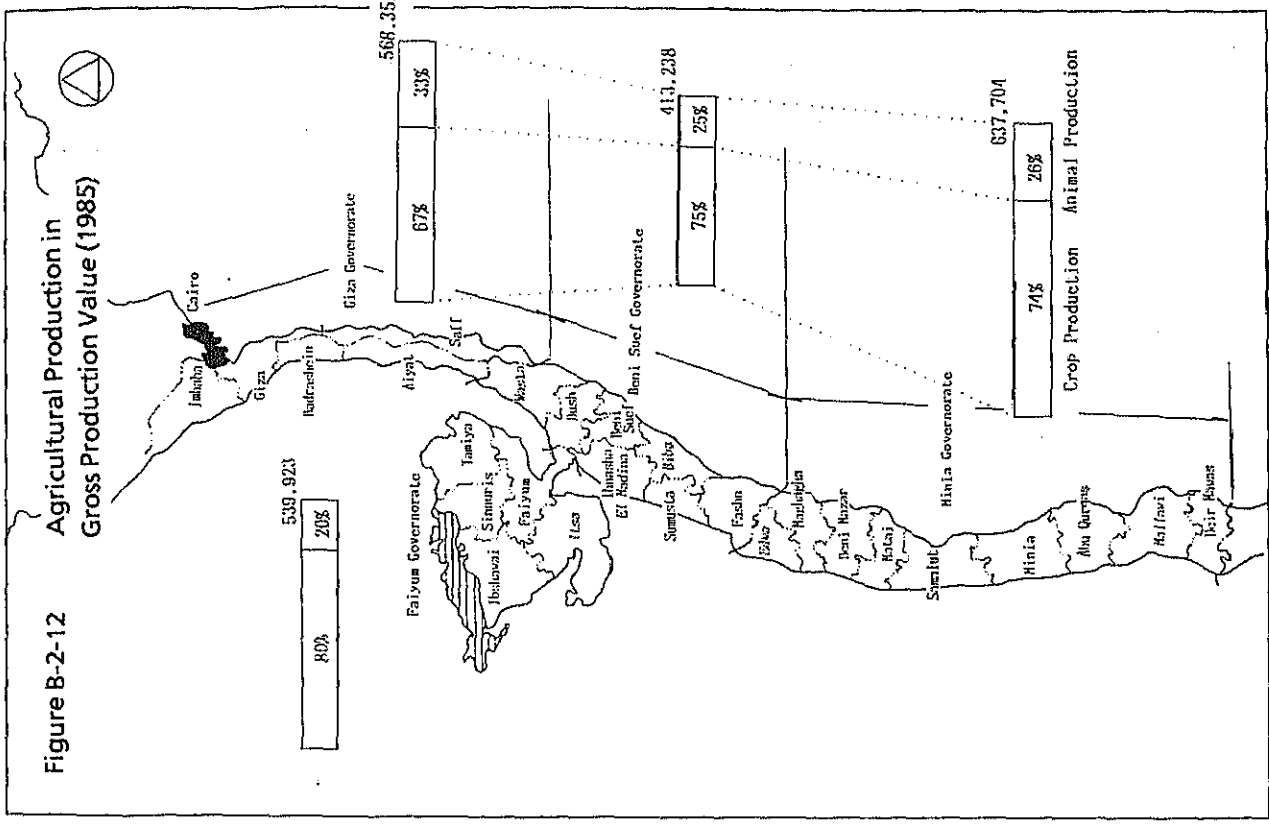
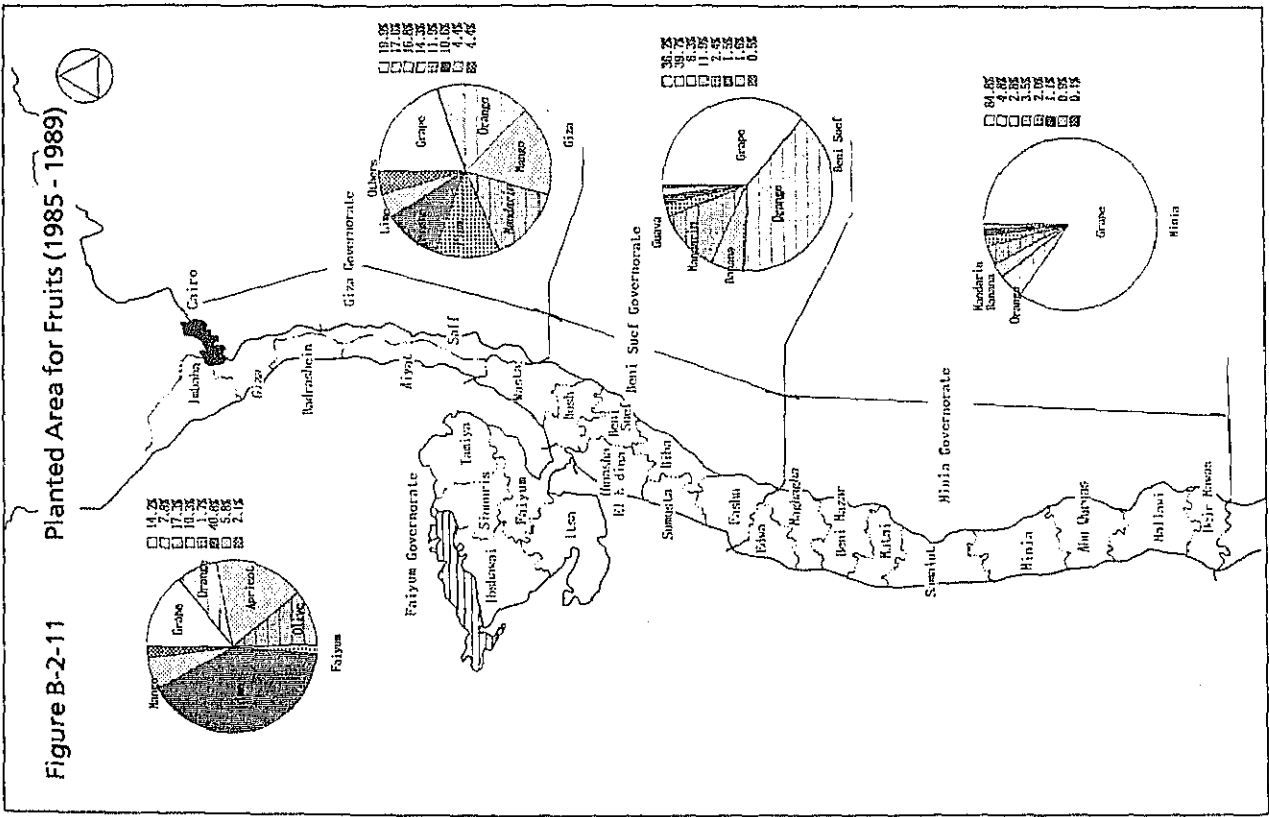


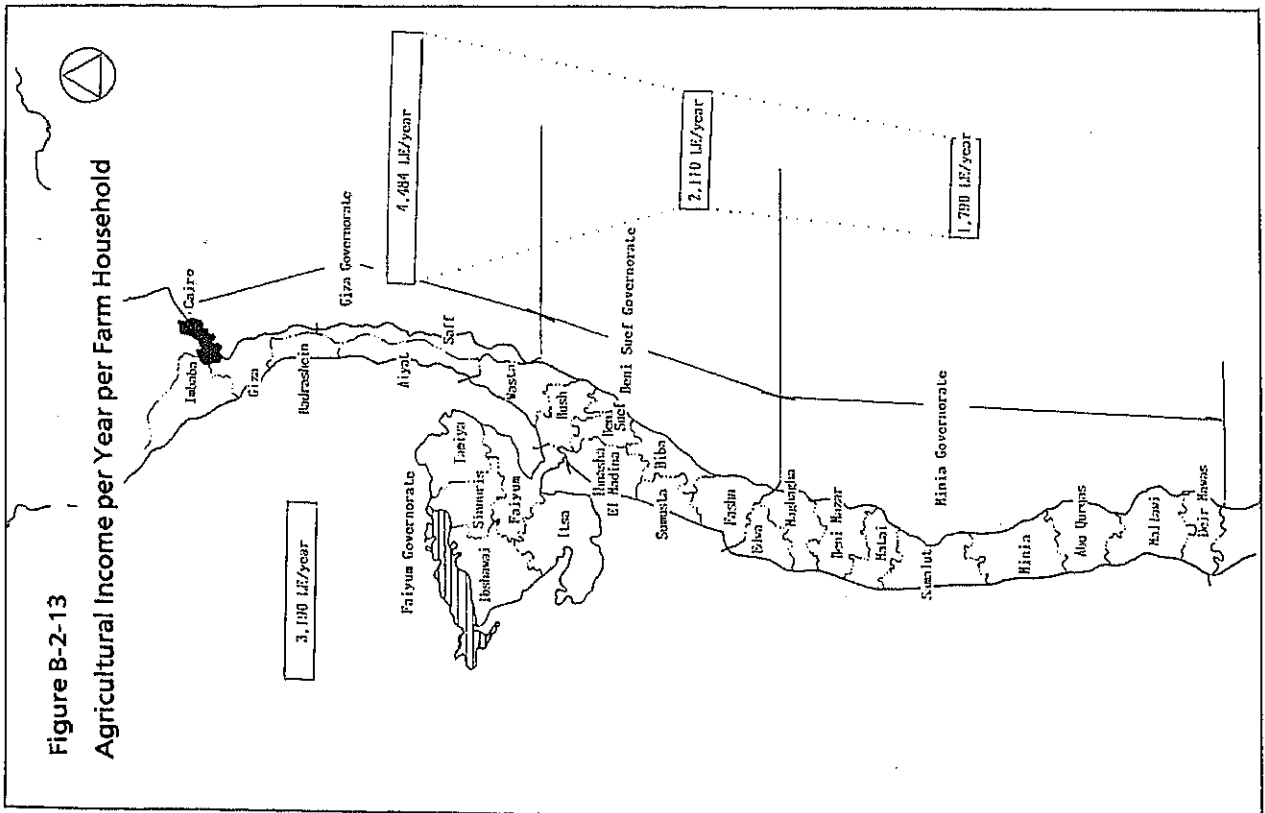
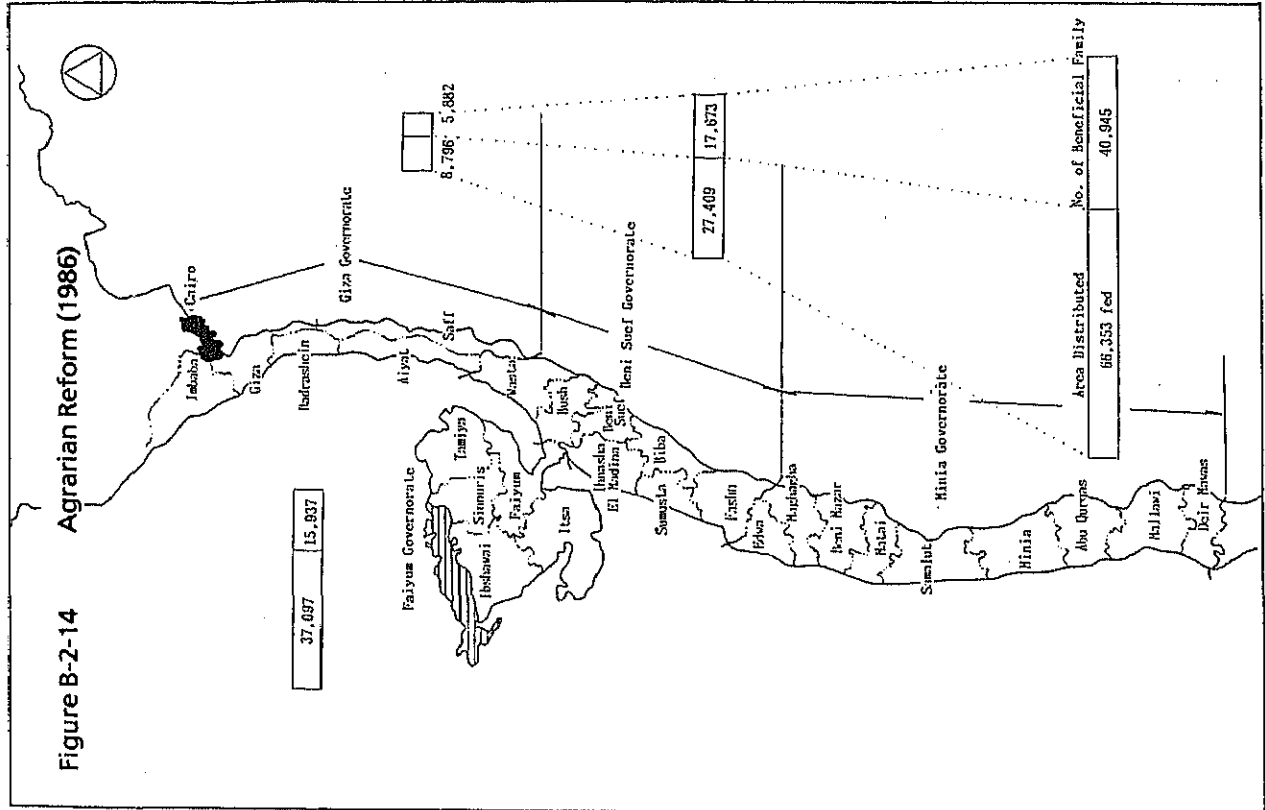
Figure B-2-5 Land Use and Ratio of Cultivable Area





