Table N-1 ESTIMATION OF WORKABLE DAYS

The state of the s												Unit:	day)
Item	Jan.	Feb.	Mar. Apr.	Apr.	Мау	Jun. Jul.	Jul.	Aug.	Sep.	Sep. Oct. Nov.	Nov.	Dec.	Total
I. Monthly day	31	28	31	30	31	30	31	3.1	30	31	30	31	365
2. Frequency of rainfall $\frac{1}{1}$.			:				
0 - 10 mm	H	α,	н	7	7	7	7	Ø	7	7	0	H	6
10 - 30 mm	ન	H	~	m	4	7	4	4	i.	7	7	H	36
30 - 50 mm	П	7	Н	н	7		0	⊣	H	α	0	H	12
more than 50 mm	r-I	0	0	71	Н	0	O	0	~ 1	ਜ	0	н.	7
3. Time length to be suspended	o	ഥ	m	임	ס	⊣	Ŋ	4	ω	7	H	ø	99
4. Workable days	. W	23	28	20	22	29	29	27	22	20	29	25	299
		· .i											

Averaged data from 1979 to 1983 at Lacovia rainfall station. Remarks: 1/: A

Table N-2 SUMMARY OF INITIAL INVESTMENT COST

		<u> </u>	(Unit:	US\$10 ³)
	Item	Foreign Currency	Local Currency	Total
T	Construction Cost			
Ι.	Construction Cost			
	1.1 Direct Construction Cost			
	Holland Area	2,460	1,570	4,030
	Black River Left Bank Area	5,060	2,390	7,450
	Broad River Right Bank Area	3,840	1,770	5,610
	Broad River Left Bank Area	3,870	1,910	5,780
	Office & Quarters	720	780	1,500
11.	Observation Wells	50	20	70
	Conservation of Environment	100	100	200
	<u>Sub-total</u>	16,100	8,540	24,640
	1.2 O&M Equipment	830	0	830
	1.3 General Expense	. 0	650	650 ¹
100	1.4 Land Acquisition	0	730	730
	1.5 Engineering Service	2,930	1,110	4,040
	Sub-total	19,860	11,030	30,840
	1.6 Physical Contingency	1,990	1,100	3,080
	Sub-total	21,850	12,130	33,980
			<u>,</u>	
	1.7 Price Contingency	4,370	5 ,0 90	9,460
	<u>Sub-total</u>	26,220	17,220	43,440
II.	Farm Guidance Service	2,790	180	2,970
III.	Farm Machinery (see Annex G)	7,470	440	7,910
IV.	Total (I + II)	36,480	17,840	54,320
v.	Post Harvest Facility (see Annex G)	10,830	860	11,690
VI.	Social Infrastructures (see Annex F)	_	5,610	5,610
VII.	Grand Total (IV + V + VI)	47,310	24,310	71,620

Including environmental monitoring cost. Remarks:

 $[\]frac{1}{2}$: Including cost for investigation and computer model simulation analysis of post project ground water inflow.

Table N-3 ANNUAL DISBURSEMENT SCHEDULE

	- 1											(Unit:		US\$103)
8 0 0 1 L	1st Ye	Year	2nd v	Year	3rd Y	ear	4th Y	Year	Sth Y	ear	6th Y	Year	7th Year	ar
			ų C	i U	L O	Ľ.C.	ь. С	L.C.	ن د د	i O	F.C	ن. ن	F.C.	
									-					
I. Construction					:	=								
1.1 Direct Construction Cost			. 4.								· .			
Holland Area	0	0	586	384	1.287	682	587	502	0	0	0	0	0	Ó
Black River Left Bank Area	0	Ö	666	340	2.259	901	1,414	854	390	290	0	0	0	0
Broad River Right Bank Area	0	0	0	O	0	346		546	973	450	610	429	0	0
Broad River Left Bank Area	Ó	0	0	0	829	232	1,293	605	1,039	200	708	569	0	0
Office & Quarters	0	0	720	780	0	0	0	0	0	0	0	0	0	0
Chservation Wells	0	0	54	23	0	0	0	0	O	0	0	0	0	0
Conservation of Environment	0	0	2	50	20	20	20	50	50	20	20	20	0	0
Sub-total	이	0	2,379	1,547	5,402	2,181	4,563	2,527	2,422	1,260	1,338	1,018	o	0
1.2 O & M Equipment	0	0	0	0	0	0	430	0	0	0	400	0	0	0
1.3 General Expense	0	58	0	106	0	114	0	123	0	123	0	123	O.	0
1.4 Land Acquisition	0	360	0	370	0	0	0	0	0	0	0	O	0	0
1.5 Engineering Services	580	220	470	780	470	180	470	180	470	180	470	172	0	0
Sub-total	580	638	2,849	2,203	5,872	2,475	5,463	2,830	2,892	1,563	2,208	1,313	이	이
1.6 Physical Contingency	28	64	285	220	587	248	546	283	289	156	221	131	٥.	0
Sub-total	638	702	3,134	2,423	6,459	2, 723	6,000	3,113	3,181	1,719	2,429	1,444	<u></u>	이
1.7 Price Contingency	32	70	321	509	1,018	106	1,295	1,445	879	1,050	826	1,114	0	٥
Sub-total	670	772	3,455	2,932	7,477	3,624	7,304	4,558	4,060	2,769	3,255	2,558	이	0
II. Farm Guidance Service	0	O	o	0	509	9	535	33	562		290	o M	596	49
III. Farm Machinery	0	. 0	1,565	220	2,007	110	Ö	6	3,895) [] }	0	8	0	0
IV. Grand Dotal	670	772	5,020	3,152	6,993	3,763	7,839	4,590	8,517	2,917	3,845	2,598	596	49

