ANNEX F PROJECT COST AND JUSTIFICATION

Appendix F Project Economy

LIST OF TABLES

F-1 PROJECT COST

- Table F-1 Cost Summary

- Land Reclamation -

(Unit: '000 LE)

Item	Local	Foreign	Total	Foreign (%)
Stage I Project				
1. Civil work	41,372	30,898	72,270	43
2. Equipment	990	8,873	9,863	90
3. Project facilities	610	-	610	-
4. Consulting services	660	2,318	2,978	78
5. Engineering & administration	9,381	-	9,381	-
Base cost (1 to 5)	53,013	42,089	95,102	44
6. Physical contingencies	5,303	4,210	9,513	44
7. Price escalation	42,891	13,124	56,015	23
Sub-Total (6 to 7)	48,194	17,334	65,528	26
Total	101,207	59,423	160,630	37
Stage II Project				
1. Pipe drain	58,991	14,183	73,174	19
2. Engineering & administration	4,781	1,134	5,852	19
Base cost (1 to 2)	63,709	15,317	79,026	19
3. Physical contingencies	6,370	1,531	7,901	19
4. Price escalation	146,390	10,450	156,840	7
Sub-Total (3 to 4)	152,760	11,981	164,741	7
Total	216,469	27,298	243,767	11
Grand Total	317,676	86,721	404,397	21

Table F-2 Cost Estimate Summary
- Land Reclamation -

Stage I

(Unit: '000 LE)

Item	Local	Foreign	Total	Foreign (%)
1. Civil works				
1-1 Pump station				
Drainage - 1 station	605	449	1,054	43
Irrigation - 4 stations	1,353	1,106	2,459	45
1-2 Irrigation canal - 337 km	12,030	9,601	21,631	44
1-3 Drainage canal - 295 km	4,748	4,153	8,901	47
1-4 On-farm development	22,636	15,589	38,225	41
Sub-Total (1)	41,372	30,898	72,270	43
2. Equipment				
2-1 Pump and motor	654	5,882	6,536	
2-2 O & M equipment	336	2,991	3,327	
Sub-Total (2)	990	8,873	9,863	90
3. Project facilities	610	-	610	
4. Consulting services	660	2,318	2,978	
5. Engineering & administration	9,381	-	9,381	
Base Cost (1 to 5)	53,013	42,089	95,102	44
6. Physical contingencies	5,303	4,210	9,513	
7. Price escalation	42,891	13,124	56,015	
Sub-Total (6 to 7)	48,194	17,334	65,528	
Total Cost	101,207	59,423	160,630	

Note: Base Cost $95,102 \times 10^3$ LE/55,740 feddan
= 1,706 LE/feddan
= 4,954 US$/ha

Table F-3 Cost Estimate Summary
- Land Reclamation -

Stage II

(Unit: '000 LE)

Item	Local	Foreign	Total
1. Pipe drain	58,991	14,183	73,174
2. Engineering & administration	4,718	1,134	5,852
Base Cost	63,709	15,317	79,026
3. Physical contigencies	6,370	1,531	7,901
4. Price escalation	146,390	10,450	156,840
Sub-Total	152,760	11,981	164,741
Total	216,469	27,298	243,767

Note: Base Cost: $79,026 \times 10^3$ LE/55,740 feddan
= 1,418 LE/feddan
= 4,117 US$/ha

Table F-4 Construction Costs - Pumping Stations

(Unit: '000 LE)

Item	Local	Foreign	Total
1. Drainage Pumping Station	605	449	1,054
2. Irrigation Pumping Stations			
M2 Station	610	519	1,129
M2-1 Station	207	166	373
M2-2 Station	207	166	373
M3 Station	329	255	584
Sub-total	1,353	1,106	2,459
Total	1,958	1,555	3,513

(Cont'd)

Construction Cost - Irrigation Canal

(Unit: '000 LE)

Item	Local	Foreign	Total
1. M1 Irrigation System			
Main canal - 16,350 m	2,798	1,163	3,961
Appurtenant structure - 9	584	532	1,116
Sub-total	3,382	1,695	5,077
Secondary canal - 73,550 m	852	604	1,456
Appurtenant structure - 82	777	902	1,679
Escape tail canal - 4,250 m	161	107	268
Sub-total	1,790	1,613	3,403
Total	5,172	3,308	8,480
2. M2 Irrigation System			
Main canal - 9,250 m	229	193	422
Appurtenant structure - 8	670	645	1,315
Sub-total	899	838	1,737
Secondary canal - 122,520 m	1,306	923	2,229
Appurtenant structure - 151	1,466	1,657	3,123
Escape tail canal - 6,550 m	222	148	370
Sub-total	2,994	2,728	5,722
Total	3,893	3,566	7,459
3. M3 Irrigation System			
Main canal - 13,000 m	411	295	706
Appurtenant structure - 8	670	645	1,315
Sub-total	1,081	940	2,021
Secondary canal - 88,420 m	823	574	1,397
Appurtenant structure - 116	906	1,110	2,016
Escape tail canal - 3,700 m	155	103	258
Sub-total	1,884	1,787	3,671
Total	2,965	2,727	5,692
Grand Total	12,030	9,601	21,631

(Cont'd)

Construction Cost - Drainage Canal

(Unit: '000 LE)

Item	Local	Foreign	Total
1. DM1 Drainage System			
Main canal - 26,850 m	1,033	1,084	2,117
Secondary canal - 79,400 m	787	693	1,480
Appurtenant - 32	203	141	344
Total	2,023	1,918	3,941
2. DM2 Drainage System			
Main canal - 8,650 m	209	213	422
Secondary canal - 118,450 m	944	756	1,700
Appurtenant - 38	537	381	918
Total	1,690	1,350	3,040
3. DM3 Drainage System			
Main canal - 8,850 m	239	245	484
Secondary canal - 53,350 m	494	426	920
Appurtenant - 23	302	214	516
Total	1,035	885	1,920
Grand Total	4,748	4,153	8,901

Construction Costs - On-farm Development

(Unit: '000 LE)

Item	Local	Foreign	Total
M1 Irrigation System - 6,650 ha	6,430	4,428	10,858
M2 Irrigation System - 9,670 ha	9,350	6,440	15,790
M3 Irrigation System - 7,090 ha	6,856	4,721	11,577
Total 23,410 ha	22,636	15,589	38,225

(cont'd)

Construction Costs - Project Facilities

(Unit: '000 LE)

Item	Quantity	Price (Local)	Cost (Local)
1. Buildings			
Project office	3,000 sq.m	100	300,000
Operation office	250 sq.m	100	25,000
Housing			
- Government staff	1,000 sq.m	100	100,000
- Guest house	200 sq.m	100	20,000
- Equipment shed	3,000 sq.m	50	150,000
Sub-total			595,000
2. Furniture	Lumpsum		15,000
Total			610,000

Cost Estimate - Consulting Services

(Unit: '000 LE)

Item	Local	Foreign	Total
1. Detailed Design			
112 man-month	246	845	1,091
2. Supervision			
196 man-month	414	1,473	1,887
Total (275 man-month)	660	2,318	2,978

Table F-5 Cost Estimate Sheet - Equipment

Item	Quantities	Price ('000 LE) Local	Price ('000 LE) Foreign	Cost ('000 LE) Local	Cost ('000 LE) Foreign	Cost ('000 LE) Total
1. Pump and Motors						
1-1. Drainage, vertical mixed flow, q = 2.84 m^3/s						
ϕ1,200, 260 KW	6 sets	51.8	466.2	311	2,797	3,108
1-2. M2 Irrigation, vertical axial flow, q = 3.34 m^3/s						
ϕ1,200, 75 KW	6 sets	25.6	230.4	154	1,382	1,536
1-3. M2-1 Irrigation, vertical axial flow, q = 1.14 m^3/s						
ϕ700, 30 KW	4 sets	9.5	85.5	38	342	380
1-4. M2-2 Irrigation, vertical axial flow, q = 0.84 m^3/s						
ϕ700, 45 KW	4 sets	10.5	94.5	42	378	420
1-5. M3 Irrigation, vertical axial flow, q = 1.59 m^3/s						
ϕ900, 75 KW	6 sets	18.2	163.8	109	983	1,092
Sub-total				654	5,882	6,536
2. O & M Equipment						
Backhoe, 0.7 m^3	3	6.0	55.0	18	165	183
- do -, 1.2 m^3	3	12.0	107.0	36	321	357
Dragline, 0.8 m^3	3	13.0	118.0	39	354	393
- do - , 1.2 m^3	3	24.7	223.3	74	670	744
Motor grader, 3.7 m	3	7.7	70.3	23	211	234
Dump truck, 8 ton	6	2.0	20.0	12	120	132

(Cont'd)

Item	Quantities	Price ('000 LE) Local	Price ('000 LE) Foreign	Cost ('000 LE) Local	Cost ('000 LE) Foreign	Cost ('000 LE) Total
Truck, 4 ton	6	1.0	11.0	6	66	72
Water truck, 10 m^3	3	2.0	20.0	6	60	66
Tire roller, 20 ton	3	3.0	26.0	9	78	87
Vehicle, 4-wheel dirve	7	1.0	10.0	7	70	77
Wagon	7	2.0	17.0	14	119	133
Motor cycle	20	0.10	0.85	2	17	19
Workshop equipment	3 lot	11.0	89.0	33	267	300
Spare parts	Lump sum			43	376	419
Sub-total				322	2,894	3,216
3. Office Equipment						
Survey equipment						
Level	8	0.175	1.20	1.4	9.6	11.0
Theodolite	8	0.500	3.20	4.0	25.6	29.6
Copy machine	4	0.350	2.40	1.4	9.6	11.0
Micro-computer	1	2.70	18.00	2.7	18.0	20.7
Electric calculator	8	0.05	0.50	0.4	4.0	4.4
Soil survey equipment	Lump sum			3.0	20.0	23.0
Miscellaneous equipment	Lump sum			1.1	10.2	11.3
Sub-total				14.0	97.0	111.0
Total				990.0	8,873.0	9,863.0

Table F-6 Cost Estimate Sheet - Consulting Services

Item	Quantities	Price (LE) Local	Price (LE) Foreign	Cost ('000 LE) Local	Cost ('000 LE) Foreign	Cost ('000 LE) Total
1. Detail Design						
Consultant Remuneration	112 m/m	-	6,970	-	780.6	780.6
International Trips	16 trips	-	3,500	-	56.0	56.0
Communication and Others	Lump sum	-	-	-	8.4	8.4
Per Diem	112 m/m	2,100	-	235.2	-	235.2
Miscellaneous	Lump sum	-	-	10.8	-	10.8
Total				246.0	845.0	1,091.0
2. Supervision						
Consultant Remuneration	196 m/m	-	6,970	-	1,366.1	1,366.1
International Trips	29 trips	-	3,500	-	101.5	101.5
Communication and Others	Lump sum	-	-	-	5.4	5.4
Per Diem	196 m/m	2,100	-	411.6	-	411.6
Miscellaneous	Lump sum	-	-	2.4	-	2.4
Total				414.0	1,473.0	1,887.0
Grand Total				660.0	2,318.0	2,978.0

Table F-7 Cost Estimate Sheet Housing and Infrastructure

(Unit : 1,000 LE)

Item	Quantity	Unit	Price	Cost
1. Housing				
(a) Satellite villages	27	place	869	18,249
(b) Service villages	6	-do-	981	5,886
(c) Central villages	2	-do-	1,642	3,284
Sub-total (1)	29	-do-		27,419
2. Road				
(a) Bridge				
Superstructures	5,280	sq.m	0.6	3,168
Substructures	83	place	28	2,324
(b) Pavement				
Trunk roads	306	10^3 sq.m	6.9	2,111
Village roads	328	10^3 sq.m	6.9	2,263
Sub-total (2)				9,866
3. Portable Water Supply				
(a) Conveyance pipelines	70	km	60.7	4,250
(b) Clarification	1	place	3,220	3,320
(c) Pipelines				
Main	28	km	156.1	4,370
Branch	100	km	45.1	4,510
(d) Water towers	31	place	32	992
(e) Pump stations	31	-do-	15	465
(f) Distribution systems	29		166.6	4,830
Sub-total (3)				22,637
4. Sewage Treatment				
(a) 2,000 persons	27	place	390	10,530
(b) 5,000 persons	2	-do-	700	1,400
(c) Collecting networks	180	km	55	9,900
Sub-total (4)				21,830

(cont'd)

(Unit : 1,000 LE)

Item	Quantity	Unit	Price	Cost
5. Electrification				
(a) 66 KV line	10	km	42.5	425
(b) 11 KV line	130	-do-	20	2,600
(c) Substations				
220 KV/66 KV	1	place	1,750	1,750
66 KV/11 KV	1	-do-	175	175
(d) Low voltage distribution	38		35	1,330
(e) Village distribution	29		50	1,450
Sub-total (5)				7,730
6. Telecommunication				
(a) Trunk cable	20	km	26	520
(b) Lines	180	km	3.7	666
(c) Central exchange	1		67	67
(d) Telex system	1		10	10
Sub-total (6)				1,263
7. Village Facilities				
(a) Social service				
Satellite village	21	place	77	1,617
Service village	6	-do-	540	3,240
Central village	2	-do-	1,634	3,268
(b) Street Pavement				
Satellitie village	21	-do-	56	1,176
Service village	6	-do-	111	666
Central village	2	-do-	167	334
Sub-total (7)				10,301
Total (1~7)				101,046
8. Engineering and Administration				15,542
Total (1~8)				116,588

Table F-8 Cost Estimate Sheet-Agro-Industry (Basic Cost)

A. Sugar Beet Processing Factory

	Million L.E.
1. Main Plant	34.67
2. Piping and Valves	5.59
3. Steel	1.35
4. Building	17.65
5. Electrical	8.89
6. Instrumentation and Control	3.13
7. Plant Spares	2.08
8. Design	2.76
9. Commissioning	1.10
10. Staff Housing	3.91
11. Vehicle and Equipment	0.18
Total	81.31

B. Milk Processing Factory

	1,000 L.E.
1. Processing Equipment	2,489.830
2. Factory Transport and Vehicles	311.300
3. Water Treatment Plant	66.180
4. Effluent Plant	125.750
5. Distribution Refrigeration Equipment	275.750
6. Mechanical Engineering Design and Planning	47.650
7. Erection and Running-in	317.000
8. Supervision of Building and External Work	64.860
9. Building	2,000.500
Total Initial Cost	5,698,820

(cont'd)

C. Base Costs for 450 TPD Tomato Factory

	1,000 L.E.
1. Main Plant(L.E. 671,680 x 3 lines)	2,015.0
2. Office Equipment and Furniture	15.0
3. Laboratory Equipment and Furniture	26.0
4. Installation Costs and Spare Parts	213.3
5. Processing Buildings, 4,800 m^2 @ L.E. 120	576.0
6. Warehouse, 6,000 m^2 @ L.E. 100	600.0
7. Laboratory and Office, 230 m^2 @ L.E. 150	34.5
8. Architect Fees and Supervision @ 8% of Building Costs	96.9
9. Staff Housing(See Table D)	937.8
10. Staff Vehicles(See Table E)	34.4
Total	4,548.9

Table F-9 Operation and Maintenance Cost After Constraction

		NO.Staff	No.Office	Salary/Month (LE)	Total/Year (LE)
1. Salary and Wages					
1) Government Offices Staff					
(i) Irrigation System Office		5	2	200	24,000
(ii) Field Offices					
a) Water Management Technologist		10	3	150	54,000
b) Gate Keeper		10	3	100	36,000
c) Ditch Tender		60	3	100	18,000 1/
d) Pumping Station		20		100	20,000 2/
				Sub-Total	152,000
Note: 1/2/ ,10 month/year					
2) Labour's Cost (Main Canals, Secondary Canals)					
L=618 km Unit Cost 1.0 LE/m					618,000
				Sub-Total	618,000
				Total	770,000
2. Electric Power Charge					
1) Drainage Pumping Station	260KWx5x5,340hr=6,942KWHx10^3				
	6,942KWHx10^3x0.025LE/KWH=174LEx10^3				174,000
2) Booster Pumping Station	5x75KW+3x30KW+3x45KW+5x75KW=975KW				
	975KWx2,380hr=2,320.5KWHx10^3				
	2,320.5KWHx10^3x0.025LE/KWH=58.0x10^3				58,000
3) Office Eqipment and Facilities					79,000
				Sub-Total	311,000
3. Repairing Cost					228,000
4. Labour's Cost (Terminal Facilities)					
Tertialy Canal (2,340 km)					413,000
Pipe Drain					334,000
				Sub-Total	747,000
5. Grand Total					2,056 ,000

Table F-10 Schedule of Expenditures
- Land Reclamation -

(Unit: '000 LE)

Year	Stage I			Stage II			Grand Total
	Base Cost	Contingencies	Total	Base Cost	Contingencies	Total	
1985	4,580	1,308	5,888	-	-	-	5,888
1986	1,737	682	2,419	-	-	-	2,419
1987	17,056	8,662	25,718	-	-	-	25,718
1988	26,246	16,225	42,471	-	-	-	42,471
1989	25,890	19,712	45,602	-	-	-	45,602
1990	14,190	13,059	27,249	-	-	-	27,249
1991	5,403	5,880	11,283	2,298	3,182	5,480	16,763
1992	-	-	-	20,954	34,586	55,540	55,540
1993	-	-	-	24,354	47,374	71,728	71,728
1994	-	-	-	14,432	32,841	47,273	47,273
1995	-	-	-	12,482	32,994	45,476	45,476
1996	-	-	-	4,506	13,764	18,270	18,270
Total	95,102	65,528	160,630	79,026	164,741	243,767	404,397

Table F-11 Schedule of Expenditures
- Land Reclamation, Stage I -

(Unit: '000 LE)

Item	1985	1986	1987	1988	1989	1990	1991	Total
1. Civil Works								
1.1 Pumping station	-	105	632	1,254	1,230	292	-	3,513
1.2 Irrigation canal	-	396	5,211	7,599	6,356	2,069	-	21,631
1.3 Drainage canal	-	211	2,487	3,270	2,292	641	-	8,901
1.4 On-farm development	-	-	7,233	8,883	10,532	7,724	3,853	38,225
Sub-Total (1)	-	712	15,563	21,006	20,410	10,726	3,853	72,270
2. Equipment	-	111	-	3,108	3,395	2,190	1,059	9,863
3. Project Facilities	-	610	-	-	-	-	-	610
4. Consulting Services	980	247	248	452	452	416	183	2,978
5. Engineering & Administration	3,600	57	1,245	1,680	1,633	858	308	9,381
Sub-Total (2 to 5)	4,580	1,025	1,493	5,240	5,480	3,464	1,550	22,832
Base Cost (1 to 5)	4,580	1,737	17,056	26,246	25,890	14,190	5,403	95,102
6. Physical Contingencies	458	174	1,706	2,625	2,589	1,420	541	9,513
7. Price Escalation	850	508	6,956	13,600	17,123	11,639	5,339	56,015
Sub-Total (6 to 7)	1,308	682	8,662	16,225	19,712	13,059	5,880	65,528
Total	5,888	2,419	25,718	42,471	45,602	27,249	11,283	160,630

Table F-12 Schedule of Expenditures
- Land Reclamation, Stage II -

(Unit: '000 LE)

Item	1991	1992	1993	1994	1995	1996	Total
1. Pipe Drain - 23,410 ha	2,128	19,402	22,550	13,363	11,558	4,173	73,174
2. Engineering & Administration	170	1,552	1,804	1,069	924	333	5,852
Base Cost (1 to 2)	2,298	20,954	24,354	14,432	12,482	4,506	79,026
3. Physical Contingencies	229	2,095	2,435	1,444	1,248	450	7,901
4. Price Escalation	2,953	32,491	44,939	31,397	31,746	13,314	156,840
Sub-Total	3,182	34,586	47,374	32,841	32,994	13,764	164,741
Total	5,480	55,540	71,728	47,273	45,476	18,270	243,767

Table F-13 Schedule of Expenditures - Base Cost -
- Land Reclamation, Stage 1 -

(Unit: '000 LE)

Item	1985	1986	1987	1988	1989	1990	1991	Total
1. Civil Works	-	712	15,563	21,006	20,410	10,726	3,853	72,270
2. Equipment	-	111	-	3,108	3,395	2,190	1,059	9,863
3. Project Facilities	-	610	-	-	-	-	-	610
4. Consulting Services	980	247	248	452	452	416	183	2,978
5. Engineering & Administration	3,600	57	1,245	1,680	1,633	858	308	9,381
Base Cost (1 to 5)	4,580	1,737	17,056	26,246	25,890	14,190	5,403	95,102
Local Cost								
1. Civil Works	-	443	9,080	11,906	11,484	6,177	2,282	41,372
2. Equipment	-	14	-	311	340	219	106	990
3. Project Facilities	-	610	-	-	-	-	-	610
4. Consulting Services	220	56	55	99	99	91	40	660
5. Engineering & Adminstration	3,600	57	1,245	1,680	1,633	858	308	9,381
Base Cost (1 to 5)	3,820	1,180	10,380	13,996	13,556	7,345	2,736	53,013
Foreign Exchange Component								
1. Civil Works	-	269	6,483	9,100	8,926	4,549	1,571	30,898
2. Equipment	-	97	-	2,797	3,055	1,971	953	8,873
3. Project Facilities	-	-	-	-	-	-	-	-
4. Consulting Services	760	191	193	353	353	325	143	2,318
5. Engineering & Administration	-	-	-	-	-	-	-	-
Base Cost (1 to 5)	760	557	6,676	12,250	12,334	6,845	2,667	42,089

Table F-14 Schedule of Expenditures - Civil Works -

(Unit: '000 LE)

Item	1985	1986	1987	1988	1989	1990	1991	Total
1. Pumping Station								
Drainage - 1 station		105	632	317				1,054
Irrigation - 4 stations				937	1,230	292		2,459
Sub-total		105	632	1,254	1,230	292		3,513
2. Irrigation Canal								
M1 irrigation system - 94 km		396	5,211	2,873				8,480
M2 irrigation system - 138 km				4,726	2,733			7,459
M3 irrigation system - 105 km					3,623	2,069		5,692
Sub-total		396	5,211	7,599	6,356	2,069		21,631
3. Drainage Canal								
DM1 drainage system - 106 km		211	2,487	1,243				3,941
DM2 drainage system - 127 km				2,027	1,013			3,040
DM3 drainage system - 62 km					1,279	641		1,920
Sub-total		211	2,487	3,270	2,292	641		8,901
4. On-farm Development								
M1 irrigation system - 6,650 ha.			7,233	3,625				10,858
M2 irrigation system - 9,670 ha.				5,258	10,532			15,790
M3 irrigation system - 7,090 ha.						7,724	3,853	11,577
Sub-total			7,233	8,883	10,532	7,724	3,853	38,225
Total		712	15,563	21,006	20,410	10,726	3,853	72,270

(cont'd)

Schedule of Expenditures - Pumping Stations -

(Unit: '000 LE)

Item		1985	1986	1987	1988	1989	1990	1991	Total
Drainage Pumping Station									
	Local		60	363	182				605
	Foreign		45	269	135				449
	Total		105	632	317				1,054
Irrigation Pumping Stations									
M2 Station:	Local				304	306			610
	Foreign				260	259			519
	Sub-total				564	565			1,129
M2-1 Station:	Local				104	103			207
	Foreign				83	83			166
	Sub-total				187	186			373
M2-2 Station:	Local				103	104			207
	Foreign				83	83			166
	Sub-total				186	187			373
M3 Station:	Local					164	165		329
	Foreign					128	127		255
	Sub-total					292	292		584
Total	Local				511	677	165		1,353
	Foreign				426	553	127		1,106
	Total				937	1,230	292		2,459
Grand Total			105	632	1,254	1,230	292		3,513

(cont'd)

Schedule of Expenditures - Irrigation Canal -

(Unit: '000 LE)

Item		1985	1986	1987	1988	1989	1990	1991	Total
M1 Irrigation System									
Main canal :	Local		280	1,679	839				2,798
	Foreign		116	698	349				1,163
Secondary canal :	Local			568	284				852
	Foreign			403	201				604
Appurtenant structure :	Local			907	454				1,361
	Foreign			956	478				1,434
Escape tail canal :	Local				161				161
	Foreign				107				107
Sub-total			396	5,211	2,873				8,480
M2 Irrigation System									
Main canal :	Local				153	76			229
	Foreign				129	64			193
Secondary canal :	Local				870	436			1,306
	Foreign				615	308			923
Appurtenant structure :	Local				1,424	712			2,136
	Foreign				1,535	767			2,302
Escape tail canal :	Local					222			222
	Foreign					148			148
Sub-total					4,726	2,733			7,459
M3 Irrigation System									
Main canal :	Local					274	137		411
	Foreign					197	98		295
Secondary canal :	Local					549	274		823
	Foreign					383	191		574
Appurtenant structure :	Local					1,050	526		1,576
	Foreign					1,170	585		1,755
Escape tail canal :	Local					-	155		155
	Foreign					-	103		103
Sub-total						3,623	2,069		5,692
Total:	Local	-	280	3,154	4,185	3,319	1,092	-	12,030
	Foreign	-	116	2,057	3,414	3,037	977	-	9,601
	Total	-	396	5,211	7,599	6,356	2,069	-	21,631

Schedule of Expenditures - Drainage Canal -

(Unit: '000 LE)

Item		1985	1986	1987	1988	1989	1990	1991	Total
DM1 Drainage System									
Main Canal :	Local		103	620	310				1,033
	Foreign		108	650	326				1,084
Secondary Canal :	Local			525	262				787
	Foreign			462	231				693
Appurtenant :	Local			135	68				203
	Foreign			95	46				141
Sub-total			211	2,487	1,243				3,941
DM2 Drainage System									
Main Canal :	Local				140	69			209
	Foreign				142	71			213
Secondary Canal :	Local				629	315			944
	Foreign				504	252			756
Appurtenant :	Local				359	178			537
	Foreign				253	128			381
Sub-total					2,027	1,013			3,040
DM3 Drainage System									
Main Canal :	Local					159	80		239
	Foreign					163	82		245
Secondary Canal :	Local					329	165		494
	Foreign					284	142		426
Appurtenant :	Local					201	101		302
	Foreign					143	71		214
Sub-total						1,279	641		1,920
Total	Local		103	1,280	1,768	1,251	346		4,748
	Foreign		108	1,207	1,502	1,041	295		4,153
	Total		211	2,487	3,270	2,292	641		8,901