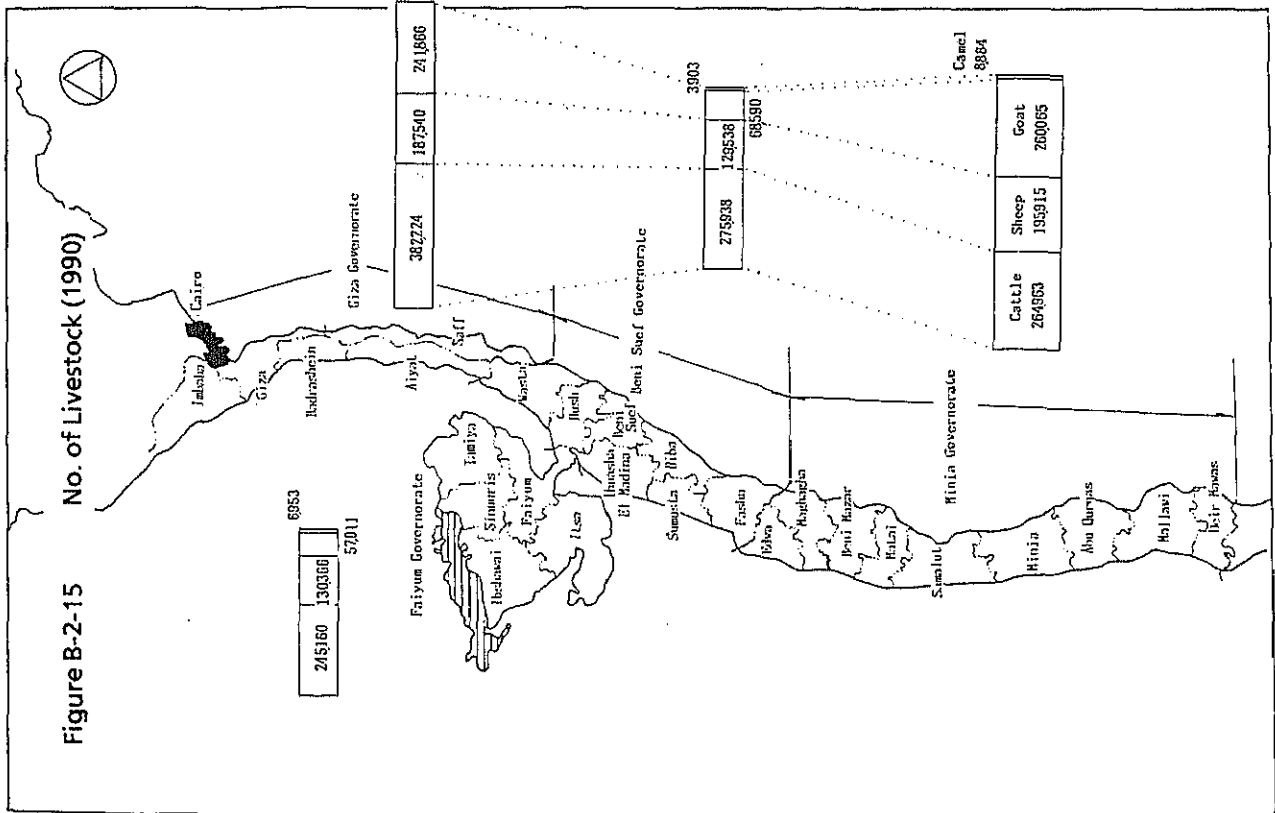








**Figure B-2-15**  
**No. of Livestock (1990)**



**Figure B-2-16**  
**No. of Agricultural Machinery (1986/87)**

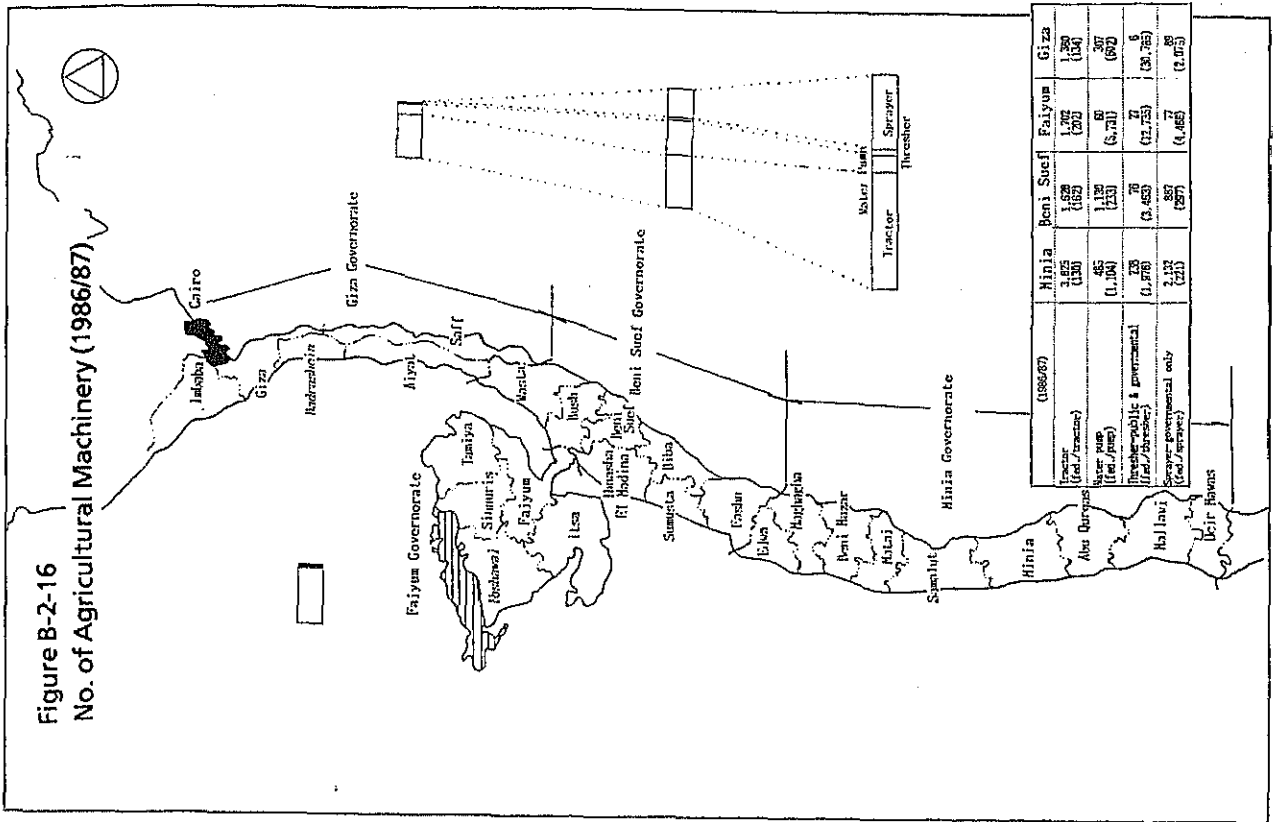


Figure B-2-18  
No. of Hospital, Length of Highway and Electrification

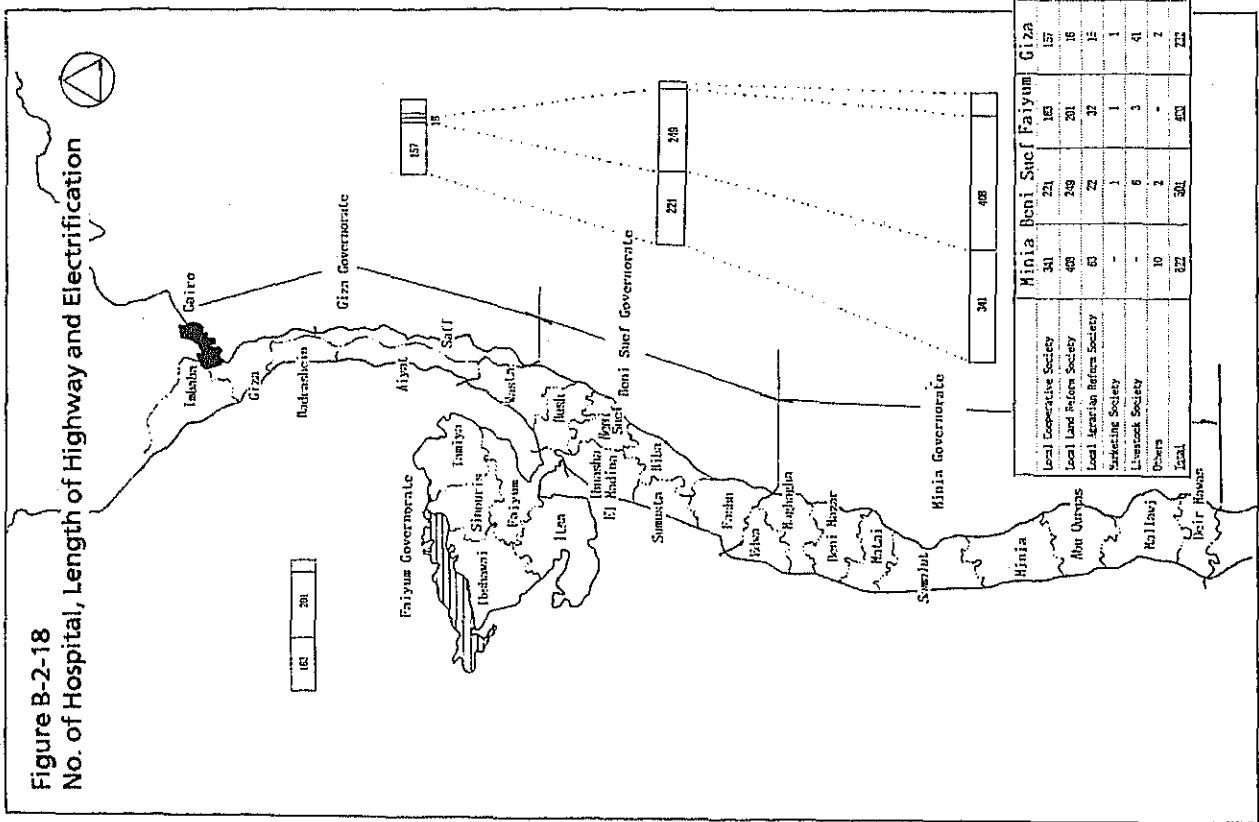
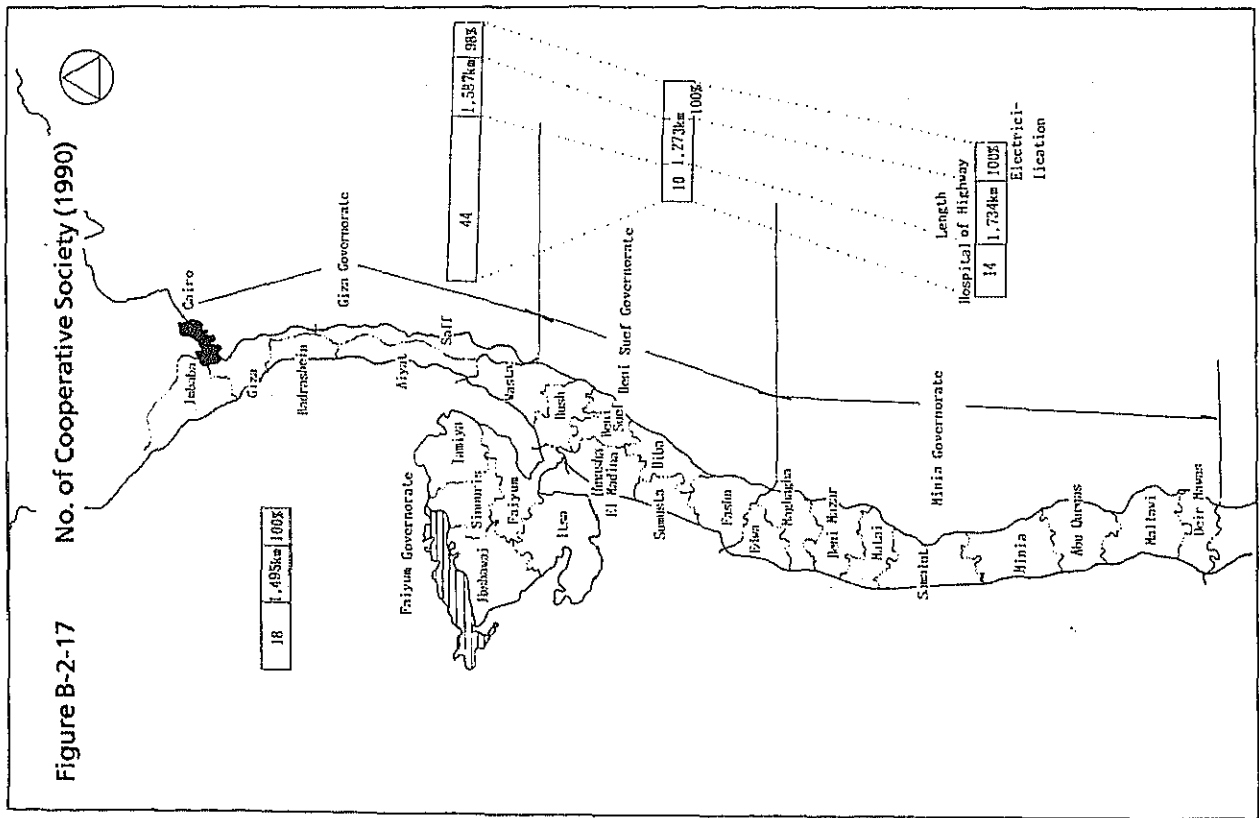


