

**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**

**VOLUME IV**

- N. COST ESTIMATION
- O. SUPPORTING SERVICES
- P. IMPLEMENTATION
- Q. ECONOMIC JUSTIFICATION  
AND FINANCIAL ANALYSIS

**JUNE 1984**

**JAPAN INTERNATIONAL COOPERATION AGENCY**



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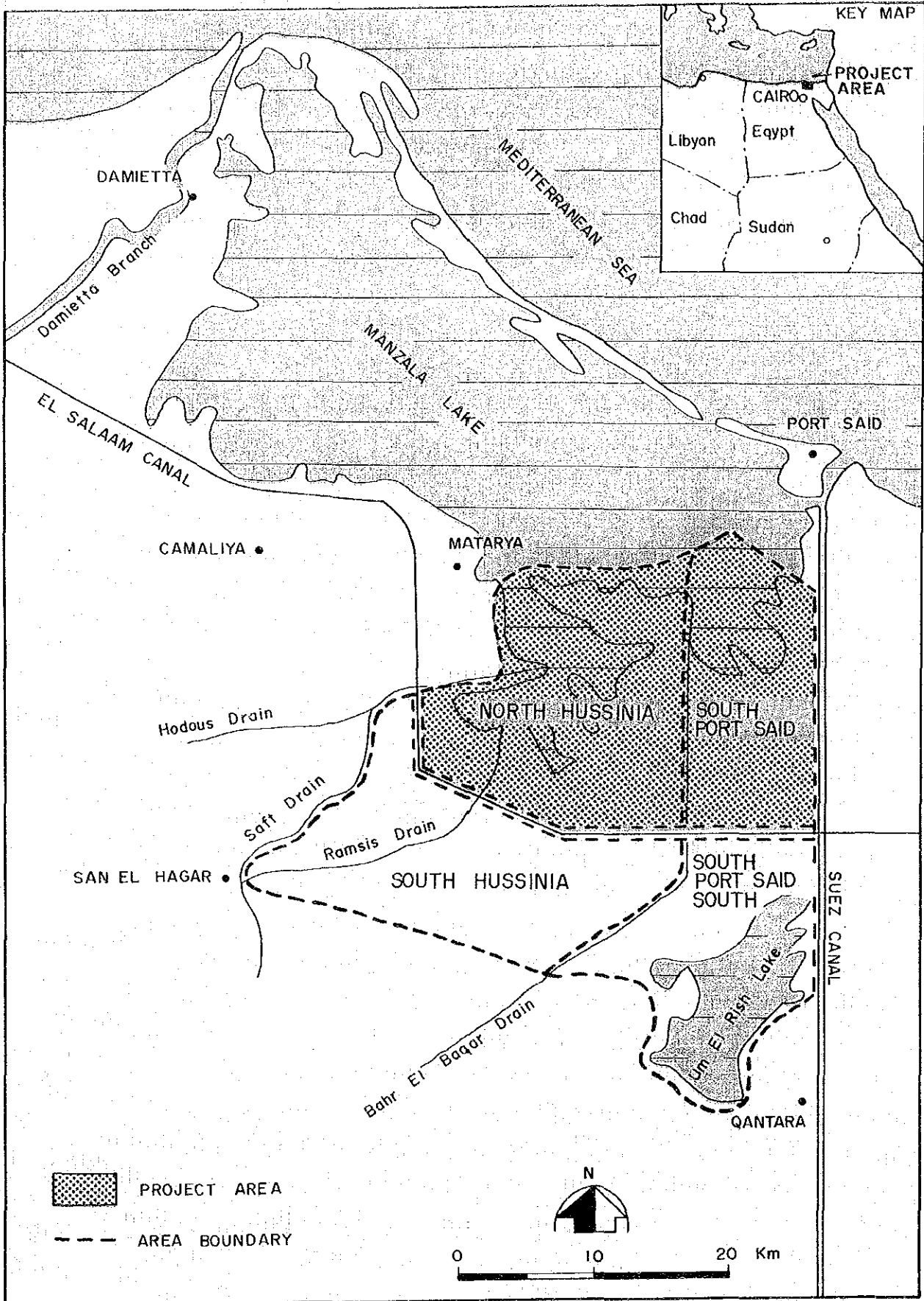
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NORTH HUSSINIA VALLEY AND SOUTH PORT SAID  
 AGRICULTURAL DEVELOPMENT PROJECT  
 LOCATION MAP



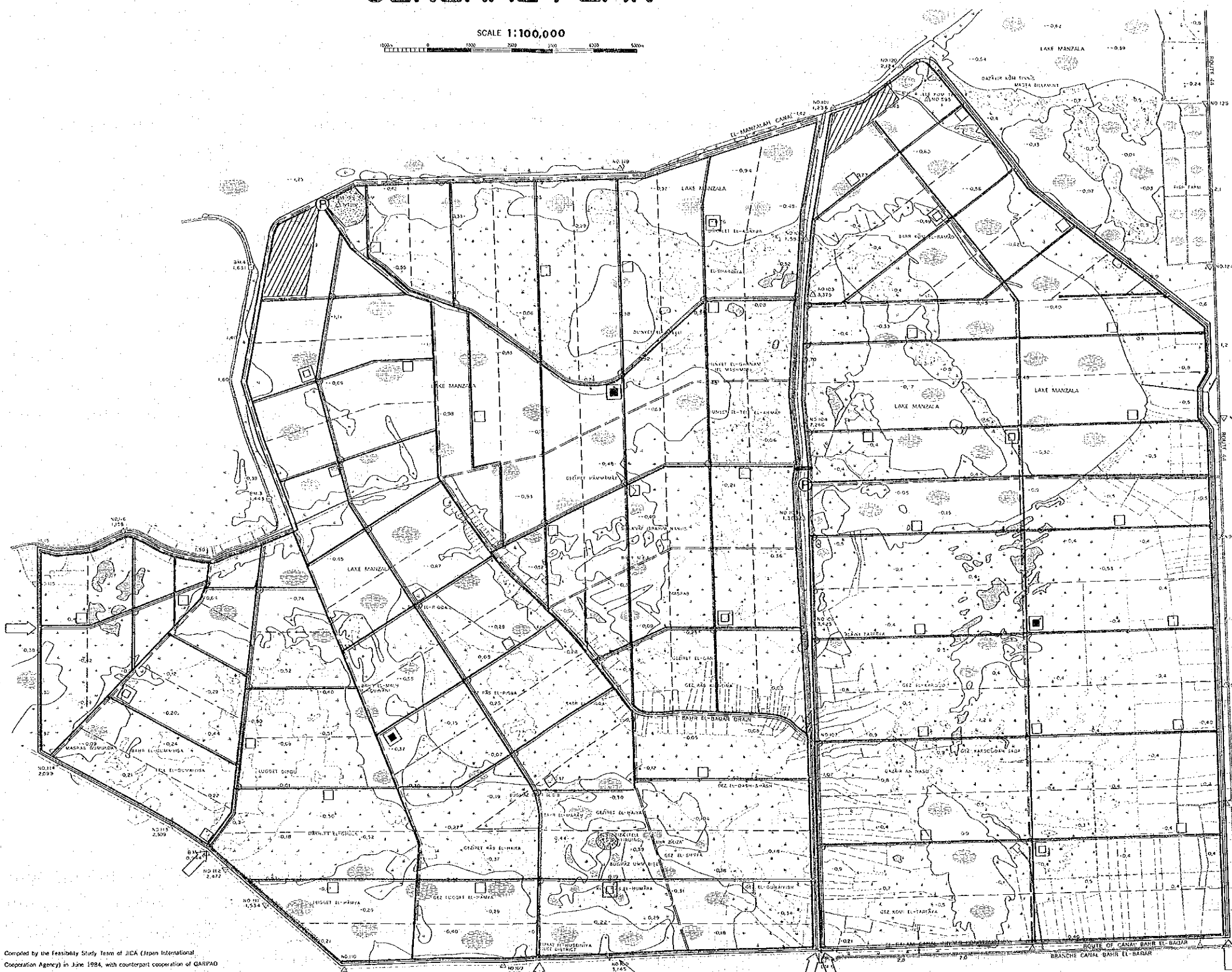
# NORTH HUSSINIA VALLEY AND SOUTH PORT SAID AGRICULTURAL DEVELOPMENT PROJECT GENERAL PLAN

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



**EL SALAM CANAL**  
(Under Construction)

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





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- ANNEX O. SUPPORTING SERVICES**
- ANNEX P. IMPLEMENTATION**
- ANNEX Q. ECONOMIC EVALUATION AND  
FINANCIAL ANALYSIS**



ANNEX

N. COST ESTIMATION



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## N. COST ESTIMATION

### 1. Conditions of Cost Estimation

The following assumptions have been adopted for estimating the Project costs:

- (1) The exchange rate between Egyptian Pound and U.S. Dollar:

US\$1.00 = LE0.80

- (2) All the construction of civil works are to be executed on a full contract basis through international competitive bidding. The equipment required for construction will be provided by the contractors. Therefore only the depreciation cost of equipment is included to the estimated Project cost.
- (3) The construction cost is divided into foreign and local currency- portions. Local currency portion is estimated based on the data collected in Port Said, Ismailia, and Cairo. Foreign currency portion is estimated based on the C.I.F. prices of materials and equipment from the neighboring port to the Project Area. The classification of local and foreign currency portions is defined as follows:

#### Local Currency Portion:

- labor wages,
- sand, gravel,
- fuel, oil, etc.,
- cement,
- inland transportation costs and local insurance,

#### Foreign Currency Portion:

- gate materials and steel,
- expenses and fees of engineering services of foreign consultants,
- vehicle required for the construction supervision and O & M equipment for the Project operation.

- (4) Physical contingency of the cost estimate are set at 10 percent.
- (5) Price contingencies applied in the estimate are 12 percent per year for the local currency portion and 5 percent year for the foreign currency portion.

## 2. Unit Prices

The unit prices of construction materials are based on the data adopted in the meetings between the Government officials in charge and the Study Team members, as well as the prices collected in Cairo, Ismailia, and Port Said as of 1983 for both foreign and local costs.

(See Table N-2-1)

## 3. Project Cost

The total Project cost was estimated at 481,836,000LE of which 334,826,000LE will be local currency and 147,010,000LE (equivalent to U.S.\$183,763,000) will be foreign currency. The breakdown of the Project costs are shown in Table N-3-1. The unit cost is 1,980LE/feddan at 1983 price.

The annual disbursement schedule is worked out based on the implementation schedule as Table N-3-5.

