Summary of Discharge Measuring

1. Outline of Measuring

Discharge measuring were carried out at El-max and Hares Pumping Stations by using current meter. Executed date, agencies and results are as follows.

Case	Date	Executed Agency	Location
1 st	14 Aug 1994	EPADP,ID and JICA	Delivery side
2 nd	17 Aug 1994	JICA	Suction side
3 rd	07 Mar 1995	ID,EPADP	Delivery side

Results of measuring show available capacity from 66.3 to 111.7 percent of nominal pump capacities in disregard of head fluctuations.

List of Discharge Measuring

Name of P. Station	Case	Location	Head (m) (Nominal)	Velocity (m/s)	P.Discharge (Nominal) cum/s	Ratio (%)
El-Max(Old)	2 nd	Suction	3.25(4.00)	0.657	11.03(12.50*1)	88.2
	3 rd	Delivery	3.40(4.00)	0.454	58.25(12.50*5)	93.2
El-Max(New)	2 nd	Suction	3.35(4.00)	0.850	13.96(12.50*1)	111.7
Hares	1 st	Delivery	3.15(3.20)	0.293	15.20(8.00*3)	63.3
	2 nd	Suction	3.00(3.20)	0.595	6.19(8.00*1)	77.3
	3 rd	Delivery	3.00(3.20)	0.289	13.88(8.00*2)	86.7

Note ; In first case of Hares,it will be neglected because running numbers of pumps were changed from three to two sets during measuring.

2. Actual Reduction Ratio

As results of study by applying pump curve, actual reduction ratios of each pump capacity are estimated as follows.

The capacity of El-max(old) and Hares pumps were declined about 17 and 19 percent,respectively. Though El-max(new) pumps seem to keep full capacity up to now at only one measuring, further measurement shall be requested.

Available Ratio of Pumps

Name of Station	Case	Head (m)			Discharge (cum/s)				Avail. Ratio
		Actual (Ha)	Nominal (H)	Ratio Ha/H	Ratio (Qo/Q)	Nominal (Q)	Esti. Qo	Actual	
El-Max(Old)	2 nd	3.25	4.00	0.81	1.10	12.50	13.75	11.03	0.80
	3 rd	3.40	4.00	0.85	1.08	12.50	13.50	11.65	0.86
El-Max(New)	2 nd	3.35	4.00	0.84	1.09	12.50	13.62	13.96	1.02
Hares	2 nd	3.00	3.20	0.94	1.01	8.00	8.08	6.19	0.77
	3 rd	3.00	3.20	0.94	1.01	8.00	8.08	6.94	0.86

Summary of Alternative Plans (El-Max)

New El-Max No.1 Pump capacity Q=150.00-62.5 =87.5 cu.m/s

Building	Pump Types	No.	Case	Pump Facility			Structure Size (m)	Cost	Running Eff.	Remarks
				cum/s	sets	Dia.mm	W * L * H	'1000LE		
A (New)	1 (One)	1	A-1-1	17.50	6	φ 2500	31.0*47.7*12.0	49400	0.95	
		2	A-1-2	14.60	7	φ 2300	32.5*47.1*11.6	52000	0.96	
		3	A-1-3	12.50	8	φ 2300	37.0*46.0*10.9	56400	0.91	
	2 (Two)	1	A-2-1	17.50 8.75	5 2	φ 2500 φ 1800	33.6*47.7*12.0	53400	0.98	
		2	A-2-2	14.60 7.30	6 2	φ 2300 φ 1650	35.0*47.1*11.6	55600	0.98	
		3	A-2-3	12.50 6.25	7 2	φ 2300 φ 1650	39.5*46.0*10.9	59600	0.96	
B (Existing)	1 (One)	1	B-1-1	17.50	6	φ 2500	--No space--	---	0.95	
		2	B-1-2	14.60	7	φ 2300	5.5*47.1*11.6	45300	0.96	
		3	B-1-3	12.50	8	φ 2300	10.0*46.0*10.9	50000	0.91	
	2 (Two)	1	B-2-1	17.50 8.85	5 2	φ 2500 φ 1800	--No space--	---	0.98	
		2	B-2-2	14.60 7.30	6 2	φ 2300 φ 1650	8.0*47.1*11.6	46600	0.98	
		3	B-2-3	12.5 6.25	7 2	φ 2300 φ 1650	12.5*46.0*10.9	51200	0.96	

Note ; 1) One standby pump is included in big size pump facilities.

2) Initial cost will be up in proportion to increase of pump numbers and low running efficiency takes high running cost.

3) Case B-1-1 and B-2-1 are not acceptable due to no replacement spaces.
Existing pump facility ------ φ 2300 * 6 sets.

4) Additional pump houses in Case B are needed.

5) Structural defects are progressive in existing pump house without any repairing works. Its life is impossible to be with new pump facilities.

6) Pump running efficiencies are not so different in any case due to many pumps provided in El-max pump stations(No.1 and No.2).
Same size pump plans are proposed for cost and maintenance(spare parts).

7) Pump diameter in Case A-1-2 and A-1-3 are same,Case A-1-2 is economical.

8) Conclusion Case A-1-2 is recommended.

Summary of Alternative Plans (Hares)

Hares P.S Pump capacity Q=30.0 cu.m/s

Pump Types	No	Case	Pump Facility			Structure Size (m)	Cost	Running Eff.	Remarks
			cum/s	sets	Dia.mm	W * L * H	'1000LE		
1 (One)	1	1-1	10.00	4	φ 2000	16.7*38.8* 9.9	32100	0.67	
	2	1-2	7.50	5	φ 1650	18.2*38.0* 9.4	32800	0.80	
	3	1-3	6.00	6	φ 1500	21.7*36.8* 8.8	34200	0.85	
2 (Two)	1	2-1	10.00 5.00	3 2	φ 2000 φ 1400	19.7*38.8* 9.9	34200	0.81	
	2	2-2	7.50 3.75	4 2	φ 1650 φ 1200	21.7*38.0* 9.4	35000	0.85	
	3	2-3	6.00 3.00	5 2	φ 1500 φ 1200	25.2*36.8* 8.7	37400	0.91	
	4	2-4	9.00 7.00	1 4	φ 1800 φ 1650	18.5*38.4* 9.4	31300	0.88	

Note ; 1) One standby pump is included in big size pump facilities except Case 2-4.

2) Initial cost will be up in proportion to increase of pump numbers and low running efficiency takes high running cost.

3) Pump running efficiency shows poor in Case 1-1 and Case 1-2 and Case 2-2 shows same value.

4) EPADP said existing pump capacity of one unit is too big for dichage control.
Existing pump capacity 8.0 cum/s * 4 sets

5) Case 2-4 shows a superiority in numbers of pumps and running efficiency but has no standby pump for big size pump.

6) Pump diameter in Case 2-2,Case 2-3 and Case 2-4 are almost same. Same size pump plans are proposed for maintenance cost(spare parts).

7) Conclusion Case 1-2 is recommended.

Calculation of Total Head and Output of New Hares Pumps

1) Total Head

Total Head Ht(m) = Actual Head (Ha) + Pipe loss about Pump(Hp)

Actual Head (Ha) = Delivery water level - Suction water level

= WL.(-)2.30 - WL.(-)5.85 = 3.55 m

Delivery Water Level= WL of Mariut Lake + Canal loss

= WL(-)2.40 +0.10 = WL.-2.30

Suction Water Level = WL of Canal - Trash rack loss

= WL.(-)5.75 - 0.10= WL.-5.85

Pipe loss about Pump(Hp); Friction ,Expansion and Bed loss of pipe ,Flap valve loss, Outlet loss etc.

= 0.45 m

Total Head Ht(m) = WL.3.55 + 0.45 = 4.00 m

2) Out put of Motor

Out put (Kw) = $0.1634 * Q * Ht * (1+\alpha) / (Ep * Et)$

Q = Design capacity = 7.50 * 60 = 450 cu.m/mim

Ht= Total Head = 4.00 m

α = Allowance = 10 to 15 %

Ep= Pump efficiency =82 %

Et= Transmission efficiency =95 %

Out put(Kw)=0.1634*450*4*(1+0.10)/(0.82*0.95) = 430 Kw

Calculation of Total Head and Output of New EL-Max Pumps

1) Total Head

Total Head Ht(m) = Actual Head (Ha) + Pipe loss about Pump(Hp)

Actual Head (Ha) = Delivery water level - Suction water level

= WL.(+)0.75 - WL.(-)3.35 = 4.10 m

Delivery Water Level= WL.of Delivery Canal

= WL(+)0.75

Suction Water Level = WL of Canal - Trash rack loss

= WL.(-)3.25 - 0.10= WL.-3.35

Pipe loss about Pump(Hp); Friction ,Expansion and Bed loss of pipe ,Flap valve loss, Outlet loss etc.

= 0.40 m

Total Head Ht(m) = WL.4.10 + 0.40 = 4.50 m

2) Out put of Motor

Out put (Kw) = $0.1634 * Q * Ht * (1+\alpha) / (Ep * Et)$

Q = Design capacity = 14.60 * 60 = 876 cu.m/mim

Ht= Total Head = 4.50 m

α = Allowance = 10 to 15 %

Ep= Pump efficiency =83 %

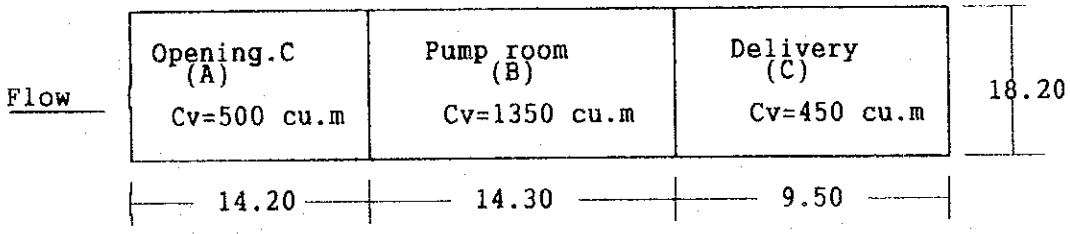
Et= Transmission efficiency =95 %

Out put(Kw)=0.1634*876*4.50*(1+0.10)/(0.83*0.95) = 900 Kw

Calculation of Piles

1) Out line of Structure

Cv ; Concrete Volume cu.m



2) Load

(A)	Dead Load	500 * 2.4	=	1200 ton
	Surcharge	0.3 t/sqm * 18.2 * 14.2	=	80
	Others		=	20
	Total	W1	=	1300 ton
(B)	Dead Load	1350 cum * 2.4	=	3240 ton
	Surcharge	0.5 t/sqm * 18.2 * 14.3	=	130
	Building	540 * 2.4	=	1300
	Machine	30 * 6	=	180
	Others		=	50
	Total	W2	=	5000 ton
(c)	Dead Load	450 * 2.4	=	1080 ton
	Surcharge	0.3 t/sqm * 18.2 * 9.5	=	50
	Others		=	20
	Total	W3	=	1150 ton

2) Bearing capacity of one pile

Pile Spec. R.C Pile D=0.5 m t=0.08 m L= 10,13 m

Strength of concrete Cc=210 kg/sq.cm

Bearing capacity of pile

$Ra = \pi * (D+t) * t * Cc / 3$

$= 3.14 * (0.50-0.08) * 0.08 * 210 * 10 / 3 = 73 \rightarrow 70$ton

Bearing capacity of foundation...Applied by Mayerhof'formula

$Ra = 43 * N * Ap / 3$

$Ap = \pi * D^{**}2 = 3.14*0.5^{**}2 = 0.196$ sqm

N = N value = 35

$Ra = 43 * 35 * 0.196 / 3 = 98$ ton

3) Numbers of pile

Nos = Load (ton) / Bearing capacity of pile

(A) Nos = 1300 / 70 = 19 → 20

(B) Nos = 5000 / 70 = 72 → 80

(B) Nos = 1150 / 60 = 17 → 20

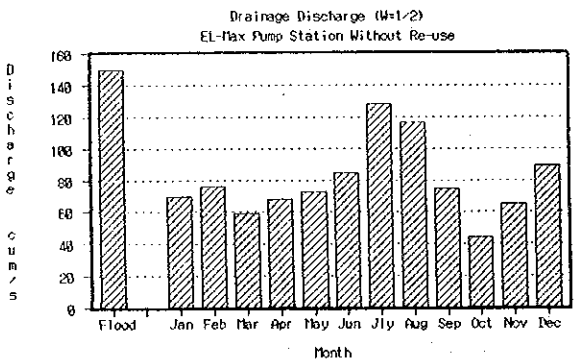
Table G-4-1 Drainage Discharge (1/2)

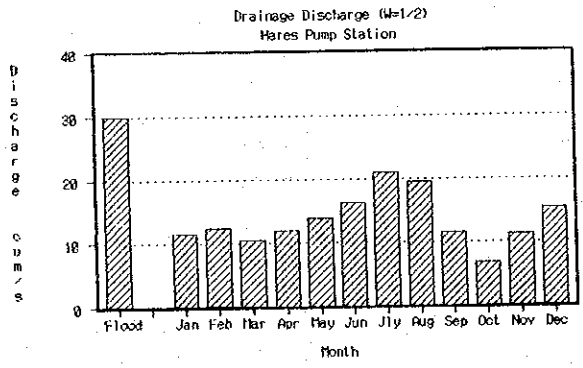
(W=1/2)

Month	EL-Max P.S										Hares P.S	
	Inflow (MCM)			Outflow (MCM)			EL-Max P.S					
	Study Area①	Others ②	S.Total	Re-Use ③	Evapo ④	Sub Total	With Re-use		Without Re-use			
							MCM	cu.m/s	MCM	cu.m/s	MCM	cu.m/s
Jan	162	37	199	44	12	56	143	53.2	187	69.6	31.0	11.6
Feb	163	31	194	33	10	43	151	62.4	184	68.6	30.0	12.4
Mar	150	30	180	92	21	113	66	24.8	158	59.1	28.0	10.5
Apr	167	26	193	91	17	108	85	32.9	176	65.8	31.0	12.0
May	183	28	211	79	17	96	115	42.9	194	72.4	37.0	13.8
Jun	213	22	235	92	15	107	127	49.1	219	81.9	42.0	16.2
Jly	334	25	359	85	15	100	259	96.5	344	128.3	56.0	20.9
Aug	306	22	328	111	17	128	200	74.7	311	116.1	52.0	19.4
Sep	191	20	211	125	19	144	68	26.2	193	72.0	30.0	11.6
Oct	116	20	136	127	18	145	-9	-	118	44.1	18.0	6.9
Nov	154	31	185	57	17	74	111	42.7	168	62.6	29.0	11.2
Dec	220	29	249	61	9	70	178	66.6	239	89.4	41.0	15.3
Total	2359	320	2679	997	188	1185	1494	52.0	2491	84.5	425.0	13.5

Note; Data source ① ANNEX-D Proposed drainage discharge of average year

②③④ ANNEX-B Water blance for Mariut Lake (January 1994)





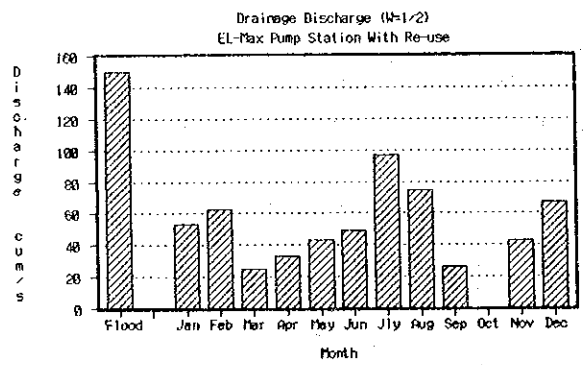


Table G-4-1 Drainage Discharge (2/2)

Inflow to Mariut Lake and El-Max Pump Station

(W=1/2)

Month	Study Area Inflow (MCM)					Inflow from Others Area (MCM)						S.Total
	Excess Water	Ground Water	Rain fall	Dike Seepage	S.Total	W.T.P	Lock Water	Nuba.D Escape	Nubaria Bypass	Ameriya Drain	Sea W. Intru	
Jan	70	51	36	5	162	5.27	8.20	11.93	5.45	4.16	1.69	36.70
Feb	68	46	44	5	163	4.94	7.40	7.57	5.82	3.63	1.53	30.89
Mar	92	51	2	5	150	5.96	8.20	9.73	0.00	4.11	1.69	29.69
Apr	108	49	5	5	167	5.94	8.92	6.08	0.00	3.89	1.64	26.47
May	128	50	0	5	183	5.78	9.21	7.32	0.00	4.02	1.69	28.02
Jun	159	49	-	5	213	5.36	8.92	2.01	0.00	3.89	1.64	21.81
Jly	278	51	-	5	334	6.89	9.21	3.21	0.00	4.02	1.69	25.02
Aug	250	51	-	5	306	7.02	9.21	0.00	0.00	4.02	1.69	21.94
Sep	137	49	-	5	191	5.94	8.92	0.00	0.00	3.89	1.64	20.38
Oct	48	51	12	5	116	6.08	8.20	0.00	0.00	4.02	1.69	19.99
Nov	89	49	11	5	154	5.99	7.93	4.62	2.61	8.04	1.64	30.83
Dec	72	51	92	5	220	6.58	8.20	0.09	6.25	5.83	1.69	28.64
Total	1499	598	202	60	2359	71.75	102.52	52.56	20.13	53.52	19.92	320.38

Note; Data source ANNEX-D Proposed drainage discharge of average year

Out flow flom Mariut Lake

Month	Evapo (MCM)		Mariut (MCM)	Sub Total (MCM)	Remarks
	Lake	Omoum			
Jan	6.77	0.15	5.27	12.19	
Feb	6.88	0.15	3.00	10.03	
Mar	8.80	0.19	12.40	21.39	
Apr	8.85	0.19	8.16	17.20	
May	9.31	0.20	7.54	17.05	
Jun	9.01	0.20	6.28	15.49	
Jly	6.77	0.15	8.51	15.43	
Aug	6.77	0.15	10.07	16.99	
Sep	6.55	0.14	11.81	18.50	
Oct	6.77	0.15	10.85	17.77	
Nov	6.55	0.14	10.50	17.19	
Dec	6.77	0.15	2.32	9.24	
Total	89.80	1.96	96.71	188.47	

Note; Data source ANNEX-B Water blance for Mariut Lake (January 1994)

Table G-4-2 Discharge Measuring Data (1/6)

Discharge Measuring
Under Secretary of West Delta Drainage Region

Pump Station Name	Hares P.S.	Deliverly	
Date	14.Aug.1994	11:30 AM	
Water Level	-2.20 (D)	-5.35 (S)	
Width	22.50	m	
Mean W. Depth	2.44	m	
Name of Eng.	Eng. Mina		

Pump Capacity	8.00*3	=	24.0 cum/s
Ratio of Discharge	15.20/24.0	=	63.3 %

Mean Velocity 0.293 m/s : Total Discharge 15.20 m3/s

Distance from Shore m	Width of Sec. m	Mean Distance m	Depth m	Area of Sec. m²	0.2*Depth Depth m	No. of Rev. / sec 1	2	Mean	V m/sec	0.8*Depth Depth m	No. of Rev. / sec 1	2	Mean	V m/sec	Mean Velocity m/sec	Discharge Q m3/sec
0.00																
3.00	3.00	3.00	1.62	4.86	0.32	70	86	78.0	0.438	1.45	44	42	43.0	0.245	0.342	1.66
5.00	2.00	2.00	3.00	6.00	0.60	45	46	45.5	0.259	2.55	38	36	37.0	0.211	0.235	1.41
7.00	2.00	2.00	2.70	5.40	0.54	39	38	38.5	0.433	2.31	37	32	34.5	0.389	0.411	2.22
9.00	2.00	2.00	2.65	5.30	0.53	38	39	38.5	0.433	2.27	30	31	30.5	0.344	0.389	2.06
11.00	2.00	2.00	2.60	5.20	0.52	21	21	21.0	0.239	2.23	25	19	22.0	0.250	0.245	1.27
13.00	2.00	2.00	2.60	5.20	0.52	21	24	22.5	0.256	2.23	21	24	22.5	0.256	0.256	1.33
15.00	2.00	2.00	2.70	5.40	0.54	24	28	26.0	0.294	2.31	28	23	25.5	0.289	0.292	1.57
17.00	2.00	2.00	2.83	5.66	0.57	25	22	23.5	0.267	2.41	21	22	21.5	0.245	0.256	1.45
19.00	2.00	2.00	2.48	4.96	0.50	25	25	25.0	0.283	2.13	26	24	25.0	0.283	0.283	1.40
21.00	2.00	3.00	1.25	3.75	0.25	19	17	18.0	0.205	1.15	20	21	20.5	0.234	0.220	0.82
22.00	1.00															
Total	22.00	22.00	2.44	51.73											0.293	15.20

Table G-4-2 Discharge Measuring Data (2/6)

Discharge Measuring

Pump Station Name	Hares P.S.	Suction
Date	17.Aug.1994	3:30 PM
Water Level	-2.65 (S)	-5.65 (D)
Width	3.30	m
Mean W. Depth	3.15	m

Pump Capacity	8.00*1	=	8.00 cum/s
Ratio of Discharge	6.19/8.00	=	77.3 %

Total Discharge 6.19 cum/s

Distance from Shore m	Width of Sec. m	Mean Distance m	Depth m	Area of Sec. m²	Nos of Survey	0.8*Depth Depth m	No. of Rev Rev/s	Rev/s	0.2*Depth Depth m	No. of Rev Rev/s	Rev/s	Av. Rev.	Mean Velocity m/sec	Discharge Q m3/sec
0.00	-	-												
1.10	1.10	1.65	3.15	5.20	1 st	2.52	90/20.5	4.39	0.63	60/24.4	2.46			
					2 nd	2.52	90/20.2	4.46	0.63	60/23.2	2.59	3.47	0.570	2.96
2.20	1.10	1.65	3.15	5.20	1 st	2.52	90/21.2	4.25	0.63	70/21.4	3.27			
					2 nd	2.52	90/22.1	4.07	0.63	70/20.6	3.40	3.75	0.620	3.22
3.30	1.10													
Total	3.30	3.30		10.40									0.595	6.19

Table G-4-2 Discharge Measuring Data (3/6)

Discharge Measuring

Pump Station Name: Hares P.S. Deliverly

Date: 07.Mar.1995 3:00 PM

Water Level: -5.35 m (S) -2.35 m (D)

Wate Width: 23.00

Mean W. Depth: 2.22

Name of Eng.: Irrigation Department

Pump Capacity	8.00 * 2 = 16.00 cum/s
Ratio of Discharge	13.88/16.0 = 86.7 %

Mean Velocity 0.289 Total Discharge 13.88 m3/s

Distance from Left m	Width of Sec. m	Mean Dis-tance m	Depth m	Area of Sec. m²	0.8*Depth Depth m	0.8*Depth No. of Rev Rev/s	0.8*Depth No. of Rev Rev/mi	0.8*Depth V m/sec	0.2*Depth Depth m	0.2*Depth No. of Rev Rev/s	0.2*Depth No. of Rev Rev/m	0.2*Depth V m/sec	Mean Velo-city m/sec	Dis-charge Q m3/sec
0.00														
3.00	3.00	4.00	1.00	4.00	0.80	15/48	18.8	0.214	0.20	15/40	22.5	0.256	0.235	0.94
5.00	2.00	2.00	2.20	4.40	1.76	25/45	33.3	0.379	0.44	30/53	34.0	0.381	0.380	1.67
7.00	2.00	2.00	2.70	5.40	2.16	20/63	19.0	0.217	0.54	30/48	25.0	0.283	0.250	1.35
9.00	2.00	2.00	2.55	5.10	2.04	20/40	30.0	0.338	0.51	20/40	30.0	0.338	0.338	1.72
11.00	2.00	2.00	2.45	4.90	1.96	21/40	31.5	0.340	0.49	30/56	32.1	0.363	0.352	1.72
13.00	2.00	2.00	2.45	4.90	1.96	30/60	30.0	0.338	0.49	20/52	23.1	0.262	0.300	1.47
15.00	2.00	2.00	2.47	4.94	1.98	20/40	30.0	0.338	0.49	25/60	25.0	0.283	0.311	1.53
17.00	2.00	2.00	2.55	5.10	2.04	10/40	15.0	0.172	0.51	20/48	25.0	0.283	0.228	1.16
19.00	2.00	2.00	2.50	5.00	2.00	15/40	22.5	0.255	0.50	20/42	28.6	0.323	0.289	1.45
21.00	2.00	3.00	1.35	4.05	1.08	15/51	17.6	0.201	0.27	20/61	19.7	0.224	0.213	0.86
23.00	2.00													
Total	23.00	23.00	2.22	47.79	1.78								0.289	13.88

Table G-4-2 Discharge Measuring Data (4/6)

Discharge Measuring

Pump Station Name: El Max P.S. (Old) Suction

Date: 14.Aug.1994 1:00 PM

Water Level: -2.65 (S) 0.60 (D)

Width: 4.00 m

Mean W. Depth: 4.20 m

Pump Capacity	12.50*1 = 12.5 cum/s
Ratio of Discharge	11.03/12.5 = 88.2 %

Total Discharge 11.03 cum/s

Distance from Shore m	Width of Sec. m	Mean Dis-tance m	Depth m	Area of Sec. m²	Nos of Survey	0.8*Depth Depth m	0.8*Depth No. of Rev Rev/s	0.8*Depth No. of Rev Rev/s	0.2*Depth Depth m	0.2*Depth No. of Rev Rev/s	0.2*Depth No. of Rev Rev/s	Av. Rev.	Mean Velo-city m/sec	Dis-charge Q m3/sec
0.00	-	-												
1.00	1.00	1.50	4.20	6.30	1 st	3.36	90/20.9	4.31	0.84	80/19.3	4.15			
					2 nd	3.36	90/20.7	4.35	0.84	90/21.0	4.29	4.27	0.700	4.41
2.00	1.00	1.00	4.20	4.20	1 st	3.36	90/22.0	4.09	0.84	90/22.2	4.05			
					2 nd	3.36	90/22.1	4.07	0.84	80/21.4	3.74	3.99	0.660	2.77
3.00	1.00	1.50	4.20	6.30	1 st	3.36	80/22.0	3.64	0.84	80/21.0	3.81			
					2 nd	0.00	80/22.0	3.64	0.84	80/20.8	3.85	3.73	0.610	3.84
4.00	1.00													
Total	4.00	4.00		16.80									0.657	11.03

Table G-4-2 Discharge Measuring Data (5/6)

Discharge Measuring

Pump Station Name	El-Max P.S. (Old) Deliverly
Date	07.Mar.1995 11.00 AM
Water Level	-2.80 m (S) +0.60 m (D)
Wate Width	45.00 m
Mean W. Depth	2.74 m
Name of Eng.	Irrigation Department

Pump Capacity	12.50 * 5 = 62.50 cum/s
Ratio of Discharge	58.25/62.5 = 93.2 %

Mean Velocity 0.454 m/sec Total Discharge 58.25 m3/s

Distance from Right m	Width of Sec. m	Mean Dis-tance m	Depth m	Area of Sec. m²	0.8*Depth Depth m	0.8*Depth No. of Rev Rev / sec	0.8*Depth No. of Rev Rev/ min	0.8*Depth V m/sec	0.2*Depth Depth m	0.2*Depth No. of Rev Rev / sec	0.2*Depth No. of Rev Rev/ min	0.2*Depth V m/sec	Mean Velo-city m/sec	Dis-charge Q m3/sec
0.00	0.00													
3.00	3.00	4.00	1.25	5.00	1.00	16/60	16.0	0.183	0.25	19/60	19.0	0.217	0.200	1.00
5.00	2.00	2.00	1.50	3.00	1.20	18/60	18.0	0.205	0.30	25/59	25.4	0.288	0.247	0.74
7.00	2.00	2.00	1.55	3.10	1.24	20/68	17.6	0.202	0.31	20/58	20.7	0.235	0.219	0.68
9.00	2.00	2.00	1.55	3.10	1.24	20/65	18.5	0.211	0.31	20/46	26.1	0.295	0.253	0.78
11.00	2.00	2.00	1.68	3.36	1.34	30/57	31.6	0.381	0.34	40/53	45.3	0.509	0.445	1.50
13.00	2.00	2.00	1.35	2.70	1.08	25/55	27.3	0.308	0.27	40/50	48.0	0.491	0.400	1.08
15.00	2.00	2.00	1.45	2.90	1.16	20/63	19.0	0.217	0.29	50/53	56.6	0.634	0.426	1.23
17.00	2.00	2.00	1.70	3.40	1.36	40/58	41.4	0.463	0.34	40/46.5	51.6	0.580	0.522	1.77
19.00	2.00	2.00	2.50	5.00	2.00	30/44	40.9	0.460	0.50	40/49	49.0	0.549	0.505	2.52
21.00	2.00	2.00	3.00	6.00	2.40	30/47	38.3	0.430	0.60	30/41	43.9	0.493	0.462	2.77
23.00	2.00	2.00	3.25	6.50	2.60	30/45	40.0	0.448	0.65	40/50.5	47.5	0.536	0.492	3.20
25.00	2.00	2.00	3.45	6.90	2.76	30/41	43.9	0.469	0.69	40/47	51.1	0.573	0.521	3.59
27.00	2.00	2.00	3.48	6.96	2.78	32/43	44.7	0.493	0.70	30/40	45.0	0.503	0.498	3.47
29.00	2.00	2.00	3.60	7.20	2.88	30/42	42.9	0.470	0.72	40/47	51.1	0.573	0.522	3.75
31.00	2.00	2.00	3.70	7.40	2.96	40/44	54.5	0.610	0.74	40/41.5	57.8	0.580	0.595	4.40
33.00	2.00	2.00	3.78	7.56	3.02	40/47	51.1	0.573	0.76	40/48	50.0	0.561	0.567	4.29
35.00	2.00	2.00	3.85	7.70	3.08	40/44.5	53.9	0.610	0.77	40/47	51.1	0.573	0.592	4.55
37.00	2.00	2.00	3.97	7.94	3.18	40/49.5	48.5	0.545	0.79	40/45	53.3	0.597	0.571	4.53
39.00	2.00	2.00	3.92	7.84	3.14	30/40	45.0	0.503	0.78	40/47	51.1	0.573	0.538	4.22
41.00	2.00	2.00	3.87	7.74	3.10	30/41	43.9	0.493	0.77	40/45.5	52.7	0.590	0.542	4.19
43.00	2.00	3.00	3.20	9.60	2.56	25/49.5	30.3	0.340	0.64	30/41	43.9	0.488	0.414	3.97
45.00	2.00													
Total	45.00	45.00	2.74	120.90									0.454	58.25

Table G-4-2 Discharge Measuring Data (6/6)

Discharge Measuring

Pump Station Name	El Max (New) P.S. Suction
Date	14. Aug. 1994 2:00 PM
Water Level	-2.75 (S) 0.60 (D)
Width	4.00 m
Water Depth	4.10 m

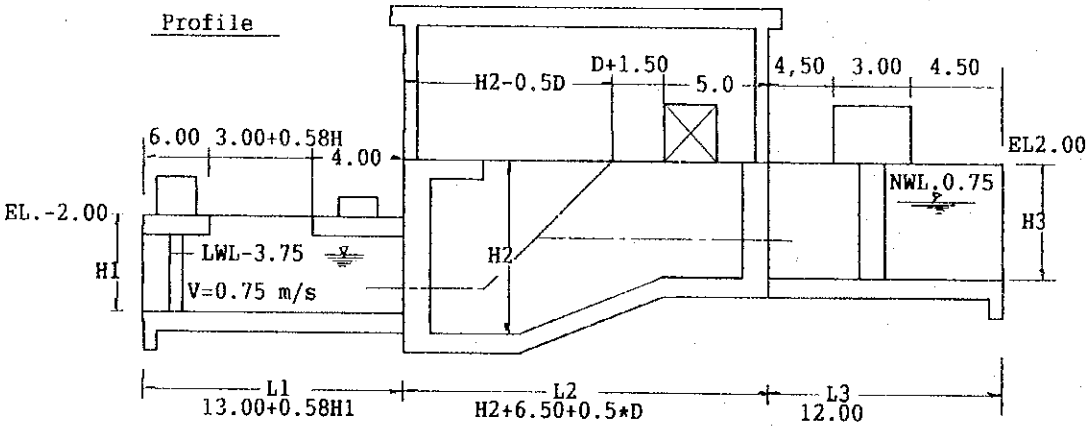
Pump Capacity	12.50*1 = 12.5 cum/s
Ratio of Discharge	13.96/12.5 = 111.7 %