Remarks: F.C.: Foreign Currency
L.C.: Local Currency

ble N-4 DIRECT CONSTRUCTION COST OF EACH AREA

					a C	леторше	Development Area				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
						1	acovia	Pump U	Lacovia Pump Up System	1				100	
Work Item	K.S. Hol	x.s. incake system Holland Area	ង ក ព	Bla Left	Black River Left Bank Area	ਮ ਰ	Brc	Broad River Right Bank Area	er Area	Left	Broad River ft Bank Area	16.8 16.8		Tora	
	i.	L.C. Total	Total	F.C.	L.C.	Total	F.C.	: C	Total		L.C.	Total	P.C.	J.C.	Total
Dranaratory works	120	7.8	861	249	1.15	364	184	97	281	185	96	281	738	386	1.124
) () ()	3 (1			ç						,	
2. Dike	თ დ ლ	Ö,	419	323	ဝှ	2/2	178	73		213	97	239	1,083	149	1,232
3. Drainage Pump Station	765	205	970	1,186	315	1,501	926	260	1,236	773	208	981	3,700	886	4,688
4. Drainage Canal	54	88	92	1,090	164	1,254	. 667	89	735	738	82	820	2,549	352	2,901
5. Catch Drain		1	(1) (2)		i	1	67	37	104	174	73	247	241	110	351
6. Intake Weir	30	9	06	ŀ	1	1	1	1	ı	1		1	30	60	8
7. Irrigation Pump Station		1	1	256	74	330	260	75	335	260	7 5	335	776	224	1,000
8. Irrigation Canal	271	529	800	376	969	972	231	318	549	208	449	657	1,086	1,892	2,978
9. Farm Road	204	81	205	292	10.5	397	236	16	327	240	06	330	972	367	1,339
10. On-Farm-Development	647	527	1,174	1,290	996	2,256	1,040	802	1,842	1,078	807	1,805	4,055	3,102	7,157
II. Office & Quarters	1		ŀ	1	t	ı	L	t	1	- 1	1	. 1	720	780	1,500
12. Observation Wells			1	ı	1	1,	1	. 1	1	t	i	1,	54	33	77
13. Conservation of Environment	1	1	ı	t .	1	ı	1	i	ı	1	ì	1	100	100	200
	·									٠					
Total	2,460	2.460 1.568 4.028	4.028	690	i c	7 447	0,00	177.1	יו ער	. Q	1 906	5 775	16.104	5773	74.647

Remarks: F.C.: Foreign Currency L.C.: Local Currency

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Table N-5 BREAKDOWN OF DIRECT CONSTRUCTION
COST FOR THE HOLLAND AREA