Table N-2-1 Unit Prices

Description	Unit	Unit Cost (L E )
Common laborer for earth work	day	7.0
Skilled laborer for earth works	day	9.0
Common laborer for building works	day	8.0
Skilled laborer for building works	day	9.0
Driver for light equipment	day	5.0
Driver for heavy equipment	day	13.0
Bricklayer	day	12.0
Welder	day	10.0
Carpenter	day	12.0
Piling driver	day	11.0
Reinforced bar bender	day	7.0
Surveyer	day	15.0
Asist. Surveyer	day	9.0
Mechanician	day	10.0
Portland cement	ton	32.0
Sulfate resisting portland cement	ton	78.0
Plain bar	ton	300.0
Shape steel	ton	330.0
Stone rip rap	cum	16.0
Broken stone at site	cum	12.0
Washed gravel at site	cum	12.0
Sand at site	cum	8.0
Timber	sq.m	280.0
Regular gasoline	lit.	0.15
Diesel oil	lit.	0.03
Grease	kg	1.2

N-3-1. Estimation of the Total Project Cost

(LE'000)

Description		L/C	F/C	Total
Stage I	1. Preparatory Work	157	-	157
	2. Civil Works			
	- Main Irrigation Canals	3,084	3,613	6,697
	- Secondary I. Canals	4,129	9,948	14,077
	- Main Drainage Canals	5,542	4,001	9,543
	- Secondary D. Canals	1,152	988	2,140
	- Housing Canals	402	380	782
	- Roads and Dykes	4,094	242	4,336
	- On-firm Facilities	52,595	40,496	93,091
	- Pumping Station	2,671	6,386	9,057
	- Tidal Dyke	3,000	-	3,000
	Sub-Total	76,669	66,054	142,723
	3. O & M Cost for Civil Works	720	-	720
	4. Administration Cost	7,120	0	7,120
5. Consulting Service	1,621	4,796	6,417	
Sub-Total	86,287	70,850	157,137	
6. Physical Contingency	8,629	7,083	15,712	
Total (Gross Construction Cost)	94,916	77,933	172,849	
7. Price Escalation	119,565	32,272	151,837	
Sub-Total	214,481	110,205	324,686	
Stage II	1. - Tile Drains	21,194	17,333	38,527
	2. O & M Cost for Civil Works	-	-	-
	3. Administration Cost	1,921	0	1,921
	4. Consulting Service	129	285	414
	Sub-Total	23,244	17,618	40,862
	5. Physical Contingency	2,324	1,763	4,087
Total (Gross Construction Cost)	25,568	19,381	44,949	
6. Price Escalation	94,777	17,424	112,201	
Sub-Total	120,345	36,805	157,150	
Price Escalation		214,342	49,696	264,038
Total Project Cost		334,826	147,010	481,836

N-3-2 Estimation of the South Port Said Block Cost

(LE'000)

	Description	L/C	F/C	Total
Stage I	1. Preparatory Work	56	-	56
	2. Civil Works			
	- Main Irrigation Canals	1,202	1,266	2,468
	- Secondary I. Canals	1,288	2,898	4,186
	- Main Drainage Canals	1,738	1,263	3,001
	- Secondary D. Canals	410	352	762
	- Housing Canals	154	146	300
	- Roads and Dykes	1,449	181	1,630
	- On-firm Facilities	19,603	15,094	34,697
	- Pumping Station	1,239	2,704	3,943
	- Tidal Dyke	-	-	-
	Sub-Total	27,083	23,904	50,987
	3. O & M Cost for Civil Works	-	-	-
4. Administration Cost	2,538	0	2,538	
5. Consulting Service	612	1,787	2,399	
Sub-Total	30,546	25,691	56,237	
6. Physical Contingency	3,054	2,568	5,622	
Total (Gross Construction Cost)	33,600	28,259	61,859	
7. Price Escalation	39,364	11,431	50,795	
Sub-Total	72,964	39,690	112,654	
Stage II	1. - Tile Drains	7,900	6,460	14,360
	2. O & M Cost for Civil Works	-	-	-
	3. Administration Cost	718	0	718
	4. Consulting Service	58	93	151
	Sub-Total	8,676	6,553	15,229
	5. Physical Contingency	868	656	1,524
Total (Gross Construction Cost)	9,544	7,209	16,753	
6. Price Escalation	30,428	5,284	35,712	
Sub-Total	39,972	12,493	52,465	
	Price Escalation	69,792	16,715	86,507
	Total Project Cost	112,936	52,183	165,119

N-3-3 Estimation of North Hussinia Block Cost

(LE'000)

	Description	L/C	F/C	Total
Stage I	1. Preparatory Work	101	-	101
	2. Civil Works			
	- Main Irrigation Canals	1,882	2,347	4,229
	- Secondary I. Canals	2,841	7,050	9,891
	- Main Drainage Canals	3,804	2,738	6,542
	- Secondary D. Canals	742	636	1,378
	- Housing Canals	248	234	482
	- Roads and Dykes	2,645	61	2,706
	- On-farm Facilities	32,992	25,402	58,394
	- Pumping Station	1,432	3,682	5,114
	- Tidal Dyke	3,000	-	3,000
	Sub-Total	46,586	42,150	88,736
	3. O & M Cost for Civil Works	463	-	463
4. Administration Cost	4,582	0	4,582	
5. Consulting Service	1,009	3,009	4,018	
Sub-Total	55,741	45,159	100,900	
6. Physical Contingency	5,575	4,515	10,090	
Total (Gross Construction Cost)	61,316	49,674	110,990	
7. Price Escalation	80,201	20,841	101,042	
Sub-Total	141,517	70,515	212,032	
Stage II	1. - Tile Drains	13,294	10,873	24,167
	2. O & M Cost for Civil Works	-	-	-
	3. Administration Cost	1,203	0	1,203
	4. Consulting Service	71	192	263
	Sub-Total	14,568	11,065	25,633
	5. Physical Contingency	1,456	1,107	2,563
Total (Gross Construction Cost)	16,024	12,172	28,196	
6. Price Escalation	64,349	12,140	76,489	
Sub-Total	80,973	24,312	104,685	
	Price Escalation	144,550	32,981	177,531
	Total Project Cost	221,890	94,827	316,717

Table N-3-4 Estimation of Blockwise Civil Work Costs

(LE'000)

Description	L/C	F/C	Total
South Port Said			
. Block 1	11,439	11,010	22,449
. Block 2	10,478	8,568	19,046
. Block 3	6,501	5,330	11,831
. Block 4	6,565	5,456	12,021
(Sub-Total)	34,983	30,364	65,347
North Hussinia			
. Block 1	13,569	13,913	27,482
. Block 2	13,377	11,321	24,698
. Block 3	14,830	13,037	27,867
. Block 4	12,522	10,186	22,708
. Block 5	5,582	4,566	10,148
(Sub-Total)	59,880	53,023	112,903
Tidal Dyke	3,000	-	3,000
Total	97,863	83,387	181,250



Table N-3-5 Annual Disbursement Schedule

(LE\$000)

Project Year	South Port Said			North Hussinia			Total Project		
	L/C	F/C	Total	L/C	F/C	Total	L/C	F/C	Total
1 1986	104	527	631	178	894	1,072	282	1,621	1,903
2 1987	162	256	418	277	434	711	439	690	1,129
3 1988	6,879	6,161	13,040	16,957	9,633	26,590	23,836	15,794	39,630
4 1989	10,855	5,711	16,626	19,455	10,646	30,101	30,310	16,417	46,727
5 1990	11,207	5,900	17,107	19,025	10,339	29,364	30,222	16,239	46,471
6 1991	14,520	7,041	21,561	24,784	12,416	37,200	39,304	19,457	58,761
7 1992	11,572	6,849	19,421	22,509	10,522	33,031	34,081	16,371	51,452
8 1993	17,161	7,185	24,346	21,014	8,993	30,007	38,175	16,178	54,353
9 1994	504	0	504	10,455	4,192	14,647	10,959	4,192	15,151
10 1995	16,389	5,061	21,450	6,190	2,444	8,634	22,579	7,505	30,074
11 1996	0	0	0	14,818	4,805	19,623	14,818	4,805	19,623
12 1997	23,583	7,432	31,015	17,048	5,416	22,464	40,331	12,848	53,479
13 1998	0	0	0	21,093	6,272	27,365	21,093	6,272	27,365
14 1999	0	0	0	28,087	7,819	35,906	28,087	7,819	35,906
Total	112,936	52,183	165,119	221,890	94,827	316,717	334,826	147,010	481,836

#### 4. Related Projects

Related projects with this agricultural development project are new village construction, pilot farm establishment and agro-industries establishment.

The construction costs are estimated as shown in Table 5-15.

Table N-4-1 Estimation of Related Projects

(LE000)			
Project	L/C	F/C	Total
New Village Construction	553,791	180,653	734,444
Pilot Farm	1,923	2,680	4,603
Agro-Industry			
Sugar Beet Factory	16,500	68,000	84,500
Milk Processing Factory	3,600	16,000	19,600
Vegetable Factory	3,610	5,410	9,020
Slaughter House	1,820	9,225	11,045

**A P P E N D I X - N**



N-1 Direct Construction Cost for the Total Project

(LE'000)