Figure B-2-17  
No. of Cooperative Society (1990)



## **APPENDIX C METEOROLOGY AND HYDROLOGY**

**C - 1 Meteorology**

**C - 2 Hydrology**



# C - 1 METEOROLOGY

## Table C-1-1 Mean Daily Temperature at Certain Stations

Station Name	Mean Daily Temperature in °C for												Annual
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Giza	11.2	12.5	15.4	19.2	23.3	26.0	26.9	26.7	24.3	22.0	18.0	13.2	19.9
Faiyum	11.6	13.2	16.1	20.4	25.1	27.2	28.1	28.0	25.6	23.2	18.7	13.5	20.9
Beni Suef	12.4	14.1	16.9	20.2	23.7	26.6	27.4	27.6	24.6	22.6	18.5	13.5	20.7
Minia	12.2	14.1	17.1	21.4	26.1	28.0	29.0	28.7	26.1	23.8	19.2	14.0	21.6
Assiout	11.7	13.3	17.1	22.2	26.6	28.8	29.4	29.1	26.5	23.8	18.6	13.6	21.7
Mean	11.8	13.4	16.5	20.7	25.0	27.3	28.2	28.0	25.4	23.1	18.6	13.6	21.0

(Source: Ireland, 1948; Ministry of War and Marine, Egypt, 1950; WMO 1974)

## Table C-1-2 Mean Daily Range of Temperature at Certain Stations

Station Name	Mean Daily Range of Temperature in °C for												Annual
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Giza	13.8	14.9	16.1	17.8	17.9	17.3	16.1	15.0	14.2	14.4	13.7	13.3	15.4
Faiyum	14.6	14.9	15.6	17.0	17.0	16.3	15.5	14.8	14.1	14.3	13.8	13.9	15.1
Beni Suef	14.3	15.4	16.8	18.1	18.2	17.7	16.3	15.1	15.1	14.7	14.6	13.8	15.8
Minia	13.8	14.5	15.8	17.1	17.0	16.3	15.2	14.4	13.0	12.7	12.8	12.9	14.6
Assiout	14.0	15.3	16.5	17.0	16.6	16.7	15.8	13.8	12.8	12.1	13.7	13.7	14.7
Mean	11.3	15.3	16.5	17.0	16.6	16.7	14.8	13.8	12.8	12.1	13.7	13.7	14.7

(Source: Ireland, 1948; Ministry of War and Marine, Egypt, 1950; WMO 1974)

## Table C-1-3 Reference Crop Evapotranspiration (Eto) for Different Regions of Egypt as Calculated by Modified Penman

Item	Region	(Unit: mm/day)												Annual
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Lower Egypt	EI Mansara	2.25	3.37	4.45	5.35	7.06	7.69	7.00	6.13	5.33	4.28	2.99	2.55	4.91
	Sakha	2.04	2.57	3.73	5.00	6.31	6.90	6.50	5.97	5.09	3.81	2.63	1.86	4.37
	Gimzeza	1.75	2.48	3.46	5.04	6.77	7.05	6.83	5.76	4.81	3.95	2.51	1.48	4.32
	Average	2.01	2.81	3.90	5.30	6.71	7.21	6.78	5.95	5.08	4.01	2.71	1.96	4.54
Middle Egypt	Giza	2.33	3.16	4.63	6.08	7.49	8.48	7.87	6.89	5.92	4.68	2.88	2.32	5.33
	Beni Suef	2.55	3.42	4.76	6.69	7.49	8.16	7.84	7.21	6.89	5.36	3.48	2.52	5.33
	EI Minia	2.42	3.20	4.58	6.19	7.19	7.90	7.68	7.09	5.97	4.79	3.22	2.32	5.21
	Mallawi	2.50	3.31	4.81	6.78	9.03	8.74	7.19	6.47	6.24	4.41	3.03	2.24	5.40
Average	2.45	3.27	4.69	6.43	7.80	8.32	7.64	6.91	6.25	4.81	3.15	2.35	5.34	
Upper Egypt	Assiout	3.51	4.75	6.49	8.40	10.12	11.00	9.90	9.54	8.67	6.39	4.74	3.37	7.84
	Shandaweel	3.24	5.65	5.89	7.53	9.14	9.62	8.56	8.23	7.45	5.04	3.89	3.16	6.46
	Kom Oubo	3.72	4.93	6.56	7.65	8.31	9.14	8.72	8.63	7.70	6.33	4.77	3.77	6.69
	Average	3.49	5.11	6.31	7.39	9.19	9.92	9.06	8.30	7.94	5.92	4.47	3.43	6.79

(Source: UNDP Report, 1981)

## Table C-1-4 Mean Monthly Relative Humidity at Certain Stations

Station Name	Mean Daily Relative Humidity (%)												Annual
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	
Giza	79	72	67	60	53	56	62	68	72	73	78	81	58
Faiyum	58	63	58	50	42	46	51	57	62	64	69	72	58
Minia	64	58	52	43	39	42	46	51	58	61	65	68	54
Mean	70	64	59	51	45	48	53	59	64	66	71	74	60

(Source: Ireland, 1948; Ministry of War and Marine, Egypt, 1950; WMO 1974)

## Table C-1-5 Monthly and Annual Mean Sky Cloudiness

Station Name	Amount of Cloudiness, in oktas for												Annual
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	
Giza	3.4	3.1	2.8	2.2	2.2	0.9	1.0	1.2	1.5	2.0	3.0	3.4	2.2
Faiyum	2.8	2.5	2.1	1.8	1.9	0.4	0.3	0.5	0.5	1.3	2.3	3.0	1.6
Beni Suef	1.2	1.1	0.7	0.9	0.4	0.2	0.5	0.3	0.4	0.6	0.6	1.2	0.7
Minia	1.9	1.8	1.6	1.2	1.4	0.2	0.2	0.2	0.3	1.1	1.7	2.3	1.2
Average	2.3	2.1	1.8	1.5	1.5	0.4	0.5	0.6	0.7	1.3	1.9	2.5	1.4

(Source: Ireland, 1948; Ministry of War and Marine, Egypt, 1950; WMO 1974)

## Table C-1-6 Meteorological Data of Middle Egypt

Month	Faiyum *				Beni Suef **				Minia ***			
	Rain- fall (mm)	Tempe- rature (°C)	Relative Humidity (%)	Rain- fall (mm)	Tempe- rature (°C)	Relative Humidity (%)	Rain- fall (mm)	Tempe- rature (°C)	Relative Humidity (%)	Rain- fall (mm)	Tempe- rature (°C)	Relative Humidity (%)
Jan.	0	12.8	68	0.5	11.8	64	0.3	11.9	58			
Feb.	2	14.3	65	2.7	13.8	57	1.4	13.3	53			
Mar.	1	17.6	59	1.8	16.6	52	0.4	16.6	48			
Apr.	1	21.6	55	1.3	20.7	47	0.5	21.2	41			
May	1	25.6	52	0.0	25.6	41	0.7	25.6	36			
Jun.	0	28.9	53	0.0	27.6	44	0.0	27.8	40			
Jul.	0	29.5	55	0.0	28.6	50	0.0	28.5	45			
Aug.	0	30.0	56	0.0	28.3	55	0.0	28.3	50			
Sept.	0	27.5	61	0.0	26.6	60	0.1	26.6	55			
Oct.	0	24.6	63	0.1	24.4	60	0.7	23.2	55			
Nov.	1	20.0	67	0.2	18.4	66	0.2	18.4	60			
Dec.	3	14.6	70	4.7	13.2	70	0.8	14.5	62			
Mean	9	22.2	60	11.3	21.3	56	5.1	21.2	50			

Source: \* S/PW Report, 1990.

\*\* Irrigation Pumping Study in Middle and Upper Egypt, May 1977.

\*\*\* Hydrology of the Nile Basin, 1985, The Netherlands.

**Table C-1-7 Maximum Daily Rainfall as Observed in the Study Area**

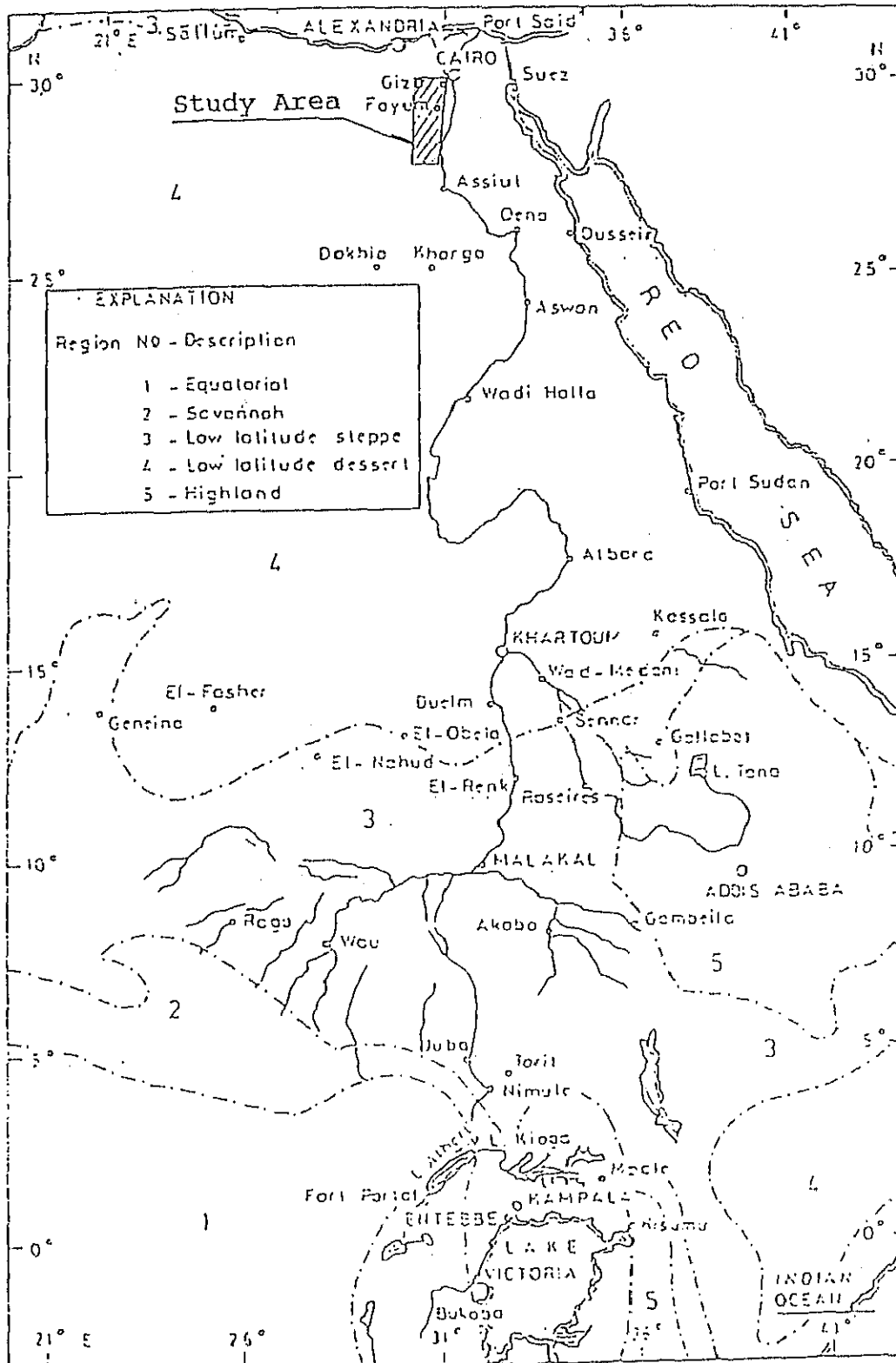
Station	Period of Observation	Maximum Rainfall in a Day
Giza	1931-1967	53 mm
Faiyum	1931-1967	44
Beni Suet	1946-1967	17
Minia	1941-1967	10
Assiout	1946-1967	3

**Table C-1-8 Estimated Annual Rainfall for Given Return Period at Some of the Rain-Gauging Stations in the Study Area (Shahin, M.M., 1983)**

Station	Distribution Function	Annual Rainfall in mm, for Return Peroid (year)						
		1.01	2	5	10	20	50	100
Giza	Pearson III	0	22	33	41	47	55	60
Faiyum	Pearson III	0	9	22	32	41	55	65
Minia	Pearson III	-	1	6	10	14	19	22

(Source: Hydrology of the Nile Basin, 1985, The Netherlands)

Figure C-1-1 Meteorological Region to the Nile Basin



(Source: Hydrology of the Nile Basin, 1985, The Netherlands)