				Foreign	nit: US\$) Local
	Item	Unit	Q'ty		Currency
1.	Preparatory Works	L.S.		120,000	78,000
2	Dike				
2.1	Black river right dike (1.9 km)			77,000	12,000
	Embankment (Clay)	m ³	47,000	26,000	2,500
	Excavation and embankment (Clay) m3	25,000	51,000	4,500
	Slope tamping	m2	18,800	Ô	5,000
2.2	Holland east dike (2.9 km)			60,000	8,000
	Excavation and embankment	_m 3	29,000	60,000	5,000
	Slope tamping	m ²	10,500	0	3,000
2.3	Holland west dike (2.4 km)			17,000	3,000
	Embankment (Clay)	_m 3	3,900	2,000	200
	Excavation and embankment (Clay) m ³	7,300	15,000	1,500
	Slope tamping	m2	5,600	0	1,300
2.4	Y.S. river bank (Improvement) (1	.6 km)		11,000	2,000
	Excavation and embankment	m3	5,400	11,000	1,000
	Slope tamping	m2	2,900	O .	1,000
2.5	Black river short cut (0.5 km)		n i sakhi pila tahu Tahungan sa		
	Excavation and hauling	m3	33,000	201,000	<u>19,000</u>
2,6	Miscellanous works	L.S.		3,000	6,000
	Sub-total (2.1 - 2.6)			<u>369,000</u>	50,000
7	Drainage Pump Station				
3.	Approach road	m	300	1,500	500
	Excavation	m3	1,200	1,500	1,000
	Backfill	m3	300	500	500
	Reinforced concrete	m3	360	16,000	29,000
	Plain concrete	m3	50	500	3,000
	Form and scaffoldings	L.S.		500	12,500
	Pump control house	m ²	60	0	30,000
	Related facilities	L.S.		1,000	200
	Pump equipment (\$800)	set	3	742,000	128,000
	Miscellaneous works	L.S.		1,500	300
	Sub-total			765,000	205,000
4	Drainage Canal (8.9 km)				
	Excavation, peat soil		30,000	53,000	5,000
	Slope tamping	m3	28,000	0	7,000
	Drainage culvert Type I	nos.	1	100	4,000
	Drainage culvert Type III	nos.	6	400	21,000
	Miscellaneous	L.S.		500	1,000
	Sub-total			54,000	38,000

- to be continued -

	경기를 받는 사람이 없는 그 없는데 없다면 다.			$f^{(n)} = \frac{1}{n} \left(\frac{1}{n} \cdot \frac{1}{n} \right)$	
				(Ui	nit: US\$)
داد کینید	Item	Unit	Q'ty	Foreign Currency	Local Currency
5.	Intake Weir		4.5		
٠.	Excavation	- 3	1 000	0 505	
	Embankment	m3 m3	1,900	2,500	400
	-Gabion	m ³	100 740	100 3,700	1.00
	Demolition of existing weir	m3	80	3,700	6,000 4,500
	Reinforcement concrete	m ³	450	21,000	41,500
1933	Metal works	kg	3,000	1,800	2,300
	Miscellaneous works	L.S.	3,000	900	5,200
	Sub-total			30,000	60,000
6.	Irrigation Canal				
6.1	Holland main canal (3,2 km)		11.5	45,000	147,000
	Excavation	m ³	1,000	1,000	100
	Embankment	m3	18,700	16,000	1,000
机图数	Slope tamping	m ²	16,000	0	4,000
1940	Concrete lining	m ³	1,600	20,000	99,000
	Sod facing	m ²	6,300	0	12,000
	Related structures				
	- Turnout	nos.	3	1,000	2,000
	- Culvert	nos.	7	3,000	14,000
	- Checkgate	nos.	2	1,000	8,000
	- Spillway	nos.	- 2	500	4,000
	- Cross drain	nos.	5	100	500
	Miscellaneous works	L.S.		2,400	2,400
6.2	Secondary and sub-secondary canal	(11.1		226,000	382,000
	Excavation	m ³	3,500	4,000	500
	Embankment	m ³	30,900	27,000	2,000
	Embankment (Dump truck 500 m)	m ³	30,800	125,000	13,000
	Slope tamping	m ²	30,000	0	8,000
	Concrete lining	m3	3,000	37,000	183,000
	Sod facing Related structures	m ²	43,000	0	81,000
	- Turnout	nos.	11	10,000	17,000
	- Culvert	nos.	37	12,000	58,000
	- Spillwây	nos.	4	1,000	7,000
i Lista de la c	- Checkgate	nos.	7	1,000	1,500
	- Drop	nos.	5	1,000	4,000
	Miscellaneous works	L.S.		8,000	7,000
	Sub-total (6.1 and 6.2)			271,000	529,000
7.	Farm Road				
7.1	Main farm road (9.0 km)			85,000	34,000
•	Pavement 10ad (9.0 km)	m3	16,000	78,000	32,000
	Excavation (Clay)	m3	3,900	3,000	300
	Embankment (Clay)	m3	3,900	3,000	100
	Slope tamping	m2	1,600	0	400
			_,		