(cont'd)

Schedule of Expenditures - On-farm Development -

Item	1985	1986	1987	1988	1989	1990	1991	Total
M1 Irrigation System (ha)			4,430	2,220				6,650
M2 Irrigation System (ha)				3,220	6,450			9,670
M3 Irrigation System (ha)						4,730	2,360	7,090
Total			4,430	5,440	6,450	4,730	2,360	23,410
Construction Cost ('000 LE)								
M1 : Local			4,283	2,147				6,430
Foreign			2,950	1,478				4,428
Sub-total			7,233	3,625				10,858
M2 : Local				3,113	6,237			9,350
Foreign				2,145	4,295			6,440
Sub-total				5,258	10,532			15,790
M3 : Local						4,574	2,282	6,856
Foreign						3,150	1,571	4,721
Sub-total						7,724	3,853	11,577
Total Local			4,283	5,260	6,237	4,574	2,282	22,636
Foreign			2,950	3,623	4,295	3,150	1,571	15,589
Total			7,233	8,883	10,532	7,724	3,853	38,225

Table F-15 Schedule of Expenditures - Equipment -

(Unit: '000 LE)

Item	1985	1986	1987	1988	1989	1990	1991	Total
1. Pumps and Motors								
Drainage, vertical mixed flow, q = 2.84 m^3/s, ø1,200 mm, 266 kW 6 sets				3,108				3,108
M2 Irrigation, vertical axial flow, q = 3.34 m^3/s, ø1,200 mm, 75 kW 6 sets					1,536			1,536
M2-1 Irrigation, vertical axial flow, q = 1.14 m^3/s, ø700 mm, 30 kW 4 sets					380			380
M2-2 Irrigation, vertical axial flow, q = 0.84 m^3/s, ø700 mm, 45 kW 4 sets					420			420
M3 Irrigation, vertical axial flow, q = 1.59 m^3/s, ø900 mm, 75 kW 6 sets						1,092		1,092
Sub-total				3,108	2,336	1,092	-	6,536
2. O & M Equipment					(M1)	(M2)	(M3)	
Backhoe (0.7 m^3) - 3					61	61	61	183
- do - (1.2 m^3) - 3					119	119	119	357
Dragline (0.8 m^3) - 3					131	131	131	393
- do - (1.2 m^3) - 3					248	248	248	744

- to be continued -

(cont'd)

Schedule of Expenditures - Equipment -

(Unit: '000 LE)

Item	1985	1986	1987	1988	1989	1990	1991	Total
Motorgrader (3.7 m) - 3					78	78	78	234
Dump Truck (8 ton) - 6					44	44	44	132
Truck (4 ton) - 6					24	24	24	72
Water Truck (10 m^3, 4 ton) - 3					22	22	22	66
Tire Roller (20 ton) - 3					29	29	29	87
Vehicle, 4 wheel drive - 7					22	33	22	77
- do - , wagon - 7					38	57	38	133
Motorcycle (90 cc) - 20					5	9	5	19
Workshop Equipment - 3					100	100	100	300
Spare Parts					138	143	138	419
Sub-total					1,059	1,098	1,059	3,216
3. Office Equipment		111						111
Total		111	-	3,108	3,395	2,190	1,059	9,863

Table F-16 Schedule of Expenditures - Consulting Services -

(Unit: '000 LE)

Item	1985	1986	1987	1988	1989	1990	1991	Total
1. Detail Design								
Consultant Remuneration	697.0	83.6	-	-	-	-	-	780.6
International Trips	56.0	-	-	-	-	-	-	56.0
Communication and Others	7.0	1.4	-	-	-	-	-	8.4
Per Diem	210.0	25.2	-	-	-	-	-	235.2
Miscellaneous	10.0	0.8	-	-	-	-	-	10.8
Sub-total	980.0	111.0	-	-	-	-	-	1,091.0
2. Supervision								
Consultant Remuneration	-	97.6	181.2	327.6	327.6	299.7	132.4	1,366.1
International Trip	-	7.0	10.5	24.5	24.5	24.5	10.5	101.5
Communication and Others	-	1.4	1.3	0.9	0.9	0.8	0.1	5.4
Per Diem	-	29.4	54.6	98.7	98.7	90.3	39.9	411.6
Miscellaneous	-	0.6	0.4	0.3	0.3	0.7	0.1	2.4
Sub-total	-	136.0	248.0	452.0	452.0	416.0	183.0	1,887.0
Total	980.0	247.0	248.0	452.0	452.0	416.0	183.0	2,978.0

Table F-17 Schedule of Expenditures - Engineering and Administration[3/], and Physical Contingencies -

(Unit: '000 LE)

Item		1985	1986	1987	1988	1989	1990	1991	Total
(Civil Works)		-	712	15,563	21,006	20,410	10,726	3,853	72,270
Engineering and Administration		3,600[1/]	57	1,245	1,680	1,633	858	308	9,381[2/]
(Base Cost)	Local	3,820	1,180	10,380	13,996	13,556	7,345	2,736	53,013
	Foreign	760	557	6,676	12,250	12,334	6,845	2,667	42,089
	Total	4,580	1,737	17,056	26,246	25,890	14,190	5,403	95,102
Physical Contingencies [1/],									
	Local	382	118	1,038	1,400	1,356	735	274	5,303
	Foreign	76	56	668	1,225	1,233	685	267	4,210
	Total	458	174	1,706	2,625	2,589	1,420	541	9,513

Notes: 1/ ; 72,270 x 0.05 = 3,600 (for detail design)
2/ ; 72,270 x 0.08 + 3,600 = 9,381
3/ ; Local cost only

Note: 1/ ; 10% of base costs

Table F-18 Schedule of Expenditures - Price Escalation -

- Land Reclamation, Stage I -

(Unit: '000 LE)

Item	1985	1986	1987	1988	1989	1990	1991	Total
Local Cost								
Base Cost	3,820	1,180	10,380	13,996	13,556	7,345	2,736	53,013
Physical Contingencies	382	118	1,038	1,400	1,356	735	274	5,303
Total	4,202	1,298	11,418	15,396	14,912	8,080	3,010	58,316
Rate of Escalation	(0.187)	(0.330)	(0.489)	(0.668)	(0.868)	(1.092)	(1.343)	
Price Escalation (1)	786	428	5,583	10,285	12,944	8,823	4,042	42,891
Foreign Cost								
Base Cost	760	557	6,676	12,250	12,334	6,845	2,667	42,089
Physical Contingencies	76	76	668	1,225	1,233	685	267	4,210
Total	836	613	7,344	13,475	13,567	7,530	2,934	46,299
Rate of Escalation	(0.076)	(0.130)	(0.187)	(0.246)	(0.308)	(0.374)	(0.442)	
Price Escalation (2)	64	80	1,373	3,315	4,179	2,816	1,297	13,124
Total (1 + 2)	850	508	6,956	13,600	17,123	11,639	5,339	56,015

F.2. Project Justification

F.2.1. Economic Evaluation of Commodities Prices

a. Exchange Rate

Exchange rate of Egyptian Pound (LE) and Japanese Yen are estimated by data sources in Table F-19. In this report the exchange rate is estimated at LE0.82 per US$. The exchange rate of Japanese Yen per US$ is estimated at Yen 288 per LE. This is the average Value for the last three month.

b. Escalation Factor

The annual escalation factor for estimation of the project cost is six percent of foreign cost and ten percent of local cost as shown in Table F-20. The former is based on ADB rate. The latter is estimated considering the wholesale price index in recent years.

c. Coversion Factor

There are two market systems in Egypt with different prices of inputs and outputs; that is, the cooperative marketing system and the cooperative marketing system. The major export or import substitution crops and cotton are sold only through the cooperative system. Amount of these crops exceeding the quota and the other crops might be sold in either market system. Reportedly, the compulsory prices in the cooperative market system were lower than the averaged prices in the free market in the 1960s by 50 to 20 percent. According to the World Bank Report entitled Agricultural Price Management in Egypt, 1980, the subsidized percent to traded inputs were as follows;

Subsidy as percent of border price - Egypt, 1975

Price	54%
Wheat	54%
Cotton	48%
Maize	44%
Meat	48%

These price systems mean that the prices received by farmers do not represent the real prices. Hence, it is necessary to estimate the economic or shadow prices for economic evaluation.

Standard conversion factor:

Table F-21 shows the claculation of Standard Conversion Factor (SCF) of 80%. On the other hand, the World Bank reported the shadow prices in Egypt. (Shadow Price for Tade Strategy and Investment Planning in Egypt, World Bank Staff Working Papers, No. 521, 1982) The SCF in this Report is 0.965.

Conversion factor on agricultural inputs and outputs:

Agricultural Machinery	1.159
Agricultural Machinery Spares	1.021
Agricultural Implements	0.992
Bags	1.280
Fertilizer (wtd average)	1.663
Pesticides	1.976
Seeds	1.149
Maize	1.313
Onions	4.259
Rice	2.043
Soybeans	0.992
Sugar	0.969
Wheat	1.591
Non traded agriculture	1.000

Shadow Wage Rate:

Market rate is LE5.0. Shadow rate is estimated at LE2.5 or 50 percent using the conversion factor of consumption of 1.070 (Table F-22).

d. Farm Gate Price

The following prices were used as the projected farm gate price.

Projected Farm Gate Price

(1983 constant price)

Item	Unit	Financial (LE)	Economic (LE)
Crop			
Rice (unhulled)	ton	105	182
Soybean	"	230	228
Tomatoes	"	70	70
Onion	"	80	80
Cauliflower	"	120	120
Cabbage	"	60	60
Sugarbeet	"	30	30
Wheat	"	233	248
Livestock			
Milk (Friesian, Baladi)	"	300	290
Cattle (live weight)	"	1,300	1,300
Seeds			
Paddy	kg	0.02	0.02
Soybean	"	0.25	0.29
Sugarbeat	"	6.0	6.89
Tomato	"	45	51.7
Onion	"	3	3.45
Cauliflower	"	3.6	4.14
Cabbage	"	3.6	4.14
Chemicals			
Robigan 2%	liter	52.0	102.75
Tamalon	"	11.79	23.29
Koprozan	kg	3.23	6.38
Lanit	"	25.86	51.10
Dimethweet	liter	3.49	6.90
Fertilizer			
Urea	ton	312	326
TSP	"	290	304
Others			
Farm Labor (unskilled)	man/day	5	2.5

e. Farm gate prices by commodity were estimated as follows.

Rice (unhulled) : Financial price of 105 L.E./ton was estimated based on GARPAD's information.
Economic price of 182 L.E./ton was estimated as shown in Table F-23.

Soybeans : Financial price of 230 L.E./ton was estimated based on GARPAD's information.
Economic price was estimatied as 230 L.E./ton x 0.992 = 228 L.E./ton. Conversion factor for soybean is 0.992 based on World Bank Report.

Tomatoes : Financial price of 70 L.E./ton is average farm gate price for private sector in Sharkia in the year 1982.
Economic price is estimated at 185 L.E./ton as shown in Table F-25.
The exportable tomato is limited by volume and varieties. This price does not reflect the true price. Hence 70 L.E./ton is applied in the economic analysis.

Onions : Financial price of 80 L.E./ton was survered at El Matariya.
Economic price is estimated such as 80 x 4.257 = 340 L.E./ton using conversion factor of onions based on World Bank Report.
In order to estimate the benefit conservatively, 80 L.E./ton was applied in the economic analysis.

Cauliflower : Market price did not available. Price of cauliflower is price of broccoli.

Cabbage : Financial price was estimated based on the results of field survey.

Sugarbeet : Financial price of 30 L.E./ton was based on GARPAD's information.

Wheat : Financial and economic prices were estimated as shown in Table F-26.

Milk : Financial price of 300 L.E./ton was obtained from farm survey.
Economic price was estimated as 300 L.E./ton x 0.968 = 290 L.E./ton using conversion factor of 0.968 (Tradable Urban consumer goods, milk & products)
According to the financial analysis on milk processing plant, optimum price is 200 L.E./ton.

Urea & TSP : Financial and Economic prices were estimated as shown in Table F-27, F-11 and F-28.

Seeds & Chemicals : Financial prices were based on informations from Ministry of Agriculture.
Economic prices were estimated using conversion factor, that is, 1.149 for seeds and 1.976 for chemicals.

F.2.2. Evaluation of Project Benefit

a. Net Production Value without Project

The value estimated in the Phase I study is updated by prices. Table F-30 shows the NPV without Project.

b. Net Production Value per Feddan and per Animal Unit with Project

Machinery costs are estimated in Table F-31 to Table F-33. NPV by crops is conservartively estimated. Tomatoes for processing are harvested in the summer season. Products will be spoiled by high temperature and delay in of collection. About 15 percent of produce is assumed to be lost before hauling to factory.
Profitability of livestock breeding is estimated on Friesian, Baladi and Sheep. As shown in Table F-38 to F-43.

c. Production and Gross Production Value

Production quantities and gross production value are shown in Table F-44 and Table F-46. This production is scheduled by Table VI-2 in main Report. Raw materials for the processing are tomatoes, sugarbeet, milk and meat Tomato production shall start in the latest year 1997 while milk and meat production will begin in 1990 to 1992.

d. Incremental Net Production Value

NPV consist of both process of crop and livestoch. NPV of livestock. NPV of livestoch is shown in Table F-47 to F-50. NPV with

the Project in full benefit stage is estimated at 49.55 million LE in the year 2006. About 60 percent of total value is occupied by crop production. (Table F-51, F-52) Incremental NPV is shown in Table F-53.

e. Project Economic Cost

Project economic cost is estimated using local currency multiplied by 0.8 of standard conversion factor as shown in Table F-54 to F-56. The cost of El Salam Canal Phase I to be allocated to the South Hussinia Project is added into cost flow for calculation of IRR.

f. Operation and Maintenance Cost

Cost items constitute salary and wages electric power charge, repairing cost, maintenance costs to tertialy canal and pipe drain. Operation and maintenance expenditures to convey water from the Nile to South Hussinia is included into annual operation and maintenance cost as shown in Table F-57. Table F-58, F-59 and shows the detail of cost.

g. Internal Rate of Return of Land Reclamation Project

The cost flow consist of project cost, O & M cost and replacement cost. Internal economic rate of return is calculated at 13.0 percent as shown in Table F-60. The cost of El Salam Canal Phase I to be allocated to the Project in counted in the first year (1985).

h. Economic Evaluation for Agro-industries

Economic internal rate of return for the processing projects for sugarbeet, milk and tomatoes are shown in Table F-61 to F-66.

i. Economic Justification of Comprehensive Development Project

EIRR of the agricultural land reclamation project is estimate at 13 percent. The Project which the agricultural land reclamation project jointed with the houses and social infrastructure is non-feasible because of low EIRR (7.3 percent or 7.2 percent). But the comprehensive development project which three component of the agricultural land reclamation, houses and social infrastructure and agricultural processing are jointed is economically feasible in the case for low unit prices of raw material, that is, 20 LE/ton of sugarbeet and 0.2 LE/kg of milk. EIRR is estimated at over 10.0 percent as shown in Table F-67 to F-70.

j. Farm Budget

Farm budget was studied on the following cases.

1. Land Classification:

M1 Block	Land Class 2, 3
"	Land Class 4

2. Farm Size:
   5.0 feddans, 15.0 feddans and 20.0 feddans.

3. Grace Period of Loam on Land and House:
   3 years and 5 years

Tables F-71 to F-76 show cropped ares, production and number of livestock by farm size by land class.
Tables F-77 and F-78 show an annual amortization for land and houses by farm size.
Table F-79 shows an annual amortization for animal.
Tables F-80 and F-81 show an annual amortization for land, house and animal by grace plriod on 5.0 feddans farmer.
Tables F-82 to F-87 show farm budget by farm size, by land class and by grace period.

Table F-19 Exchange Rates

1. Yen and US$ in Average Value per Month

		(Buying)	(Selling)
1983	May	233.78 Yen/$	235.78 Yen/$
	June	239.20	241.20
	July	239.47	241.47
	August	243.32	245.32
	September	241.84	243.84
	October	231.98	233.98
	November	234.28	236.28
	Sep. - Nov. 1/3	236.03	239.03
	Jun. - Nov. 1/6	238.35	240.35

Source: Bank of Tokyo

2. L.E. and US$

2-1. End of 1982

	L.E. per US$	
	(Buying)	(Selling)
Official rate	0.7000	0.707
Privilege rate	0.8316832	0.840

Source: JETRO, May, 1983

2-2. SDR and US$ per Pound

	SDR	US$
March	1.3244	1.4286
April	1.3208	1.4286
May	1.3260	1,4286
June	1.3372	1.4286
July	1.3533	1.4286
August	1.3676	1.4286
September	1.3517	1.4286
October	1.3486	1.4286

Note: Market rate is the Central Bank buying rate.
SDR; Special Drawing Right.

Source: International Financial Statistics, Dec. 1983.
International Manetary Fund.

- Continued -

2-3. Report of the Lake - Manzala - South Hussinia Agricultural Project Identification Mission.
FAO/World Bank Cooperative Programme, July, 1983.

US$ 1.00 = LE 0.82 as of May 1983
(LE 1.00 = US$ 1.2195)

2-4. Bank MISR rate exchanged by F/S survey team.

		US$/LE
1983	Oct. 13	0.819
	" 20	0.818
	" 30	0.816
	Nov. 7	0.818
	" 10	0.818
	" 14	0.823
	" 20	0.819
	" 29	0.818
	Average	0.819

2-5. Staff Appraisal Report, ARG, New Land Development Project (West Nubrariya) Oct. 1980, World Bank.

US$ 1.00 = LE 0.70 as of Jan. 1980
(LE 1.00 = US$ 1.4286)

Table F-20 Price Escalation Rates

A. Foreign Cost

Year	Annual Escalation Rates (Civil Work)
1983	8.0
1984	7.5
1985	7.0
1986 - 90	6.0

Source : A.D.B.
10 Feb. 1983

B. Local Cost

Index Numbers of Wholesale Prices

Year	All Items	Annual Growth Rate (%)	Construction Materials (%)	Petroleum & Fuel (%)	Machinery & Implements (%)	Transport. Equipment (%)	Agri. Crops (%)	Foodstuffs Beverages (%)
1976	170.7							
1977	186.6	9.3	11.1	3.1	0.0	12.6	13.9	9.6
1978	214.1	14.7	20.9	6.0	22.7	11.4	20.4	7.1
1979	234.6	9.6	53.3	12.9	11.8	11.8	3.0	12.2
1980	285.2	21.6	6.9	21.2	13.3	13.3	28.4	21.6
1981	308.9	8.3	12.7	4.1	0.4	4.2	8.7	8.3

Average 1976 - 1981 12.5 1/

Note : 1/ $308.9 \div 170.7 = 1.8096$
$(1+0.125)^5 = 1.802$
$(1+0.13)^5 = 1.842$

Source: Statistical Yearbook 1952 - 1981
Aug. 1982

Table F-21 Calculation of Standard Conversion Factor

(Unit : LE 1,000)

	1978	1979	1980	1981	Average
1. Import (c.i.f., total)	2,632,191	2,686,213	3,402,000	6,187,497	3,726,975
2. Export (f.o.b., total)	679,754	1,287,813	2,132,178	2,262,982	1,590,682
3. Import Duties and Taxes	1,009,505	961,844	1,153,958	2,175,256	1,325,141
4. Export Duties and Taxes	2,142	1,119	1,030	1,182	1,368
5. Export Subsidy	-	-	-	-	-
6. (1 + 2)	3,311,945	3,974,026	5,534,178	8,450,479	5,317,657
7. (1 + 2 + 3 - 4 - 5)	4,319,308	4,934,751	6,687,106	10,624,553	6,641,430
8. SCF (6 ÷ 7)	0.766	0.805	0.827	0.795	0.800

Table F-22 Shadow Wage

1. Labor Days of 5 Feddan

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Requirement	31.7	23.7	22.6	31.8	16.9	35.0	22.8	15.3	14.8	13.3	16.1	20.0
Available	52.0	48.0	52.0	50.0	52.0	50.0	52.0	52.0	50.0	52.0	50.0	52.0

2. $\frac{31.7 + 22.6 + 16.9 + 22.8 + 15.3 + 13.3 + 20.0}{52.0} + \frac{31.8 + 35.0 + 14.8 + 16.1}{50.0} + \frac{23.7}{48.0} = 5.18$ days

3. $\frac{5.18 \text{ day} \times 5 \text{ L.E./day}}{12 \text{ month}} = 2.16$

4. $\frac{2.16 \times 1.070 \text{ (Conversion factor of Consumption)}}{5} = 0.46 \doteqdot 0.5$

5. Shadow wage = 5.0 x 0.5 = 2.5 L.E.

Table F-23 Price Structure of Paddy

—— 1983 Constant Price ——

Cost item	1995 (Economic)	
1. 1995 Export Price		
Thai 5% broken rice, fob. Bangkok us$	447	1/
2. Export price, fob. Port Said		
gradedifferential: less 10%	405	
3. L.E. equivalent (us$1.00=L.E.0.82)	335	
4. Processing and transport: 2/		
	10	
transport ex-mill /ton rice	10	
milling cost /ton rice	34	
Cooperating marketing cost /1.58 tons paddy	1	
Subtotal marketing Costs /ton rice	55	
5.Farmgate price of 1.58 tons paddy	280	
6.Farm gate price of ton paddy	182	

Source: 1/ Table F- 7

2/ Agricultural Price Management in Egypt. World Bank Staff Working Paper No. 388, April, 1980, Table 17

Table F-24 Projection of FOB Rice Price, Thai 5% Broken

(Unit: $/Ton)

Year	Current $ 1/	1981 Constant $ 2/	1982 Constant $ 3/	1983 Constant $ 4/
1979	331	342		
1980	434	413		
1981	483	483		
1982	229	298	229	
1983	327	306	307	327
1985	394	350	351	374
1990	719	425	426	454
2995	939	418	419	447

Note: 1/ and 2/ are based on the Quarterly Review of Commodity Markets and Half-Yearly Revision of Commodity Price Forecasts, Dec. 21, 1982, World Bank.
3/ and 4/ are estimated by Consultants.

Table F-25 Price Structure for Tomatoes

Cost Item	1982 Financial	1982 Economic
1. F.O.B., Cairo Airport		
(us $ / ton)	520	520
(L.E. / ton)	426	426
2. Profit; Nile Company (5%)	25	20
3. Overheads, Management fees	21	17
4. Handling cost, airport	16	21
5. Transport	25	34
6. Packing, packing materials	23	18
7. Collection, grading	10	8
8. Price of selected tomatoes, South Hussinia	306	308
9. Wastage, losses, not acceptable 30%	122	123
10. Farm gate price for delivered tomatoes (export)	184	185

Note : Based on Fayoum Agricultural Development Project Feasibility Study, Oct. 1982, Agrar-Und Hydrotechnik GMBH.

Table F-26 Financial and Economic Price Structure for Wheat

- 1983 Constant Price -

Cost Item		Financial		Economic	
1. F.O.B.,U.S.A. (us $/ton)	1/	190		190	
2. Ocean Fright (us $/ton)		+ 40		+ 40	
3. C.I.F.,Alexandria (us $/ton)		230		230	
(L.E./ton)		190		190	
4. Management fee, profit, imports	2/	+ 10		+ 14	5/
5. Port fees, fiscal stamps	3/	+ 5		+ 7	5/
6. Port handling, storage, sundries	4/	+ 30		+ 40	5/
7. Trnsport Alexandria to Cairo		+ 10		+ 14	6/
8. Transport South Hussinia to Cairo		7		10	
9. Collection, storage, commission		5		7	
10. Farm gate price per ton		233		248	

Note : 1/ Quarterly Revew of Commodity markets and Half-Yearly Revision of Commodity Price Forecasts. World Bank, Dec.,21,1982. Wheat is Canadian NO.1, Western Bed Spring in store Thunder Bay.

2/, 3/, 4/ are based on Fayoum Agricultual Development Project, Fesibility Study, Oct. 1892.

5/ Conversion facters of port and harbor charges is 1.315 based on Shadow Prices for Trade Strategy and Investment Planning in Egypt, World Bank, 1982.

6/ Conversion factor of road transport (goods) is 1.365 based on World Bank Report.

Table F- 27 Financial and Economic Price Structure for Urea (N-45) - 1983 Constant Price

Cost Item		1990 Fin.	1990 Econ.	1995 Fin.	1995 Econ.
1. Exported Price, F.O.B. Europe	(US$/ton)	283	283	294	294
2. Ocean Freight	(US$/ton)	+35	+35	+36	+36
3. Import Price, C.I.F. Alexandria	(US$/ton)	318	318	330	330
	(LE/ton)	260	260	270	270
4. Port Handling, Storage and Processing		+15	+20	+15	+20
5. Ex-godown Price		275	280	285	290
6. Transport Cost from Port to Zagazig Storage		+20	+27	+20	+27
7. Transport Cost from Storage to Farm		+ 7	+ 9	+ 7	+ 9
8. Farm Gate Price per ton		302	316	312	326

Note: Fin. : Financial
Econ.: Economic

Table F-28 Financial and Economic Price Structure for TSP - 1983 Constant Price

Cost Item	1990, 1995 Financial	Economic
1. Export Price, F.O.B. US. Gulf (US$/ton)	200	208
2. Ocean Freight (US$/ton)	+40	+40
3. Import Price, C.I.F. Alexandria (US$/ton)	248	248
4. Port Handling, Storage and Processing	+15	+20
5. Ex-godown Price	263	268
6. Transport Cost from Port to Zagazig Storage	+20	+27
7. Transport Cost from Storage Farm	+ 7	+ 9
8. Farm Gate Price per ton	290	304

Table F-29 Projection of Fertilizer (FOB Price)

(Unit: US$/ton)

		1981	1982	1983	1985	1990	1995
Urea	45%						
	Current	216	160	200	267	445	616
1981	Constant	216	159	187	213	265	275
1982	"	-	160	188	214	267	277
1983	"	-	-	200	228	283	294
T S P	46%						
	Current	161	160	172	218	327	439
1981	Constant	161	139	161	174	195	195
1982	"	-	160	185	200	224	224
1983	"	-	-	172	185	208	208
Potash	60%						
	Current	112	81	100	129	183	247
1981	Constant	112	80	94	103	110	110
1982	"	-	81	95	104	113	113
1983	"	-	-	100	110	117	117

Note: 1. Urea is FOB Europe, bagged.
2. TSP is FOB US. Gulf.
3. Muriate of Potash in FOB Vancouver.

