

THE ARAB REPUBLIC OF EGYPT  
MINISTRY OF DEVELOPMENT, HOUSING AND LAND RECLAMATION  
GENERAL AUTHORITY FOR REHABILITATION  
PROJECTS AND AGRICULTURAL DEVELOPMENT

FEASIBILITY STUDY  
ON  
THE NORTH HUSSINIA VALLEY & SOUTH PORT SAID  
AGRICULTURAL DEVELOPMENT PROJECT  
MAIN REPORT

JUNE 1984

JAPAN INTERNATIONAL COOPERATION AGENCY

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国際協力事業団	
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## PREFACE

In response to the request of the Government of the Arab Republic of Egypt, the Government of Japan decided to conduct a feasibility study on the North Hussinia Valley and South Port Said Agricultural Development Project and entrusted the study to the Japan International Cooperation Agency (JICA). The JICA sent to Egypt a survey team headed by Dr. Yoshizo Mochizuki three times in the period from April 1983 to December 1983.

The team exchanged views with the officials concerned of the Government of Egypt and conducted a field survey. After the team returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

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

June 1984



Keisuke Arita

President

Japan International Cooperation Agency





## LETTER OF TRANSMITTAL

Mr. Keisuke Arita  
President  
Japan International Cooperation Agency (JICA)  
Tokyo, Japan

Dear Sir;

We have the pleasure of submitting herewith the final report on the feasibility study of the North Hussinia Valley and South Port Said Agricultural Development Project in the Arab Republic of Egypt.

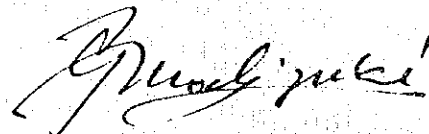
Team's study was conducted during a year beginning from April 1983 to March 1984; the field surveys in and around the project-site were integrated with the home-office works on three occasions in the meanwhile through which a series of discussion-meetings took place from time to time with the Egyptian authorities concerned for satisfactorily steering the course of the study until the draft final report was prepared; GARPAD's comments on the draft final report are fully incorporated in this report.

The aims and purposes of this project are not confined within land reclamation solely meant for food production-increase; they lie in realization of a sort of regional development plan which involves construction of new village communities, establishment of a Pilot Farm, introduction of agro-industries, etc. We are convinced that a successful implementation of this project along the general directions given in this report would greatly contribute to the socio-economic development of the country in the future.

In submitting this report, we wish to express our heart-felt thanks to GARPAD, Ministries of Land Reclamation, Irrigation, Agriculture and Economic Cooperation of the Government of Egypt as well as the officials of JICA, Ministry of Foreign Affairs and the Ministry of Agriculture, Forestry and Fisheries of the Government of Japan; the assistances provided by the Japanese Embassy in Egypt and JICA's Cairo Office are sincerely appreciated; we also like to mention that we have been greatly indebted to the Chairman and the members of the Advisory Committee for their kind advices given us on each turn of our survey and study activities.