Total Discharge 13.96 cum/s

Distance from Shore m	Width of Sec. m	Mean Dis-tance m	Depth m	Area of Sec. m^2	Nos of Survey	0.8*Depth Depth m	0.8*Depth No. of Rev Rev/s	0.8*Depth Rev/s	0.2*Depth Depth m	0.2*Depth No. of Rev Rev/s	0.2*Depth Rev/s	Av. Rev.	Mean Velo-city m/sec	Dis-charge Q m3/sec
0.00	-	-												
1.00	1.00	1.50	4.10	6.15	1 st	3.28	110/20.3	5.42	0.82	70/20.4	3.43			
					2 nd	3.28	110/21.3	5.16	0.82	60/20.5	2.93	4.24	0.700	4.31
2.00	1.00	1.00	4.10	4.10	1 st	3.28	100/20.6	4.85	0.82	100/20.6	4.85			
					2 nd	3.28	110/21.9	5.02	0.82	110/19.6	5.61	5.09	0.840	3.44
3.00	1.00	1.50	4.10	6.15	1 st	3.28	120/21.7	5.53	0.82	140/20.4	6.86			
					2 nd	0.00	120/22.5	5.33	0.82	140/20.4	6.86	6.15	1.010	6.21
4.00	1.00													
Total	4.00	4.00		16.40									0.850	13.96

Table G-4-3 Dimensions of each Alternative Plans (El-Max)

Case	Pump size	W (m)	L1(m)	L2(m)	L3(m)	HI(m)	H2(m)	H3(m)
A-1-1	φ2500 * 6	31.00	17.00	18.70	12.00	6.94	10.94	6.30
A-1-2	φ2300 * 7	32.50	16.80	18.30	12.00	6.62	10.62	6.00
A-1-3	φ2300 * 8	37.00	16.40	17.60	12.00	5.92	9.92	6.00
A-2-1	φ2500 * 5 φ1800 * 2	33.60	17.00	18.70	12.00	6.94	10.94	6.30
A-2-2	φ2300 * 6 φ1650 * 2	35.00	16.80	18.30	12.00	6.62	10.62	6.00
A-2-3	φ2300 * 7 φ1650 * 2	39.50	16.40	17.60	12.00	5.92	9.92	6.00
B-1-2	φ2300 * 1 φ2300 *(6)	5.50	16.80	18.30	12.00	6.62	10.62	6.00
B-1-3	φ2300 * 2 φ2300 *(6)	10.00	16.40	17.60	12.00	5.92	9.92	6.00
B-2-2	φ2300 *(6) φ1650 * 2	8.00	15.90	16.30	12.00	4.99	8.99	4.70
B-2-3	φ2300 *(6) φ2300 * 1 φ1650 * 2	12.50	16.40	17.60	12.00	5.92	9.92	6.00



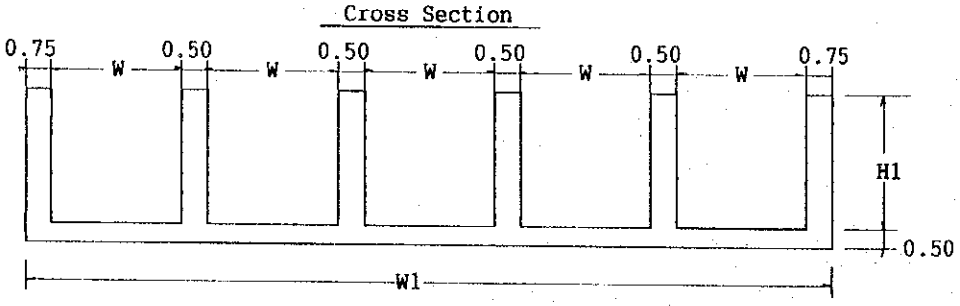
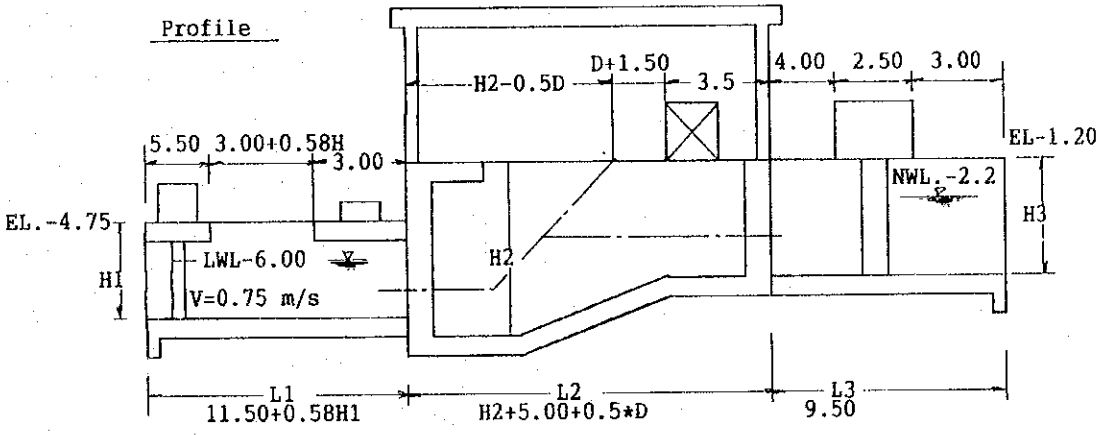


Table G-4-4 Dimensions of each Alternative Plans (Hares)

Case	Pump size	W (m)	L1(m)	L2(m)	L3(m)	HI(m)	H2(m)	H3(m)
1-1	φ2000 * 4	16.70	14.40	14.90	9.50	5.06	8.91	5.75
1-2	φ1650 * 5	18.20	14.20	14.30	9.50	4.58	8.43	5.05
1-3	φ1500 * 6	21.70	13.80	13.50	9.50	3.92	7.77	4.75
2-1	φ2000 * 3 φ1400 * 2	19.70	14.40	14.90	9.50	5.06	8.91	5.75
2-2	φ1650 * 4 φ1200 * 2	21.70	14.20	14.30	9.50	4.58	8.43	5.05
2-3	φ1500 * 5 φ1100 * 2	25.20	13.80	13.50	9.50	3.92	7.77	4.75
2-4	φ1800 * 1 φ1650 * 4	18.50	14.30	14.60	9.50	4.89	8.74	5.35



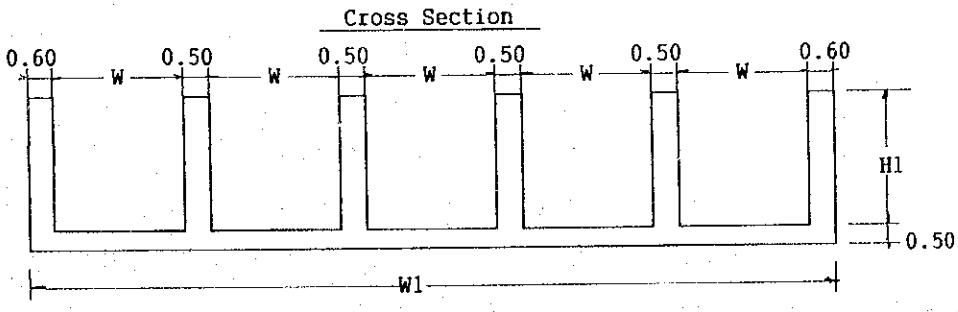


Table G-4-5 Structure's Dimensions of each Alternative Plans (1/4)

El-Max

Description			Unit	A-1-1	A-1-2	A-1-3	A-2-1		A-2-2		A-2-3		Remarks
							1	2	1	2	1	2	
Pump	Discharge	Q	cum/s	17.50	14.60	12.50	17.50	8.75	14.60	7.30	12.50	6.25	
	Sets	n	Sets	6	7	8	5	2	6	2	7	2	
	Diameter	D	mm	2500	2300	2300	2500	1800	2300	1650	2300	1650	
	Velocity	V	m/s	3.57	3.51	3.01	3.57	3.44	3.51	3.41	3.01	2.92	Q/(πD^2/4)
Opening	Flow Area	Ao	sqm	23.33	19.47	16.67	23.33	11.67	19.47	9.73	16.67	8.33	Q/(Va=0.75)
Inlet	Width	W	m	4.50	4.00	4.00	4.50	3.30	4.00	3.00	4.00	3.00	
	Water depth	Hd	m	5.19	4.87	4.17	5.19	3.54	4.87	3.24	4.17	2.78	Ao/W >1.5*D
	Suction W.L	LWL	EL.	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75	-3.75	
	Bed Level	B.Ll	EL.	-8.94	-8.62	-7.92	-8.94	-7.29	-8.62	-6.99	-7.92	-6.53	LWL-Hd
	Wall Level	W.Ll	EL.	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00	
	Hight	Hl	m	6.94	6.62	5.92	6.94	←	6.62	←	5.92	←	W.Ll-B.Ll
	Width	Wl	m	31.00	32.50	37.00	26.00 33.60	7.60 ←	28.00 35.00	7.00 ←	32.50 39.50	7.00 ←	Wti=0.50 m Wto=0.75 m
	Length	Ll	m	17.00	16.80	16.40	17.00	←	16.80	←	16.40	←	13+0.58*Hl
Pump Room	Floor Level	F.L	EL.	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
	Height	H2	m	10.94	10.62	9.92	10.94	←	10.62	←	9.92	←	FL-B.Ll
	Width	W2	m	31.00	32.50	37.00	33.60	←	35.00	←	39.50	←	W2=Wl
	Length	L2	m	18.70	18.30	17.60	18.70	←	18.30	←	17.60	←	H2+0.5D+6.5
Delivery	Bed Level	BL3	EL.	-4.30	-4.00	-4.00	-4.30	-3.25	-4.00	-3.03	-4.00	-3.03	0.75-1.5D-1.3
	Wall Level	Wl.3	EL.	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	Const.
	Hight	H3	m	6.30	6.00	6.00	6.30	←	6.00	←	6.00	←	WL3-BL3
	Width	W3	m	31.00	32.50	37.00	33.60	←	35.00	←	39.50	←	
	Length	L3	m	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
Pump House	Width	W4	m	39.00	40.50	45.00	41.60	←	43.00	←	47.50	←	W3+8.00

Table G-4-5 Structure's Dimensions of each Alternative Plans (2/4)

Description			Unit	B-1-1	B-1-2	B-1-3	B-2-1		B-2-2		B-2-3		Remarks
							1	2	1	2	1	2	
Pump	Discharge	Q	cum/s	17.50	14.60	12.50	17.50	8.75	14.60	7.30	12.50	6.25	
	Sets		Sets	(6)	(6).1	(6).2	(5)	(1).1	(6)	2	(6).1	2	
	Diameter	D	mm	2500	2300	2300	2500	1800	2300	1650	2300	1650	
	Velocity	V	m/s	-	3.51	3.01	-	-	-	3.41	3.01	2.92	Q/(πD^2/4)
Opening	Flow Area	Ao	sqm	-	19.47	16.67	-	-	-	9.73	16.67	8.33	Q/(Va=0.75)
Inlet	Width	W	m	-	4.00	4.00	-	-	-	3.00	4.00	3.00	
	Water depth	Hd	m	-	4.87	4.17	-	-	-	3.24	4.17	2.78	Ao/W >1.5*D
	Suction W.L	LWL	EL.	-	-3.75	-3.75	-	-	-	-3.75	-3.75	-3.75	
	Bed Level	B.L1	EL.	-	-8.62	-7.92	-	-	-	-6.99	-7.92	-6.53	LWL-Hd
	Wall Level	W.L1	EL.	-	-2.00	-2.00	-	-	-	-2.00	-2.00	-2.00	
	Hight	H1	m	-	6.62	5.92	-	-	-	4.99	5.92	←	WL1-BL1
	Width	W1	m	-	5.50	10.00	-	-	-	8.00	5.25 12.50	7.25 ←	Wti=0.50 m Wto=0.75 m
	Length	L1	m	-	16.80	16.40	-	-	-	15.90	16.40	←	13+0.58*H1
Pump Room	Floor Level	F.L	EL.	-	2.00	2.00	-	-	-	2.00	2.00	2.00	
	Height	H2	m	-	10.62	9.92	-	-	-	8.99	9.92	8.53	FL-B.L1
	Width	W2	m	-	5.50	10.00	-	-	-	8.00	12.50	←	W2=W1
	Length	L2	m	-	18.30	17.60	-	-	-	16.30	17.60	←	H2+0.5D+6.5
Deliverly	Bed Level	BL3	EL.	-	-4.00	-4.00	-	-	-	-2.70	-4.00	←	0.75-2D-0.15
	Wall Level	WL3	EL.	-	2.00	2.00	-	-	-	2.00	2.00	2.00	Const.
	Hight	H3	m	-	6.00	6.00	-	-	-	4.70	6.00	←	
	Width	W3	m	-	5.50	10.00	-	-	-	8.00	12.50	←	
	Length	L3	m	-	12.00	12.00	-	-	-	12.00	12.00	←	2.5*2+3.0+4.0
Pump House	Width	W4	m	-	9.50	14.00	-	-	-	12.00	16.50	←	W3+4.00

Table G-4-5 Structure's Dimensions of each Alternative Plans (3/4)

Hares

Description			Unit	1-1	1-2	1-3	2-1		2-2		2-3		Remarks
							1	2	1	2	1	2	
Pump	Discharge	Q	cum/s	10.00	7.50	6.00	10.00	5	7.50	3.75	6.00	3.00	
	Sets	n	Sets	4	5	6	3	2	4	2	5	2	
	Diameter	D	mm	2000	1650	1500	2000	1400	1650	1200	1500	1100	
	Velocity	V	m/s	3.18	3.51	3.40	3.18	3.25	3.51	3.32	3.40	3.16	Q/(πD^2/4)
Opening	Flow Area	Ao	sqm	13.33	10.00	8.00	13.33	6.67	10.00	5.00	8.00	4.00	Q/(Va=0.75)
Inlet	Width	W	m	3.50	3.00	3.00	3.50	3.00	3.00	3.00	3.00	3.00	
	Water depth	Hd	m	3.81	3.33	2.67	3.81	←	3.33	←	2.67	←	Ao/W >1.5*D
	Suction W.L	LWL	EL.	-6.00	-6.00	-6.00	-6.00	-6.00	-6.00	-6.00	-6.00	-6.00	
	Bed Level	B.L1	EL.	-9.81	-9.33	-8.67	-9.81	-6.00	-9.33	-6.00	-8.67	-6.00	LWL-Hd
	Wall Level	W.L1	EL.	-4.75	-4.75	-4.75	-4.75	-4.75	-4.75	-4.75	-4.75	-4.75	
	Hight	H1	m	5.06	4.58	3.92	5.06	1.25	4.58	1.25	3.92	1.25	WL1-B.L1
	Width	W1	m	16.70	18.20	21.70	12.60 19.70	7.10 ←	14.60 21.70	7.10 ←	18.10 25.20	7.10 ←	Wti=0.50 m Wto=0.60 m
	Length	L1	m	14.40	14.20	13.80	14.40	←	14.20	←	13.80	←	11.5+0.58*H1
Pump Room	Floor Level	F.L	EL.	-0.90	-0.90	-0.90	-0.90	-0.90	-0.90	-0.90	-0.90	-0.90	
	Height	H2	m	8.91	8.43	7.77	8.91	5.10	8.43	5.10	7.77	5.10	FL-B.L1
	Width	W2	m	16.70	18.20	21.70	19.70	←	21.70	←	25.20	←	
	Length	L2	m	14.90	14.30	13.50	14.90	←	14.30	←	13.50	←	H2+0.5D+5.0
Deliverly	Bed Level	BL3	EL.	-6.95	-6.25	-5.95	-6.95	-5.75	-6.25	-5.35	-5.95	-5.15	-2.2-2D-0.75
	Wall Level	WL3	EL.	-1.20	-1.20	-1.20	-1.20	-1.20	-1.20	-1.20	-1.20	-1.20	Const.
	Hight	H3	m	5.75	5.05	4.75	5.75	4.55	5.05	4.15	4.75	3.95	WL3-BL3
	Width	W3	m	16.70	18.20	21.70	19.70	←	21.70	←	25.20	←	
	Length	L3	m	9.50	9.50	9.50	9.50	←	9.50	←	9.50	9.50	2.5*2+3.0+1.5
Pump House	Width	W4	m	24.70	26.20	29.70	27.70	←	29.70	←	33.20	←	W3+8.00

Table G-4-5 Structure's Dimensions of each Alternative Plans (4/4)

Ilares

Description			Unit	2-4			Remarks
				1	2		
Pump	Discharge	Q	cum/s	9.00	7.00		
	Sets	n	Sets	1	4		
	Diameter	D	mm	1800	1650		
	Velocity	V	m/s	3.54	3.27		Q/(πD^2/4)
Opening	Flow Area	Ao	sqm	12.00	9.33		Q/(Va=0.75)
Inlet	Width	W	m	3.30	3.00		
	Water depth	Hd	m	3.64	3.11		Ao/W >1.5*D
	Suction W.L	LWL	EL.	-6.00	-6.00		
	Bed Level	B.L1	EL.	-9.64	-9.11		NWL-Hd
	Wall Level	W.L1	EL	-4.75	-4.75		
	Hight	H1	m	4.89	4.36		WL1-BL1
	Width	W1	m	4.40 18.50	14.10		Wti=0.50 m Wto=0.60 m
	Length	L1	m	14.30	←		11.5+0.58*H1
Pump Room	Floor Level	F.L	EL.	-0.90	-0.90		
	Height	H2	m	8.74	8.21		FL-B.L1
	Width	W2	m	18.50	←		W2=W1
	Length	L2	m	14.60	←		H2+0.5D+5.0
Deliverly	Bed Level	BL3	EL.	-6.55	-6.25		-2.2-2D-0.75
	Wall Level	WL3	EL.	-1.20	-1.20		Const.
	Hight	H3	m	5.35	5.05		WL3-BL3
	Width	W3	m	18.50	←		
	Length	L3	m	9.50	9.50		2.5*2+3.0+1.5
Pump House	Width	W4	m	26.50	←		W3+8.00

Table G-4-6 Cost Estimation in Each Case (New El-Max Pumping Station)

Amount : 1000 LE

Name	Unit Rate LE	Unit	Case A-1-1		A-1-2		A-1-3		A-2-1		A-2-2		A-2-3	
			Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount
A. Pump Facility		L.S	1	38400		40700		44200		41500		43500		46600
B. Civil Works														
1. Tempo. Works	2465	W*L (sqm)	1479	3645	1531	3773	1702	4195	1603	3951	1649	4064	1817	4479
2. Foundation	160	W*L (sqm)	1479	237	1531	245	1702	272	1603	256	1649	264	1817	291
3. Earth Work														
Excavation	14	cu.m	29300	410	28800	403	29200	409	30900	433	30300	424	30500	427
Filling	15	cu.m	14800	222	14400	216	14200	213	15300	230	14800	222	14500	218
4. Conc. Works														
R. Concrete	236	cu.m	5300	1251	5500	1298	5800	1369	5800	1369	5900	1392	6100	1440
Form Work	58	sqm	8700	505	9000	522	9600	557	9400	545	9800	568	10500	609
Reins. Bar	1626	ton	636	1034	660	1073	696	1132	696	1132	708	1151	732	1190
5. Building	1600	sqm	729	1167	741	1186	792	1267	778	1245	787	1259	836	1338
6. Others	30%	L.S		2541		2615		2824		2748		2803		2997
Sub Total				11011		11331		12238		11907		12148		12988
Total				49411		52031		56438		53407		55648		59588
				49400		52000		56400		53400		55600		59600

Name	Unit Rate LE	Unit	Case B-1-1		B-1-2		B-1-3		B-2-1		B-2-2		B-2-3	
			Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount	Q'ty	Amount
A. Pump Facility		L.S	-	-		42800		46200	-	-		43500		46600
B. Civil Works														
1. Tempo. Works	2465	W*L (sqm)	-	-	259	639	460	1134	-	-	354	872	553	1362
2. Foundation	160	W*L (sqm)	-	-	259	41	460	74	-	-	553	88	553	88
3. Earth Work														
Excavation	14	cu.m	-	-	13000	182	14500	203	-	-	11300	158	15900	223
Filling	15	cu.m	-	-	10000	150	10500	158	-	-	8700	131	10500	158
4. Conc. Works														
R. Concrete	236	cu.m	-	-	1200	283	1800	425	-	-	1600	378	2300	543
Form Work	58	sqm	-	-	2300	133	3000	174	-	-	2900	168	4000	232
Reins. Bar	1626	ton	-	-	144	234	216	351	-	-	192	312	276	449
5. Building	1600	sqm	-	-	174	278	246	394	-	-	196	313	290	465
6. Others	30%	L.S	-	-		582		874	-	-		726		1056
Sub Total						2523		3786				3146		4574
Total						45323		49986				46646		51174
						45300		50000				46600		51200

Table G-4-7 Cost Estimation in Each Case (New Hares Pumping Station)

Amount : 1000 LE

Name	Unit Rate LE	Unit	Case 1-1 Q'ty	1-1 Amount	1-2 Q'ty	1-2 Amount	1-3 Q'ty	1-3 Amount	2-1 Q'ty	2-1 Amount	2-2 Q'ty	2-2 Amount	2-3 Q'ty	2-3 Amount
A. Pump Facility		L.S		25200		25500		26200		26200		26500		28200
B. Civil Works														
1. Tempo. Works	3842	W*L (sqm)	648	2490	692	2657	799	3068	764	2937	825	3169	927	3563
2. Foundation	894	W*L (sqm)	648	579	692	618	799	714	764	683	825	737	927	829
3. Earth Work														
Excavation	14	cu.m	17900	251	17000	238	16800	235	19400	272	18600	260	18500	259
Filling	15	cu.m	11500	173	10500	158	9900	149	11900	179	11400	171	10900	164
4. Conc. Works														
R. Concrete	236	cu.m	2200	519	2300	543	2400	566	2500	590	2700	637	2700	637
Form Work	58	sqm	4100	238	4250	247	4500	261	4700	273	4900	284	5100	296
Reins. Bar	1626	ton	264	429	276	449	288	468	300	488	324	527	324	527
5. Building	1800	sqm	368	662	375	674	401	722	413	743	425	764	448	807
6. Others	30%	L.S		1602		1675		1855		1849		1965		2124
Sub Total				6943		7259		8039		8013		8515		9206
Total				32143		32759		34239		34213		35015		37406
				32100		32800		34200		34200		35000		37400

Name	Unit Rate LE	Unit	Case 2-4 Q'ty	2-4 Amount
A. Pump Facility		L.S		23800
B. Civil Works				
1. Tempo. Works	3842	W*L (sqm)	710	2730
2. Foundation	894	W*L (sqm)	710	635
3. Earth Work				
Excavation	14	cu.m	17600	246
Filling	15	cu.m	12700	191
4. Conc. Works				
R. Concrete	236	cu.m	2400	566
Form Work	58	sqm	4600	267
Reins. Bar	1626	ton	288	468
5. Building	1800	sqm	387	696
6. Others	30%	L.S		1740
Sub Total				7539
Total				31339
				31300

Table G-4-8 Outline of Structure and Quantity

Name	Case	Pump Facility			Structure	Building	Earth Work		Structure		Remarks
		Capac.	Dia	Sets	W * L * H (m) (m) (m)	W * L (m) (m)	Excav. cum	B.Fill cum	Con.V cum	F.Work sqm	
El-Max	A-1-1	17.50	φ2500	6	31.0*47.7*12.0	39.0*18.7	29300	14800	5300	8700	
	A-1-2	14.60	φ2300	7	32.5*47.1*11.6	40.5*18.3	28800	14400	5500	9000	
	A-1-3	12.50	φ2300	8	37.0*46.0*10.9	45.0*17.6	29200	14200	5800	9600	
	A-2-1	17.50	φ2500	5	33.6*47.7*12.0	41.6*18.7	30900	15300	5800	9400	
		8.75	φ1800	2							
	A-2-2	14.60	φ2300	6	35.0*47.1*11.6	43.0*18.3	30300	14800	5900	9800	
		7.30	φ1650	2							
	A-2-3	12.50	φ2300	7	39.5*46.0*10.9	47.5*17.6	30500	14500	6100	10500	
		6.25	φ1650	2							
	B-1-2	14.60	φ2300	(6) 1	5.5*47.1*11.6	9.5*18.3	13000	10000	1200	2300	
	B-1-3	12.50	φ2300	(6) 2	10.0*46.0*10.9	14.0*17.6	14500	10500	1800	3000	
	B-2-2	14.60	φ2300	(6)							
		7.30	φ1650	2	8.0*47.1*11.6	12.0*18.3	11300	8700	1600	2900	
	B-2-3	12.50	φ2300	(6)							
		12.50	φ2300	1	12.5*46.0*10.9	16.5*17.6	15900	10500	2300	4000	
		6.25	φ1650	2							
Hares	1-1	10.00	φ2000	4	16.7*38.8* 9.9	24.7*14.9	17900	11500	2200	4100	
	1-2	7.50	φ1650	5	18.2*38.0* 9.4	26.2*14.3	17000	10500	2300	4250	
	1-3	6.00	φ1500	6	21.7*36.8* 8.8	29.7*13.5	16800	9900	2400	4500	
	2-1	10.00	φ2000	3	19.7*38.8* 9.9	27.7*14.9	19400	11900	2500	4700	
		5.00	φ1400	2							
	2-2	7.50	φ1650	4	21.7*38.0* 9.4	29.7*14.3	18600	11400	2700	4900	
		3.75	φ1200	2							
	2-3	6.00	φ1500	5	25.2*36.8* 8.8	33.2*13.5	18500	10900	2700	5100	
		3.00	φ1100	2							
	2-4	9.00	φ2000	1	15.2*38.4* 9.4	26.5*14.6	17600	12700	2400	4600	
		7.00	φ1650	4							

Table G-4-9 El-Max Running Efficiency (1/2)

1) Cases

Total Porposed Discharge 150 cu.m/s El-Max No.2 Pump Capacity 12.5 cu.m/s*5(+1)sets = 62.5 cum/s

Case	Running	Pump Capacty and Numbers		Running Efficiency(REF)	Remarks
		Big Size	Small Size		
Case-A-1-1 &	(A)	17.5 cum/s*5(+1)sets	-	0.85	
Case-B-1-1	(B)	17.5 cum/s*5(+1)sets	-	0.95	
Case-A-2-1 &		17.5 cum/s*4(+1)sets	8.75 cum/s*2(+0)sets	0.98	
Case-B-2-1					
Case-A-1-2 &	(A)	14.6 cum/s*6(+1)sets		0.89	
Case-B-1-2	(B)	14.6 cum/s*6(+1)sets		0.96	
Case-A-2-2 &		14.6 cum/s*5(+1)sets	7.3 cum/s*2(+0)sets	0.98	
Case-B-2-2					
Case-A-1-3 &		12.5 cum/s*7(+1)sets		0.91	
Case-B-1-3					
Case-A-2-3 &		12.5 cum/s*6(+1)sets	6.25 cum/s*2(+0)sets	0.96	
Case-B-2-3					

Note ; Case 1-1,1-2 & 1-3 : All new pumps(project) are same size.
Case 2-1,2-2 & 2-3 : Half capacity pumps(small size) are provided.
Running (A) : New pumps shall be run at first.
Running (B) : Most suitable operation.
Meaning of '(+1) & (0)' are numbers of standby pumps.

2) Running Efficiency

Month	Discharge (cum/s)	Case A-1-1 & B-1-1 (A) 12.5 (sets)	17.5 (sets)	Discha (cum/s)	RFF	(B) 12.5 (sets)	17.5 (sets)	Discha (cum/s)	RFF	Case A-2-1 & B-2-1 12.5 (sets)	17.5 (sets)	8.75 (sets)	Discha (cum/s)	RFF
Flood	150.0	5	5	150.0	1.00	5	5	150.0	1.00	5	4	2	150.0	1.00
Peak	125.0	4	5	137.5	0.91	5	4	132.5	0.94	4	4	1	128.8	0.97
Jan	53.2	-	4	70.0	0.76	3	1	55.0	0.97	3	1	-	55.0	0.97
Feb	62.4	-	4	70.0	0.89	5	-	62.5	1.00	3	1	1	63.8	0.98
Mar	24.8	-	2	35.0	0.71	2	-	25.0	0.99	2	-	-	25.0	0.99
Apr	32.9	-	2	35.0	0.94	-	2	35.0	0.94	2	-	1	33.8	0.97
May	42.9	-	3	52.5	0.82	1	2	47.5	0.90	-	2	1	43.8	0.98
Jun	49.1	-	3	52.5	0.94	4	-	50.0	0.98	4	-	-	50.0	0.98
Jly	96.5	1	5	100.0	0.97	5	2	97.5	0.99	5	2	-	97.5	0.99
Aug	74.7	-	5	87.5	0.85	2	3	77.5	0.96	4	1	1	76.3	0.98
Sep	26.2	-	2	35.0	0.75	1	1	30.0	0.87	-	1	1	26.3	1.00
Oct	-	-		0.0	-	-	-	-	-	-	-	-	-	-
Nov	42.7	-	3	52.5	0.81	1	2	47.5	0.90	-	2	1	43.8	0.98
Dec	66.6	-	4	70.0	0.95	4	1	67.5	0.99	2	2	1	68.8	0.97
Total	572.0			660	0.85			595.0	0.95				584	0.98

Note; Data source ANNEX-D Proposed drainage discharge of average year.

Table G-4-9 El-Max Running Efficiency (2/2)

Month	Discharge (cum/s)	Case A-1-2 & B-1-2 (A) 12.5 (sets)	14.6 (sets)	Discha (cum/s)	RFF	(B) 12.5 (sets)	14.6 (sets)	Discha (cum/s)	RFF	Case A-2-2 & B-2-2 12.5 (sets)	14.6 (sets)	7.3 (sets)	Discha (cum/s)	RFF
Flood	150.0	5	6	150.1	1.00	5	6	150.1	0.01	5	5	2	150.1	1.00
Peak	125.0	5	5	135.5	0.92	3	6	125.1	0.01	3	6	-	125.1	1.00
Jan	53.2	-	4	58.4	0.91	2	2	54.2	0.98	2	2	-	54.2	0.98
Feb	62.4	-	5	73.0	0.85	5	-	62.5	1.00	5	-	-	62.5	1.00
Mar	24.8	-	2	29.2	0.85	2	-	25.0	0.99	2	-	-	25.0	0.99
Apr	32.9	-	3	43.8	0.75	3	-	37.5	0.88	1	1	1	34.4	0.96
May	42.9	-	3	43.8	0.98	-	3	43.8	0.98	-	3	-	43.8	0.98
Jun	49.1	-	4	58.4	0.84	4	-	50.0	0.98	4	-	-	50.0	0.98
Jly	96.5	2	5	98.0	0.98	2	5	98.0	0.98	2	5	-	98.0	0.98
Aug	74.7	-	6	87.6	0.85	6	-	75.0	1.00	6	-	-	75.0	1.00
Sep	26.2	-	2	29.2	0.90	1	1	27.1	0.97	1	1	-	27.1	0.97
Oct	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov	42.7	-	3	43.8	0.97	4	-	50.0	0.85	-	3	-	43.8	0.97
Dec	66.6	-	5	73.0	0.91	3	2	66.7	1.00	3	2	-	66.7	1.00
Total	572.0			638	0.89			590	0.96				581	0.98

Month	Discharge (cum/s)	Case A-1-3 & B-1-3 12.5 (sets)	12.5 (sets)	Discharge (cum/s)	RFF	Case A-2-3 & B-2-3 12.5 (sets)	6.25 (sets)	Discharge (cum/s)	RFF	Remarks
Flood	150.0	5	7	150.0	1.00	11	2	150.0	1.00	
Peak	125.0	5	5	125.0	1.00	8	2	125.0	1.00	
Jan	53.2	-	5	62.5	0.85	4	1	56.3	0.95	
Feb	62.4	-	5	62.5	1.00	5	-	62.5	1.00	
Mar	24.8	-	2	25.0	0.99	2	-	25.0	0.99	
Apr	32.9	-	3	37.5	0.88	3	-	37.5	0.88	
May	42.9	-	4	50.0	0.86	3	1	43.8	0.98	
Jun	49.1	-	4	50.0	0.98	4	-	50.0	0.98	
Jly	96.5	2	6	100.0	0.97	8	-	100.0	0.97	
Aug	74.7	-	6	75.0	1.00	6	-	75.0	1.00	
Sep	26.2	-	3	37.5	0.70	2	1	31.3	0.84	
Oct	-	-	-	-	-	-	-	-	-	
Nov	42.7	-	4	50.0	0.85	3	1	43.8	0.98	
Dec	66.6	-	6	75.0	0.89	5	1	68.8	0.97	
Total	572.0			625	0.91			594	0.96	

Note; Data source ANNEX-D Proposed drainage discharge of average year.