Source : Quarterly Review of Commodity Markets and Half-Yearly Revision of Commodity Price Forecasts, World Bank, Dec. 1982.

Table F-30 Net Production Value without Project (Economic)

—— L.E / feddan and 1,000 L.E. ——

	Paddy	Cotton	Wheat	Vegetables	
Yield (t/fed)	1.22	0.46	0.67	3.36	
Unit Price (L.E./ton)	222	659	203	70	
G.P.V.(L.E./fed)	271	303	136	235	
Production Cost (L.E./ha)					
Seed	18	51	22	2	
Fertilizers	17	20	9	20	
Agri.Chemicals	-	4	-	10	
Fuel	3	2	2	2	
Agri.machinery	11	8	10	8	
Labor	126	98	49	78	
Miscellaneous	17	18	9	12	
Sub-total	192	201	92	132	
N.P.V.(L.E./fed)	79	102	44	103	
					Total
Cropped area (ha)	1,600	800	800	200	3,400
(fd)	3,810	1,900	1,900	480	8,090
Total NPV (1,000L.E)	300	194	84	49	627

Table F-31 Unit Price of Farm Machines

	Cif. Alexandria (LE)	Transportation Cost from Alex. to Project Area (LE)	Value at Project Area (LE)
Tractor 90 P.S.	20,500	80	20,580
" 40 P.S.	6,560	80	6,640
Chisel Plow	980	10	990
Disk Harrow	1,310	10	1,320
Puddler	2,460	15	2,475
Transplanter	4,870	70	4,940
Combine	28,700	200	28,900
Planter	3,110	20	3,130
Cultivator	770	5	775
Ridger	1,480	10	1,490
Sprayer (Power)	2,300	15	2,315
Subsoiler	1,260	10	1,270
Bean Harvester	9,510	150	9,660
Beet Harvester	910	5	915
Broadcaster	1,230	10	1,240
Trailor	3,120	15	3,135

Table F-32 Fixed Cost of Farm Machines

	Purchase Price (LE)	Annual Depreciation (LE)	Annual Repair Cost (LE)	Annual Fixed Cost Per set (LE)
Tractor 90 P.S.	20,580	3,700	2,400	6,100
40 P.S.	6,640	1,200	780	1,980
Chisel Plow	990	90	40	130
Disk Harrow	1,320	120	40	160
Puddler	2,475	220	70	290
Transplanter	4,940	640	400	1,040
Combine	28,900	5,200	2,890	8,090
Planter	3,130	470	300	770
Cultivator	775	70	40	110
Ridger	1,490	130	50	180
Sprayer (Power)	2,315	260	120	380
Subsoiler	1,270	110	40	150
Bean Harvester	9,660	1,740	480	2,220
Beet Harvester	915	160	90	250
Broadcaster	1,240	110	60	170
Trailor	3,135	700	190	890

Table F-33 Fixed Cost of Farm Machines - Economic

	Purchase Price (LE)	Annual Depreciation (LE)	Annual Repair Cost (LE)	Annual Fixed Cost Per set (LE)
Tractor 90 P.S.	23,850	4,290	2,780	7,070
40 P.S.	7,695	1,390	900	2,290
Chisel Plow	1,150	105	45	150
Disk Harrow	1,530	140	45	185
Puddler	2,870	255	80	335
Transplanter	5,725	740	460	1,200
Combine	33,495	6,025	3,350	9,375
Planter	3,630	545	350	895
Cultivator	900	80	45	125
Ridger	1,725	150	60	210
Sprayer (Power)	2,685	300	140	440
Subsoilor	1,470	130	45	175
Bean-harvester	11,195	2,015	555	2,570
Beet-harvester	1,060	185	105	290
Broadcaster	1,440	130	70	200
Trailor	3,635	810	220	1,030

Note: Purchase Price = Financial x 1.159 (conversion factor of agricultural machinery)

Table F-34 Fixed Cost and Wage of Operator by Crops - Financial

Farm Machines	Fixed Cost Per Set (LE)	Rice		Soybean		Sugarbeet		Tomato		Onion	
		No. of Machine	Fixed Cost ('000LE)	No. of Machine	Fixed Cost ('000LE)	No. of Machine	Fixed Cost ('000LE)	No. of Machine	Fixed Cost ('000LE)	No. of Machine	Fixed Cost ('000LE)
Tractor 90 P.S.	6,100		236		236		236		172		164
40 P.S.	1,980										
Chisel Plow	130	19	2	21	3	20	3	4	1	22	3
Disk Harrow	160	20	3	22	4	20	3	4	1	22	4
Puddler	290	29	8								
Transplanter	1,040	76	79								
Combine	8,090	24	194								
Planter	770			35	27	33	26				
Sprayer (Power)	380					13	5				
Subsoiler	150	13	2	14	2	14	2	3	1	14	2
Bean-harvester	2,220			16	36						
Beet-harvester	250					72	18				
Broadcaster	170	6	1								
Trailor	890					40	36				
Total			528		308		329		175		173
Cropped Area (feddan)			18,580		18,580		18,580		13,580		13,000
Fixed Cost per feddan (LE)			28		17		18		13		13
Fixed Cost include unknown factor (x 1.2 LE)			34		20		22		16		16
Wage of Operator (LE)			8		8		8		8		8
Total Cost per feddan (LE)			42		30		30		24		24

Table F-35 Fixed Cost and Wage of Operator by Crops - Economic

Farm Machines	Fixed Cost Per Set (LE)	Rice		Soybean		Sugarbeet		Tomato		Onion	
		No. of Machine	Fixed Cost ('000LE)	No. of Machine	Fixed Cost ('000LE)	No. of Machine	Fixed Cost ('000LE)	No. of Machine	Fixed Cost ('000LE)	No. of Machine	Fixed Cost ('000LE)
Tractor 90 P.S.	7,070		274		274		274		200		190
40 P.S.	2,290										
Chisel Plow	150	19	3	21	3	20	3	4	1	22	3
Disk Harrow	185	20	4	22	4	20	4	4	1	22	4
Puddler	335	29	10								
Transplanter	1,200	76	91								
Combine	9,375	24	225								
Planter	895			35	27	33	26				
Sprayer (Power)	440					13	5				
Subsoiler	175	13	2	14	2	14	2	3	1	14	2
Bean-harvester	2,570			17	36						
Beet-harvester	290					72	21				
Broadcaster	200	6									
Trailor	1,030					40	41				
Total			609		346		376		203		199
Cropped Area (feddan)			18,580		18,580		18,580		13,580		13,000
Fixed Cost per feddan (LE)			33		19		20		15		15
Fixed Cost include unknown factor (x 1.2 LE)			40		23		24		18		18
Wage of Operator (LE)			4		4		4		4		4
Total Cost per feddan (LE)			44		27		28		22		22

Table F-36 Net Production Value with Project - Economic

(Unit: L.E./Feddan)

	Paddy	Soybean	Sugarbeet	Tomato	Onion	Cauliflower	Cabbage
Yield (t/fed)	3.0	1.2	25	17 1/	10	4.9	20
Unit Price (L.E./ton)	182	228	30	70	80	120	60
G.P.V. (L.E./fed)	546	274	750	1,190	800	588	1,200
Production Cost (L.E./ha)							
Seed	1.2	10.4	48.2	10.3	12.1	2.1	2.1
Fertilizers	61.5	50.0	78.2	133.6	137.7	83.1	90.6
Agri. chemicals	16.6	-	40.9	83.9	69.9	12.5	38.0
Fuel	15	13.2	21.6	6.7	6.7	6.7	6.7
Agri. machinery	44	27	28	22	22	22	22
Labor	63	40	52	280	100	200	200
Miscellaneous	22	14	56	53	72	32	41
Sub-total	223	154	325	590	420	358	400
N.P.V. (L.E./fed)	323	120	425	600	380	230	800

Note: 1/ ... About 15 % is assumed as loss before hauling to factory.

Table F-37 Net Production Value with Project - Financial

(Unit: L.E./Feddan)

	Paddy	Soybean	Sugarbeet	Tomato	Onion	Cauliflower	Cabbage
Yield(ton/fed)	3.0	1.2	25	17	10	4.9	20
Unit Price (LE/ton)	105	230	30	70	80	120	60
G.I. (LE/Feddan)	315	276	750	1,190	800	588	1,200
Production Cost(LE/Fd)							
Seed	1.2	9.0	42.0	9.0	10.5	1.8	1.8
Fertilizer	58.8	47.7	74.7	127.6	131.6	79.3	92.3
Agri-Chemicals	8.3	-	20.8	42.5	35.4	5.4	18.4
Fuel	2.3	3.3	5.4	2.2	2.2	2.2	2.2
Agri-Machinery	42	30	30	24	24	24	24
Labor	126	80	110	560	200	240	240
Total Cost							
excl. Labor Cost	113	90	173	205	204	113	139
incl. Labor Cost	239	170	283	765	404	353	379
Farm Income	202	186	577	985	596	475	1,061
Net Farm Income	76	106	467	425	396	235	821

Table F-38 Profitability of Friesian (per Feeding Unit)
- Financial -

Gross Income

	Unit	Yield (kg)	Production (kg)	Unit Price (LE/ton)	Gross Income (LE)
Milk	1	3,655	3,655	300	1,096.5
Cull	0.14	500	70	500	35.00
Bull calf	0.42	55	23	1,800	41.00
Heifer	0.14	300	42	1,300	55.00
Manure	-	-	9,000	3	27.00
Total					1,254.5

Production Cost

Berseem	9.1 t x 12 LE/ton	109.20 LE
Rice straw	1.3 x 25	32.50
Berseem hay	0.6 x 80	48.00
Maize leaves	3.3 x 12	39.60
Sorghum straw	3.4 x 20	68.00
Concentrate	1.6 x 40	64.00
Labor	0.2 x 5 LE/day x 365	365.00
Medicine		4.00
Others		73.00
Total		803.3

Net Income 451.2 LE

≒ 451.0 LE

Table F-39 Profitability of Baladi Cow (Per Feeding Unit)
- Financial -

Gross Income

	Unit	Yield (kg)	Production (kg)	Unit Price (LE/ton)	Gross Income (LE)
Milk	1	900	900	300	270.00
Cull	0.14	380	53	500	26.50
Bull Calf	0.37	350	130	1,800	234.00
Heifer	0.30	200	60	1,300	78.00
Manure			8,500	3	25.50
Total					634.00

Production Cost

Berseem	6.3 t x 12 LE/ton	75.6 LE
Rice straw	1.3 x 25	32.5
Berseem Hay	0.2 x 80	16.0
Maize Leaves	1.4 x 12	16.8
Sorghum Straw	0.6 x 20	12.0
Labor	0.1 x 5 LE/day x 365	182.5
Medicine		3.0
Others		34.0
Total		372.4

Net Income 261.6 LE

≑ 262.0 LE

Table F-40 Profilability of Sheep (per Feeding Unit)
- Financial -

Gross Income		
Farm gate price	55.0 LE/head	6 month old
Manure	5.0	
Wool	1.0	1 kg x 1 ^{LE} = 1 LE
Total	61.0	
Production Cost		
Forage	13.3 LE/head	
Concentrate	6.7	
Labor	6.0	
Veterinary care	7.0	
Others	2.0	
Total	35.0	
Net Income	26.0 LE/head	

Table F-41 Profitability of Friesian(per Feeding Unit)
- Economic -

Gross Income

	Unit	Yield (kg)	Production (kg)	Unit Price (LE/ton)	Gross Income (LE)
Milk	1	3,655	3,655	290	1,060.00
Cull	0.14	500	70	500	35.00
Bull calf	0.42	55	23	1,800	41.00
Heifer	0.14	300	42	1,300	55.00
Manure	-	-	9,000	3	27.00
Total					1,191.00

Production Cost

Berseem	9.1 t x 14 LE/ton	127.4 LE
Rice straw	1.3 x 28	36.4
Berseem hay	0.6 x 88	52.8
Maize leaves	3.3 x 14	46.2
Sorghum straw	3.4 x 23	78.2
Concentrate	1.6 x 72	115.2
Labor	0.2 x 2.5 LE/day x 365	182.5
Medicine		4.0
Others		64.3
Total		707.0

Net Income 484.00 LE

Note: Conversion factor of concentrate is applied by 1.797 which is factor of maze imported.
Other fodder's conversion factor is 1.085.

Table F-42 Profitability of Baladi Cow(per Feeding Unit)
- Economic -

Gross Income

	Unit	Yield (kg)	Production (kg)	Unit Price (LE/ton)	Gross Income (LE)
Milk	1	900	900	290	261.00
Cull	0.14	380	53	500	26.50
Bull Calf	0.37	350	130	1,800	234.00
Heifer	0.30	200	60	1,300	78.00
Manure			8,500	3	25.50
Total					625.00

Production Cost

Berseem	6.3 t	x 14 LE/ton	88.2 LE
Rice Straw	1.3	x 28	36.4
Berseem Hay	0.2	x 88	17.6
Maize Leaves	1.4	x 14	19.6
Sorghum Straw	0.6	x 23	13.8
Labor	0.1 x 2.5 LE/day x 365		91.4
Medicine			3.0
Others			27.0
Total			297.0

Net Income 328.00 LE

Note: Conversion factor of animal fodder is 1.085.
Conversion factor of medicines is 0.939.

Table F-43 Profitability of Sheep (per Feeding Unit)
- Economic -

Gross Income		
Farm gate price	55.0 LE/head	6 month old
Manure	5.0	
Wool	1.0	1 kg x 1 ^{LE} = 1 LE
Total	61.0	
Production Cost		
Forage	14.4 LE/head	
Concentrate	12.0	
Labor	3.0	
Veterinary care	7.0	
Others	2.0	
Total	38.4	
Net Income	22.6 LE/head ≒	23 LE/head

Table F-44 Gross Production Quantities

(Unit: tons)

Year	Rice		Soybean		Sugarbeet		Tomato		Onion		Cauliflower		Cabbage	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
1990	15,199	15,199	-	-	-	-	-	-	-	-	-	-	-	-
1991	41,101	41,101	-	-	-	-	-	-	-	-	-	-	-	-
1992	61,242	61,242	567	550	12,960	12,701	-	-	2,552	2,501	293	287	1,355	1,328
1993	44,410	44,410	7,297	7,078	166,564	163,233	-	-	32,482	31,832	3,735	3,660	17,408	17,060
1994	39,400	39,400	11,891	8,624	267,002	261,662	-	-	49,026	48,046	5,678	5,564	28,157	27,594
1995	37,116	37,116	15,566	15,098	329,682	323,088	-	-	65,575	64,264	8,063	7,902	37,303	36,557
1996	40,278	40,278	16,484	15,990	355,850	348,733	-	-	75,276	73,770	9,825	8,377	41,536	40,705
1997	42,739	42,739	17,752	17,219	377,149	369,606	4,872	4,775	87,411	85,751	10,942	10,723	43,986	43,106
1998	45,940	45,940	18,243	17,696	409,177	401,033	35,864	35,147	102,443	100,394	12,082	11,840	47,740	46,785
1999	50,063	50,063	20,461	19,847	441,575	432,744	55,630	54,517	115,542	113,231	12,452	12,203	49,200	48,216
2000	53,315	53,315	21,659	21,109	458,115	448,953	91,760	87,861	124,057	121,576	13,126	12,863	51,864	50,827
2001	54,746	54,746	22,295	21,630	464,475	455,210	115,820	113,504	127,916	125,358	13,525	13,255	53,436	52,367
2002	55,740	55,740	22,295	21,630	464,475	455,210	143,358	140,491	130,150	127,400	14,000	13,720	55,320	54,490
2003	55,740	55,740	22,295	21,630	464,475	455,210	152,230	149,185	130,150	127,400	14,000	13,720	55,320	54,490
2004	55,740	55,740	22,295	21,630	464,475	455,210	157,260	154,115	130,150	127,400	14,000	13,720	55,320	54,490
2005	55,740	55,740	22,295	21,630	464,475	455,210	160,020	156,800	130,150	127,400	14,000	13,720	55,320	54,490

Note: A; Cropped area includes the spaces where tractor can not plow at edge of field.

B; Exclude the spaces such as A.
This is net cropping area or actual area to be applied for economic evaluation.

Table F-45 Gross Production Value - Economic - (1,000 E.L.)

Year	Rice			Soybean			Sugabeet			Tomato		
	Q'ty (ton)	Unit Price (LE/t)	Value	Q'ty (ton)	Price (LE/t)	Value	Q'ty (ton)	Price (LE/t)	Value	Q'ty (ton)	Price (LE/t)	Value
1990	15,199	182	2,752	-	228	-	-	30	-	-	70	-
1991	41,101		7,480	-		-	-		-	-		-
1992	61,242		11,146	550		125	12,701		381	-		-
1993	44,410		8,083	7,078		1,614	163,233		4,897	-		-
1994	39,400		7,171	8,624		1,966	261,662		7,850	-		-
1995	37,116		6,755	15,098		3,442	323,088		9,693	-		-
1996	40,278		7,331	15,990		3,646	348,733		10,462	-		-
1997	42,739		7,778	17,219		3,926	369,606		11,088	4,775		334
1998	45,940		8,361	17,696		4,035	401,033		12,031	35,147		2,460
1999	50,063		9,111	19,847		4,525	432,744		12,982	54,517		3,816
2000	53,315		9,703	21,109		4,813	448,953		13,469	87,861		6,150
2001	54,746		9,964	21,630		4,932	455,210		13,656	113,504		7,945
2002	55,740		10,145	21,630		4,932	455,210		13,656	140,491		9,834
2003	55,740		10,145	21,630		4,932	455,210		13,656	149,185		10,443
2004	55,740		10,145	21,630		4,932	455,210		13,656	154,115		10,788
2005	55,740		10,145	21,630		4,932	455,210		13,656	156,800		10,976

continued (Economic GPV)

Year	Onion			Cauliflower			Cabbage			Gross Production Value
	Q'ty (ton)	Price (LE/t)	Value	Q'ty (ton)	Price (LE/t)	Value	Q'ty (ton)	Price (LE/t)	Value	
1990	-	80	-	-	120	-	-	60	-	2,752
1991	-		-	-		-	-		-	7,480
1992	2,501		200	287		34	1,328		80	11,966
1993	31,832		2,547	3,660		439	17,060		1,024	18,604
1994	48,046		3,844	5,564		668	27,594		1,656	23,155
1995	64,264		5,141	7,902		948	36,557		2,193	28,172
1996	73,770		5,901	8,377		1,005	40,705		2,442	30,787
1997	85,751		6,860	10,723		1,287	43,106		2,586	33,859
1998	100,394		8,032	11,840		1,421	46,785		2,807	39,147
1999	113,231		9,058	12,203		1,464	48,216		2,893	43,849
2000	121,576		9,726	12,863		1,544	50,827		3,050	48,455
2001	125,358		10,029	13,255		1,591	52,367		3,142	51,259
2002	127,400		10,192	13,720		1,646	54,490		3,269	53,674
2003	127,400		10,192	13,720		1,646	54,490		3,269	54,283
2004	127,400		10,192	13,720		1,646	54,490		3,269	54,628
2005	127,400		10,192	13,720		1,646	54,490		3,269	54,816

Table F-46 Gross Production Value - Financial - (1,000 E.L.)

Year	Q'ty (ton)	Price (LE/t)	Value	Q'ty (ton)	Price (LE/t)	Value	Sugar-beet	Tomato	Onion	Cauli-flower	Cabbage	G.P.V.
1990	15,199	105	1,596	-	230	-	-	-	-	-	-	1,596
1991	41,101		4,316	-		-	-	-	-	-	-	4,316
1992	61,242		6,430	550		127	381	-	200	34	80	7,252
1993	44,410		4,663	7,078		1,628	4,897	-	2,547	439	1,024	15,198
1994	39,400		4,137	8,624		1,984	7,850	-	3,844	668	1,656	20,139
1995	37,116		3,897	15,098		3,473	9,693	-	5,141	948	2,193	25,345
1996	40,278		4,229	15,990		3,678	10,462	-	5,901	1,005	2,442	27,717
1997	42,739		4,488	17,219		3,960	11,088	334	6,860	1,287	2,586	30,603
1998	45,940		4,824	17,696		4,070	12,031	2,460	8,032	1,421	2,807	35,645
1999	50,063		5,257	19,847		4,565	12,982	3,816	9,058	1,464	2,893	40,035
2000	53,315		5,598	21,109		4,855	13,469	6,150	9,726	1,544	3,050	44,392
2001	54,746		5,748	21,630		4,975	13,656	7,945	10,029	1,591	3,142	47,086
2002	55,740		5,853	21,630		4,975	13,656	9,834	10,192	1,646	3,269	49,325
2003	55,740		5,853	21,630		4,975	13,656	10,443	10,192	1,646	3,269	50,034
2004	55,740		5,853	21,630		4,975	13,656	10,788	10,192	1,646	3,269	50,379
2005	55,740		5,853	21,630		4,975	13,656	10,976	10,192	1,646	3,269	50,567

Table F-47 NPV of Livestock with the Project - Million L.E.
- Economic -

Fattening Cattle

Year	Friesian Head	Friesian NPV/ head (L.E.)	Friesian Total NPV (10^6L.E.)	Baladi Head	Baladi NPV/ head (L.E.)	Baladi Total NPV (10^6L.E.)	Total NPV (10^6L.E.)
1990	870	484	0.42	1,780	328	0.58	1.00
1991	1,480		0.72	3,050		1.00	1.72
1992	2,470		1.20	5,080		1.67	2.87
1993	3,200		1.55	6,590		2.16	3.71
1994	3,490		1.69	7,180		2.36	4.05
1995	4,040		1.96	8,300		2.72	4.68
1996	4,480		2.17	9,200		3.02	5.19
1997	4,760		2.30	9,790		3.21	5.51
1998	4,760		2.30	9,790		3.21	5.51

Milking Cows

Year	Friesian Head	Friesian NPV/ head (L.E.)	Friesian Total NPV (10^6L.E.)	Baladi Head	Baladi NPV/ head (L.E.)	Baladi Total NPV (10^6L.E.)	Total NPV (10^6L.E.)
1990	2,060	484	1.00	4,800	328	1.57	2.57
1991	3,530		1.71	8,240		2.70	4.41
1992	5,890		2.85	13,730		4.50	7.35
1993	7,630		3.69	17,800		5.84	9.53
1994	8,320		4.03	19,410		6.37	10.40
1995	9,620		4.66	22,440		7.36	12.02
1996	10,660		5.16	24,870		8.16	13.32
1997	11,340		5.49	26,460		8.68	14.17
1998	11,340		5.49	26,460		8.68	14.17

Table F-48 NPV of Livestock with the Project - Million L.E. - Economic - (cont'd)

Sheep

Year	Head	NPV/ head (L.E.)	Total NPV (10^6L.E.)
1990	2,770	23	0.06
1991	7,640		0.18
1992	9,830		0.23
1993	8,670		0.20
1994	7,380		0.17
1995	6,850		0.16
1996	7,850		0.18
1997	8,690		0.20
1998	9,360		0.22
1999	9,610		0.22
2000	9,860		0.23
2001	10,000		0.23
2002	10,180		0.23

N.P.V.

Year	Fattening Cattle	Milking Cows	Sheep	Total
			10^6L.E.	
1990	1.00	2.57	0.06	3.63
1991	1.72	4.41	0.18	6.31
1992	2.87	7.35	0.23	10.45
1993	3.71	9.53	0.20	13.44
1994	4.05	10.40	0.17	14.62
1995	4.68	12.02	0.16	16.86
1996	5.19	13.32	0.18	18.69
1997	5.51	14.17	0.20	19.88
1998	5.51	14.17	0.22	19.90
1999	5.51	14.17	0.22	19.90
2000	5.51	14.17	0.23	19.91
2001	5.51	14.17	0.23	19.91
2002	5.51	14.17	0.23	19.91

Table F-49 NPV of Livestock with the Project - Million L.E.
- Financial -

Fattening Cattle

Year	Friesian Head	Friesian NPV/ head (L.E.)	Friesian Total NPV (10^6L.E.)	Baladi Head	Baladi NPV/ head (L.E.)	Baladi Total NPV (10^6L.E.)	Total NPV (10^6L.E.)
1990	870	451	0.39	1,780	262	0.47	0.86
1991	1,480		0.67	3,050		0.80	1.47
1992	2,470		1.11	5,080		1.33	2.44
1993	3,200		1.44	6,590		1.73	3.17
1994	3,490		1.57	7,180		1.88	3.45
1995	4,040		1.82	8,300		2.17	3.99
1996	4,480		2.02	9,200		2.41	4.43
1997	4,760		2.15	9,790		2.56	4.71
1998	4,760		2.15	9,790		2.56	4.71

Milking Cows

Year	Friesian Head	Friesian NPV/ head (L.E.)	Friesian Total NPV (10^6L.E.)	Baladi Head	Baladi NPV/ head (L.E.)	Baladi Total NPV (10^6L.E.)	Total NPV (10^6L.E.)
1990	2,060	451	0.93	4,800	262	1.26	2.19
1991	3,530		1.59	8,240		2.16	3.75
1992	5,890		2.66	13,730		3.60	6.26
1993	7,630		3.44	17,800		4.66	8.10
1994	8,320		3.75	19,410		5.09	8.84
1995	9,620		4.33	22,440		5.88	10.21
1996	10,660		4.81	24,870		6.52	11.33
1997	11,340		5.11	26,460		6.93	12.04
1998	11,340		5.11	26,460		6.93	12.04

Table F-50 NPV of Livestock with the Project - Million L.E.
- Financial - (cont'd)

Sheep

Year	Head	NPV/head (L.E.)	Total NPV (10^6 L.E.)
1990	2,770	26	0.07
1991	7,640		0.20
1992	9,830		0.26
1993	8,670		0.23
1994	7,380		0.19
1995	6,850		0.18
1996	7,850		0.20
1997	8,690		0.23
1998	9,360		0.24

N.P.V.