Sincerely yours,

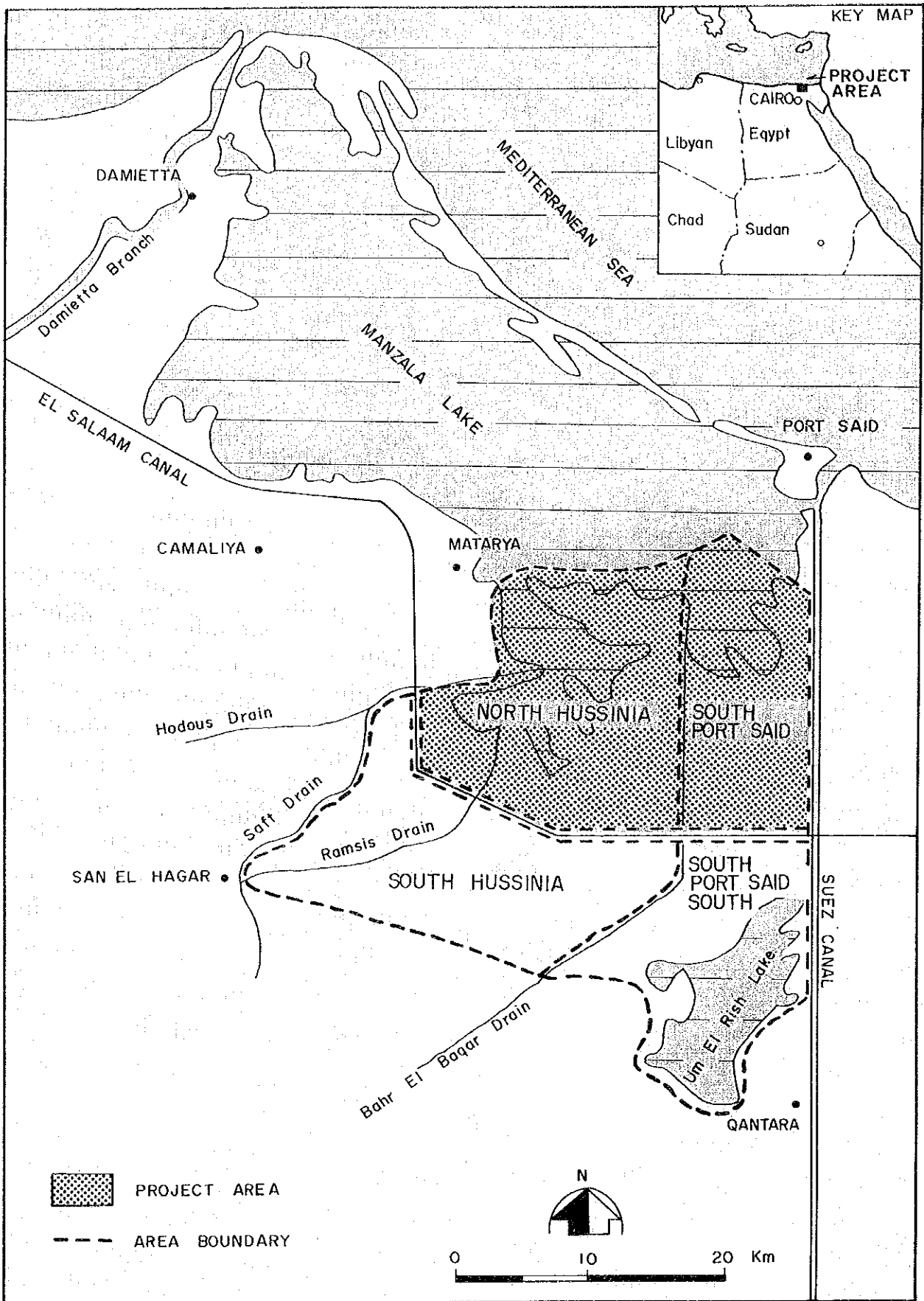
June, 1984



Yoshizo MOCHIZUKI  
Leader of the Feasibility  
Study Team

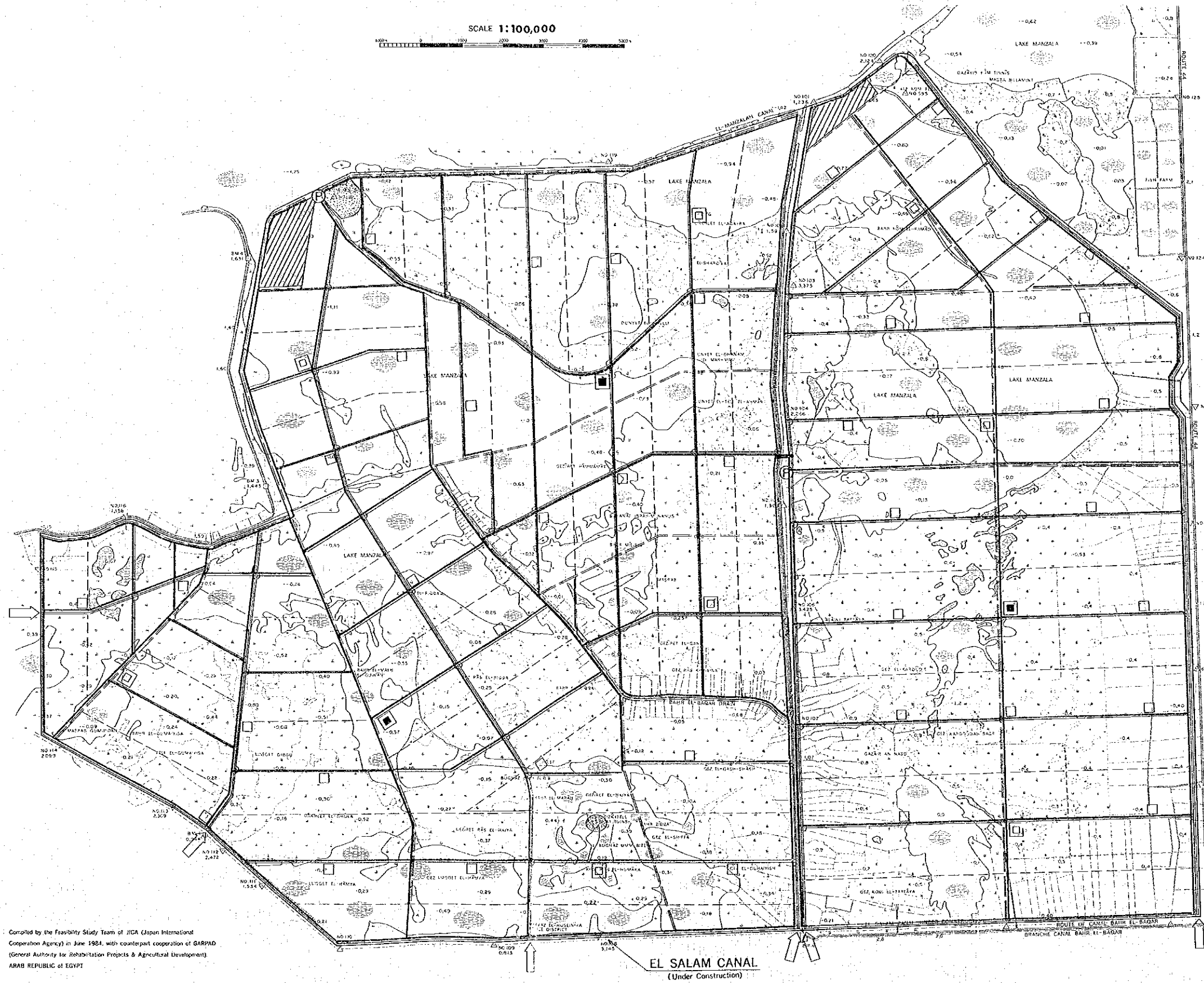


NORTH HUSSINIA VALLEY AND SOUTH PORT SAID  
 AGRICULTURAL DEVELOPMENT PROJECT  
 LOCATION MAP



# NORTH HUSSINIA VALLEY AND SOUTH PORT SAID AGRICULTURAL DEVELOPMENT PROJECT GENERAL PLAN

SCALE 1:100,000



## LEGEND

- Project Boundary
- Main Road
- Main Irrigation Canal
- Main Drainage Canal
- Secondary Irrigation Canal
- Secondary Drainage Canal
- Agro-Industrial Zone
- Ruin
- Central Village
- Service Village
- Satellite Village
- Drainage Pumping Station
- Intake of Main Canal
- Intake of Secondary Canal
- Bridge on Bashitir Drainage Canal

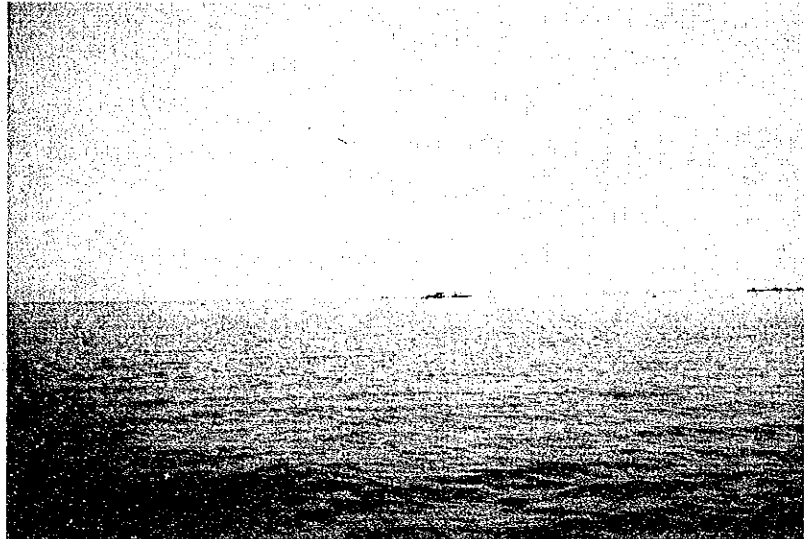
Compiled by the Feasibility Study Team of JICA (Japan International Cooperation Agency) in June 1984, with counterpart cooperation of GARPAD (General Authority for Rehabilitation Projects & Agricultural Development), ARAB REPUBLIC OF EGYPT