Table G-4-10 Hares Running Efficiency (1/2)

1) Cases

Total Porposed Discharge 30 cu.m/s

Case	Run ning	Pump Capacty and Numbers		Running Effi-ciency (REF)	Remarks
		Big Size	Small Size		
Case-1-1	-	10.0 cum/s*3 (+1) sets	-	0.67	
Case-2-1	-	10.0 cum/s*2 (+1) sets	5.0 cum/s*2 (+0) sets	0.81	
Case-1-2	-	7.5 cum/s*4 (+1) sets	-	0.80	
Case-2-2	-	7.5 cum/s*3 (+1) sets	3.75 cum/s*2 (+0) sets	0.85	
Case-1-3	-	6.0 cum/s*5 (+1) sets	-	0.85	
Case-2-3	-	6.0 cum/s*4 (+1) sets	3.0 cum/s*2 (+0) sets	0.91	
Case-2-4	-	9.0 cum/s*1 (+0) sets	7.0 cum/s*3 (+1) sets	0.88	

Note ; Case-1-1, Case-1-2 & Case-1-3 — All new pumps (project) are same size.
Case-2-1, Case-2-2 & Case-2-3 — Half capacity pumps (small size) are provided.
Case-2-4 — 9.0 cu.m/s Pump for flood (30.0 - 20.9)
Meaning of ' (+1) & (0)' are numbers of standby pumps.

2) Running Efficiency

Month	Discharge		Case-1-1			Case-2-1				Case-1-2			Remarks
	(MCM)	(cum/s)	10.0 (sets)	Discharge (cum/s)	RFF	10.0 (sets)	5.0 (sets)	Discharge (cum/s)	RFF	7.5 (sets)	Discharge (cum/s)	RFF	
Flood		30.0	3	30.0	1.00	3	-	30.0	1.00	5	30	1.00	
Jan	31.0	11.6	2	20.0	0.58	1	1	15.0	0.77	2	15.0	0.77	
Feb	30.0	12.4	2	20.0	0.62	1	1	15.0	0.83	2	15.0	0.83	
Mar	28.0	10.5	2	20.0	0.52	1	1	15.0	0.70	2	15.0	0.70	
Apr	31.0	12.0	2	20.0	0.60	1	1	15.0	0.80	2	15.0	0.80	
May	37.0	13.8	2	20.0	0.69	1	1	15.0	0.92	2	15.0	0.92	
Jun	42.0	16.2	2	20.0	0.81	1	1	15.0	1.08	3	22.5	0.72	
Jly	56.0	20.9	3	30.0	0.70	2	1	25.0	0.84	3	22.5	0.93	
Aug	52.0	19.4	2	20.0	0.97	2	-	20.0	0.97	3	22.5	0.86	
Sep	30.0	11.6	2	20.0	0.58	1	1	15.0	0.77	2	15.0	0.77	
Oct	18.0	6.9	1	10.0	0.69	1	-	10.0	0.69	1	7.5	0.93	
Nov	29.0	11.2	2	20.0	0.56	1	1	15.0	0.75	2	15.0	0.75	
Dec	41.0	15.3	2	20.0	0.77	2	1	25.0	0.61	3	22.5	0.68	
Total	425.0	161.7		240.0	0.67			200.0	0.81		202.5	0.80	

Note; Data source ANNEX-D Proposed drainage discharge of average year.

Table G-4-10 Hares Running Efficiency (2/2)

Month	Discharge		Case-2-2				Case-1-3			Case-2-3			
			7.5	3.75	Disch arge	RFF	6.0	Disch arge	RFF	6.0	3.0	Disch arge	RFF
	(MCM)	(cum/s)	(sets)	(sets)	(cum/s)		(sets)	(cum/s)		(sets)	(sets)	(cum/s)	
Flood		30.0	4		30.0	1.00	5	30	1.00	4	2	30.0	1.00
Jan	31.0	11.6	2	-	15.0	0.77	2	12	0.96	2	-	12.0	0.96
Feb	30.0	12.4	2	-	15.0	0.83	3	18	0.69	2	1	15.0	0.83
Mar	28.0	10.5	1	1	11.3	0.93	2	12	0.87	2	-	12.0	0.87
Apr	31.0	12.0	2	-	15.0	0.80	2	12	1.00	2	-	12.0	1.00
May	37.0	13.8	2	-	15.0	0.92	3	18	0.77	2	1	15.0	0.92
Jun	42.0	16.2	2	1	18.8	0.86	3	18	0.90	3	-	18.0	0.90
Jly	56.0	20.9	3	-	22.5	0.93	4	24	0.87	3	1	21.0	1.00
Aug	52.0	19.4	3	-	22.5	0.86	4	24	0.81	3	1	21.0	0.92
Sep	30.0	11.6	2	-	15.0	0.77	2	12	0.96	2	-	12.0	0.96
Oct	18.0	6.9	1	-	7.5	0.93	2	12	0.58	1	1	9.0	0.77
Nov	29.0	11.2	1	2	15.0	0.75	2	12	0.93	2	-	12.0	0.93
Dec	41.0	15.3	2	1	18.8	0.82	3	18	0.85	3	-	18.0	0.85
Total	425.0	161.7			191.3	0.85		192.0	0.85			177.0	0.91

Month	Dischage		Case-2-4			
			9.0	7.0	Discha rge	REF
	(MCM)	(cum/s)	(sets)	(sets)	(cum/s)	
Flood		30.0	1	3	30	1.00
Jan	31.0	11.6	-	2	14	0.83
Feb	30.0	12.4	-	2	14	0.89
Mar	28.0	10.5	-	2	14	0.75
Apr	31.0	12.0	-	2	14	0.85
May	37.0	13.8	-	2	14	0.99
Jun	42.0	16.2	-	3	21	0.77
Jly	56.0	20.9	-	3	21	1.00
Aug	52.0	19.4	-	3	21	0.92
Sep	30.0	11.6	-	2	14	0.83
Oct	18.0	6.7	-	1	7	0.96
Nov	29.0	11.2	-	2	14	0.80
Dec	41.0	15.3	1	1	16	0.96
	425.0	161.5				0.88

Note; Data source ANNEX-D Proposed drainage discharge of average year.

FIGURE G-4-1 MONTHLY DISCHARGES EL-MAX P.S

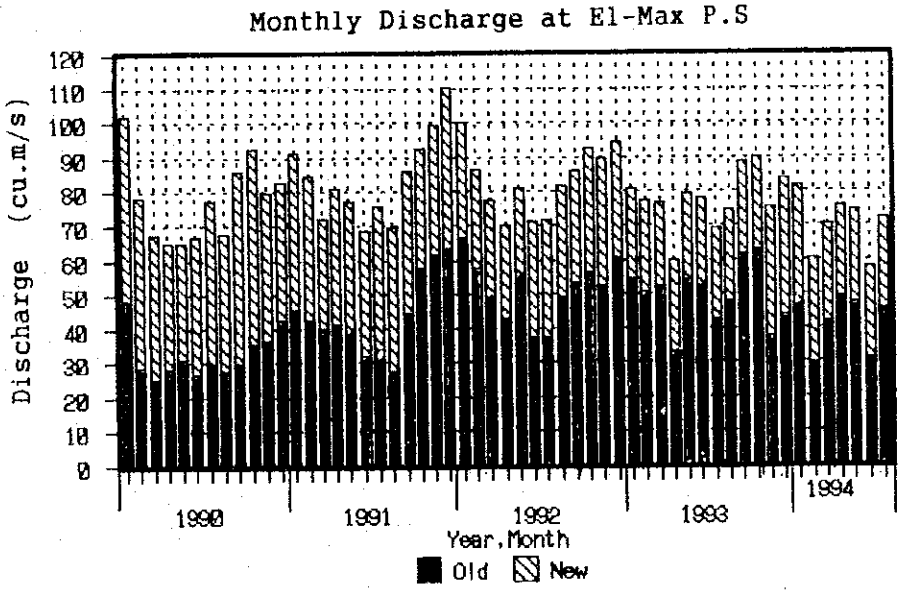


FIGURE G-4-2 MONTHLY DISCHARGES HARES P.S

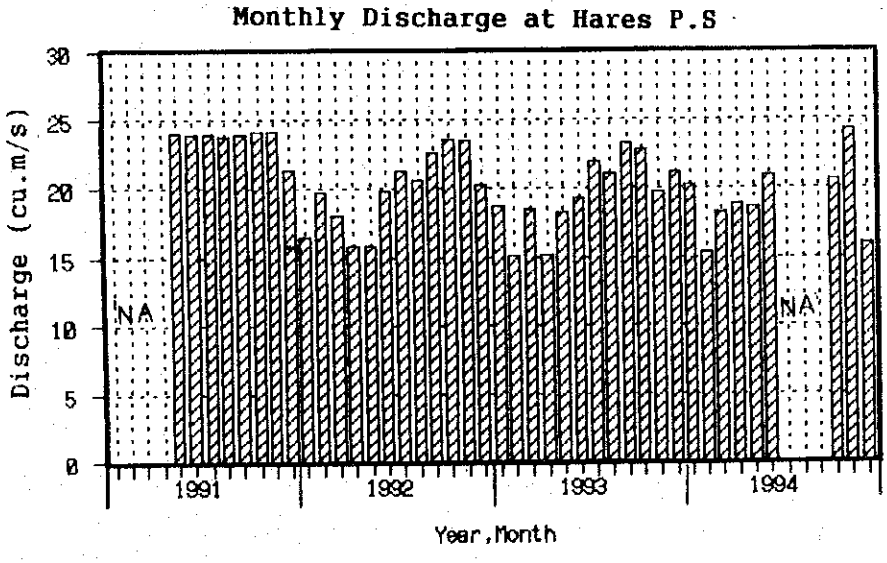
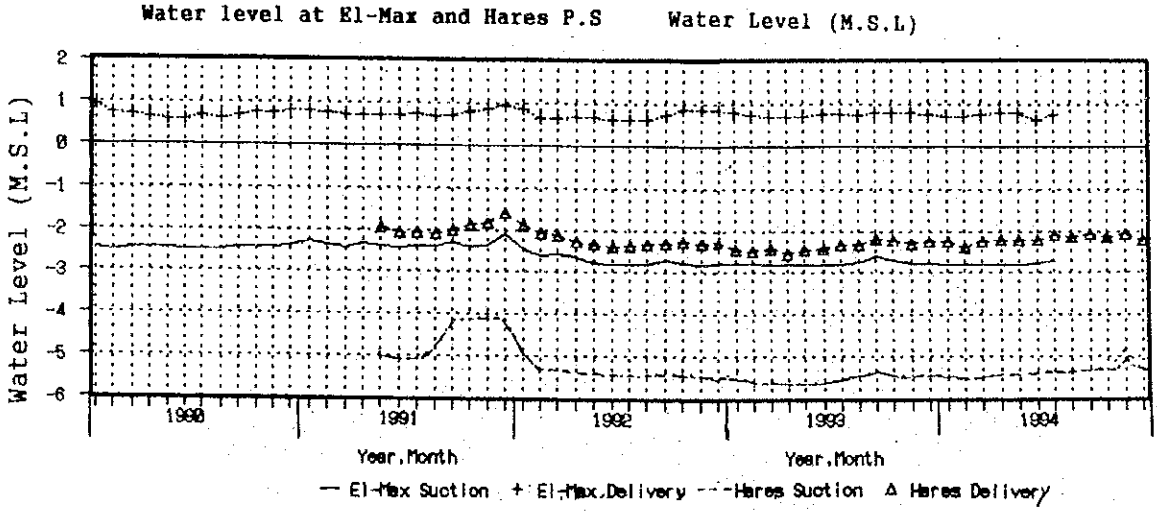


FIGURE G-4-3 WATER LEVEL AT EL-MAX AND HARES P.S



Head loss between El-Max suction W.L and Hares delivery W.L

Year	Water Level (M.S.L)		Head loss
	El-Max Suction	Hares Delivery	(m)
1991	-2.35	-1.95	0.40
1992	-2.71	-2.25	0.46
1993	-2.77	-2.37	0.40
1994	-2.78	-2.20	0.58

FIGURE G-4-4 PLAN and PROFILE of EL-MAX NO.1 EXISTING P.S

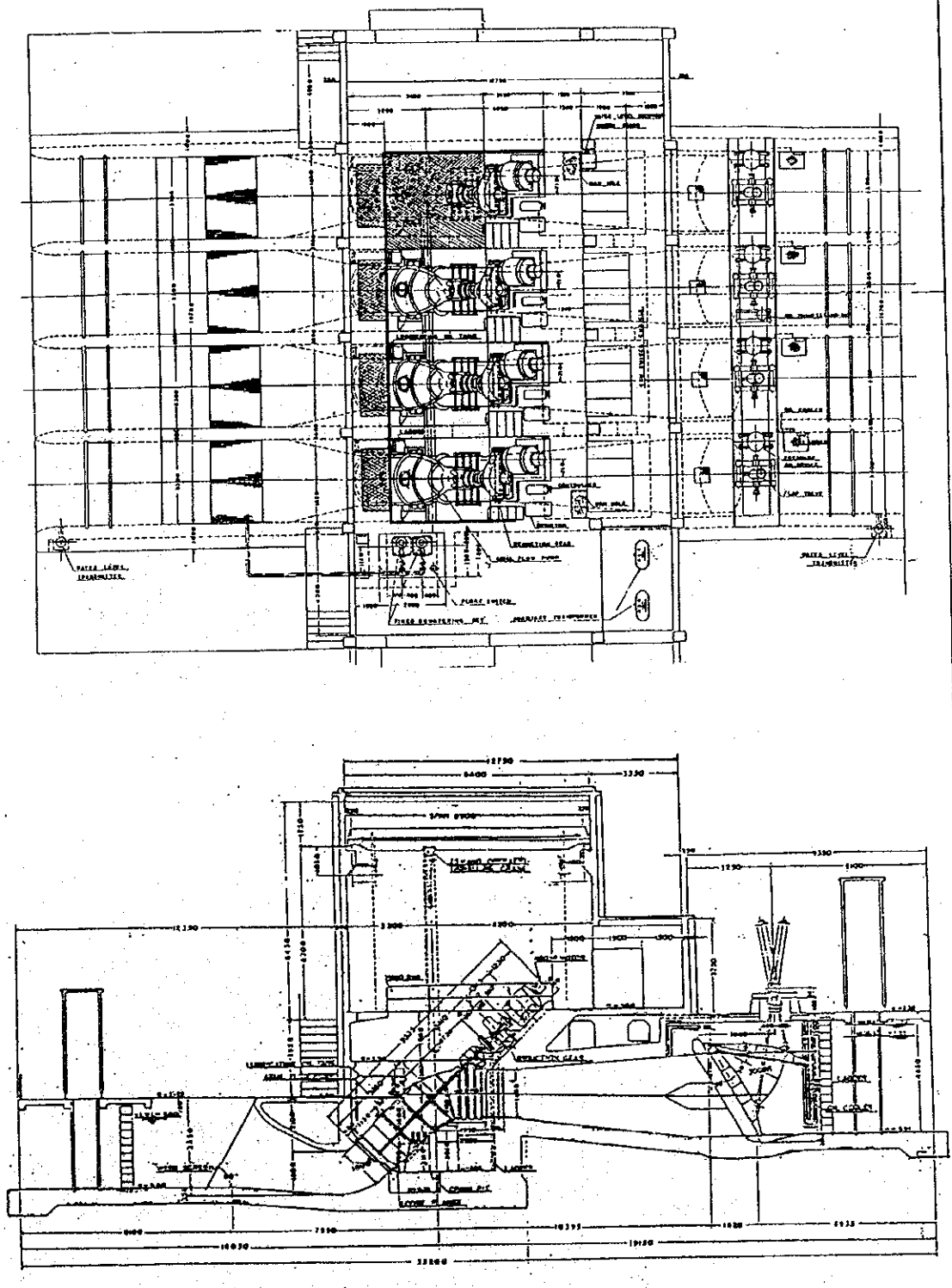


FIGURE G-4-5 PLAN and PROFILE of HARES EXISTING P.S

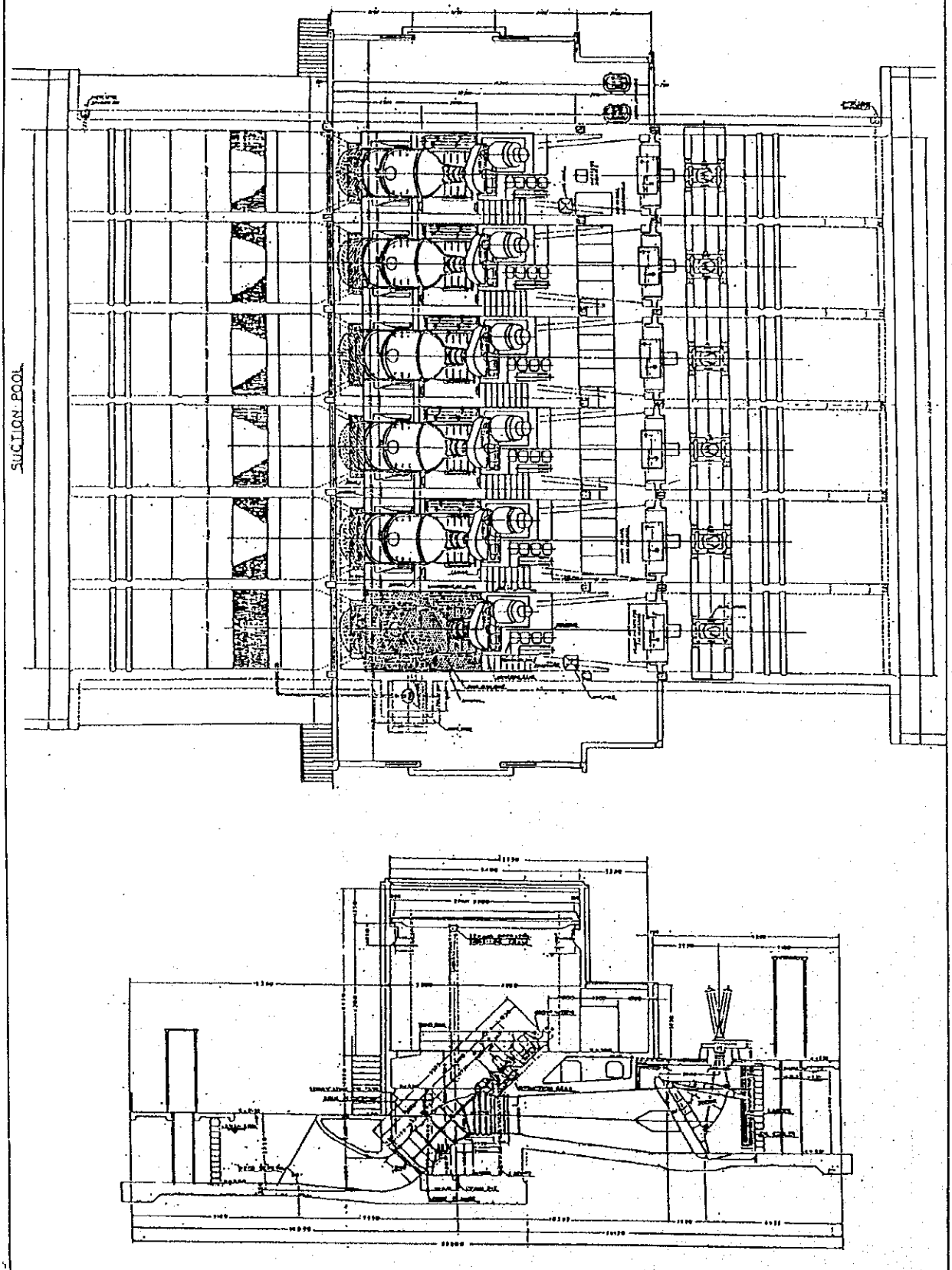


FIGURE G-4-6 NO.1 BORING DATA

El-Max (Boring No.1) GL.+1.16

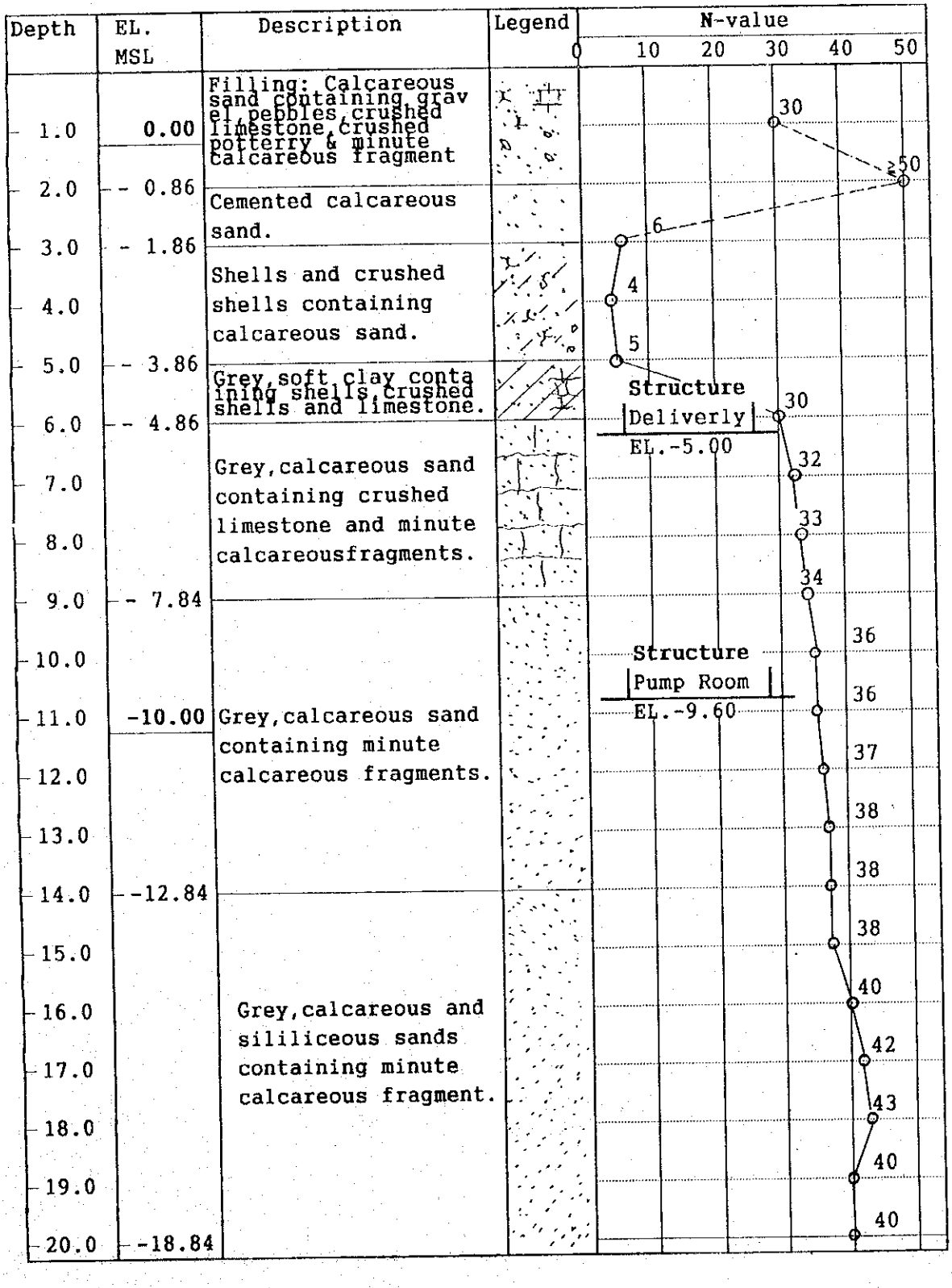
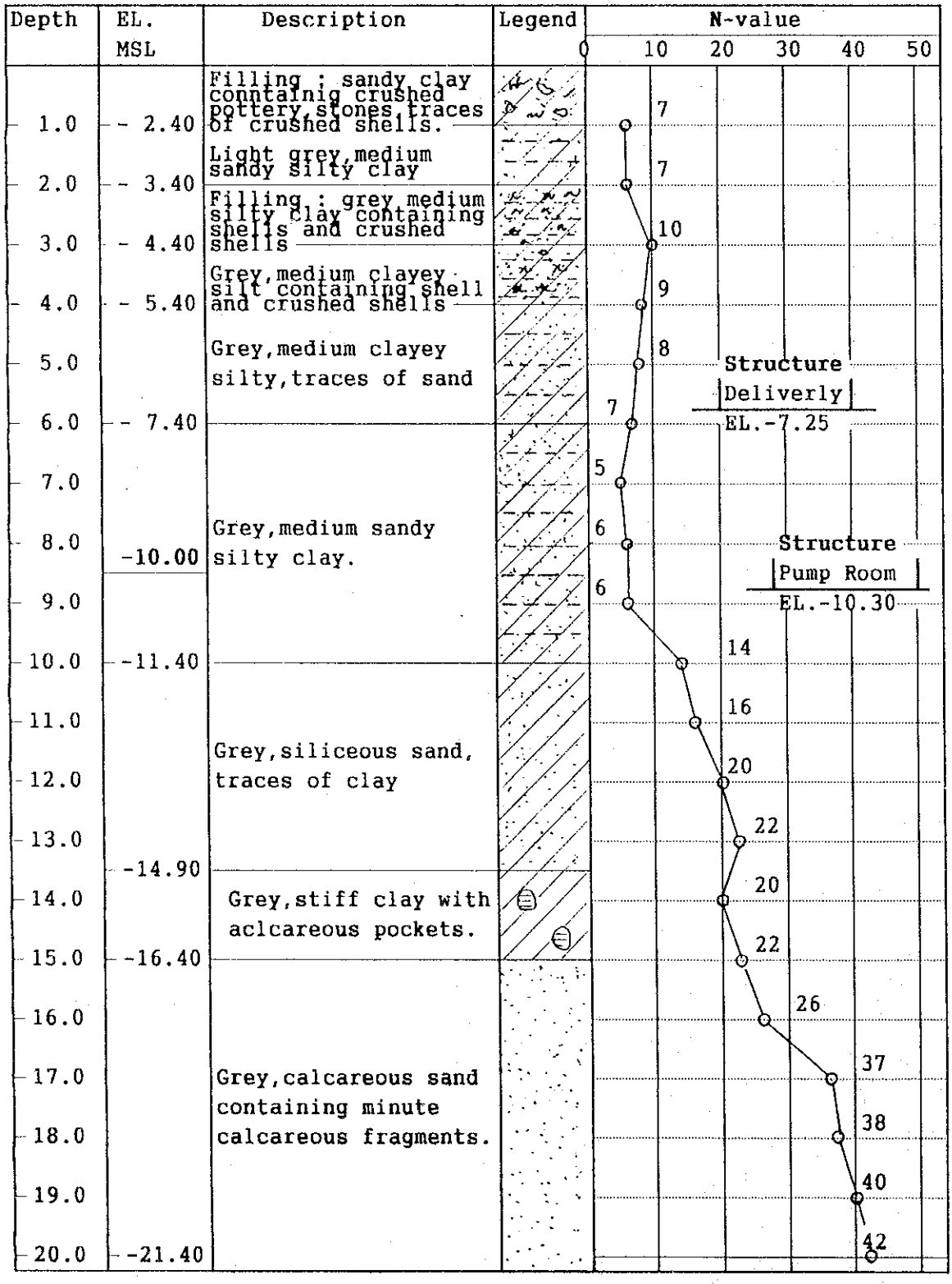


FIGURE G-4-7 NO.2 BORING DATA

Hares (Boring No.2) GL.-1.40



H. PROJECT COSTS

ANNEX H. PROJECT COSTS

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ANNEX H. Project Costs

1.1 Conditions of Cost Estimation

The project costs are estimated under the following conditions;

i) The civil works are to be constructed on a contract basis, and the construction machinery and equipment required for the construction works will be provided by the contractors. Therefore, only depreciation costs of the machineries and equipment are included in the construction costs.

ii) The project costs consist of construction and associated costs. Components of the project costs are shown in Figure H-2-1 for priority development area and Figure H-2-3 for priority development project, respectively. Out of the associated costs, subsurface tile drain costs should be burden by farmers with a repayment period of 20 years.

iii) The exchange rate between Egyptian Pound (LE) and U.S. Dollar is fixed as follows;

U.S. Dollar = 3.374 Egyptian Pound (LE)

iv) The physical contingency related to the construction and associated costs is set at 10 percent of the direct costs. The price escalation for foreign currency is predicted applying the international inflation index established by the World Bank as shown below, and on the other hand, for local currency 19 percent of inflation index is applied making reference for index established by Central Agency for Public Mobilization and Statistics.

Year	Inflation Index (%)	Year	Inflation Index (%)
1994	100	2001	121
1995	103	2002	123
1996	106	2003	126
1997	109	2004	129
1998	112	2005	132
1999	114	2006	135
2000	118		

1.2 Construction Costs

1) Basic Rate

The basic rate of labor, material and construction equipment is estimated considering the prevailing rate in Egypt, as of July 1994.

2) Unit Costs

Unit costs of construction work are calculated, in accordance with the proposed items, which are classified by construction methods, since the construction of the project will be executed on a contract basis with the costs of overhead, profit and taxes used in current MPWWR projects.

3) Construction Costs

The construction costs are estimated based on the unit costs for individual working items. The construction costs will be divided into foreign and local currency portions. Local currency portion is to be estimated on the basis of current price in Egypt in 1994, while foreign portion is estimated on the CIF price in Egypt.

1.3 Associated Costs

Associated costs are composed of on-farm development and subsurface drain costs, land acquisition and compensation costs, engineering and administration costs, and operation and maintenance equipment costs. As for the land purchase price, prevailing land values in the vicinity of project area were used.

1.4 Project Costs

1) Project Costs

The project costs for priority development area and project are estimated and they are summarized as shown in Table H-2-1 and Table H-2-12, respectively.

2) Disbursement Schedule

The annual disbursement schedule for both the project costs as mentioned in the above is estimated on the basis of the implementation schedule, and their summaries are shown in Table H-2-10 and Table H-2-21.

1.5 Operation and Maintenance Costs

The operation and maintenance costs annually required for the projects are composed of the annual salaries and wages of O/M organization staff, administration and general expenditure, pump operation cost, equipment repair and maintenance costs, fuel cost and office maintenance costs.

The operation and maintenance costs for both the priority development area and project were estimated as shown in Table H-2-11 and Table H-2-22, respectively.

1.6 Replacement Costs

Some facilities, especially mechanical works have shorter useful life than the project life of 50 years, and require replacement of the facilities within the project life. The followings show the useful life of the mechanical works.