⁻ to be continued - N - 17

				Foreign	nit: US\$) Local
	Item	Unit	Q'ty	Currency	Currency
	2 (10 4)····			119,000	47,000
. 2	Secondary farm road (19.4 km)	_m 3	19,000	92,000	38,000
r .	Pavement	ա3	2,800	2,500	300
	Embankment (Peat)	m ³	15,000	13,000	1,000
÷	Embankment (Clay)	m ³		6,500	200
	Excavation (Clay)	m ²	9,100	0,500	3,000
	Slope tamping	and the state of t	13,000	500	3,000
	Road passing	nos.	1	4,500	1,500
	Miscellaneous works	L.S.		그 아는 그렇게 없었다.	
	Sub-total (7.1 and 7.2)			204,000	81,000
	Land Reclamation (560 ha)				
1	Irrigation facilities			76,000	237,000
	Soil cement	m ³	3,600	50,000	122,000
	Excavation	_m 3	7,400	0	45,000
	Embankment	ε _m 3	18,700	13,000	
	Slope tamping	m ²	183,000	0	5,000
	Related structure				
	- Culvert	nos.	28	4,000	25,000
	- Division box	nos.	140	12,000	39,000
2	Drainage facilities			131,000	60,000
_	Excavation	m ³	7,300	9,000	1,000
	Slope tamping	m ²	16,000	0	4,000
	Farm drain	km	120	115,000	7,000
	Culvert	nos.	28	7,000	48,000
3	Farm road			128,000	84,000
,	Embankment	_m 3	51,000	36,000	1,700
	Slope tamping	m ²	61,000	0	16,000
	Marl pavement	m3	17,000	82,200	34,000
	Tractor passage (with Flume)	nos.	140	9,500	32,000
	Tractor passage (with finite)	nos.	420	300	300
		11.00			
4	Land grading		200	802,000	140,000
	Land clearing (Pasture)	ha 3	280	124 666	102,000
	Land grading (Clay)	_m 3	134,000	124,000	5,000
	Ripping	ha	560	178,000	8,000
	Levee	ha	560	0	25,000
5	Miscellaneous works	L.S.		10,000	6,000
	Sub-total (8.1 - 8.5)			647,000	527,000

Table N-6 BREAKDOWN OF DIRECT CONSTRUCTION COST FOR THE BLACK RIVER LEFT BANK AREA

				(U 1)	nit: US\$)
	Item	Unit	Q'ty	Foreign	Local
	A COM	0111.0	y cy	Currency	Currency
1.	Preparatory Works	L.S.		249,000	115,000
2.	Dike (8.7 km)				
	Excavation and embankment (Clay)	m ³	117,000	230,000	21,000
18 3	Embankment (Clay)	_m 3	70,000	40,000	3,000
	Embankment (Peat)	m ³	46,000	40,000	3,000
100	Sodding	m^2	61,800	0	16,000
14 A.	Miscellaneous works	L.S.		13,000	8,000
	<u>Sub-total</u>			323,000	50,000
		-			
3.	Drainage Pump Station			to the second	
	Approach road	m	1,000	5,000	2,000
	Excavation	_m 3	2,000	1,500	500
	Backfill	m ³	350	500	500
	Reinforced concrete	m3	500	24,000	42,500
	Plain concrete	_m 3	100	1,000	4,000
· ·	Form and scaffoldings	L.S.		1,000	20,000
	Pump control house	m ²	60	0	30,000
14 (4)	Related facilities	L.S.		1,500	500
147	Pump equipment (\$800)	set	5	1,150,000	214,000
	Miscellaneous works	L.S.		1,500	1,000
	Sub-total			1,186,000	315,000
4	Drainage Canal (13.6 km)				
4.	Excavation (Clay)	m3	104,000	181,000	16,000
	Excavation (Clay) Excavation (Peat)	m3	193,000	890,000	50,000
	Excavation (Peat) Excavation (Limestone)	m3	1,350	2,000	.100
		m ²	75,000	2,000	19,000
	Sodding (Clay)	m ²	118,000		30,000
	Sodding (Peat)	-	118,000	0 200	15,000
	Drainage culvert Type I	nos.			5,000
* 11	Drainage culvert Type II	nos.	1 6	100 400	26,000
	Drainage culvert Type III	nos.	Ð		2,900
	Miscellanous works	L.S.		16,300	2,900
	Sub-total			1,090,000	164,000