\* : Cost for stage II works

Year															
Description		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Total															
1. Preparatory Work	L/C	157	0	157	0	0	0	0	0	0	0	0	0	0	0
	F/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Pump Station	L/C	2,671	0	0	2,671	0	0	0	0	0	0	0	0	0	0
	F/C	6,386	0	0	6,386	0	0	0	0	0	0	0	0	0	0
3. Main Drainage Canal	L/C	5,542	0	0	2,771	2,771	0	0	0	0	0	0	0	0	0
	F/C	4,001	0	0	2,000	2,001	0	0	0	0	0	0	0	0	0
4. Irrigation Canal and Land Reclamation	L/C	65,456	0	0	3,268	10,458	11,764	13,726	11,833	10,594	2,524	1,239	50	0	0
	F/C	55,667	0	0	2,784	8,907	10,020	11,684	10,061	8,989	2,144	1,072	0	0	0
5. Tyde Dyke	L/C	3,000	0	0	3,000	0	0	0	0	0	0	0	0	0	0
	F/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6. O.M Cost for Construction	L/C	720	0	0	0	114	30	30	101	101	172	86	86	0	0
	F/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Tile Drain	L/C	21,194	0	0	0	0	0	0	0	0	3,677*	2,843*	7,278*	3,377*	4,019*
	F/C	17,333	0	0	0	0	0	0	0	0	3,007*	2,325*	5,952*	2,762*	3,287*
Sub. Total	L/C	98,740	0	157	11,710	13,343	11,794	13,756	11,934	10,695	2,696	1,325	136	0	0
	F/C	83,387	0	0	11,170	10,908	10,020	11,684	10,061	8,989	2,144	1,072	0	0	0
	L/C											3,677*	2,843*	7,278*	3,377*
	F/C											3,007*	2,325*	5,952*	2,762*
8. Administration Cost	L/C	9,109	0	8	1,144	1,213	1,091	1,273	1,100	985	242	120	12	0	0
	F/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	L/C											334*	253*	662*	307*
	F/C											0	0	0	0
9. Consulting Service	L/C	1,681	193	103	137	195	252	221	154	128	88	81	0	0	0
	F/C	5,079	1,145	529	353	502	725	576	370	261	138	195	0	0	0
	L/C											30*	18*	46*	18*
	F/C											51*	48*	90*	48*
Sub. Total	L/C	109,530	193	268	12,991	14,751	13,137	15,250	13,188	11,808	3,026	1,526	148	0	0
	F/C	88,466	1,145	529	11,523	11,410	10,745	12,266	10,431	9,250	2,282	1,267	0	0	0
	L/C											4,041*	3,114*	7,986*	3,702*
	F/C											3,058*	2,373*	6,047*	2,810*
10. Physical Contingency	L/C	10,954	19	27	1,299	1,475	1,314	1,525	1,320	1,181	303	153	15	0	0
	F/C	8,848	114	53	1,153	1,141	1,074	1,227	1,043	925	228	127	0	0	0
	L/C											404*	311*	799*	370*
	F/C											306*	237*	605*	281*
Total	L/C	120,484	212	295	14,290	16,226	14,451	16,775	14,508	12,989	3,329	1,679	163	0	0
	F/C	97,314	1,259	582	12,676	12,551	11,819	13,487	11,474	10,175	2,510	1,394	0	0	0
	L/C											4,445*	3,425*	8,785*	4,072*
	F/C											3,364*	2,610*	6,647*	3,091*
Grand Total		217,798	1,471	877	26,966	28,777	26,270	30,268	25,981	23,164	5,839	10,882	6,198	15,432	7,163

N-2 Direct Construction Cost for South Port Said Block

(LE'000)

\* : Cost for stage II works

Year															
Description		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Total														
1. Preparatory Work	L/C	58	0	58	0	0	0	0	0	0	0	0	0	0	0
	F/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Pump Station	L/C	1,239	0	0	1,239	0	0	0	0	0	0	0	0	0	0
	F/C	2,704	0	0	2,704	0	0	0	0	0	0	0	0	0	0
3. Main Drainage Canal	L/C	1,738	0	0	869	869	0	0	0	0	0	0	0	0	0
	F/C	1,263	0	0	631	632	0	0	0	0	0	0	0	0	0
4. Irrigation Canal and Land Reclamation	L/C	24,106	0	0	1,203	3,850	4,330	5,053	4,812	4,812	46	0	0	0	0
	F/C	19,937	0	0	997	3,190	3,589	4,181	3,987	3,987	0	0	0	0	0
5. Tyde Dyke	L/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	F/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6. O.M Cost for Construction	L/C	274	0	0	0	57	15	15	86	15	86	0	0	0	0
	F/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Tile Drain	L/C	7,900	0	0	0	0	0	0	0	0	0	3,677*	0	4,223*	0
	F/C	6,460	0	0	0	0	0	0	0	0	0	3,007*	0	3,453*	0
Sub. Total	L/C	35,315	0	58	3,311	4,776	4,345	5,068	4,898	4,827	132	3,677*	0	4,223*	0
	F/C	30,364	0	0	4,332	3,822	3,589	4,187	3,987	3,987	0	3,007*	0	3,453*	0
8. Administration Cost	L/C	3,285	0	3	382	430	397	463	444	441	7	334*	0	384*	0
	F/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9. Consulting Service	L/C	622	71	38	56	77	128	103	51	40	0	30*	0	28*	0
	F/C	1,879	424	196	163	189	315	252	126	121	0	51*	0	42*	0
Sub. Total	L/C	39,222	71	99	3,749	5,283	4,870	5,634	5,393	5,308	139	4,041*	0	4,635*	0
	F/C	32,243	424	196	4,495	4,011	3,904	4,439	4,113	4,108	0	3,058*	0	3,495*	0
10. Physical Contingency	L/C	3,922	7	10	375	528	487	563	539	531	14	404*	0	464*	0
	F/C	3,225	42	20	450	401	390	444	411	411	0	306*	0	350*	0
Total	L/C	43,144	78	109	4,124	5,811	5,357	6,197	5,932	5,839	153	4,445*	0	5,099*	0
	F/C	35,468	466	216	4,945	4,412	4,294	4,883	4,524	4,519	0	3,364*	0	3,845*	0
Grand Total		78,612	544	325	9,069	10,223	9,651	11,080	10,456	10,358	153	7,809	0	8,944	0

N-3 Direct Construction Cost for North Hussinia Block

(LE'000)

\* : Cost for stage II works

Year															
Description		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Total															
1. Preparatory Work	L/C	99	0	99	0	0	0	0	0	0	0	0	0	0	0
	F/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Pump Station	L/C	1,432	0	0	1,432	0	0	0	0	0	0	0	0	0	0
	F/C	3,682	0	0	3,682	0	0	0	0	0	0	0	0	0	0
3. Main Drainage Canal	L/C	3,804	0	0	1,902	1,902	0	0	0	0	0	0	0	0	0
	F/C	2,738	0	0	1,369	1,369	0	0	0	0	0	0	0	0	0
4. Irrigation Canal and Land Reclamation	L/C	41,350	0	0	2,065	6,608	7,434	8,673	7,021	5,782	2,478	1,239	50	0	0
	F/C	35,730	0	0	1,787	5,717	6,431	7,503	6,074	5,002	2,144	1,072	0	0	0
5. Tyde Dyke	L/C	3,000	0	0	3,000	0	0	0	0	0	0	0	0	0	0
	F/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6. O.M Cost for Construction	L/C	446	0	0	0	57	15	15	15	86	86	86	86	0	0
	F/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Tile Drain	L/C	13,294	0	0	0	0	0	0	0	0	0	2,843*	3,055*	3,377*	4,019*
	F/C	10,873	0	0	0	0	0	0	0	0	0	2,325*	2,499*	2,762*	3,287*
Sub. Total	L/C	63,425	0	99	8,399	8,567	7,449	8,688	7,036	5,868	2,564	136	0	0	0
	F/C	53,023	0	0	6,838	7,086	6,431	7,503	6,074	5,002	2,144	0	0	0	0
8. Administration Cost	L/C	5,824	0	5	762	783	694	810	656	544	235	12	0	0	0
	F/C	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	L/C											253*	278*	307*	365*
	F/C											0	0	0	0
9. Consulting Service	L/C	1,059	122	65	81	118	124	118	103	88	88	81	18*	18*	18*
	F/C	3,200	721	333	190	313	410	324	244	140	138	195	48*	48*	48*
Sub. Total	L/C	70,308	122	169	9,242	9,468	8,267	9,616	7,795	6,500	2,887	148	0	0	0
	F/C	56,223	721	333	7,028	7,399	6,841	7,827	6,318	5,142	2,282	0	0	0	0
	L/C											3,114*	3,351*	3,702*	4,401*
	F/C											2,373*	2,547*	2,810*	3,335*
10. Physical Contingency	L/C	7,032	12	17	924	947	827	962	780	650	289	15	0	0	0
	F/C	5,623	72	33	703	740	684	783	632	514	228	0	0	0	0
	L/C											311*	335*	370*	440*
	F/C											237*	255*	281*	334*
Total	L/C	77,340	134	186	10,166	10,415	9,094	10,578	8,575	7,150	3,176	163	0	0	0
	F/C	61,846	793	366	7,731	8,139	7,525	8,610	6,950	5,656	2,510	0	0	0	0
	L/C											3,425*	3,686*	4,072*	4,841*
	F/C											2,610*	2,802*	3,091*	3,669*
Grand Total		139,186	927	552	17,897	18,554	16,619	19,188	15,525	12,806	5,686	6,198	6,488	7,163	8,510





N-4 Price Escalation Calculation for the Total Project

(LE000)

Project Year	L/C			F/C			Total		
	Const. Cost	Price Escala.	Total	Const. Cost	Price Escala.	Total	Const. Cost	Price Escala.	Total
1	212	70	282	1,457	164	1,621	1,669	234	1,903
2	295	144	439	582	108	690	877	252	1,129
3	14,290	9,546	23,836	12,676	3,118	15,794	26,966	12,664	39,630
4	16,226	14,084	30,310	12,551	3,866	16,417	28,777	17,950	46,727
5	14,451	15,781	30,222	11,819	4,420	16,239	26,270	20,201	46,471
6	16,775	22,529	39,304	13,493	5,964	19,457	30,268	28,493	58,761
7	14,507	19,574	34,081	11,474	5,897	16,371	25,981	25,471	51,452
8	12,989	25,186	38,175	10,175	6,003	16,178	23,164	31,189	54,353
9	3,329	7,630	10,959	2,510	1,682	4,192	5,839	9,312	15,151
10	6,124	16,455	22,579	4,758	2,747	7,505	10,872	19,202	30,074
11	3,588	11,230	14,818	2,610	2,195	4,805	6,198	13,425	19,623
12	8,785	31,846	40,631	6,201	12,848	19,049	38,047	53,479	91,526
13	4,072	17,021	21,093	3,091	3,181	6,272	7,163	20,202	27,365
14	4,841	23,246	28,087	3,669	4,150	7,819	8,510	27,396	35,906
Total	120,484	214,342	334,826	97,314	49,696	147,010	217,798	264,078	481,836

N-5 Price Escalation Calculation for South Port Said

(IE'000)