Year	Fattening Cattle	Milking Cows	Sheep	Total
		10^6 L.E.		
1990	0.86	2.19	0.07	3.12
1991	1.47	3.75	0.20	5.42
1992	2.44	6.26	0.26	8.96
1993	3.17	8.10	0.23	11.50
1994	3.45	8.84	0.19	12.48
1995	3.99	10.21	0.18	14.38
1996	4.43	11.33	0.20	15.96
1997	4.71	12.04	0.23	16.98
1998	4.71	12.04	0.24	19.59

Table F-51 N.P.V. with the Project - Economic -

(Unit: Million L.E.)

	Crop			Livestock	Total
	G.P.V.	P.C.	N.P.V.	N.P.V.	N.P.V.
1990	2.75	1.98	0.77	3.63	4.40
1991	7.48	4.85	2.63	6.31	8.94
1992	11.97	7.31	4.66	10.45	15.11
1993	18.60	11.74	6.86	13.44	20.30
1994	23.16	14.75	8.41	14.62	23.03
1995	28.17	17.46	10.71	16.86	27.57
1996	30.79	17.87	12.92	18.69	31.61
1997	33.86	19.94	13.92	19.88	33.80
1998	39.15	21.18	17.97	19.90	37.87
1999	43.85	22.28	21.57	19.90	41.47
2000	48.46	23.41	25.05	19.91	44.96
2001	51.26	24.12	27.14	19.91	47.05
2002	53.67	24.95	28.72	19.91	48.63
2003	54.28	25.10	29.18	19.91	49.09
2004	54.63	25.18	29.45	19.91	49.36
2005	54.82	25.18	29.64	19.91	49.55

Table F-52 N.P.V. with the Project - Financial -

(Unit: Million L.E.)

	Crop			Livestock	Total
	G.P.V.	P.C.	N.P.V.	N.P.V.	N.P.V.
1990	1.60	2.17	-0.57	3.59	3.02
1991	4.32	5.19	-0.87	6.22	5.35
1992	7.25	7.76	-0.51	10.29	9.78
1993	15.20	11.58	3.62	13.25	16.87
1994	20.14	14.36	5.78	14.38	20.16
1995	25.35	16.88	8.47	16.59	25.06
1996	27.72	17.96	9.76	18.39	28.15
1997	30.60	19.53	11.07	19.58	30.65
1998	35.65	21.14	14.51	19.59	34.10
1999	40.04	22.42	17.62	19.59	37.21
2000	44.39	23.97	20.42	19.59	40.01
2001	47.09	24.89	22.20	19.59	41.79
2002	49.33	25.97	23.36	19.59	42.95
2003	50.03	26.16	23.87	19.59	43.46
2004	50.38	26.27	24.11	19.59	43.70
2005	50.57	26.27	24.30	19.59	43.89

Table F-53 Incremental N.P.V.

(Unit: Million L.E.)

	N.P.V. with the Project	N.P.V. without the Project	In cremental N. P. V.
1990	4.40	0.63	3.77
1991	8.94	0.64	8.30
1992	15.11	0.64	14.47
1993	20.30	0.65	20.95
1994	23.03	0.66	23.69
1995	27.57	0.66	28.23
1996	31.61	0.67	32.28
1997	33.80	0.68	33.12
1998	37.87	0.68	37.19
1999	41.47	0.69	40.78
2000	44.96	0.70	44.26
2001	47.05	0.70	46.35
2002	48.63	0.71	47.92
2003	49.09	0.71	48.38
2004	49.36	0.72	48.64
2005	49.55	0.73	48.82

Table F-54 Project Economic Cost for Land Reclamation, Stage I

(Unit: 1,000 LE)

		Basic Cost	Physical Contin.	Total Cost	L.C. x 0.8 + F.C.
1985	F.C.	760	76	836	836
	L.C.	3,820	382	4,202	3,362
	Total	4,580	458	5,038	4,198
1986	F.C.	557	56	613	613
	L.C.	1,180	118	1,298	1,038
	Total	1,737	174	1,911	1,651
1987	F.C.	6,676	668	7,344	7,344
	L.C.	10,380	1,038	11,418	9,134
	Total	17,056	1,706	18,762	16,478
1988	F.C.	12,250	1,225	13,475	13,475
	L.C.	13,996	1,400	15,396	12,317
	Total	26,246	2,625	28,871	25,792
1989	F.C.	12,334	1,233	13,567	13,567
	L.C.	13,556	1,356	14,912	11,930
	Total	25,890	2,589	28,479	25,497
1990	F.C.	6,848	685	7,530	7,530
	L.C.	7,345	735	8,080	6,464
	Total	14,190	1,420	15,610	13,994
1991	F.C.	2,667	267	2,934	2,934
	L.C.	2,736	274	3,010	2,408
	Total	5,403	541	5,944	5,342
Total	F.C.	42,089	4,210	46,299	46,299
	L.C.	53,013	5,303	58,316	46,653
	Total	95,102	9,513	104,615	92,952

Table F-55 Project Economic Cost for Land Reclamation, Stage II

(Unit: 1,000 L.E.)

		Basic Cost	Physical Contin.	Total Cost	L.C. x 0.8 + F.C.
1991	F.C.	445	44	489	489
	L.C.	1,853	185	2,038	1,630
	Total	2,298	227	2,527	2,119
1992	F.C.	4,062	406	4,468	4,468
	L.C.	16,892	1,689	18,581	14,865
	Total	20,954	2,095	23,049	19,333
1993	F.C.	4,721	472	5,193	5,193
	L.C.	19,633	1,963	21,596	17,277
	Total	24,354	2,435	26,789	22,470
1994	F.C.	2,797	280	3,077	3,077
	L.C.	11,635	1,164	12,799	10,239
	Total	14,432	1,444	15,876	13,316
1995	F.C.	2,419	242	2,661	2,661
	L.C.	10,063	1,006	11,069	8,855
	Total	12,482	1,248	13,730	11,516
1996	F.C.	873	87	960	960
	L.C.	3,633	363	3,996	3,197
	Total	4,506	450	4,956	4,157
Total	F.C.	15,317	1,531	16,848	16,848
	L.C.	63,709	6,370	70,079	56,063
	Total	79,026	7,901	86,927	72,911

Table F-56 Project Economic Cost for Land Reclamation, Stage I + Stage II

(Unit: Million L.E.)

	Stage I	Stage II	Total
1985	4.20	-	4.20
1986	1.65	-	1.65
1987	16.48	-	16.48
1988	25.79	-	25.79
1989	25.50	-	25.50
1990	13.99	-	13.99
1991	5.34	2.12	7.46
1992	-	19.33	19.33
1993	-	22.47	22.47
1994	-	13.32	13.32
1995	-	11.52	11.52
1996	-	4.16	4.16
Total	92.95	72.91	165.86

Table F-57 Operation and Maintenance Total Cost

(Unit: Million L.E.)

Project Year	South Hussinia	El Salam Canal 1/	Total
1(1985)	-	-	-
2(1986)	-	-	-
3(1987)	-	-	-
4(1988)	0.38	0.27	0.65
5(1989)	0.75	0.71	1.46
6(1990)	1.32	1.00	2.32
7(1991)	2.26	1.51	3.77
8(1992)	2.86	1.54	4.40
9(1993)	2.35	1.56	3.91
10(1994)	2.08	1.56	3.64
11(1995)	1.91	1.59	3.50
12(1996)	1.91	1.59	3.50
13(1997)	1.91	1.61	3.50
14(1998)	1.91	1.63	3.50
15(1999)	1.91	1.66	3.50
16(2000)	1.91	1.68	3.50
17(2001)	1.91	1.71	3.50
18(2002)	1.91	1.49	3.50
19(2003)	1.91	1.51	3.50
20(2004)	1.91	1.51	3.50

Note : 1/ South Hussinia Agricultural Project Identification Missior Report, July, 1983, Annex 1, Table 6.

Table F-58 Operation and Maintenance Cost in 1995

- Economic -

1. Salary and Wages

1) Government Office Staff

	No. Staff	No. Office	Salary/ Month (L.E.)	Total/ Year (L.E.)
(i) Irrigation Sustem Office	5	2	200	24,000
(ii) Field Offices				
a) Water Management Technologist	10	3	150	54,000
b) Gate Keeper	10	3	100	36,000
c) Ditch Tender	60	3	100	18,000 1/
d) Pumping Station	20		100	20,000 2/
Note : 1/, 2/... 10 month/year				
			Sub-total	152,000

2) Labour's Cost (Main Canals, Secondary Canals)
L = 618 km Unit Cost 0.5 L.E./m

	Sub-total	309,000
	Total	461,000

2. Electric Power Charge

1) Drainge Pumping Station
260 KWH x 5 x 5, 340 hr = 6,942 KWH x 10^3
6,942 KWH x 10^3 x 0.083 L.E./KWH = 576 L.E. x 10^3 576,000

2) Booster Pumping Station
5 x 75 KW + 3 x 30 KW + 3 x 45 KW + 5 x 75 KW = 975 KW
975 KW x 2,380 hr = 2,320.5 KWH x 10^3
2,320.5 KWH x 10^3 x 0.083 L.E./KWH = 192,000 192,000

3) Office Equipment and Facilities (400 KW) 79,000

	Sub-total	847,000

3. Repairing Cost 228,000

4. Labour's Cost Terminal Facilities
Tertialy Cannal (2,340 KW) 206,000
Pipe Drain 167,000

5, Grand Total 1,909,000

34.2 L.E./ Fed.

(81.5 L.E./hr)

Note : Conversion Factor for Elecricity is 3.321.

Table F-59 Annual Operation and Maintenance Cost in the South Hussinia Project

(1,000 L.E.)

	1988	1989	1990	1991	1992	1993	1994	1995
1. Salary & Wages								
1) Offices Staff								
(i) Irrig. System Office	12	24	24	24	24	24	24	24
(ii) Field Office		43	86	128	128	128	128	128
Sub-total	12	67	110	152	152	152	152	152
			(87)	(213)	(309)	(309)	(309)	(309)
2) Labour Cost	-	-	174	426	618	618	618	618
			(197)	(365)	(461)	(461)	(461)	(461)
Total	12	67	284	578	770	770	770	770
	(304)	(623)	(639)	(771)	(847)	(847)	(847)	(847)
2. Electric Power Change	103	221	237	288	311	311	311	311
3. Reparing Cost	62	62	94	174	228	228	228	228
4. Labour Cost								
			(47)	(115)	(167)	(188)	(199)	(206)
Tertial Cannal	-	-	94	230	334	380	399	413
			(342)	(839)	(1,152)	(536)	(206)	-
Open drain	-	-	684	1,679	2,303	1,072	412	-
					15	186	277	334
Pihe drain	-	-	-	-	(7)	(93)	(139)	(167)
5. Total								
Financial	177	350	1,393	2,949	3,961	2,947	2,397	2,056
Economic	378	752	1,319	2,264	2,862	2,353	2,080	1,909

Note : Figures in the Parenthesis show economic cost.

Table F-60 EIRR of Agricultural Land Reclamation Project

(unit : million L.E.)

Project Year	Project Cost	O & M Cost	Replace. Cost	Total Cost	Increment. N.P.R.	Benefits	Present Worth Value 12%	Present Worth Value 13%
1 (1985)	29.43	-	-	29.43	-	-29.43	-26.28	-26.05
2 (1986)	1.65	-	-	1.65	-	- 1.65	- 1.32	- 1.29
3 (1987)	16.48	-	-	16.48	-	-16.48	-11.73	-11.43
4 (1988)	25.79	0.65	-	26.44	-	-26.44	-16.80	-16.22
5 (1989)	25.50	1.46	-	26.96	-	-26.96	-15.30	-14.63
6 (1990)	13.99	2.32	-	16.31	3.77	-12.54	- 6.35	- 6.02
7 (1991)	7.46	3.77	-	11.23	8.30	- 2.93	- 1.33	- 1.25
8 (1992)	19.33	4.40	-	23.73	14.47	- 9.26	- 3.74	- 3.48
9 (1993)	22.47	3.91	-	26.38	20.95	- 5.43	- 1.95	- 1.80
10 (1994)	13.32	3.64	-	16.96	23.69	6.73	2.16	1.98
11 (1995)	11.52	3.50	-	15.02	28.23	13.21	3.79	3.44
12 (1996)	4.16	3.50	-	7.66	32.28	24.62	6.31	5.68
13 (1997)	-	3.50	-	3.50	33.12	29.62	6.79	6.05
14 (1998)	-	3.50	-	3.50	37.19	33.69	6.89	6.09
15 (1999)	-	3.50	1.10	4.60	40.78	36.18	6.61	5.79
16 (2000)	-	3.50	1.10	4.60	44.26	39.66	6.47	5.61
17 (2001)	-	3.50	1.10	4.60	46.35	41.75	6.08	5.23
18 (2002)	-	3.50	-	3.50	47.92	44.42	5.77	4.92
19 (2003)	-	3.50	3.11	6.61	48.38	41.77	4.85	4.10
20 (2004)	-	3.50	2.34	5.84	48.64	42.80	4.44	3.72
21 (2005)	-	3.50	1.09	4.59	48.82	44.23	4.10	3.40
22 (2006)	-	3.50	-	3.50	48.82	45.32	3.74	3.08
23 (2007)	-	3.50	-	3.50	48.82	45.32	3.34	2.72
24 (2008)	-	3.50	-	3.50	48.82	45.32	2.99	2.41
25 (2009)	-	3.50	1.10	4.60	48.82	44.22	2.60	2.08
26 (2010)	-	3.50	1.10	4.60	48.82	44.42	2.32	1.84
27 (2011)	-	3.50	1.10	4.60	48.82	44.42	2.07	1.63
28 (2012)	-	3.50	-	3.50	48.82	45.32	1.90	1.48
29 (2013)	-	3.50	-	3.50	48.82	45.32	1.69	1.31
30 (2014)	-	3.50	-	3.50	48.82	45.32	1.51	1.16
31 (2015)	-	3.50	-	3.50	48.82	45.32	1.35	1.02
32 (2016)	-	3.50	-	3.50	48.82	45.32	1.21	0.91
33 (2017)	-	3.50	-	3.50	48.82	45.32	1.08	0.80
34 (2018)	-	3.50	3.11	6.61	48.82	42.21	0.89	0.66
35 (2019)	-	3.50	3.40	6.90	48.82	41.92	0,79	0.58
36 (2020)	-	3.50	2.19	5.69	48.82	43.13	0.73	0.53
37 (2021)	-	3.50	1.10	4.60	48.82	44.22	0.67	0.48
38 (2022)	-	3.50	-	3.50	48.82	45.32	0.61	0.44
39 (2023)	-	3.50	-	3.50	48.82	45.32	0.54	0.39
40 (2024)	-	3.50	-	3.50	48.82	45.32	0.48	0.34
41 (2025)	-	3.50	-	3.50	48.82	45.32	0.44	0.30
42 (2026)	-	3.50	-	3.50	48.82	45.32	0.39	0.27
43 (2027)	-	3.50	-	3.50	48.82	45.32	0.34	0.24
44 (2028)	-	3.50	1.10	4.60	48.82	44.22	0.30	0.20
45 (2029)	-	3.50	1.10	4.60	48.82	44.22	0.27	0.18
46 (2030)	-	3.50	1.10	4.60	48.82	44.22	0.24	0.16
47 (2031)	-	3.50	-	3.50	48.82	45.32	0.22	0.15
48 (2032)	-	3.50	-	3.50	48.82	45.32	0.19	0.13
49 (2033)	-	3.50	3.11	6.61	48.81	42.21	0.16	0.11
50 (2034)	-	3.50	2.34	5.84	48.82	42.98	0.15	0.09
Total	191.10	160.15	31.69	382.94	1,929.97	1,547.03	12.67	- 0.57

EIRR = 0.12 + 12.67 / (12.67 + 0.57) x 0.01 = 0.1295 = 13.0%

Table F-61 EIRR of Sugarbeet Processing Plant

-Sugarbeet Processing Plant(raw beet price 20LE/ton)- (unit;million LE)

YEAR	PROJECT COST			INCREMENTAL BENEFITS (2)	PROJECT RETURN (3) =(2)-(1)	PRESENT WORTH VALUE (3)*DISCOUNT RATE	
	CAPITAL	O & M	TOTAL (1)			(22 %)	(23 %)
1	7.41	0.10	7.51	0.0	-7.51	-6.16	-6.11
2	23.54	0.10	23.64	0.0	-23.64	-15.88	-15.63
3	31.74	0.93	32.67	0.0	-32.67	-17.99	-17.56
4	17.42	7.02	24.44	14.63	-9.81	-4.43	-4.29
5	0.92	10.24	11.16	23.44	12.28	4.54	4.36
6	0.56	14.42	14.98	35.70	20.72	6.28	5.98
7	0.21	16.99	17.20	43.05	25.85	6.43	6.07
8	0.23	16.99	17.22	43.03	25.81	5.26	4.93
9	0.19	16.99	17.18	43.05	25.87	4.32	4.01
10	0.13	16.99	17.12	43.03	25.91	3.55	3.27
11	0.11	16.99	17.10	43.03	25.93	2.91	2.66
12	3.30	16.99	20.29	43.02	22.73	2.09	1.90
13	0.03	16.99	17.02	43.02	26.00	1.96	1.76
14	0.06	16.99	17.05	43.02	25.97	1.60	1.43
15	0.01	16.99	17.00	43.02	26.02	1.32	1.17
16	0.02	16.99	17.01	43.02	26.01	1.08	0.95
17	0.0	16.99	16.99	43.02	26.03	0.89	0.77
18	0.03	16.99	17.02	43.02	26.00	0.73	0.63
19	0.06	16.99	17.05	43.02	25.97	0.59	0.51
20	0.01	16.99	17.00	43.02	26.02	0.49	0.41
21	0.02	16.99	17.01	43.02	26.01	0.40	0.34
22	0.0	16.99	16.99	43.02	26.03	0.33	0.27
23	0.03	16.99	17.02	43.02	26.00	0.27	0.22
24	15.59	16.99	32.58	43.02	10.44	0.09	0.07
25	0.01	16.99	17.00	43.02	26.02	0.18	0.15
26	0.02	16.99	17.01	43.02	26.01	0.15	0.12
27	0.0	16.99	16.99	43.02	26.03	0.12	0.10
28	0.03	16.99	17.02	43.02	26.00	0.10	0.08
29	0.06	16.99	17.05	43.02	25.97	0.08	0.06
30	0.01	16.99	17.00	70.19	53.19	0.14	0.11
TOTAL	101.75	440.57	542.32	1133.51	591.19	1.43	-1.25

E I R R = 23 ..... 22 + 1.43 / (1.43 + 1.25) = 22.53

Table F-62 EIRR of Sugarbeet Processing Plant

Sugarbeet Processing Plant(raw beet price:30LE/ton) (uint:million LE)

YEAR	PROJECT COST			INCREMENTAL BENEFITS	PROJECT RETURN	PRESENT WORTH VALUE	
	CAPITAL	O & M	TOTAL (1)	(2)	(3) =(2)-(1)	(3)*DISCOUNT RATE (18 %)	(19 %)
1	7.41	0.10	7.51	0.0	-7.51	-6.36	-6.31
2	23.54	0.10	23.64	0.0	-23.64	-16.98	-16.69
3	31.74	0.93	32.67	0.0	-32.67	-19.88	-19.39
4	17.42	8.65	26.07	14.63	-11.44	-5.90	-5.70
5	0.92	12.86	13.78	23.44	9.66	4.22	4.05
6	0.56	18.44	19.00	35.70	16.70	6.19	5.88
7	0.21	21.79	22.00	43.05	21.05	6.61	6.23
8	0.23	21.79	22.02	43.03	21.01	5.59	5.22
9	0.19	21.79	21.98	43.05	21.07	4.75	4.40
10	0.13	21.79	21.92	43.03	21.11	4.03	3.71
11	0.11	21.79	21.90	43.03	21.13	3.42	3.12
12	3.30	21.79	25.09	43.02	17.93	2.46	2.22
13	0.03	21.79	21.82	43.02	21.20	2.47	2.21
14	0.06	21.79	21.85	43.02	21.17	2.09	1.85
15	0.01	21.79	21.80	43.02	21.22	1.77	1.56
16	0.02	21.79	21.81	43.02	21.21	1.50	1.31
17	0.0	21.79	21.79	43.02	21.23	1.27	1.10
18	0.03	21.79	21.82	43.02	21.20	1.08	0.93
19	0.06	21.79	21.85	43.02	21.17	0.91	0.78
20	0.01	21.79	21.80	43.02	21.22	0.77	0.65
21	0.02	21.79	21.81	43.02	21.21	0.66	0.55
22	0.0	21.79	21.79	43.02	21.23	0.56	0.46
23	0.03	21.79	21.82	43.02	21.20	0.47	0.39
24	15.59	21.79	37.38	43.02	5.64	0.11	0.09
25	0.01	21.79	21.80	43.02	21.22	0.34	0.27
26	0.02	21.79	21.81	43.02	21.21	0.29	0.23
27	0.0	21.79	21.79	43.02	21.23	0.24	0.19
28	0.03	21.79	21.82	43.02	21.20	0.21	0.15
29	0.06	21.79	21.85	43.02	21.17	0.17	0.14
30	0.01	21.79	21.80	70.19	48.39	0.34	0.26
TOTAL	101.75	564.04	665.79	1133.51	467.72	3.38	0.12

E I R R = 19 ..... 18 + 3.38 / (3.38 + 0.12) = 18.97

Table F-63 EIRR of Milk Processing Plant

-Milk Processing Plant(raw milk price;0.3LE)

(unit;million LE)

YEAR	PROJECT COST			INCREMENTAL BENEFITS	PROJECT RETURN	PRESENT WORTH VALUE	
	CAPITAL	O & M	TOTAL (1)	(2)	(3) =(2)-(1)	(3)*DISCOUNT RATE (-1 %)	(0 %)
1	4.57	0.0	4.57	0.0	-4.57	0.0	-4.57
2	0.57	3.74	4.31	3.28	-1.03	0.0	-1.03
3	0.28	6.27	6.55	5.69	-0.86	0.0	-0.86
4	0.23	10.22	10.45	9.72	-0.73	0.0	-0.73
5	0.46	13.15	13.61	12.61	-1.00	0.0	-1.00
6	0.44	14.25	14.69	13.81	-0.88	0.0	-0.88
7	3.65	16.50	20.15	16.06	-4.09	0.0	-4.09
8	0.34	18.35	18.69	17.87	-0.82	0.0	-0.82
9	0.60	19.55	20.15	19.04	-1.11	0.0	-1.11
10	0.0	19.55	19.55	19.04	-0.51	0.0	-0.51
11	0.0	19.55	19.55	19.04	-0.51	0.0	-0.51
12	0.11	19.55	19.66	19.04	-0.62	0.0	-0.62
13	3.05	19.55	22.60	19.04	-3.56	0.0	-3.56
14	0.0	19.55	19.55	19.04	-0.51	0.0	-0.51
15	0.0	19.55	19.55	19.04	-0.51	0.0	-0.51
16	0.0	19.55	19.55	19.04	-0.51	0.0	-0.51
17	0.11	19.55	19.66	19.04	-0.62	0.0	-0.62
18	3.05	19.55	22.60	19.04	-3.56	0.0	-3.56
19	0.0	19.55	19.55	19.04	-0.51	0.0	-0.51
20	0.0	19.55	19.55	19.04	-0.51	0.0	-0.51
21	0.11	19.55	19.66	19.04	-0.62	0.0	-0.62
22	0.0	19.55	19.55	19.04	-0.51	0.0	-0.51
23	0.0	19.55	19.55	19.04	-0.51	0.0	-0.51
24	0.0	19.55	19.55	19.04	-0.51	0.0	-0.51
25	3.05	19.55	22.60	19.04	-3.56	0.0	-3.56
TOTAL	20.62	414.83	435.45	402.72	-32.73	0.0	-32.73

E I R R = -1 ..... -1 + 0.0 / (0.0 + 32.73) = -1.00

Table F-64 EIRR of Milk Processing Plant

-Milk Processing Plant(raw milk price;0.2SLE/kg)

(unit;millon LE)

YEAR	PROJECT COST			INCREMENTAL BENEFITS	PROJECT RETURN	PRESENT WORTH VALUE (3)*DISCOUNT RATE	
	CAPITAL	O & M	TOTAL (1)	(2)	(3) =(2)-(1)	(16 %)	(17 %)
1	4.57	0.0	4.57	0.0	-4.57	-3.94	-3.91
2	0.57	3.24	3.81	3.28	-0.53	-0.39	-0.39
3	0.28	5.41	5.69	5.69	0.00	0.00	0.00
4	0.23	8.76	8.99	9.72	0.73	0.40	0.39
5	0.46	11.25	11.71	12.61	0.90	0.43	0.41
6	0.44	12.18	12.62	13.81	1.19	0.49	0.46
7	3.65	14.09	17.74	16.06	-1.68	-0.59	-0.56
8	0.34	15.67	16.01	17.87	1.86	0.57	0.53
9	0.60	16.68	17.28	19.04	1.76	0.46	0.43
10	0.0	16.68	16.68	19.04	2.36	0.53	0.49
11	0.0	16.68	16.68	19.04	2.36	0.46	0.42
12	0.11	16.68	16.79	19.04	2.25	0.38	0.34
13	3.05	16.68	19.73	19.04	-0.69	-0.10	-0.09
14	0.0	16.68	16.68	19.04	2.36	0.30	0.26
15	0.0	16.68	16.68	19.04	2.36	0.25	0.22
16	0.0	16.68	16.68	19.04	2.36	0.22	0.19
17	0.11	16.68	16.79	19.04	2.25	0.18	0.16
18	3.05	16.68	19.73	19.04	-0.69	-0.05	-0.04
19	0.0	16.68	16.68	19.04	2.36	0.14	0.12
20	0.0	16.68	16.68	19.04	2.36	0.12	0.10
21	0.11	16.68	16.79	19.04	2.25	0.10	0.08
22	0.0	16.68	16.68	19.04	2.36	0.09	0.07
23	0.0	16.68	16.68	19.04	2.36	0.08	0.06
24	0.0	16.68	16.68	19.04	2.36	0.07	0.05
25	3.05	16.68	19.73	19.04	-0.69	-0.02	0.01
TOTAL	20.62	354.16	374.78	402.72	27.94	0.18	-0.19