**EL SALAM CANAL**  
(Under Construction)



**The Project Area**

**Lake Manzala**



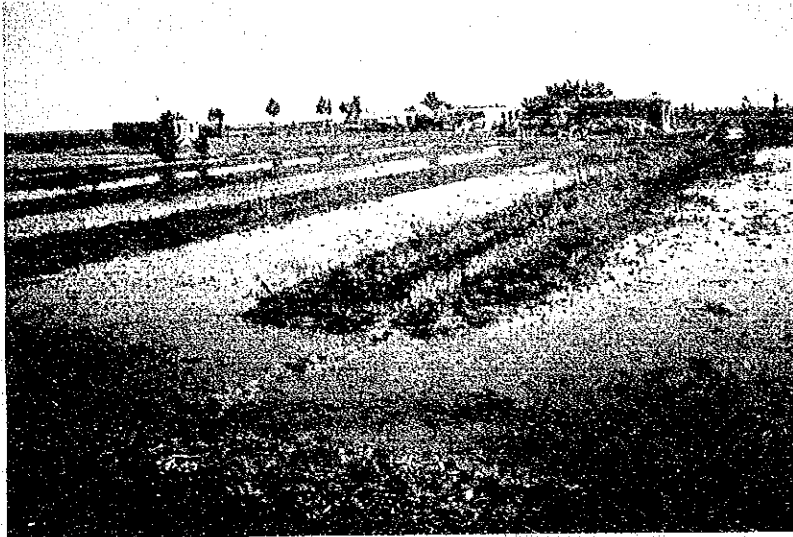
**Up-Land**



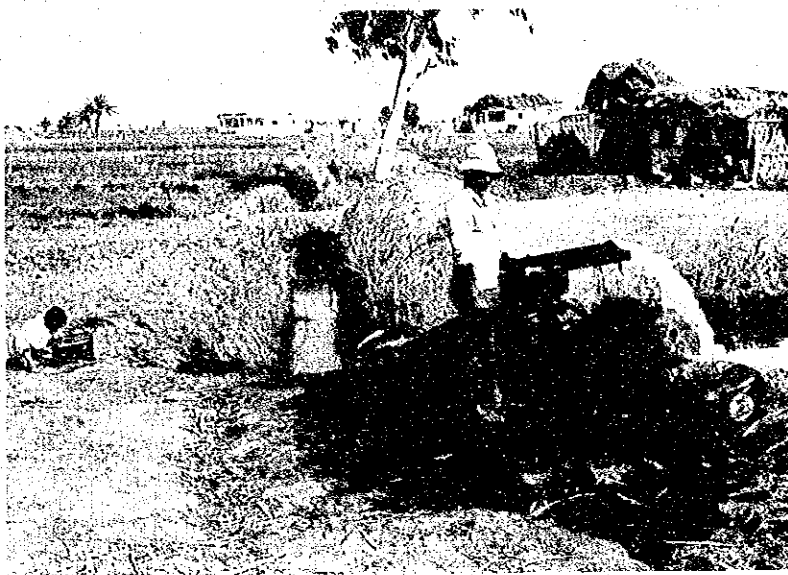
**Cultivated Field**



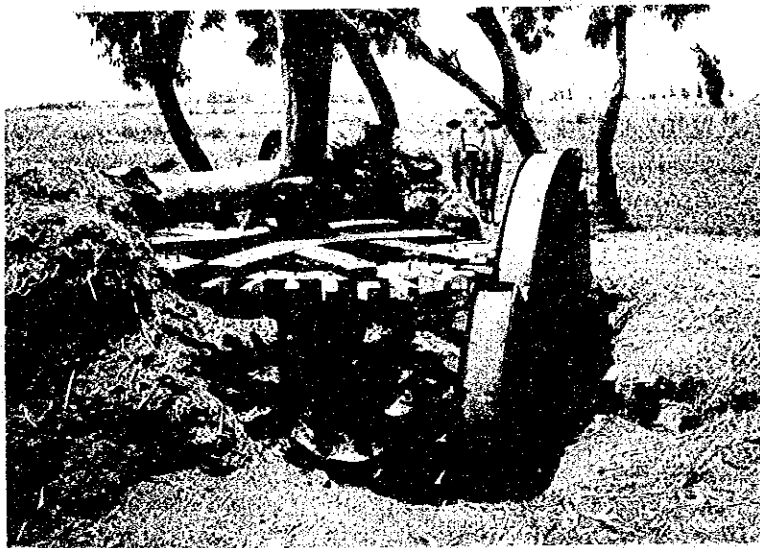
**Present Activity in the  
Project Area**



Paddy Field



Pumping Drainage



Drainage by Animal  
"SAKIYA"