					nit: US\$)
	Item	Unit	Q'ty	Foreign Currency	Local Currency
	Lacovia Irrigation Pump Station				
5.	Approach road	m	500	2,500	1,000
	Excavation	m3	2,100	2,300	1,400
	Backfill	_m 3	400	400	200
	Reinforced concrete	m3	500	23,000	40,000
٠.	Plain concrete	m3	100	600	3,000
	Form and scaffoldings	L.S.		800	18,000
	Pump control house	m2	60	1,400	31,000
	Related facilities	L.S.		800	300
	Pump equipment (\$700)	set	4	743,000	128,000
	Miscellaneous works	L.S.		1,200	1,100
	Sub-total			776,000	224,000
•	Allocation for Black River Left	Bank Are	<u>ea</u>	256,000	74,000
	Allocation for Broad River Right	Bank Ar	rea	260,000	75,000
	Allocation for Broad River Left	Bank Are	ea.	260,000	75,000
6,	Irrigation Canal				
5.1	Slipe main canal (5.2 km)				
	Excavation	m ³	18,000	21,000	1,000
	Embankment (with Backhoe)	m3	10,000	21,000	1,000
	Embankment (Dump Truck 2,000 m)	m ³	49,000	228,000	26,000
	Slope tamping	m ²	29,000	0	7,000
	Concrete lining	ε_{m}	3,000	36,000	180,000
	Sod facing	m ²	23,000	0	44,000
	Related structures		3,0	12 000	21,000
	- Turnout	nos.	16 6	13,000 4,000	21,000
	- Culvert - Checkqate	nos.	6	23,000	21,000
	- Checkgace - Spillway	nos.	5	1,000	9,000
	- Spillway - Drop	nos.	1	500	1,000
	Miscellaneous works	L.S.	•	7,500	5,000
	Total	J.J.		355,000	337,000
-	Allocation for Black River Left	Bank Are	a	214,000	203,000
	Allocation for Broad River Right	100		141,000	134,000
2 0				162 000	303 000
6.2	Secondary and sub-secondary cana Excavation	1 (12.3 m3	8,000	$\frac{162,000}{10,000}$	393,000 1,000
	Embankment (with Backhoe)	m3	36,000	76,000	5,000
•	Slope tamping	m ²	36,000	0	9,000
	Concrete lining	m ³	4,000	44,000	223,000
	Sod facing	m ²	30,000	0	56,000
•	Related structures - Turnout	nos.	25	16,000	43,000
	- Culvert	nos.	12	7,000	35,000
	- Spillway	nos.	5	1,000	9,000
	- Checkgate	nos.	13	1,000	2,000
	- Drop	nos.	3	1,000	3,000
	Miscellaneous works	L.S.		6,000	7,000
	Sub-total (6.1 and 6.2)			376,000	596,000

⁻ to be continued -

				(1	Unit: U
. <u> </u>	Item	Unit	Q'ty	Foreign Currency	Loca. Curre
7.	Farm Road	:			
7.1	Main farm road (7.1 km)	;		97,000	24 (
	Pavement	m ³	13,000	63,000	$\frac{34}{26}$,
	Embankment (Clay)	m3	31,000	27,000	20,
ş .	Slope tamping	m2	13,000	0	3,
	Miscellaneous works	L.S.		6,000	2,
7 2	Secondary farm road (26.5 km)				
7.2	Pavement	_m 3	07.000	195,000	$\frac{71}{2}$
	Embankment (Peat)		27,000	131,000	54,0
	Embankment (Clay)	m3	16,000	13,500	1,
	Slope tamping	m3	47,000	41,500	3,0
	Miscellaneous works	m2	35,000	0	9,0
	MISCELLARIEOUS WOLKS	L.S.		9,000	3,
	Sub-total (7.1 and 7.2)			292,000	105,0
8.	Land Reclamation (920 ha)				
8.1	Irrigation facilities	*		116,000	509,0
	Soil cement	m3	6,500	70,000	$\frac{337}{217}$
1. J.	Excavation	- m3	8,800	0	54,0
	Embankment	m3	27,500	19,500	1,5
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Slope tamping	m2	43,500	0	11,
	Related structure		,		,
	- Culvert	nos.	46	8,000	57,5
	- Division box	nos.	230	18,500	167,6
8.2	Drainage facilities	•		316,000	105,0
	Excavation	m ³	12,000	22,000	2,0
	Slope tamping	m ²	26,000	0	7,0
	Farm drain	km	200	283,000	24,0
	Culvert	nos.	46	11,000	72,0
0.3					-
8.3	Farm road	2	700 000	249,000	123,0
	Embankment	m ³	192,000	130,000	10,0
	Slope tamping	m ²	100,000	0	26,0
	Marl pavement	_{In} 3	24,000	117,300	48,5
	Tractor passage (with Flume)	nos.	165	1,200	38,3
	Tractor passage	nos.	570	500	2
8.4	Land grading			584,000	213,0
19 35	Land clearing - Grass -	ha	460	0	143,0
+ , 5	Land grading	m3	190,000	217,000	13,0
	Ripping	ha	920	367,000	16,0
	Levee	ha	920	0	41,0
8.5	Miscellaneous works	L.S.		16,000	16,0
	Sub-total (8.1 - 8.5)	* **		1,290,000	966,0
	. The second sec				