EIRR= 16 ..... 16 + 0.18 / (0.18 + 0.19) = 16.48

Table F-65 EIRR of Milk Processing Plant

-Milk Processing Plant(raw milk price;0.20LE)

(unit;million LE)

YEAR	PROJECT COST			INCREMENTAL BENEFITS (2)	PROJECT RETURN (3) =(2)-(1)	PRESENT WORTH VALUE (3)*DISCOUNT RATE	
	CAPITAL	O & M	TOTAL (1)			(37 %)	(38 %)
1	4.57	0.10	4.67	0.0	-4.67	-3.41	-3.38
2	0.57	2.75	3.32	3.28	-0.04	-0.02	-0.02
3	0.28	4.56	4.84	5.69	0.85	0.33	0.32
4	0.23	7.30	7.53	9.72	2.19	0.62	0.60
5	0.46	9.35	9.81	12.61	2.80	0.58	0.56
6	0.44	10.10	10.54	13.81	3.27	0.49	0.47
7	3.65	11.67	15.32	16.06	0.74	0.08	0.08
8	0.34	12.98	13.32	17.87	4.55	0.37	0.35
9	0.60	13.82	14.42	19.04	4.62	0.27	0.25
10	0.0	13.82	13.82	19.04	5.22	0.22	0.21
11	0.0	13.82	13.82	19.04	5.22	0.16	0.15
12	0.11	13.82	13.93	19.04	5.11	0.12	0.11
13	3.05	13.82	16.87	19.04	2.17	0.04	0.03
14	0.0	13.82	13.82	19.04	5.22	0.06	0.06
15	0.0	13.82	13.82	19.04	5.22	0.05	0.04
16	0.0	13.82	13.82	19.04	5.22	0.03	0.03
17	0.11	13.82	13.93	19.04	5.11	0.02	0.02
18	3.05	13.82	16.87	19.04	2.17	0.01	0.01
19	0.0	13.82	13.82	19.04	5.22	0.01	0.01
20	0.0	13.82	13.82	19.04	5.22	0.01	0.01
21	0.11	13.82	13.93	19.04	5.11	0.01	0.01
22	0.0	13.82	13.82	19.04	5.22	0.01	0.00
23	0.0	13.82	13.82	19.04	5.22	0.00	0.00
24	0.0	13.82	13.82	19.04	5.22	0.00	0.00
25	3.05	13.82	16.87	19.04	2.17	0.00	0.00
TOTAL	20.62	293.75	314.37	402.72	88.35	0.08	-0.07

E I R R= 38 ..... 37 + 0.08 / (0.08 + 0.07) = 37.51

Table F-66 EIRR of Tomato Processing Plant

-Tomato Paste Processing Plant(raw tomato price;SOLE/ton) (unit;million LE)

YEAR	PROJECT COST			INCREMENTAL BENEFITS	PROJECT RETURN	PRESENT WORTH VALUE (3)*DISCOUNT RATE	
	CAPITAL	O & M	TOTAL (1)	(2)	(3) =(2)-(1)	(37 %)	(38 %)
1	2.65	0.07	2.72	0.0	-2.72	-1.99	-1.97
2	1.17	3.68	4.85	4.73	-0.12	-0.06	-0.06
3	2.65	5.70	8.35	7.46	-0.89	-0.35	-0.34
4	2.75	9.16	11.91	12.04	0.13	0.04	0.04
5	4.51	11.97	16.48	15.54	-0.94	-0.19	-0.19
6	0.0	14.85	14.85	19.20	4.35	0.66	0.63
7	0.0	15.57	15.57	20.42	4.85	0.54	0.51
8	0.0	16.31	16.31	21.18	4.87	0.39	0.37
9	0.0	16.53	16.53	21.49	4.96	0.29	0.27
10	0.0	16.53	16.53	21.49	4.96	0.21	0.20
11	0.64	16.53	17.17	21.49	4.32	0.14	0.12
12	0.0	16.53	16.53	21.49	4.96	0.11	0.10
13	0.60	16.53	17.13	21.49	4.36	0.07	0.07
14	0.0	16.53	16.53	21.49	4.96	0.06	0.05
15	0.60	16.53	17.13	21.49	4.36	0.04	0.03
16	0.0	16.53	16.53	21.49	4.96	0.03	0.03
17	0.0	16.53	16.53	21.49	4.96	0.02	0.02
18	0.0	16.53	16.53	21.49	4.96	0.02	0.02
19	0.0	16.53	16.53	21.49	4.96	0.01	0.01
20	0.0	16.53	16.53	21.49	4.96	0.01	0.01
21	0.64	16.53	17.17	21.49	4.32	0.01	0.00
22	0.0	16.53	16.53	21.49	4.96	0.00	0.00
23	0.60	16.53	17.13	21.49	4.36	0.00	0.00
24	0.0	16.53	16.53	21.49	4.96	0.00	0.00
25	0.60	16.53	17.13	21.49	4.36	0.00	0.00
26	0.0	16.53	16.53	21.49	4.96	0.00	0.00
27	0.0	16.53	16.53	21.49	4.96	0.00	0.00
28	0.0	16.53	16.53	21.49	4.96	0.00	0.00
29	0.0	16.53	16.53	21.49	4.96	0.00	0.00
30	0.0	16.53	16.53	21.49	4.96	0.00	0.00
TOTAL	17.41	440.97	458.38	573.35	114.97	0.07	-0.06

E I R R = 38 ..... 37 + 0.07 / (0.07 + 0.06) = 37.56

Table F-67

Economic Internal Rate of Return - Land Recla.+ Social Infra + Agri. Process.
- Include Social Benefit, Process with Sugarbeet and Milk -
(Unit Price of Material : Beet 20 LE/ton, Milk 0.2 LE/kg)

(Unit: Million LE)

YEAR	PROJECT COST (1)	INCREMENTAL BENEFITS (2)	PROJECT RETURN (3) =(2) - (1)	PRESENT WORTH VALUE (3)*DISCOUNT RATE (10 %)	(11 %)
1	32.02	0.0	-32.02	-29.11	-28.85
2	4.24	0.0	-4.24	-3.50	-3.44
3	22.69	0.0	-22.69	-17.05	-16.59
4	31.77	0.0	-31.77	-21.70	-20.93
5	69.51	0.25	-69.26	-43.01	-41.10
6	58.71	7.62	-51.09	-28.84	-27.31
7	64.72	14.87	-49.85	-25.58	-24.01
8	89.96	25.20	-64.76	-30.21	-28.10
9	93.95	49.45	-34.50	-14.63	-13.49
10	45.81	62.20	16.39	6.32	5.77
11	52.47	81.25	28.78	10.09	9.13
12	45.33	94.46	29.13	15.65	14.04
13	42.29	96.45	54.16	15.69	13.95
14	41.65	100.54	58.89	15.51	13.66
15	42.69	104.11	61.42	14.70	12.84
16	42.78	107.59	64.81	14.10	12.20
17	48.91	109.67	60.76	12.02	10.31
18	41.49	111.24	69.75	12.55	10.66
19	44.63	111.70	67.07	10.97	9.23
20	43.92	111.96	68.04	10.11	8.44
21	45.62	112.14	66.52	8.99	7.43
22	41.46	112.14	70.68	8.68	7.12
23	41.49	112.14	70.65	7.89	6.41
24	41.63	112.14	70.51	7.16	5.76
25	42.57	93.10	50.53	4.66	3.72
26	33.33	112.14	78.81	6.61	5.23
27	32.06	112.14	80.08	6.11	4.78
28	32.51	112.14	79.63	5.52	4.29
29	50.76	112.14	61.38	3.87	2.98
30	37.46	112.14	74.68	4.28	3.26
31	38.20	112.14	73.94	3.85	2.91
32	42.96	112.14	69.18	3.28	2.45
33	40.99	112.14	71.15	3.06	2.27
34	45.23	112.14	66.91	2.62	1.93
35	44.87	112.14	67.27	2.39	1.74
36	43.66	112.14	68.48	2.22	1.60
37	42.68	112.14	69.46	2.04	1.46
38	41.52	112.14	70.62	1.89	1.34
39	41.47	112.14	70.67	1.72	1.21
40	55.77	112.14	56.37	1.25	0.87
41	55.88	67.86	11.98	0.24	0.17
42	38.68	67.86	29.18	0.53	0.36
43	39.45	112.14	72.69	1.21	0.82
44	42.77	112.14	69.37	1.05	0.70
45	42.90	112.14	69.24	0.95	0.63
46	42.75	112.14	69.39	0.87	0.57
47	32.34	112.14	79.80	0.90	0.59
48	31.07	112.14	81.70	0.84	0.54
49	38.89	112.14	73.25	0.69	0.44
50	38.12	112.14	74.02	0.63	0.40
TOTAL	2188.63	4445.16	2256.53	20.08	-9.61

E I R R = 11 ..... 10 + 20.08 / (20.08 + 9.61) = 10.68

Table F-68

Economic Internal Rate of Return - Land Recla.+ Social Infra.+ Agri. Process.
- Exclude Social Benefit, Process with Sugarbeet and Milk -
(Unit Price of Material : Beet 20 LE/ton, Milk 0.2 LE/kg)

(Unit: Million LE)

YEAR	PROJECT COST (1)	INCREMENTAL BENEFITS (2)	PROJECT RETURN (3) =(2)-(1)	PRESENT WORTH VALUE (3)*DISCOUNT RATE (10 %)	(11 %)
1	32.02	0.0	-32.02	-29.11	-28.85
2	4.24	0.0	-4.24	-3.50	-3.44
3	22.69	0.0	-22.69	-17.05	-16.59
4	31.77	0.0	-31.77	-21.70	-20.93
5	69.51	0.0	-69.51	-43.16	-41.25
6	58.71	7.05	-51.66	-29.16	-27.62
7	64.72	13.99	-50.73	-26.03	-24.43
8	89.96	24.19	-65.77	-30.68	-28.54
9	83.95	48.19	-35.76	-15.17	-13.98
10	45.81	60.94	15.13	5.83	5.33
11	52.47	79.99	27.52	9.65	8.73
12	45.33	93.20	47.87	15.25	13.68
13	42.29	95.19	52.90	15.32	13.62
14	41.65	99.28	57.63	15.18	13.37
15	42.69	102.85	60.16	14.40	12.57
16	42.78	106.33	63.55	13.83	11.97
17	48.91	108.44	59.50	11.77	10.09
18	41.49	109.98	68.49	12.32	10.47
19	44.63	110.44	65.81	10.76	9.06
20	43.92	110.70	66.78	9.93	8.28
21	45.62	110.88	65.26	8.82	7.29
22	41.46	110.88	69.42	8.53	6.99
23	41.49	110.88	69.39	7.75	6.29
24	41.63	110.88	69.25	7.03	5.66
25	42.57	110.88	68.31	6.30	5.03
26	33.33	91.84	58.51	4.91	3.88
27	32.06	110.88	78.82	6.01	4.71
28	32.51	110.88	78.37	5.43	4.22
29	50.76	110.88	60.12	3.79	2.92
30	37.46	110.88	73.42	4.21	3.21
31	38.20	110.88	72.68	3.79	2.86
32	42.96	110.88	67.92	3.22	2.41
33	40.99	110.88	69.89	3.01	2.23
34	45.23	110.88	65.65	2.57	1.89
35	44.87	110.88	66.01	2.35	1.71
36	43.66	110.88	67.22	2.17	1.57
37	42.68	110.88	68.20	2.01	1.43
38	41.52	110.88	69.36	1.85	1.31
39	41.47	110.88	69.41	1.69	1.19
40	55.77	67.86	12.09	0.27	0.19
41	55.88	67.86	11.98	0.24	0.17
42	38.68	110.88	72.20	1.32	0.90
43	39.45	110.88	71.43	1.19	0.80
44	42.77	110.88	68.11	1.03	0.69
45	42.90	110.88	67.98	0.93	0.62
46	42.75	110.88	68.13	0.85	0.56
47	32.34	110.88	78.54	0.89	0.58
48	31.07	110.88	79.81	0.82	0.53
49	38.89	110.88	71.99	0.67	0.43
50	38.12	110.88	72.76	0.62	0.39
TOTAL	2188.63	4392.05	2203.42	12.95	-15.78

E I R R = 10 ..... 10 + 12.95/ (12.95 + 15.78) = 10.45

Table F-69

Economic Internal Rate of Return - Land Recla.+ Social Infra.+ Agri. Process.
- Include Social Benefit, Process with Sugarbeet, Milk and Tomatoes -
(Unit Price of Materia! Beet 20 LE/ton, Milk 0.2 LE/kg, Tomato 80 LE/ton)

(Unit: Million LE)

YEAR	PROJECT COST (1)	INCREMENTAL BENEFITS (2)	PROJECT RETURN (3) =(2)-(1)	PRESENT WORTH VALUE (3)*DISCOUNT RATE (10 %)	(11 %)
1	32.02	0.0	-32.02	-29.11	-28.85
2	4.24	0.0	-4.24	-3.50	-3.44
3	22.69	0.0	-22.69	-17.05	-16.59
4	31.77	0.0	-31.77	-21.70	-20.93
5	69.51	0.25	-69.26	-43.01	-41.10
6	58.71	7.62	-51.09	-28.84	-27.31
7	64.72	14.87	-49.85	-25.58	-24.01
8	89.96	25.20	-64.76	-30.21	-28.10
9	83.95	49.45	-34.50	-14.63	-13.49
10	45.81	62.20	16.39	6.32	5.77
11	52.47	81.25	28.78	10.09	9.13
12	45.33	94.46	49.13	15.65	14.04
13	45.01	96.45	51.44	14.90	13.25
14	46.50	105.27	58.77	15.48	13.63
15	51.04	111.57	60.53	14.49	12.65
16	54.69	119.63	64.94	14.13	12.23
17	65.39	125.21	59.82	11.84	10.15
18	56.34	130.44	74.10	13.33	11.32
19	60.38	132.12	71.74	11.73	9.88
20	60.23	133.14	72.91	10.84	9.04
21	62.15	133.63	71.48	9.66	7.99
22	57.99	133.63	75.64	9.29	7.61
23	58.66	133.63	74.97	8.37	6.80
24	58.16	133.63	75.47	7.66	6.17
25	59.70	114.59	54.89	5.07	4.04
26	49.86	133.63	83.77	7.03	5.56
27	49.19	133.63	84.44	6.44	5.04
28	49.04	133.63	84.59	5.87	4.55
29	67.29	133.63	66.34	4.18	3.22
30	53.99	133.63	79.64	4.56	3.48
31	54.73	133.63	78.90	4.11	3.11
32	59.49	133.63	74.14	3.51	2.63
33	58.16	133.63	75.47	3.25	2.41
34	61.76	133.63	71.87	2.81	2.07
35	62.00	133.63	71.63	2.55	1.86
36	60.19	133.63	73.44	2.38	1.72
37	59.81	133.63	73.82	2.17	1.55
38	58.05	133.63	75.58	2.02	1.43
39	58.00	133.63	75.63	1.84	1.29
40	72.30	133.63	61.33	1.36	0.94
41	72.41	89.35	16.94	0.34	0.23
42	55.21	89.35	34.14	0.62	0.43
43	56.62	133.63	77.01	1.28	0.87
44	59.30	133.63	74.33	1.12	0.75
45	60.03	133.63	73.60	1.01	0.67
46	59.28	133.63	74.35	0.93	0.61
47	49.47	133.63	84.16	0.95	0.62
48	47.60	133.63	86.03	0.89	0.57
49	55.42	133.63	78.21	0.73	0.47
50	54.65	133.63	78.98	0.67	0.43
TOTAL	2781.27	5190.43	2409.16	27.84	-3.60

E I R R = 11 .... 10 + 27.84 / (27.84 + 3.60) = 10.89

Table F-70

Economic Internal Rate of Return - Land Recla.+ Social Infra. + Agri. Process - Exclude Social Benefit, Process with Sugarbeet, Milk and Tomatoes

(Unit Price of Material ; Beet 20 LE/ton, Milk 0.2 LE/kg, Tomato 80 LE/ton)

(Unit: Million)

YEAR	PROJECT COST (1)	INCREMENTAL BENEFITS (2)	PROJECT RETURN (3) =(2)-(1)	PRESENT WORTH VALUE (3)*DISCOUNT RATE (10 %)	(11 %)
1	32.02	0.0	-32.02	-29.11	-28.85
2	4.24	0.0	-4.24	-3.50	-3.44
3	22.69	0.0	-22.69	-17.05	-16.59
4	31.77	0.0	-31.77	-21.70	-20.93
5	69.51	0.0	-69.51	-43.16	-41.25
6	58.71	7.05	-51.66	-29.16	-27.62
7	64.72	13.99	-50.73	-26.03	-24.43
8	89.96	24.19	-65.77	-30.68	-28.54
9	83.95	48.19	-35.76	-15.17	-13.98
10	45.81	60.94	15.13	5.83	5.33
11	52.47	79.99	27.52	9.65	8.73
12	45.33	93.20	47.87	15.25	13.68
13	45.01	95.19	50.18	14.54	12.92
14	46.50	104.01	57.51	15.14	13.34
15	51.04	110.31	59.27	14.19	12.39
16	54.69	118.37	63.68	13.86	11.99
17	65.39	123.95	58.56	11.59	9.93
18	56.34	129.18	72.84	13.10	11.13
19	60.38	130.86	70.48	11.52	9.70
20	60.23	131.88	71.65	10.65	8.89
21	62.15	132.37	70.22	9.49	7.85
22	57.99	132.37	74.38	9.14	7.49
23	58.66	132.37	73.71	8.23	6.69
24	58.16	132.37	74.21	7.53	6.06
25	59.70	132.37	72.67	6.71	5.35
26	49.86	113.33	63.47	5.33	4.21
27	49.19	132.37	83.18	6.34	4.97
28	49.04	132.37	83.33	5.78	4.49
29	67.29	132.37	65.08	4.10	3.16
30	53.99	132.37	78.38	4.49	3.42
31	54.73	132.37	77.64	4.05	3.06
32	59.49	132.37	72.88	3.45	2.58
33	58.16	132.37	74.21	3.20	2.37
34	61.76	132.37	70.61	2.76	2.03
35	62.00	132.37	70.37	2.50	1.82
36	60.19	132.37	72.18	2.34	1.69
37	59.81	132.37	72.56	2.13	1.53
38	58.05	132.37	74.32	1.99	1.41
39	58.00	132.37	74.37	1.81	1.27
40	72.30	89.35	17.05	0.38	0.26
41	72.41	89.35	16.94	0.34	0.23
42	55.21	132.37	77.16	1.41	0.96
43	56.62	132.37	75.75	1.26	0.85
44	59.30	132.37	73.07	1.10	0.74
45	60.03	132.37	72.34	0.99	0.66
46	59.28	132.37	73.09	0.91	0.60
47	49.47	132.37	82.90	0.94	0.61
48	47.60	132.37	84.77	0.87	0.57
49	55.42	132.37	76.95	0.72	0.46
50	54.65	132.37	77.72	0.66	0.42
TOTAL	2781.27	5137.32	2356.05	20.71	-9.78

E I R R = 11 ..... 10 + 20.71 / (20.71 + 9.78) = 10.68

Table F-71 Production of 5.0 Feddan Farm (M1 Block, Land Class 2, 3)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Cropped Area (Feddan)														
Rice	4.0	4.0	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Berseem	4.0	4.0	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Soybean	-	-	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62
Sugarbeet	-	-	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63
Sorghum	-	-	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Tomato	-	-	-	-	-	-	-	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Onion	-	-	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Cauliflower	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Cabbage	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Production (Ton)														
Rice	4.8	6.0	2.69	3.14	3.59	3.74	3.88	4.48	4.98	4.98	4.98	4.98	4.98	4.98
Berseem	40.0	52.0	22.41	26.89	29.88	29.88	34.36	37.35	37.35	41.50	41.50	41.50	41.50	41.50
Soybean	-	-	1.13	1.30	1.46	1.46	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62
Sugarbeet	-	-	26.08	29.34	29.34	32.60	34.23	37.49	40.75	40.75	40.75	40.75	40.75	40.75
Sorghum	-	-	12.35	13.30	15.20	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10
Tomato	-	-	-	-	-	-	-	9.8	11.20	12.60	14.00	14.00	14.00	14.00
Onion	-	-	5.18	5.18	6.21	7.25	8.28	10.12	11.50	11.50	11.50	11.50	11.50	11.50
Cauliflower	-	-	0.60	0.60	0.80	1.00	1.00	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Cabbage	-	-	2.80	3.20	3.60	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
No. of Livestock (Head)														
Milk Cow:Friesian	-	-	0.6	0.7	0.8	0.8	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Baladi	3.2	3.7	1.4	1.6	1.8	1.8	1.9	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Meat Cattle:														
Friesian	-	-	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Baladi	1.2	1.4	0.5	0.6	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Sheep	-	-	0.5	0.6	0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8

Table F-72 Production of 5.0 Feddan Farm (M1 Block, Land Class 4)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Cropped Area (Feddan)														
Rice	4.0	4.0	4.0	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Berseem	4.0	4.0	4.0	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
Soybean	-	-	-	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62	1.62
Sugarbeet	-	-	-	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63
Sorghum	-	-	-	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Tomato	-	-	-	-	-	-	-	-	-	-	0.70	0.70	0.70	0.70
Onion	-	-	-	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Cauliflower	-	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Cabbage	-	-	-	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Production (Ton)														
Rice	4.8	6.0	6.0	2.69	3.14	3.59	3.74	3.88	4.48	4.98	4.98	4.98	4.98	4.98
Berseem	40.0	52.0	52.0	22.41	26.89	29.88	34.36	37.35	37.35	37.35	41.5	41.5	41.5	41.5
Soybean	-	-	-	1.13	1.30	1.46	1.46	1.62	1.62	1.62	1.62	1.62	1.62	1.62
Sugarbeet	-	-	-	26.08	29.34	29.34	32.60	34.23	37.49	40.75	40.75	40.75	40.75	40.75
Sorghum	-	-	-	12.35	13.30	15.20	17.10	17.10	17.10	17.10	17.10	17.10	17.10	17.10
Tomato	-	-	-	-	-	-	-	-	-	-	9.8	11.2	12.6	14.0
Onion	-	-	-	5.18	5.18	6.21	7.25	8.28	9.32	10.47	11.5	11.5	11.5	11.5
Cauliflower	-	-	-	0.60	0.60	0.80	1.0	1.0	1.0	1.0	1.25	1.25	1.25	1.25
Cabbage	-	-	-	2.80	3.12	3.60	4.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
No. of Livestock (Head)														
Milk Cow:Friesian	-	-	-	0.6	0.8	0.8	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Baladi	3.2	3.7	3.7	1.4	1.6	1.8	1.9	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Meat Cattle:														
Friesian	-	-	-	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Baladi	1.2	1.4	1.4	0.5	0.6	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Sheep	-	-	-	0.5	0.6	0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.9	0.8

Table F-73 Production of 15 Feddan Farm (M1 Block, Land Class 2,3)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Cropped Area (Feddan)														
Rice	12.0	12.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Berseem	12.0	12.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Soybean	-	-	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.85
Sugarbeet	-	-	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90
Sorghum	-	-	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85
Tomato	-	-	-	-	-	-	-	2.12	2.12	2.12	2.12	2.12	2.12	2.12
Onion	-	-	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44
Cauliflower	-	-	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Cabbage	-	-	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Production (Ton)														
Rice	14.4	18.0	8.07	9.42	10.77	11.22	11.64	13.44	14.94	14.94	14.94	14.94	14.94	14.94
Berseem	120.0	156.0	67.23	80.67	89.64	103.68	112.05	124.5	124.5	124.5	124.5	124.5	124.5	124.5
Soybean	-	-	3.39	3.90	4.38	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86	4.86
Sugarbeet	-	-	78.24	88.02	88.02	97.80	102.69	112.47	122.25	122.25	122.25	122.25	122.25	122.25
Sorghum	-	-	37.05	39.90	45.60	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30
Tomato	-	-	-	-	-	-	-	29.40	33.60	37.80	42.00	42.00	42.00	42.00
Onion	-	-	15.54	15.54	18.63	21.75	24.84	30.36	34.50	34.50	34.50	34.50	34.50	34.50
Cauliflower	-	-	1.80	1.80	2.40	3.00	3.00	3.75	3.75	3.75	3.75	3.75	3.75	3.75
Cabbage	-	-	8.40	9.60	10.80	12.00	12.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
No. of Livestock (Head)														
Milk Cow:Friesian	-	-	1.8	2.1	2.4	2.4	2.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Baladi	9.6	11.1	4.2	4.8	5.4	5.4	5.7	6.9	6.9	6.9	6.9	6.9	6.9	6.9
Meat Cattle:														
Friesian	-	-	0.6	0.9	0.9	0.9	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Baladi	3.6	5.2	1.5	1.8	2.1	2.1	2.4	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Sheep	-	-	1.5	1.8	1.8	1.8	2.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4