**Existing Activity in the  
Project Area**

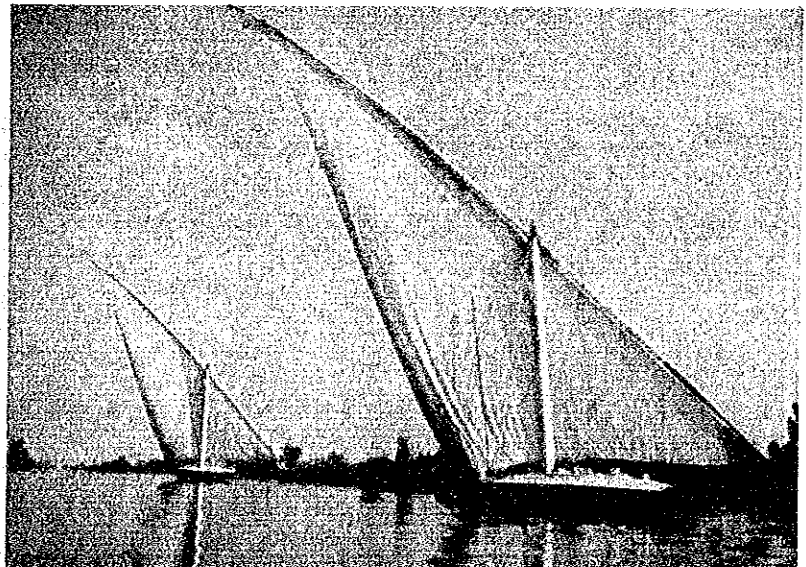
**Cultivated Field**



**Animal Husbandry**



**Fisheries Boat**





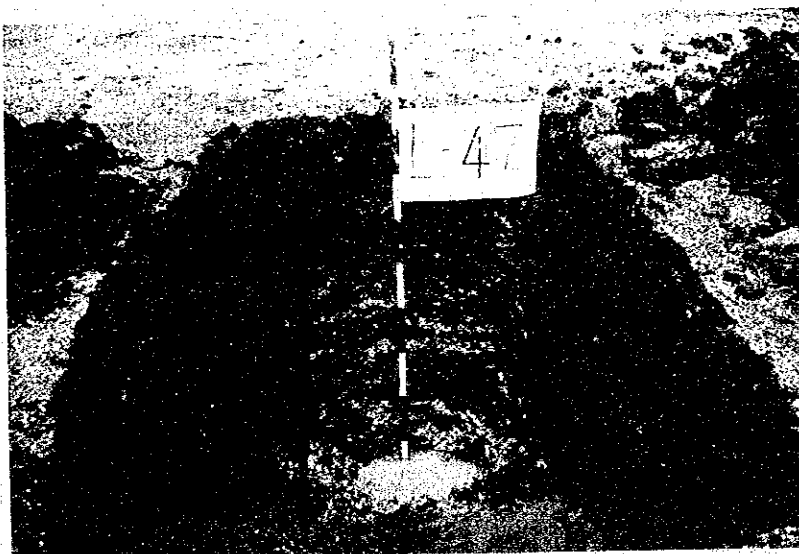
**Soil Survey**



**Up-land Area**

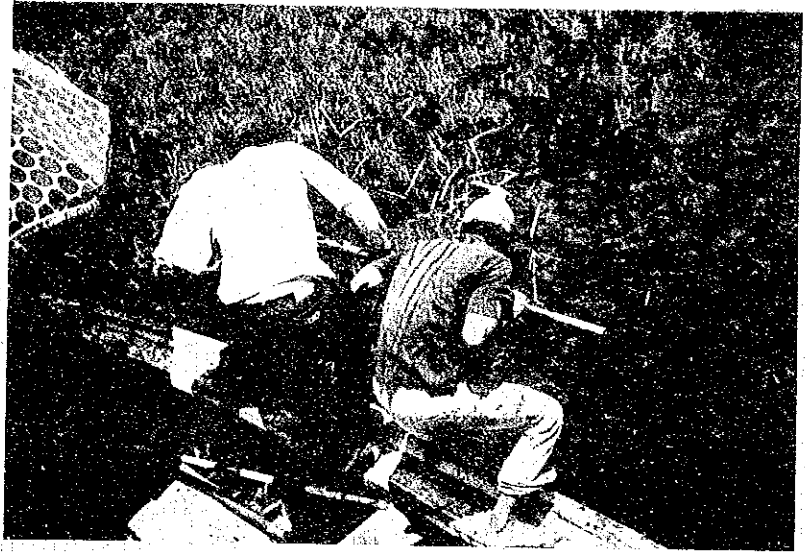


**Surveying**



**Profile**

Soil Survey



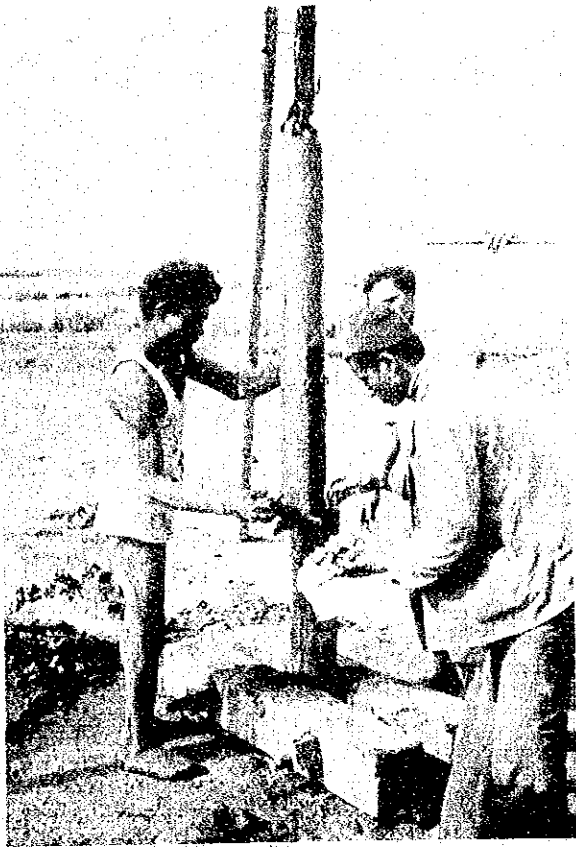
Inundated Area



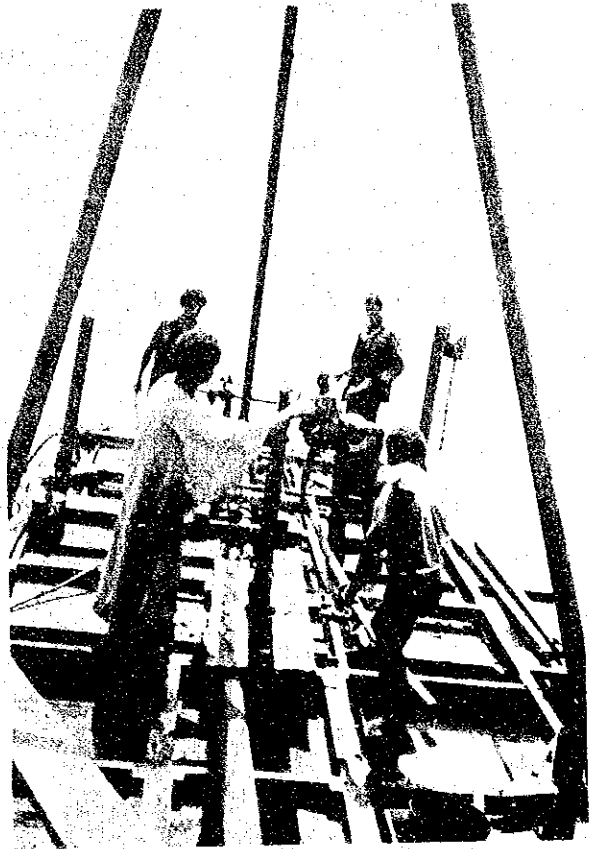
Sampling



Profile

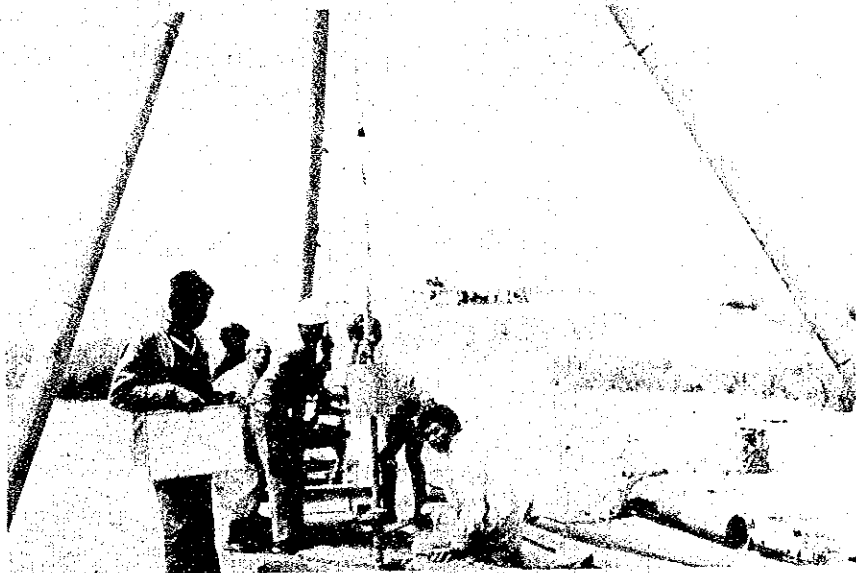


Sampling



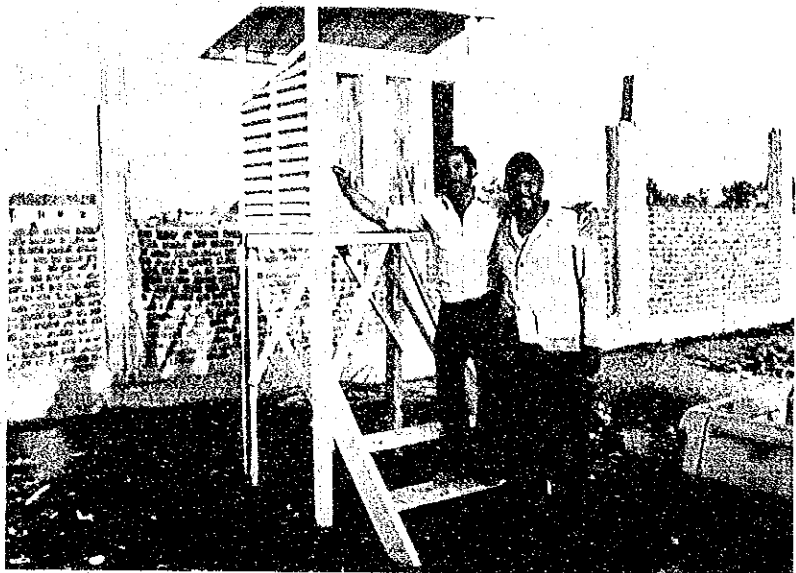
Surveying in Inundated Area

### Soil Mechanics and Foundation Survey

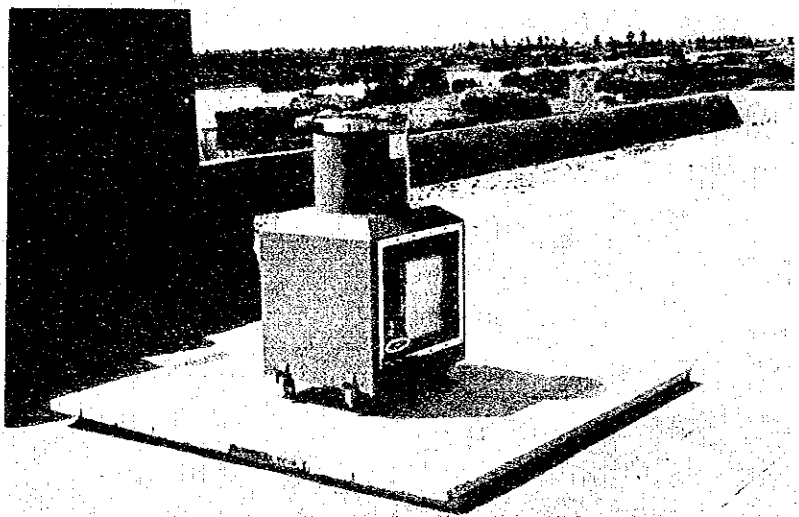


Surveying in Up-land Area

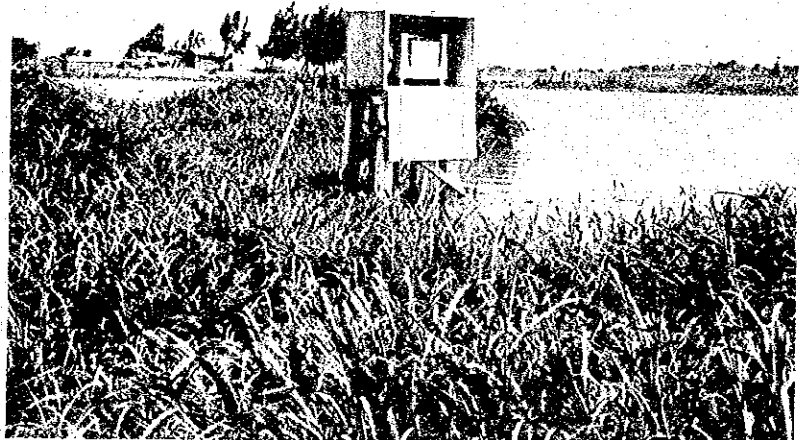
Thermometer Shelter  
placed at Baqar Village