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Table N-7 BREAKDOWN OF DIRECT CONSTRUCTION COST
FOR THE BROAD RIVER RIGHT BANK AREA

(Unit: USS)

				Foreign	nit: US\$. Local
:	Item	Unit	Q'ty	Currency	Currency
L •	Preparatory Works	L.S.		184,000	97,000
2.	Dike (5.5 km)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
•	Excavation and embankment (Peat)	m ³	27,000	128,000	8,000
-	Embankment (Peat)	m3	55,000	48,000	4,00
	Sodding	m2	20,000	Ö	5,00
	Miscellaneous works	L.S.		2,000	6,00
	Sub-total			178,000	23,00
	Drainage Pump Station				
	Approach road	m	200	1,000	40
	Excavation	m3	1,400	4,000	2,80
	Backfill	m3	300	300	20
	Reinforced concrete	m3	450	20,000	35,00
	Plain concrete	m3	50	600	3,00
-	Form and scaffoldings	L.S.		500	16,00
	Pump control house	m ²	60	0.	30,00
	Related facilities	L.S.		700	70
	Pump equipment (\$\delta 800)	set	4	948,000	171,00
	Miscellaneous works	L.S.		900	90
	<u>Sub-total</u>			976,000	260,00
	Daniel (7, O lem)				
	Drainage Canal (7.0 km)	m3	142,000	655,000	57,00
•	Excavation (Peat) Drainage culvert Type III	nos.	2	200	10,50
	Miscellaneous	L.S.	Z	11,800	50 50
•		ш.о.			
	Sub-total			667,000	68,000
	Cotton Daniel (A. O. Ing.)				
	Catch Drain (4.0 km)	3	42.000	51,700	3 00
	Excavation	Em.	42,000		3,00
	Embankment	m2	8,000 4,200	4,500	500
	Ripping	III.Z	4,200	7,300	30
	Related structures - Culvert Type I	noo	2	400	12,000
-	- Culvert Type II	nos. nos.	1	200	3,500
	- Drain culvert Type I	nos.	וֹ	2,000	16,500
	Miscellaneous works	L.S.	.	900	10,30
		2,0,			
	Sub-total			67,000	37,000
	and the control of th			나는 사는 사가를 하다.	

⁻ to be continued -

					nit: US\$
	Item	Unit	Q'ty	Foreign	Local
				Currency	Currenc
7.	Irrigation Canal				
	TITAYA CAOIF CARAT				
7.1	Mountainside main canal (8.8 km)				
	Excavation	m ³	10,000	13,000	90
	Embankment	$\epsilon_{ m m}$	34,000	30,000	2,00
	Embankment (Dump truck 1,000 m)	_m 3	18,000	77,000	8,00
	Slope tamping	m^2	42,000	0	11,00
11.	Concrete lining	ε _m 3	4,000	52,000	260,00
	Sod facing	m^2	24,000	0	44,00
	Related structures				, .
	- Turnout	nos.	13	8,000	13,00
	- Culvert	nos.	6	4,000	27,00
	- Checkgate	nos.	. 6	22,000	20,00
n,	- Spillway	nos.	2	500	4,00
	- Cross drain	nos.	. 3	700	4,00
	Miscellaneous works	L.S.		7,800	7,10
	Total			215,000	401,00
	Allocation for Broad River Right 1	Bank Ar	ea	43,000	80,00
14) 434]	Allocation for Broad River Left Ba	ank Are	a	172,000	321,00
7.2	Slipe main canal (5.2 km)			141,000	134,00
7.3	Secondary and sub-secondary canal	(3.1 k	m)	47,000	104,00
	Excavation	m3	300	500	10
	Embankment (Backhoe)	m^3	12,000	25,000	1,00
	Slope tamping	_m 2	10,000	0	2,00
rt vivi Statistic	Concrete lining	m3	1,000	12,000	62,00
	Sod facing	m^2	9,000	. 0	18,00
	Related structures				
	- Turnout	nos.	8	5,000	8,00
11	- Culvert	nos.	4 .	1,000	6,00
3,5	- Spillway	nos.	2	1,000	4,00
46,774	- Checkgate	nos	2	500	50
100	Miscellaneous works	L.S.		2,000	2,40
	Sub-total (7.1 - 7.3)			231,000	318,00
3.	Farm Road	· ·		. :	
				110 000	46 00
3.1	Main farm road (8.7 km)	3	10.000	118,000	46,00
sare"	Pavement	_m3	19,000	92,000	38,00
1	Embankment, peat	m3	8,700	7,500	1,00
	Embankment, clay	m3	17,000	15,000	1,00
	Slope tamping	m ²	18,000	0	4,50
	Miscellaneous works	L.S.		3,500	1,50