Table F-74 Production of 15 Feddan Farm (M1 Block, Land Class 4)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Cropped Area (Feddan)														
Rice	12.0	12.0	12.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Berseem	12.0	12.0	12.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Soybean	-	-	-	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.85	4.85
Sugarbeet	-	-	-	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.90
Sorghum	-	-	-	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85
Tomato	-	-	-	-	-	-	-	-	-	-	2.12	2.12	2.12	2.12
Onion	-	-	-	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44	3.44
Cauliflower	-	-	-	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Cabbage	-	-	-	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74
Production (Ton)														
Rice	14.4	18.8	18.8	8.07	9.42	10.77	11.22	11.64	13.44	14.94	14.94	14.94	14.94	14.94
Berseem	120.0	156.0	156.0	67.23	80.67	89.64	103.08	112.05	112.05	112.05	124.5	124.5	124.5	124.5
Soybean	-	-	-	3.39	3.90	4.38	4.38	4.86	4.86	4.86	4.86	4.86	4.86	4.86
Sugarbeet	-	-	-	78.24	88.02	88.02	97.80	102.69	112.47	122.25	122.25	122.25	122.25	122.25
Sorghum	-	-	-	37.05	39.90	45.60	51.30	51.30	51.30	51.30	51.30	51.30	51.30	51.30
Tomato	-	-	-	-	-	-	-	-	-	-	29.40	33.60	37.80	42.00
Onion	-	-	-	15.54	15.54	18.63	21.75	24.84	27.96	31.41	34.50	34.50	34.50	34.50
Cauliflower	-	-	-	1.80	1.80	2.40	3.00	3.00	3.00	3.00	3.75	3.75	3.75	3.75
Cabbage	-	-	-	8.40	9.36	10.80	12.0	12.0	12.0	12.0	15.0	15.0	15.0	15.0
No. of Livestock (Head)														
Milk Cow: Friesian	-	-	-	1.8	2.1	2.4	2.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Baladi	9.6	11.1	11.1	4.2	4.8	5.4	5.7	6.9	6.9	6.9	6.9	6.9	6.9	6.9
Meat Cattle:														
Friesian	-	-	-	0.6	0.9	0.9	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Baladi	-	-	-	1.5	1.8	1.8	2.1	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Sheep														

Table F-75 Production of 20 Feddan Farm (M1 Block, Land Class2,3)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Cropped Area (Feddan)														
Rice	16.0	16.0	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66
Berseem	16.0	16.0	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66
Soybean	-	-	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46
Sugarbeet	-	-	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53
Sorghum	-	-	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
Tomato	-	-	-	-	-	-	-	2.82	2.82	2.82	2.82	2.82	2.82	2.82
Onion	-	-	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59
Cauliflower	-	-	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Cabbage	-	-	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Production (Ton)														
Rice	19.2	24.0	10.76	12.56	14.36	14.96	15.52	17.92	19.92	19.92	19.92	19.92	19.92	19.92
Berseem	160.0	208.0	89.64	107.56	119.52	119.52	137.44	149.40	149.40	166.0	166.0	166.0	166.0	166.0
Soybean	-	-	4.52	5.20	5.84	5.84	6.48	6.48	6.48	6.48	6.48	6.48	6.48	6.48
Sugarbeet	-	-	104.32	117.36	117.36	130.4	136.92	149.96	163.00	163.00	163.00	163.00	163.00	163.00
Sorghum	-	-	49.40	53.20	60.80	68.40	68.40	68.40	68.40	68.40	68.40	68.40	68.40	68.40
Tomato	-	-	-	-	-	-	-	39.20	44.80	50.40	56.00	56.00	56.00	56.00
Onion	-	-	20.72	20.72	24.84	29.00	33.12	40.48	46.00	46.00	46.00	46.00	46.00	46.00
Cauliflower	-	-	2.40	2.40	3.20	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Cabbage	-	-	11.20	12.80	14.40	16.00	16.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
No. of Livestock (Head)														
Milk Cow: Friesian	-	-	2.4	2.8	3.2	3.2	3.6	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Baladi	12.8	14.8	5.6	6.4	7.2	7.2	7.6	9.2	9.2	9.3	9.2	9.2	9.2	9.2
Meat Cattle:														
Friesian	-	-	0.8	1.2	1.2	1.2	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Baladi	4.8	5.6	2.0	2.4	2.8	2.8	3.2	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Sheep	-	-	2.0	2.4	2.4	2.4	2.8	3.2	3.2	3.2	3.2	3.2	3.2	3.2

Table F-76 Production of 20 Feddan Farm (M1 Block, Land Class 4)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Cropped Area (Feddan)														
Rice	16.0	16.0	16.0	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66
Berseem	16.0	16.0	16.0	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66	6.66
Soybean	-	-	-	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46	6.46
Sugarbeet	-	-	-	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53	6.53
Sorghum	-	-	-	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
Tomato	-	-	-	-	-	-	-	-	-	-	2.82	2.82	2.82	2.82
Onion	-	-	-	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59	4.59
Cauliflower	-	-	-	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Cabbage	-	-	-	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Production (Ton)														
Rice	19.2	24.0	24.0	10.76	12.66	14.36	14.96	15.52	17.92	19.92	19.92	19.92	19.92	19.92
Berseem	160.0	208.0	208.0	89,64	107.56	119.52	119.52	137.44	149.40	149.40	166.00	166.00	166.00	166.00
Soybean	-	-	-	4.52	5.20	5.84	5.84	6.48	6.48	6.48	6.48	6.48	6.48	6.48
Sugarbeet	-	-	-	104.32	117.36	117.36	130.40	136.92	149.96	163.00	163.00	163.00	163.00	163.00
Sorghum	-	-	-	49.40	53.20	60.80	68.40	68.40	68.40	68.40	68.40	68.40	68.40	68.40
Tomato	-	-	-	-	-	-	-	-	-	-	39.20	44.80	50.40	56.00
Onion	-	-	-	20.72	20.72	24.84	29.00	33.12	40.48	46.00	46.00	46.00	46.00	46.00
Cauliflower	-	-	-	2.40	2.40	3.20	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00
Cabbage	-	-	-	11.20	12.80	14.40	16.00	16.00	20.00	20.00	20.00	20.00	20.00	20.00
No. of Livestock (Head)														
Milk Cow: Friesian	-	-	-	2.4	2.8	3.2	3.2	3.6	4.0	4.0	4.0	4.0	4.0	4.0
Baladi	12.8	14.8	14.8	5.6	6.4	7.2	7.2	7.6	9.2	9.2	9.2	9.2	9.2	9.2
Meat Cattle:														
Friesian	-	-	-	0.8	1.2	1.2	1.2	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Baladi	4.8	5.6	5.6	2.0	2.4	2.8	2.8	3.2	3.6	3.6	3.6	3.6	3.6	3.6
Sheep	-	-	-	2.0	2.4	2.4	2.4	2.8	3.2	3.2	3.2	3.2	3.2	3.2

Table F-77 Annual Amortization for Land and House

-3 years in grace period-

Farm Size	5 Feddan	15 Feddan	20 Feddan
1. Reclamated Land	25,000	75,000	100,000
2. House (LE)	2,500	8,000	8,000
3. Repayment Period (year)	25	25	25
4. Grace Period (year)	3	3	3
5. Interest (%)	0	1.0	1.0
6. Total Value of Interest			
a. Annual amortization of capital(LE) (X)	1,250	3,773	4,909
b. Times of repayment (LE) (n)			
c. Total Value=X x i x1/2 x $\frac{n(n+1)}{2}$ =1.265X	0	4,773	6,210
7. Total Money Borrowed	27,500	87,773	114,210
8. Annual Amortization (Land, House) 7÷22	1,250	3,990	5,191

Table F-78 Annual Amortization for Land and House

-5 years in grace period-

Farm Size	5 Feddan	15 Feddan	20 Feddan
1. Reclamated Land	25,000	75,000	100,000
2. House (LE)	2,500	8,000	8,000
3. Repayment Period (year)	25	25	25
4. Grace Period (year)	5	5	5
5. Interest (%)	0	1.0	1.0
6. Total Value of Interest			
a. Annual amortization of capital(LE) (X)	1,375	4,150	5,400
b. Times of repayment (LE) (n)	20	20	20
c. Total Value=X x i x1/2 x $\frac{n(n+1)}{2}$ = 1.05 X	0	4,358	5,670
7. Total Money Borrowed (LE)	27,500	87,358	113,670
8. Annual Amortization Land, House) 7÷22	1,375	4,368	5,684

Table F-79 Annual Amortization for Animal

	5 Feddan	15 Feddan	20 Feddan
1. Number Animal			
Baladi to be bought in 1990 year (head)	4.4	13.2	17.6
Friesian to be bought in 1992 or 1993 year (head)	0.8	2.4	3.2
2. Borrowed money			
Baladi (unit: 250 LE)	1,100	3,300	4,400
Friesian(unit: 600 LE)	480	1,440	1,920
3. Repayment Period (year)	5	5	5
4. Interest (%)	6.0	6.0	6.0
5. Total value of interest			
a. Annual amortization of capital (LE) (x)			
Baladi	220	660	880
Friesian	96	288	384
b. Total value (LE) (0.45x)			
Baladi	99	297	396
Friesian	43	130	173
6. Total money borrowed (LE)			
Baladi	1,199	3,597	4,796
Friesian	523	1,570	2,093
7. Annual Amortization 6 ÷ 5			
Baladi	240	719	959
Friesian	105	314	419

Table F-80 Annual Amortization for Land, House and Animal - 5 Feddan Farm

- 3 year in Grace Period on Land & House - (Unit : L.E.)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
5 Feddan Farm														
Land Class 2, 3														
a. Land & House	-	-	-	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
b. Animal														
Baladi	220	240	240	240	240	-	-	-	-	-	-	-	-	-
Friesian	-	-	105	105	105	105	105	-	-	-	-	-	-	-
sub-total	220	240	345	345	345	105	105	-	-	-	-	-	-	-
c. Total Amortization	220	240	345	1,595	1,595	1,355	1,355	1,250	1,250	1,250	1,250	1,250	1,250	1,250
Land Class 4														
a. Land & House	-	-	-	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
b. Animal														
Baladi	220	240	240	240	240	-	-	-	-	-	-	-	-	-
Friesian	-	-	-	105	105	105	105	105	-	-	-	-	-	-
sub-total	220	240	240	345	345	105	105	105	-	-	-	-	-	-
c. Total Amortization	220	240	240	1,595	1,595	1,355	1,355	1,355	1,250	1,250	1,250	1,250	1,250	1,250

Table F-S1 Annual Amortization for Land, House and Animal - 5 Feddan Farm

- 5 years in Grace Period on Land & House - (Unit : L.E.)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
5 Feddan Farm														
Land Class 2,3														
a. Land & House	-	-	-	-	-	1,375	1,375	1,375	1,375	1,375	1,375	1,375	1,375	1,375
b. Animal														
Baladi	220	240	240	240	240	-	-	-	-	-	-	-	-	-
Friesian	-	-	105	105	105	105	105							
sub-total	220	240	345	345	345	105	105							
c. Total Amortization														
	220	240	345	345	345	1,585	1,585	1,375	1,375	1,375	1,375	1,375	1,375	1,375
Land Class 4														
a. Land & House	-	-	-	-	-	1,375	1,375	1,375	1,375	1,375	1,375	1,375	1,375	1,375
b. Animal														
Baladi	220	240	240	240	240	-	-	-	-	-	-	-	-	-
Friesian	-	-	-	105	105	105	105	105	-	-	-	-	-	-
sub-total	220	240	240	345	345	105	105	105	-	-	-	-	-	-
c. Total Amortization														
	220	240	240	345	345	1,585	1,585	1,585	1,375	1,375	1,375	1,375	1,375	1,375

Table F-82 Farm Budget of 5.0 Feddan Farm (M1 Block Land Class 2, 3)

(Unit: L.E.)

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Gross Income															
Crop		504	630	1,978	2,187	2,402	2,647	2,829	3,914	4,273	4,371	4,437	4,437	4,437	4,437
Livestock		1,058	3,234	2,240	2,687	3,003	3,003	3,387	3,835	3,835	3,835	3,835	3,835	3,835	3,835
Total		1,562	3,864	4,218	4,874	5,405	5,650	6,216	7,749	8,108	8,206	8,272	8,272	8,272	8,272
Production Cost															
Crop		316	316	666	729	823	862	891	1,029	1,044	1,058	1,076	1,076	1,076	1,076
Livestock		410	1,898	1,369	1,644	1,836	1,836	2,075	2,347	2,347	2,347	2,347	2,347	2,347	2,347
Total		726	2,214	2,035	2,373	2,659	2,698	2,966	3,373	3,388	3,402	3,423	3,423	3,423	3,423
Net Prod. Value															
Crop		188	314	1,312	1,458	1,579	1,785	1,938	2,885	3,229	3,313	3,361	3,361	3,361	3,361
Livestock		648	1,336	871	1,043	1,167	1,167	1,312	1,488	1,488	1,488	1,488	1,488	1,488	1,488
Total		836	1,650	2,183	2,501	2,746	2,952	3,250	4,376	4,720	4,804	4,849	4,849	4,849	4,849
Annual Amortization (Land, House and Animal)															
	A	220	240	345	1,595	1,595	1,355	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250
	B	220	240	345	345	345	1,585	1,585	1,375	1,375	1,375	1,375	1,375	1,375	1,375
Water Charge (37 L.E. x 5 fed.)		185	185	185	185	185	185	185	185	185	185	185	185	185	185
Living Cost		1,200	1,260	1,330	1,400	1,480	1,560	1,650	1,800	1,900	2,040	2,040	2,040	2,040	2,040
Balance	A	-769	-35	323	-679	-514	-148	60	1,141	1,385	1,329	1,374	1,374	1,374	1,374
	B	-769	-35	323	571	736	-378	-170	1,016	1,260	1,204	1,249	1,249	1,249	1,249

Note : Grace period on land and house is calculated using two cases.
A ..... 3 years B ..... 5 years

Table F-83 Farm Budget of 5.0 Feddan Farm (M1 Block, Land Class 4)

(Unit: L.E.)

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Gross Income															
Crop		504	530	630	1,978	2,187	2,402	2,647	2,829	3,074	3,317	4,175	4,273	4,371	4,437
Livestock		1,058	3,234	3,234	2,240	2,812	3,003	3,387	3,835	3,835	3,835	4,835	3,835	3,835	3,835
Total		1,562	3,864	3,864	4,218	4,999	5,405	6,034	6,664	6,909	7,142	8,010	8,108	8,206	8,272
Production Cost															
Crop		316	316	316	681	713	792	811	885	914	914	1,029	1,044	1,058	1,076
Livestock		410	1,898	1,898	1,368	1,724	1,836	2,075	2,347	2,347	2,347	2,347	2,547	2,347	2,347
Total		726	2,214	2,214	2,049	2,437	2,628	2,886	3,229	3,258	3,251	3,376	3,391	3,402	3,423
Net Prod. Value															
Crop		188	314	314	1,297	1,474	1,610	1,836	1,944	2,160	2,393	2,522	3,229	3,313	3,361
Livestock		648	1,336	1,336	872	1,088	1,167	1,312	1,488	1,488	1,488	1,488	1,488	1,488	1,488
Total		836	1,650	1,650	2,169	2,562	2,777	3,148	3,435	3,651	3,881	4,010	4,717	4,801	4,849
Annual Amortization (Land, House)															
	A	220	240	240	1,595	1,595	1,355	1,355	1,355	1,250	1,250	1,250	1,250	1,250	1,250
	B	220	240	240	345	345	1,585	1,585	1,585	1,375	1,375	1,375	1,375	1,375	1,375
Water Charge (37 L.E. x 5 fed)		185	185	185	185	185	185	185	185	185	185	185	185	185	185
Living Cost		1,200	1,260	1,330	1,400	1,480	1,560	1,650	1,800	1,900	2,040	2,040	2,040	2,040	2,040
Balance	A	-769	-35	-105	-1,011	-698	-323	-42	95	316	406	535	1,242	1,326	1,374
	B	-769	-35	-105	239	552	-553	-272	-135	191	281	410	1,117	1,201	1,249

NNote: Grace Period on land and house is calculated using two cases.

A ..... 3 years B ..... 5 years.

Table F-84 Farm Budget of 15 Feddan Farm (M1 Block, Land Class 2,3)

(Unit: L.E.)

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Gross Income															
Crop		1,512	1,890	5,934	6,561	7,206	7,941	8,487	11,742	12,819	13,113	13,311	13,311	13,311	13,311
Livestock		3,174	9,702	6,720	8,061	9,009	9,009	10,161	11,505	11,505	11,505	11,505	11,505	11,505	11,505
Total		4,686	11,592	12,654	14,622	16,215	16,950	18,648	23,247	24,324	24,618	24,816	24,816	24,618	24,816
Production Cost															
Crop		948	948	1,998	2,187	2,469	2,586	2,673	3,087	3,132	3,174	3,228	3,228	3,228	3,228
Livestock		1,230	5,694	4,107	4,932	5,508	5,508	6,225	7,041	7,041	7,041	7,041	7,041	7,041	7,041
Hired Labor		258	1,825	1,034	1,034	1,034	1,034	1,034	1,034	1,034	1,034	1,034	1,034	1,034	1,034
Total		2,436	8,467	7,139	8,153	9,011	9,128	9,932	11,162	11,207	11,249	11,303	11,303	11,303	11,303
Net Prod. Value															
Total		2,250	3,125	5,515	6,469	7,204	7,822	8,716	12,085	13,117	13,369	13,513	13,513	13,513	13,513
Annual Amortization (Land, House and Animal)															
	A	660	719	1,033	5,023	5,023	4,304	4,304	3,990	3,990	3,990	3,990	3,990	3,990	3,990
	B	660	719	1,033	1,033	1,033	4,682	4,682	4,368	4,368	4,368	4,368	4,368	4,368	4,368
Water Charge (37 L.E. x 15 fed)		555	555	555	555	555	555	555	555	555	555	555	555	555	555
Living Cost		1,200	1,260	1,330	1,400	1,480	1,560	1,650	1,800	1,900	2,040	2,040	2,040	2,040	2,040
Balance	A	-165	591	2,597	-509	146	1,430	2,207	5,740	6,672	6,784	6,928	6,928	6,928	6,928
	B	-165	591	2,597	3,481	4,136	1,025	1,829	5,362	6,294	6,406	6,550	6,550	6,550	6,550

Note : Grace Period on land and house is calculated using two cases.

A ..... 3 years B ..... 5 years

Table F-85 Farm Budget of 15 Feddan Farm (M1 Block, Land Class 4)

(Unit : L.E.)

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Gross Income															
Crop		1,512	1,890	1,890	5,934	6,561	7,206	7,941	8,487	9,222	9,951	12,525	12,819	13,113	13,311
Livestock		3,174	9,702	9,702	6,720	8,436	9,009	10,161	11,505	11,505	11,505	11,505	11,505	11,505	11,505
Total		4,686	11,592	11,592	12,654	14,997	16,215	18,102	19,992	20,727	21,426	24,030	24,324	24,618	24,816
Production Cost															
Crop		948	948	948	2,043	2,139	2,376	2,433	2,655	2,742	2,742	3,087	3,132	3,174	3,228
Livestock		1,230	5,694	5,694	4,104	5,172	5,508	6,225	7,041	7,041	7,041	7,041	7,041	7,041	7,041
Hired Labor		258	1,825	1,825	1,034	1,034	1,034	1,034	1,034	1,034	1,034	1,034	1,034	1,034	1,034
Total		2,436	8,467	8,467	7,181	8,345	8,918	9,692	10,730	10,817	10,817	11,612	11,207	11,249	11,303
Net Prod. Value															
Total		2,250	3,125	3,125	5,473	6,652	7,297	8,410	9,262	9,910	10,609	12,868	13,117	13,369	13,513
Annual Amortization (Land, House and Animal)															
	A	660	719	719	5,023	5,023	4,304	4,304	3,990	3,990	3,990	3,990	3,990	3,990	3,990
	B	660	719	719	1,033	1,033	4,682	4,682	4,368	4,368	4,368	4,368	4,368	4,368	4,368
Water Charge (37 L.E. x 15 fed)		555	555	555	555	555	555	555	555	555	555	555	555	555	555
Living Cost		1,200	1,260	1,330	1,400	1,480	1,560	1,650	1,800	1,900	2,040	2,040	2,040	2,040	2,040
Balance	A	-165	591	521	-1,505	-406	878	1,901	2,917	3,465	4,024	6,283	6,532	6,784	6,928
	B	-165	591	521	2,485	3,584	500	1,523	2,539	3,087	3,646	5,905	6,154	6,406	6,550

Note : ibid

Table F-86 Farm Budget of 20 Feddan Farm (M1 Block, Land Class 2,3)

(Unit: L.E.)

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Gross Income															
Crop		2,016	2,520	7,912	8,748	9,608	10,588	11,316	15,656	17,092	17,484	17,748	17,748	17,748	17,748
Livestock		4,232	12,936	8,960	10,748	12,012	12,012	13,548	15,340	15,340	15,340	15,340	15,340	15,340	15,340
Total		6,248	15,456	16,872	19,496	21,620	22,600	24,864	30,996	32,432	32,824	33,088	33,088	33,088	33,088
Production Cost															
Crop		1,264	1,264	2,664	2,916	3,292	3,448	3,564	4.116	4,176	4,232	4,304	4,304	4,304	4,304
Livestock		1,640	7,592	5,476	6,576	7,344	7,344	8,300	9,388	9,388	9,388	9,388	9,388	9,388	9,388
Hired Labor		541	2,738	2,165	2,165	2,165	2,165	2,165	2,165	2,165	2,165	2,165	2,165	2,165	2,165
Total		3,445	11,594	10,305	11,657	12,801	12,957	14,029	15,669	15,729	15,785	15,857	15,857	15,857	15,857
Net Prod. Value															
Total		2,803	3,862	6,567	7,839	8,819	9,643	10,835	15,327	16,703	17,039	17,231	17,231	17,231	17,231
Annual Amortization (land, House and Animal)															
	A	880	959	1,378	6,569	6,569	5,619	5,610	5,191	5,191	5,191	5,191	5,191	5,191	5,191
	B	880	959	1,378	1,378	1,378	6,103	6,103	5,684	5,684	5,684	5,684	5,684	5,684	5,684
Water Charge. (37 L.E. x 20 fed)		740	740	740	740	740	740	740	740	740	740	740	740	740	740
Living Cost		1,200	1,260	1,330	1,400	1,480	1,560	1,650	1,800	1,900	2,040	2,040	2,040	2,040	2,040
Balance	A	-17	903	3,119	-870	30	1,733	2,835	7,596	8,872	9,068	9,260	9,260	9,260	9,260
	B	-17	903	3,119	4,321	5,221	1,240	3,342	7,103	8,379	8,575	8,767	8,767	8,767	8,767

Note : ibid

Table F-87 Farm Budget of 20 Feddan Farm (M1 Block, Land Class 4)

(Unit: L.E.)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Gross Income														
Crop	2,016	2,520	2,520	7,912	8,748	9,608	10,588	11,316	12,296	13,268	16,700	17,092	17,484	17,484
Livestock	4,232	12,936	12,936	8,960	11,248	12,012	13,548	15,340	15,340	15,340	15,340	15,340	15,340	15,340
Total	6,248	15,456	15,456	16,872	19,996	21,620	24,136	26,656	27,636	28,568	32,040	32,432	32,824	33,088
Production Cost														
Crop	1,264	1,264	1,264	2,724	2,852	3,168	3,244	3,540	3,656	3,656	4,116	4,176	4,232	4,304
Livestock	1,640	7,592	7,592	5,472	6,896	7,344	8,300	9,388	9,388	9,388	9,388	9,388	9,388	9,388
Hired Labor	541	2,738	2,738	2,165	2,165	2,165	2,165	2,165	2,165	2,165	2,165	2,165	2,165	2,165
Total	3,445	11,594	11,594	10,361	11,913	12,677	13,709	15,093	15,209	15,209	15,669	15,729	15,785	15,857
Net Prod. Value														
Total	2,803	3,862	3,862	6,511	8,083	8,943	10,427	11,563	12,427	13,359	16,371	16,703	17,039	17,231
Annual Amortization (Land, House and Animal)														
A	880	959	959	6,569	6,569	5,610	5,610	5,610	5,191	5,191	5,191	5,191	5,191	5,191
B	880	959	959	1,378	1,378	6,103	6,103	6,103	5,684	5,684	5,684	5,684	5,684	5,684
Water Charge (37 L.E. x 20 fed)	740	740	740	740	740	740	740	740	740	740	740	740	740	740
Living Cost	1,200	1,260	1,330	1,400	1,480	1,560	1,650	1,800	1,900	2,040	2,040	2,040	2,040	2,040
Balance A	-17	903	833	-2,198	-706	1,033	2,427	3,413	4,596	5,388	8,400	8,732	9,068	9,260
B	-17	903	833	2,993	4,485	540	1,934	2,920	4,103	4,895	7,907	8,239	8,575	8,767

Note : ibid.

ANNEX . MINUTES OF MEETING

MINUTES OF MEETING

OF

FEASIBILITY STUDY

ON

SOUTH HUSSINIA VALLEY

AGRICULTURAL DEVELOPMENT PROJECT PHASE II

IN

ARAB REPUBLIC OF EGYPT

August 27, 1983, Cairo

藤野 欽一

K. Fujino

ON BEHALF OF

JAPANESE-TEAM

KINICHI FUJINO

ON BEHALF OF

EGYPTIAN GOVERNMENT

MINUTES OF MEETING

(August 21 - August 27, 1983)

In response to the request of the Government of Arab Republic of Egypt (hereinafter referred to as "the Government") the scope of works team (hereinafter referred to as "the Team") sent by Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the technical cooperation on behalf of the Government of Japan, discussed the feasibility study of the South Hussinia Valley Agricultural Development Project Phase II (hereinafter referred to as "the Project") in the Arab Republic of Egypt with counterparts, General Authority for Rehabilitation Project and Agricultural Development (hereinafter referred to as "GARPAD") as a representative for the Ministry of Development, State for Housing, and Land Reclamation and other authorities concerned. Member list of both sides are attached in Annex I (A and B). Both sides agreed on the Scope of Works attached in Annex II, and in that connection both sides had the following discussions;

1. Both sides agreed that the feasibility study would be executed, using the terms of reference attached in Annex III as a guideline after the terms of reference was amended as follows.

(1) Page 27-II-Re. 1
Re. 1 (field soil survey)

a. Upland area (60% of total project area)
One augering per 200 feddan:
- General depth 2 m
- Depth 3 m: one every 2,000 feddan = (one every 10 augerings)
- Depth 4-5m: one every 5,000 feddan = (one every 25 augerings)

Furthermore open pit survey would be executed by the Government in close contact with the feasibility study team as follows.