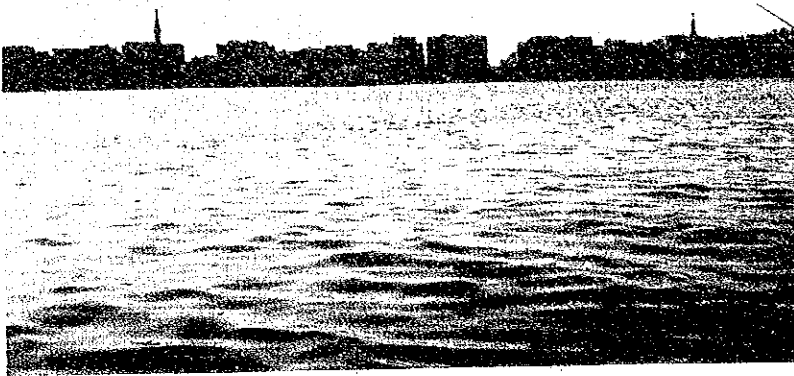


Automatic Rain gauge  
placed at Baqar Village

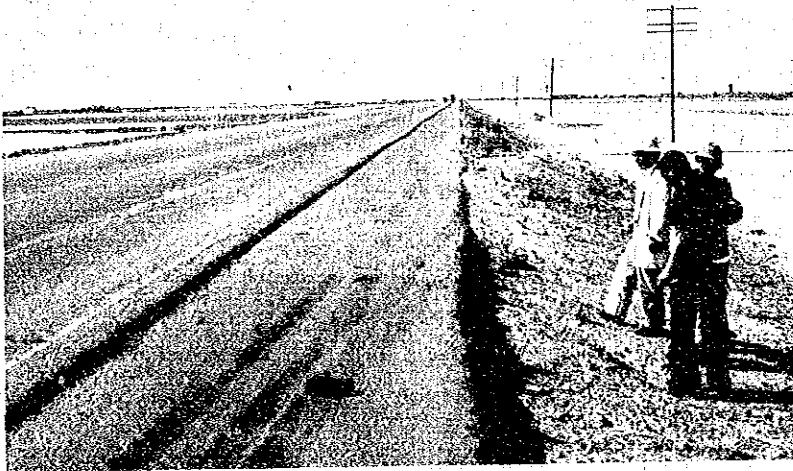


Automatic Water gauge  
placed in Hadous Drain

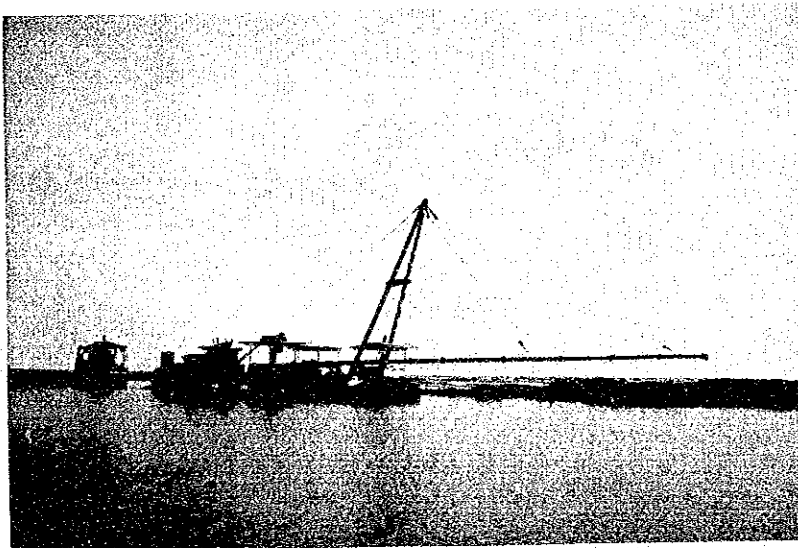




Matariya Town neighbors  
the Project Area



Route 44  
Port Said-Ismailia



Construction Site of  
El Salam Canal

Ceremony of Signing  
(1)



Ceremony of Signing  
(2)



Stuff Meeting at  
Agricultural Department  
in Port Said





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## ABBREVIATIONS

ARE	Arab Republic of Egypt
FAO	Food and Agriculture Organization
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
JICA	Japan International Cooperation Agency
MOI	Ministry of Irrigation
MOA	Ministry of Agriculture
MOLR	Ministry of Land Reclamation
GARPAD	General Authority for Rehabilitation Projects and Agricultural Development
PBADC	Principal Bank for Development of Agricultural Credit
GDP	Gross Domestic Product
GNP	Gross National Product
EIRR	Economic Internal Rate of Return
FC	Foreign Currency
LC	Local Currency
km	kilometer
m	meter
cm	centimeter
mm	millimeter
ton, m.t	metric ton
kg	kilogram
g	gram
ℓ	litre
m <sup>2</sup>	square meter
m <sup>3</sup>	cubic meter
ha	hectare
fed	feddan (Egyptian unit of area)
m <sup>3</sup> /sec	cubic meter per second
mmhos/cm	millimhos per centimeter
ppm	part per million
kwh	kilowatt hour
KVA	Kilovolt ampere
EC	Electrical conductivity
L	Length
Q	discharge
H	head
Fig.	figure
i.e.	that is (id est)
LE	Egyptian Pound
φ	diameter
°C	centigrade
hr	hour

min	minute
sec	second
%	percent
min	minimum
max	maximum
No	Number

#### Conversion Factors

1 Feddan	4,200 sq.m = 0.42 ha
1 knot	1,852 m/h = 0.5144 m/sec
1 horsepower	75 kg.m/sec





SUMMARY



## SUMMARY

### 1. AGRICULTURE IN EGYPT

Egyptian Agriculture has great potential in the national economy. In 1981, the agriculture occupied 17.3 percent (1,645 million LE) of GDP (9,496 million LE) as the second, 36.2 percent of employment as the top, 29.7 percent of export as the second and 21.5 percent of income as the top.

Rapid population growth has worsened the domestic food supply, i.e. 34.3 percent of the import and 49.8 percent of the trade deficit assign to food, and the self-sufficiency rate is only 53.4 percent. The arable land per capita declined from 0.25 feddan (0.10 hectare) in 1955 to 0.15 feddan (0.06 hectare) in 1980.

In order to increase food production and create employment opportunities, the government has proposed to reclaim additional 2.8 million feddan (1.18 million hectares) by the year 2,000 to the present 6.3 million feddan (2.65 million hectares) arable land, this comprehensive plan is called the "Horizontal expansion plan".

### 2. BACKGROUND OF SURVEY

This project is one of the horizontal expansion plan. The Egyptian government requested the Japanese government to carry out its feasibility study (F/S); accordingly, Japan International Cooperation Agency (JICA) has sent the F/S team to the proposed area in three times between April and December in 1983 for surveying and planning.