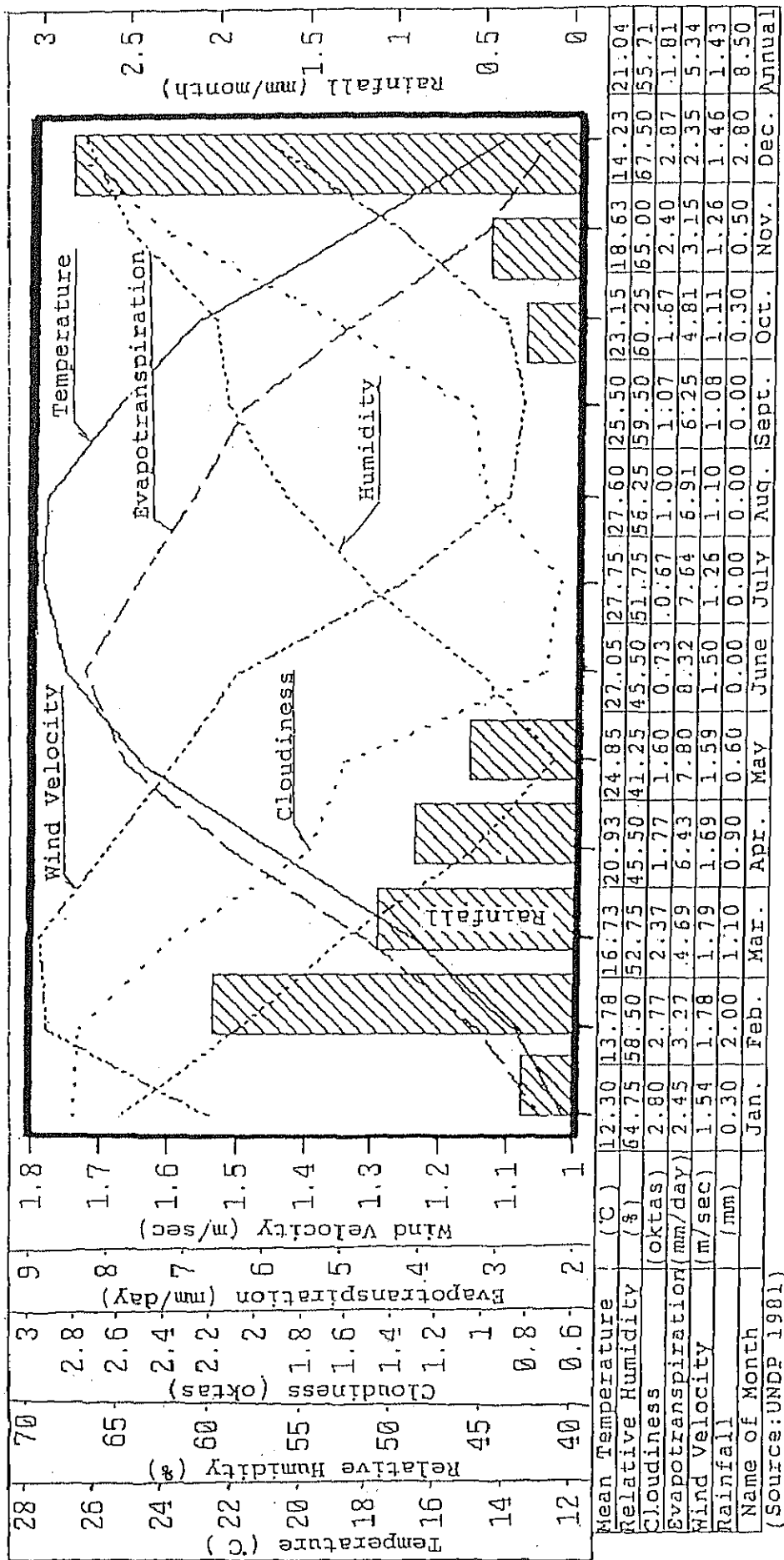


Figure C-1-2 Climate in the Study Area

(Source: UNDP 1981)



# C-2 HYDROLOGY

**Table C-2-1 Annual Discharge Records of the Four Regulators**

Year	Sakoula Regulator	Bahr Yusuf Intake	Bairout Regulator	Assiout Barrage
1990	13.80	18.15	16.00	38.60
1989	-	17.25	15.00	37.00
1988	15.30	17.70	15.50	37.00
1987	-	16.00	15.50	36.00
1986	-	16.65	15.40	35.00
1985	-	16.35	15.30	35.00
1984	-	16.00	16.20	35.55
1983	-	17.30	15.40	36.00
1982	-	17.70	15.30	37.00
1981	-	17.75	17.15	37.50

(Unit: million m<sup>3</sup>)

**Table C-2-2 D. S. Aswan Released Water**

Year	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total
1965/1966	5.57	6.36	6.38	6.35	12.60	10.80	7.76	4.58	3.81	3.20	3.50	5.35	79.36
1966/1967	4.75	6.60	6.96	5.65	8.67	7.14	3.19	3.42	2.74	3.39	3.89	4.56	60.96
1967/1968	4.48	5.87	6.62	8.32	7.10	12.70	5.59	4.67	3.28	4.23	4.06	3.70	71.22
1968/1969	4.78	5.35	6.66	6.10	4.17	3.80	3.33	3.24	2.90	3.70	3.97	3.66	51.72
1969/1970	4.87	6.57	7.71	6.07	4.20	3.81	3.64	3.39	3.06	3.98	4.99	3.92	56.21
1970/1971	5.42	6.52	6.72	6.11	4.29	3.75	3.60	3.25	3.55	3.79	4.28	3.94	55.22
1971/1972	5.48	6.49	6.97	6.22	4.85	3.78	3.67	3.30	3.43	4.02	4.24	4.04	56.49
1972/1973	5.30	6.54	7.00	6.30	4.24	4.74	3.62	3.02	3.52	3.52	4.38	4.00	56.28
1973/1974	5.26	6.59	7.00	6.38	4.23	3.85	3.93	3.58	2.82	3.96	4.54	4.12	56.26
1974/1975	5.24	6.62	7.02	6.26	4.03	3.91	4.06	3.51	3.19	3.86	4.53	4.19	56.42
1975/1976	5.08	6.42	6.74	5.64	3.88	3.69	3.72	3.48	3.54	3.59	4.02	3.89	53.69
1976/1977	4.82	6.27	6.69	5.88	4.03	4.03	3.93	4.03	3.91	3.66	4.59	4.08	55.92
1977/1978	4.86	6.45	6.66	5.84	4.16	4.34	4.19	4.91	4.45	4.32	5.23	5.40	60.81
1978/1979	5.66	6.32	6.93	5.86	4.50	4.50	4.49	4.49	3.83	4.31	4.60	4.35	59.84
1979/1980	5.20	6.55	7.05	4.94	4.56	4.03	3.80	3.83	3.53	4.03	4.41	4.14	56.07
1980/1981	5.03	6.43	7.02	5.98	4.45	3.91	3.90	3.62	3.93	3.62	4.43	4.11	56.71
1981/1982	4.92	6.40	7.06	6.06	4.56	4.34	4.20	4.34	4.34	4.03	4.48	4.22	58.95
1982/1983	5.04	6.48	6.91	6.11	5.56	4.34	4.20	4.34	4.36	3.92	4.91	4.31	61.48
1983/1984	4.77	6.51	6.90	6.22	4.43	4.05	3.89	3.86	3.81	4.11	4.34	5.60	58.49
1984/1985	4.81	6.51	6.90	6.15	4.60	4.50	3.75	3.66	3.21	4.04	3.96	4.07	56.16
1985/1986	4.89	6.58	6.89	6.13	4.51	4.17	3.73	3.68	3.08	3.82	4.02	4.02	55.62
1986/1987	4.79	6.34	6.73	6.13	4.56	4.08	3.48	3.57	2.90	3.75	3.94	4.05	54.82
1987/1988	4.97	6.94	6.82	6.18	4.57	3.79	3.27	3.24	2.53	3.42	3.69	3.97	53.39
1988/1989	4.86	6.72	6.65	5.96	4.38	3.64	3.24	3.12	2.49	3.22	3.95	4.08	52.31
1989/1990	5.11	7.18	6.97	6.14	4.39	3.39	3.22	3.10	2.50	3.46	4.10	4.20	53.76
1990/1991	5.48	7.15	6.86	6.18	4.34	3.44	3.21	3.06	2.30	3.45	4.10	4.18	53.75
Recent	Max	5.66	7.18	7.71	6.38	6.56	4.74	4.49	4.91	4.45	4.32	5.23	5.60
23	Min	4.77	5.35	6.65	4.94	3.88	3.39	3.21	3.02	2.30	3.22	3.69	3.66
Years	Mean	5.07	6.54	6.91	6.04	4.46	3.99	3.74	3.65	3.35	3.82	4.33	4.20
Recent	Max	5.66	7.18	7.06	6.38	6.56	4.74	4.49	4.91	4.45	4.32	5.23	5.60
20	Min	4.77	6.27	6.65	4.94	3.88	3.39	3.21	3.02	2.30	3.22	3.69	3.69
Years	Mean	5.08	6.60	6.89	6.03	4.49	4.03	3.78	3.70	3.37	3.82	4.32	4.25
Recent	Max	5.48	7.18	7.06	6.22	6.56	4.50	4.20	4.34	4.36	4.11	4.91	5.50
10	Min	4.77	6.40	6.65	5.96	4.34	3.39	3.21	3.06	2.30	3.22	3.69	3.97
Years	Mean	4.96	6.74	6.87	6.13	4.63	3.97	3.62	3.60	3.15	3.72	4.15	4.27

Note: The broken line means the boundary of before and after High Aswan Dam.  
Source: Planning Department, Giza, MPWR, 1991

Table C-2-3 (Cont'd)

(Unit: million m<sup>3</sup>)

Date	1990												1991		
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.			
1	18.400	18.775	17.150	10.227	10.537	8.645	10.302	5.000	11.337	11.051	10.830				
2	18.400	18.775	16.525	9.815	10.537	8.832	8.747	7.500	11.564	11.288	10.330				
3	18.400	18.400	15.964	9.815	10.287	8.832	3.882	8.750	11.564	11.455	9.860				
4	18.400	17.775	15.652	8.915	10.037	8.832	3.203	11.162	10.939	11.705	9.860				
5	17.975	17.775	14.905	8.790	10.937	8.834	2.000	11.080	10.877	11.705	9.860				
6	18.400	17.775	14.905	9.290	10.537	9.082	1.500	11.000	10.502	11.705	9.860				
7	18.400	17.775	15.155	9.477	10.537	9.082	0.500	10.625	10.502	11.705	9.860				
8	18.400	17.775	15.155	9.850	10.443	9.186	0.000	10.625	9.752	11.705	10.080				
9	18.400	18.150	14.711	10.288	10.443	8.749	0.000	10.625	9.752	11.455	10.080				
10	18.400	18.350	14.467	10.662	10.130	8.495	0.000	10.875	9.669	11.455	10.080				
11	18.400	18.600	13.967	10.662	10.192	8.374	0.000	11.575	9.669	11.455	10.080				
12	18.400	18.538	13.967	10.662	10.005	8.124	0.000	12.374	9.669	11.455	10.580				
13	18.650	18.538	13.405	10.662	9.880	8.124	0.000	12.749	9.669	11.455	11.580				
14	18.650	18.538	12.780	11.029	9.755	8.311	0.000	13.495	9.919	11.455	11.580				
15	18.650	18.664	12.405	11.473	9.630	8.061	0.000	13.499	10.169	11.335	11.955				
16	18.650	18.664	12.655	11.473	9.457	8.248	0.000	13.499	10.856	11.335	11.955				
17	18.650	18.664	12.655	12.410	9.020	8.248	0.000	13.874	11.856	11.335	12.580				
18	18.400	18.664	12.468	12.410	9.020	8.248	0.000	13.874	11.856	11.335	12.580				
19	18.400	18.384	12.468	11.785	9.145	8.061	0.000	13.874	12.056	11.335	12.892				
20	18.400	18.664	12.281	11.785	9.145	7.811	0.000	13.433	12.056	11.335	12.892				
21	18.400	18.538	12.281	11.785	8.745	7.811	0.000	13.874	12.256	11.080	12.892				
22	18.400	18.538	12.468	11.780	8.745	7.249	0.000	13.000	11.856	11.080	12.892				
23	18.400	18.538	12.468	11.348	7.145	7.499	0.000	13.000	11.731	11.080					
24	18.400	18.338	12.468	11.348	7.645	8.124	0.000	12.500	11.544	11.080					
25	18.400	18.338	12.468	11.348	8.020	8.747	0.000	12.250	11.544	11.080					
26	18.400	18.850	11.985	11.848	8.020	8.497	0.000	11.377	11.144	11.080					
27	18.400	17.900	11.601	11.065	8.332	10.305	0.000	11.377	11.144	10.830					
28	18.650	17.607	11.227	10.662	8.332	10.305	0.000	11.377	11.144	11.080					
29	18.650	17.650	10.727	10.662	8.332	10.305	0.000	10.894	10.894	11.080					
30	18.650	17.650	10.727	10.662	8.645	10.305	0.000	10.894	10.894	11.080					
31	18.650	17.400	-	10.662	-	10.305	0.000	10.894	-	-	-				
Total	572.225	566.570	492.660	334.650	280.735	269.631	30.134	328.163	339.278	339.619	245.153				

(Source: Minia Irrigation Directorate, El Minia, 1991)

Table C-2-3 Daily Discharge Records at Bahr Yusef Intake

(Unit: million m<sup>3</sup>)