- Five open pits for each major soil type
- Three open pits for each secondary soil type

b. Swamp & inundated area (40% of total project area)
One augering per 500 feddan with the depth of 2 m

Approximate total number of augerings in the project area 74,000 feddan

- Depth 4-5 m: 9 (upland area)
- Depth 3 m: 23 (upland area)
- Depth 2 m: 222 (upland area) + 60 (swamp & inundated area)

(2) Page 28-II-Re. 2
Re. 2 (hydraulic conductivity)

a. Upland area
One measuring site per 2,000 feddan

b. Swamp & inundated area
One measuring site per 4,000 feddan

In each site 2 locations; some 10 meters apart.
In each location measurement till 2 different depth.
These measurements to be combined with the field soil survey and to be executed by the same people.

Number of sites	23 (upland area) +	7 (swamp & inundated area)
Number of locations	46 (upland area) +	14 (swamp & inundated area)
Number of measurements	92 (upland area) +	28 (Swamp & inundated area)

2. (1) Laboratory leaching experiment

Both sides agreed that the laboratory leaching test would be carried out by the Government with the expense of JICA by the end of November. JICA would supply the equipment necessary for the laboratory leaching test.

(2) Field leaching experiment

In order to improve the accuracy of the result of the Laboratory leaching experiment above both sides agreed that the following investigations would be carried out as soon as possible by the Government.

a. Arrangement of the field leaching experiment plots at the location which both sides agreed upon and the source of water which is recommended by the team.

b. Leaching tests described in the terms of reference. The analysis of the leaching test results would be carried out by the Japanese feasibility study team.

3. As far as the marketing survey and socio-economic survey are concerned, both sides agreed that the Government would present data and information obtained in the feasibility study of North Hussinia Valley and South Port Said Agricultural Development Project and provide the obtained data and information to the Japanese feasibility study team of the Project.

4. Both sides agreed that the Government would designate needed number of counterparts for the feasibility study team in order to finish the study in a shorter period.

5. The team recognized that the Project was scheduled to be implemented from 1983/1984 in the five year plan and that the Government attached the great importance to the Project. For the above reason, both sides agreed to make an effort for the smoother execution of the feasibility study of the Project.

6. Both sides agreed that the evaluation of the total cost includes among other things the cost of housing. The Government will clarify the concept of the facilities to be included in the study at the first meeting with the feasibility study team.

7. Both sides agreed that GARPAD will be the representative of the Government for the project and make good coordination among the relevant authorities of the Government in the feasibility study execution.

MEMBER LIST OF GOVERNMENT OF EGYPT TEAM

Name	Position
Eng. Abdel Wahab Selim	Chairman, General Authority for Rehabilitation Projects and Agricultural Development (GARPAD)
Eng. Maher Bahaa Eldin	Vice Chairman, GARPAD
Dr. Rifki Anwar	Technical Counselor, GARPAD
Dr. Samier Nagmoush	Technical Counselor, GARPAD
Eng. Youssif Amin	Technical Counselor, GARPAD

MEMBER LIST OF
JAPAN INTERNATIONAL COOPERATION AGENCY TEAM

Name	Position
Mr. Kin-ichi FUJINO	Director, Integrated Rural Development Office, Land Improvement & Consolidation Div., Agricultural Structure Improvement Bureau, Ministry of Agriculture, Forestry, & Fisheries (MAFF)
Mr. Kazuyuki KOBAYASHI	Section Chief, Irrigation & Drainage Div., Agricultural Structure Improvement Bureau, MAFF
Mr. Teruyoshi KUMASHIRO	Staff, Technical Affairs Div., Agricultural, Forestry, & Fisheries Planning & Survey Dept., Japan International Cooperation Agency

SCOPE OF WORKS FOR FEASIBILITY STUDY

ON

THE SOUTH HUSSINIA VALLEY

AGRICULTURAL DEVELOPMENT PROJECT PHASE II

IN

THE ARAB REPUBLIC OF EGYPT

I. INTRODUCTION

In response to the request of the Government of the Arab Republic of Egypt (hereinafter referred to as "the Government"), the Government of Japan has decided to conduct the feasibility study on the South Hussinia Valley Agricultural Development Project Phase II, (hereinafter referred to as "the Project") in accordance with laws and regulations in force in Japan. The Japan International Cooperation Agency (JICA), the official agency responsible for the implementation of the technical cooperation programme of the Government of Japan, will carry out the study.

This scope of works is prepared to indicate the outline of essential features of the feasibility study which is to be carried out in close cooperation with the Government and its authorities concerned.

II. OBJECTIVES OF THE STUDY

The objectives of the study are:

1. To formulate the phase II development plan of the South Hussinia Valley Agricultural Development Project which mainly consists of cash crop cultivation, stockbreeding development, agro-industrialization, community development etc. on the basis of the result of the feasibility study of the phase I development of the project which was executed by JICA in 1980 and to examine and assess the feasibility of the overall project, and

2. To transfer the technology, related to the study to Egyptian counterparts through their participation in the survey.

The objective area is approximately 74,000 feddan (31,000 ha).

III. OUTLINE OF THE STUDY

The study will include field work and home work described as follows:

A. Field Work

1-1. Collection and review of the relevant existing data and information including.

a. Soil
b. Irrigation and drainage
c. Agronomy
d. Stockbreeding
e. Agro-industry
f. Agro and regional economy and social structure
g. Social infrastructure
h. Other supplementary data and information

1-2. Field survey and analysis

a. Soil survey
b. Land use survey
c. Irrigation and drainage survey
d. Land reclamation survey
e. Land disposal survey
f. Agronomy survey (including mechanization)
g. Stockbreeding survey
h. Agro-economy survey
i. Agro-industry survey
j. Regional economy and socio-demography survey
k. Construction materials and costs survey
l. Marketing survey
m. Determination of the basic items for the project planning including:

(a) Outline of water requirement
(b) Outline of the land use and cropping pattern
(c) Outline of irrigation and drainage method and network
(d) Leaching method
(e) Outline of land reclamation plan
(f) Estimation of yield
(g) Outline of Stockbreeding Development Plan
(h) Outline of Agro-industrialization Plan
(i) Outline of land disposal plan
(j) Outline of social infrastructure plan

B. Home Work

(1) Formulation of overall agricultural development plan
(2) Estimation of the costs and benefits of the project
(3) Economic evaluation
(4) Preparation of implementation schedule of the project
(5) Formulation of maintenance and operation plan for the project

IV. WORK SCHEDULE

The work schedule is shown in the attached sheet. To carry out the study, JICA will dispatch the required survey team (hereinafter referred to as "the Team") in accordance with the work schedule attached herewith.

V. REPORTS

JICA will prepare and submit to the Government following reports in English.

1. Plan of Operation
   Twenty (20) copies at the commencement of the study
2. Field Report
   Twenty (20) copies at the end of the field work
3. Draft Final Report
   Twenty (20) copies at the end of the home work
   Within one month after the draft final report presentation by JICA, the Government will forward its comments on the draft final report.
4. Final Report
   Fifty (50) copies within two (2) months after receipt of the comments of the draft final report.

VI. UNDERTAKING OF THE GOVERNMENT OF EGYPT

To facilitate smooth performance of the field work, the Government is requested.

(1) To designate the following counterpart personnel to cooperate the Team in conducting the survey effectively,
   a. General Planning
   b. Soil
   c. Irrigation and Drainage

d. Agronomy
e. Stockbreeding
f. Agro-industry
g. Community Development
h. Agro-economy

The number of counterparts personnel and their assignment period should be decided by prior consultation on the Team with Egyptian Authorities concerned at the commencement of the study.

(2) To provide the available data and information for the survey and permit the Team to bring them back to Japan for the home work within regulation in force in Egypt,
(3) To provide for the Team permission to enter and conduct the survey in the Project Area,
(4) To arrange the Team's visit to relevant ministries, local government and other public agencies,
(5) To make arrangement for the quick and smooth custom clearance of the survey equipment and materials brought by the Team for field study into Egypt and for exemption from any taxes, duties and charges imposed on those,
(6) To make arrangement of exemption from taxes, duties, and charges to be imposed on the incomes of the Team members, provided that such incomes are not derived from local sources,
(7) To arrange vehicles and motorboats for the field operation,
(8) To arrange the recruitment of non-technical local staff such as secretaries, typists, labourers, and drivers,
(9) To provide the Team with an office space both near the Project site and in Cairo, and to arrange accommodation near the Project site,
(10) To guarantee the security of the Team members during the survey period,

(11) To arrange medical services for the Team during its stay in Egypt, if necessary, and

(12) To undertake to bear claims, if any arises, against the Team in the survey resulting from, occurring in the course of, or otherwise with the discharge of their official functions in Egypt, except for those claims arising from the willful misconducts or gross negligence of the Team.

VII. UNDERTAKING OF JICA

The followings are to be undertaken by the Government of Japan:

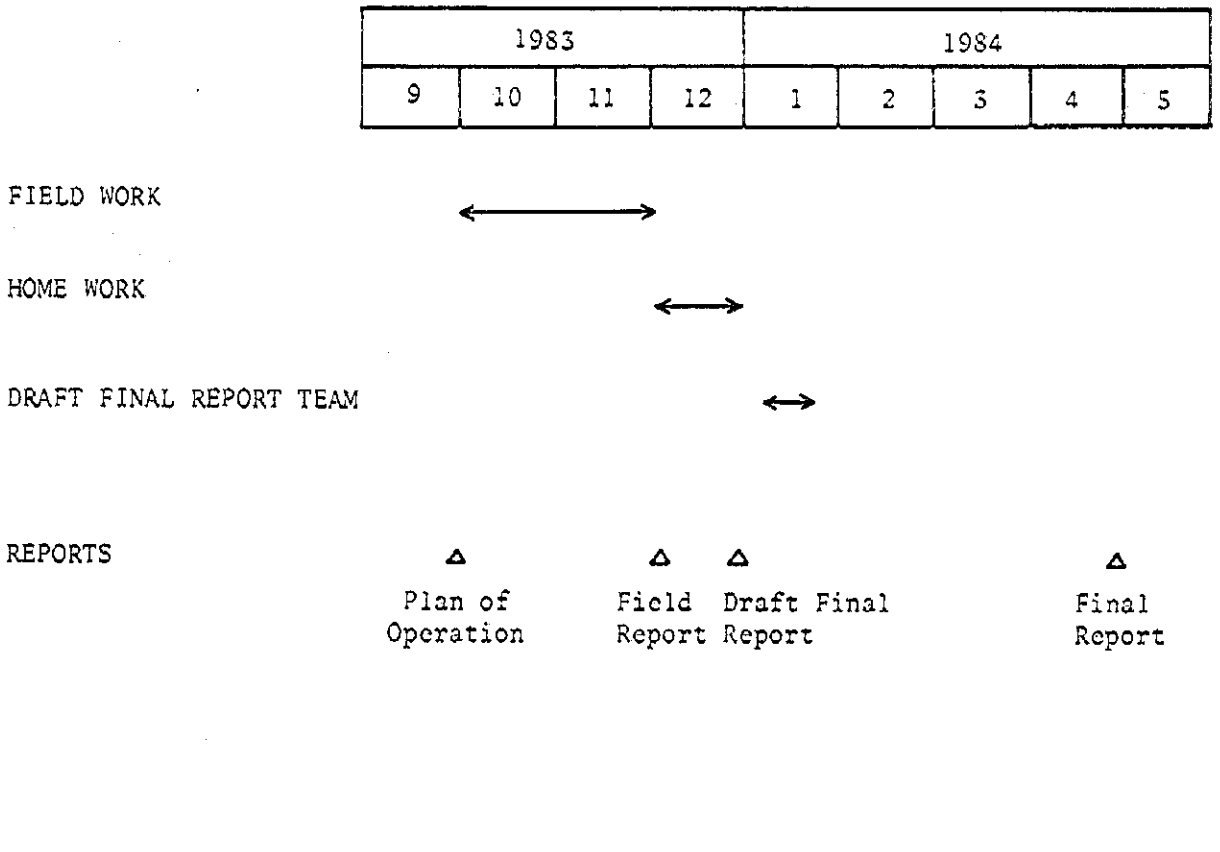
(1) To dispatch the Team to conduct field study,

(2) To transfer the technology related to this survey to Egyptian counterparts through their participation in the survey,

(3) To bear the direct cost of the whole survey and preparation of the feasibility study and report except for the cost borne by the Government of Egypt, and

(4) To receive Egyptian counterpart personnel in Japan and bear the expense of transportation and stay.

TENTATIVE SCHEDULE OF THE FEASIBILITY STUDY



Terms of Reference for Feasibility Study

For

The South Hussinia Valley Agricultural Development Project

Phase II

Study Objectives of Phase II

1. The determine the best way for land reclamation practice under the prevailing local conditions including; irrigation and drainage systems, reclaimability and drainability of the soils, infrastructures, together with the execution programme, time schedule and cost estimates.

2. Study more than one alternative to determine the optimum crop rotation and crop pattern recommended for implementation, farm machinery farm unit production and farm management. Prepare farm models and cash flows in accordance with FAO/CP guidelines.

3. To study the animal production development in the project area as related to the suggested crop rotation.

4. To study the possibilities of industrializing the agricultural and animal production and investigate their cost marketing facilities, price return benefits for different marketing packs.

   It's important to assess the benefits which could be obtained through the implementation of agro-industrial complex for the national economy.

5. To study the technical, economic and financial implications of alternative marketing systems for the different crops, animal production and industrial products.

6. To study the different methods of land disposal in the project area and the community development needed to select one or a combination of those systems that proves to be the best. Also to make a socio-economic survey of present land occupation in the project area, number of farmers, farm size, classes, types of farms crops, fish farms .... etc.

7. Evaluation of the total cost of the project including all infrastructures, roads, electricity network, potablewater, industries .... in phase I after its up dating.

8. To carry out a complete economical and financial evaluation for the implementation of the project.

9. preparation of implementation schedule of the project.

Consultant's Tasks:

Results of phase II of the study will interface with the results of phase I and the overall planning of the project area.

Task I: Collection of Available Information:

To collect and analyse all pertiment and available data and information and if needed generate additional information necessary for the adequate completion of the feasibility study (including a socio-economic survey of present land use and land tenure)

Task II: Land Reclamation:

The consultant will study the most suitable method of reclamation of the project area, based on the results of the soil studies and water.

It is important to select the appropriate irrigation system, hence various methods of surface irrigation such as border, strip and furrow irrigation should be investigated to select the optimum method under different conditions of soils and crops.

The consultant will conduct further field investigations on drainability and reclaimability of the soils and determine the following:-

1. Identification of the occurrence, depth, tickness and nature of permeable and poorly permeable strata to a peneral depth of 2 meters, with 10 percent up to 5 meters.

2. Quantitative assessment of horizontal permeability and transmissivity of permeable layers.

3. Quantitative assessment of vertical resistivity of overlying soil layers.

4. Quantitative assessment of leaching characteristics.

Specifications of the study for augerings and hydraulic conductivity tests are given in Annex I.

Task III: Crop Rotation:

It is very important to make the best use of irrigation water, for this reason the development of alternative cropping rotations, and staging of project development on a year by year basis is requested.

The final crop station should include fodder crops for animal husbandry, field crops, industrial crops, and vegetable for fresh exportation and canning. In all events various rotations should be suggested for the final cropping pattern after reaching the stage of merginal planting with the aim of selecting the most appropriate rotation to the prevailing conditions and with the highest economic return.

The study should include the economic unit production based on the suitable crop rotation.

Due to the lack of hand labour and high wages, the use of farm machinery should be considered, the mechanization requirements of the selected alternatives of crop rations for small and large holders will be evaluated, as related to labour requirements, including the identification of

type and number of requiring machines for both centralized mechanization and local utilization. The input requirements needed for the suitable crop rotation (seed fertilizers, pesticided, herbicides, fuel, lubricants, labour .... etc.) leading to the definition of production cost should be studied.

Task IV: Animal Production:

Since the crop rotation will include fodder crop for animal production, it is important to study the animal husbandry (includes beef, sheep and chicken) of the project. The study will include the type and number of animals recommended, their housing system, rations & products. The specifications, costs, inputs and outputs of such investment are also studied. The study have to include buffalo system based on milk, cheese and ghee production.

Task V: Agro-industry:

The consultant should list and explore any industries which would be installed in the project area to cover the industrialization aspect of the project. The study will include the possibility of processing, preserving and manufacturing of various yields of vegetables fruits and animal production in the area.

Technical and economical analyses for various suggested units, size, simplified design and marketing plans either for national consumption or exporting should be studied.

The technical component will focus on: raw materials, location parameter, inputs, output technology, manpower, organization, management services, supporting infrastructure and training. The economic and financial aspect will include: investment and running costs, income, market input and output, taxes, economic and financial rate of return.

Task VI: Marketing:

The study will be carried to identify for the forecasted different products obtained from the most suitable cropping system and animal production either directly or after their transformation the national or international marketing potential, and determine the following:-

- The selling potential of such products
- Their price trend, to be used as in input to the project economical analysis
- Their main qualitative characteristics for better respond to market demand (processing, preservation and packing modalities.

The results of the marketing study, the climatic features and the land capability will make it possible to identify the crops and preferential cropping systems to be further analyzed at technical and economic level.

Task VII: Land Tenure and Community Development:

Different methods of land tenure systems in the project area, such as land distribution among settlers, distribution among college graduates, areas for joint ventures, or land sales, should be studied.

The consultant should select one or more of these methods which he believes is the most suitable. After the selection of the land tenure method the infrastructure and service buildings a community development approach in agreement with the selected method must be outlined.

The study will include the economically suitable acreage and sites allocated to each of these categories.

Task VIII: Evaluation of the Total Cost:

Cost estimates for all components studied in phase II will be evaluated.

The capital and operational costs needed will be quantified, with breakdown in local and foreign currency.

Cost analysis for the various agricultural production sectors, mechanization and agro-industrial complexes will be worked in as much detail as possible. The overall total cost of the project phase I (after adding escalation of price) and phase II will be evaluated.

Task IX: Economical Analysis:

In order to decide upon the economic viability of the project the consultant is requested to undertake an economic analysis of the project and present tables showing the economic parameters of the project. These parameter will reflect the detail cost of the capital investment broken down by system elements and correlated to execution phases into the local and foreign components of said cost payment of loans, yearly operational cost and returns, cash flows, foreign flow, calculation of internal rate of return sensitivity test and any other tables which might reflect the accurate economical status of the project.

Additionally the consultant shall investigate the possible means of financing the project and evaluating the relevant financial costs in local and foreign currency.

Task X: preparation of Implementation Schedule:

To provide the planning necessary for the realization of the different activities of phase II as it interiace with activities of phase I i.e. the overall planning of the project area (water supply, irrigation, and drainage networks, land rehabilitation, agriculture, agro-industries, infrastructure ... etc.) allowing for the possibility of project implementation by stages whereby each area of the project and its village would represent a stage of the process. For each system within each village area, a detailed time schedule for realization work will be prepared, to be correlated to the relevant manpower and cost estimates.

DRAINABILITY AND RECLAIMABILITY CLASSIFICATION OF SOILS IN THE SOUTH HUSSINIA PROJECT AREA

I. Components of the Study:

1.1. Identification of permeable and poorly permeable strata by field augering and visual observation of textural and structural characteristics and their vaniation; visual observation when groundwater is first observed and rate of flow into the auger hole (in relation to depth of hole below the static water table). Also consistency of various layers; assessment of ripening of soft clay by squeezing.

1.2. Measurement of hydraulic conductivity by "auger hole method" at different depths in different soil profiles to calibrate the visual observations and estimations as mentioned under 1) above.

1.3. Assessment of vertical permeability (resistivity) and leaching characteristics by small scale field leaching experiments.

1.4. Identification of possible alkali problems and gypsum requirements by detailed laboratory analyses and laboratory leaching disturbed soil. To be done for only a very limited number of surface soil samples. (Soils in the project area are likely to be rich in natural gypsum, so gypsum application will generally not be required).

1.5. Some samples (30-40 samples) of surface layers or representative soils to be taken for complete laboratory analysis. On the same samples laboratory leaching tests to be performed.

1.6. Data of the above investigations to be processed in their inter-relationship and to be presented in a Drainage - Reclamation Potential Classification map, scale 1:10,000 (This is a convenient practical working scale although it may not exactly correspond with the density of observations).

II. QUANTITIES AND SOME SPECIFICATIONS

Re 1. (field survey by augering)

One augering per 200 feddan:

- General depth 2 m
- Depth 3 m: one every 2000 fed (= one every 10 augerings)
- Depth 4-5 m: one every 5000 fed (= one every 25 augerings)

Approximate total number of augerings in the project area 73000 fed.

- Depth 4-5 m: 15
- Depth 3 m: 35
- Depth 2 m: 365

Re 2. (hydraulic conductivity)

One measuring site per 2000 feddan.

In each site 2 locations; some 10 meters apart. In each location measurement till 2 different depths.

These measurements to be combined with survey under.

1) Above and by the same people

Number of sites	35
Number of locations	70
Number of measurements	140

Re 3. (leaching experiments)

Two small - scale drainage-leaching experimental plots in representative soil types.

Arrangement of each plot:

- Minimum 2 parallel open field drains of proper depth; spaced 15 to 25 m; length some 30 to 50 m (length at least 2 times spacing)

- Water level in the drains to be kept low, for which most probably a pump will be needed.

- Basins between drains are flooded; water movement and decrease in salinity are monitored.

Analysis of the data should yield:

- Vertical resistivity of surface clay soil.

- Horizontal transmissivity of permeable sub-soil stratum.

- Leaching characteristics of soil (decrease of salinity in relation to net depth of water percolation)

These data to be used for calibration of soil drainability classification (together with results sub 2) and to estimate speed of reclamation and amount of water needed for reclamation phase prior to cropping.

MINUTES OF MEETING

FOR

PLAN OF OPERATION OF FEASIBILITY STUDY

ON

SOUTH HUSSINIA AGRICULTURAL

DEVELOPMENT PROJECT

IN

ARAB REPUBLIC OF EGYPT

OCTOBER 20, 1983, CAIRO

Shoji Yamada

SHOJI YAMADA

On Behalf of Japanese Team

Samier Nagomoush

SAMIER NAGOMOUSH

On Behalf of Egyptian

Government

Kazumi Ueda

KAZUMI UEDA

On Behalf of Supervisory

Committee, JICA

MINUTES OF MEETING

(October 9, 10 and 12, 1983)

The Japanese and Egyptian delegates appointed to study and discuss the Plan of Operation submitted by the Japanese side for Phase II of the feasibility study for South Hussinia Valley Agricultural Development Project met on October 9, 10 and 12, 1983, and agreed that the Scope of Works with the terms of reference after amendment agreed upon by both parties on August 27, 1983, will be the basis of the study. Hence the Scope of Works with the amended terms of reference previously agreed upon by both parties are considered as an integral part of the Plan of Operation, and in case of any deviation between them, the terms of reference after amendment will be the guideline.

MINUTES OF MEETING

FOR

SOUTH HUSSINIA VALLEY AGRICULTURAL

DEVELOPMENT PROJECT PHASE II

IN

ARAB REPUBLIC OF EGYPT

OCTOBER 29, 1983, CAIRO

SHOJI YAMADA
LEADER OF JAPANESE F/S TEAM (JICA)

SAMIR NAGMOUSH
ON BEHALF OF EGYPTIAN
GOVERNMENT

WITNESSED BY;

KAZUMI UEDA
LEADER OF SUPERVISORY GROUP (JICA)

MINUTES OF MEETING

On 23 October 1983 the Study Team submitted to GARPAD the letters No. SH-001 and -002 requesting to held a meeting to discuss several items and factors involved in its study on the South Hussinia Agricultural Development Project Phase II (hereinafter referred to as "the Project") of which the following items were clarified at the meetings on 25 to 27 October, 1983;

1. Joint-committee, Discussion Item A. General I

The Study Team understands that such sub-committee meetings as held on 26 October 1983 will be arranged for the study on the Project from time to time, and that the joint-committee would consist of the following five sections;

Section	Office	Personnel in Charge
1) Irrigation and Drainage	MOI and GARPAD	Mr. Morris Kamel
2) Agriculture	GARPAD	Dr. Rifki, Mr. Mohamed
3) Construction	-do-	Mr. Yussif Amin
4) Soil	-do-	Dr. Samir Nagmoush
5) Economics	-do-	Mr. H. Badr, Mrs. Elham

2. Land Tenure and Disposal, Discussion Item B

Regarding this item, GARPAD stated that the Study Team should study various land tenure systems, for instance, taking into consideration the land disposal to college graduates and joint ventures, etc., in addition to a study on small land holder system with less than six feddans. In this relation, GARPAD will provide the Study Team with Law 143.

3. Target Cropping Intensity, Discussion Item C-2

The standard cropping intensity is 200 percent. It would be impossible to attain the cropping intensity of 300 percent in the whole Project Area, and this intensity could be marked in limited areas of the Project Area to which vegetable cropping will be introduced.

4. Water Duty of 30 Cubic Meters per Feddan per Day, Discussion Item F-1.

A water duty more than 30 cubic meters but less than 40 cubic meters per feddan per day could be supplied on the premise that such water duty is reasonable from the aspect of cropping patterns: however, the annual total amount of water shall not exceed 8,000 cubic meters per feddan in principle. The water duty on both east and west banks of the Suez Canal has been estimated at 30 cubic meters per feddan per day on an average. However, GARPAD suggested that the water requirement shall be estimated based on the optimum cropping patterns with the highest IRR.

5. The following items were discussed in the sub-committee meeting on 26 October 1983, and the Minutes of the said meeting are annexed to this paper.

Ref. No. SH-001
Item A. General - 2, 3, and 4
F. Irrigation
G. Drainage

Ref. No. SH-002
Item 1.
2.
8.

6. Specially in relation with the soil survey, the Study Team confirmed the following;

a. Soil samples will be handed-over to the laboratory from 3 to 15 November, 1983. Laboratory analyses shall be completed by the end of November. These samples include those obtained in swampy and inundated areas for permeability tests (hydraulic conductivity).