The F/S team carried out field surveys, data collection and discussions with the government, and analyses of the collected materials, proposal of the plan and evaluation of the project at the home office.

The results of survey and study are formulated as the Final Report.

### 3. GENERAL FEATURES OF THE PROJECT AREA

#### 3-1 Location and Scale

Lake Mazala is located at the North-eastern part of the Nile Delta, and is a sub-saline lake closed from Mediterranean Sea by a sandbar, and has an area of about 2,370 km<sup>2</sup>. The proposed area is located at the south-eastern part of Lake Manzala and covers about 110,000 feddan.

Of this proposed area, about 90 percent is under the lake or in the adjacent grass swamp, where the traffic consist of by small boats, and the remaining about 10 percent is upland area where about 2,000 squatters are engaged in agriculture by using the drain water from the neighboring drainage canals.

Bashtir canal runs through about the center but somewhat towards the east of the proposed area from South to North. It divides the area into two parts, the eastern

side is called "South Port Said" and has about 41,000 feddan, while the western side is called "North Hussinia" and has about 69,000 feddan.

### 3-2 Meteorology

The proposed area is much influenced by Mediterranean climate while inland areas are of a desert type climate. The area has an average annual precipitation of about 73 mm, an average annual humidity of 73%, and an average monthly temperature of 14.2°C in winter (January) and 27.4°C in summer (September). Winter crop production can be planned with irrigation.

### 3-3 Soils

Soils in the area are generally classified into two types of upland and inundated, however with only a little difference between the two, the inundated soil is estimated to reveal the similar traits of the upland soil after reclamation.

From the view of origin, the soil in the area is defined as marine alluvial soil. In terms of Soil Taxonomy classification, soils of the area are classified into six types on upland, and five in inundated area. The major soil characteristics are as follows:

Items	Upland	Swamp	Inundated
Texture	←—————	Silt ~ Clay	—————→
pH	7.4	7.5	7.6
EC (mmhos/cm)	18.4 – 21.4	16.6 – 18.3	14.8 – 16.0
Permeability (cm/sec)	←—————	$3.1 \times 10^{-3} \sim 2.8 \times 10^{-4}$	—————→

## 4. PRODUCTION PLAN

### 4-1 Agriculture

The total arable area has an area of 85,800 feddan, in which two cropping patterns are applied; Pattern-1 is for clayey soil in the South-West section of 65,404 feddan, and Pattern-2 is for the Loamy soil in the North-east section of 20,394 feddan.

Cropping Pattern	Summer Crops	Winter Crops
C. Pattern – 1	Paddy rice	Berseem
	Soybeans	Sugar beet
	Sorghum	Vegetables
C. Pattern – 2	Paddy rice	Berseem
	Soybeans	Sugar beet
	Sorghum 1/2	Vegetables
	Vegetables 1/2	

For the initial one or two year(s) leaching right after the completion of construction work, paddy rice and berseem are repeated for the following three years, then three-year rotation of the above cropping patterns is practiced with the adaptation period of five years. Thus, normal production will start at the ninth or tenth year after construction work is completed.

Crop production output based on 200% intensity are shown below:

Crop	Acreage		Yield (ton)	Production (ton)
	(Feddan)	(%)		
Rice	28,600	(16.7)	3.0	85,800
Berseem	28,600	(16.7)	25.0	715,000
Sugar beet	28,600	(16.7)	25.0	715,000
Soybeans	28,600	(16.7)	1.2	34,320
Sorghum	25,200	(14.5)	18.0	453,600
W. Vegetable	28,600	(16.7)		195,071
S. Vegetable	3,400	( 2.0)		29,412
<b>Total:</b>	<b>171,600</b>	<b>(100.0)</b>		

Farming is assisted by machinery; 90 Ps tractors are applied for plowing and 40 Ps for other general operations.

#### 4-2 Animal Husbandry

Livestock comprising of 5,000 heads of Friesian breed, 5,000 heads of Baladi breed and 1,500 heads of buffalo will be newly introduced within 3 initial years of project development among all the farm households in the Project area, who are encouraged to organize themselves into livestock growers co-operative society.

Under intensive animal husbandry extension services combined with expert veterinary care, the livestock originally introduced are expected to bring about in Year 12, when forage production reaches full development stage, Friesian-Baladi combined output of meat and milk amounting to 4,650 tons and 142,000 tons respectively. The number of Baladi and buffalo would then occupy 10-15 percent of the total cattle population.

In Year 14, the Baladi are assumed to be largely replaced by the Friesian breed, when the Friesian alone would deliver 5,000 tons of milk. In the same year, buffalo would also provide 590 tons of meat and 5,450 tons of milk.

Most of cow milk (both Friesian and Baladi) will be processed into UHT milk, butter and cheese, while buffalo milk will be locally consumed. Milk collecting centers equipped with bulk coolers will be established in each village to be transhipped to the milk plant. A centralized cattle breeding center will also be founded and operated by the Project Management Authorities.

Introduction of sheep or goat at 1.5 heads per household/year is also considered.

#### 4-3 Fishery

In the proposed area of 110,000 feddan, 12,500 feddan are now applied for open fishery and 21,120 feddan are for closed fishery. These fishery products will all be evaluated as negative benefits since the whole area is planned to be reclaimed as the results of F/S. The negative benefits are estimated at 2.54 million LE/year.

Lake Manzala is one of the limited lake/swamp resources in Egypt and provides a good qualified inland water fishery ground. The proposed area now produces 15.95 million LE (27,160 tons) including Tilapia and others. Since this production is supported with high nutrient input through Bahr El Baqar drain, this fishery ground is planned to be moved outside the proposed area in Lake Manzala by shifting the drain.

#### 4-4 Agro-Industry

Storage, processing, transportation, and marketing systems are pointed out as an especially less development field in Egyptian agriculture, and thus, the introduction of processing is one of the important objectives. Agro-industries are planned here as being widely applicable for not only this proposed area but also for other areas. Furthermore, processing requires such a large scale that each plant can be built as an independent project. Therefore, building of these plants is to be implemented by separating them from this project.

The major agro-industry are as follows:

Sugar Beet Factory	Capacity	600,400 ton/year
Milk Processing Plant	Capacity	167,000 ton/year
Tomato Paste Factory	Capacity	75,000 ton/year
Slaughter House	Capacity	50,000 heads/year

Establishment of these agro-industrial facilities have been planned by taking into consideration the joint-use of the materials between the South Hussinia Project Area.

#### 4-5 Pilot Farm

Pilot farm of 500 feddans, including 400 feddans used for testing farms and 100 feddans used for facilities, is provided before starting the implementation of the main project. Training centers are also provided. Main items examined in this farm are as follows:

Cultivation, Fertilization, Pest Controlling,  
Irrigation & Drainage, Mechanized farming, etc.

The probable cost for the Pilot Farm is estimated at 4, 164 thousand LE.



#### 4-6 Supporting Service

Among the supporting services indispensable for successful implementation of the proposed agricultural and animal husbandry development project, the research and extension services are basically sought to be provided by the Government.

Additional or applied research programmes and refresher courses on behalf of the extension staff will also be conducted at the Pilot Farm established in the project area.

Rural credit, input supply, and marketing services are to be provided in an integrated manner through the farmers' own co-operative system. One is the PBDAC-affiliated multi-purpose agricultural co-operative, and the other is the "specialized" co-operative of livestock growers and vegetable growers.

### 5. DEVELOPMENT PLAN

#### 5-1 Project Area

The total area is 110,000 feddan, of which the arable land is 85,800 feddan; the arable ratio is 78 percent.