⁻ to be continued - N - 23

Item	Unit	Q'ty	Foreign	nit: US\$) Local
			Currency	Currency
2 Secondary farm road (16.5 km)			118,000	45,000
2 Secondary farm road (16.5 km) Pavement	_m 3	17,000	83,000	34,000
Embankment (Peat)	ີ່ _ຫ 3	7,500	6,000	1,000
Embankment (Clay)	m ³	27,000	24,000	2,000
Slope tamping	m ²	25,000	0	6,500
Miscellaneous works	L.S.		5,000	1,500
			그는 것 만난 일본 청소리에 된	
Sub-total (8.1 and 8.2)			236,000	91,000
Land Reclamation (800 ha)				
l Irrigation facilities			89,000	482,000
Soil cement	m ³	5,900	50,000	198,000
Excavation	m3	7,100	0	44,000
Embankment	m ³	24,000	16,000	1,000
Slope tamping	m2	42,000	0	11,000
Related structure			영 경우 경영하다	
- Culvert	nos.	40	8,000	54,000
- Division box	nos.	200	15,000	174,000
2 Drainage facilities			302,000	100,000
Excavation	m ³	10,000	20,000	2,000
Slope tamping	m^2	23,000	0	6,000
Farm drain	km	168	272,000	24,000
Culvert	nos.	40	10,000	68,000
3 Farm road			215,000	73,000
Embankment	m3	174,000	117,600	10,000
Slope tamping	m ²	87,000	0	22,900
Marl pavement	m ³	20,000	97,000	40,000
Tractor passage	nos.	400	400	100
4 Land grading		A STATE OF THE STA	415,000	134,000
Land clearing - Grass -	ha	800	0	79,000
Land grading (Peat)	m ³	65,000	78,000	6,000
Ripping	ha	800	337,000	14,000
Levee	ha	800	0	35,000
5 Miscellaneous works	L.s.		19,000	13,000
Sub-total (9.1 - 9.5)			1,040,000	802,000
	1000			

Table N-8 BREAKDOWN OF DIRECT CONSTRUCTION COST FOR THE BROAD RIVER LEFT BANK AREA

					nit: US\$)
	/Item	Unit	Q'ty	Foreign Currency	Local Currency
1.	Preparatory Works	L.S.		185,000	96,000
2.	Dike (5.7 km)			The state of	
	Excavation and embankment (Peat)	ϵ_{m}	35,000	168,000	10,000
100	Embankment (Peat)	m ³	49,000	43,000	4,000
$\tau = 1$	Sodding	m2	20,000	43,000	5,000
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Miscellaneous works	L.S.	20,000	2,000	7,000
	Sub-total				
				213,000	26,000
3.	Drainage Pump Station				
- £.	Approach road	m	1,400	7,000	3,000
1000	Excavation	m3	1,200	4,000	2,000
****	Backfill	_m 3	300	300	200
	Reinforced concrete	m3	360	17,000	29,000
	Plain concrete	m3	40	500	2,000
	Form and scaffoldings	L.S.		500	12,000
	Pump control house	m ²	60	0	30,000
	Related facilities	L.S.		1,500	1,000
	Pump equipment (ø800)	set	3	741,000	128,000
	Miscellaneous works	L.S.		1,200	800
	Sub-total			773,000	208,000
4.	Drainage Canal (8.2 km)				
	Excavation (Peat)	m ³	158,000	730,000	65,000
	Drainage culvert Type I	nos.	. 1	100	7,000
	Drainage culvert Type III	nos.	2	100	9,000
	Miscellaneous	L.S.		7,800	1,000
·	Sub-total		•	738,000	82,000
5.	Catch Drain (13.0 km)			:	
	Excavation	_m 3	105,400	130,000	7,000
	Embankment	m3	38,000	21,000	2,000
1.	Ripping	m ²	10,500	18,000	1,000
	Related structures		•		. 1.
	- Culvert Type I	nos.	5	1,000	30,000
	- Culvert Type II	nos.	4	500	13,500
	- Drainage culvert Type I	nos.	1	2,000	17,000
	Miscellaneous works	L.S.		1,500	2,500
	Sub-total			174,000	73,000
6.	Lacovia Irrigation Pump Station			260,000	75,000