The field report should be prepared at the end of November 1983. The Project Plan in this report should be formulated based on results of laboratory soil analyses and leaching tests. Hence, the Study Team sincerely expects that a part of the results of analyses and tests entrusted to the Government will be sent to Soil Engineer around 20 November, 1983.

b. Leaching Methods

Laboratory leaching tests:

Equipment to be supplied by JICA would be sent to GARPAD at the soonest time possible. The manual for leaching methods would be prepared by Soil Engineer of the Study Team.

Field leaching experiment:

The Government is requested to carry out the experiment as soon as possible in accordance with the S/W.

c. Deep Boring

Deep boring of 10 meters was requested by GARPAD on 11 October 1983 instead of five meters boring. Hence, if extra cost is needed for the deep boring, GARPAD will pay the difference.

MINUTES OF MEETING
ON
IRRIGATION AND DRAINAGE OF THE PROJECT

1. Purpose of the Meeting

By following the recommendation made at the meeting on October 25, 1983 at GARPAD, the sub-committee on irrigation and drainage was held at the Ministry of Irrigation on October 26, 1983. The main objective of the meeting was to discuss and exchange views in the field of irrigation and drainage planning for the Project. The result of discussions at the meeting has been presented hereinafter.

2. Attendance

Egyptian side: Eng. Morris Kamel, Eng. Helmy Mahmoud Ibrahim (MOI)
Eng. Mohamed Rihan, Eng. Hassan Abul El Nasr (GARPAD)

Japanese side: Messrs. K. Ueda, H. Kikuchi, M. Yamawaki, K. Ohta, T. Matsunaga, and O. Yoshida

3. Conclusions of the Meeting

a) The peak water duty at summer shall not exceed 40 cubic meters per feddan per day.
b) The total amount of water to be used shall not exceed 8,000 cubic meters per feddan per year in principle.
c) The El Salaam Canal will convey its water on the basis of a 24 hours per day continuous flow through the year.
d) The salt content of the water in the El Salaam Canal is 800 ppm after mixing.
e) Leaching requirement shall be calculated by using the equation described in the FAO irrigation and drainage paper 24.

f) The feasibility study team will make alternative studies on the irrigation method of gravity and lifting by farmers in consideration of technical soundness and economical feasibility.

g) The feasibility study team will prepare drainage plans based on the results of soil survey and analysis which are in progress.

MINUTES OF MEETING
ON
AGRICULTURE

The meeting on the agriculture section was held on October 26, 1983 at GARPAD. Mr. H. KOHRIKI, Agronomist of the Feasibility Study Team of the Project attended together with Mr. KUMASHIRO of JICA Mission and staff of the North Hussinia Project Feasibility Study Team. The attendants and the kind of crops decided are shown as follows;

1. Attendants

° GARPAD: Dr. RIFKI Anwar
Mr. MOHAMOUD Fahmay
Mr. SALAH Raslan
Mr. SAIED Zahran
Mr. MOHEMED Ebrahiem

° JICA:	Mr. T. Kumashiro	JICA Mission
	Mr. H. Kohriki	South Hussinia F/S Team
	Mr. K. Kariya	North Hussinia F/S Team
	Mr. T. Maruo	- do -
	Mr. S. Shindo	- do -

2. Kind of Crops

The crops to be introduced in crop rotation in the Project are decided as follows;

1) To select the salt tolerant crops and economic crops during the early stage of reclamation

2) Kind of crops

a) Crops for export .... Rice, vegetables and so forth
b) Fodder crops ..... Berseem, sorghum and so forth
c) Industrial crops .... Sugarbeat, vegetables, oil seeds and so forth

3. Crop intensity

To reach 200 percent.

MINUTES OF MEETING
(ECONOMICS)

1. Date: 26 October 1983 (10:20 - 12:30)
2. Place: GARPAD
3. Attendance:

GARPAD:
Eng. Badr Hafez, Agro-Economist

Supervisory Group:
Mr. S. Takemura, Agricultural Economist

Survey Team:
Mr. S. Yamada, Team Leader, South Hussinia Project
Mr. Y. Miyanishi, Agro-Economist, North Hussinia Project

1) As for Second Five Years Plan, GARPAD makes inquiry to the Ministry of Planning about existence and availability of text book for the said Plan in English version.

2) GARPAD has a feeling that an I.R.R. of land reclamation project should be not less than 10 percent.

3) Survey Team explained that such cost for social infrastructure including housing for settlers shall not be included in the economic evaluation of the Project, namely in the calculation of I.R.R. GARPAD requested to calculate I.R.R. in both cases of including and excluding social infrastructure cost.

4) GARPAD will provide available data and information on the Governmental subsidiary system for main food items from the Ministry of Agriculture.

5) Survey Team expressed that the study for marketing shall be conducted during the 2nd stage of field survey.

6) GARPAD commented that an alternative study would be required for planning sugarbeet factory in the Project, taking into consideration the two existing sugarbeet factories.

MINUTES OF MEETING

FOR

SOUTH HUSSINIA VALLEY AGRICULTURAL

DEVELOPMENT PROJECT PHASE II

IN

ARAB REPUBLIC OF EGYPT

December 3, 1983

CAIRO

Shoji Yamada

SHOJI YAMADA

LEADER OF JAPANESE F/S TEAM

(JICA)

Samir Naguib

SAMIR NAGMOUSH

ON BEHALF OF EGYPTIAN

GOVERNMENT

In conformity with the Scope of the Works for the South Hussinia Valley Agricultural Development Project Phase II, the Study Team submitted to GARPAD 20 copies of field reports on November 27, 1983. The meeting between the GARPAD and the Study Team was held at the GARPAD on November 30, 1983, in order to discuss the project proposal presented by the Study Team and exchange views on the Project.

By following a briefing by the Study Team, the GARPAD has commented on the field reports as presented hereinafter;

1. Land Disposal

- Land disposal to agricultural cooperatives farms, JV farms and state farms shall be studied.
- In deciding a size of settler, income analyses are very important.
- Since the construction works shall be mostly implemented with construction equipment, settler may not be required for the construction of the project works as labourer, also from view points of timing for settling.

2. Irrigation and Drainage

- The irrigation efficiency of 64 percent seems high, and the GARPAD considers 55 percent of irrigation efficiency in the beginning of reclamation, when canals are not lined.
- As for rotational irrigation, water supply of four days on and four days off is recommendable for easy maintenance of canals, especially for weed control.
- The depth of drains should be more than 1.3 m considering the depth of root zone of not rice but sugarbeet and other crops.
- In the early stage of reclamation, drain spacing should be less than 25 m as proposed.

3. Rural Development

- A regional planning should be prepared by including not only three areas but also adjacent regions, in which future extension should be considered.
- For housing plans, no garden will be required as it need irrigation and drainage, and at least two rooms are required. Mud bricks are not available in the project area due to difficulty to procure materials.
- Connecting roads with adjacent areas should be considered. Main roads along the El Salaam Canal should be incorporated in the road network planning.
- Potable water should be provided either from the Nile river or Ismailia Canal in consideration of salinity in the water of El Salaam Canal. It is not advisable to convey the potable water to all the settler hours, but a community fountain per each group is recommended.
- New advanced sewage systems will be required instead of traditional ones.
- The existence of transmission lines does not mean the availability to the Project. If necessary, costs to generate power should be included in the Project.

4. Construction Schedule

Construction of the pumping station and main drains will start in March 1984, having a construction period of 18 months.

5. Crop Rotation

- Approach to planning of crop rotation is acceptable. The optimal crop rotation under prevailing conditions should be backed up with figures.

6. Land Reclamation

- Leaching requirements seem not enough, when considered water quality of the El Salaam Canal (Salinity of 1,000 ppm)

7. Crop Cultivation

- Validity of introducing summer vegetables shall be explained in consideration of labour requirements, agro-industry etc.
- Crop yields are acceptable.
- Farmers grouping plans are acceptable.

8. Marketing

- Majority of crop disposal are not under the Government control and Government intervention for crop disposal will be gradually lesser.
- Export to Arab countries shall be studied in consideration of international marketability.

9. Agro-industry

- Proposal for milk plant are agreeable, but it is necessary to study in Selection of type, and products, taking into consideration Egyption's preference, markatability and so on.
- Vegetables do not include peas, why ?
- How to process cabbage.

10. Mechanization

- Sub-soiler is essentially required.
- Mouldboard is not applicable and chisel plow is recommendable.

11. Economics

- Sensitivity analyses should be made.

12. Soil

- Field investigation was satisfactory and the investigated points were uniformly distributed in the Project Area. These data certainly become the supplement of Phase I study.
- Add the profile data obtained from Phase I study.
- Agree the approach of soil classification.
- Area of soil classification should be measured, and area of poorly drainable land should be measured in Japan.
- Salinity maps should be made for both surface and subsurface layers.
- Other suggestions for the preparation of maps such as title name and legend.

13. Others

- Careful attention should be needed whether the equation for leaching water requirement in the report is applicable for the Project Area or not.
- Due to the lack of time (48 hours), the egyptian experts could not read the report carefully and properly comment. Hence the above comments are not the official ones the official comments will be send to the consultant through JICA within two weeks time.

LIST OF ATTENDANCE

GARPAD

Dr. Samir Nagmoush
Dr. Rifki M. Anwar
Mr. Youssef Amin
Mr. Badr Hafer
Mr. Mohmaud Galal Gougon
Mr. Mohemed Rihan
Mr. Gomah El Azaz
Mr. Sani Ibrahim
Mr. Emad El Borgy
Mr. Fayez S. Hanna
Mr. Salah Ralen
Mr. Fathalla Mahamed Shoker
Mrs. Elham Elthanly

JICA South Hussinia F/S Team

Mr. Shoji Yamada	:	Leader
Mr. Kunio Ohta	:	Irrigation and Drainage
Dr. Shiro Terasawa	:	Soil
Dr. Naruo Kondo	:	Soil
Mr. Kazuo Nakabayashi	:	Soil
Mr. Hirokazu Kouriki	:	Agriculture and Agro-industry
Mr. Yoshihiko Nishikawa	:	Community Development

MINUTES OF MEETING
FOR
DRAFT FINAL REPORT
ON
SOUTH HUSSINIA VALLEY AGRICULTURAL DEVELOPMENT PROJECT PHASE II
IN
ARAB REPUBLIC OF EGYPT

FEBRUARY 2, 1984, CAIRO

Shoji Yamada

SHOJI YAMADA
LEADER OF JAPANESE F/S TEAM
(JICA)

SAMIR NAGHMOUSH
ON BEHALF OF EGYPTIAN
GOVERNMENT

WITNESSED BY:

K. Fujino

KIN-ICHI FUJINO
LEADER OF SUPERVISORY GROUP
(JICA)

A. Selim

ABDEL WAHAB SELIM
CHAIRMAN OF GARPAD

MINUTES OF MEETING

(January 27 to February 2, 1984)

In response to the request of the Government of Egypt (hereinafter referred to as the "Government"), the Draft Final Report Team for South Hussinia Valley Agricultural Development Project Phase II (hereinafter referred to as the "Team") was sent by Japan International Cooperation Agency (hereinafter referred to as "JICA").

The Team held meetings with the General Authority for Rehabilitation Projects & Agricultural Development of the Ministry of Development. State for Housing & Land Reclamation, the Ministry of Irrigation and other Egyptian authorities concerned in order to discuss the Draft Final Report which was forwarded to the Government by JICA prior to the arrival of the Team.

List of Attendants is attached in Annex I, and the final comments of the Government to the Draft Final Report are shown in Annex III. After several discussions, both parties agreed as described herein.

1. Irrigation

1) Water Requirement

a. The leaching requirement will be checked again using various equations.
b. The cultivated area, cropping pattern, and water requirement after replacing open drains with pipe drains will be studied. The upper limited of 40 cubic meters per feddan per day will be considered as the maximum daily water requirement.

2) Earth Volumes for Embankment

In case of the gravity irrigation system, the shortage of earth volumes for embankment of irrigation canals will be planned to compensate within the Project Area, that is, by excavation of drainage canals and by side borrow. Further studies on the method of side borrow, area of spoiled lands, thickness of surface soil cutting, distance of earth movement, and the cost will be made so that earth balance can be computed.

3) Comparison of Irrigation Methods by Gravity with Small Field

List Units taking into consideration the cost of lining of the 45 percent of canal length.

Advantage and disadvantages of each method will be studied, and the way how to overcome the disadvantages of gravity irrigation will be clarified.

4) Countermeasures Against Weeds and Canal Gradients

It is difficult to control weeds by Egyptian traditional irrigation methods. Due to the topographic conditions of the

Project Area, the canals have to be unavoidably designed to have very small gradients. It is necessary to increase the flow velocity to more than 70 centimeters per second for weed control. In order to increase the flow velocity by steepening the canal gradients, the Project cost should increase to a great extent owing to the increasing number of pumping stations and pump head. Weed control should depend upon the other methods, accordingly. Various methods such use of chemicals, specially by fish species or machinery, etc., will be studied, and the initial cost and running cost in case of increasing the canal gradient for a higher flow velocity will be studied.

5) Colored Map Showing Irrigation Rotation

Taking one irrigation unit as an example, irrigation rotation and its duration in winter and summer for the main, branch, and tertiary canals will be shown on maps.

6) Rotation Water Management

Structures which are easy to handle and have sufficient accuracy will be studied.

7) Discharge of Tertiary Canals

Back data for discharge computation of tertiary canals (380 litters per second) and its irrigation duration will be shown in detail.

8) Execution Plan of Reclaiming Submerged Lands

A detailed execution plan will be included in the Final Report.

9) Reasons for Lining of Main Canal

The lining of 45 percent of the main canal was design aiming to expand the irrigable area as much as possible without pumping up through reducing the head loss of the canal. A comparative study on irrigation facilities, irrigable area, and cost in cases with and without lining will be included in Appendix of the Final Report.

10) Dimension of Basin

From both aspects of construction and farm management, the best dimension of the basin will be shown for a few cases with different land slopes.

11) Berm Width

The term "berm width" in the text will be revised to "top width of embankment".

12) Water Measurement Structure at Turnouts

Parshall flumes are planned to be installed to the main canal where necessary. For secondary, and other alternatives which are more economical will be studied.

13) Escape-Tails

Escape-tails will be additionally designed in the Final Report.

14) Implementation Schedule

a. From the viewpoint of reducing the cost escalation, the alternative with a construction period as short as possible will be studied to cope with the schedule of Five-Year Plan.

b. Execution of roads, potable water, electricity, and housing should be started without delay to cope with the general plan of land reclamation.

15) Source of Raw Construction Materials

Taking into consideration the present tendency of shortage of bricks, the sources will be studied. Both plans, that is, a plan to build a small factory of cement blocks within or in the vicinity of the Project Area and a plan to procure them from existing factories will be studied.

16) Since the boundaries of squaters' cultivated lands are not clear, a qualitative study on these lands will be carried out taking into consideration the present cultivated land tenure conditions.

2. Rural Development

1) Mosques

The construction plan of mosques will be revised so that these will be built by the Government, and the cost will be included in the Project.

2) Location of Villages

A study on water feeding facilities to domestic animals at emergent time and sanitary facilities will be carried out in the Final Report. An alternative study will be made to locate villages as much as possible next to the main canals without upsetting maximum walking distance of the farmers.

3) Roads and Electricity

The construction cost of roads and electricity will be checked.

4) Sewage Disposal

In accordance with a comment given to the Field Report, the sewage disposal plan was formulated to introduce the latest method. The other methods will be studied for comparison.

3. Soils

1) Maps

Clear maps will be prepared for the Final Report.

2) Soil Alkalinity and Gypsum Requirement

After checking soil alkalinity, the gypsum requirement will be estimated.

3) Nomenclature of Family Category

A term of "clayey" will be added following to "very-fine" or "fine" in order to clarify the particle size class.

4) Geomorphological Map

A geomorphological map will be prepared although its accuracy will not be so high as other maps.

5) Salinity Classification Maps

Soil salinity changes abruptly due to the local micro-topographical and groundwater conditions. Nevertheless, mapping units will be shown on the maps for the Final Report.

6) Classification of Swamp and Inundated Lands

Only some paragraphs concerning the classification of the area will be changed in the text.

4. Agriculture

1) Crop Rotation in Second Stage

GARPAD accepted the Team's explanation that some vegetables will not be included in the crop rotation for summer cropping in the second stage despite of their high profitability due to a high soil salinity in this stage.

2) Percent of Fodder Cropping Area

Open drains will be replaced with pipe drains, resulting in an increase in the total cropping area. A further study will be carried out to balance the fodder cropping areas in both seasons in the way to utilize the increased cropping area for this purpose.

3) Introduction of Broccoli

The destination of all broccoli will be revised to export in consideration of Egyptian's taste. The possibility to substitution cauliflower for broccoli will be studied.

4) Grading and Packing Plants

The cost for grading and packing plants for vegetables will be included in the Final Report.

5) Small Machines for Settlers' Field

The small scale mechanization of settlers' field will be mentioned in more detail in the Final Report. Training for operation and maintenance of farm machinery will be important. A training center will be studied to be set up in the Project Area.

6) Picking Methods of Some Crops Like Tomatoes

Mechanization of picking tomatoes will be studied.

7) Buffaloes Breeding

A further study on buffaloes breeding will be made.

8) Number of Friesian Cows to be Imported

The profitability of friesian breeding is larger than that of baladi breeding. Hence, the possibility to increase the number of imported friesian cows and breed them will be studied.

9) Economic Approach to Sheep Breeding

Economic approach to sheep breeding will be made in the Final Report.

10) Feedable Number of Freisian Cows

The feedable number of freizian cows will be reviewed.

11) European Market for Fresh Vegetables

A study on European market for off-season vegetables will be included in the Final Report.

5. Economic Justification

1) Analysis Period

The analysis period in estimating the Economic Internal Rate Return (EIRR) is internationally 50 years. The periods applied for EIRR on the agro-industry projects will be revised to 50 years in the Final Report.

2) EIRR

a. This Project is an integrated project which consists of three components; land reclamation, housing & social infrastructure, and agro-industry. The benefits of both land reclamation and agro-industry projects are tangible by monetary terms. Although the housing and social infrastructural projects could bring about a great deal of benefits, those are intangible by monetary terms. However, by using some hypothetic methods, EIRR of the integrated project consisting of these project components will be estimated in the Final Report. The EIRR of 15.5 percent shown in Page IV-10 is the rate in case of the joint project of land reclamation and agro-industry without taking into consideration the cost of El Salaam Canal Phase I.

b. The isolated EIRR for the land reclamation project without and with the cost of El Salaam Canal Phase I has been estimated at 16.6 percent and 13.0 percent, respectively. From the viewpoint of national economy, the logical or real EIRR of the land reclamation project shall be found at 13.0 percent. These EIRR will be re-estimated since the total cultivated area will be revised.

c. EIRR in case of combining the land reclamation project and the housing & infrastructure project in consideration of the cost of El Salaam Canal Phase I has been estimated at 8.1 percent. This figure was computed only for reference since the benefits from the housing and infrastructure project cannot be expressed in monetary term without hypothetic method. This EIRR will be re-estimated.

d. The EIRR for sugarbeet factory and milk processing factory will be re-estimated based on the revised cultivated area.

f. More detailed analysis will be made for various combination of the project components.

g. Pay-back study of investments will be made.

LIST OF ATTENDANTS

Government of Egypt

1. GARPAD

Mr. Abdel Wahab Selim	Chairman
Mr. Maher Bahaa El Din	Vice Chairman
Mr. Zaki Arnaaut	Director of Planning & Follow-up Sector (MLR)
Dr. Samir Naghmoush	Counsellor
Dr. Rifky M. Anwar	Counsellor
Mr. Ahmed Fahmy	Counsellor
Mr. Yussif Amin	Counsellor
Mr. Hassan Abu El Nasr	General Manager, Civil Eng. Dep.
Mr. Badr Hafez	Agro-economist
Dr. Fayez S. Hanna	Soil Scientist
Mr. Mohamed Rihan	Civil Engineer
Mr. Fathalla Shaker	Agro-industry
Mr. Mahmoud Hamdi Khadr	Agro-horticulture
Mr. Emad El Deen Ibrahim	Animal Breeding
Ms. Elham Hamdi El Khamly	Agro-economist
Ms. Sohair Amien	Chairman's office
Ms. Nazli Ali	Chairman's office
Mr. Salah Raslan	Agricultural Engineer

2. MOI

Mr. Moris Kamel	First Undersecretary
Mr. Helmy Mahmoud Ibrahim	Undersecretary

Draft Final Report Team

1. Supervisory Group

Mr. Kin-ichi Fujino	Leader
Mr. Shogo Takemura	Agro-economist
Mr. Teruyoshi Kumashiro	Coordinator

2. Feasibility Study Team

Mr. Shoji Yamada	Leader
Mr. Kazuo Nakabayashi	Soil Scientist

JICA Representative Office in Egypt

Mr. Junsaku Koizumi	Resident Representative
Mr. Masao Yamawaki	Irrigation Expert (MOI)

CARPAD'S COMMENTS ON DRAFT FINAL REPORT FOR SOUTH HUSSINIA VALLEY AGRICULTURAL DEVELOPMENT PROJECT PHASE II

1. Soils

1) The soil analyses show that some soil samples may be alkali soils since the ESP is higher than 15. Yet the gypsum requirement was not determined to show if the gypsum present may be sufficient to cover the alkalinity.

2) In all the family names, the particle size class should be clearly mentioned. In addition, a geomorphological map is needed. Moreover, the salinity maps (surface and subsurface soils) should show different mapping units for all the studied area.

3) The bottoms of the swamps and inundated area are not soils and therefore they cannot be classified according to the soil taxonomy.

2. Irrigation

1) To revise calculation of water requirement taking into consideration the following;

a) Calculate the leaching requirement using various equations.

b) That after completion of reclamation the total cultivated area after eliminating the area occupied by open drains will reach about 63,000 fed.

2) In the case of using gravity irrigation, the source of the earth needed for construction of the high embankment should be studied, also the economic of such practices on the project cost.

Due to problems encountered and the high cost involved of lining of canals and erecting of large pumping stations, it is suggested that other alternatives for substituting the three main pumping stations by small field lift units should be considered. The comparison can be attached to the appendix.

3) Study of the non-weeding velocity. Therefore, the canal profile and hydraulic gradient should be revised.

4) A coloured map showing the irrigation rotation (winter and summer rotations) for the main and branch canals, also including the duration of each rotation must be included in the report.

5) If possible, study of design for improved water offtake for improving the water management in the Project Area.

6) To revise discharge of tertiary canals according to irrigation rotation and its duration and estimation of the cost. The water management should accordingly be taken into consideration.

7) To submit a detailed execution plan to reclaim submerged lands and dry the surface soils and enable the subsoil plowing with a minimum cost and equipment.

8) To clarify the reasons of lining of about 45 percent of main canals while the seepage losses shall be very small due to low permeability of the soil.

9) Indicate the best economic dimensions of the basin when using basin irrigation method, taking into consideration land grading and mechanization.

10) Berm width of eight meters for main canals is big, five meters may be sufficient.

11) Parshall flumes as measuring structures at the head of main and secondary canals seem costly, if possible study another cheaper alternatives.

12) It is asked to add escape-tails at the end of main and branch canals.

13) As to implementation schedule;

a) To study the possiblity of carrying out the execution of the Project Area to cope with the general plan of reclamation.

b) To start execution with roads, potable water, electricity and housing, etc.

14) To determine the sources of raw construction materials for building houses and other constructions if possible.

15) It is required to study separate way of irrigation and drainage for the caltivated land held by squaters.

16) Village Facilities Plan;

Mosques are to be constructed by the Government and not by settlers. It is required, whenever possible, to modify the location of the villages to be far from drains.

17) As to Land Disposal;

The Five-Year Plan is 1982 - 1987 and not 1980 - 1984.

18) Roads;

The estimated cost for roads should be revised.

19) Sewage Disposal;

System of sewage disposal should be revised possibly using the second alternative to reduce cost.

20) Project Cost;

a. Revision of project implementation schedule according to the Government Five-Year Plan, as this will affect the escalation value and hence the project cost.

b. To revise cost of electricity networks. Present estimated cost per feddan LE 54 is low.

Agriculture

1) The suggested crop rotation in Stage two and three are similar in many respects. Both include vegetables which may not be successful in the second stage due to the high soil salinity. Moreover, in the permanent rotation the percent of fodder crops during the winter season is higher than the summer. It is suggested that the percent of fodders be balanced between both seasons.

2) The introduction of broccoli in the rotation although it is intended for export, yet a part will be consumed locally. Broccoli does not suit the taste of the Egyptian consumers.

3) No grading and packing plants for vegetables were included in the agro-industrial part of the report.

4) Very little was presented on the mechanization of the small field of settlers although Japan is advanced in this field. the training needed for operation and maintenance of machines is important. Moreover, some crops such as tomatoes if picked by hand will be very costly.

5) The animal husbandry section, baffaloes will excluded primarily because of their large need of water. Moreover, in the report it was suggested to import only a small number of friesian cows for milk production, which it concentrated on a large number of local cows for meat production. It is suggested to import a large number of friesian cows for milk production. Fattening for meat production will be through the calves born on the farm.

6) Although the report discussed the possibility of sheep production yet nothing was presented on the sheep production economy.

7) The number of cows on the Project Area during the full production stage should be determined according to the acreage of fodders. Since one third of the area will be planted with fodder crops, hence it will be possible to increase the number of imported friesian cows.

8) The report has only covered marketing of fresh vegetables to the near-by Arabian countries, while no study was made for the European market which is better market for off-season vegetables especially for broccoli which is not common for Arabic market.

Economical Justification

1) The life time of the Project was taken to be 50 years. Calculation for shorter life-time should be made for comparison.

2) The EIRR for the overall project was given as 16.6 percent, which is high for such project. Meanwhile, when housing, infrastructure and cost of El Salaam Canal (Phase I) are included, the EIRR drops to 8.1 percent which low and cannot cover the rate of interest on the loan prevailing at the present time.

3) The EIRR for the sugarbeet factory and the milk processing factory as calculated in the report are 14.3 percent and 11.0 percent respectively seem to be low and should be revised.