Land Use	N. Hussinia (fed.)	S. Port Said (fed.)	Total (fed.)
Whole area	69,000	41,000	110,000
Residence	1,950	1,350	3,300
Facilities (Canals, Drains, Roads, etc.)	13,050	7,850	20,900
Arable land	54,000	31,800	85,800

#### 5-2 Land Distribution

The distribution of farmers is as follows:

Class	Unit (fed.)	Household	Area (fed.)
Small Holder	5.0	12,400	62,000
Large Holder (Secondary S.)	15.0	1,048	15,720
Large Holder (University)	20.0	525	10,480
Total		13,973	88,200

26,460 feddan composing 30 percent of the total will be sold for cash to the reclamation cooperatives in bulk in order to mobilize idle funds. The remaining 70 percent (61,740 feddan) will be distributed among settlers, of which 12,350 feddan is sold by auction.

### 5-3 New Village Development

This development is planned on 240,000 feddan and includes not only this project of 110,000 feddan but also the surrounding government projects of South Hussinia (80,000 feddan) and South Port Said South (50,000 feddan).

As the new community, a total of 52 villages and town including 40 satellite villages, 8 service villages, 3 central villages and 1 town covering a wide area are planned.

Item	Agriculture	Non-agriculture	Total
Total households	13,973	5,827	19,800
Total population	69,865	29,135	99,000

### 5-4 Field Plan

In consideration of the efficient utilization of agricultural machinery, effective irrigation, economical scale of farming, crop rotation etc., the following field lots are applied.

Field lot	: 70.0 m x 100 m
Farmers lot	: 210 m x 100 m = 2.1 ha = 5 feddan

### 5-5 Irrigation

Irrigation method	: Surface irrigation
Peak evapotranspiration	: 8.7 mm/day (July)
Irrigation efficiency	: $E_p = 64\%$ ( $E_c 90 \times E_b 95 \times E_a 75\%$ )
Applied formula	: Blaney-Criddle method

The results of calculation show the following water requirements:

Peak water requirement	: 44.6 m <sup>3</sup> /day/feddan
Annual water requirement	: 8,117 m <sup>3</sup> /year/feddan
Canal capacity	: 1,032 l/sec/feddan

Although this peak requirement is 12 percent larger than 40.0 m<sup>3</sup>/day/feddan regulated by the Ministry of Irrigation, without satisfying this requirement the growing area in summer will have to be reduced by 8,800 feddan.

### 5-6 Drainage

The fine textured soil and high water table involved in the area contribute to excessive irrigation water or cumulated salt content by capillary action. For the solution, the following field drainage improvement works are planned.

Breaking subsurface soil	: Practice over the field to provide coarse pores in soil
Open drain	: 23.3 m interval 1.3 m deep
Tile drain	: 23.3 m interval 1.3 m deep In the primary leaching period whole drains are open drains, after the period whole open drains are shifted to tile drains.
Drainage discharge	: Peak 27.5 m <sup>3</sup> /day/feddan, annually 3,681 m <sup>3</sup> /year feddan
Initial leaching	: Based on the probable salt content of 8 to 32 mmhos/cm, 14 mmhos/cm on average, the leaching requirement is decided at 1,500 mm which is 3,900 m <sup>3</sup> /fed (90m <sup>3</sup> /day/fed) and the period at 43 days, to lower the content to be 6 mmhos/cm with one time leaching.
Normal leaching	: With the irrigation water including 900 ppm (1.4 mmhos/cm) salt, leaching is executed several times by flooding 120% of the planned irrigation water volume.

#### 5-7 Construction Component

Considering the efficient using of construction machinery, building of settlement facilities, training of settlers etc., the construction period is decided at 9 years including the initial leaching period and others. Based on the irrigation & drainage systems, the construction is executed by dividing the area into nine blocks with the four blocks of South Port Said and five blocks of North Hussinia.

Scale of main works is shown below.

Dyke	: 80.0 km
Drainage pump station	: 2 stations
Main canal	: 106.2 km
Secondary canal	: 264.7 km
Intake Barrage for main canal	: 6 points
Main drain	: 109.4 km
Secondary drain	: 218.5 km
Bridge	: 88 points
Land reclamation	: 85,800 feddan

## 5-8 Project Costs

The project costs here do not include the building costs of agro-industrial factories, settlement facilities and Pilot Farm. All costs are shown below with the exchange rate of US\$1.00 = LE 0.80.

(LE '000)			
Cost Item	Local Currency	Foreign Currency	Total
Direct costs	109,531	88,468	197,999
Physical contingency	10,953	8,846	19,799
Price escalation	214,342	49,696	264,038
Total:	334,826	147,010	481,836

Unit Cost: 4,380 LE/Fed. : 5,475 \$/ha : 1,314 thousand yen/ha.

For references, other related projects suggest the following costs.

(LE '000)			
Work Items	Local Currency	Foreign Currency	Total
New Village	553,791	180,653	734,444
Agro-industries	25,530	98,640	124,170
Pilot Farm	1,923	2,680	4,603

## 6. PROJECT JUSTIFICATION

The project implementation requires the total investment of 1,216.3 million LE in 1983 constant prices. Of this 721.0 million LE is estimated as the price escalation.

(LE '000)			
	Land Reclamation	Infrastructure	Total
F/C	147,010	180,653	327,663
L/C	334,826	553,791	888,617
Total	481,836	734,444	1,216,280

By re-valuing the fuel costs and the costs for common labor in the land reclamation component and by applying the standard conversion factor for the other local currency portion in the land reclamation component as well as the whole local currency portion in the infrastructure component, the economic cost of the initial investment is estimated at 430.3 million LE as shown below;

	(LE '000)		
	Land Reclamation	Infrastructure	Total
F/C	97,314	110,276	207,590
L/C	88,932	133,759	222,697
Total	186,246	244,035	430,281

The annual agricultural benefits after the full development stage is estimated at 55.04 million LE, which includes the negative benefit of 2.54 million LE arising from the fishery sector.

#### Agricultural Benefit after Full Development

	(LE '000)		
Item	Crop	Livestock	Total
With Project	41,142	36,123	77,265
Without Project	960	—	960
Increment	40,182	36,123	76,305
Negative Benefit	—	—	2,540
Agr. Benefit	—	—	73,765

On the basis of the above economic costs and benefit, the following economic internal rates of return were calculated:

- Land Reclamation Component 13.8%<sup>11</sup>
- Inclusive of Infrastructure Component 8.7%

Thus, the Project is economically feasible and the financial analysis reveals that beneficiary farmers can still realize a positive balance in their farm budget after the full development stage, after payment of cash farm costs, annual amortization and living expenses.

<sup>11</sup> = IRR of 13.8% has been computed excluding the allocated cost by the El Salam Canal; the rate including such allocated cost would be 11.3%.

## CONCLUSION AND RECOMMENDATION



## **CONCLUSION**

### **1. Feasibility**

The North Hussinia and South Port Said Agricultural development project is feasible, both technically and economically.

Definition of this project, as a new project approved by the Egyptian government in the Economic and Social Development Five Year Plan 1982/83 – 1986/87, requires preparation for the quick commencement based on the results of this study.

### **2. Construction Period**

Technically and economically, it is appropriate to develop the whole area of North Hussinia 69,000 feddan and South Port Said 41,000 feddan.

However, from the viewpoint of the effective execution and the budgetary preparation in local currency, a nine-year implementation plan for the North Hussinia is divided into five sub-blocks, and seven-year implementation plan for the South Port Said is divided into four sub-blocks.

### **3. Major Points**

This project is a large scale new reclamation project and will be a pioneer for the following horizontal extension projects. Hence, five main objectives were provided: the creation of employment opportunities, the efficient utilization of water resource, the introduction of mechanized farming, the establishment of new rural communities, and the introduction of agro-industries.