- Pumps and gates : 25 years
- O/M equipment : 10 year

FIGURE H - 2 - 1 PROJECT COST COMPONENTS (PRIORITY DEVELOPMENT AREA)

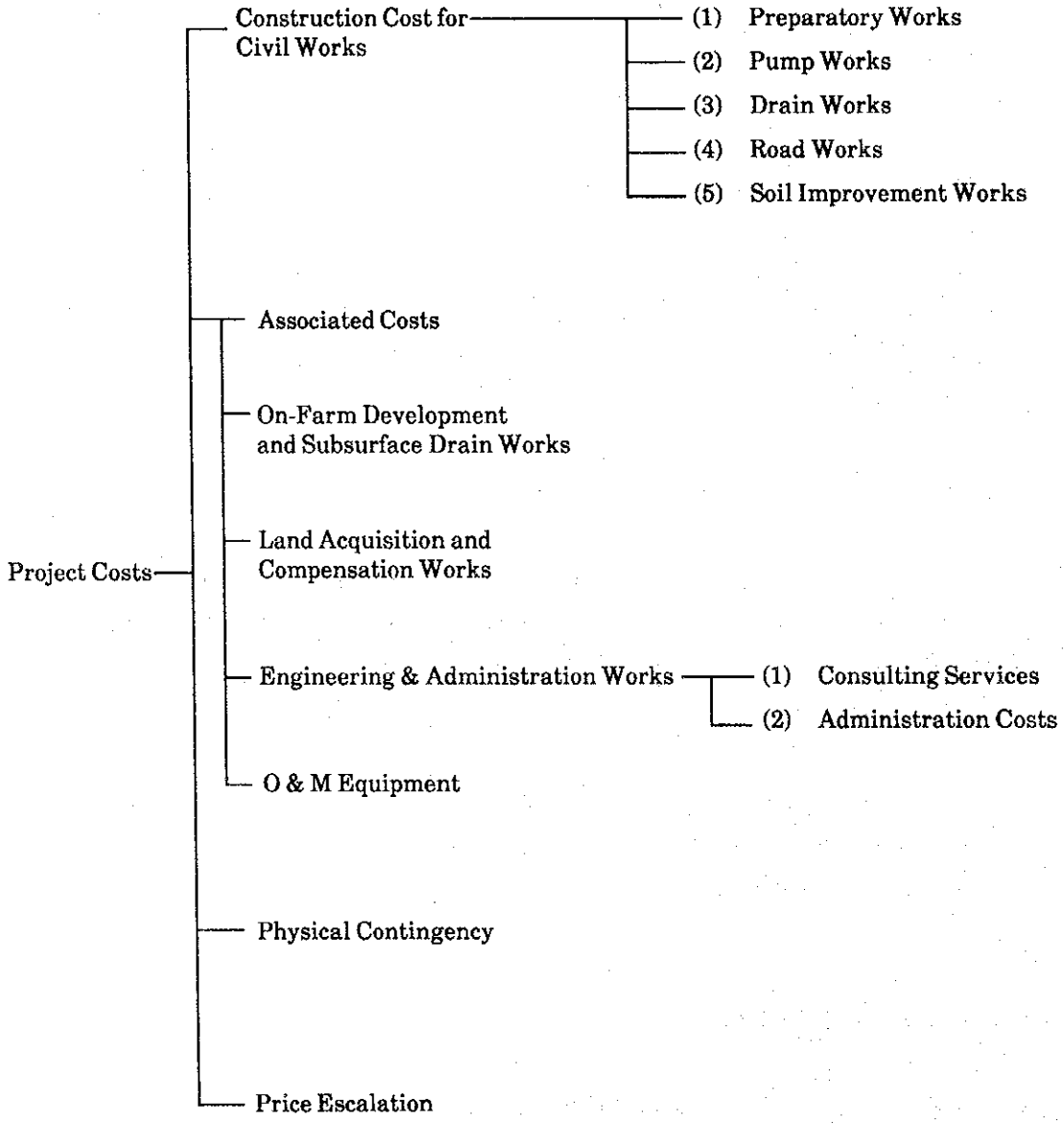

Table H-2-1 Project Costs (Priority Development Area)

(unit: '000 L.E)

Descriptions	F/C	L/C	Total
1. Construction Works			
1.1 Preparatory Works	70	2,010	2,080
1.2 Pump Works	26,640	6,180	32,820
1.3 Drain Works	26,260	7,480	33,740
1.4 Road Works	8,630	12,340	20,970
1.5 Soil Improvement Works	12,690	13,180	25,870
Sub-total	74,290	41,190	115,480
2. On-Farm Development and Subsurface Drain Works			
2.1 On-Farm Development Works	5,660	2,420	8,080
2.2 Subsurface Drain Works	22,660	9,710	32,370
Sub-total	28,320	12,130	40,450
3. Land Acquisition and Compensation Works	-	640	640
4. Engineering and Administration Works			
4.1 Consulting Services	9,390	8,760	18,150
4.2 Administration	1,420	1,420	2,840
Sub-total	10,810	10,180	20,990
5. O & M Equipment	5,310	800	6,110
6. Total (1 - 5)	118,730	64,940	183,670
7. Physical Contingency (10%)	11,880	6,490	18,370
8. Total (6 - 7)	130,610	71,430	202,040
9. Price Escalation	14,880	54,220	69,100
10. Grand Total	145,490	125,650	271,140

Table H - 2 - 2 Preparation Works (Priority Development Area)

Description	Unit	Q'ty	Unit Rate (LE)		Amount ('000 LE)		
			F/C	L/C	F/C	L/C	Total
1. Project Facility for Construction Supervision							
- Site Office	sq.m	200	240	560	48	112	160
- Equipment Warehouse	sq.m	300	40	160	12	48	60
- Furniture and Equipment	L.S		-	33,000	-	33	33
Total					60	193	253
2. Additional Survey and Investigation							
2.1 Pumping Works							
a) Topographic Survey							
- Plane Survey	ha	0.2	-	850	-	1	1
- Intake Drain Longitudinal and Cross Section Survey	km	0.5	-	5,000	-	3	3
b) Geological Investigation							
- Core Drilling and Laboratory Test	m	20	-	300	-	6	6
- Standard Penetration Test	time	20	-	30	-	1	1
Sub-total					-	11	11
2.2 Drain Works (including Road Works)							
a) Longitudinal and Cross Section Survey							
- Main Drain	km	24	-	5,000	-	120	120
- Branch	km	57	-	5,000	-	285	285
b) Plane Survey							
- El-Hagel Feeding Canal Siphon	ha	1	-	850	-	1	1
c) Geological Investigation							
- Core Drilling and Laboratory Test for b)	m	120	-	300	-	36	36
- Standard Penetration Test for b)	time	120	-	30	-	4	4
Sub-total					-	446	446
2.3 On-Farm Development and Subsurface Drain							
- Plane Survey (including Cadastral Maps)	ha	22,650	-	20	-	453	453
2.4 Soil Survey							
- Auger Boring	site	2,300	-	120	-	276	276
- Chemical Soil Survey	site	460	-	240	-	111	111
- Preparation on Soil Improvement Plan	L.S	1	-	5,000		50	50
Sub-total					-	437	437
2.5 Miscellaneous (10%)						134	134
Total					-	1,481	1,481
3. Overhead, Profit and Tax (20%)					12	334	346
Grand Total					72	2,008	2,080

Table H - 2 - 3 - (1/4) Drain and Road Works (Priority Development Area)

Description	Unit	Q'ty	Unit Cost (LE)	Amount ('000 LE) F/C	L/C	Total
(1) Hares Main Drain						
- Earth Work						
Excavation (Pump Dredger)	cu.m	588,350	6.5	3,212	612	3,824
(Backhoe)	cu.m	719,180	4.6	2,746	2562	3,308
Embankment	cu.m	45,100	6.0	227	43	270
Transportation of Soil	cu.m	1,262,500	6.4	6,060	2,020	8,080
Sub-Total				12,245	3,237	15,482
- Others Works	L. S			2,449	647	3,096
Total (1)				14,694	3,884	18,578
(2) Branches						
- Eearth Work						
Excavation (Backhoe)	cu.m	977,000	4.6	3,775	719	4,494
Embankment	cu.m	384,600	6.0	1,938	369	2,307
Transportation of soil	cu.m	592,500	6.4	2,844	948	3,792
Revetment	cu.m	15,500	70.0	434	651	1,085
Sub-Total				8,991	2,687	11,678
- Others Works	L.S			1,798	537	2,335
Total (2)				10,789	3,224	14,013
(3) El-Hagel Feeding Cannal Siphon						
- Temporaly Work						
(Diversion Channel and Cofferdam)						
Excavation	cu.m	1,050	4.6	4	1	5
Back Filling	cu.m	1,050	3.0	1	2	3
Embankment	cu.m	210	3.0	1	1	2
- Eearth Work						
Excavation	cu.m	9,780	4.6	37	8	45
Back Filling (Manual)	cu.m	1,440	4.5	0	6	6
(Machine)	cu.m	5,780	3.0	8	10	18
Transportation of Soil	cu.m	2,560	6.4	12	4	16
- Concrete Work						
Plain Concrete	cu.m	1,230	143.5	81	95	176
Reinforced Concrete	cu.m	270	163.3	21	23	44
Reinforced Concrete (Crane)	cu.m	270	230.8	35	27	62
From Work	sqm	1,030	44.9	2	44	46
Reinforcement Bar	ton	45.9	1,625.7	64	10	74
- Pipe Material						
SP ø 1800	ton	125	3,200	360	40	400
- Revetment	cu.m	870	70.7	24	37	61
Sub-Total				650	308	958
- Other Works	L.S			130	62	192
Total (3)				780	370	1,150
Drain Works Grand Total (1)+(2)+(3)						33,741 ≒33,740

Table H - 2 - 3 - (2/4) Drain and Road Works (Priority Development Area)

Description	Unit	Q'ty	Unit Cost (LE)	Amount ('000 LE) F/C	L/C	Total
(4) Gravel Pavement						
- Pavement Work	sq.m	494,750	17.0	3,364	5,046	8,410
Sub-Total				3,364	5,046	8,410
- Others Works	L. S	1		673	1,009	1,682
Total (4)				4,037	6,055	10,092
(5) Asphalt Pavement						
- Revetment Work	sq.m	130,000	53.0	2,756	4,134	6,890
Sub-Total				2,756	4,134	6,890
- Others Works	L. S	1		551	827	1,378
Total (5)				3,307	4,961	8,268
(6) Bridge (Type-A)						
- Temporaly Work						
(Diversion Channel and Cofferdam)						
Excavation	cu.m	4,100	4.6	16	3	19
Back Filling	cu.m	4,100	3.0	6	7	13
Embankment	cu.m	780	3.0	1	1	2
- Eearth Work						
Excavation	cu.m	1,100	4.6	4	1	5
Back Filling (Manual)	cu.m	200	4.5	0	1	1
(Machine)	cu.m	790	3.0	1	1	2
Transportation of Soil	cu.m	110	6.4	1	1	2
- Concrete Work						
Plain Concrete	cu.m	120	163.3	9	10	19
From Work	sq.m	740	44.9	1	32	33
Reinforcement Bar	ton	10.2	1,625.7	14	2	16
- Revetment	cu.m	150	70.0	4	6	10
Sub-Total				57	65	122
- Others Works	L. S	1		11	13	24
Total (/1unit)				68	78	146
Total (6)	L. S	1		68	78	146

Table H - 2 - 3 - (3/4) Drain and Road Works (Priority Development Area)

Description	Unit	Q'ty	Unit Cost (LE)	Amount ('000 LE) F/C	L/C	Total
(7) Bridge (Type-B)						
- Temporaly Work						
(Diversion Channel and Cofferdom)						
Excavation	cu.m	4,100	4.6	16	3	19
Back Filling	cu.m	4,100	3.0	6	7	13
Embankment	cu.m	780	3.0	1	1	2
- Eearth Work						
Excavation	cu.m	1,100	4.6	4	1	5
Back Filling (Manual)	cu.m	200	4.5	0	1	1
(Machine)	cu.m	790	3.0	1	1	2
Transportation of Soil	cu.m	110	6.4	1	1	2
- Concrete Work						
Plain Concrete	cu.m	120	163.3	10	11	21
From Work	sq.m	880	44.9	2	38	40
Reinforcement Bar	ton	10.8	1,625.7	16	3	19
- Revetment	cu.m	150	70.0	4	6	10
Sub-Total				61	73	134
- Others Works	L. S	1		12	15	27
Total (/1unit)				73	88	161
Total (7)	L. S	2		146	176	322
(8) Bridge (Type-B)						
- Temporaly Work						
(Diversion Channel and Cofferdom)						
Excavation	cu.m	4,100	4.6	16	3	19
Back Filling	cu.m	4,100	3.0	6	7	13
Embankment	cu.m	780	3.0	1	1	2
- Eearth Work						
Excavation	cu.m	1,100	4.6	4	1	5
Back Filling (Manual)	cu.m	200	4.5	0	1	1
(Machine)	cu.m	790	3.0	1	1	2
Transportation of Soil	cu.m	110	6.4	1	1	2
- Concrete Work						
Reinforced Concrete	cu.m	145	163.3	11	13	24
From Work	sq.m	930	44.9	2	40	42
Reinforcement Bar	ton	12.75	1,625.7	17	3	20
- Revetment	cu.m	150	70.0	4	6	10
Sub-Total				63	77	140
- Others Works	L. S	1		13	15	28
Total (/1unit)				76	92	168
Total (8)	L. S	2		152	184	336

Table H - 2 - 3 - (4/4) Drain and Road Works (Priority Development Area)

Description	Unit	Q'ty	Unit Cost (LE)	Amount ('000 LE) F/C	L/C	Total
(9) Bridge (Type-D)						
- Temporaly Work						
(Diversion Channel and Cofferdom)						
Excavation	cum	2,900	4.6	11	2	13
Back Filling	cum	2,900	3.0	4	5	9
Embankment	cum	610	3.0	1	1	2
- Eearth Work						
Excavation	cum	700	4.6	3	1	4
Back Filling (Manual)	cum	130	4.5	0	1	1
(Machine)	cum	490	3.0	1	1	2
Transportation of Soil	cum	70	6.4	1	1	2
- Concrete Work						
Reinforced Concrete	cum	120	163.3	9	10	19
From Work	spm	425	44.9	1	18	19
Reinforcement Bar	ton	11.050	1,625.7	15	3	18
- Revetment	cum	120	70.0	3	5	8
Sub-Total				49	48	97
- Other Works	L. S			5	4	9
Total (/1unit)				54	52	106
Total (9)	L. S	17		918	884	1,802
Road Works Grand Total (4) + (5) + (6) + (7) + (8) + (9)						20,966 ≒20,970

Table H - 2 - 4 Hares Pumping Station Works (Priority Development Area)

Description	Unit	Q'ty	Unit Rate (LE)		Amount ('000 LE)		
			F/C	L/C	F/C	L/C	Total
1. Mechanical and Electric Facility							
- Mechanical Facility	1	L.S			15,300	-	15,300
- Electric Facility	1	L.S			3,700	-	3,700
- Crane, Valve, Trashrack, Stop Log	1	L.S			2,100	2,000	4,100
- Installation	1	L.S			400	2,000	2,400
Total					21,500	4,000	25,500
2. Civil Works							
- Temporary Work							
Sheet Pile	t	450	4,500	500	2,025	225	2,250
Filling Soil	cum	1,200	15	9	18	11	29
Road, Bridge, Dewatering	L.S	1			200	200	400
- Foundation							
Concrete Pile ø 0.5, L=10.0m	nos	60	1,419	1,303	85	78	163
Concrete Pile ø 0.5, L=13.0m	nos	60	1,844	1,694	111	102	212
Sheet Pile	the	40	5,500	600	220	24	244
- Eearth Work							
Excavation	cum	17,000	10	4	170	68	238
Back Filling	cum	10,500	11	4	116	42	158
- Concrete Work							
Reinforced Concrete	cum	2,300	130	106	299	244	543
Form Work	sqm	4,250	2	56	9	238	247
Reinforcement	t	276	1,393	233	384	64	449
- Building	sqm						
Reinforced Concrete	cum	540	136	111	73	60	133
Form Work	sqm	3,600	11	56	40	202	241
Reinforcement	t	65	1,393	233	90	15	105
Others (Mortal, Window, Door)	L.S	1			110	110	220
Sub-Total					3,950	1,682	5,632
- Others Work (Canal Protection, Road Pavement, etc.)	%	30	30		1,185	505	1,690
Total					5,134		7,321
Grand Total					26,634		32,821 ≒32,800

Table H - 2 - 5 Soil Improvement Works (Priority Development Area)

Description	Unit	Q'ty	Unit Rate (LE)		Amount ('000 LE)		
			F/C	L/C	F/C	L/C	Total
Soil Improvement							
1. Gypsum							
- Land Class 1 & 2 (3 years)	ha	39,600	-	60	-	2,376	2,376
- Land Class 3 & 4 (5 years)	ha	47,250	-	120	-	5,670	5,670
2. Application Works (75ps Tractor)							
- Land Class 1 & 2 (3 years)	ha	39,600	101	38	4,000	1,505	5,505
- Land Class 3 & 4 (5 years)	ha	47,250	101	38	4,772	1,796	6,568
3. Subsoiling (75 ps Tractor)							
- Land Class 1 & 2	ha	13,200	173	81	2,284	1,069	3,353
- Land Class 3 & 4	ha	9,450	173	81	1,635	765	2,400
Total					12,691	13,181	25,872

Table H - 2 - 6 Land Acquisition and Compensation Costs (Priority Development Area)

Description	Unit	Q'ty	Unit Cost (LE)	Amount ('000 LE)			Remarks
				F/C	L/C	Total	
1. Land Acquisition							
- Hares Pumping Station	sq.m	11,000	4			44	
Total (A)							
2. Land Compensation							
- Hares Main Drain	sq.m	227,500	4LE/m^2/month	100	370	370	10 days
- El-Hager Feeding Canal Siphon	sq.m	9,000	4LE/m^2/month	100	108	108	3month
- Bridge	sq.m	14,740	4LE/m^2/month	100	118	118	2month
Total (B)						596	
Grand Total (A) + (B)						640	

Table H - 2 - 7 Consulting Service Costs (Priority Development Area)

Item	Description	Quantity	Unit	Rate	Total Amount: Foreign Currency	Total Amount: Local Currency
				(LE)	('000LE)	('000 LE)
1.	Detailed Design Stage					
1.1	Foreign Currency					
	Consultants Remuneration	34	month	80,000	2,720	
	Out-of Pocket Expenses					
	International Travel Expense	9	trip	27,000	243	
	Reimbursable Cost Items and Others (10%)		LS		296	
	Miscellaneous (10%)				326	
	Sub-total				3,585	
1.2	Local Currency					
	Consultants Remuneration	38	month	40,000		1,520
	Consultants Perdiem					
	Foreign	34	month	3,500		119
	Local	11	month	2,500		28
	Living Allowance and Quarters					
	Foreign	34	month	4,500		153
	Local	11	month	2,000		22
	Local Communication and Transportation		LS			80
	Printing of Report		LS			15
	Miscellaneous (10%)		LS			194
	Sub-total					2,131
2.	Construction Supervision Stage					
2.1	Foreign Currency					
	Consultants Remuneration	57	month	80,000	4,560	
	Out-of Pocket Expenses					
	International Travel Expense	9	trip	27,000	243	
	Reimbursable Cost Items and Others (10%)		LS		480	
	Miscellaneous (10%)		LS		528	
	Sub-total				5,811	
2.2	Local Currency					
	Consultants Remuneration	98	month	40,000		3,920
	Consultants Perdiem					
	Foreign	57	month	3,500		200
	Local	98	month	2,500		245
	Living Allowance and Quarters					
	Foreign	57	month	4,500		257
	Local	98	month	2,000		196
	Local Communication and Transportation		LS			200
	Printing of Report		LS			45
	Miscellaneous (10%)		LS			506
	Sub-total					5,569
3.	Supporting Services and Management Stage					
3.1	Foreign Currency					
	Consultants Remuneration	-	month	-		
	Out-of Pocket Expenses					
	International Travel Expense	-	month	-		
	Reimbursable Cost Items and Others (10%)		LS	-		
	Miscellaneous (10%)		LS	-		
	Sub-total			-		
3.2	Local Currency					
	Consultants Remuneration	20	month	40,000		800
	Consultants Perdiem					
	Foreign	-	month	3,500		-
	Local	20	month	2,500		50
	Living Allowance and Quarters					
	Foreign	-	month	4,500		-
	Local	20	month	2,000		40
	Local Communication and Transportation		LS			60
	Printing of Report		LS			10
	Miscellaneous (10%)		LS			96
	Sub-total					1,056
	Total				9,396	8,756

Note: Proposed schedule of consulting services is shown in Figure H-2-2.

FIGURE H - 2 - 2 PROPOSED SCHEDULE FOR CONSULTING SERVICES (PRIORITY DEVELOPMENT AREA)

Description	Man-Month		1998			1999			2000			2001			2002		
	Foreign	Local	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
I. Detailed Design																	
1. Leader	12	-															
2. Hydrologist	2	-															
3. Irrigation and Drainage Engineer	2	-															
4. Engineering Geologist	-	4															
5. Soil Mechanical Engineer	-	4															
6. Design Engineer (Pump)	4	-															
7. - do - (Drain)	-	4															
8. - do - (Structure)	-	4															
9. - do - (On-Farm)	-	4															
10. - do - (Architecture)	-	4															
11. Mechanical Engineer (Equipment)	3	-															
12. Construction Planner	3	-															
13. Cost Estimator	3	-															
14. Specialist for Tender Document	-	2															
15. Specification Writer	-	2															
16. Agronomist	3	-															
17. Soil Scientist	-	4															
18. Economist	2	-															
19. Extension Specialist	-	3															
20. Environmental Expert	-	3															
Sub-total	34	38															
II. Construction Supervision																	
II-1. Tendering																	
1. Project Engineer (Leader)	2	-															
2. Mechanical Engineer	2	-															
3. Cost Estimator	1	-															
Sub-total	5	-															
II-2. Construction Supervision																	
4. Project Engineer (Leader)	36	-															
5. Pump Engineer	18	-															
6. Drain and Structure Engineer	-	24															
7. Architect	-	20															
8. On-Farm Facilities Engineer	-	36															
9. Mechanical Engineer	3	-															
10. Surveyor	-	18															
Sub-total	57	98															
III. Supporting Services and Management																	
1. Agronomist	-	8															
2. Extension Service Specialist	-	12															
Sub-total	-	20															
Total	96	156															

Note: Foreign Consultants Local Consultants

Table H - 2 - 8 Administration Cost (Priority Development Area)

(unit: '000 LE)

1. Personnel Cost

a) Detailed Design Stage

EPADP Design Staff	1,200	LE/month	× 60 man-month	=	72
MED Design Staff	1,200	LE/month	× 60 man-month	=	72
Sub-total					144

b) Construction Stage

Project Management Dept.					
Project Manager	18,000	LE/year	× 1 person	=	18
Assistant Manager	14,400	LE/year	× 1 person	=	14
Secretary	9,600	LE/year	× 1 person	=	10
Administration Dept.					
Section Chief	12,000	LE/year	× 1 person	=	12
Accounting Clerk	6,000	LE/year	× 1 person	=	6
Assistant Accounting Clerk	4,800	LE/year	× 2 persons	=	10
Administration Clerk	4,800	LE/year	× 1 person	=	5
Typist	4,800	LE/year	× 2 persons	=	10
Land Acquisition Dept.					
Section Chief	12,000	LE/year	× 1 person	=	12
Clerk	4,800	LE/year	× 2 person	=	10
Assistant	4,800	LE/year	× 2 person	=	10
Typist	4,800	LE/year	× 2 person	=	10
Engineering Dept.					
Section Chief	12,000	LE/year	× 1 person	=	12
Civil Engineer	9,600	LE/year	× 2 persons	=	19
Technician	9,600	LE/year	× 4 persons	=	38
Topo-surveyor	8,400	LE/year	× 2 persons	=	17
Mechanical Dept.					
Driver (Vehicles)	9,600	LE/year	× 2 persons	=	19
Operator (Heavy equipment)	9,600	LE/year	× 2 persons	=	19
Security Guard	4,800	LE/year	× 3 persons	=	14
Janitor	4,800	LE/year	× 3 persons	=	14
Sub-total					279
279,000 LE × 4 years					= 1,116
Total					1,260

2. Equipment Costs for Construction Supervision

(unit: '000 LE)

Description	Q'ty	Unit Cost F/C	Unit Cost L/C	Amount F/C	Amount L/C	Amount Total
Station Wagon (4WD)	12	70	-	840	-	840
Motorcycle	6	8	-	48	-	48
Theodrite	2	12	-	24	-	24
Current Meter	2	8	-	16	-	16
EC Meter	2	2	-	4	-	4
Radio Set	1	20	-	20	-	20
Walkie-Talkie	12	2	-	24	-	24
Automatic Rain Gauge	1	8	-	8	-	8
Desk Top Computer	2	10	-	20	-	20
Drafting Board	2	2	-	4	-	4
Copy Machine	2	10	-	20	-	20
Miscellaneous (5%)				51	-	51
Transportation Cost	L.S	-	10	-	10	10
Total				1,079	10	1,089

3. Repair and Maintenance Cost

Vehicle Repair	70,000 LE ×10% × 12 units	=	84
Vehicle Fuel	1.0 LE/lit × 5 lit/day × 250 days × 12 units	=	15
Building Maintenance	193,000 LE × 4%	=	8
Office Supply		=	15
Total			122
122,000 LE × 4 years =			488

4. Grand Total

	F/C	L/C	Total
Personnel Cost	-	1,260	1,260
Equipment Cost for Construction Supervision	1,079	10	1,089
Repair and Maintenance Cost	336	152	488
Total	1,415	1,422	2,837

Table H - 2 - 9 O & M Equipment Cost (Priority Development Area)

(unit: '000 L.E)

Description	Q'ty	Unit Cost		Amount		
		F/C	L/C	F/C	L/C	Total
Motor Grader	3	450	-	1,350	-	1,350
Bulldozer, 3.0 ton	3	200	-	600	-	600
Loader Backhoe Combination	3	340	-	1,020	-	1,020
Flat Bet Truck	6	100	-	600	-	600
Pick Up Truck	6	50	-	300	-	300
Station Wagon (4WD)	3	70	-	210	-	210
Motorcycle	9	8	-	72	-	72
Diesel Generating Set, 15 KV	3	35	-	105	-	105
Concrete Mixer	3	25	-	75	-	75
Concrete Vibrator, 1/2"	3	4	-	12	-	12
Hand-tool Set for Field Workshop	6	50	-	300	-	300
VHF/FM Communication System	1	120	-	120	-	120
Desk Top Computer	1	70	-	70	-	70
Other O&M Equipment (15%)	L.S			-	725	725
Sub-total				4,834	725	5,559
Spare Parts (10%)				483	73	556
Total				5,317	798	6,115

TABLE H-2-10 DISBURSEMENT SCHEDULE OF PROJECT COSTS (PRIORITY DEVELOPMENT AREA)

(Unit: '000 LE)

Descriptions	1998			1999			2000			2001			2002			Total		
	F/C	L/C	Total	F/C	L/C	Total	F/C	L/C	Total	F/C	L/C	Total	F/C	L/C	Total	F/C	L/C	Total
1. Construction Works																		
1.1 Preparatory Works	72	2,008	2,080	-	-	-	-	-	-	-	-	-	-	-	-	72	2,008	2,080
1.2 Pumping Works	-	-	-	-	-	-	-	-	-	8,880	2,062	10,942	17,754	4,125	21,879	26,634	6,187	32,821
1.3 Drain Works	-	-	-	-	-	-	13,131	3,739	16,870	13,132	3,739	16,871	-	-	-	26,263	7,478	33,741
1.4 Road Works	-	-	-	-	-	-	5,752	8,225	13,977	2,876	4,113	6,989	-	-	-	8,628	12,338	20,966
1.5 Soil Improvement Works	-	-	-	-	-	-	4,230	4,393	8,623	4,231	4,394	8,625	4,230	4,394	8,624	12,691	13,181	25,872
Sub-total	72	2,008	2,080				23,113	16,357	39,470	29,119	14,308	43,427	21,984	8,519	30,503	74,288	41,192	115,480
2. On-Farm Development and Subsurface Drain Works																		
2.1 On-Farm Development Works	-	-	-	-	-	-	1,886	808	2,694	1,888	810	2,698	1,886	808	2,694	5,660	2,426	8,086
2.2 Subsurface Drain Works	-	-	-	-	-	-	7,552	3,236	10,788	7,553	3,238	10,791	7,552	3,236	10,788	22,657	9,710	32,367
Sub-total	-	-	-	-	-	-	9,438	4,044	13,482	9,441	4,048	13,489	9,438	4,044	13,482	28,317	12,136	40,453
3. Land Acquisition and Compensation Works	-	-	-	-	318	318	-	318	318	-	-	-	-	-	-	-	636	636
4. Engineering and Administration Works																		
4.1 Consulting Services	3,289	2,101	5,390	470	-	470	1,503	2,014	3,517	1,785	2,364	4,149	2,349	2,277	4,626	9,396	8,756	18,152
4.2 Administration	-	144	144	353	319	672	354	319	673	354	320	674	354	320	674	1,415	1,422	2,837
Sub-total	3,289	2,245	5,534	823	319	1,142	1,857	2,333	4,190	2,139	2,684	4,823	2,703	2,597	5,300	10,811	10,178	20,989
5. O&M Equipment	5,317	798	6,115	-	-	-	-	-	-	-	-	-	-	-	-	5,317	798	6,115
6. Total (1-5)	8,678	5,051	13,729	823	637	1,460	34,408	23,052	57,460	40,699	21,040	61,739	34,125	15,160	49,285	118,733	64,940	183,673
7. Physical Contingency (10%)	868	505	1,373	82	64	146	3,441	2,305	5,746	4,070	2,104	6,174	3,412	1,516	4,928	11,873	6,494	18,367
8. Total (6-7)	9,546	5,556	15,102	905	701	1,606	37,849	25,357	63,206	44,769	23,144	67,913	37,537	16,676	54,213	130,606	71,434	202,040
9. Price Escalation	-	528	528	9	212	221	1,703	13,972	15,675	5,104	19,557	24,661	8,070	19,944	28,014	14,886	54,213	69,099
10. Grand Total (8-9)	9,546	6,084	15,630	914	913	1,827	39,552	39,329	78,881	49,873	42,701	92,574	45,607	36,620	82,227	145,492	125,647	271,139

TABLE H-2-11 OPERATION AND MAINTENANCE COST (PRIORITY DEVELOPMENT AREA)

Description	Annual Cost
	('000 L.E)
Salary and Wage	451.2
Administration and General Expenditure	45.1
Pump Operation Cost	291.9
Equipment Repair and Maintenance Cost	611.5
Fuel Cost	28.7
Drain Maintenance Cost	420.6
Office Maintenance Cost	20.1
Total	1,869.1

1. Salary and Wage

Description	No. of Staff	Rate	Total Cost
		(LE/year)	('000 L.E)
1.1 Nubariya Drainage Diretorate (EPADP)			
Director General	1	14,400	14.4
Administration Branch			
Administration	1	9,600	9.6
Accounting	1	6,000	6.0
Material	1	6,000	6.0
Security and Labor	4	4,800	19.2
Engineering Branch			
Budget Planning	1	9,600	9.6
Pre-Survey	1	8,400	8.4
Design	2	8,400	16.8
Mechanical Branch			
Vehicle	2	9,600	19.2
O&M Equipment	2	9,600	19.2
Communication	1	6,000	6.0
Drainage Center (Three Offices)			
Chief	3	6,000	18.0
Administration	3	6,000	18.0
Operation			
Drainage Technician	6	6,000	36.0
Drain Tender	15	6,000	90.0
Repairing and Maintenance	9	6,000	54.0
Drainage Advisory Staff	6	6,000	36.0
Sub-total			386.4

Description	No. of Staff	Rate	Total Cost
		(LE/year)	('000 L.E)
1.2 El-Max Directorate (MED)	1	14,400	14.4
Director General	2	9,600	19.2
Mechanical Engineer	2	6,000	12.0
Pump Operator	4	4,800	19.2
Security and Labor			
			64.8
Sub-total			451.2
Total			
2. Administration and General Expenditure Cost			
LE 451,200×0.10			45.1
3. Pump Operation Cost			
4,525 hr×430 kw×0.15 LE/KWh			291.9
4. Equipment Repair and Maintenance Cost			
LE 6,115,000×0.10			611.5
5. Fuel Cost			
Heavy Equipment;			
0.20 LE/lit×20 lit/day×150 days×9 units			5.4
Truck;			
0.20 LE/lit×20 lit/day×150 days×12 units			7.2
Vehicle;			
1.0 LE/lit×15 lit/day×300 days×3 units			13.5
Motorcycle and Others (10%)			2.6
Total			28.7
6. Omoum Main Drain Maintenance Cost			
O&M Road Maintenance			
Geavel; LE 2,448,000×2%			49.0
Drain Maintenance			
LE 18,578,000×2%			371.6
Total			420.6
7. Office Maintenance Cost			
Building Maintenance Cost			
LE 253,000×4%/year			10.1
Office Supplies			10.0
Total			20.1

FIGURE H-2-3 PROJECT COST COMPONENTS (PRIORITY DEVELOPMENT PROJECT)