Project Year	L/C			F/C			Total		
	Const. Cost	Price Escala.	Total	Const. Cost	Price Escala.	Total	Const. Cost	Price Escala.	Total
1	78	26	104	466	61	527	544	87	631
2	109	53	162	216	40	256	325	93	418
3	4,124	2,755	6,879	4,945	1,216	6,161	9,069	3,971	13,040
4	5,811	5,044	10,855	4,412	1,359	5,771	10,223	6,403	16,626
5	5,357	5,850	11,207	4,294	1,606	5,900	9,651	7,456	17,107
6	6,197	8,323	14,520	4,883	2,158	7,041	11,080	10,481	21,561
7	5,932	5,640	11,572	4,524	2,325	6,849	10,456	7,965	19,421
8	5,839	11,322	17,161	4,519	2,666	7,185	10,358	13,988	24,346
9	153	351	504	0	0	0	153	351	504
10	4,445	11,944	16,389	3,364	1,697	5,061	7,809	13,641	21,450
11	0	0	0	0	0	0	0	0	0
12	5,099	18,484	23,583	3,845	3,587	7,432	8,944	22,071	31,015
13	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0
Total	43,144	69,792	112,936	35,468	16,715	52,183	78,612	86,507	165,119

N-6. Price Escalation Calculation for North Hussinia

(LE'000)

Project Year	L/C			F/C			Total		
	Const. Cost	Price Escala.	Total	Const. Cost	Price Escala.	Total	Const. Cost	Price Escala.	Total
1	134	44	178	791	103	894	925	147	1,072
2	186	91	277	366	68	434	552	159	711
3	10,166	6,791	16,957	7,731	1,902	9,633	17,897	8,693	26,590
4	10,415	9,040	19,455	8,139	2,507	10,646	18,554	11,547	30,101
5	9,094	9,931	19,025	7,525	2,814	10,339	16,619	12,745	29,364
6	10,578	14,206	24,784	8,610	3,806	12,416	19,188	18,012	37,200
7	8,575	13,934	22,509	6,950	3,572	10,522	15,525	17,506	33,031
8	7,150	13,864	21,014	5,656	3,337	8,993	12,806	17,201	30,007
9	3,176	7,279	10,455	2,510	1,682	4,192	5,686	8,961	14,647
10	1,679	4,511	6,190	1,394	1,050	2,444	3,073	5,561	8,634
11	3,588	11,230	14,818	2,610	2,195	4,805	6,198	13,425	19,623
12	3,686	13,362	17,048	2,802	2,614	5,416	6,488	15,976	22,464
13	4,072	17,021	21,093	3,091	3,181	6,272	7,163	20,202	27,365
14	4,841	23,246	28,087	3,669	4,150	7,819	8,510	27,396	35,906
Total	77,340	144,550	221,890	61,846	32,981	94,827	139,186	177,531	316,717

N-7 (1) Civil work cost of each block (South Port Said: SP)

(Unit:LE000)

Description	Unit	Volume	Currency	Construction Block				Total
				SP-1	SP-2	SP-3	SP-4	
<b>Stage I</b>								
Main Irrigation Canals	m	39,750	L/C F/C	336 407	404 450	182 164	280 245	1,202 1,266
Secondary Irrigation	m	91,150	L/C F/C	317 724	355 760	301 683	315 731	1,288 2,898
Main Drainage Canals	m	25,300	L/C F/C	1,203 879	0 0	535 384	0 0	1,738 1,263
Secondary Drainage Canals	m	77,670	L/C F/C	98 85	140 120	85 72	87 75	410 352
Housing Canals	m	18,200	L/C F/C	23 22	55 52	46 43	30 29	154 146
Roads and Dikes			L/C F/C	500 136	362 6	273 4	314 35	1,449 181
On-farm Facilities	fed.	31,980	L/C F/C	5,505 4,239	6,530 5,208	3,620 2,787	2,948 3,040	19,603 15,094
Pumping Station	site	1	L/C F/C	1,239 2,704	0 0	0 0	0 0	1,239 2,704
Sub-total	m		L/C F/C	9,221 9,196	7,846 6,416	5,042 4,137	4,974 4,155	27,083 23,904
<b>Stage II</b>								
Tile Drain	fed.	31,980	L/C F/C	2,218 1,814	2,632 2,152	1,459 1,193	1,591 1,301	7,900 6,460
Total			L/C F/C	11,439 11,010	10,478 8,568	6,501 5,330	6,565 5,456	34,983 30,364
Grand Total				22,449	19,046	11,831	12,021	65,347

N-8 (2) Civil work cost of each block (North Hussinia: NH)  
(Unit:LE000)

Description	Unit	Volume	Currency	Construction Block					Total
				NH-1	NH-2	NH-3	NH-4	NH-5	
<b>Stage I</b>									
Main Irrigation Canals	m	66,400	L/C F/C	223 300	356 388	864 1,256	292 256	147 147	1,882 2,347
Secondary Irrigation Canals	m	173,540	L/C F/C	623 1,516	633 1,605	771 1,994	562 1,339	252 596	2,841 7,050
Main Drainage Canals	m	84,100	L/C F/C	624 441	1,055 765	508 363	836 603	781 566	3,804 2,738
Secondary Drainage Canals	m	104,750	L/C F/C	156 134	198 170	173 147	155 134	60 51	742 636
Housing Canals	m	29,400	L/C F/C	55 52	53 50	55 52	60 57	25 23	248 234
Roads and Dikes			L/C F/C	558 31	445 6	701 10	680 10	261 4	2,645 61
On-farm Facilities	fed.	53,820	L/C F/C	7,055 5,432	7,582 5,838	8,381 6,453	7,083 5,453	2,891 2,226	32,992 25,402
Pumping Station	site	1,432	L/C F/C	0 3,682	0 0	0 0	0 0	0 0	1,432 3,682
Sub-total	m		L/C F/C	10,726 11,588	10,322 8,822	11,453 10,275	9,668 7,852	4,417 3,613	46,586 42,150
<b>Stage II</b>									
Tile Drain	fed.	53,820	L/C F/C	2,843 2,325	3,055 2,499	3,377 2,762	2,854 2,334	1,165 953	13,294 10,873
Total			L/C F/C	13,569 13,913	13,377 11,321	14,830 13,037	12,522 10,186	5,582 4,566	59,880 53,023
Grand Total				27,482	24,698	27,867	22,708	10,148	112,903

N-9 Construction Costs for each Item (South Port Said)

Working Item	SP-1		SP-2		SP-3		SP-4		Total	
	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC
Main Irrigation Canal	336	407	404	450	182	164	280	245	1,202	1,266
Secondary Drainage Canal	98	85	140	120	85	72	87	75	410	352
Secondary Irrigation Canal	317	724	355	760	301	683	315	731	1,288	2,898
Canal Along Housing Area	23	22	55	52	46	43	30	29	1,541	146
Road & Dyke	500	136	362	6	273	4	314	35	1,449	181
On farm Facilities	5,505	4,239	6,530	5,028	3,620	2,787	3,948	3,040	19,603	15,094
Main Drainage Canal	1,203	879	0	0	535	384	0	0	1,738	1,263
Pump Station	1,239	2,704	0	0	--	--	0	0	1,239	2,704
Tile Drain	2,218	1,814	2,632	2,152	1,459	1,193	1,591	1,301	7,900	6,460
Total	11,439	11,010	10,478	8,568	6,501	5,330	6,565	5,456	34,983	30,364

N-10 Construction Costs for each Item (North Hussinia)

Working Item	NH-1		NH-2		NH-3		NH-4		NH-5		Total	
	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC
Main Irrigation Canal	223	300	356	388	864	1,256	292	256	147	147	1,882	2,347
Secondary Drainage Canal	156	134	198	170	173	147	155	134	60	51	742	636
Secondary Irrigation Canal	623	1,516	633	1,605	771	1,994	562	1,339	252	596	2,841	7,050
Canal Along Housing Area	55	52	53	50	55	52	60	57	25	23	248	234
Road & Dyke	558	31	445	6	701	10	680	10	261	4	2,645	61
On farm Facilities	7,055	5,432	7,582	5,838	8,381	6,453	7,083	5,453	2,891	2,226	32,992	25,402
Main Drainage Canal	624	441	1,055	765	508	363	836	603	781	566	3,804	2,738
Pump Station	1,432	3,682	--	--	--	--	--	--	--	--	1,432	3,682
Tile Drain	2,843	2,325	3,055	2,499	3,377	2,762	2,854	2,334	1,165	953	13,294	10,873
Total	13,569	13,913	13,377	11,321	14,830	13,037	12,522	10,186	5,582	4,566	59,880	53,023





**ANNEX**

**O. SUPPORTING SERVICES**



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## 0. SUPPORTING SERVICES

### 1. Farmers' Organization

#### 1-1 General

The agricultural supporting services including credit, inputs supply and marketing, in a linked-up manner among each other, on behalf of the farmers in the project area will be provided through co-operative systems which will be properly located under the umbrella of the Principal Bank for Development of Agricultural Credit (PBDAC). Extension services shall be offered by the Government (through an overall coordination by the kind offices of the Project Management Headquarters) in a manner which is perfectly coordinated with the village agricultural co-operatives' functions. The organizational and functional setup of agricultural supporting services in the project area is schematically illustrated in Fig. 0-1-1: Flow Chart of Agricultural Supporting Services and the Role of Multi-Purpose Agricultural Co-operative in Satellite Village. In order to provide satisfactory agricultural supporting services (comprising, out of others, rural credit, inputs supply, extension, and marketing) with the entire farm-households in the project area, it is advisable to make it semi-compulsory on the part of the farmers to become members of the Multi-Purpose Agricultural Co-operative to be organized in each and every satellite village. The important-most functions of the satellite village agricultural co-operative would be to:

- (i) Establish cropping patterns and crop rotation systems as advised by the Project Management Headquarters;
- (ii) Co-ordinate with PBDAC in the delivery of inputs and credit to the member-farmers and the collection and marketing of agricultural produce ("controlled" crops, in particular);