Date	1989												1990		
	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.			
1	16.750	16.750	15.700	10.400	10.650	8.000	7.500	4.000	13.500	11.972	12.575	13.400			
2	16.250	16.750	14.155	10.900	11.150	7.750	6.500	5.000	13.000	11.972	12.575	13.400			
3	16.250	16.750	14.155	10.900	10.900	8.000	5.000	7.300	12.750	11.972	12.575	13.650			
4	16.750	17.000	14.155	10.900	10.900	7.750	3.000	10.310	12.300	11.972	12.575	14.110			
5	16.750	16.750	13.650	10.400	10.900	7.750	1.000	11.300	12.300	11.972	12.575	14.372			
6	16.750	16.750	13.150	9.400	10.900	7.750	1.000	11.500	12.300	11.972	12.575	14.372			
7	16.750	17.000	13.150	9.400	10.900	7.750	0.000	12.000	12.300	11.972	12.575	14.372			
8	16.750	17.250	12.650	8.900	10.900	7.500	0.000	11.750	12.050	11.972	13.075	14.372			
9	16.900	17.000	12.900	9.400	10.900	7.500	0.000	11.500	12.050	12.160	12.825	15.372			
10	16.900	16.750	12.900	8.900	10.900	7.500	0.000	11.500	12.050	12.160	12.825	15.372			
11	16.350	16.700	12.900	8.900	10.400	7.500	0.000	11.500	12.050	12.160	12.825	15.372			
12	16.350	17.000	12.900	9.400	10.400	7.600	0.000	11.500	11.650	12.160	12.825	15.372			
13	17.000	17.000	12.900	9.400	10.400	6.950	0.000	11.000	12.150	12.200	12.575	16.875			
14	17.000	16.750	12.900	10.150	9.700	6.950	0.000	12.000	12.150	11.972	12.825	16.875			
15	17.000	17.000	12.150	10.150	9.500	6.950	0.000	12.500	12.150	11.972	12.575	17.372			
16	17.000	17.000	12.150	10.150	9.250	6.800	0.000	12.250	12.150	11.972	12.575	17.372			
17	16.400	17.250	12.400	9.650	8.750	6.850	0.000	12.250	12.150	11.972	12.700	17.452			
18	16.650	17.500	12.400	9.650	8.500	6.000	0.000	12.000	12.150	11.972	12.700	17.452			
19	16.900	17.375	12.400	10.400	8.500	6.000	0.000	12.500	12.150	11.722	12.770	17.952			
20	16.900	17.050	12.400	10.150	8.500	6.000	0.000	13.000	12.150	11.972	12.824	17.952			
21	16.900	17.050	11.900	10.150	8.500	5.500	0.000	13.500	12.150	11.979	13.134	18.400			
22	17.000	16.900	11.650	10.150	7.000	5.500	0.000	13.750	12.400	12.222	13.134	18.400			
23	17.250	16.800	11.900	10.400	7.000	5.500	0.000	13.750	12.400	12.222	13.134	18.400			
24	17.250	16.800	11.650	10.400	7.000	5.500	0.000	14.000	12.400	12.222	13.134	18.400			
25	17.250	16.800	11.400	10.400	7.500	6.500	0.000	14.000	12.900	12.222	13.500	18.400			
26	17.250	16.300	11.400	10.400	8.000	7.500	0.000	14.000	13.150	12.222	13.500	18.400			
27	17.000	16.300	11.400	10.400	8.500	7.500	0.000	14.000	13.150	12.222	13.500	17.980			
28	17.250	16.175	10.900	10.650	8.250	7.500	0.000	14.000	12.850	12.222	13.750	18.100			
29	16.750	15.055	10.900	10.650	8.000	7.500	0.000	14.000	12.850	12.222	13.750	18.350			
30	17.000	15.805	9.900	10.650	8.000	7.500	0.000	14.000	12.432	12.575	13.500	18.350			
31	17.000	16.050	-	10.650	-	8.000	2.000	12.555	-	-	13.200	-			
Total	521.350	519.310	375.065	312.900	280.650	218.850	26.000	327.680	384.437	352.500	401.180	456.018			

(Source: Minia Irrigation Directorate, El Minia, 1991)

**Table C-2-4 Discharge at Sakoula Regulator**

(Unit: million m<sup>3</sup>)

Date	1989																							
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June												
1	14.100	-	13.850	10.550	8.800	6.700	0.000	0.000	10.200	9.150	9.850	10.550												
2	14.100	-	13.850	10.550	9.150	6.700	0.000	0.000	10.200	9.150	9.850	10.550												
3	14.100	-	13.850	10.250	9.150	6.700	0.000	-	10.200	9.500	9.850	10.550												
4	14.100	-	13.500	7.640	9.500	6.700	0.000	-	9.500	9.640	9.850	10.550												
5	14.100	-	13.200	10.200	8.800	6.350	0.000	-	9.500	9.640	9.850	10.550												
6	14.100	-	13.200	10.200	8.800	6.000	0.000	-	9.500	9.640	9.850	10.550												
7	14.400	-	13.200	9.850	8.800	6.000	0.000	-	9.500	9.640	9.850	11.250												
8	14.400	-	12.900	9.500	8.800	5.650	0.000	-	9.500	9.640	9.850	11.250												
9	14.700	-	12.600	8.800	8.800	5.650	0.000	-	9.850	9.640	9.850	11.250												
10	14.700	-	12.720	8.800	8.800	5.650	0.000	-	9.500	9.640	9.850	11.250												
11	14.700	-	12.900	8.800	8.800	-	0.000	-	9.500	9.640	9.850	10.840												
12	14.700	-	12.400	8.400	8.800	-	0.000	-	9.500	9.640	9.850	11.740												
13	14.700	-	11.600	8.400	8.800	5.300	0.000	-	9.290	9.500	9.150	-												
14	14.700	-	11.600	8.400	8.800	5.300	0.000	-	9.290	9.500	9.150	-												
15	14.100	-	11.600	8.800	8.100	5.300	0.000	-	9.290	9.500	9.150	12.400												
16	-	15.000	11.600	8.800	7.750	5.300	0.000	8.100	9.150	9.500	9.150	12.510												
17	-	15.000	11.600	8.800	7.750	5.300	0.000	8.800	9.150	9.500	9.500	12.750												
18	-	15.000	11.600	8.450	7.750	5.300	0.000	8.800	8.800	9.500	9.850	13.900												
19	-	15.000	11.600	8.450	7.750	5.300	0.000	8.800	8.800	9.500	9.850	13.900												
20	-	15.000	11.600	8.800	7.750	5.300	0.000	8.800	8.800	9.290	9.850	13.140												
21	-	15.000	11.600	8.800	7.750	5.300	0.000	8.800	9.150	9.150	10.200	13.140												
22	-	14.700	11.600	8.800	7.750	5.300	0.000	9.150	9.300	9.150	10.200	13.900												
23	-	14.700	11.390	8.800	7.750	5.300	0.000	9.150	9.500	9.640	10.200	14.305												
24	-	14.700	11.600	8.800	7.750	5.300	0.000	9.150	9.500	9.850	10.200	13.205												
25	-	14.700	11.250	8.800	7.450	5.300	0.000	9.150	9.710	9.850	10.200	-												
26	-	14.700	11.250	8.800	7.050	5.300	0.000	10.200	9.850	9.850	10.200	13.500												
27	-	14.700	10.950	8.800	7.050	5.300	0.000	10.200	9.500	9.850	10.200	-												
28	-	14.700	10.900	8.800	7.050	5.300	0.000	10.200	9.500	9.850	10.200	-												
29	-	14.400	10.900	8.800	7.050	5.300	0.000	-	9.500	9.850	10.200	-												
30	-	14.400	10.550	8.800	6.700	5.300	0.000	-	9.150	9.850	10.550	-												
31	-	14.400	-	8.800	-	5.300	0.000	-	9.150	-	10.550	-												
Total													215.700	236.100	357.950	279.240	244.450	182.600	0.000	119.300	292.850	287.240	306.750	277.630

[Source: Minia Irrigation Directorate, El Minia, 1991]

**Table C-2-4 (Cont'd)**

(Unit: million m<sup>3</sup>)

Date	1990																						
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May												
1	13.000	14.400	13.500	9.500	-	7.050	7.050	0.000	9.250	-	8.750												
2	13.000	14.400	12.900	9.500	8.450	7.050	7.050	-	9.250	8.550	8.750												
3	13.500	14.400	12.900	9.150	8.450	7.050	7.050	-	9.250	8.550	8.750												
4	13.500	14.400	12.900	7.640	8.450	7.050	7.050	-	9.250	8.550	8.750												
5	13.500	14.400	12.900	7.459	8.450	7.050	7.050	-	9.250	8.550	8.750												
6	13.870	14.100	12.300	8.100	8.310	7.700	0.000	-	7.900	8.550	8.750												
7	13.800	14.100	11.950	8.100	8.310	6.700	0.000	-	7.900	8.550	8.750												
8	13.800	14.100	11.740	8.100	8.100	6.350	0.000	-	-	8.550	8.750												
9	14.100	14.100	11.250	8.100	7.150	6.350	0.000	-	-	8.550	8.750												
10	14.100	14.100	-	8.100	7.750	6.350	0.000	-	-	8.200	8.750												
11	13.920	14.100	-	8.100	7.750	6.350	0.000	-	-	8.200	8.750												
12	14.040	14.100	-	8.100	7.400	6.350	0.000	-	-	8.200	8.750												
13	13.920	14.100	-	8.100	7.400	6.350	0.000	-	-	8.200	8.750												
14	14.040	14.160	-	8.450	7.400	6.350	0.000	-	-	8.200	8.750												
15	14.270	14.400	-	9.150	7.400	6.350	0.000	-	-	-	8.750												
16	14.280	14.400	10.900	9.150	7.400	6.350	0.000	-	-	8.750	8.550												
17	14.140	14.400	-	9.150	7.400	6.000	0.000	-	-	8.750	8.950												
18	14.400	14.100	-	9.150	7.400	6.000	0.000	-	-	8.750	9.300												
19	-	14.100	10.200	9.150	7.400	6.000	0.000	-	-	8.250	9.600												
20	-	14.100	10.200	9.150	7.400	6.000	0.000	-	-	8.250	9.950												
21	-	14.100	9.850	9.150	7.400	6.000	0.000	-	-	8.550	9.950												
22	-	14.280	9.850	9.150	7.400	6.000	0.000	9.150	-	8.550	9.950												
23	-	14.280	9.850	9.150	7.050	6.000	0.000	9.150	-	8.550	-												
24	-	14.280	9.850	9.150	7.050	6.000	0.000	9.150	-	8.550	-												
25	14.400	14.280	9.850	9.150	7.050	6.350	0.000	9.150	-	8.550	-												
26	14.400	14.100	9.500	8.940	7.050	7.050	0.000	-	-	8.550	-												
27	14.400	13.800	9.500	8.940	7.050	7.750	0.000	-	-	8.550	-												
28	14.400	13.600	9.500	8.940	7.050	7.750	0.000	-	7.550	8.750	-												
29	14.400	-	9.500	8.800	7.050	7.750	0.000	-	7.550	8.750	-												
30	14.400	14.400	9.500	8.800	7.950	7.750	0.000	-	7.550	8.750	-												
31	14.400	-	-	-	-	7.750	0.000	-	-	-	-												
Total													349.980	411.780	240.380	261.560	218.970	206.950	135.250	36.600	84.700	237.950	197.500

[Source: Minia Irrigation Directorate, El Minia, 1991]

Table C-2-5 Discharge at Lahoun Regulator

(Unit: million m<sup>3</sup>)