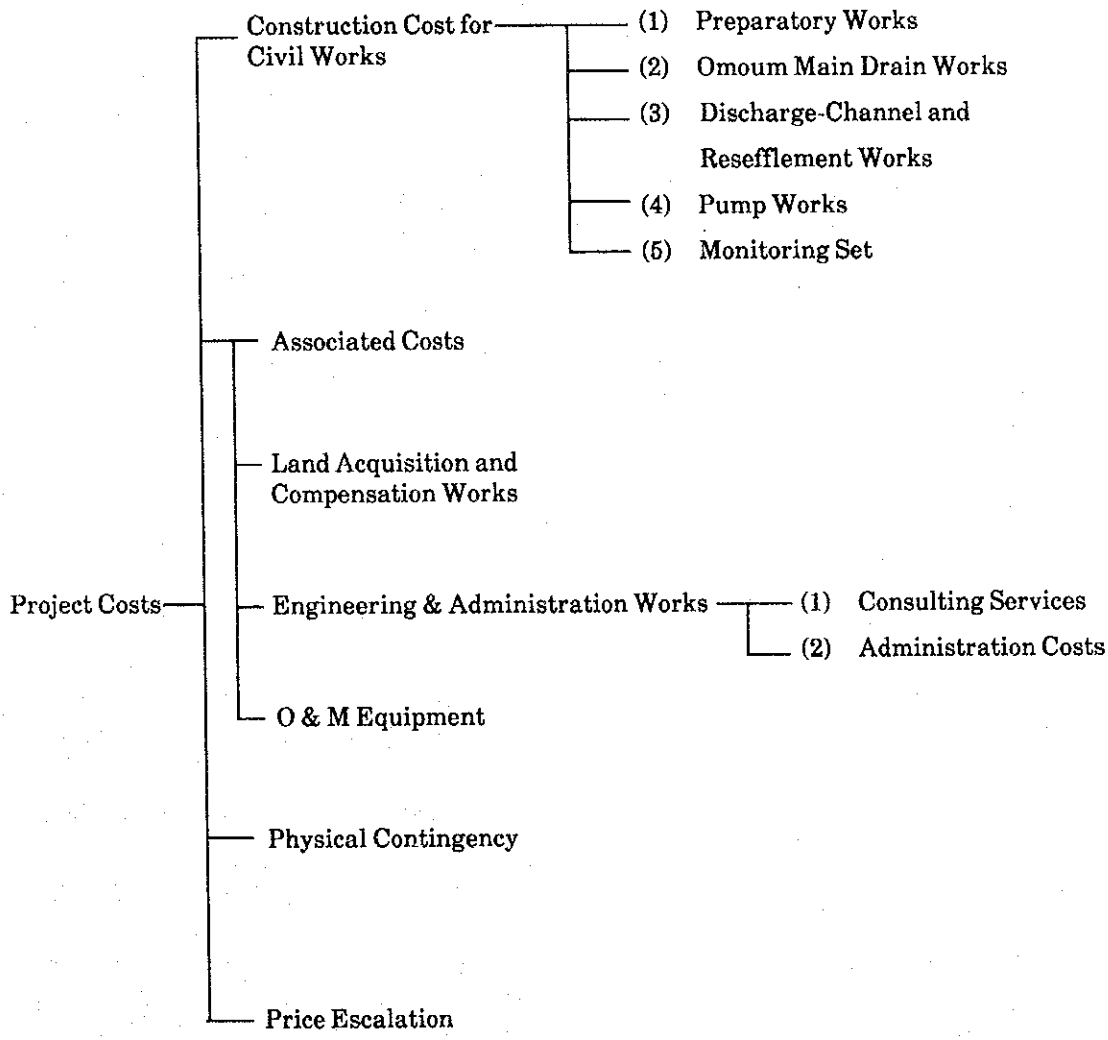

Table H-2-12 Project Costs (Priority Development Project)

(unit: '000 L.E)

Descriptions	F/C	L/C	Total
1. Construction Works			
1.1 Preparatory Works	70	410	480
1.2 Omoum Main Drain Works	32,970	10,830	43,800
1.3 Discharge-Channel and Resettlement Works	15,510	2,770	18,280
1.4 El-Max Pumping Station	41,700	10,330	52,030
1.5 Monitoring Set	250	100	350
Sub-total	90,500	24,400	114,940
2. On-Farm Development and Subsurface Drain Works	-	-	-
3. Land Acquisition and Compensation Works	-	-	-
4. Engineering and Administration Works			
4.1 Consulting Services	9,070	7,470	16,540
4.2 Administration	1,420	1,420	2,840
Sub-total	10,490	8,890	19,380
5. O & M Equipment	3,200	480	3,680
6. Total (1 - 5)	104,190	33,810	138,000
7. Physical Contingency (10%)	10,420	3,380	13,800
8. Total (6 - 7)	114,610	37,190	151,800
9. Price Escalation	15,020	31,360	46,380
10. Grand Total (8 - 9)	129,630	68,550	198,180

Table H-2-13 Preparation Works (Priority Development Project)

Description	Unit	Q'ty	Unit Rate (LE)		Amount ('000 LE)		
			F/C	L/C	F/C	L/C	Total
1. Project Facility for Construction Supervision							
- Site Office	sq.m	200	240	560	48	112	160
- Equipment Warehouse	sq.m	300	40	160	12	48	60
- Furniture and Equipment	L.S		-	33,000	-	33	33
Total					60	193	253
2. Additional Survey and Investigation							
2.1 Pump Works							
a) Topographic Survey							
- Plane Survey	ha	-	-	850	-	-	-
- Intake Omoum Main Drain Longitudinal and Cross Section Survey	km	1	-	5,000	-	5	5
b) Geological Investigation							
- Core Drilling and Laboratory Test	m	20	-	300	-	6	6
- Standard Penetration Test	time	20	-	30	-	1	1
Sub-total					-	12	12
2.2 Omoum Main Drain Works							
a) Longitudinal and Cross Section Survey	km	11	-	5,000	-	55	55
b) Plane Survey							
- Nubariya Siphon	ha	0.5	-	850	-	1	1
- Gate Facilities	ha	0.2	-	850	-	1	1
c) Geological Investigation							
- Core Drilling and Laboratory Test	m	80	-	300	-	24	24
- Standard Penetration Test	time	80	-	30	-	3	3
d) Embankment Material Test							
- Test Pit excavation	place	5	-	300	-	2	2
- Soil laboratory Test	sample	15	-	100	-	2	2
Sub-total					-	88	88
2.3 Discharge-Channel							
a) Longitudinal and Cross Section Survey	km	1	-	5,000	-	5	5
b) Plane Survey	ha	10	-	850	-	9	9
c) Geological Investigation							
- Core Drilling	m	60	-	300	-	18	18
Sub-total					-	32	32
2.4 Miscellaneous (10%)						13	13
Total					-	145	145
3. Overhead, Profit and Tax (20%)					12	67	79
Grand Total					72	405	477

Table H-2-14 (1/2) Omoum Main Drain Works (Priority Development Project)

Description	Unit	Q'ty	Unit Cost (LE)	Amount ('000 LE) F/C	L/C	Total
(1) Separation Dike of Mariut Lake						
- Temporaly Work						
Diversion Channel and Cofferdam	cum	410,000	9.1	3,314	597	3,731
- Eearth Work						
Excavation	cum	1,894,600	4.6	7,234	1,482	8,716
Embankment of Soil	cum	196,100	8.3	1,367	260	1,627
Transpotation of Soil	cum	1,359,000	6.4	6,523	2,174	8,697
- Road Works						
Gravel Pavement	sqm	63,700	17.0	433	650	1,083
Sub-total				18,691	5,163	23,854
- Others Works	L.S	1		5,607	1,549	7,156
Total (1)				24,298	6,712	31,010
(2) Gate Facility		per 1 unit				
- Eearth Work						
Excavation	cum	2,540	4.6	10	2	12
Back Filling (Manual)	cum	170	4.5	0	1	1
Back Filling (Machine)	cum	700	3.0	1	1	2
Transpotation of Soil	cum	1,670	6.4	8	3	11
- Concrete Work						
Reinforced concrete	cum	670	163.3	51	58	109
Reinforced concrete (crane)	cum	70	230.8	9	7	16
Form Work	sqm	1,680	44.9	3	72	75
Reinforcement bar	t	62.9	1,625.7	88	14	102
- Foundation						
Concrete Pile (ø500, L=20 m)	m	800	272	113	104	217
Steel Sheet-Pile	t	20.592	6,100	113	13	126
- Steel Gate Equipment	t	6.240	75,000	421	47	468
- Riprap and Revetment	cu.m	700	70	20	29	49
Sub-total				837	351	1,188
- Others Work	L.S			251	105	356
Total (/1 unit)				1,088	1,456	1,544
Total (2)	L.S	7		7,616	3,192	10,808

Table H-2-14 (2/2) Omoum Main Drain Works (Priority Development Project)

Description	Unit	Q'ty	Unit Cost (LE)	Amount ('000 LE) Cost	Cost	Total
(3) Nubariya Siphon						
- Setting Basion						
Excavation	cum	60,480	4.6	231	47	278
Embankment	cum	13,900	8.3	97	18	115
Transporation of Soil	cum	37,300	6.4	179	60	239
- Riprap and Revetment	cum	9,100	70.0	255	382	637
- Stop-Log Gate and Screen Bar						
Stop-Log Gate (Timber)	cum	35	800.0	1	27	28
Others	L.S	1		1	10	11
- Manhole						
i) Eearth Work						
Excavation (Manual)	cum	1,100	3.3	0	4	4
Excavation (Machine)	cum	2,500	2.2	5	1	6
Back Filling (Manual)	cum	1,700	4.5	0	7	7
Back Filling (Machine)	cum	1,700	3.0	2	3	5
Compaction	cum	3,400	2.3	7	1	8
ii) Concrete Work						
Reinforced Concrete	cum	120	163.3	9	10	19
Form Work	sqm	480	230.8	4	106	111
Reinforced Bar	t	10,200	1,625.7	14	2	16
Others	L.S	1		8	35	43
Sub-total				813	713	1,526
- Other Works	L.S			244	214	458
Total (3)				1,057	927	1,984
Grond Total (1) + (2) + (3)				32,971	10,831	43,802
				+ 32,970 +	10,830+	43,800

Table H-2-15 Discharge-Channel and Resettlement Works (Priority Development Project)

Description	Unit	Q'ty	Unit Cost (LE)	Amount ('000 LE) F/C	L/C	Total
1. Temporaly Work						
Excavation	cum	18,780	2.2	34	7	41
Banking	cum	18,780	3.0	25	31	56
Transporation of Soil	cum	37,560	6.4	180	60	240
Steel Sheet-Pile	t	2,460	5,000	11,070	1,230	12,300
2. Eearth Work						
Excavation	cum	33,100	4.6	126	26	152
Embankment	cum	200	6.0	1	0	1
Transporation of Soil	cum	32,900	6.4	158	53	211
3. Revetment	cum	12,200	70.0	342	512	854
Sub-total (1)				11,936	1,919	13,855
4. Other Works	L.S			3,581	576	4,157
Sub-total (2)				15,517	2,495	18,012
6. Resettlement Cost	Unit	135	2,000	0	270	270
Grand total (1)+(2)				15,517 ≒15,510	2,765 ≒2,770	18,282 ≒18,280

Table H-2-16 El-Max Pumping Station (Priority Development Project)

Description	Unit	Q'ty	Unit Rate (LE)		Amount ('000 LE)		
			F/C	L/C	F/C	L/C	Total
I. Mechanical and Electric Facility							
1. Mechanical Facility	1	L.S			24,500	-	24,500
2. Electric Facility	1	L.S			6,100	-	6,100
3. Crane, Valve, Trashrack, Stop-log	1	L.S			3,100	3,000	6,100
4. Installation	1	L.S			400	3,600	4,000
Total					34,100	6,600	40,700
II. Civil Works							
1. Temporary Works							
Sheet Pile	t	550	4,500	500	2,475	275	2,750
Filling Soil	cum	1,050	15	9	16	9	25
Removal of Existing P.S & Road, Bridge, Dewatering	L.S	1			500	500	1,000
2. Foundation							
Concrete Pile	nos	-	-	-	-	-	-
Sheet Pile	t	40	5,500	600	220	24	244
3. Eearth Work							
Excavation	cum	28,800	10	4	288	115	403
Back Filling	cum	14,400	11	4	158	58	216
4. Concrete Work							
Reinforced Concrete	cum	5,500	130	106	715	583	1,298
Form Work	sqm	9,000	2	56	18	504	522
Reinforthment	t	660	1,393	233	919	154	1,073
5. Building	sqm						
Reinforced Concrete	cum	900	136	111	122	100	222
Form Work	sqm	5,800	11	56	64	325	389
Reinforthment	t	108	1,393	233	150	25	176
Others (mortal, window, door)	L.S	1			200	200	400
Sub-Total					5,846	2,872	8,718
6. Others Work (Canal protection, Road pavement, etc.)	%	30	30		1,754	861	2,615
Total					7,600		11,333
Grand Total					41,700	10,330	52,033
							* 2,030

Table H-2-17 Monitoring Set (Priority Development Project)

Description	Unit	Q'ty	Unit Rate (LE)		Amount ('000 LE)		
			F/C	L/C	F/C	L/C	Total
EC Meter	set	2	100		200		200
Equipment	set	2	15		30		30
Monitoring House	set	2	8		16		16
Installation of Monitoring Set	set	2		50		100	10
Total					246	100	346

Table H - 2 - 18 Consulting Service Cost (Priority Development Project)

Item	Description	Quantity	Unit	Rate	Total Amount: Foreign Currency	Total Amount: Local Currency
				(LE)	('000LE)	('000 LE)
1.	Detailed Design Stage					
1.1	Foreign Currency					
	Consultants Remuneration	32	month	80,000	2,560	
	Out-of Pocket Expenses					
	International Travel Expense	8	trip	27,000	216	
	Reimbursable Cost Items and Others (10%)		LS		278	
	Miscellaneous (10%)				305	
	Sub-total				3,359	
1.2	Local Currency					
	Consultants Remuneration	23	month	40,000		920
	Consultants Perdiem					
	Foreign	32	month	3,500		112
	Local	7	month	2,500		18
	Living Allowance and Quarters					
	Foreign	32	month	4,500		144
	Local	7	month	2,000		14
	Local Communication and Transportation		LS			80
	Printing of Report		LS			15
	Miscellaneous (10%)		LS			130
	Sub-total					1,433
2.	Construction Supervision Stage					
2.1	Foreign Currency					
	Consultants Remuneration	57	month	80,000	4,560	
	Out-of Pocket Expenses					
	International Travel Expense	6	trip	27,000	162	
	Reimbursable Cost Items and Others (10%)		LS		472	
	Miscellaneous (10%)		LS		519	
	Sub-total				5,713	
2.2	Local Currency					
	Consultants Remuneration	101	month	40,000		4,040
	Consultants Perdiem					
	Foreign	94	month	3,500		329
	Local	101	month	2,500		253
	Living Allowance and Quarters					
	Foreign	94	month	4,500		423
	Local	101	month	2,000		202
	Local Communication and Transportation		LS			200
	Printing of Report		LS			45
	Miscellaneous (10%)		LS			549
	Sub-total					6,041
	Total				9,072	7,474

Note: Proposed schedule of consulting services is shown in Figure H-2-4.

5) Combined Unit Price

Works	Unit	Quantity	Unit Rate (LE)		Unit Rate (LE)	
			F/C	L/C	F/C	L/C
1.Filling Soil						
Excavation by Loader (Wheel)	cu.m	1.1	1.1	0.4	1.21	0.44
Transportation	cu.m	2.2	4.8	3.2	10.56	7.04
Compaction by Bulldozer	cu.m	0.9	1.9	0.4	1.71	0.36
Filling by Manual	cu.m	0.1	0.0	4.5	0.00	0.45
Others	cu.m				1.52	0.71
Total					15.00	9.00
2.Excavation						
Excavation by Bulldozer	cu.m	0.3	2.8	0.5	0.84	0.15
Loading by Loader (Crawler)	cu.m	0.3	3.2	0.7	0.96	0.21
Excavation by Backhoe	cu.m	0.3	1.9	0.3	0.57	0.09
Excavation by Dragline	cu.m	0.3	4.5	0.8	1.35	0.24
Excavation by Manual	cu.m	0.1	0.0	3.3	0.00	0.33
Transportation	cu.m	1.1	4.8	1.6	5.28	1.76
Finishment, others	%	20.0		20.0	1.00	1.22
Total					10.0	4.0
3.Filling						
Loading by Loader (Wheel)	cu.m	1.1	1.1	0.4	1.21	0.44
Transportation	cu.m	1.1	4.8	1.6	5.28	1.76
Compaction by Bulldozer	cu.m	0.9	4.8	1.6	4.32	1.44
Filling by Manual	cu.m	0.1	1.9	0.4	0.19	0.04
Others					0.00	0.32
Total					11.0	4.00
4.Concrete Work						
Plain Concrete placed by manual	cu.m	-	1.1	0.4	0.00	0.00
Reins. Concrete placed by manual	cu.m	0.1	78.5	91.9	7.85	9.19
Reins. Concrete placed by crane	cu.m	0.9	128.5	102.0	115.65	91.80
Others (Curing, Joint, Water stop)	cu.m	10%			12.50	10.01
Total					136.00	111.00
5.Form Work						
Form Work	sq.m	1.0	1.6	43.3	1.60	43.30
Scaffold and Others		30%			0.40	12.70
Total					2.00	56.00

FIGURE H-2-4 PROPOSED SCHEDULE FOR CONSULTING SERVICES (PRIORITY DEVELOPMENT PROJECT)

Description	Man-Month		1998			1999			2000			2001			2002		
	Foreign	Local	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
I. Detailed Design																	
1. Leader	12	-															
2. Hydrologist	2	-															
3. Irrigation and Drainage Engineer	3	-															
4. Engineering Geologist	-	4															
5. Soil Mechanical Engineer	-	4															
6. Design Engineer (Pump)	4	-															
7. - do - (Structure)	-	4															
8. - do - (Architecture)	-	4															
9. Mechanical Engineer (Equipment)	3	-															
10. Construction Planner	3	-															
11. Cost Estimator	3	-															
12. Specialist for Tender Document	-	2															
13. Specification Writer	-	2															
14. Economist	2	-															
15. Environmental Expert	-	3															
Sub-total	32	23															
II. Construction Supervision																	
II-1. Tendering																	
1. Project Engineer (Leader)	2	-															
2. Mechanical Engineer	2	-															
3. Cost Estimator	1	-															
Sub-total	5	-															
II-2. Construction Supervision																	
4. Project Engineer (Leader)	36	-															
5. Pump Engineer	18	-															
6. Structure Engineer	-	36															
7. Architect	-	24															
8. Mechanical Engineer	3	-															
9. Surveyor	-	18															
Sub-total	57	78															
Total	94	101															

Note: Foreign Consultants Local Consultants

Table H - 2 - 19 Administration Cost (Priority Development Area)

(unit: '000 LE)

1. Personnel Cost

a) Detailed Design Stage

EPADP Design Staff	1,200	LE/month	× 60 man-month	=	72
MED Design Staff	1,200	LE/month	× 60 man-month	=	72
Sub-total					144

b) Construction Stage

Project Management Dept.					
Project Manager	18,000	LE/year	× 1 person	=	18
Assistant Manager	14,400	LE/year	× 1 person	=	14
Secretary	9,600	LE/year	× 1 person	=	10
Administration Dept.					
Section Chief	12,000	LE/year	× 1 person	=	12
Accounting Clerk	6,000	LE/year	× 1 person	=	6
Assistant Accounting Clerk	4,800	LE/year	× 2 persons	=	10
Administration Clerk	4,800	LE/year	× 1 person	=	5
Typist	4,800	LE/year	× 2 persons	=	10
Land Acquisition Dept.					
Section Chief	12,000	LE/year	× 1 person	=	12
Clerk	4,800	LE/year	× 2 person	=	10
Assistant	4,800	LE/year	× 2 person	=	10
Typist	4,800	LE/year	× 2 person	=	10
Engineering Dept.					
Section Chief	12,000	LE/year	× 1 person	=	12
Civil Engineer	9,600	LE/year	× 2 persons	=	19
Technician	9,600	LE/year	× 4 persons	=	38
Topo-surveyor	8,400	LE/year	× 2 persons	=	17
Mechanical Dept.					
Driver (Vehicles)	9,600	LE/year	× 2 persons	=	19
Operator (Heavy equipment)	9,600	LE/year	× 2 persons	=	19
Security Guard	4,800	LE/year	× 3 persons	=	14
Janitor	4,800	LE/year	× 3 persons	=	14
Sub-total					279
279,000 LE × 4 years					= 1,116
Total					1,260

2. Equipment Costs for Construction Supervision

(unit: '000 LE)

Description	Q'ty	Unit Cost F/C	Unit Cost L/C	Amount F/C	Amount L/C	Amount Total
Station Wagon (4WD)	12	70	-	840	-	840
Motorcycle	6	8	-	48	-	48
Theodrite	2	12	-	24	-	24
Current Meter	2	8	-	16	-	16
EC Meter	2	2	-	4	-	4
Radio Set	1	20	-	20	-	20
Walkie-Talkie	12	2	-	24	-	24
Automatic Rain Gauge	1	8	-	8	-	8
Desk Top Computer	2	10	-	20	-	20
Drafting Board	2	2	-	4	-	4
Copy Machine	2	10	-	20	-	20
Miscellaneous (5%)				51	-	51
Transportation Cost	L.S	-	10	-	10	10
Total				1,079	10	1,089

3. Repair and Maintenance Cost

Vehicle Repair	70,000 LE × 10% × 12 units	=	84
Vehicle Fuel	1.0 LE/lit × 5 lit/day × 250 days × 12 units	=	15
Building Maintenance	193,000 LE × 4%	=	8
Office Supply		=	15
Total			122
122,000 LE × 4 years =			488

4. Grand Total

	F/C	L/C	Total
Personnel Cost	-	1,260	1,260
Equipment Cost for Construction Supervision	1,079	10	1,089
Repair and Maintenance Cost	336	152	488
Total	1,415	1,422	2,837

Table H - 2 - 20 O & M Equipment Cost (Priority Development Project)

(unit: '000 L.E)

Description	Q'ty	Unit Cost		Amount		
		F/C	L/C	F/C	L/C	Total
Motor Grader	1	450	-	450	-	450
Bulldozer, 3.0 ton	1	200	-	200	-	200
Loader Backhoe Combination	1	340	-	340	-	340
Aquatic Weed Harvester	1	1,300	-	1,300	-	1,300
Flat Bet Truck	2	100	-	200	-	200
Pick Up Truck	2	50	-	100	-	100
Station Wagon (4WD)	1	70	-	70	-	70
Motorcycle	3	8	-	24	-	24
Diesel Generating Set, 15 KV	1	35	-	35	-	35
VHF/FM Communication System	1	120	-	120	-	120
Desk Top Computer	1	70	-	70	-	70
Other O&M Equipment (15%)	L.S			-	436	436
Sub-total				2,909		3,345
Spare Parts (10%)				291	44	335
Total				3,200	480	3,680

TABLE H-2-21 DISBURSEMENT SCHEDULE OF PROJECT COSTS (PRIORITY DEVELOPMENT PROJECT)

(Unit: '000 LE)

Descriptions	1998			1999			2000			2001			2002			Total		
	F/C	L/C	Total	F/C	L/C	Total	F/C	L/C	Total	F/C	L/C	Total	F/C	L/C	Total	F/C	L/C	Total
1. Construction Works																		
1.1 Preparatory Works	72	405	477	-	-	-	-	-	-	-	-	-	-	-	-	72	405	477
1.2 Pumping Works	-	-	-	-	-	-	-	-	-	13,886	3,441	17,327	27,814	6,892	34,706	41,700	10,333	52,033
1.3 Omoum Main Drain Works	-	-	-	-	-	-	10,990	3,610	14,600	10,991	3,610	14,601	10,990	3,611	14,601	32,971	10,831	43,802
1.4 Discharge-Channel and Resettlement Works	-	-	-	-	-	-	10,345	1,843	12,188	5,172	922	6,094	-	-	-	15,517	2,765	18,282
1.5 Monitoring Set	-	-	-	-	-	-	246	100	346	-	-	-	-	-	-	246	100	346
Sub-total	72	405	477	-	-	-	21,581	5,553	27,134	30,049	7,973	38,022	38,804	10,503	49,307	90,506	24,434	114,940
2. On-Farm Development and Subsurface Drain Works	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Land Acquisition and Compensation Works	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Engineering and Administration Works																		
4.1 Consulting Services	3,084	1,719	4,803	454	-	454	1,452	1,794	3,246	1,724	2,167	3,891	2,358	1,794	4,152	9,072	7,474	16,546
4.2 Administration	-	144	144	353	319	672	354	319	673	354	320	674	354	320	674	1,415	1,422	2,837
Sub-total	3,084	1,863	4,947	807	319	1,126	1,806	2,113	3,919	2,078	2,487	4,565	2,712	2,114	4,826	10,487	8,896	19,383
5. O&M Equipment	3,200	480	3,680	-	-	-	-	-	-	-	-	-	-	-	-	3,200	480	3,680
6. Total (1-5)	6,356	2,748	9,104	807	319	1,126	23,387	7,666	31,053	32,127	10,460	42,587	41,516	12,617	54,133	104,193	33,810	138,003
7. Physical Contingency (10%)	635	275	910	81	32	113	2,339	766	3,105	3,213	1,046	4,259	4,151	1,262	5,413	10,419	3,381	13,800
8. Total (6-7)	6,991	3,023	10,014	888	351	1,239	25,726	8,432	34,158	35,340	11,506	46,846	45,667	13,879	59,546	114,612	37,191	151,803
9. Price Escalation	-	287	287	9	106	115	1,158	4,646	5,804	4,029	9,723	13,752	9,818	16,559	26,417	15,014	31,361	46,375
10. Grand Total (8-9)	6,991	3,310	10,301	897	457	1,354	26,884	13,078	39,962	39,369	21,229	60,598	55,485	30,478	85,963	129,626	68,552	198,178

TABLE H-2-22 OPERATION AND MAINTENANCE COST (PRIORITY DEVELOPMENT PROJECT)

Description	Annual Cost
	('000 L.E)
Salary and Wage	230.8
Administration and General Expenditure	23.1
Pump Operation Cost	779.3
Equipment Repair and Maintenance Cost	368.0
Fuel Cost	9.6
Drain Maintenance Cost	402.2
Office Maintenance Cost	20.1
Total	1,833.1

1. Salary and Wage

Description	No. of Staff	Rate	Total Cost
		(LE/year)	('000 L.E)
1.1 Nubariya Drainage Diretorate (EPADP)			
Director General	1	14,400	14.4
Administration Branch			
Administration	1	9,600	9.6
Accounting	1	6,000	6.0
Material	1	6,000	6.0
Security and Labor	4	4,800	19.6
Engineering Branch			
Budget Planning	1	9,600	9.6
Pre-Survey	1	8,400	8.4
Design	2	8,400	16.8
Mechanical Branch			
Vehicle	2	9,600	19.2
O&M Equipment	2	9,600	19.2
Communication	1	6,000	6.0
Sub-total			134.8
1.2 El-Max Directorate (MED)			
Director General	1	14,400	14.4
Mechanical Engineer	2	9,600	19.2
Pump Operator	4	6,000	24.0
Security and Labor	8	4,800	38.4
Sub-total			9.60
Total			230.8

Description	Total Cost
	('000 L.E)
2. Administration and General Expenditure Cost	
LE 230,800×0.10	23.1
3. Pump Operation Cost	
3,247 hr×900 kw×0.15 LE/Kwh	438.3
3,248 hr×700 kw×0.15 LE/Kwh	341.0
Total	779.3
4. Equipment Repair and Maintenance Cost	
LE 3,680,000×0.10	368.0
5. Fuel Cost	
Heavy Equipment;	
0.20 LE/lit×20 lit/day×150 days×3 units	1.8
Truck;	
0.20 LE/lit×20 lit/day×150 days×4 units	2.4
Vehicle;	
1.0 LE/lit×15 lit/day×300 days×1 units	4.5
Motorcycle and Others (10%)	0.9
Total	9.6
6. Omoum Main Drain Maintenance Cost	
O&M Road Maintenance	
Geavel: LE 1,082,000×2%	21.6
Drain Maintenance	
LE 19,040,000×2%	380.8
Total	402.2
7. Office Maintenance Cost	
Building Maintenance Cost	
LE 253,000×4%/year	10.1
Office Supplies	10.0
Total	20.1

Table H-2-23 Unit Price for Construction Works

1) Labour fee

Description		Unit	EPADP		Alex 'A'	Final	Component (%)	
			Damanhur	Cairo	Ltd.		F/C	L/C
Engineer	Civil Engineer	LE/day	30		40~50	35	0	100
	Architecture	LE/day	30		40~50	35	0	100
	Electric and Mechanical Engineer	LE/day	20		40~50	35	0	100
	Surveyor	LE/day	30	5	30~40	30	0	100
Technician (Common)	Forman	LE/day	15	15	20~30	15	0	100
	Skilled Labour	LE/day	20	20	25	21	0	100
	Common Labour	LE/day	8		15~20	11	0	100
	Light Labour	LE/day	8	10	12~15	10	0	100
Technician (Special)	Concrete Worker	LE/day	15	15	15	15	0	100
	Form Worker	LE/day	20	20	20	20	0	100
	Reinforcing Worker	LE/day	20	5	20	20	0	100
	Steel Man	LE/day	20	15	20	18	0	100
	Welder	LE/day	30	60	60~80	50	0	100
	Mason	LE/day	20		20	20	0	100
	Electrician	LE/day	20	10	30	20	0	100
	Mechanic	LE/day	20	10	30	20	0	100
	Driver (Heavy Equipment)	LE/day	20	50	50	40	0	100
	Driver (Light Equipment)	LE/day	10	10	40	20	0	100
	Driver (Special Equipment)	LE/day	20		50	35	0	100
	Common Driver	LE/day	10		20	15	0	100
	Carpenter	LE/day	20	20	20	20	0	100
	Head Carpenter	LE/day	25	25	30	26	0	100

Note; All unit prices are in case of contract base.
All unit prices include of 30 % of over head.

2) Construction Material

Work Type	Items	Unit	EPADP		Alex 'A'	Final	Component (%)	
			Damanhur	Cairo	Ltd.		F/C	L/C
Concrete Work	Cement	LE/ton	240	200	200~220	213	50	50
	Sand	LE/cu.m	15~20	7	16~17	15	5	95
	Gravel (Big)	LE/cu.m	30~35	10	35~45	32	5	95
	Gravel (Small)	LE/cu.m		25			5	95
	Ready Mixed Concrete (10~30MPA9)	LE/cu.m						
Reinforcing Work	Reinforcing Bar Deformed Bar < 16 mm	LE/ton	1,250	1,400	1,350~1,400	1,333	90	10
	Reinforcing Bar Deformed Bar > 16 mm	LE/ton	1,500		1,350	1,425	90	10
Temporary Work	Timber	LE/cu.m		800		800	5	95
	Wooden Board	LE/cu.m	80	800		800	5	95
	Steel Sheet Pile	LE/ton	5,000	3,500	3,500	4,000	90	10
Gate Work, Others	Steel Gate	LE/kg	2.5	3.0	5.0	3.5	50	50
	Gasoline	LE/lit	1.0	1.0	1.0	1.0	30	70
	Diesel Oil	LE/lit	0.4	0.2	0.4	0.8	30	70
	Lubrication Oil	LE/lit	5.0	5.0	5.0	5.0	30	70

Note; All unit prices are in case of contract base.
All unit prices include of 30 % of over head.