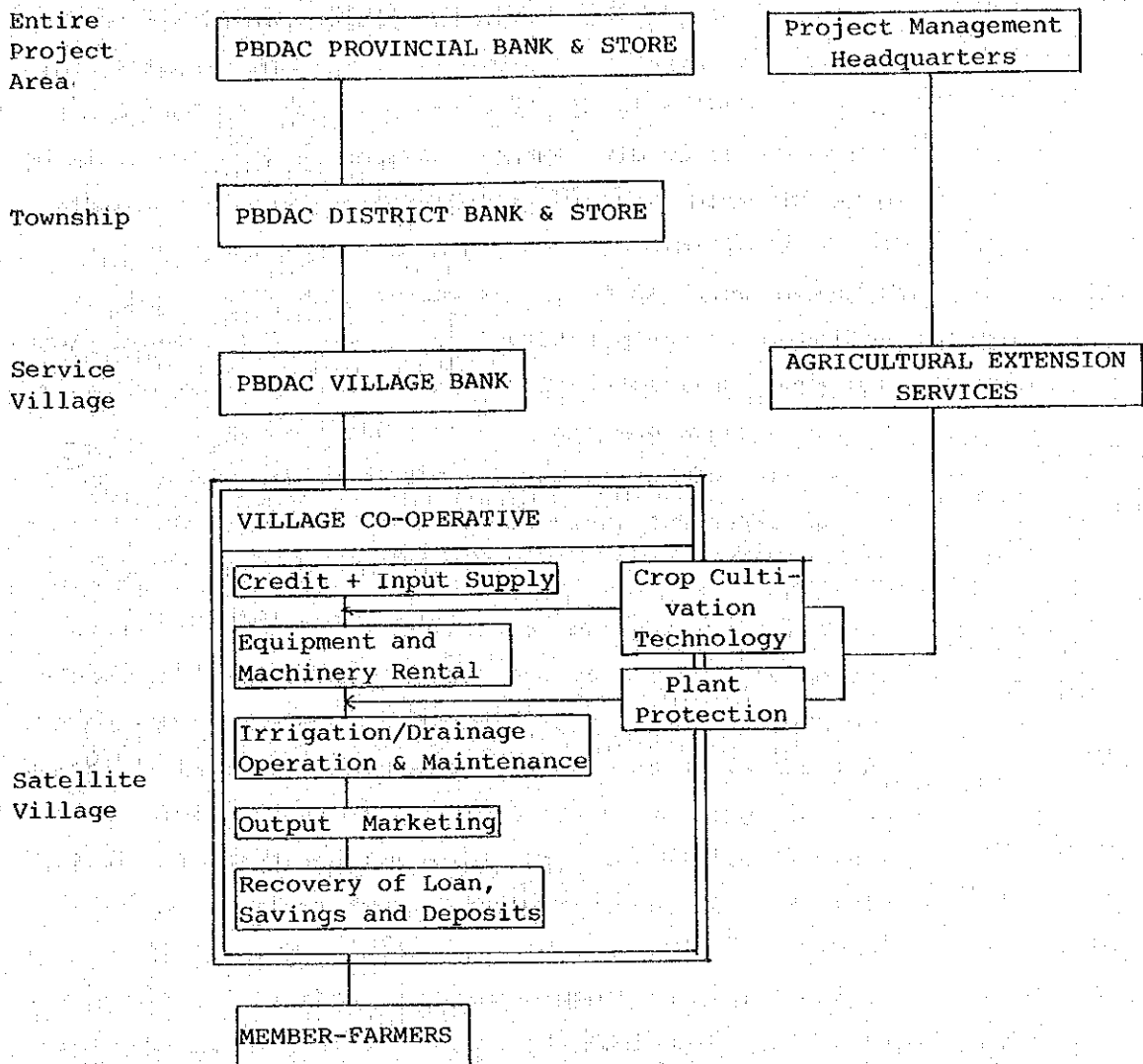


Fig. 0-1-1 Flow Chart of Agricultural Supporting Services and The Role of Multi-Purpose Agricultural Co-operative in Satellite Village

- (iii) Taking up the leadership of its member-farmers in water management and control as well as O&M of irrigation/drainage facilities below the tertiary channels in its service-area;
- (iv) Facilitating the delivery and dissemination of agricultural extension services and advice to its member-farmers;
- (v) Providing the special agricultural services including plant protection, equipment and machinery rental, etc.
- (vi) Encouraging its member-farmers for saving and depositing their surplus capital at the village co-operative so that they may be enabled to depend less and less on the PBDAC's loans for seasonal crop cultivation, and for buying an increasing number of shares of their co-operative to strengthen its financial position.

It may not be an over-simplification of the matter to say that agricultural co-operatives in Egypt act mostly as conduits for funds from the Principal Bank for Development of Agricultural Credit (PBDAC) to the small farmers and a consolidator of small farmer accounts in the capacity of PBDAC's agent, viz: provision of credit services, mainly short-term loan "in kind" (primarily the "subsidized" input materials), some medium/long term loans "in cash", and other banking services like deposits and savings, plus purchasing of the "controlled" crop outputs which are marketed by the PBDAC. In other words, the village agricultural co-operatives are functioning fairly well in supply of the "subsidized" input materials and collection of the "controlled" crops (cotton, rice, wheat, etc.), but less serviceful towards farmers who grow livestock (except supply of feedstuff) and vegetables at the same time.

1-2 Needs to Organize "Specialized" Co-operatives

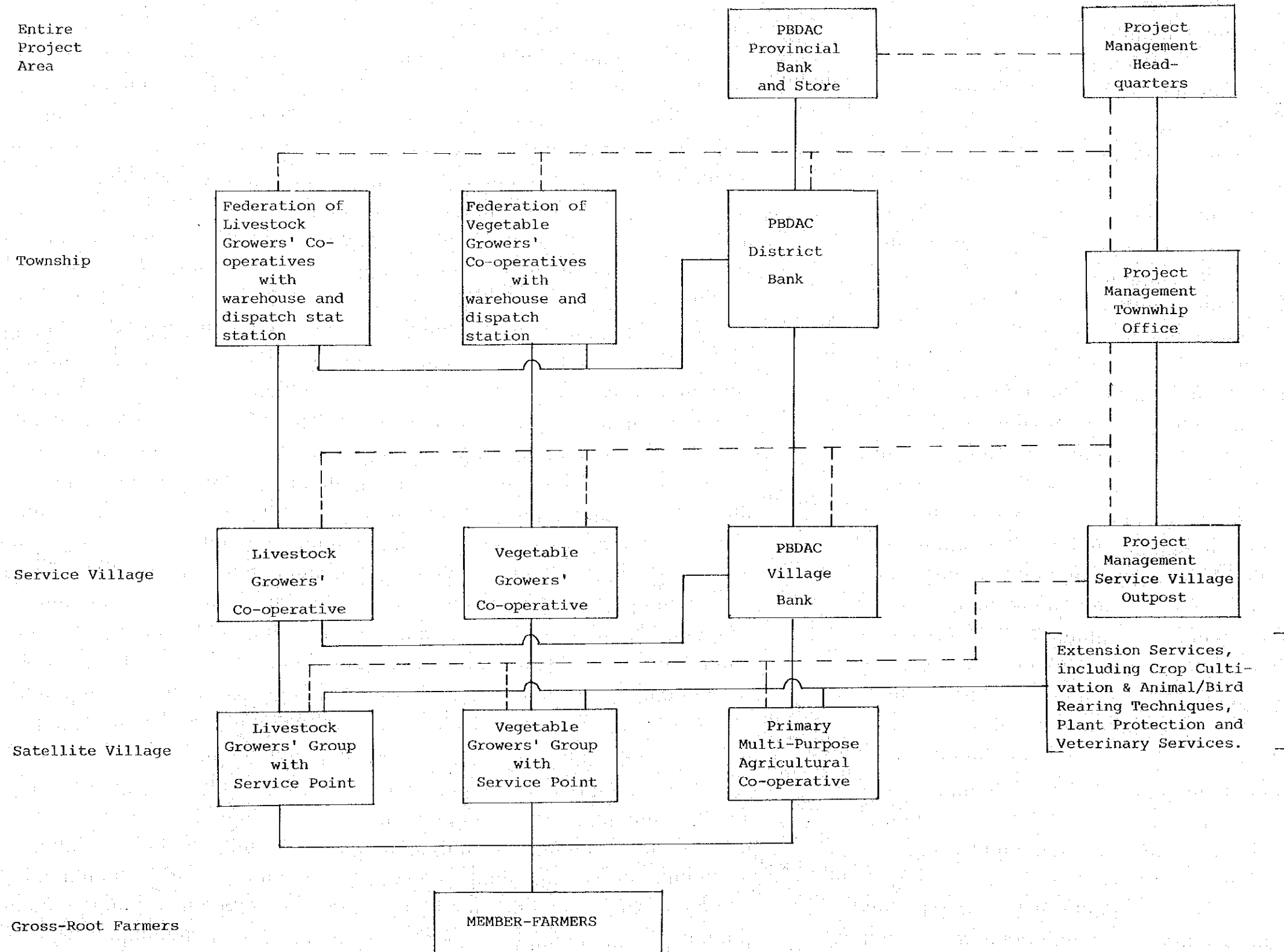
The cropping patterns proposed for the majority of the settling farmers are aimed at combining crop cultivation with family-sized livestock raising for the two main purposes of improving the reclaimed soils' fertility, and to provide regular cash-income. Encouragement is also given to an increased production of cash crops such as vegetables as and where soil conditions will be progressively improved. Under such circumstances, it will significantly facilitate economical raising of the project as a whole to encourage the farmers who will be automatically made members of the satellite village agricultural co-operatives (multi-purpose) to simultaneously form each one group for livestock raising and vegetable production; these groups will be affiliated to their respective "specialized" co-operatives at the service village level which attend at credit, inputs supply, extension, and marketing services peculiar to each line of activities.

This will imply double or sometimes triple affiliation to different kinds of co-operative by a single farmer but it is unavoidable to foster animal husbandry and cash crop production in the project area, since the process of cultivation, post-harvest procedures such as - in case of vegetables - sorting, packing, and shipment to destinations are rather different from that of "controlled" crops. Similarly, livestock growers should be entitled to a guaranteed supply of fodder (particularly enriched feedstuff), good veterinary care, and profitable marketing which will involve collection and processing of milk and slaughtering; poultry, again, will require veterinary care for healthy growth of birds, collection and packaging of eggs and shipments of eggs and meat, in quite a different manner to vegetables and "controlled" crops. In fact, agriculture-based processing industries will badly need such organizational setup for their sound operation. Organizational setup of these "specialized" co-operative is shown in Fig. O-1-2: Organizational Set-Up of "Specialized" Co-operatives and Their Relationships with PBDAC.





Fig. 0-1-2 Organizational Setup of "Specialized" Co-operatives and Their Relationship with PBDAC





### 1-3 Function of Different Co-operatives

The function of such a "specialized" co-operative system will be almost the same with that of the Multi-Purpose Agricultural Co-operative except that while the latter provides linked-up services primarily for "controlled" crop production, the former does so for livestock raising and vegetable production.

The Multi-Purpose Agricultural Co-operative (MPAC) is expected to serve its member-farmers fairly well for their enlarged reproduction of the "controlled" crops items, by virtue of its functioning as an agent of the PBDAC Village Bank at the service village level. This PBDAC Village Bank can in turn expect help from the PBDAC District Bank (in our project area, it will be established at Township level) which can likewise expect help from the PBDAC Provincial Bank catering to the network of PBDAC-affiliated co-operative system in the larger area involving the South Hussinia Valley and South Port Said South.