Date	1990											
	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.
1	5.140	5.260	5.050	4.460	4.040	3.310	3.515	0.000	4.610	4.460	4.040	4.464
2	5.140	5.260	5.050	4.460	4.090	3.310	3.515	0.000	4.610	4.460	4.040	4.464
3	5.140	5.260	5.050	4.460	4.090	3.310	4.040	0.000	4.610	4.460	4.180	4.464
4	5.140	5.290	5.050	4.460	4.090	3.310	4.040	0.000	4.610	4.460	4.180	4.464
5	5.140	5.260	5.050	4.460	4.095	3.170	4.040	0.000	4.510	4.330	4.180	4.464
6	5.140	5.260	5.050	4.460	4.095	3.170	4.040	1.500	4.610	4.330	4.180	4.464
7	5.140	5.260	5.050	4.460	4.095	3.170	4.040	1.500	4.490	4.330	4.180	4.464
8	5.200	5.260	5.050	4.330	4.095	3.170	4.040	2.510	4.360	4.330	4.180	4.464
9	5.200	5.260	4.790	4.330	4.045	3.170	4.040	4.040	4.170	4.330	4.180	4.464
10	5.260	5.260	4.790	4.330	4.045	3.170	0.000	3.630	4.040	4.330	4.180	4.610
11	5.210	5.260	4.790	4.330	4.045	3.170	0.000	3.630	4.000	4.330	4.180	4.610
12	5.210	5.260	4.790	4.330	4.040	3.170	0.000	3.515	4.040	4.330	4.180	4.610
13	5.210	5.260	4.790	4.330	4.040	3.170	0.000	3.570	4.040	4.460	4.460	4.617
14	5.210	5.290	4.790	4.330	4.040	3.170	0.000	3.570	4.330	4.460	4.460	4.617
15	5.210	5.290	4.790	4.180	4.040	3.170	0.000	4.040	4.330	4.330	4.460	4.610
16	5.210	5.290	4.790	4.180	4.040	3.170	0.000	4.330	4.330	4.330	4.330	4.610
17	5.140	5.290	4.790	4.040	4.040	3.170	0.000	4.330	4.460	4.330	4.330	4.610
18	5.140	5.290	4.610	4.040	4.040	3.170	0.000	4.330	4.460	4.330	4.330	4.610
19	5.260	5.290	4.610	4.040	4.040	3.170	0.000	4.040	4.460	4.330	4.330	4.610
20	5.260	5.290	4.610	4.040	4.040	3.170	0.000	3.390	4.460	4.330	4.330	4.610
21	5.140	5.290	4.610	4.040	4.040	3.310	0.000	4.040	4.460	4.330	4.330	4.760
22	5.140	5.290	4.610	4.040	4.040	3.310	0.000	4.040	4.330	4.330	4.330	4.600
23	5.140	5.260	4.610	4.040	4.040	3.310	0.000	4.330	3.510	4.180	4.330	4.600
24	5.260	5.230	4.610	4.040	4.040	3.310	0.000	4.330	4.330	4.180	4.460	5.050
25	5.260	5.260	4.610	4.040	4.040	3.310	0.000	4.330	4.330	4.180	4.460	5.050
26	5.260	5.260	4.610	4.040	4.040	3.310	0.000	4.330	4.330	4.180	4.460	4.700
27	5.260	5.140	4.610	4.040	4.040	3.310	0.000	4.330	4.040	4.180	4.460	4.990
28	5.260	5.290	4.610	4.040	4.040	3.310	0.000	4.330	4.040	4.180	4.460	5.050
29	5.260	5.260	4.610	4.040	4.040	3.310	0.000	4.040	4.180	4.460	4.460	5.000
30	5.260	5.290	4.610	4.040	4.040	3.310	0.000	4.040	4.040	4.180	4.460	5.200
31	5.260	5.230	4.460	4.040	4.040	3.460	0.000	4.330	4.330	4.460	4.460	4.460
Total	161.200	163.330	143.440	130.490	121.585	100.660	135.310	85.985	133.410	129.480	133.580	133.900

Source: Minia Irrigation Directorate, El Minia, 1991.

Table C-2-5 (Cont'd)

(Unit: million m<sup>3</sup>)

Date	1990												1991				
	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.					
1	5.200	5.420	5.410	4.460	4.180	4.040	4.040	0.000	4.460	4.330	4.040	4.040					
2	5.200	5.260	5.410	4.460	4.180	4.040	4.040	0.000	4.460	4.330	4.040	4.040					
3	5.200	5.260	5.350	4.460	4.180	4.040	4.040	0.000	4.460	4.330	4.040	4.040					
4	5.200	5.295	5.260	4.460	4.180	4.040	4.040	0.000	4.460	4.330	4.040	4.040					
5	5.290	5.290	5.290	4.460	4.180	4.040	4.040	0.000	4.460	4.330	4.040	4.040					
6	5.290	5.290	5.290	4.460	4.180	4.040	4.040	1.500	4.460	4.330	4.040	4.040					
7	5.200	5.290	5.050	4.330	4.180	4.040	4.040	2.510	3.750	4.040	4.040	4.040					
8	5.200	5.260	5.050	4.330	4.180	4.040	4.040	4.040	3.310	4.040	4.040	4.040					
9	5.200	5.260	5.050	4.330	4.180	4.040	4.040	4.040	3.220	3.310	4.040	4.040					
10	5.110	5.260	5.050	4.330	4.180	4.040	0.000	4.040	3.660	4.040	4.040	4.040					
11	5.110	5.260	5.050	4.330	4.180	4.040	0.000	4.040	3.600	4.040	4.040	4.040					
12	5.200	5.260	5.050	4.270	4.180	4.040	0.000	4.095	3.600	4.040	4.040	4.040					
13	5.230	5.260	5.050	4.150	4.180	4.040	0.000	4.095	3.460	4.040	4.040	4.040					
14	5.350	5.290	5.050	4.150	4.180	4.040	0.000	4.095	3.460	4.040	4.040	4.040					
15	5.350	5.290	5.050	4.150	4.180	4.040	0.000	4.095	3.460	4.040	4.040	4.040					
16	5.350	5.350	5.050	4.330	4.180	4.040	0.000	4.095	3.890	4.040	4.040	4.040					
17	5.350	5.410	5.050	4.330	4.180	4.040	0.000	4.095	3.890	4.040	4.040	4.040					
18	5.350	5.350	5.050	4.330	4.095	4.040	0.000	4.095	3.890	4.040	4.180	4.180					
19	5.427	5.350	4.600	4.330	4.095	4.040	0.000	4.330	3.890	4.040	4.180	4.180					
20	5.350	5.350	4.610	4.330	4.040	4.040	0.000	4.330	3.890	4.040	4.180	4.180					
21	5.350	5.350	4.610	4.330	4.040	4.040	0.000	4.330	3.890	4.040	4.180	4.180					
22	5.440	5.350	4.610	4.330	4.040	4.040	0.000	4.330	3.890	4.040	4.180	4.180					
23	5.440	5.410	4.610	4.180	4.040	4.040	0.000	4.330	3.310	4.040	4.040	4.040					
24	5.350	5.410	4.610	4.180	4.040	4.040	0.000	4.460	3.310	4.040	4.040	4.040					
25	5.320	5.410	4.610	4.180	4.040	4.040	0.000	4.460	3.750	4.040	4.040	4.040					
26	5.320	5.410	4.610	4.180	4.040	4.040	0.000	4.460	3.750	4.040	4.040	4.040					
27	5.320	5.410	4.610	4.180	4.040	4.040	0.000	4.460	4.040	4.040	4.040	4.040					
28	5.200	5.390	4.460	4.180	4.040	4.040	0.000	4.460	4.040	4.040	4.040	4.040					
29	5.200	5.410	4.460	4.180	4.040	4.040	0.000	4.460	4.330	4.040	4.040	4.040					
30	5.390	5.410	4.460	4.180	4.040	4.040	0.000	4.460	4.330	4.040	4.040	4.040					
31	5.220	5.410	4.180	4.040	4.040	4.040	0.000	4.000	4.330	4.040	4.040	4.040					
Total	163.527	165.555	147.230	133.060	123.630	115.240	136.360	91.565	120.590	122.360	122.360	122.360					

Source: Minia Irrigation Directorate, El Minia, 1991.



Aswan Monthly Releases  
(1986-1991)

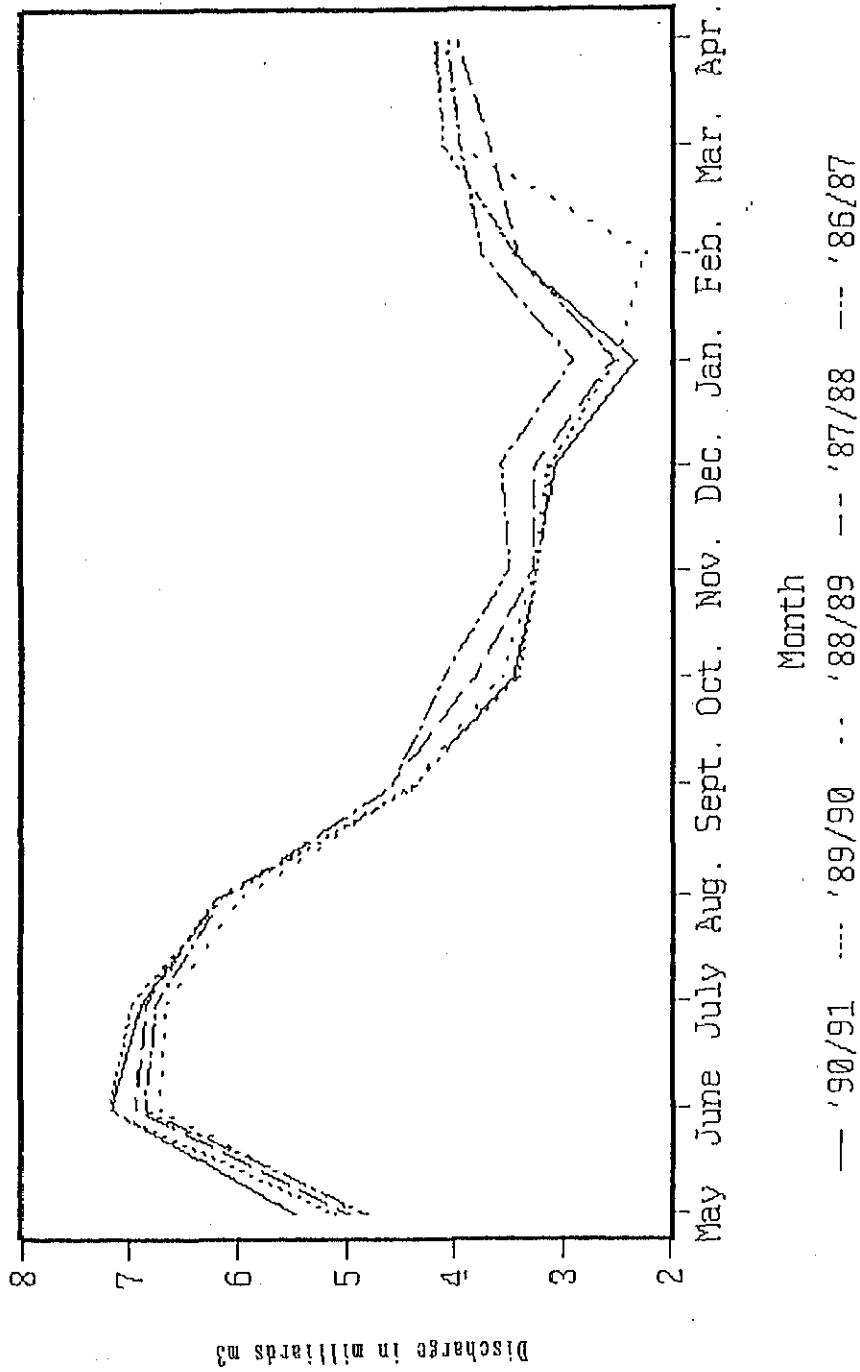
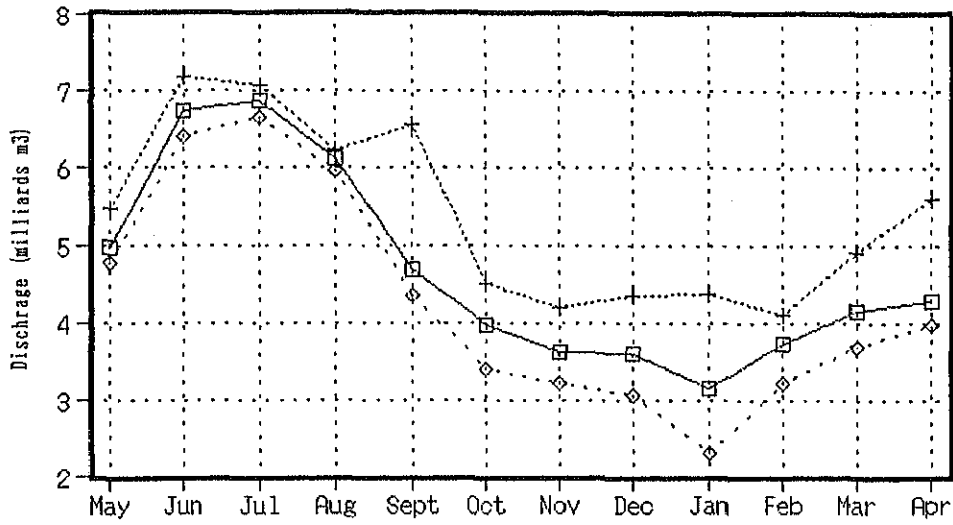
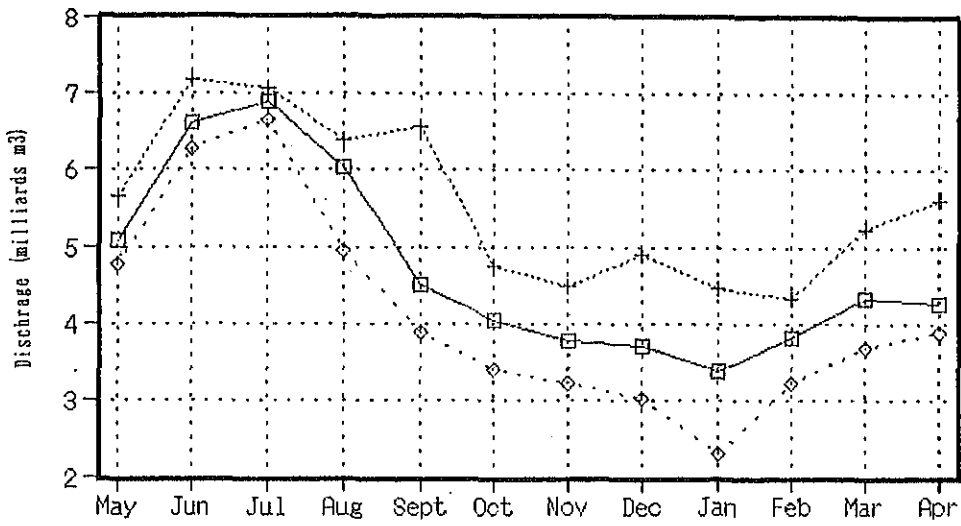