3) Equipment and Fuel Consumption

Equipment	Size	Unit	Cost	Fuel Consumption	Power	Component (%)	
						F/C	L/C
				(lit/p.s/h)	(P.S)		
Bulldozer	D-11	LE/day	1,200	D 0.117	104	90	10
Back hoe	1.2 cu.m Backet	LE/day	1,000	D 0.114	206	90	10
	0.6 cu.m Backet	LE/day	1,000	D 0.114	127	90	10
Clamshell	30 ton	LE/day	1,250	D 0.114	153	90	10
Dump Truck	4 ton	LE/day	220	D 0.035	182	90	10
	10 ton	LE/day	400	D 0.035	334	90	10
Truck	10 ton	LE/day	375	D 0.036	311	90	10
	5 ton	LE/day	250	D 0.036	183	90	10
Concrete Mixer	0.2 cu.m	LE/day	150	D 0.135		90	10
Truck Mixer	3.0cu.m	LE/day	800	D 0.135		90	10
Tractor Shovel	Grawler Type	LE/day	750	D 0.118		90	10
	Wheel Type	LE/day	450	D 0.104		90	10
Truck crane	20 ton	LE/day	1,000	D 0.034	150	90	10
Crawler crane	40 ton	LE/day	1,375	D 0.061	152	90	10
Diesel-hammer	3.5 ton	LE/day		E 0.305 Kwh/kw	119	90	10
Concrete Cutter	D-40 cm	LE/day	200	G 0.151	10	90	10
Water Tank Car	10 cu.m	LE/day	250	D 0.029	290	90	10
Compressor	5.0 cu.m/m	LE/day	180	G 0.130	50	90	10
Generator	15 KVA	LE/day	135	D 0.117		90	10
				G 0.308	20	90	10
Pump	ø4'	LE/day	150	D 0.210	10	90	10
Compactor	70 kg	LE/day	200	G 0.211	5	90	10
Dredger		LE/day					

Note; All unit prices are in case of contract base. Cost; from Cairo Contractor D; Diesel oil
All unit prices include of 30 % of over head. Fuel consumption; Japanese standard

4) Works

Description	Quantity	Unit	Unit Price (LE)	F/C (%)	F/C Cost	L/C (%)	L/C Cost
1. Excavation by Manual	1.0	cu.m	3.3	0	0.0	100	3.3
2. Back filling by Manual	1.0	cu.m	4.5	0	0.0	100	4.5
3. Excavation and Pushing by Bulldozer	1.0	cu.m	3.3	84	2.8	16	0.5
4. Excavation by Backhoe (0.6 cu.m)	1.0	cu.m	4.6	83	3.8	17	0.8
5. Excavation by Backhoe (1.2 cu.m)	1.0	cu.m	2.2	83	1.9	17	0.3
6. Excavation by Dragline (0.6 cu.m)	1.0	cu.m	5.4	84	4.5	16	0.8
7. Excavation by Clamshell (0.6 cu.m)	1.0	cu.m	9.1	84	7.7	16	1.4
8. Compaction by Bulldozer	1.0	cu.m	2.3	84	1.9	16	0.4
9. Excavation and Loading by Wheel Type Loader	1.0	cu.m	1.5	76	1.1	28	0.4
10. Excavation and Loading by Crawler Type Loader	1.0	cu.m	3.8	82	3.2	18	0.7
11. Transportation by Dump Truck (11 ton) L=3.0 km	1.0	cu.m	6.4	75	4.8	25	1.6
12. Reinforced Concrete	1.0	cu.m	163.3	47	76.9	53	86.4
13. Reinforced Concrete (Placed by Manual)	1.0	cu.m	170.4	46	78.5	54	91.9
14. Reinforced Concrete (Placed by Crane)	1.0	cu.m	230.8	56	128.8	44	102.0
15. Plain Concrete	1.0	cu.m	143.5	46	66.2	54	77.3
16. Plain Concrete (Placed by Manual)	1.0	cu.m	149.9	45	67.6	55	82.3
17. Concrete Pile by Pile Hammer (ø 50 cm L=7.0 m)	1.0	nos	1,905.2	52	993.0	48	912.2
18. Reinforcement Bar	1.0	ton	1,625.7	86	1,393.0	14	232.7
19. Form Work	1.0	sq.m	44.9	4	1.6	96	43.3
20. Mortal	1.0	sq.m	9.1	40	3.6	60	5.5

I. PROJECT ECONOMY

ANNEX I. PROJECT ECONOMY

List of Tables

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1. Priority Development Area

2. Priority Development Project

1. **Major Concepts Employed in Obtaining Net Income in Tables I-2-20 through I-2-29 in Hares Area and Tables I-2-37 through I-2-47 in Project Development Project Area(Omoum)**

Net Income Model --------> Net Income by Crop in Hares (Omoum) Area
Gross Income Model ------> Gross Income by Crop in Hares(Omoum) Area
Tables I-2-20 through I-2-29 [net income in Hares Area] Tables I-2-37 through I-2-47 [net income in Omoum Area]

Financial(Economic) Values of Major Crops and Inputs were taken from Ministry of Agriculture and the World Bank Report Tables I-2- through I-2-19

Net Income of Crop per feddan = (Crop Yield:ton/fed) x (F[E] Value) - (Input Qty) x (Price) n

Hares Area Net Income = Sum of Major Crops' Net Income in Hare
Omoum Area Net Income = Sum of Major Crops' Net Income in Omoum

Net Income by Crop without Project
Given current crop pattern(% crop share) multiplied by current yield per feddan multiplied by net income[gross income - production cost]

Net Income by Crop with Project
Crop pattern(% crop share with project) multiplied by the expected yield per feddan with drainage and/irrigation improvement under this JICA project multiplied by net income[gross income - production cost]

Reduction of Flood Damages
With project crop damages would be reduced. The expected valu of crop damages reduction was based on 1991 crop damages with the probability of 10% occurring. Table I-2-50.

Farm Cash Model ----> Representative farm household net income
Following the similar crop pattern prevailing in an area whe representative farm household is located.

Adjusting Factor
Last two columns of Tables I-2-49 was created in order to avoid over estimates of net financial(economic) incom 56.8 percent of Omoum Area (177,800 feddan) has no drainage improvement while the remaining 43.7 pecent (138,000 feddan) has drainage improvement.

Assume that 177,800 feddan is expected to increase at 48% (45%) of F(E) value while 138,000 feddan to increase at half of 48% (45%) of F(E) value. The weighted average turned out to be 0.79 for F and E value. Last column of Table I-2-49 indicate 0.79.

FIRR and EIRR and subsequent sensitivity analysis were based on adjusted net financial(economic) income in Omoum area. Tables I-2-58 and I-2-59 are a summary of FIRR and EIRR.

Allocation Factor

Net financial(economic) income in Omoum was allocated on the basis of allocation factor by area. Net financial(economic) income in Omoum minus that of Hares area was allocated by percentage crop share with project multiplied by 1.201, the correction factor. The result is indicated in the last column of Table I-2-51.

Allocation factor is used to obtain Table I-2-48, net financial and economic incremental crop value(income) by area.

2. Relations among Table I-2-20 and I-2-29

FINANCIAL(Table I-2-20)

Net Income(LE/fed)	-13.21 [1188.54+196.00 - 1397.75] Net Income without Project. This above figure goes to column 1 of Table I-2-2 [Wheat F Value in Hares]
	Net Income with Project. 151.52 [1366.82+225.40 - 1440.70] Economic net income with project goes to column 3 of Table I-2-29 [Wheat F Value in Hares]
Hares Area Net Income	-0.22 [-13.21 multiplied by 16,992 feddan crop area without project Hares] Net Income without Project. -0.22 goes to colum 1of Table I-2-29 [Wheat F Value in Hares]
	2.61 Net Income with Project goes to year 9 and thereafter, column 3 of Table I-2-19 [Wheat]

ECONOMIC(Table I-2-20)

Net Income(LE/fed)	252.21 This above figure goes to column 1 of Table I-2-29[Wheat E Values in Hares]
	469.11 This figure goes to column 4 of Table I-2-29 What E Value with project.
Hares Area Net Income	4.29 This figure goes to column 2 of Table I-2-29 [Wheat E Value in Hares]
	8.09 This figure goes to Year 9 and thereafter of column 4, Table I-2-2 [Wheat E Value]

The same method was applied to obtain Table I-2-47 from Table I-2-3 in Omoum Area.

Table I-2-1 Economic Price of Wheat and Maize (1994/1995 Price)

Item	Unit	Wheat	Maize
IBRD Project Prices For The Year 2005			
(1990 Constant Price)	US $	132	84
Adjusted to 1994/95 Price (+ 14%)	US $	150	96
Sea Freight and Insurance	US $	19	12
Cost C.I.F. Alexandria	US $	169	108
Converted to L.E ($1 = L.E 3.37)	L.E	570	364
Port charges, handling ,etc.	L.E	41	41
Wastage and losses (3% of C.I.F.)	L.E	17	11
Importer's margins, and other costs			
(5% of C.I.F.)	L.E	29	18
Cost ex - Alexandria	L.E	657	434
Delta price :			
Transport to Delta (150 Km)			
(L.E 0.13 / ton - Km)	L.E	20	20
Trader's margins and other costs.			
(10 percent of Alex. price)	L.E	66	44
Value at Delta market			
(50 Km) (0.13/ ton / Km)	L.E	7	7
Trader's margins etc.			
(10% of market Price)	L.E	76	51
Project farm - gate Price :			
(per ton)	L.E	**826**	**556**
Price per ardab			
Wheat=150kg, Maize=140kg	LE	**125**	**78**

Source: Tables 10-21 through 10-28 were taken from Irrigation Improvement Project,IPP,MPWWR,1994, Annex 3 Agricultural Aspect & Annexe 5 Economic Analysis.

Table I-2-2 Economic Price of Broad Beans (1994/1995 Price)

Item	Unit	LE
IBRD Project Prices For The Year 2005		
Of the Price of Canadian No. 1		
Western Red Spring Wheat (CW RRS)13.5%		
(1990 constant price)	US $	132
Adjust to US No.1 Soft Red Wenter FOB		
Atlantic Ports (132 x 0.85)	US $	112
Adjust to 1994 / 95 price (+ .14)	US $	128
Sea Freight and insurance	US $	16
Cost C.I.F. Alexandria	US $	144
Converted to L.E ($1 = L.E. 3.37)	L.E.	485
Port charges, handling, etc.	L.E.	32
Wastage and losses in port (3% of CIF)	L.E.	15
Importer's margins, and other costs		
(5% of C.I.F.)	L.E.	25
Cost ex - Alexandria	L.E.	556
Delta price components:		
Transport Wheat to mill		
(1 ton 150 km x LE 0.13)	L.E.	20
Wastage and losses on route to mill		
(3% of Alex Price)	L.E.	17
Imported Wheat Price at delta mill	L.E.	593
Trader's margin (5% of Delta Price)	L.E.	30
Transport From Farm to mill		
(1ton x 50 km x L.E. 0.13)	L.E	7
Wastage to mill (3% of Delta Price)	L.E	18
Delta Price	L.E	647
Farm gate Shadow Price of Bean at Delta		
(L.E. 647 x 2.3)	L.E	**1488**
Farm gate Shadow Price of Bean/Ard	L.E	231

Table I-2-3 Economic Price of Rice (1994/1995 Price)

Item	Unit	Value
Milled Rice :		
World Bank Projected Prices For The Year 2005 for Rice, Thai 5% Brokens FOB Bangkok (1990 Constant Price)	US $	242
Adjusted To 1994 / 95 Price (+ 14 %)	US $	276
Quality Adjustment (- 10 %)	US $	248
Sea Freight and Insurance	US $	31
Cost C.I.F. Alexandria	US $	279
Converted to L.E ($1 = L.E. 3.37)		940
Port Charges , Handling, etc.	L.E	41
Wastage and Losses (3% oF C.F.I.)	L.E	28
Importer's Margins. and Costs, (5% Of C.I.F.)	L.E	47
Cost - Port Alex	LE	1057
Transport To cairo (230 Km x Le 0.13)	L.E.	30
Trader's Margin and Other Costs (10 % Of Alex. Price)	L.E.	107
Value At Cairo Market	L.E	1194
Transport From Delta To Cairo (100 Km	L.E.	14
Milling Costs (L.E. 81 / Ton)	L.E.	81
Value At Mill	L.E	1099
Unmilled Rice :		
Value At Mill (65 % Milling Rate)	L.E	714
Transport From Farm To Mill (50 Km)		7
Trader's Margin and Other Costs (10 % Of Mill Price)	L.E.	71
Projected Farm Gate Price At Delta	L.E.	**636**

Table I-2-4 Economic Price of Cotton (1994/1995 Price)

Item	Unit	Val Delta
Cotton Lint FOR Export :		
World Bank Projected Prices For The Year 2005		
For The Price Middiling 13 / 32 inch Cotton		
(CIF Europe in 1990 Constant Price)	US $	1,480
Adjusted To 1994 / 95 Price (+ 0.14)	US $	1,687
Quality Permium Of (94 %up)	US $	3,273
Sea freight and insurance to Europe	US $	360
Cost FOB Alexandria	US $	2,913
Converted To L.E. ($ 1 = L.E 3.37)	L.E.	9,817
a - Port Charges, Handling, etc.	L.E.	39
b - wastage and Losses (3% Of C.I.F.)	L.E.	295
c - Exporter's and Trader's Other costs and		
Margins, Ginnery To FOB (5 % Of FOB	L.E.	495
Total Cost (a + b + c)	L.E.	829
Value At Alexandria Of 1.00 Mt Of Lint	L.E.	8988
Transport From Delta and Nile Valley To Alex.		
(150 Km, 600 Kg x L..E. 0.13)	L.E.	20
Export Parity Value Of Lint At Local Ginn	L.E.	**8968**
Cotton Seed		
IBRD Projected Price For The Year 2005		
For Soybean CIF N. Europe		
(1990 Constant Prices)	US $	233
Adjusted To 1994 / 95 Price (+ 14 %)	US $	266
Cotton Seed Price CIF Alex. 80 % Of So	US $	212
Converted To L.E. ($1 = L.E. 3.37)	L.E.	714
a - Port charges, Handling, etc.	L.E.	32
b - Wastage and Losses (3 % Of C.I.F.)	L.E.	22
c - Emporter's Margins and Other Costs		
(5 % Of CIF)	L.E.	36
Value ex - Alex. Port	L.E.	804
Transport To Delta and Nile Valley	Unit	
(150 Km, 600 Km x L.E. 0.13)	L.E.	20
Trader's Margins and Other Costs (10 %	L.E.	81
Value Of Seed In Delta and Nile Valley	L.E.	**905**
One Ton Seed Cotton Has : 289 Kg Lint	L.E.	2616
544 Kg Seed	L.E.	496
Seed Cotton/ton	L.E.	**3112**
Ginning Cost	US $	137
Transport To Ginnery (50 Km At L.E. 0.1	L.E.	7
Other Marketing costs and Margin (5%)	L.E.	154
Projected Farm Gate Price/ton	L.E.	**2814**
Price Per Kantar (157.5 Kg)	L.E.	**443**

Table I-2-5 Economic Price of Flax Seed (1994/1995 Price)

Item		Price
Weighted average Of IBRD Project Prices To The Year 2005 Of The Prices Of Groundnut Oil (CIF Rotterdam) and Groundnut Meal (CIF Argentina) , in 1990 Constant Pric	US $	339
adjusted To 1994 / 95 Price (+ 14 %)	US $	386
Sea Freight and Insurance	US $	48
Cost C.I.F. Alexandria	US $	435
Converted To L.E. ($1 = L.E 3.37)	L.E.	1,466
Value=Flax Seed CIF Alex (1479*1.08)	L.E.	1,583
Port Charges, Handling, etc.	L.E.	41
Wastage and Losses (3 % Of C.I.F.)	L.E.	47
Importer's Margins, and Other Costs (5 % Of C.I.F.)	L.E.	79
Cost at Alexandria	L.E.	1,750
Delta Price :		
Transport To delta (150 Km) (L.E. 0.13 / Ton - Km)	L.E.	20
Trader's Margins and Other Costs. (10 % Percent Of Alex. Price) .	L.E.	174
Value Of Delta Market.	L.E.	1,944
Transport From Farm To The Market (70 Km) (0.13 / Ton Km)	L.E.	9
Trader's Margins etc. (10 % Of Market Price)	L.E.	195
Projected Farm - Gate Price/ton	L.E.	**1,740**

Table I-2-6 Economic Price of Sunflower Seed (1994/1995 Price)

Item	Unit	Sunflower
IBRD Project Prices For The Year 2005		
Of the Price of Soybeans (CIF Europe)		
(1990 constant price)	US $	233
Adjust to 1994 / 95 price (+ 14%)	US $	266
Sea Freight and insurance	US $	33
Cost C.I.F. Alexandria	US $	299
Converted to L.E ($1 = L.E. 3.37)	L.E.	1,008
Value of 1.16 conv. factor, CIF Alex.		
(1008*1.16=1180)	L.E.	1,169
Port charges, handling, etc.	L.E.	30
Wastage and losses From port to oil mill		
(3% of CIF)	L.E.	35
Importer's margins, and other costs		
(5% of C.I.F.)	L.E.	58
Cost ex - Alexandria	L.E.	1,292
Delta price :		
Transport to Oil Mill in Tanta		
(1.16 x 130 km x LE 0.13)	L.E.	23
Handling Costs and Losses		
(0.03 Of Ale. ex Price)		39
Value of Sunflower Seed at Oil Mill	L.E.	1,354
Transport Of Seed From To Oil Mill		
In Tant (50 Km LE 0.13)	L.E	7
Handling Costs and Losses		
(5% Of Mill Delivery Value)	L.E.	67
Farm gate Price Of Sunflower	L.E	**1,280**

Note: Current dollar price deflated by WB price Index
CIF Egypt is assumed to be the same as CIF Europe
Adjusted by the ratio of average prices of sunflower seed and soybeans from 1971 to 1984, World Bank Commodity Trade and Price Trend, 1986 edition
Port charges assumed to be LE 30 per ton

Table I-2-7 Financial and Economic Seed Prices (Constant 1994/1995)

LE/Kg

Crop	Fin Price	Econ Price
Wheat	0.63	1.22
Broad Bean	1.45	2.52
Flax	1.25	2.68
Long Bersheem	2.06	2.06
Short Bersheem	2.06	2.06
Winter Veg	7	7
Sunflower	1.31	1.9
Cotton	0.17	0.9
Rice	1.5	1.09
Maize	0.71	0.93
summerVeg	7	7
Citrus	9.4	10.5

Source: Irrigation Improvement Project, Annex 5
IPP & PPD of MPWWR, Cairo, 1994

Table I-2-8 Animal Power Inputs

Animal Hour

Crop	Manure Donkey	Crop Donkey	Culti'n Cow
Wheat	45	30	0
Beans	30	18	0
Flax	0	30	0
L Ber'm	0	0	0
S Ber'm	0	0	0
Veg(S)	75		0
Suger Beet	0	10	0
Cotton	60	30	0
Rice	15	20	0
Maize(s)	60	24	0
Vegetables	75		0
Citrus	60		0

Table I-2-9 Labor Inputs
Man-hour

Crop	NonDep't	Yield Dep't
Wheat	62	90
Beans	68	94
Flax	96	102
L Ber'm	60	72
S Ber'm	30	36
Veg(S)	246	145
Suger Beet	110	50
Cotton	310	250
Rice	177	60
Maize(s)	170	89
Vegetables	300	144
Citrus	180	110

Table I-2-10 Machinery Inputs
Tractor Hour

Crop	Tractor/hr
Wheat	2.5
Beans	3
Flax	2.5
L Ber'm	2.5
S Ber'm	0
Veg(S)	3.5
Suger Beet	3
Cotton	3
Rice	3
Maize(s)	2
Vegetables	3.5
Citrus	4.2

Table I-2-11 Irrigation Pump
Hour/Feddan

Crop	Pump/Hr
Wheat	20
Beans	16
Flax	16
L Ber'm	30
S Ber'm	12
Veg(W)	27
Veg(S)	30
SugarBeet	16
Cotton	32
Rice	55
Maize(s)	27

Table I-2-12 Economic Prices of Fertilizers

Item	Currency Unit	Urea (N)	Phosph (P2O5)	Potash (K20)
IBRD Price	$	135	121	103
Adjusted(+14%)	$	154	138	117
Feight&Insur'ce	$	17	15	13
CIF Alex	$	171	153	130
$1=LE3.4	LE	581	520	442
PortCharge	LE	32	32	32
Loss(3%CIF)	LE	17	15	13
ImpMargin(5%CIF)	LE	29	26	22
Bagging	LE		35	35
Cost exAlex	LE	659	628	544
DeltaPrice	LE			
Transp't	LE	20	20	20
Dist'n(10%ExAlex)	LE	65	62	54
Delv'y	LE	7	7	7
FarmGatePrice	LE	751	717	625
% of N,PO,KO	%	46	44	50
FGateNutrientPrice	LE	1633	1559	1359

Table I-2-13 Pumping costs

Item	Unit	5HP Pump	7.5HP Pump	15HP Pump
ReplacementCost	LE	2150	2850	3800
Converted to $	$	1070	1418	1891
Value in 95	$	1435	1902	2536
Converted to LE	LE	4879	6467	8622
Discharge(m3/hr)	m3	110	170	275
Fuel(lit/hr)	Liter	1	1.3	2.1
Life(hr)	Hour	10	10	10
1 TotalVarCost	LE	1.94	2.17	2.78
2 TotalCost/hr				
500hr use	LE	3.07	3.67	4.78
1000Hr Use	LE	2.72	3.21	4.17
1500Hr Use	LE	2.6	3.04	3.95

Table I-2-14 Shadow Price of Diesel Oil

World Bank Price	$	17
Adjusted 95 Price	$	19.39

Table I-2-15 Threshing Machine

Item	Currency Unit	Cost
Replacement Cost	$	4849
Adj Price 95	$	6503
LE($1=LE3.4)	LE	22110
Cost/Hr	LE	8.85
Diesel Fuel	LE	2.88
Repairs	LE	8.85
Driver	LE	1.5
Other cost	LE	0.29
Sub Total	LE	22.37
Allow'ce	LE	2.24
Cost/Hr	LE	25
Cost/Fed	LE	86

Table I-2-16 Economic Costs Of Back Motor Sprayer (1995 price/Ton)

Item	LE	Cost
Market Price	LE	1500
Adj Price	LE	1534
Amort'n10Yr	LE	14
Hour Cost	LE	0.03
Fuel	LE	0.18
Repair & Other	LE	0.06
Driver	LE	1
SubTotalCost	LE	1.24
Allowan'ce	LE	0.12
Cost/Hr	LE	1.36

Table I-2-17 Economic Costs of Tractor Operation

Item	Unit	COST
65 HP Tractor	$	17000
Adj to 95 Price	$	22800
Local LE(3.4LE=$)	LE	77520
Cost/Hr	LE	15.77
Repair	LE	7.88
Driver	LE	1.5
Fuel & Other	LE	5.28
Sub Total Cost	LE	30.43
Allow'ce 10%	LE	3.04
Cost/Hr	LE	33.47

Table I-2-18 Shadow Price of Plowing Costs

Item	Unit	Cost
Replacement Cost	$	2094
Adj to 95 Price	$	2808
Local LE(3.4=$)	LE	9547
Amortization cost	LE	2479
Amort'n Cost/Hr	LE	4.13
O & M Cost	LE	1.57
Sub Total	LE	5.7
Mgmt Cost	LE	0.57
Power Cost/Hr	LE	6.27
Plowing/Hr	LE	40
Plowing/fed	LE	16

Table I-2-19 Financial and Economic Prices (Constant 1995 Price)
LE/Kg and LE/Ton

Crop	LocalUnit =LU	Kg	Fin'l Price LE/LU	Econ Price LE/LU	Fin'l Price LE/Ton	Econ Price LE/Ton
MAJOR CROP						
Wheat	Ard	150	96	125	639	826
Bean	Ard	155	199	231	1283	1488
Barley	Ard	120	60	60	500	500
Flax	Ton	1000	1098	1740	1098	1740
Bers'm(L)	Ton	1000	61	47	61	47
Bers'm(S)	Ton	1000	61	47	61	47
Veg(W)	Ton	1000	520	400	520	400
Sug Beet	Ton	1000	67	103	67	103
Cotton	Kantar	157.5	458	443	2907	2814
Rice	Ton	1000	350	636	350	636
Maize(S)	Ard	140	74	78	528	556
Sunflower	Ton	1000	1152	1280	1152	1280
Veg(S)	Ton	1000	176	300	176	300
Citrus	Ton	1000	546	450	546	450
CROP BY PRODUCT						
Wh Straw	Load	250	20	20	80	80
BeanStw	Load	250	15	15	60	60
CotStlk	Load	250	5	15	20	60
MzStlk	Load	250	5	15	20	60
B'mSeed	Ardab	175	360	360	2057	2057
B'leyStw	Load	250	20	20	80	80
RiceStr	Load	250	5	5	20	20

Source: 1995 F and E Prices are from Ministry of Agriculture & Land Reclamation Undersecretariat for Agricultural Economics and Statistics(AES) files.
World Bank Report 13454-Egt, Annex VI, Tables 1 & 2, Dec., 1994.

Table I-2-20 Estimation of Net Income (Wheat)

Financial

Financial Price: LE/ton 639 W/Proj Area 53920 % Share 32 CropArea 17254
Crop: Wheat WO/Proj Area 47200 % Share 36 CropArea 16992

Item	Price/Unit	Qty WO/Proj	F Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	639/ton	1.86	1188.54	2.01	2.06	2.12	2.14	1283.43	1318.90	1355.32	1366.82
By Product	20/load	9.8	196.00	10.58	10.88	11.17	11.27	211.60	217.60	223.40	225.40
PROD COST											
NonYield Dependent											
Seed	.63/kg	50	31.50	50.00	50.00	50.00	50.00	31.50	31.50	31.50	31.50
Manure	2.6/m3	15	39.00	15	15	15	15	39.00	39.00	39.00	39.00
Fertilizer											
N	1.1/kg	70	77.00	70	70	70	70	77.00	77.00	77.00	77.00
P2O5	1.25/kg	30	37.50	30	30	30	30	37.50	37.50	37.50	37.50
K	1.04/kg	40	41.60	40	40	40	40	41.60	41.60	41.60	41.60
Other											
Insectic'd	9.95/liter	15	149.25	15	15	15	15	149.25	149.25	149.25	149.25
Fungic'd	30/liter	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Herbic'd	15/liter	2	30.00	1.00	1.00	1.00	1.00	15.00	15.00	15.00	15.00
Machinery											
Land Prep	10/hr	2.5	25.00	2.5	2.5	2.5	2.5	25.00	25.00	25.00	25.00
Spraying	5/hr	2	10.00	2	2	2	2	10.00	10.00	10.00	10.00
Irigat'n	10/hr	20	200.00	20	20	20	20	200.00	200.00	200.00	200.00
Animal											
Cultivat'n	10/hr	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transp'n	5/hr	45	225.00	45	45	45	45	225.00	225.00	225.00	225.00
Labor											
Family	1.2/hr	61	73.20	61	61	61	61	73.20	73.20	73.20	73.20
Hired	1.2/hr	61	73.20	61	61	61	61	73.20	73.20	73.20	73.20
Yield Dep'd											
Machinery											
Threshing	25/hr	2.7	67.50	2.92	3.00	3.08	3.11	73.00	75.00	77.00	77.75
Winnowin	25/hr	2.4	60.00	2.59	2.74	2.74	2.76	64.75	68.50	68.50	69.00
Animal											
Transp'n	5/hr	30	150.00	32.40	33.30	34.20	34.50	162.00	166.50	171.00	172.50
Labor											
Family	1.2/hr	45	54.00	48.60	49.95	51.30	51.75	58.32	59.94	61.56	62.10
Hired	1.2/hr	45	54.00	48.60	49.95	51.30	51.75	58.32	59.94	61.56	62.10
TOTAL	LE/fed		1397.75					1413.64	1427.13	1436.87	1440.70
NET INCOME(LE/fed)			-13.21					81.39	109.37	141.85	151.52
HARES AREA NET INCOME(Mill LE)			-0.22								2.61
GROSS INCOME			23.53								27.47
PRODUCTION COST			23.75								24.86

Notes: Income=(Yield/fed)*(Price/unit)
Data taken from Tables F-2-10(1) through F-2-10(9)
Crop Production Model, Input Output in Physical Quantity
Cost of Production=(Quantity/fed)*(Price/unit)
Hares Area Net Income=(Net Income/fed)*Crop Share(%)*Potential Deveopment Area
Net Income=Gross Income - Production Cost

Economic

Economic Price: LE/ton 826 W/Proj Area 53920 % Share 32 CropArea 17254
Crop: Wheat WO/Proj Area 47200 % Share 36 CropArea 16992

Item	Price/Unit	Qty WO/Proj	E Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	826/ton	1.86	1536.36	2.01	2.06	2.12	2.14	1659.02	1704.86	1751.95	1766.81
By Product	20/load	9.8	196.00	10.58	10.88	11.17	11.27	211.60	217.60	223.40	225.40
PROD COST											
NonYield Dependent											
Seed	1.22/kg	50	61.00	50.00	50.00	50.00	50.00	61.00	61.00	61.00	61.00
Manure	2.6/m3	15	39.00	15	15	15	15	39.00	39.00	39.00	39.00
Fertilizer											
N	1.6/kg	70	112.00	70	70	70	70	112.00	112.00	112.00	112.00
P2O5	1.5/kg	30	45.00	30	30	30	30	45.00	45.00	45.00	45.00
K	1.3/kg	40	52.00	40	40	40	40	52.00	52.00	52.00	52.00
Other											
Insectic'd	9.95/liter	15	149.25	15	15	15	15	149.25	149.25	149.25	149.25
Fungic'd	30/liter	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Herbic'd	15/liter	2	30.00	1.00	1.00	1.00	1.00	15.00	15.00	15.00	15.00
Machinery											
Land Prep	10/hr	2.5	25.00	2.5	2.5	2.5	2.5	25.00	25.00	25.00	25.00
Spraying	5/hr	2	10.00	2	2	2	2	10.00	10.00	10.00	10.00
Irigat'n	10/hr	20	200.00	20	20	20	20	200.00	200.00	200.00	200.00
Animal											
Cultivat'n	10/hr	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transp'n	5/hr	45	225.00	45	45	45	45	225.00	225.00	225.00	225.00
Labor											
Family	1.2/hr	61	73.20	61	61	61	61	73.20	73.20	73.20	73.20
Hired	1.2/hr	61	73.20	61	61	61	61	73.20	73.20	73.20	73.20
Yield Dep'd											
Machinery											
Threshing	25/hr	2.7	67.50	2.92	3.00	3.08	3.11	73.00	75.00	77.00	77.75
Winnowin	25/hr	2.4	60.00	2.59	2.74	2.74	2.76	64.75	68.50	68.50	69.00
Animal											
Transp'n	5/hr	30	150.00	32.40	33.30	34.20	34.50	162.00	166.50	171.00	172.50
Labor											
Family	1.2/hr	45	54.00	48.60	49.95	51.30	51.75	58.32	59.94	61.56	62.10
Hired	1.2/hr	45	54.00	48.60	49.95	51.30	51.75	58.32	59.94	61.56	62.10
TOTAL	LE/fed		1480.15					1496.04	1509.53	1519.27	1523.10
NET INCOME(LE/fed)			253.21					374.58	412.93	456.08	469.11
HARES AREA NET INCOME(Mill LE)			4.29								8.09
GROSS INCOME			29.44								34.37
PRODUCTION COST			25.15								26.26

Table I-2-21 Estimation of Net Income (Beans)

Financial

			Hares Area				W/Proj	Area 53920	% Share 12	CropArea 6470	
			Financial Price: LE		1263		WO/Proj	Area 47200	% Share 11	CropArea 5192	
			Crop:	Beans							
Item	Price/Unit	Qty WO/Proj	F Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	1263/ton	0.837	1073.87	0.92	0.96	0.98	1.00	1181.26	1234.95	1256.83	1288.65
By Product	15/load	4.1	61.50	4.51	4.71	4.80	4.92	67.65	70.65	72.00	73.80
PROD COST											
NonYield Dependent											
Seed	1.45/kg	60	87.00	60	60	60	60	87.00	87.00	87.00	87.00
Manure	2.6/m3	20	52.00	20	20	20	20	52.00	52.00	52.00	52.00
Fertilizer											
N	1.1/kg	15.5	17.05	15.5	15.5	15.5	15.5	17.05	17.05	17.05	17.05
P2O5	1.25/kg	15	18.75	15	15	15	15	19.38	19.38	19.38	19.38
K	1.04/kg	30	31.20	30	30	30	30	31.20	31.20	31.20	31.20
Other											
Insectic'd	9.95/liter	0	0.00	0	0	0	0	0.00	0.00	0.00	0.00
Fungic'd	30/liter	0	0.00	0	0	0	0	0.00	0.00	0.00	0.00
Herbic'd	15/liter	2	30.00	2	2	2	2	30.00	30.00	30.00	30.00
Machinery											
Land Prep	10/hr	3	30.00	3	3	3	3	30.00	30.00	30.00	30.00
Spraying	5/hr	4	20.00	4	4	4	4	20.00	20.00	20.00	20.00
Irrigat'n	10/hr	16	160.00	16	16	16	16	160.00	160.00	160.00	160.00
Animal											
Cultivat'n	10/hr	0	0.00	0	0	0	0	0.00	0.00	0.00	0.00
Transp'n	5/hr	30	150.00	30	30	30	30	150.00	150.00	150.00	150.00
Labor											
Family	1.2/hr	34	40.80	34	34	34	34	40.80	40.80	40.80	40.80
Hired	1.2/hr	34	40.80	34	34	34	34	40.80	40.80	40.80	40.80
Yield Dep'd											
Machinery											
Threshing	25/hr	2	50.00	2.20	2.30	2.34	2.40	55.00	57.50	58.50	60.00
Winnowin	25/hr	2.4	60.00	2.64	2.76	2.81	2.88	66.00	69.00	70.25	72.00
Animal											
Transp'n	5/hr	18	90.00	19.80	20.70	21.06	21.60	99.00	103.50	105.30	108.00
Labor											
Family	1.2/hr	47.84	57.17	52.40	54.79	55.74	57.17	62.88	65.75	66.89	68.60
Hired	1.2/hr	47.84	57.17	52.40	54.79	55.74	57.17	62.88	65.75	66.89	68.60
TOTAL	LE/fad		991.94					1023.99	1039.72	1046.05	1055.43
NET INCOME(LE/fed)			143.44					224.92	265.88	282.78	307.01
HARES AREA NET INCOME(Mil LE)			0.74								1.99
GROSS INCOME			5.89								8.82
PRODUCTION COST			5.15								6.83