Similar relationship of co-operation among different echelons will need to be established for the success of the "specialized" co-operatives, the one for the livestock growers and the other for the vegetable growers. The reason why the project area farmers are encouraged to organize "specialized" co-operatives while holding the membership of the MPAC has already been justified on the ground that MPAC, as an agent of the PBDAC, is not supposed to extend sufficient services which are legitimately required for enlarged reproduction of animal husbandry and vegetable cultivation, particularly in their production and marketing aspects. If so, the "specialized" co-operatives have to have a working relationship, both horizontally and perpendicularly, with particular emphasis on production-oriented assistance and marketing.

1-4 Special Considerations for Successful "Specialized"  
Co-operatives

The "specialized" co-operatives, being organized at the service village level, have their respective 'service points' at the satellite village level through which specific input materials are distributed and specific end-products collected to and from their members; the input items reaching the hand of the livestock growers' group may happen to be the feedstuff and the end-products they deliver may happen to be milk and cattle for slaughtering; similarly, the inputs may happen to be farm chemicals and the end-product, vegetables in case of the vegetable growers' group. In both cases, input distribution and output collection takes place through the 'service points' which are, in fact, the lower levels of both "specialized" co-operatives.

However, prior to input distribution and output collection through such service points, necessary arrangements have to be made for procurement and marketing. Such arrangements are the main function of the "specialized" co-operatives which, however, often exceed independent efforts by a single or isolated primary co-operative. This is the very reason why primary "specialized" co-operatives have to have horizontal as well as higher levels to help fulfilling their tasks.

As long as input materials are available through the PBDAC system, such may be obtained by the help of the PBDAC Village Bank; if otherwise the "specialized" co-operatives must have their own joint purchasing machinery. On the marketing aspect, again, the livestock growers' co-operative will have to enter into sales contracts with, (for instance), the milk processing plant and the slaughter house, and the vegetable growers' co-operative, with the vegetable processing plant and the buyers in and out of the project area. Warehousing and transport arrangements also need to be made on behalf of their primary co-operatives. The upper levels, ("federation"), are, therefore, badly required for smooth

input supply and profitable marketing through the "specialized" co-operative system whether it is for livestock growers or vegetable growers.

Such "federation" may be established at each Township level and affiliated with the primary "specialized" co-operatives organized at the service village level. Both federations will have warehouses and dispatch stations. Fleets of vehicles may be hired from a transportation company catering for the general transport needs within the project area.

The function of these federations is of utmost importance for the success of the animal husbandry and vegetable production campaign in the project area. Both federations will have the three main functions of: (i) close co-ordination with the Project Management Headquarters; (ii) close contact with the processing plants in the project area (milk processing plant and slaughter house, in case of the livestock growers co-op. federation and the vegetable processing plants, in case of the vegetable growers co-op. federation), and (iii) liaison with the main consumer groups in the cities and towns in the country as well as the export agents in the international ports (both sea and air), so that the federations will be in a position to collect reliable data and information for analyzing and forecasting the current and future trends of the demand and supply of the products they handle. Forecasts of the coming season's demand in quantity and quality with the possible prices obtainable for each will be communicated to the service village co-operatives. Thus, the project area farmers will have reliable information to make rational judgements for their respective ventures, and the service village co-operatives can make the necessary arrangements for obtaining credit+input supply from the PBDAC. The functional aspects of the "specialized" co-operative system purported for techno-economic development of animal husbandry and vegetable production in the project area will be shown in

Table O-1-1 Functional Aspects of The "Specialized" Co-operative Systems

Kinds of Service	Method of Providing Services	Institutions Concerned
Township (Federation of "Specialized" Co-operatives)	<ul style="list-style-type: none"> <li>- Co-ordination among different echelons of the co-operative system, including education and training of office-bearers and employees;</li> <li>- Collection of data and information for analysis and forecasting of marketing situations;</li> <li>- Information services on behalf of the entire co-operative system</li> <li>- Business negotiations with purchasing/processing agencies on behalf of its member co-operatives;</li> <li>- Warehousing and transportation of input materials and end-products on behalf of its member co-ops.</li> </ul>	<p>With full knowledge of the daily activities of all the co-op. organizations under its umbrella, always co-ordinate with the Project Management Headquarters to invigorate their function; obtain financial assistances from PBDAC on behalf of its member co-ops.</p> <p>Project Management Headquarters and Project Management Township Office;</p> <p>PBDAC Provincial Bank and PBDAC District Bank;</p> <p>Main consumer groups in the cities and towns and export agencies in the international ports.</p>
Service Village (Primary "Specialized" Co-operative)	<ul style="list-style-type: none"> <li>- Provision of credit+input supplies with its member-farmers;</li> <li>- Collection of Products and recovery of loans;</li> <li>- Delivery of Products to its Township Federation;</li> <li>- Assistance in effective dissemination of Extension Services (including crop cultivation &amp; animal/bird rearing techniques, plant protection and veterinary services)</li> </ul>	<p>Credit+input supplies obtainable from PBDAC through its Village Bank will be allocated among its Group-Members in the satellite villages through Service Points; Extension Services will be forthcoming from the Project Management Central Village Outpost.</p> <p>PBDAC Village Bank;</p> <p>Project Management Central Village Outpost.</p>
Satellite Village (Service-Point)	<ul style="list-style-type: none"> <li>- Allocation of credit+input supplies among member-farmers through Service Point;</li> <li>- Penetration of Extension Services among the member-farmers.</li> </ul>	<p>Through maintenance of close relationships with respective primary "specialized" co-operative in the Central Village.</p> <p>Primary "Specialized" co-op. in the Central Village;</p> <p>Multi-Purpose Agricultural Co-operatives;</p> <p>Project Management Central Village Outposts</p>

## 2. Marketing

### 2 -1 General

The study on marketing plan in this report is roughly divided into two sections of marketability and marketing channels. According to the crop cultivation plan as well as the animal husbandry plan, the main output of the project is rice, soybeans, sugar beet, vegetables, dairy milk and beef cattle. While some portion of these products except sugar beet will be directly consumed by the growers and dwellers in the project area, most of the remainder will be provided to the proposed agro-industrial complexes as raw materials.

In order to assess the domestic marketability of these products, a nationwide analysis on the demand and supply has been made on the basis of figures obtained from the Second Five-Year Plan.

As for international marketability, reference is made to the "Feasibility Report on the South Hussinia Valley Agricultural Development Project" for the Arabian market and the "West Nubariya Feasibility Study Report" for the European market.

### 2 -2 Domestic Marketability

#### (1) Demand and Supply Analysis (Domestic)

##### a) Population Projection

While the total population is estimated at 43,465 thousand in 1981 according to the latest Statistical Yearbook published by Central Agency for Public Mobilisation and Statistics, the projected population in year of 2000 is 65 million according to the Second Five-Year Plan prepared by the Ministry of Planning. By using these figures, the total population is projected as follows;



	(Unit : Thousand)				
	<u>1981/82</u>	<u>1986/87</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Population	43,932	48,838	52,616	58,492	65,000

b) Material Balance during the Plan Period

Table O-2-1 shows an extract for selected commodity on material balance of resources and uses. The resources consist of domestic production and imports, and the uses comprise seeds, animal diet, intermediate consumption, final consumption, change in stock and exports. The selected commodities are wheat, high quality flour, maize, white rice, vegetables, animal meat, soybeans and refined sugar.

c) Food Consumption and Income Elasticity

The Plan projected that the GDP per capita will increase from 470LE to 620LE at 1981/82 constant prices, or at an average rate of increase of 5.7 percent per annum.

Food consumption per capita has been calculated in Table O-2-2 taking into consideration the sum of the intermediate and final consumptions as the total consumption, and the projected population. Also the income elasticity of demand for the selected commodities is computed in the same table. The income elasticity of demand means the rate of marginal increase of demand (consumption) against marginal increase of income, for example : the income elasticity of 0.82 in wheat means that if the income increases by LE 10, the consumption of wheat does by 0.82 kg.

Table O-2-1 Material Balance of Resources and Uses (Unit: 1,000 ton)

Item	Resources				Uses							
	Domestic Production	Imports	Total	Seeds	Animal Diet	Intermediate Consumption	Final Consumption	Change Stock	Exports	Total		
Wheat	81/82	1,983	4,022	6,005	115	-	95	5,700	20	75	-	6,005
	86/87	2,387	4,904	7,291	118	-	119	6,934	25	95	-	7,291
High Quality Flour	81/82	-	1,160	1,160	-	-	-	180	966	14	-	1,160
	86/87	200	1,257	1,457	-	-	-	207	1,232	18	-	1,457
Maize	81/82	3,375	1,177	4,552	60	84	68	4,268	15	57	-	4,552
	86/87	4,021	1,251	5,272	62	96	77	4,947	15	72	-	5,272
White Rice	81/82	1,554	-	1,554	-	-	-	61	1,455	13	25	1,554
	86/87	2,250	-	2,250	-	-	-	70	2,000	16	164	2,250
Vegetables	81/82	9,106	67	9,173	56	-	455	132	8,410	-	120	9,173
	86/87	10,270	60	10,330	63	-	514	138	9,440	-	175	10,330
Animal	81/82	362	141	503	-	-	-	10	493	-	-	503
Meat	86/87	397	204	601	-	-	-	12	589	-	-	601
Soybean	81/82	135	-	135	4	-	2	129	-	-	-	135
	86/87	316	-	316	10	-	6	300	-	-	-	316
Refined Sugar	81/82	630	708	1,338	-	-	-	162	1,156	10	10	1,338
	86/87	1,000	570	1,570	-	-	-	200	1,345	15	10	1,570

Source: Five-Year Plan for Economic and Social Development (1982/83 - 1986/87)

Table O-2-2 Food Consumption and Income Elasticity

	<u>1981/82</u>	<u>1986/87</u>	<u>Increase in the Period</u>	<u>Income Elasticity (kg/LE10)</u>
I. Population (million)	43,932	48,838	4,906	-
II. Per Capita GDP (LE)	470	620	150	-
III. Food Consumption				
1. Wheat				
Total ('000 ton)	5,720	6,959	1,239	-
Per Capita (kg)	130.2	142.5	12.3	0.820
2. High Quality Flour				
Total ('000 ton)	1,146	1,439	293	-
Per Capita (kg)	26.1	29.5	3.4	0.227
3. Maize				
Total ('000 ton)	4,283	4,962	679	-
Per Capita	97.5	101.6	4.1	0.273
4. White Rice				
Total ('000 ton)	1,516	2,070	554	-
Per Capita (kg)	34.5	42.4	7.9	0.527
5. Vegetables				
Total ('000 ton)	8,542	9,578	1,036	-
Per Capita (kg)	194.4	196.1	1.7	0.113
6. Animal Meat				
Total ('000 ton)	503	601	98	-
Per Capita (kg)	11.4	12.3	0.9	0.060
7. Soybeans				
Total ('000 ton)	129	300	171	-
Per Capita (kg)	2.9	6.1	3.2	0.213
8. Refined Sugar				
Total ('000 ton)	1,318	1,545	227	-
Per Capita (kg)	30.0	31.6	1.6	0.107