Figure C-2-1 Aswan Mean Monthly Releases for the Past 5 Years

for the Past 10 Years



for the Past 20 Years



for the Past 23 Years

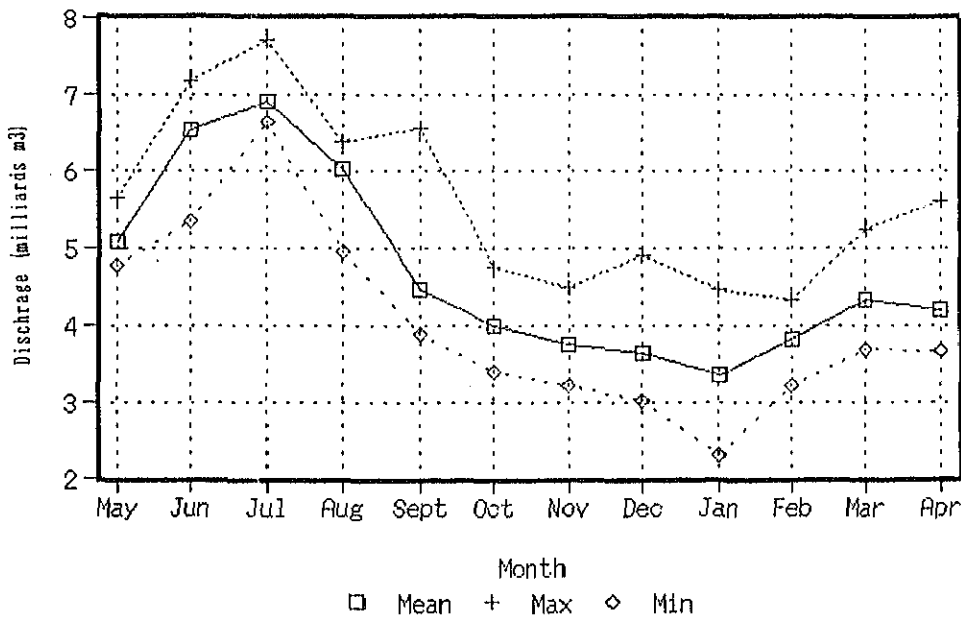
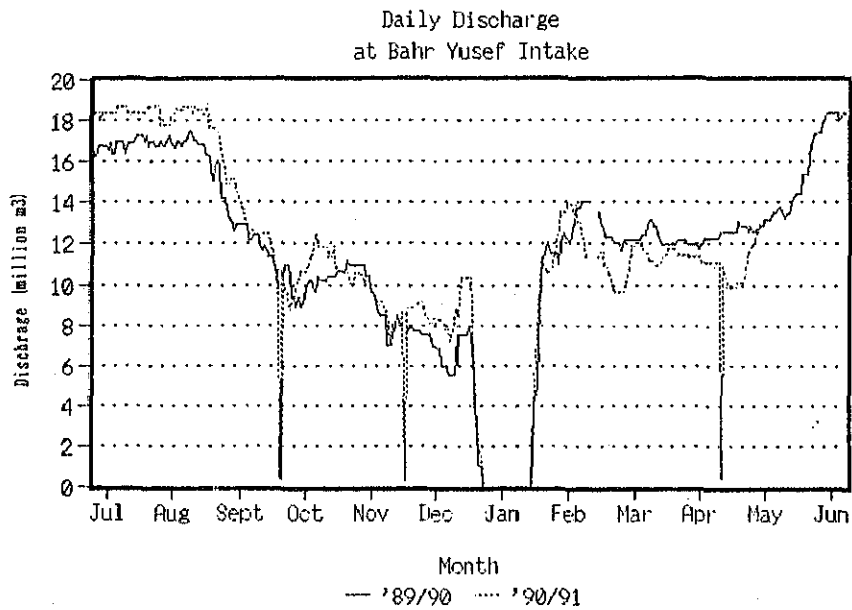
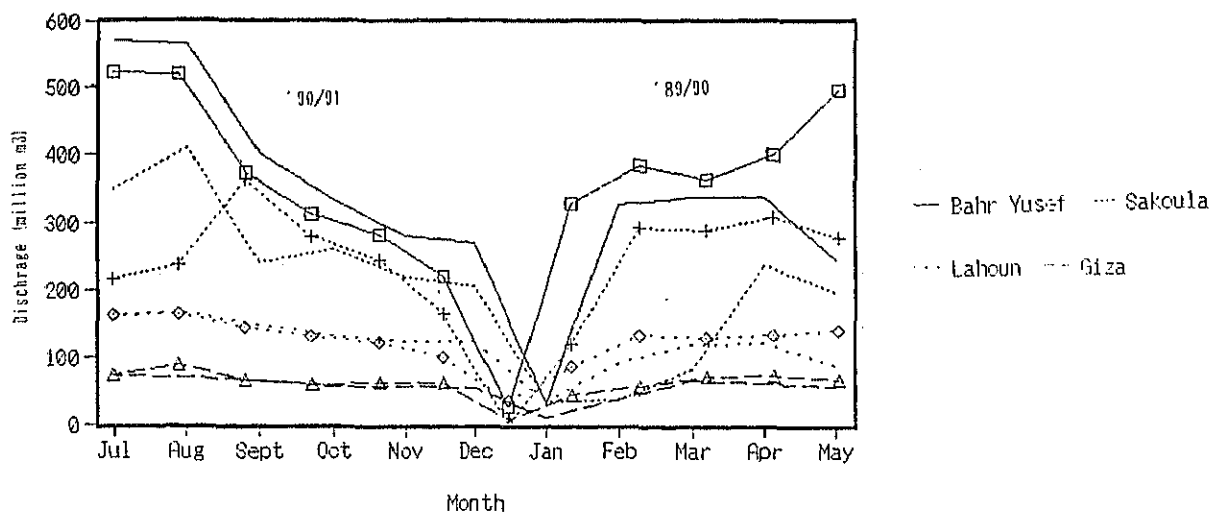


Figure C-2-2 Aswan Maximum, Minimum and Mean Monthly Releases



**Figure C-2-3 Daily Discharge Records at Bahr Yusef Intake**



(Unit: million m<sup>3</sup>)

Item	Period	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
B. Yusef Intake	'89-90	521.850	419.310	375.065	312.900	280.650	218.850	26.000	327.660	384.437	362.500	401.180	496.018
	'90-91	572.225	466.570	402.060	334.650	280.735	269.631	30.134	328.163	339.278	339.619	245.158	-
Sakoula Reg.	'89-90	115.700	136.000	163.960	279.240	244.450	162.800	0.000	119.300	232.830	287.240	306.750	277.530
	'90-91	149.980	111.780	240.390	261.560	218.970	206.950	35.250	36.600	84.700	237.950	197.500	-
Lahoun Reg.	'89-90	161.200	163.330	143.440	130.490	121.585	100.660	35.310	85.985	133.410	129.480	133.580	139.900
	'90-91	163.527	165.335	147.290	133.060	123.690	124.240	36.360	91.965	120.590	122.360	89.580	-
Giza C. Intake	'89-90	72.440	88.160	66.480	59.660	62.080	62.490	6.600	43.230	58.245	70.560	72.240	67.410
	'90-91	74.010	69.970	66.040	57.530	56.660	56.070	11.310	40.405	66.400	61.100	57.410	-

(Source: Minia Irrigation Directorate, El Minia, 1991)

**Figure C-2-4 Monthly Discharge at the Given Intake  
and Regulators along the Bahr Yusef Canal**



**APPENDIX D      SOIL AND LAND USE**



Figure D-1 Soil Profile in Harika Command Area

Village Name	Bortbat No.1	Bortbat No.2	Bortbat No.3	Bortbat No.4
Crop( April)	cotton	berseem	cotton	maize
Location	along canal	along canal	along canal	along canal
Water EC	0.46 mS	-	0.40 mS	-
Soil pH	7.9	7.7	7.8	7.9
Soil EC(mS)	0.3 mS	2.5 mS	1.8 mS	2.9 mS
SoilMoisture	dry on surface	dry on surface	dry on surface	wet on surface
SoilSalinity	weakly saline	weakly saline	weakly saline	no salt-crust
0cm	crackdeveloped	crackdeveloped	salt crystal formation	only fine salt crystal
10	Clay	Heavy Clay	Silly Clay	seashell and humus
20	7.5YR 2/3	7.5YR 2/2	----- pan -----	Silly Clay
30cm	-----	-----	-----	5YR 3/2
40	Heavy Clay	Heavy Clay	round gravelly	-----
50	deep subsolum	deep subsolum	7.5YR 3/2	-----
60cm	-----	-----	Heavy Clay	-----
Yield(ton/t)				
Cotton	0.8	0.8	0.95	0.6 - 0.7
Wheat	1.8	1.8	1.5	2.3
Maize	3.4	1.8	1.8	Nily 0.7
Broadbean	-	0.9	1.6	-

Source : Observed and Measured by Survey Team and Oral Information

Village Name	Bortbat No.5	Berazatin No.1	Berazatin No.2	Al Edwa
Crop( April)	berseem	maize	cucumber	sunflower
Location	along canal	along a drain	along a drain	along canal
Water EC	-	0.46 mS	0.46 mS	-
Soil pH	8.0	8.1	8.1	8.0
Soil EC(mS)	2.1	2.0	2.2	1.8
SoilMoisture	surface dry	surface dry	surface dry	surface dry
SoilSalinity	weakly saline	not saline	not but near	not saline
0cm	salt crust formation	crackdeveloped	typical crack formation	no crust
10	Heavy Clay	Silty Clay	Sandy Clay	cracky
20	7.5YR 3/2	7.5YR 3/2	7.5YR 2/2	stone found
30cm	gravel found	-----	-----	Heavy Clay
40	7.5YR 2/2	5 YR 3/2	7.5YR 2/2	7.5YR 2/3
50	Sandy Clay	Heavy Clay	Heavy Clay	----- pan -----
60cm	deep subsolum	deep subsolum	----- pan -----	-----
Yield(Lon/t)				
Cotton	1.3	0.5	0.9	0.8
Wheat	2.1 - 2.3	2.1	2.1	1.5
Maize	2.1	2.5	1.8	1.1
Broadbean	-	0.9	-	0.5

Source : Observed and Measured by Survey Team and Oral Information

Figure D-1 Soil Profile in Harika Command Area (Contd.)

Village Name	KafrAbdKhalck3	Bascalon No.1	Bascalon No.2	Bascalon No.3
Crop( April)	maize	maize	farales	wheat
Location	along a drain	along a canal	along a canal	along a drain
Water EC(mS)	-	0.42		-
Soil pH	7.8	7.7	7.8	7.8
Soil EC(mS)	0.8	0.2	0.2	0.1
SoilMoisture	surface dry	surface dry	surface wet	surface dry
SoilSalinity	weakly saline	weakly saline	not saline	weakly saline
0cm	salt crust formation	salt crust formation	no salt crust	salt crystals visible
10		gravels found	cracky gravels found	no crack developed
20	Heavy Clay 7.5YR 3/2	Heavy Clay 7.5YR 3/2	Heavy Clay 7.5YR 2/3	Clay 10YR 2/2
30cm				
40	blocky structure	massive structure		
50	gravelly	Silty Clay 7.5YR 2/2		Silty Clay 10YR 3/3
60cm	deep solum		Sandy Clay 7.5YR 2/2	
Yield(ton/f)				
Cotton	0.5 - 0.6	0.8	0.8 - 0.9	0.8
Wheat	0.9	1.1	1.5	1.2
Maize	0.8	1.0	1.1	1.0
Beans	0.5	-	0.5	-

Source : Observed and measured by Survey Team and Oral Information

Village Name	Bascalon No.4	BeniWalkanNo.1	BeniWalkanNo.2	BeniWalkanNo.3
Crop( April)	vineyard	cotton	maize	sesame
Location	along a canal	along a drain	along a drain	along a canal
Water EC(mS)	-	-	0.49	-
Soil pH	7.8	8.0	8.0	7.8
Soil EC(mS)	0.1	2.3	3.2	3.8
SoilMoisture	surface wet	surface dry	surface wet	surface dry
SoilSalinity	not saline	weakly saline	not saline	severelysaline
0cm				
10	wide cracks well developed	weak salt crust formed	cracks developed	salt crust well developed
20	Heavy Clay 7.5YR 3/2	Silty Clayloam 7.5YR 2/2	Heavy Clay 7.5YR 3/2	Heavy Clay 7.5YR 2/2
30cm				
40	prismy and bricky structure		prismy structure	
50	hard	Heavy Clay 7.5YR 2/1		10YR 3/2
60cm		pan	deep solum	Heavy Clay
Yield(ton/f)				
Cotton	-	0.6 - 0.8	-	0.2
Wheat	-	2.6	1.5	0.6
Maize	-	1.4	-	1.0
Beans	-	-	0.5	0.8

Source : Observed and measured by Survey Team and Oral Information

Figure D-1 Soil Profile in Harika Command Area (Contd.)