Notes: Income=(Yield/fed)*(Price/Unit)
Data taken from Tables F-2-10(1) through F-2-10(9)
Crop Production Model, Input Output In Physical Quantity
Cost of Production=(Quantity/fed)*(Price/Unit)
Hares Area Net Income=(Net Income/fed)*Crop Share(%)*Potential Development Area

Economic

			Hares Area				W/Proj	Area 53920	% Share 12	CropArea 6470	
			E Price: LE		1488		WO/Proj	Area 47200	% Share 11	CropArea 5192	
			Crop:	Beans							
Item	Price/Unit	Qty WO/Proj	E Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	1488/ton	0.837	1073.87	0.92	0.96	0.98	1.00	1181.26	1234.95	1256.83	1288.65
By Product	15/load	4.1	61.50	4.51	4.71	4.80	4.92	67.65	70.65	72.00	73.80
PROD COST											
NonYield Dependent											
Seed	2.52/kg	60	151.20	60	60	60	60	151.20	151.20	151.20	151.20
Manure	2.6/m3	20	52.00	20	20	20	20	52.00	52.00	52.00	52.00
Fertilizer											
N	1.6/kg	15.5	24.80	15.5	15.5	15.5	15.5	24.80	24.80	24.80	24.80
P2O5	1.5/kg	15	22.50	15	15	15	15	23.25	23.25	23.25	23.25
K	1.3/kg	30	39.00	30	30	30	30	39.00	39.00	39.00	39.00
Other											
Insectic'd	9.95/liter	0	0.00	0	0	0	0	0.00	0.00	0.00	0.00
Fungic'd	30/liter	0	0.00	0	0	0	0	0.00	0.00	0.00	0.00
Herbic'd	15/liter	2	30.00	2	2	2	2	30.00	30.00	30.00	30.00
Machinery											
Land Prep	10/hr	3	30.00	3	3	3	3	30.00	30.00	30.00	30.00
Spraying	5/hr	4	20.00	4	4	4	4	20.00	20.00	20.00	20.00
Irrigat'n	10/hr	16	160.00	16	16	16	16	160.00	160.00	160.00	160.00
Animal											
Cultivat'n	10/hr	0	0.00	0	0	0	0	0.00	0.00	0.00	0.00
Transp'n	5/hr	30	150.00	30	30	30	30	150.00	150.00	150.00	150.00
Labor											
Family	1.2/hr	34	40.80	34	34	34	34	40.80	40.80	40.80	40.80
Hired	1.2/hr	34	40.80	34	34	34	34	40.80	40.80	40.80	40.80
Yield Dep'd											
Machinery											
Threshing	25/hr	2	50.00	2.20	2.30	2.34	2.40	55.00	57.50	58.50	60.00
Winnowin	25/hr	2.4	60.00	2.64	2.76	2.81	2.88	66.00	69.00	70.25	72.00
Animal											
Transp'n	5/hr	18	90.00	19.80	20.70	21.06	21.60	99.00	103.50	105.30	108.00
Labor											
Family	1.2/hr	47.84	57.17	52.40	54.79	55.74	57.17	62.88	65.75	66.89	68.60
Hired	1.2/hr	47.84	57.17	52.40	54.79	55.74	57.17	62.88	65.75	66.89	68.60
TOTAL	LE/fed		1075.44					1107.61	1123.35	1129.88	1139.06
NET INCOME(LE/fed)			59.94					141.30	182.26	199.15	223.39
HARES AREA NET INCOME(Mil LE)			0.31								1.45
GROSS INCOME			5.89								8.82
PRODUCTION COST			5.58								7.37

Table I-2-22 Estimation of Net Income (L. Berseem)

Financial

F Price Crop: 61 L Bersh'm

W/Proj Area 53920 % Share 21 CropArea 11323
WO/Proj Area 47200 % Share 21 CropArea 9912

Item	Price/Unit	Qty WO/Proj	F Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	61/ton	22.50	1372.50	24.75	25.88	26.33	27.00	1509.75	1578.68	1606.13	1647.00
By Product											
PROD COST											
NonYield D											
Seed	2.06/kg	25.00	51.50	25.00	25.00	25.00	25.00	51.50	51.50	51.50	51.50
Manure	2.6/m3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertilizer											
N	1.1/kg	15.00	16.50	15.50	15.50	15.50	15.50	17.05	17.05	17.05	17.05
P2O5	1.25/kg	20.00	25.00	15.00	15.00	15.00	15.00	18.75	18.75	18.75	18.75
K	1.04/kg	75.00	78.00	30.00	30.00	30.00	30.00	31.20	31.20	31.20	31.20
Other											
Insectic'd	9.95/liter	1.00	9.95	1.00	1.00	1.00	1.00	9.95	9.95	9.95	9.95
Fungic'd	30/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machinery											
Land Prep	10/hr	2.50	25.00	2.50	2.50	2.50	2.50	25.00	25.00	25.00	25.00
Spraying	5/hr	2.00	10.00	2.00	2.00	2.00	2.00	10.00	10.00	10.00	10.00
Irrigat'n	10/hr	30.00	300.00	30.00	30.00	30.00	30.00	300.00	300.00	300.00	300.00
Animal											
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transp'n	5/hr	30.00	150.00	30.00	30.00	30.00	30.00	150.00	150.00	150.00	150.00
Labor											
Family	1.2/hr	60.00	72.00	60.00	60.00	60.00	60.00	72.00	72.00	72.00	72.00
Hired	1.2/hr	60.00	72.00	60.00	60.00	60.00	60.00	72.00	72.00	72.00	72.00
Yield Dep'd											
Machinery											
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Animal											
Transp'n	5/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor											
Family	1.2/hr	72.00	86.40	79.20	82.80	84.24	86.40	95.04	99.36	101.09	103.68
Hired	1.2/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	LE/fed		896.35					852.49	858.81	858.54	861.13
NET INCOME(LE/fed)			476.15					657.28	721.87	747.59	785.87
HARES AREA NET INCOME(Mill LE)			4.72								8.90
GROSS INCOME			13.80								18.65
PRODUCTION COST			8.86								9.75

Notes: Income=(Yield/fed)*(Price/unit)
Data taken from Tables F-2-10(1) through F-2-10(9)
Crop Production Model, Input Output in Physical Quantity
Cost of Production=(Quantity/fed)*(Price/unit)
Hares Area Net Income=(Net Income/fed)*Crop Share(%)*Potential Development Area

Economic

E Price Crop: 47 L Bersh'm

W/Proj Area 53920 % Share 21 CropArea 11323
WO/Proj Area 47200 % Share 21 CropArea 9912

Item	Price/Unit	Qty WO/Proj	E Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	47/ton	22.50	1057.50	24.75	25.88	26.33	27.00	1163.25	1216.36	1237.51	1269.00
By Product											
PROD COST											
NonYield D											
Seed	2.06/kg	25.00	51.50	25.00	25.00	25.00	25.00	51.50	51.50	51.50	51.50
Manure	2.6/m3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertilizer											
N	1.6/kg	15.00	24.00	15.50	15.50	15.50	15.50	24.80	24.80	24.80	24.80
P2O5	1.5/kg	20.00	30.00	15.00	15.00	15.00	15.00	22.50	22.50	22.50	22.50
K	1.3/kg	75.00	97.50	30.00	30.00	30.00	30.00	39.00	39.00	39.00	39.00
Other											
Insectic'd	9.95/liter	1.00	9.95	1.00	1.00	1.00	1.00	9.95	9.95	9.95	9.95
Fungic'd	30/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machinery											
Land Prep	10/hr	2.50	25.00	2.50	2.50	2.50	2.50	25.00	25.00	25.00	25.00
Spraying	5/hr	2.00	10.00	2.00	2.00	2.00	2.00	10.00	10.00	10.00	10.00
Irrigat'n	10/hr	30.00	300.00	30.00	30.00	30.00	30.00	300.00	300.00	300.00	300.00
Animal											
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transp'n	5/hr	30.00	150.00	30.00	30.00	30.00	30.00	150.00	150.00	150.00	150.00
Labor											
Family	1.2/hr	60.00	72.00	60.00	60.00	60.00	60.00	72.00	72.00	72.00	72.00
Hired	1.2/hr	60.00	72.00	60.00	60.00	60.00	60.00	72.00	72.00	72.00	72.00
Yield Dep'd											
Machinery											
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Animal											
Transp'n	5/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor											
Family	1.2/hr	72.00	86.40	79.20	82.80	84.24	86.40	95.04	99.36	101.09	103.68
Hired	1.2/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	LE/fed		928.35					871.79	876.11	877.84	880.43
NET INCOME(LE/fed)			129.15					291.46	340.25	359.67	388.57
HARES AREA NET INCOME(Mill LE)			1.28								4.40
GROSS INCOME			10.46								14.37
PRODUCTION COST			9.20								9.97

Table I-2-23 Estimation of Net Income (S. Berseem)

Financial

F Price 61 | W/Proj Area 53920 | % Share 17 | CropArea 9166
Crop: S Bersh'm | WO/Proj Area 47200 | % Share 17 | CropArea 8024

Item	Price/Unit	Qty WO/Proj	F Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	61/ton	9.80	603.90	10.89	11.39	11.58	11.88	664.29	694.79	706.38	724.68
By Product											
PROD COST											
NonYield D											
Seed	2.06/kg	25.00	51.50	25.00	25.00	25.00	25.00	51.50	51.50	51.50	51.50
Manure	2.6/m3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertilizer											
N	1.1/kg	7.50	8.25	7.50	7.50	7.50	7.50	8.25	8.25	8.25	8.25
P2O5	1.25/kg	20.00	25.00	20.00	20.00	20.00	20.00	25.00	25.00	25.00	25.00
K	1.04/kg	40.00	41.60	40.00	40.00	40.00	40.00	41.60	41.60	41.60	41.60
Other											
Insectic'd	9.95/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fungic'd	30/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machinery											
Land Prep	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spraying	5/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Irrigat'n	10/hr	12.00	120.00	12.00	12.00	12.00	12.00	120.00	120.00	120.00	120.00
Animal											
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transp'n	5/hr	30.00	150.00	30.00	30.00	30.00	30.00	150.00	150.00	150.00	150.00
Labor											
Family	1.2/hr	30.00	36.00	15.00	15.00	15.00	15.00	18.00	18.00	18.00	18.00
Hired	1.2/hr	30.00	36.00	15.00	15.00	15.00	15.00	18.00	18.00	18.00	18.00
Yield Dep'd											
Machinery											
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Animal											
Transp'n	5/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor											
Family	1.2/hr	36.00	43.20	39.60	31.40	42.12	43.20	47.52	37.68	50.54	51.84
Hired	1.2/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	LE/fed		511.55					479.87	470.03	482.89	484.19
NET INCOME(LE/fed)			92.35					184.42	224.76	223.49	240.49
HARES AREA NET INCME(Mill LE)			0.74								2.20
GROSS INCOME			4.85								6.64
PRODUCTION COST			4.10								4.44

Notes: Income=(Yield/fed)*(Price/unit)
Data taken from Tables F-2-10(1) through F-2-10(9)
Crop Production Model, Input Output In Physical Quantity
Cost of Production=(Quantity/fed)*(Price/unit)
Hares Area Net Income=(Net Income/fed)*Crop Share(%)*Potential Development Area

Economic

E Price 47 | W/Proj Area 53920 | % Share 17 | CropArea 9166
Crop: S Bersh'm | WO/Proj Area 47200 | % Share 17 | CropArea 8024

Item	Price/Unit	Qty WO/Proj	E Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	47/ton	9.80	465.30	10.89	11.39	11.58	11.88	511.83	535.33	544.26	558.36
By Product											
PROD COST											
NonYield D											
Seed	2.06/kg	25.00	51.50	25.00	25.00	25.00	25.00	51.50	51.50	51.50	51.50
Manure	2.6/m3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertilizer											
N	1.6/kg	7.50	12.00	7.50	7.50	7.50	7.50	12.00	12.00	12.00	12.00
P2O5	1.5/kg	20.00	30.00	20.00	20.00	20.00	20.00	30.00	30.00	30.00	30.00
K	1.3/kg	40.00	52.00	40.00	40.00	40.00	40.00	52.00	52.00	52.00	52.00
Other											
Insectic'd	9.95/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fungic'd	30/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machinery											
Land Prep	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spraying	5/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Irrigat'n	10/hr	12.00	120.00	12.00	12.00	12.00	12.00	120.00	120.00	120.00	120.00
Animal											
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transp'n	5/hr	30.00	150.00	30.00	30.00	30.00	30.00	150.00	150.00	150.00	150.00
Labor											
Family	1.2/hr	30.00	36.00	15.00	15.00	15.00	15.00	18.00	18.00	18.00	18.00
Hired	1.2/hr	30.00	36.00	15.00	15.00	15.00	15.00	18.00	18.00	18.00	18.00
Yield Dep'd											
Machinery											
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Animal											
Transp'n	5/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor											
Family	1.2/hr	36.00	43.20	39.60	31.40	42.12	43.20	47.52	37.68	50.54	51.84
Hired	1.2/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	LE/fed		530.70					499.02	489.18	502.04	503.34
NET INCOME(LE/fed)			-65.40					12.81	46.15	42.22	55.02
HARES AREA NET INCME(Mill LE)			-0.52								0.50
GROSS INCOME			3.73								5.12
PRODUCTION COST			4.26								4.61

Table I-2-24 Estimation of Net Income (Vegetable (W))

Financial

F Price Crop: 520 Veg(W)

W/Proj Area 53920 % Share 18 CropArea 9706
WO/Proj Area 47200 % Share 12 CropArea 5664

Item	Price/Unit	Qty WO/Proj	F Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	520/ton	8.00	4160.00	9.20	9.80	10.00	10.00	4784.00	5096.00	5200.00	5200.00
By Product											
PROD COST											
NonYield D											
Seed	7/kg	1.00	7.00	1.00	1.00	1.00	1.00	7.00	7.00	7.00	7.00
Manure	2.6/m3	30.00	78.00	30.00	30.00	30.00	30.00	78.00	78.00	78.00	78.00
Fertilizer											
N	1.1/kg	40.00	44.00	40.00	40.00	40.00	40.00	44.00	44.00	44.00	44.00
P2O5	1.25/kg	25.00	31.25	25.00	25.00	25.00	25.00	31.25	31.25	31.25	31.25
K	1.04/kg	80.00	83.20	80.00	80.00	80.00	80.00	83.20	83.20	83.20	83.20
Other											
Insectic'd	9.95/liter	1.50	14.93	1.50	1.50	1.50	1.50	14.93	14.93	14.93	14.93
Fungic'd	30/liter	2.00	60.00	2.00	2.00	2.00	2.00	60.00	60.00	60.00	60.00
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machinery											
Land Prep	10/hr	3.50	35.00	3.50	3.50	3.50	3.50	35.00	35.00	35.00	35.00
Spraying	5/hr	8.00	40.00	8.00	8.00	8.00	8.00	40.00	40.00	40.00	40.00
Irigat'n	10/hr	27.00	270.00	27.00	27.00	27.00	27.00	270.00	270.00	270.00	270.00
Animal											
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transp'n	5/hr	75.00	375.00	75.00	75.00	75.00	75.00	375.00	375.00	375.00	375.00
Labor											
Family	1.2/hr	148.00	177.60	148.00	148.00	148.00	148.00	177.60	177.60	177.60	177.60
Hired	1.2/hr	148.00	177.60	148.00	148.00	148.00	148.00	177.60	177.60	177.60	177.60
Yield Dep'd											
Machinery											
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Animal											
Transp'n	5/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor											
Family	1.2/hr	72.50	87.00	83.38	87.00	90.63	90.63	100.06	104.40	108.76	108.76
Hired	1.2/hr	72.50	87.00	72.50	87.00	90.63	90.63	87.00	104.40	108.76	108.76
TOTAL	LE/fed		1567.58					1580.63	1802.38	1811.09	1811.09
NET INCOME(LE/fed)			2592.43					3203.37	3493.63	3588.91	3588.91
HARES AREA NET INCME(Mill LE)			14.66								34.83
GROSS INCOME			23.56								50.47
PRODUCTION COST			8.88								15.64

Notes: Income=(Yield/fed)*(Price/unit)
Data taken from Tables F-2-10(1) through F-2-10(9)
Crop Production Model, Input Output in Physical Quantity
Cost of Production=(Quantity/fed)*(Price/unit)
Hares Area Net Income=(Net Income/fed)*Crop Share(%)*Potential Development Area

Economic

E Price Crop: 400 Veg(W)

W/Proj Area 53920 % Share 18 CropArea 9706
WO/Proj Area 47200 % Share 12 CropArea 5664

Item	Price/Unit	Qty WO/Proj	E Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	400/ton	8.00	3200.00	9.20	9.80	10.00	10.00	3680.00	3920.00	4000.00	4000.00
By Product											
PROD COST											
NonYield D											
Seed	7/kg	1.00	7.00	1.00	1.00	1.00	1.00	7.00	7.00	7.00	7.00
Manure	2.6/m3	30.00	78.00	30.00	30.00	30.00	30.00	78.00	78.00	78.00	78.00
Fertilizer											
N	1.6/kg	40.00	64.00	40.00	40.00	40.00	40.00	64.00	64.00	64.00	64.00
P2O5	1.5/kg	25.00	37.50	25.00	25.00	25.00	25.00	37.50	37.50	37.50	37.50
K	1.3/kg	80.00	104.00	80.00	80.00	80.00	80.00	104.00	104.00	104.00	104.00
Other											
Insectic'd	9.95/liter	1.50	14.93	1.50	1.50	1.50	1.50	14.93	14.93	14.93	14.93
Fungic'd	30/liter	2.00	60.00	2.00	2.00	2.00	2.00	60.00	60.00	60.00	60.00
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machinery											
Land Prep	10/hr	3.50	35.00	3.50	3.50	3.50	3.50	35.00	35.00	35.00	35.00
Spraying	5/hr	8.00	40.00	8.00	8.00	8.00	8.00	40.00	40.00	40.00	40.00
Irigat'n	10/hr	27.00	270.00	27.00	27.00	27.00	27.00	270.00	270.00	270.00	270.00
Animal											
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transp'n	5/hr	75.00	375.00	75.00	75.00	75.00	75.00	375.00	375.00	375.00	375.00
Labor											
Family	1.2/hr	148.00	177.60	148.00	148.00	148.00	148.00	177.60	177.60	177.60	177.60
Hired	1.2/hr	148.00	177.60	148.00	148.00	148.00	148.00	177.60	177.60	177.60	177.60
Yield Dep'd											
Machinery											
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Animal											
Transp'n	5/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Labor											
Family	1.2/hr	72.50	87.00	83.38	87.00	90.63	90.63	100.06	104.40	108.76	108.76
Hired	1.2/hr	72.50	87.00	72.50	87.00	90.63	90.63	87.00	104.40	108.76	108.76
TOTAL	LE/fed		1614.63					1627.66	1649.43	1658.14	1658.14
NET INCOME(LE/fed)			1585.38					2052.32	2270.58	2341.86	2341.86
HARES AREA NET INCME(Mill LE)			8.96								22.73
GROSS INCOME			19.12								38.82
PRODUCTION COST			9.15								16.09

Table I-2-25 Estimation of Net Income (Cotton)

Financial

								W/Proj	Area 53920	% Share 17	CropArea 9168		
			F Price	2907				WO/Proj	Area 47200	% Share 17	CropArea 8024		
			Crop:	Cotton									
Item	Price/Unit	Qty WO/Proj	F Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4		
INCOME													
Main	2907/ton	1.10	3204.97	1.27	1.32	1.38	1.38	3685.71	3845.96	4006.21	4006.21		
By Product	15/load	6.40	96.00	7.36	7.68	8.00	8.00	110.40	115.20	120.00	120.00		
PROD COST													
NonYield D													
Seed	.17/kg	65.00	11.05	65.00	65.00	65.00	65.00	11.05	11.05	11.05	11.05		
Manure	2.6/m3	20.00	52.00	20.00	20.00	20.00	20.00	52.00	52.00	52.00	52.00		
Fertilizer													
N	1.1/kg	80.00	88.00	80.00	80.00	80.00	80.00	88.00	88.00	88.00	88.00		
P2O5	1.25/kg	30.00	37.50	30.00	30.00	30.00	30.00	37.50	37.50	37.50	37.50		
K	1.04/kg	30.00	31.20	30.00	30.00	30.00	30.00	31.20	31.20	31.20	31.20		
Other													
Insectic'd	9.95/liter	7.00	69.65	7.00	7.00	7.00	7.00	69.65	69.65	69.65	69.65		
Fungic'd	30/liter	1.00	30.00	1.00	1.00	1.00	1.00	60.00	60.00	60.00	60.00		
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Machinery													
Land Prep	10/hr	3.00	30.00	3.00	3.00	3.00	3.00	30.00	30.00	30.00	30.00		
Spraying	5/hr	14.00	70.00	14.00	14.00	14.00	14.00	70.00	70.00	70.00	70.00		
Irrigat'n	10/hr	32.00	320.00	32.00	32.00	32.00	32.00	320.00	320.00	320.00	320.00		
Animal													
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Transp'n	5/hr	60.00	300.00	60.00	60.00	60.00	60.00	300.00	300.00	300.00	300.00		
Labor													
Family	1.2/hr	155.00	186.00	155.00	155.00	155.00	155.00	186.00	186.00	186.00	186.00		
Hired	1.2/hr	155.00	186.00	155.00	155.00	155.00	155.00	186.00	186.00	186.00	186.00		
Yield Dep'd													
Machinery													
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Animal													
Transp'n	5/hr	30.00	150.00	34.50	36.00	37.50	37.50	172.50	180.00	187.50	187.50		
Labor													
Family	1.2/hr	125.00	150.00	143.75	150.00	156.25	156.25	172.50	180.00	187.50	187.50		
Hired	1.2/hr	125.00	150.00	143.75	150.00	156.25	156.25	172.50	180.00	187.50	187.50		
TOTAL	LE/fed		1881.40					1958.90	1981.40	2003.90	2003.90		
NET INCOME(LE/fed)			1439.57					1837.21	1979.76	2122.31	2122.31		
HARES AREA NET INCME(Mil LE)			11.55								19.45		
GROSS INCOME			26.49								37.82		
PRODUCTION COST			14.94								18.37		

Notes: Income=(Yield/fed)*(Price/unit)
Data taken from Tables F-2-10(1) through F-2-10(8)
Crop Production Model, Input Output in Physical Quantity
Cost of Production=(Quantity/fed)*(Price/unit)
Hares Area Net Income=(Net Income/fed)*Crop Share(%)*Potential Deveopment Area

Economic

								W/Proj	Area 53920	% Share 17	CropArea 9168		
			E Price	2814				WO/Proj	Area 47200	% Share 17	CropArea 8024		
			Crop:	Cotton									
Item	Price/Unit	Qty WO/Proj	E Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4		
INCOME													
Main	2814/ton	1.10	3102.44	1.27	1.32	1.38	1.38	3567.80	3722.92	3878.04	3878.04		
By Product	15/load	6.40	96.00	7.36	7.68	8.00	8.00	110.40	115.20	120.00	120.00		
PROD COST													
NonYield D													
Seed	.8/kg	65.00	58.50	65.00	65.00	65.00	65.00	58.50	58.50	58.50	58.50		
Manure	2.6/m3	20.00	52.00	20.00	20.00	20.00	20.00	52.00	52.00	52.00	52.00		
Fertilizer													
N	1.6/kg	80.00	128.00	80.00	80.00	80.00	80.00	128.00	128.00	128.00	128.00		
P2O5	1.5/kg	30.00	45.00	30.00	30.00	30.00	30.00	45.00	45.00	45.00	45.00		
K	1.3/kg	30.00	39.00	30.00	30.00	30.00	30.00	39.00	39.00	39.00	39.00		
Other													
Insectic'd	9.95/liter	7.00	69.65	7.00	7.00	7.00	7.00	69.65	69.65	69.65	69.65		
Fungic'd	30/liter	1.00	30.00	1.00	1.00	1.00	1.00	60.00	60.00	60.00	60.00		
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Machinery													
Land Prep	10/hr	3.00	30.00	3.00	3.00	3.00	3.00	30.00	30.00	30.00	30.00		
Spraying	5/hr	14.00	70.00	14.00	14.00	14.00	14.00	70.00	70.00	70.00	70.00		
Irrigat'n	10/hr	32.00	320.00	32.00	32.00	32.00	32.00	320.00	320.00	320.00	320.00		
Animal													
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Transp'n	5/hr	60.00	300.00	60.00	60.00	60.00	60.00	300.00	300.00	300.00	300.00		
Labor													
Family	1.2/hr	155.00	186.00	155.00	155.00	155.00	155.00	186.00	186.00	186.00	186.00		
Hired	1.2/hr	155.00	186.00	155.00	155.00	155.00	155.00	186.00	186.00	186.00	186.00		
Yield Dep'd													
Machinery													
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Animal													
Transp'n	5/hr	30.00	150.00	34.50	36.00	37.50	37.50	172.50	180.00	187.50	187.50		
Labor													
Family	1.2/hr	125.00	150.00	143.75	150.00	156.25	156.25	172.50	180.00	187.50	187.50		
Hired	1.2/hr	125.00	150.00	143.75	150.00	156.25	156.25	172.50	180.00	187.50	187.50		
TOTAL	LE/fed		1964.15					2061.65	2084.15	2106.65	2106.65		
NET INCOME(LE/fed)			1234.28					1816.55	1753.97	1691.39	1691.39		
HARES AREA NET INCME(Mil LE)			9.90								17.34		
GROSS INCOME			25.68								36.65		
PRODUCTION COST			15.78								19.31		

Table I-2-26 Estimation of Net Income (Maize)

Financial

F Price 528 | W/Proj Area 53920 | % Share 32 | CropArea 17254
Crop: Maize | WO/Proj Area 47200 | % Share 36 | CropArea 16992

Item	Price/Unit	Qty WO/Proj	F Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	528/ton	2.09	1101.41	2.23	2.29	2.38	2.40	1178.28	1211.55	1255.90	1266.98
By Product	5/load	8.34	41.70	8.92	9.17	9.51	9.59	44.60	45.85	47.55	47.95
Fodders	5/load	1.00	5.00	1.07	1.10	1.14	1.15	5.35	5.50	5.70	5.75
PROD COST											
NonYield D											
Seed	.71/kg	25.00	4.25	25.00	25.00	25.00	25.00	4.25	4.25	4.25	4.25
Manure	2.6/m3	20.00	52.00	20.00	20.00	20.00	20.00	52.00	52.00	52.00	52.00
Fertilizer											
N	1.1/kg	80.00	88.00	80.00	80.00	80.00	80.00	88.00	88.00	88.00	88.00
P2O5	1.25/kg	70.00	87.50	70.00	70.00	70.00	70.00	87.50	87.50	87.50	87.50
K	1.04/kg	60.00	62.40	60.00	60.00	60.00	60.00	62.40	62.40	62.40	62.40
Other											
Insectic'd	9.95/liter	1.00	9.95	1.00	1.00	1.00	1.00	9.95	9.95	9.95	9.95
Fungic'd	30/liter	1.50	45.00	1.50	1.50	1.50	1.50	60.00	60.00	60.00	60.00
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machinery											
Land Prep	10/hr	3.00	30.00	3.00	3.00	3.00	3.00	30.00	30.00	30.00	30.00
Spraying	5/hr	4.00	20.00	4.00	4.00	4.00	4.00	20.00	20.00	20.00	20.00
Irrigat'n	10/hr	27.00	270.00	27.00	27.00	27.00	27.00	270.00	270.00	270.00	270.00
Animal											
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transp'n	5/hr	60.00	300.00	60.00	60.00	60.00	60.00	300.00	300.00	300.00	300.00
Labor											
Family	1.2/hr	85.00	102.00	85.00	85.00	85.00	85.00	102.00	102.00	102.00	102.00
Hired	1.2/hr	85.00	102.00	85.00	85.00	85.00	85.00	102.00	102.00	102.00	102.00
Yield Dep'd											
Machinery											
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Animal											
Transp'n	5/hr	24.00	120.00	24.00	24.00	24.00	24.00	120.00	120.00	120.00	120.00
Labor											
Family	1.2/hr	44.50	53.40	44.50	44.50	44.50	44.50	53.40	53.40	53.40	53.40
Hired	1.2/hr	44.50	53.40	44.50	44.50	44.50	44.50	53.40	53.40	53.40	53.40
TOTAL	LE/fed		1399.90					1414.90	1414.90	1414.90	1414.90
NET INCOME(LE/fed)			-258.79					-192.02	-167.50	-111.45	-99.96
HARES AREA NET INCME(Mill LE)			-4.36								-1.72
GROSS INCOME			19.42								22.69
PRODUCTION COST			23.79								24.41

Notes: Income=(Yield/fed)*(Price/unit)
Data taken from Tables F-2-10(1) through F-2-10(9)
Crop Production Model, Input Output in Physical Quantity
Cost of Production=(Quantity/fed)*(Price/unit)
Hares Area Net Income=(Net Income/fed)*Crop Share(%)*Potential Deveopment Area

Economic

E Price 556 | W/Proj Area 53920 | % Share 32 | CropArea 17254
Crop: Maize | WO/Proj Area 47200 | % Share 36 | CropArea 16992

Item	Price/Unit	Qty WO/Proj	E Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	556/ton	2.09	1159.82	2.23	2.29	2.38	2.40	1240.77	1275.80	1322.60	1334.18
By Product	5/load	8.34	41.70	8.92	9.17	9.51	9.59	44.60	45.85	47.55	47.95
Fodders	5/load	1.00	5.00	1.07	1.10	1.14	1.15	5.35	5.50	5.70	5.75
PROD COST											
NonYield D											
Seed	.93/kg	25.00	23.25	25.00	25.00	25.00	25.00	23.25	23.25	23.25	23.25
Manure	2.6/m3	20.00	52.00	20.00	20.00	20.00	20.00	52.00	52.00	52.00	52.00
Fertilizer											
N	1.6/kg	80.00	128.00	80.00	80.00	80.00	80.00	128.00	128.00	128.00	128.00
P2O5	1.5/kg	70.00	105.00	70.00	70.00	70.00	70.00	105.00	105.00	105.00	105.00
K	1.3/kg	60.00	78.00	60.00	60.00	60.00	60.00	78.00	78.00	78.00	78.00
Other											
Insectic'd	9.95/liter	1.00	9.95	1.00	1.00	1.00	1.00	9.95	9.95	9.95	9.95
Fungic'd	30/liter	1.50	45.00	1.50	1.50	1.50	1.50	45.00	45.00	45.00	45.00
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machinery											
Land Prep	10/hr	3.00	30.00	3.00	3.00	3.00	3.00	30.00	30.00	30.00	30.00
Spraying	5/hr	4.00	20.00	4.00	4.00	4.00	4.00	20.00	20.00	20.00	20.00
Irrigat'n	10/hr	27.00	270.00	27.00	27.00	27.00	27.00	270.00	270.00	270.00	270.00
Animal											
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transp'n	5/hr	60.00	300.00	60.00	60.00	60.00	60.00	300.00	300.00	300.00	300.00
Labor											
Family	1.2/hr	85.00	102.00	85.00	85.00	85.00	85.00	102.00	102.00	102.00	102.00
Hired	1.2/hr	85.00	102.00	85.00	85.00	85.00	85.00	102.00	102.00	102.00	102.00
Yield Dep'd											
Machinery											
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Animal											
Transp'n	5/hr	24.00	120.00	24.00	24.00	24.00	24.00	120.00	120.00	120.00	120.00
Labor											
Family	1.2/hr	44.50	53.40	44.50	44.50	44.50	44.50	53.40	53.40	53.40	53.40
Hired	1.2/hr	44.50	53.40	44.50	44.50	44.50	44.50	53.40	53.40	53.40	53.40
TOTAL	LE/fed		1492.00					1492.00	1492.00	1492.00	1492.00
NET INCOME(LE/fed)			-290.46					-206.83	-170.35	-121.95	-109.87
HARES AREA NET INCME(Mill LE)			-4.94								-1.90
GROSS INCOME			20.42								23.65
PRODUCTION COST			26.35								25.74

Table I-2-27 Estimation of Net Income (Sunflower)

Financial

								W/Proj	Area	% Share	CropArea
			F Price	1152					53920	8	4314
			Crop:	Sunflower				WO/Proj	Area	% Share	CropArea
									47200	8	3776