Source: Second Five-Year Plan

Of course, income elasticity curves of the respective commodities differ for each other, namely (linear, exponential and so on), but in this report it is assumed due to the limitations of available statistical data that a linear curve of income elasticities calculated in Table O-2-2 will last until the year 2000.

d) Projection of Total Consumption (Demand)

By assuming that the GDP per capita will increase with linear curve, or will increase from 620LE in 1986/87 to 1,040LE in 2000, the per capita consumption of the selected commodities is calculated as shown in Table O-2-3 taking the income elasticity computed in Table O-2-2 into consideration. Consequently, the total consumption (demand) for the selected commodities are obtained in Table O-2-4.

e) Projection of Domestic Production

By extending the projected domestic production of the selected commodities during 1981/82 thru 1986/87 given in Table O-2-1 with a linear curve until year 2000, their domestic production in year 2000 is estimated in Table O-2-5.

f) Conclusion

As seen in Table O-2-6, demands for the selected commodities, except white rice and vegetables, exceed their supply, which means that soybeans, sugar beet and beef cattle to be produced in the project area will have enough domestic marketability.

When considering those categories of seeds, losses, change in stock for material uses given in Table O-2-1, the balance of white rice and vegetables is either marginal or turns deficit. Especially the projection for domestic production of white rice is

Table O-2-3 Projection of Per Capita Consumption

(Unit: kg per year)

	Income Elasticity (kg/LE10)	1981/82	1986/87	1990	1995	2000
1. GDP per capita (LE)	-	470	620	740	890	1,040
2. Increment of above (LE)	-	0	150	270	420	570
3. Per capita consumption						
Wheat	0.820	130.2	142.5	152.3	164.6	176.9
High Quality Flour	0.227	26.1	29.5	32.2	35.6	39.0
Maize	0.273	97.5	101.6	104.9	109.0	113.1
White Rice	0.527	34.5	42.4	48.7	56.6	64.5
Vegetables	0.113	194.4	196.1	197.5	199.1	200.8
Animal Meat	0.060	11.4	12.3	13.0	13.9	14.8
Soybeans	0.213	2.9	6.1	8.7	11.8	15.0
Refined Sugar	0.107	30.0	31.6	32.9	34.5	36.1

Table O-2-4 Projection of Total Consumption<sup>1/</sup>

(Unit: '000 ton)

	1981/82	1986/87	1990	1995	2000
1. Population (million)	43,932	48,838	52,616	58,492	65,000
2. Total Consumption					
Wheat	5,720	6,959	8,013	9,628	11,499
High Quality Flour	1,146	1,439	1,694	2,082	2,535
Maize	4,283	4,962	5,519	6,376	7,352
White Rice	1,516	2,070	2,562	3,311	4,193
Vegetables	8,542	9,578	10,392	11,646	13,052
Animal Meat	503	601	684	813	962
Soybeans	129	300	458	690	975
Refined Sugar	1,318	1,545	1,731	2,018	2,347

Note: <sup>1/</sup> Total consumption does not include those necessary quantity for seed, animal diet, loss, change in stock and exports

Table O-2-5 Projection of Domestic Production

(Unit: '000 ton)

<u>Commodity</u>	<u>1981/82</u>	<u>1986/87</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Wheat	1,983	2,387	2,710	3,114	3,518
High Quality Flour	0	200	360	560	760
Maize	3,375	4,021	4,538	5,184	5,830
White Rice	1,554	2,250	2,807	3,503	4,199
Vegetables	9,106	10,270	11,201	12,365	13,529
Animal Meat	362	397	425	460	495
Soybeans	135	316	461	642	823
Refined Sugar	630	1,000	1,296	1,666	2,036

Table O-2-6 Balance of Demand and Supply in Year 2000

(Unit: '000 ton)

<u>Commodity</u>	<u>Demand</u>	<u>Supply</u>	<u>Balance</u>
Wheat	11,499	3,518	-7,981
High Quality Flour	2,535	760	-1,775
Maize	7,352	5,830	-1,522
White Rice	4,193	4,199	6
Vegetables	13,052	13,529	477
Animal Meat	962	495	-467
Soybeans	975	823	-152
Refined Sugar	2,347	2,036	-311

rather optimistic, because the rice cultivated area had gradually decreased recently and increases in rice yield could not offset the rice cultivated area in its total production (see Table O-2-7)

g) Dairy Products

In the above study, dairy products are not included because of the lack of available data on dairy products in the second Five-Year Plan. The Feasibility Study Report on Cold Storage Chain Development Project, JICA, November 1983, forecasts the demand and supply of meat and chicken, and cheese and butter until year 2000 as follows:

Forecast Demand and Supply of Animal Products

	(Unit: 1,000 tons)			
	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
<u>Demand</u>				
Meat and chicken	634	797	980	1,191
Cheese and butter	411	474	544	623
<u>Supply</u>				
Meat and chicken	475	512	549	588
Cheese and butter	366	408	451	494
<u>Balance</u>				
Meat and chicken	-159	-285	-431	-603
Cheese and butter	- 45	- 66	- 93	-129

Note: The demand for meat and chicken in the above table is conservatively forecasted.

Thus, milk to be produced in the project area is also domestically marketable after processing.

Table O-2-7 Summary of Agricultural Production

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
<b>I. Cultivated Area ('000 feddan)</b>						
Wheat	1,396	1,207	1,380	1,391	1,326	1,400
Berseem	2,757	2,854	2,782	2,777	2,711	2,778
Vegetables*	790	763	810	868	877	868
Onions	28	31	27	21	28	23
Cotton	1,248	1,424	1,189	1,196	1,245	1,178
Rice**	1,079	1,040	1,031	1,040	972	956
Maize**	1,891	1,765	1,899	1,885	1,905	1,923
Soybeans	17	33	82	100	83	109

Note: \* Both summer and winter croppings

\*\* Including Nile cropping

**II. Production ('000 ton)**

Wheat	1,960	1,697	1,933	1,856	1,796	1,938
Vegetables	5,884	5,584	6,205	6,757	5,675	6,830
Onions	652	723	599	560	611	654
Raw Cotton	1,084	1,099	1,188	1,288	1,408	1,326
Rice	2,300	2,272	2,351	2,511	2,384	2,236
Maize	3,047	2,724	3,117	2,938	3,231	3,308
Soybeans	11	26	78	106	92	130

**III. Average Yield (ton/feddan)**

Wheat	1.40	1.41	1.40	1.33	1.35	1.38
Vegetables	7.44	7.32	7.66	7.78	6.47	7.87
Onions	23.29	23.32	22.19	26.67	21.82	28.43
Raw Cotton	0.87	0.77	1.00	1.08	1.13	1.13
Rice	2.13	2.18	2.28	2.41	2.45	2.34
Maize	1.61	1.54	1.64	1.56	1.70	1.72
Soybeans	0.65	0.79	0.95	1.06	1.11	1.19

Source: Statistical Yearbook, August 1982



2-3 International Marketability

(1) European Market for Fresh Vegetables

a) Onion

In the years since the enlargement of the EEC in 1973, imports by the Nine from non-Community sources have exceeded 300,000 tonnes except in 1975 when they fell to 278,000 tonnes following the excellent European harvest in 1974. In 1977 they leapt to over 470,000 tonnes after the 1976 drought. West Germany and UK are the major importers, each taking over 100,000 tonnes a year, and over 150,000 tonnes in 1977. Despite being the world's largest exporter the Netherlands is a considerable importer - about 40,000 tonnes in both 1976 and 1977.

The major non-EEC suppliers have been Spain, Egypt, Israel and Eastern European countries. Imports by the EEC from Egypt have fluctuated in the 27,000 - 47,000 tonnes a year range, with a downward trend (see Table O-2-8).

Production in the Netherlands and UK has been expanding fairly rapidly in recent years and is expected to continue to do so. In these countries the production season has been extended with the introduction of over-wintering Japanese varieties which are harvested in July and August. Imports are expected to go on increasing in West Germany, France and Belgium, however, as consumption outstrips production. Net imports into the EEC will probably continue to rise as a result - imports by the other four countries are comparatively insignificant.

Table O-2-8 IMPORTS OF ONIONS BY EEC

(Unit : ton)

	1973	1974	1975	1976	1977
TO: EEC 9	370,671	322,790	277,824	347,245	470,409
West Germany	135,455	126,345	122,829	106,065	162,908
France	49,814	38,675	28,195	42,924	53,000
Italy	6,570	1,242	729	1,052	8,383
Netherlands	17,246	17,738	11,088	41,639	39,237
Belgium/ Luxembourg	3,844	2,640	2,323	3,950	41,594
UK	146,163	130,000	105,277	135,597	154,014
Ireland	N/A	845	833	948	N/A
Denmark	11,579	5,305	6,552	7,220	11,273
From: Egypt	50,443	47,402	31,547	38,862	27,746

(1) Including shallots

(2) Approximation - bulb onions having been included with onion sets in Nimexe.

Sources: Nimexe: European Communities Statistics

National Trade Returns for 1977 - and for Denmark and UK for 1973.

b) Tomato

The EEC countries are very large consumers and producers of tomatoes. By virtue of the considerable trade between member countries, the Community is about 80% self-sufficient. Nevertheless, it imports over 350,000 tonnes of fresh tomatoes a year, chiefly during the November to mid-May period as shown in the following.

FRESH TOMATOES:

ANNUAL IMPORTS BY THE EEC FROM OUTSIDE THE COMMUNITY

	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
Nov. 1st to May 14th	331,282	320,326	322,658	293,692	303,900
May 15th to Oct. 31st	57,366	43,652	65,471	59,222	55,529
Total	388,648	363,978	388,129	352,914	359,429

Sources: Nimexe; European Communities Statistics  
National Trade Returns for 1977 and also for 1973  
for Denmark and the U.K.