Village Name	Beniwalkan No. 4	Out of Harila Command, West of Sakoula Drain	barley	berseem	barley
Crop (April)	wheat	farales	near drain	near drain	far from drain
Location	along a canal	-	-	0.50	-
Water EC (mS)	-	8.0	7.4	7.9	7.7
Soil pH	2.0	1.4	2.9	19.8	
Soil EC (mS)	2.0	1.4	2.9	19.8	
Soil Moisture	surface dry	surface dry	surface dry	surface dry	surface dry
Soil Salinity	not saline	saline	saline	saline	saline
0cm	narrow cracks developed	degraded soil no crack	calcium carbonate crust formation	salt crystals on ridges	
10	heavy clay	salt crystals	Sandy Clay	Sandy loam	
20	7.5YR 2/2	Loamy Sand	10YR 2/2	2.5Y 2/1	
30cm					
40					
50	heavy clay	Sandy Loam	Sandy Clay loam	Loamy Sand	
60cm	7.5YR 3/2	10YR 2/1	7.5YR 3/1	2.5Y 2/1	
Yield (ton/f)					
Cotton	0.6	no cotton	0.5	-	
Wheat	1.8	-	1.2	-	
Maize	1.1	-	0.8	-	
Beans	0.5	-	0.7	-	






Source : Observed and measured by Survey Team and Oral Information

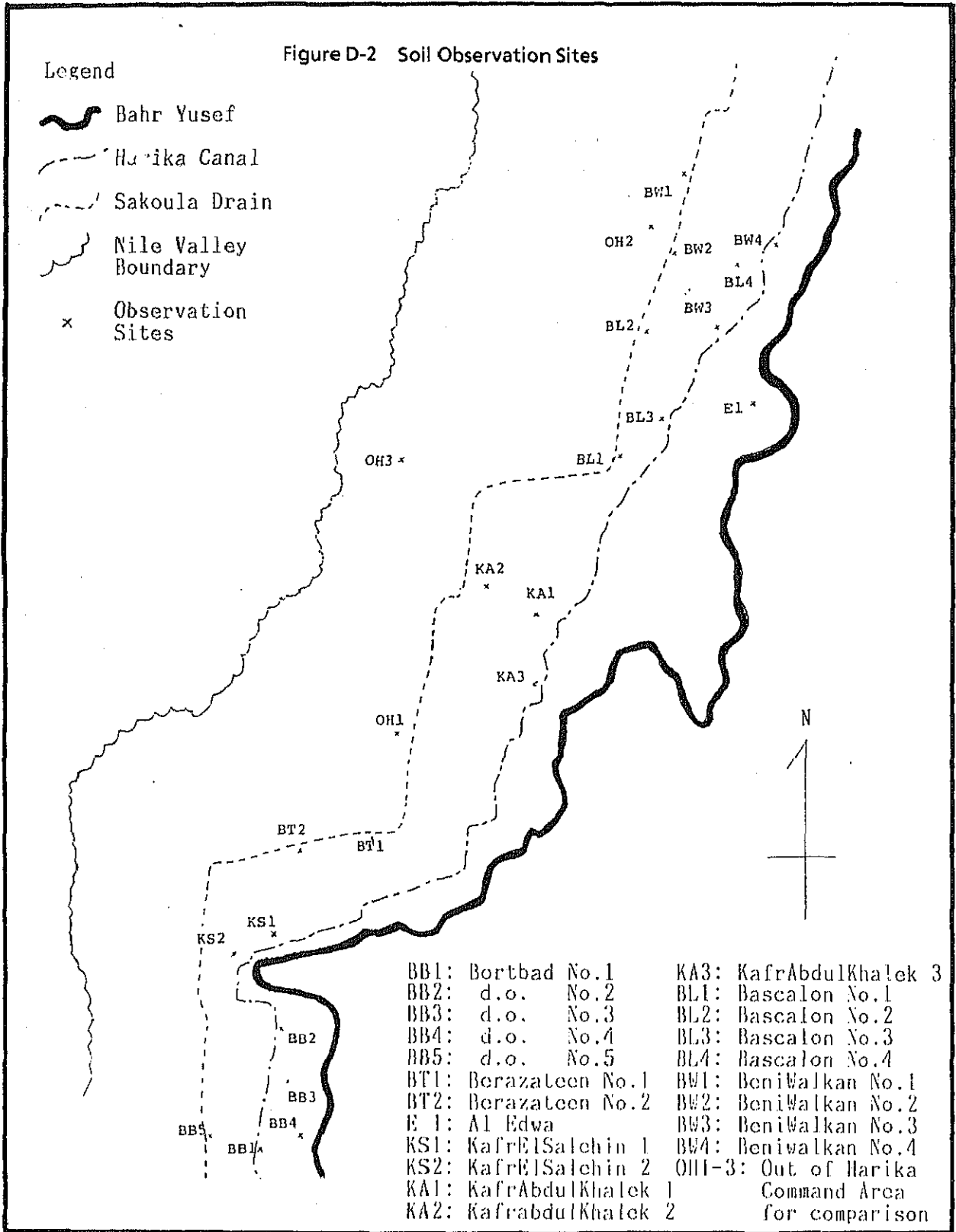
Village Name	KafrSaleheen 1	KafrSaleheen 2	KafrAbdKhaleki	KafrAbdKhalek 2
Crop (April)	cotton	cotton	cotton	wheat
Location	along a canal	along a canal	along a canal	along a drain
Water EC (mS)	-	-	-	0.03
Soil pH	8.0	8.0	7.9	7.7
Soil EC (mS)	2.4	2.8	2.7	2.7
Soil Moisture	surface dry	surface dry	dried sola	dried sola
Soil Salinity	not saline	fairly saline	fairly saline	weakly saline
0cm	feeble crystal	well developed salt crust	salt crust	feeble salt crystals
10	Silly Clay	Silty Clay	heavy Clay	humus found
20	gravelly solum	gravelly solum		heavy Clay
30cm	5 YR 3/1	7.5YR 3/2	feeble pan	gravelly
40				5 YR 2/2
50	Clay	Clay	heavy Clay	
60cm	7.5YR 2/1	7.5YR 2/1		deep subsoil
Yield (ton/f)				
Cotton	1.3	0.9	0.5 - 0.6	0.8 - 0.9
Wheat	2.3	2.3	0.8	2.2
Maize	2.5	2.8	0.7	2.1
Beans	0.9	0.9	-	-

Source : Observed and measured by Survey Team and Oral Information

Figure D-2 Soil Observation Sites

Legend

-  Bahr Yusef
-  Harika Canal
-  Sakoula Drain
-  Nile Valley Boundary
-  Observation Sites



- |                        |                        |
|------------------------|------------------------|
| BB1: Bortbad No.1      | KA3: KafrAbdulKhalek 3 |
| BB2: d.o. No.2         | BL1: Bascalon No.1     |
| BB3: d.o. No.3         | BL2: Bascalon No.2     |
| BB4: d.o. No.4         | BL3: Bascalon No.3     |
| BB5: d.o. No.5         | BL4: Bascalon No.4     |
| BT1: Berazateen No.1   | BW1: BeniWalkan No.1   |
| BT2: Berazateen No.2   | BW2: BeniWalkan No.2   |
| E 1: Al Edwa           | BW3: BeniWalkan No.3   |
| KS1: KafrElSalchin 1   | BW4: Beniwalkan No.4   |
| KS2: KafrElSalchin 2   | OH1-3: Out of Harika   |
| KA1: KafrAbdulKhalek 1 | Command Area           |
| KA2: KafrabduKhalek 2  | for comparison         |

## **APPENDIX E      IRRIGATION AND DRAINAGE**

**E - 1      Present Water Distribution**

**E - 2      Present Conditions on Irrigation and  
Drainage**

**E - 3      Proposed Irrigation Plan**





**E-1 Present Water Distribution**

**Table E-1-1 Actual Irrigation Water Distribution at Harika Canal**

Month \ Day	1	5	10	15	20	25	30
Apr. 1991		5 5 (17h) 7 days	10 12 (17h)		20 20 (17h) 5 days	25 25 (17h)	30 (17h)
May 1991	3 days (17h)	5 5 (17h) 5 days	10 10 (17h)		20 20 (17h) 6 days	25 26 (17h)	
June 1991	4 4 (17h) 5 days	9 9 (17h)	14 (17h)		19 19 (17h) 15 days	24 29 (17h)	
July 1991	4 4 (17h) 5 days	9 9 (17h)			19 19 (17h) 7 days	24 26 (8h)	
Aug. 1991	3 3 (8h)	8 8 days	12(8-19) 11 (17h)		18 17 (16h) 6 days	23 23 (17h)	31 (17h)
Sept. 1991	2 8 days	7 8 (20h)			17 17 (17h) 5 days	22 22 (17h)	
Oct. 1991	2 2 (17h) 4 days	7 6 (17h)		15 (8h)	17 17 (17h) 10 days	22 25 (8h)	
Nov. 1991	1 2 (8h) 6 days	6 8 (11h)			16 16 (17h) 5 days	21 21 (17h)	
Dec. 1991	1 1 (17h) 9 days	6 10 (8h)			16 16 (9h) 23 days		
Jan. 1992		5 8 (17h)			1/5--1/30 (Water closure period)		
Feb. 1992		4 6 (12h) 5 d	11 15 (17h) 2 d	14 17 (17h)	19 19 (17h) 6 days	24 25 (9h) 1 day	26 27
Mar. 1992		5 5 (17h)	10 10 (17h)		20	25	

Source: Magaga District Office, Minia Directorate, Irrigation Department

Note : ..... shows scheduled irrigation working period (5 days each).  
 ————— shows actual irrigation working period.

Figure E-1-1 Present Organizational Structure For Water Distribution

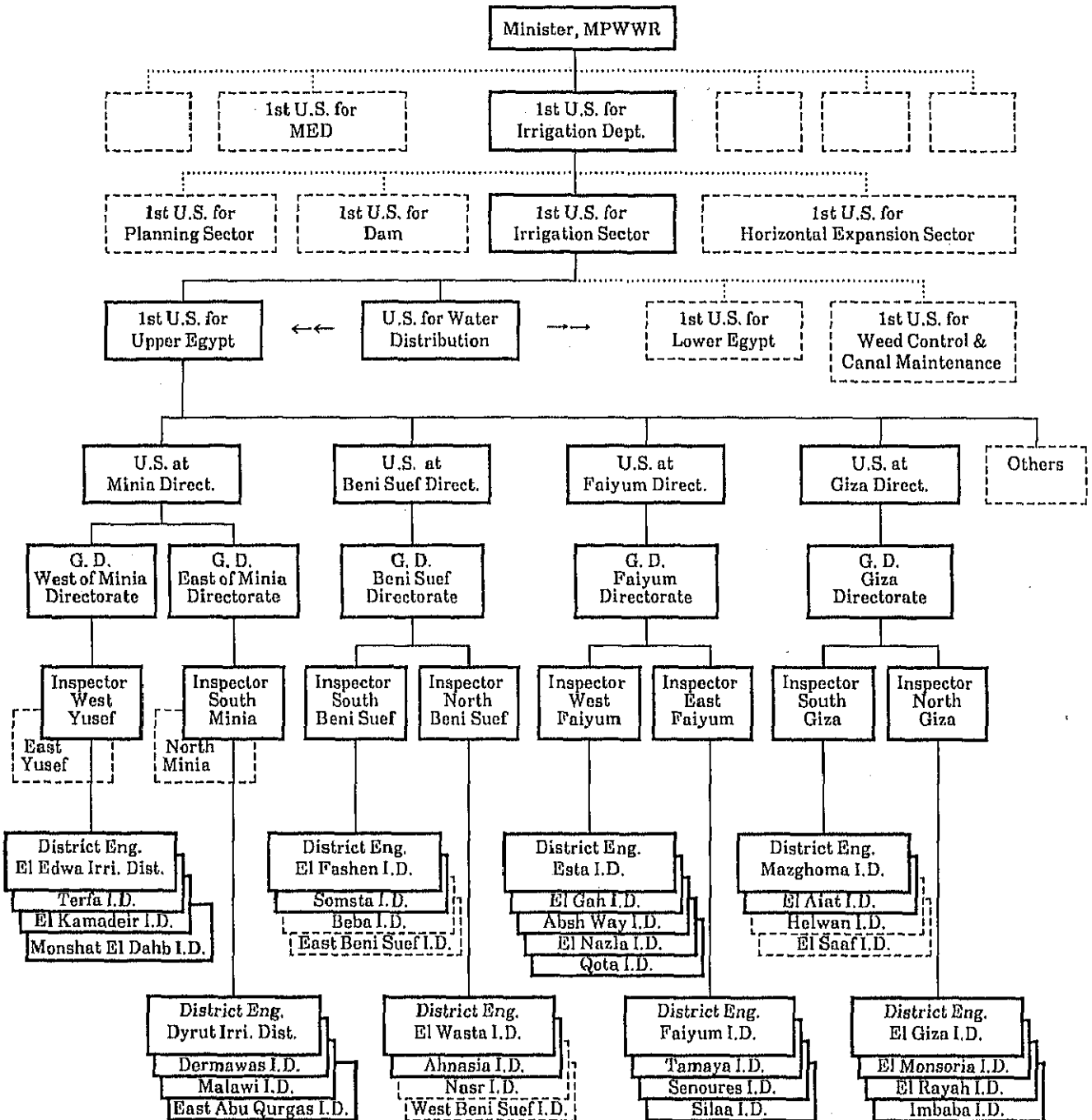


Figure E-1-2 Organization Chart of Minia Irrigation Directorate, MPWWR