### **4. Joint Facilities**

The El Salam Canal which is presently under construction is used as the main canal of this Project; the El Salam includes outside benefited areas such as South Hussinia and South Port Said South. Facilities such as water supply works, pilot farm, agro-industries and others would be inefficient if being built for individual sub-block. Thus, they were planned as common facilities to these sub-blocks.

### **5. Agro-Industries**

Building agro-industries such as sugar factories, milk processing factories, etc. will be planned in another independent project since they are large-scale and capital-intensive plants.



## 6. Cost and Benefit

Major project components such as project area, project cost, project benefit, economic internal rate of return, etc. are as follows;

Items	Unit	N. Hussinia	S. Port Said	Total Project
Project Area	fed	69,000	41,000	110,000
Arable Area	fed	54,000	31,800	85,800
Direct Cost	LE '000	139,186	78,612	217,798
Total Cost	LE '000	316,717	165,119	481,836
Project Benefit	LE '000	48,378	28,887	77,265
E.I.R.R.	%	12.8	16.0	13.8
Unit Cost	LE/fed	2,017	1,917	1,980

## **RECOMMENDATION**

Based on the definition of technical and economical feasibility of the project, the Egyptian government is recommended to urgently discuss the solution for the following eleven items:

### **1. Establishment of the Pilot Farm**

For definition of construction standard and confirmation of effectiveness of open ditches, tile drains, subsoil breaking, leaching, etc., and trial of soil improvement, mechanized farming, fertilized growing, etc. a pilot farm is urgently required.

### **2. Squatters**

Many squatters live in the Project Area, farming or fishing. Despite the irregularity, some people have been present for several decades, and some Governorates have provided public facilities involving primary schools, clinics, mosques, etc. The government should urgently investigate their present situation, and study ways to making them settle in this Project or any other.

### **3. Movement of the Fishing Ground**

Most of the Proposed Area is lake and swamp which is now used as a fishing ground for the people living inside or outside the area. This area is sustained by sewerage water through Bahr El Baqar drain. To maintain the fishery, the government should move the fishing ground to offshore of the Lake Manzala by using the Bashtir Drain.

### **4. Local Currency**

This project is an extremely large agricultural development project. Thus, accommodation of local currency as well as foreign currency is indispensable for this project to be completed on schedule. Urgent budgetary treatment should be given.

### **5. Divided and Machinery-intensive Construction**

To quickly perform on implementation schedule, this project is required to be divided into several construction sections and executed by machinery.

### **6. Training of Settled Farmers**

Since this project will accept many people with little experience of farming, training new farmers before settlement may control the success. The government should urgently provide a farmer training facilities simultaneously with the pilot farm.

### **7. Water Requirements**

In Egypt, water is one of the most important natural resources. However, enough water on the other hand must be obtained. Otherwise, production will be reduced,

and the farm land will have salt encroachment and will be lain waste. The government should carefully provide the technically required volume of water.

#### **8. Water Management**

Lifting irrigation is economically inefficient although it has been adopted for farmers to save water. Thus, establishing the gravity irrigation as a new water management system is of great importance; on the other hand, it is necessary to teach farmers new moral and method for water usage.

#### **9. Administration and Farmers' Organization**

For the practice of high economical agriculture, to use necessary fertilizers, to use organic matters and to introduce farm machinery are indispensable.

For it, obtaining substantial supporting services is one of the factors to bring success into such a large agricultural development project. The government should assist the establishment of a substantial system for administration and farmers' organization.

#### **10. New Rural Communities**

Modern villages having business, education, medical care and communication services must be newly built simultaneously with agricultural land and facilities construction. They must be new communities in which farmers can so enjoy their life and make the project become a model for development.

Since village construction costs are paid from the local currency, the government should urgently establish detailed procedures to support this construction both financially and technically.

#### **11. Marketing**

Marketing systems, including transportation, storage and processing are one of the less developed fields in Egypt. These three subsystems must be sufficiently established for the efficient trade of products. However, these cannot be covered with one Project, but should be conducted broadly and comprehensively.

The government should urgently consider such establishment.

## CURRENT SITUATION AND FIELD SURVEY



## CHAPTER 1 INTRODUCTION



## CHAPTER I. INTRODUCTION

### 1. BACKGROUND OF THE STUDY & ITS PROCEDURES

The Government of Arab Republic of Egypt visualized, in view of increasing self-sufficiency rate of foodstuff through expansion of farmland and of creating additional employment opportunities, the North Hussinia Valley & South Port Said Agricultural Development Project and requested the Government of Japan for cooperation in its realization. In response to this request, the Government of Japan dispatched, in September 1982, a Preliminary Survey Mission to Egypt to study the scope of technical assistance and to decide its contents to meet the Egyptian demand.

Upon mutual agreement on the scope and contents of such technical cooperation, the Japan International Cooperation Agency (JICA) undertook to carry out the feasibility study of the said Project through combination of field surveys and home office works in the period of time from April 1983 to March 1984.

The procedures taken for implementation of the feasibility study are as follows:

i) Basic Survey (April 2 to May 3, 1983)

3-member Team was sent to Egypt to explore the project-site primarily from the soil and hydrological angles. The same Team chalked out, through exchange of views and opinions with the authorities concerned of the Egyptian Government, a guideline for execution of the study.

ii) First Survey (May 17 to August 15, 1983)

The Feasibility Study Team comprising of 14 specialists attended at field survey, collection of data and information, discussions with the agencies concerned, etc., in order to consolidate the fundamental approach toward answering the problems both subject-wise and project-wise. The Team's findings were assimilated in the Field Report No. 1 which was submitted before the Team's return to Japan. The Interim Report was prepared as a result of the Home office work by mid-October 1983 by taking full consideration of the comments given by the Egyptian authorities on the Field Report No. 1.

iii) Second Survey (October 18 to December 14, 1984)

The F/S Team returned to Egypt to elaborate, concretize and finalize its proposals made in its Interim Report which was accepted by the Egyptian Government with some reservations. Field Report No. 2 prepared at the conclusion of the second survey reflected the Team's efforts to accommodate the Egyptian thinking at the threshold of its compilation of the Draft Final Report in its home-office work. Draft Final Report was presented in March 1984 and the Egyptian comments on it were given on two occasions during the ensuing two months. The Final Report has been completed by fully incorporating such comments.



## 2. AIMS AND PURPOSES OF THE FEASIBILITY STUDY AND ITS COVERAGE

110,000 feddan in the northeastern part of the Nile Delta have been studied from land-reclamation-cum-agricultural development aspect to substantiate the North-Hussinia Valley & South Port Said Agricultural Development Project. The project's feasibility has been evaluated technically, economically and financially by taking into consideration the compensation for fisheries loss resulting from land reclamation, the introduction of agro-industries to raise the project's economic return, the construction of new settlements to accommodate the settlers and the establishment of Pilot Farm to assure a steady implementation of the project on a sound scientific basis.

The feasibility study has been conducted on the basis of the Scope of Work which had been mutually agreed upon between the two Governments; in actual performance, the F/S Team has had, at each stage of the progress of its study, a series of discussion meetings with the Egyptian authorities concerned, on one hand, and with the Advisory Committee, on the other.

The Final Report comprises:

1) Main Report

2) Associated Report in 5 Volumes:

Volume I:	Annex A	Soils
	" B	Land Capability Classification
Volume II:	" C	Agriculture
	" D	Animal Husbandry
	" E	Fisheries
	" F	Agro-Industry
	" G	Meteorology and Hydrology
Volume III:	Annex H	Irrigation
	" I	Drainage
	" J	Land Reclamation
	" K	Land Disposal
	" L	Structure Design
	" M	Rural Development
Volume IV:	Annex N	Cost Estimation
	" O	Supporting Services
	" P	Implementation
	" Q	Economic Evaluation and Financial Analysis
Volume V:		Drawings