Consumer preference for tomato types vary between countries, but the trend in recent years in the northern countries, including northern France, has been towards the smooth-skinned, round varieties of the Moneymaker type. In the Mediterranean area, segmented varieties of the Marmande type are still favoured.

The trend towards the round type shows signs of being reversed as consumers seek a tomato with the stronger flavour of the segmented type, but with a better appearance.

(2) Near Eastern Market for Fresh Vegetables

According to the trade statistics, 1981, the following quantity of tomatoes produced in Egypt was exported to Arab countries (See Table 0-2-9)

Kuwait	1,284 ton,	Saudi Arabia	1,036 ton
Lebanon	391 " ,	U.A.E.	233 "
Bahrain	154 " ,	Oman	23 "
Algeria	5 "		

In the above, the quantities of tomatoes exported have been fluctuating in the recent year as follows;

(Unit: tons)

	<u>1979</u>	<u>1980</u>	<u>1981</u>
Kuwait	1,711	677	1,284
Saudi Arabia	463	577	1,036

Kuwait is the largest market for Egyptian tomatoes. But the marketable quantity seems to be unsteady. Hence, the CIF price of fresh tomato imported in Kuwait could be compared by the exported country. As shown in Table 0-2-10, the CIF price per kg of Egyptian tomatoes is ranked highest at about three times those of Jordan and Saudi Arabian tomatoes. It may be considered that Egyptian tomatoes are of high quality, but the high CIF price could make exports of Egyptian tomatoes unsteady.

Tables 0-2-11 through 0-2-13 show CIF prices of garlic, onions, frozen vegetables and temporary preservative, fruits juice & vegetable juice by countries and other vegetables exported. The CIF price of Egyptian garlic is fairly high. Onion prices can not be referred to since the quantity is so little. Egyptian vegetable frozen or in temporary preservation show comparatively low CIF prices, but fruit juices & vegetable juices fetch the highest price. Cucumbers, eggplants and fresh beans also fetch high prices. Table 0-2-14 shows the

Table O-2-9 Fresh Tomato Exported from Egypt

Country	1981			1980			1979		
	Value 1,000 LE	Qt ton	LE/Kg	Value 1,000 LE	Qt ton	LE/Kg	Value 1,000 LE	Qt ton	LE/Kg
(Arab Country)									
Saudi Arabia	373	1,036	0.36	197	577	0.34	151	463	0.33
Algeria	2	5	0.40	-	-	-	-	-	-
Lebanon	131	391	0.34	235	688	0.34	315	1,150	0.27
Kuwait	440	1,284	0.34	230	677	0.34	423	1,711	0.25
Bahrain	54	154	0.35	-	-	-	9	32	0.28
U.A.E.	76	233	0.33	-	-	-	20	79	0.25
Oman	9	23	0.39	-	-	-	-	-	-

Table O-2-10 Fresh Tomato Imported in Kuwait - 1980

Country	Value 1,000 K.D.	Qt ton	K... /Kg	Country	Value 1,000 K.D.	Qt ton	K... /Kg
Iraq	34.9	323.5	0.11	Turkey	843.1	8,516.0	0.10
Jordan	1,065.2	10,647.7	0.10	Italy	40.5	270.0	0.15
Lebanon	125.2	1,220.1	0.10	Greece	5.9	37.4	0.16
Saudi Arabia	590.7	5,827.8	0.10	Rumania	3.8	40.5	0.09
U.A.E.	14.9	152.8	0.10				
<u>Egypt</u>	<u>448.3</u>	<u>1,570.2</u>	<u>0.29</u>	<u>Total</u>	<u>3,182.2</u>	<u>28,888.0</u>	<u>0.11</u>
Cyprus	1.5	3.2	0.47				
India	1.3	7.5	0.17				
Iran	5.3	56.6	0.09				

Note: K. .; Kuwait

Source: Trade Year Book.

Table O-2-11 Vegetables Imported in Kuwait -- 1980

<u>Country</u>	<u>Garlic</u>		<u>Onion</u>	
	<u>Value</u> <u>1,000 K...</u>	<u>Qt</u> <u>ton</u>	<u>Value</u> <u>1,000 K...</u>	<u>Qt</u> <u>ton</u>
Iraq	11.5	40.6	32.4	383.4
Jordan	0.1	0.5	2.5	34.8
Lebanon	201.4	678.5	73.3	1,057.5
Saudi Arabia	0.3	0.6	19.4	145.2
<u>Egypt</u>	99.3	289.0	4.5	6.4
India	31.8	127.8	6.8	102.3
Iran	1.4	3.9	6.5	77.7
Turkey	65.0	230.3	632.0	8,413.4
Taiwan	5.7	25.1	160.1	1,660.7
Pakistan	6.6	22.5	560.0	7,809.4
South Korea	3.2	2.4	272.2	3,700.1
U.S.A.	0.1	0.5	28.8	364.4
Siria	7.2	26.4	1.0	12.5
<u>Total</u>	<u>433.5</u>	<u>1,448.0</u>	<u>1,799.2</u>	<u>23,825.3</u>
				<u>0.08</u>

Table O-2-12 Processing Vegetable Imported in Kuwait — 1980

Vegetable, Frozen or in Temporary Preservation				Fruits Juice & Vegetable Juice			
Country	Value 1,000 K...	Qt ton	K.../Kg	Country	Value 1,000 K...	Qt ton	K.../Kg
Egypt	232.4	746.0	0.31	Egypt	53.6	150.5	0.36
Canada	83.7	319.9	0.26	Saudi Arabia	1.0	4.6	0.21
U.S.A.	85.7	205.2	0.42	Brazil	37.2	360.3	0.10
Cyprus	43.2	76.8	0.56	Canada	3.3	12.8	0.26
India	21.0	59.4	0.35	U.S.A.	323.0	1,167.1	0.28
Taiwan	20.4	117.0	0.17	U.K.	75.0	220.3	0.34
China	15.4	80.0	0.19	Italy	114.1	319.5	0.36
Denmark	6.9	19.0	0.37	Taiwan	839.8	4,811.3	0.17
France	22.3	73.5	0.30	Japan	582.0	2,970.4	0.20
Germany Fed. Rep.	13.4	16.4	0.82	Singapore	183.3	862.6	0.21
Netherland	142.8	273.2	0.52	Denmark	257.2	1,306.8	0.20
U.K.	237.1	463.6	0.51	Austria	117.3	424.9	0.28
Greece	43.5	92.9	0.47	France	19.3	63.8	0.3
Poland	138.3	541.8	0.26	Germany Fed. Rep.	103.4	410.4	0.25
New Zealand	89.0	244.2	0.36				
<b>Total</b>	<b>1,251.3</b>	<b>3,492.0</b>	<b>0.36</b>	<b>Total</b>	<b>3,250.5</b>	<b>15,251.3</b>	<b>0.21</b>

Table O-2-13 Vegetables Imported in Kuwait - 1980

Country	Cucumber			Eggplant		
	Value 1,000 K.D.	Qt ton	K.D./Kg	Value 1,000 K.D.	Qt ton	K.D./Kg
Iraq	38.0	364.8	0.10	30.4	323.8	0.09
Jordan	816.6	8,039.8	0.10	406.9	4,117.1	0.10
Lebanon	210.3	2,038.7	0.10	73.8	749.1	0.10
Saudi Arab.	1.0	9.5	0.10	0.8	8.4	0.10
Siria	1.7	17.0	0.10	3.2	28.5	0.11
UAE	0.1	0.8	0.15	10.5	33.7	0.31
Egypt	32.9	98.0	0.34	1.1	2.2	0.51
Iran	1.7	12.3	0.13	0.6	5.5	0.10
Turkey	11.6	113.4	0.10	21.7	222.1	0.10
Greece	0.7	3.1	0.22	0.2	0.4	0.48
<b>Total</b>	<b>1,114.8</b>	<b>10,698.8</b>	<b>0.10</b>	<b>549.3</b>	<b>5,491.2</b>	<b>0.10</b>

Country	Fresh Bean			Califlowers		
	Value 1,000 K.D.	Qt ton	K.D./Kg	Value 1,000 K.D.	Qt ton	K.D./Kg
Iraq	4.8	35.5	0.13	363.4	3,606.6	0.10
Jordan	78.9	652.6	0.12	5.4	54.6	0.10
Lebanon	3.1	24.4	0.13	1.6	20.5	0.08
Saudi Arab.	0.3	2.5	0.12	0.4	3.1	0.12
UAE	0.0	0.8	0.10	1.2	10.8	0.11
Egypt	112.8	318.2	0.35	0.02	0.1	0.10
Turkey	39.4	268.6	0.15	0.8	1.3	0.60
Cyprus	1.6	3.1	0.53	0.5	5.4	0.10
Spanish	30.1	39.4	0.08			
Greece	0.1	1.0	0.13			
<b>Total</b>	<b>246.1</b>	<b>1,554.5</b>	<b>0.18</b>	<b>373.6</b>	<b>3,704.0</b>	<b>0.10</b>



Table O-2-14 Exported Vegetable, Egypt, 1981 - ton

Country	Onion	Garlic	Artichokes	Haricot	Peas	String beans	Potatoes	Water Melon	Vegetable Presented	Sunflower seeds
Arab Countries										
Saudi Arab.	375	382	387	268	160	51	2,301	2,649	63	-
Lebanon	1,038	404	310	-	-	-	38,360	2,351	53	-
Kuwait	-	123	31	390	106	254	273	5,360	661	-
Bahrain	-	28	-	-	-	-	-	-	12	-
UAE	-	74	-	235	95	30	153	-	147	-
Oman	-	-	-	-	-	-	-	-	12	-
Algeria	-	-	-	-	-	-	-	10	-	-
USSR	7,664	3,437	-	-	-	-	-	-	-	-
Eastern Europe										
Western Europe										
Spanish	700	-	-	-	-	-	-	-	-	-
Sweden	-	-	-	-	-	-	-	-	137	-
Austria	47	29	-	63	-	-	-	71	-	-
UK	1,214	117	-	49	58	-	53,380	-	282	-
Italy	2,181	684	-	-	-	-	1,000	103	68	-
Belgium	-	-	-	85	-	-	-	-	91	38
Gibraltar	-	-	-	-	-	-	-	-	10	-
Germany F.R.	1,220	27	-	48	-	-	-	-	1,843	1,268
France	3,462	442	-	570	-	-	-	-	52	-
Netherland	1,061	-	-	4,321	-	-	-	-	1,192	468
Swiss	-	-	115	253	-	-	-	-	-	248

Note : L/ : Onion dehydrated

Source: Trade Yearbook