Item	Price/Unit	Qty WO/Proj	F Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	1152/ton	0.75	864.00	0.80	0.83	0.86	0.86	921.60	956.16	990.72	990.72
By Product											
Fodders											
PROD COST											
NonYield D											
Seed	1.31/kg	5.00	6.55	5.00	5.00	5.00	5.00	6.55	6.55	6.55	6.55
Manure	2.6/m3	20.00	52.00	20.00	20.00	20.00	20.00	52.00	52.00	52.00	52.00
Fertilizer											
N	1.1/kg	70.00	77.00	70.00	70.00	70.00	70.00	77.00	77.00	77.00	77.00
P2O5	1.25/kg	30.00	37.50	30.00	30.00	30.00	30.00	37.50	37.50	37.50	37.50
K	1.04/kg	60.00	62.40	60.00	60.00	60.00	60.00	62.40	62.40	62.40	62.40
Other											
Insectic'd	9.95/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fungic'd	30/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machinery											
Land Prep	10/hr	3.00	30.00	3.00	3.00	3.00	3.00	30.00	30.00	30.00	30.00
Spraying	5/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Irrigat'n	10/hr	20.00	200.00	20.00	20.00	20.00	20.00	200.00	200.00	200.00	200.00
Animal											
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transp'n	5/hr	60.00	300.00	60.00	60.00	60.00	60.00	300.00	300.00	300.00	300.00
Labor											
Family	1.2/hr	100.00	120.00	100.00	100.00	100.00	100.00	120.00	120.00	120.00	120.00
Hired	1.2/hr	100.00	120.00	100.00	100.00	100.00	100.00	120.00	120.00	120.00	120.00
Yield Dep'd											
Machinery											
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Animal											
Transp'n	5/hr	12.00	60.00	12.84	13.20	13.68	13.80	64.20	66.00	68.40	69.00
Labor											
Family	1.2/hr	30.00	36.00	32.10	33.00	34.20	34.50	38.52	39.60	41.04	41.40
Hired	1.2/hr	30.00	36.00	32.10	33.00	34.20	34.50	38.52	39.60	41.04	41.40
TOTAL	LE/fed		1137.45					1146.89	1150.65	1155.93	1157.25
NET INCOME(LE/fed)			-273.45					-225.09	-194.49	-165.21	-166.53
HARES AREA NET INCME(Mil LE)			-1.03								-0.72
GROSS INCOME			3.26								4.27
PRODUCTION COST			4.30								4.99

Notes: Income=(Yield/fed)*(Price/unit)
Data taken from Tables F-2-10(1) through F-2-10(9)
Crop Production Model, Input Output in Physical Quantity
Cost of Production=(Quantity/fed)*(Price/unit)
Hares Area Net Income=(Net Income/fed)*Crop Share(%)*Potential Development Area

Economic

								W/Proj	Area	% Share	CropArea
			E Price	1280					53920	8	4314
			Crop:	Sunflower				WO/Proj	Area	% Share	CropArea
									47200	8	3776

Item	Price/Unit	Qty WO/Proj	E Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4
INCOME											
Main	1280/ton	0.75	960.00	0.80	0.83	0.86	0.86	1024.00	1062.40	1100.80	1100.80
By Product											
Fodders											
PROD COST											
NonYield D											
Seed	1.9/kg	5.00	9.50	5.00	5.00	5.00	5.00	9.50	9.50	9.50	9.50
Manure	2.6/m3	20.00	52.00	20.00	20.00	20.00	20.00	52.00	52.00	52.00	52.00
Fertilizer											
N	1.6/kg	70.00	112.00	70.00	70.00	70.00	70.00	112.00	112.00	112.00	112.00
P2O5	1.5/kg	30.00	45.00	30.00	30.00	30.00	30.00	45.00	45.00	45.00	45.00
K	1.3/kg	60.00	78.00	60.00	60.00	60.00	60.00	78.00	78.00	78.00	78.00
Other											
Insectic'd	9.95/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fungic'd	30/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Machinery											
Land Prep	10/hr	3.00	30.00	3.00	3.00	3.00	3.00	30.00	30.00	30.00	30.00
Spraying	5/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Irrigat'n	10/hr	20.00	200.00	20.00	20.00	20.00	20.00	200.00	200.00	200.00	200.00
Animal											
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Transp'n	5/hr	60.00	300.00	60.00	60.00	60.00	60.00	300.00	300.00	300.00	300.00
Labor											
Family	1.2/hr	100.00	120.00	100.00	100.00	100.00	100.00	120.00	120.00	120.00	120.00
Hired	1.2/hr	100.00	120.00	100.00	100.00	100.00	100.00	120.00	120.00	120.00	120.00
Yield Dep'd											
Machinery											
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Animal											
Transp'n	5/hr	12.00	60.00	12.84	13.20	13.68	13.80	64.20	66.00	68.40	69.00
Labor											
Family	1.2/hr	30.00	36.00	32.10	33.00	34.20	34.50	38.52	39.60	41.04	41.40
Hired	1.2/hr	30.00	36.00	32.10	33.00	34.20	34.50	38.52	39.60	41.04	41.40
TOTAL	LE/fed		1198.50					1207.74	1211.70	1216.98	1218.30
NET INCOME(LE/fed)			-238.50					-183.74	-149.30	-116.18	-117.50
HARES AREA NET INCME(Mil LE)			-0.90								-0.51
GROSS INCOME			3.62								4.75
PRODUCTION COST			4.53								5.26

Table I-2-28 Estimation of Net Income (Vegetable(S))

Financial

F Price 178
Crop: Veg(S)

									W/Proj Area 53920	% Share 43	CropArea 23188	
									WO/Proj Area 47200	% Share 37	CropArea 17464	
Item	Price/Unit	Qty WO/Proj	F Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	
INCOME												
Main	176/ton	12.00	2112.00	13.80	14.40	15.00	15.00	2428.80	2534.40	2640.00	2640.00	
By Product												
Fodders												
PROD COST												
NonYield D												
Seed	7/kg	12.00	84.00	5.00	5.00	5.00	5.00	35.00	35.00	35.00	35.00	
Manure	2.6/m3	20.00	52.00	20.00	20.00	20.00	20.00	52.00	52.00	52.00	52.00	
Fertilizer												
N	1.1/kg	60.00	66.00	60.00	60.00	60.00	60.00	66.00	66.00	66.00	66.00	
P2O5	1.25/kg	45.00	56.25	45.00	45.00	45.00	45.00	56.25	56.25	56.25	56.25	
K	1.04/kg	80.00	83.20	80.00	80.00	80.00	80.00	83.20	83.20	83.20	83.20	
Other												
Insectic'd	9.95/liter	5.00	49.75	5.00	5.00	5.00	5.00	49.75	49.75	49.75	49.75	
Fungic'd	30/liter	10.00	300.00	10.00	10.00	10.00	10.00	300.00	300.00	300.00	300.00	
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Machinery												
Land Prep	10/hr	3.50	35.00	3.50	3.50	3.50	3.50	35.00	35.00	35.00	35.00	
Spraying	5/hr	25.00	125.00	25.00	25.00	25.00	25.00	125.00	125.00	125.00	125.00	
Irrigat'n	10/hr	30.00	300.00	30.00	30.00	30.00	30.00	300.00	300.00	300.00	300.00	
Animal												
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Transp'n	5/hr	75.00	375.00	75.00	75.00	75.00	75.00	375.00	375.00	375.00	375.00	
Labor												
Family	1.2/hr	150.00	180.00	150.00	150.00	150.00	150.00	180.00	180.00	180.00	180.00	
Hired	1.2/hr	150.00	180.00	150.00	150.00	150.00	150.00	180.00	180.00	180.00	180.00	
Yield Dep'd												
Machinery												
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Animal												
Transp'n	5/hr	7.14	35.70	8.21	8.57	8.93	8.93	41.05	42.85	44.65	44.65	
Labor												
Family	1.2/hr	72.50	87.00	83.38	87.00	90.63	90.63	100.06	104.40	108.76	108.76	
Hired	1.2/hr	72.50	87.00	32.10	87.00	90.63	90.63	38.52	104.40	108.76	108.76	
TOTAL	LE/fed		2095.90					2016.83	2088.85	2099.36	2099.36	
NET INCOME(LE/fed)			16.10					411.97	445.55	540.64	540.64	
HARES AREA NET INCME(Mill LE)			0.28								12.54	
GROSS INCOME			36.88								81.21	
PRODUCTION COST			36.60								48.67	

Notes: Income=(Yield/fed)*(Price/unit)
Data taken from Tables F-2-10(1) through F-2-10(9)
Crop Production Model, Input Output in Physical Quantity
Cost of Production=(Quantity/fed)*(Price/unit)
Hares Area Net Income=(Net Income/fed)*Crop Share(%)*Potential Deveopment Area

Economic

E Price 300
Crop: Veg(S)

									W/Proj Area 53920	% Share 43	CropArea 23188	
									WO/Proj Area 47200	% Share 37	CropArea 17464	
Item	Price/Unit	Qty WO/Proj	E Value WO/Proj	Qty Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	F Value Yr1	With Yr2	Project Yr3	Yr1:Yr4 Yr4	
INCOME												
Main	300/ton	12.00	3600.00	13.80	14.40	15.00	15.00	4140.00	4320.00	4500.00	4500.00	
By Product												
Fodders												
PROD COST												
NonYield D												
Seed	7/kg	12.00	84.00	5.00	5.00	5.00	5.00	35.00	35.00	35.00	35.00	
Manure	2.6/m3	20.00	52.00	20.00	20.00	20.00	20.00	52.00	52.00	52.00	52.00	
Fertilizer												
N	1.6/kg	60.00	96.00	60.00	60.00	60.00	60.00	96.00	96.00	96.00	96.00	
P2O5	1.5/kg	45.00	67.50	45.00	45.00	45.00	45.00	67.50	67.50	67.50	67.50	
K	1.3/kg	80.00	104.00	80.00	80.00	80.00	80.00	104.00	104.00	104.00	104.00	
Other												
Insectic'd	9.95/liter	5.00	49.75	5.00	5.00	5.00	5.00	49.75	49.75	49.75	49.75	
Fungic'd	30/liter	10.00	300.00	10.00	10.00	10.00	10.00	300.00	300.00	300.00	300.00	
Herbic'd	15/liter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Machinery												
Land Prep	10/hr	3.50	35.00	3.50	3.50	3.50	3.50	35.00	35.00	35.00	35.00	
Spraying	5/hr	25.00	125.00	25.00	25.00	25.00	25.00	125.00	125.00	125.00	125.00	
Irrigat'n	10/hr	30.00	300.00	30.00	30.00	30.00	30.00	300.00	300.00	300.00	300.00	
Animal												
Cultivat'n	10/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Transp'n	5/hr	75.00	375.00	75.00	75.00	75.00	75.00	375.00	375.00	375.00	375.00	
Labor												
Family	1.2/hr	150.00	180.00	150.00	150.00	150.00	150.00	180.00	180.00	180.00	180.00	
Hired	1.2/hr	150.00	180.00	150.00	150.00	150.00	150.00	180.00	180.00	180.00	180.00	
Yield Dep'd												
Machinery												
Threshing	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Winnowin	25/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Animal												
Transp'n	5/hr	7.14	35.70	8.21	8.57	8.93	8.93	41.05	42.85	44.65	44.65	
Labor												
Family	1.2/hr	72.50	87.00	83.38	87.00	90.63	90.63	100.06	104.40	108.76	108.76	
Hired	1.2/hr	72.50	87.00	32.10	87.00	90.63	90.63	38.52	104.40	108.76	108.76	
TOTAL	LE/fed		2157.95					2078.88	2150.90	2161.41	2161.41	
NET INCOME(LE/fed)			1442.05					2061.12	2169.10	2338.59	2338.59	
HARES AREA NET INCME(Mill LE)			25.18								54.22	
GROSS INCOME			62.87								104.34	
PRODUCTION COST			37.69								50.11	

Table I-2-29 Net Financial and Economic Income by Crop

		WO/Proj Crop Share:	47,200	feddan			W/Proj	63,920	feddan											
	Wheat				Beans				L Sersh'm				S Sersh'm			Veg(W)				
	WO	WO	W	W	WO	WO	W	W	WO	WO	W	W	WO	WO	W	W	WO	WO	W	W
Ton/Fed	1.86		2.14	15%	0.84		0.98	17%	22.50		27.00	20%	9.90		11.88	20%	8.00		10.00	25%
Crop:%	36		32		11		12		21		21		17		17		13		16	
Ton	31605		36924	17%	4361		6341	45%	223020		305726	37%	79438		106897	37%	45312		97056	114%
F(E)LE/Fed	-13.21	252.21	151.62	469.11	143.44	59.94	307.01	223.39	476.15	129.19	766.87	368.57	92.35	-65.40	240.49	55.02	2592.43	1585.38	3568.91	2341.86
Year	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE
1	-0.22	4.29	-0.22	4.29	0.74	0.31	0.74	0.31	4.72	1.28	4.72	1.28	0.74	-0.52	0.74	-0.52	14.68	8.98	14.68	8.98
2	-0.22	4.29	-0.22	4.29	0.74	0.31	0.74	0.31	4.72	1.28	4.72	1.28	0.74	-0.52	0.74	-0.52	14.68	8.98	14.68	8.98
3	-0.22	4.29	-0.22	4.29	0.74	0.31	0.74	0.31	4.72	1.28	4.72	1.28	0.74	-0.52	0.74	-0.52	14.68	8.98	14.68	8.98
4	-0.22	4.29	-0.22	4.29	0.74	0.31	0.74	0.31	4.72	1.28	4.72	1.28	0.74	-0.52	0.74	-0.52	14.68	8.98	14.68	8.98
5	-0.22	4.29	-0.22	4.29	0.74	0.31	0.74	0.31	4.72	1.28	4.72	1.28	0.74	-0.52	0.74	-0.52	14.68	8.98	14.68	8.98
6	-0.22	4.29	0.48	5.24	0.74	0.31	1.64	1.18	4.72	1.28	5.74	2.06	0.74	-0.52	5.29	4.08	14.68	8.98	19.72	12.42
7	-0.22	4.29	1.18	6.19	0.74	0.31	1.76	1.27	4.72	1.28	6.76	2.64	0.74	-0.52	5.74	4.42	14.68	8.98	24.76	15.86
8	-0.22	4.29	1.86	7.14	0.74	0.31	1.88	1.36	4.72	1.28	7.76	3.82	0.74	-0.52	6.18	4.77	14.68	8.98	29.80	19.30
9	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
10	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
11	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
12	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
13	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
14	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
15	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
16	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
17	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
18	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
19	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
20	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
21	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
22	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
23	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
24	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
25	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
26	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
27	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
28	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
29	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
30	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
31	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
32	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
33	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
34	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
35	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
36	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
37	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
38	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
39	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
40	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
41	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
42	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
43	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
44	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
45	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
46	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
47	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
48	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
49	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73
50	-0.22	4.29	2.61	8.09	0.74	0.31	1.99	1.45	4.72	1.28	8.90	4.40	0.74	-0.52	2.20	0.50	14.68	8.98	34.83	22.73

Source: Hares Production Survey, 1995
Ton = Crop Area multiplied by Crop Share(%)multiplied by Yield/ton.
Net F(E) Value = Net Income(LE/Fed) without project taken from I-2-20(I-2-20A) to I-2-26(I-2-28A).
Net F(E) Value = Hares Area Net Income(Mill LE) with project taken from last columns, Table I-2-20(I-2-20A) to I-2-26(I-2_28A).

Cotton WO 1.10 17 8826 1439.57	WO 1234.28	W 1.38 17 12650 2122.31	W 25% 43% 1951.39	Maize WO 2.09 36 35513 -256.79	WO -290.48	W 2.40 32 41411 -39.96	W 15% 17% -64.87	Sunflow'r WO 0.75 8 2832 -273.45	WO -238.50	W 0.86 8 3710 -166.53	W 15% 31% -117.50	Veg(S) WO 12.00 37 209568 16.10	WO 1442.05	W 15.00 43 347784 540.64	W 25% 66% 2338.59	Total Crop F Value WO	In E Value WO	Hares F Value W	Area E Value W	Diff in F Value W - WO	Diff in E Value W - WO
F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE	F Mill LE	E Mill LE
11.55	9.90	11.55	9.90	-4.36	-4.94	-4.36	-4.94	-1.03	-0.90	-1.03	-0.90	0.28	25.18	0.28	25.18	27.10	43.58	27.10	43.58	0.00	0.00
11.55	9.90	11.55	9.90	-4.36	-4.94	-4.36	-4.94	-1.03	-0.90	-1.03	-0.90	0.28	25.18	0.28	25.18	27.10	43.58	27.10	43.58	0.00	0.00
11.55	9.90	11.55	9.90	-4.36	-4.94	-4.36	-4.94	-1.03	-0.90	-1.03	-0.90	0.28	25.18	0.28	25.18	27.10	43.58	27.10	43.58	0.00	0.00
11.55	9.90	11.55	9.90	-4.36	-4.94	-4.36	-4.94	-1.03	-0.90	-1.03	-0.90	0.28	25.18	0.28	25.18	27.10	43.58	27.10	43.58	0.00	0.00
11.55	9.90	11.55	9.90	-4.36	-4.94	-4.36	-4.94	-1.03	-0.90	-1.03	-0.90	0.28	25.18	0.28	25.18	27.10	43.58	27.10	43.58	0.00	0.00
11.55	9.90	13.53	11.90	-4.36	-4.94	-3.70	-4.18	-1.03	-0.90	-0.88	-0.80	0.28	25.18	3.35	32.44	27.10	43.58	45.17	64.34	18.07	20.76
11.55	9.90	15.51	13.90	-4.36	-4.94	-3.04	-3.42	-1.03	-0.90	-0.73	-0.70	0.28	25.18	6.42	39.70	27.10	43.58	58.36	80.06	31.26	36.48
11.55	9.90	17.49	15.90	-4.36	-4.94	-2.38	-2.66	-1.03	-0.90	-0.58	-0.60	0.28	25.18	9.49	46.96	27.10	43.58	71.52	95.79	44.42	52.21
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
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11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
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11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74
11.55	9.90	19.45	17.34	-4.36	-4.94	-1.72	-1.90	-1.03	-0.90	-0.72	-0.51	0.28	25.18	12.54	54.22	27.10	43.58	80.08	106.32	52.98	62.74

Table I-2-30 Irrigation System Improvement Costs for Priority Development Area

(unit : '000 LE)

Year	Project Cost 1/			Economic Cost 2/		
	F/C	L/C	Total	F/C	L/C	Total
1998	-	-	-	-	-	-
1999	-	-	-	-	-	-
2000	4,279	2,304	6,583	3,723	2,304	6,027
2001	4,280	2,305	6,585	3,724	2,305	6,029
2002	4,279	2,304	6,583	3,723	2,304	6,027
Total	12,838	6,913	19,751	11,170	6,913	18,083

Note: 1/ : Total project costs are estimated making reference to West Nubariya Agricultural Intensification Project, as shown below:
872 LE/ha(366 LE/fed.) x 22,600 ha = 19,751,000 LE
Foreign and local portions are estimated on the basis of 65 and 36 percent of total cost.

2/ : Economic costs = Project cost x 0.87

Table I-2-31 Estimation of Economic Project Costs for Priority Development Area

(unit : '000 LE)

Year	Hares Area Project Cost 1/ (1)		Priority Develop. Project Cost 2/ (2)		Total Allocation Cost (3)		Allocated Costs for Agric. Sector 3/ (4)=(3)x0.7		Allocated Priority Dev. Project Costs for Agric. Sector (5)=((2)-(3)+(4))x1.1	
	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C
1998	9,546	5,556	6,356	2,748	-	-	-	-	6,992	3,023
1999	905	701	807	319	-	-	-	-	888	351
2000	37,849	25,357	23,387	7,666	10,345	1,843	7,242	1,290	22,312	7,824
2001	44,769	23,144	32,127	10,460	19,058	4,363	13,341	3,054	29,051	10,066
2002	37,537	16,676	41,516	12,617	27,814	6,892	19,470	4,824	36,489	11,604
Total	130,606	71,434	104,193	33,810	57,217	13,098	40,053	9,168	95,732	32,868

Note: 1/ : Project costs mentioned in the above do not include the price escalation cost (see Table H-2-11)
2/ : Project costs exclusive of contingency
3/ : Allocating share for Agricultural sector = Total allocation costs x sharing ratio 0.7
Hares and Abis pumping station discharge = 444 MCM
Omoumu main drain discharge = 843 MCM
Other discharge = 542 MCM
Total =1,829 MCM
Sharing ratio = (444 + 843)/1,829 = 0.70

Year	Allocated Priority Develop. Project Costs for Hares Area 4/ (6)=(5)x0.125			Total Hares Area Project Costs (7)=(1)+(6)			Economic Total Hares Area Project Costs 5/ (8)=F/C of (7) x0.87		
	F/C	L/C	Total	F/C	L/C	Total	F/C	L/C	Total
1998	874	378	1,252	10,420	5,934	16,354	9,065	5,934	14,999
1999	111	44	155	1,016	745	1,761	884	745	1,629
2000	2,789	978	3,767	40,638	26,335	66,973	35,355	26,335	61,690
2001	3,631	1,258	4,889	48,400	24,402	72,802	42,108	24,402	66,510
2002	4,561	1,451	6,012	42,098	18,127	60,225	36,625	18,127	54,752
Total	11,966	4,109	16,075	142,572	75,543	218,115	124,037	75,543	199,580

Note: 4/ : Allocated costs for Hares area = (5) x Hares area ratio of 0.125 (22,600 ha/180,710 ha)
5/ : Economic project costs = Project costs for foreign currency portions x Standard Conversion Factor (SCF) of 0.87

Table I-2-32 Operation and Maintenance Cost for Priority Development Area

(unit : '000 LE)

Description	Financial O & M Costs		Economic O & M Costs		
	Priority Dev. Area (Hares Area) (1)	Priority Dev. Project (2)	Priority Dev. Area (3)	Priority Dev. Project Allocat. Cost for Agri. Sector and Hares Area 2/ (4)	Total (5) = (3) + (4)
Salary and wage	451.2	230.8	451.2	20.2	471.4
Administration and general expenditure	45.1	23.1	45.1	2.0	47.1
Pump operation costs	291.9	779.3	291.9	68.2	360.1
Equipment repair and maintenance costs	611.5	368.0	532.0 1/	28.0	560.0
Fuel costs	28.7	9.6	9.6	0.8	10.4
Drain maintenance costs	420.6	402.2	365.9 1/	35.2	401.1
Office maintenance costs	20.1	20.1	20.1	1.8	21.9
Total	1,869.1	1,833.1	1,715.8	156.2	1,872.0

Note; 1/ : Economic O & M costs = equipment repair and maintenance costs x 0.87
2/ : Economic O & M costs = O & M costs for priority development project x 0.125 x 0.70

Table I-2-33 Replacement Costs for Priority Development Area

(unit: '000 LE)

Description	Financial Replacement Costs		Economic Replacement Costs		
	Priority Dev. Area (Hares Area) (1)	Priority Dev. Project (2)	Priority Dev. Area 1/ (3)	Priority Dev. Project Allocat. Cost for Agri. Sector and Hares Area 2/ (4)	Total (5) = (3) + (4)
Pump equipment	25,500 (year: 2022)	29,071 (year: 2008) 40,700 (year: 2022) 29,071 (year: 2033)	22,185 (year: 2022)	2,213 (year: 2008) 3,098 (year: 2022) 2,213 (year: 2033)	
Gate equipment		3,276 (year: 2022)		249 (year: 2022)	
Total	25,500	102,118	22,185	7,773	29,958

Note: 1/ : Economic replacement costs = Financial replacement costs x 0.87
2/ : Economic replacement costs = Replacement costs for priority development project x 0.125 x 0.70 x 0.87

Table I-2-34 Internal Rate of Return

	Assumed Area	at 6th Yr and Full Benefits at 9th Yr and thereafter						FIRR	EIRR
NetBenefits Accrue 6th to 9th Yr	Diff W - WO F Value	Diff W - WO E Value	ProjCost	O&M	PumpRepl &GateCost	Nubar'ya Irrigat'n	Flood Reduct'n Benefits	0.1641	0.1853
	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE
1	0.00	0.00	14.99	1.87			1.65	-15.21	-15.21
2	0.00	0.00	1.63	1.87			1.65	-1.85	-1.85
3	0.00	0.00	61.69	1.87		6.03	1.65	-67.94	-67.94
4	0.00	0.00	66.51	1.87		3.03	1.65	-72.76	-72.76
5	0.00	0.00	54.75	1.87		6.03	1.65	-61.00	-61.00
6	18.07	20.76		1.87			1.65	17.85	20.54
7	31.26	36.48		1.87			1.65	31.04	36.26
8	44.42	52.21		1.87			1.65	44.20	51.99
9	52.98	62.74		1.87			1.65	52.76	62.52
10	52.98	62.74		1.87			1.65	52.76	62.52
11	52.98	62.74		1.87	2.21		1.65	50.55	60.31
12	52.98	62.74		1.87			1.65	52.76	62.52
13	52.98	62.74		1.87			1.65	52.76	62.52
14	52.98	62.74		1.87			1.65	52.76	62.52
15	52.98	62.74		1.87			1.65	52.76	62.52
16	52.98	62.74		1.87			1.65	52.76	62.52
17	52.98	62.74		1.87			1.65	52.76	62.52
18	52.98	62.74		1.87			1.65	52.76	62.52
19	52.98	62.74		1.87			1.65	52.76	62.52
20	52.98	62.74		1.87			1.65	52.76	62.52
21	52.98	62.74		1.87			1.65	52.76	62.52
22	52.98	62.74		1.87			1.65	52.76	62.52
23	52.98	62.74		1.87			1.65	52.76	62.52
24	52.98	62.74		1.87			1.65	52.76	62.52
25	52.98	62.74		1.87	3.35		1.65	49.41	59.17
26	52.98	62.74		1.87			1.65	52.76	62.52
27	52.98	62.74		1.87			1.65	52.76	62.52
28	52.98	62.74		1.87			1.65	52.76	62.52
29	52.98	62.74		1.87			1.65	52.76	62.52
30	52.98	62.74		1.87			1.65	52.76	62.52
31	52.98	62.74		1.87			1.65	52.76	62.52
32	52.98	62.74		1.87			1.65	52.76	62.52
33	52.98	62.74		1.87			1.65	52.76	62.52
34	52.98	62.74		1.87			1.65	52.76	62.52
35	52.98	62.74		1.87			1.65	52.76	62.52
36	52.98	62.74		1.87	2.21		1.65	50.55	60.31
37	52.98	62.74		1.87			1.65	52.76	62.52
38	52.98	62.74		1.87			1.65	52.76	62.52
39	52.98	62.74		1.87			1.65	52.76	62.52
40	52.98	62.74		1.87			1.65	52.76	62.52
41	52.98	62.74		1.87			1.65	52.76	62.52
42	52.98	62.74		1.87			1.65	52.76	62.52
43	52.98	62.74		1.87			1.65	52.76	62.52
44	52.98	62.74		1.87			1.65	52.76	62.52
45	52.98	62.74		1.87			1.65	52.76	62.52
46	52.98	62.74		1.87			1.65	52.76	62.52
47	52.98	62.74		1.87			1.65	52.76	62.52
48	52.98	62.74		1.87			1.65	52.76	62.52
49	52.98	62.74		1.87			1.65	52.76	62.52
50	52.98	62.74		1.87			1.65	52.76	62.52

Sensitivity Analysis

20%BenDn F Value	20%BenDn E Value	20%BenDn FIRR	20%BenDn EIRR	2Yr Delay F Value	2Yr Delay E Value	2Yr Delay FIRR	2Yr Delay EIRR	20%CostUp F Value	20%CostUp E Value	20%CostUp FIRR	20%CostUp EIRR	F NPV Dis=12%	E NPV Dis=12%
		0.1383	0.1571			0.1349	0.1504			0.1412	0.1604		
												218.02	257.48
Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE	Mill LE
0.00	0.00	-15.21	-15.21	0.00	0.00	-15.21	-15.21	20.23	20.23	-18.58	-18.58	0.00	0.00
0.00	0.00	-1.85	-1.85	0.00	0.00	-1.85	-1.85	4.20	4.20	-2.55	-2.55	0.00	0.00
0.00	0.00	-67.94	-67.94	0.00	0.00	-67.94	-67.94	83.51	83.51	-81.86	-81.86	0.00	0.00
0.00	0.00	-72.76	-72.76	0.00	0.00	-72.76	-72.76	89.29	89.29	-87.64	-87.64	0.00	0.00
0.00	0.00	-61.00	-61.00	0.00	0.00	-61.00	-61.00	75.18	75.18	-73.53	-73.53	0.00	0.00
14.48	16.61	14.24	16.39	0.00	0.00	-0.22	-0.22	2.24	2.24	17.48	20.17	18.07	20.76
25.01	29.18	24.79	28.96	0.00	0.00	-0.22	-0.22	2.24	2.24	30.67	35.89	31.28	36.48
35.54	41.77	35.32	41.55	18.07	20.76	17.85	20.54	2.24	2.24	43.83	51.62	44.42	52.21
42.38	50.19	42.16	49.97	31.28	36.48	31.04	36.26	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	44.42	52.21	44.20	51.99	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	39.95	47.76	52.98	62.74	50.55	60.31	4.90	4.90	49.73	59.49	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	38.81	46.62	52.98	62.74	49.41	59.17	6.26	6.26	48.37	58.13	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.08	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	39.95	47.76	52.98	62.74	50.55	60.31	4.90	4.90	49.73	59.49	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74
42.38	50.19	42.16	49.97	52.98	62.74	52.76	62.52	2.24	2.24	52.39	62.15	52.98	62.74

Table I-2-35 Farm Budget Production Model in Hares Area

Based orTable I-2-20 thru I-2-28

Crop	Without Crop Fed	NetIncome LE/Fed	Project F Value LE	With Crop Fed	NetIncome LE/Fed	Project F Value LE	Diff F Value LE
Wheat	1.08	-13	-14	0.96	152	145	160
Bean	0.33	143	47	0.36	307	111	63
L Bersh'm	0.63	476	300	0.63	786	495	195
S Bersh'm	0.51	92	47	0.51	240	123	76
Cotton	0.51	1440	734	0.51	2122	1082	348
Sunflower	0.24	-273	-66	2.40	-167	-400	-334
Maize	1.08	-257	-277	0.96	-100	-96	181
Veg(W)	0.36	2592	933	0.54	3589	1938	1005
Veg(S)	1.11	16	18	1.29	541	697	680
Citrus	0.00	0	0	0.00	0	0	0
Total	5.85		1723			4096	2373
Total Land	3.00		1723			4096	2373
	4.2		2412			5734	3323
Crop Int'ty	195.00%						
Family	7						
Adult	4						
Children	3						
H:/Day	8						
Econ Rent	1800						
OwnerCash	for 3 feddan		1723			4096	
TenantCash	for 3 feddan		-77			2296	

F Value=Feddan*net income of Crop Production Model
where Feddan follows the same cropping patterns
in Hares area, 1995, as indicated in column 2,
Wheat:36, Beans:11,L Bersh'm:21,S Bersh'm:17
Veg(W):12, Cotton:17,Maize:36,Sunflower:8,Veg(S):37

Future Cropping Patters:
Wheat:32,Beans:12,L Bersheem:21,S Bersheem:17,Veg(W),18
Cotton:,17, Maize:32,Sunflower:8,Veg(S):43

Net income wo/project was taken from net income corresponding to F Value WO/Proj while net income W/Project was from the last colum Yr4 with project, Tables I-2-20 thru I-2-28

Table I-2-36 Summary of Costs and Benefits

1. Crop Area : Present to Future	47,190 to 53,920 Feddan		
2. Population: Present	104,000		
3. Net Crop Yields:	Year 1		Year 9-50
F Value(Mill LE)	0		52.98
E Value(Mill LE)	0		62.74
4. Farm Budget(3 feddan)	WO/Proj	W/Proj	Diff
F Value(LE)	1,723	4,096	2,373
5. Other Benefits:	Extension Service Marketing Service Environment Quality Improvement		
5. NPV of Crop Yields @Dis=12%:		F Value	E Value
Benefits accrue Year 6 Full Benefits Year 9-50(Mill LE) (Table I-2-34)		218.02	257.46
6. Internal Rate of Return(%)		FIRR	EIRR
		16.41	18.53
7. Sensitivity(Nubariya Included)			
Benefits 20% Down		13.83	15.71
2 Year Delay		13.49	15.04
Project Cost 20% Up		14.12	16.04

Notes:
Social Discount Rate = 12%.
Standard Conversion Factor of Foreign Portion of Project Costs = 0.87
Net Crop Value = (Yield/fed)*(Difference in Value between W/Proj and WO/Proj)* F(E) Value, Table I-2-34
3. Last two columns of Diff in F Value(E Value), Table I-2-29
4. Table I-2-35, Farm Budget Production Model in Hares
5. Last two columns of Net PV, Table I-2-34
6. FIRR,EIRR of Table I-2-34
7. Sensitivity Analysis of Table I-2-34