⁻ to be continued -

1 1	Item	Unit	Q'ty	Foreign	nit: US\$) Local
	Teem and the party of the party	Oitec	× -7	Currency	Currency
7	Irrigation Canal				
7.1	Mountainside main canal (8.8 km)			172,000	321,000
7.2	Secondary and sub-secondary canal	(5,05	km)	36,000	128,000
	Excavation	m ³	3,500	4,000	200
	Embankment	ա3 ա2	8,000 15,000	7,000 0	500 4,000
	Slope tamping	m ²	1,500	18,000	93,000
	Concrete lining Sod facing	m ²	8,000	10,000	15,000
	Related structures				
	- Turnout	nos.	3	2,000	3,,000
	- Culvert	nos.	4	1,000	6,000
	- Spillway	nos	1.	200	2,000
	- Checkgate	nos.	2	100	300
	- Cross drain Miscellaneous works	nos.	1_{c}	200 3,500	2,000 2,000
		L.S.			
	Sub-total (7.1 and 7.2)			<u>208,000</u>	449,000
8.	Farm Road				
8.1	Main farm road (9.7 km)			129,000	.45,000
0.1	Pavement	_m 3	17,500	85,000	35,000
	Embankment (Peat)	m ³	4,500	4,000	500
	Embankment (Clay)	m ³	38,000	33,000	2,000
	Slope tamping	\mathfrak{m}^2	18,000	0, -	5,000
	Miscellaneous works	L.S.		7,000	2,500
8.2	Secondary farm road (17.3 km)			111,000	45,000
٠,	Pavement	m ³	17,300	84,000	34,000
	Embankment (Peat)	m3 m3	7,600 17,400	6,000	1,000 1,000
	Embankment (Clay) Slope tamping	m ²	25,000	15,000 0	7,000
	Miscellaneous works	L.S.	25,000	6,000	2,000
	Sub-total (8.1 and 8.2)			240,000	90,000
9.	Land Reclamation (800 ha)				
9.1	Irrigation facilities			98,000	482,000
	Soil cement	E _m	5,900	59,000	198,000
	Excavation	m3 m3	7,100 24,000	0 16,000	44,000 1,000
	Embankment Slope tamping	າແວ _m 2	42,000	10,000	11,000
	Related structure	***	.2/000		
	- Culvert	nos.	40	8,000	54,000
	- Division box	nos.	200	15,000	174,000
9.2	Drainage facilities			302,000	100,000
19.4	Excavation	_m 3	10,000	20,000	2,000
	Slope tamping	m ²	23,000	0	6,000
	Farm drain	km	168	272,000	24,000
	Culvert	nos.	40	10,000	68,000
	- to be co	ontinu	ed -		
	\mathbf{N}_{i}	26			
1000					

			(บ	nit: US\$)
Item	Unit Ç)'ty	Foreign Currency	Local Currency
9.3 Farm road Embankment Slope tamping Marl pavement Tractor passage	m ² 87	1,000 7,000 0,000 400	215,000 117,000 0	73,000 9,900 23,000 40,000 100
9.4 Land grading Land clearing - Grass - Land grading (Peat) Ripping Levee	ha m ³ 96 ha ha	800 5,000 800 800	452,000 0 115,000 337,000 0	139,000 79,000 10,000 14,000 36,000
9.5 Miscellaneous works <u>Sub-total (9.1 - 9.5)</u>	L.S.		11,000 1,078,000	13,000 807,000
Total			3,869,000	1,906,000

Table N-9 BREAKDOWN OF DIRECT CONSTRUCTION
COST OF OFFICE AND QUARTERS

						(Unit: US\$)		
	Item	Unit	Q'ty	Foreign Currency	Local Currency	Total		
1.	Main office	m ²	400	100,000	76,000	176,000		
2.	Branch office (90m ² x4)	m2	360	96,000	62,000	158,000		
3.	Workshop	_m 2	100	24,000	20,000	44,000		
4.	Quarters	m ²	2,000	480,000	400,000	880,000		
5.	Motor pool	m^2	5,000	0	75,000	75,000		
6.	Land reparation for office yard including fencing, etc.	L.S.		20,000	147,000	167,000		
	Total			720,000	780,000	1,500,000		

Table N-10 PROCUREMENT COST OF MAJOR OPERATION AND MAINTENANCE EQUIPMENT

			(Ur	nit: US\$)
	Equipment	Q'ty	Unit Price	Total
1.	Tractor shovel 1.0 m3	1	60,000	60,000
2.	Swamp type bulldozer 13 t	2	95,000	190,000
3.	Swamp type backhoe 0.4 m ³	2	100,000	200,000
4.	Dump truck 8 t	1	30,000	30,000
5.	Truck 4 t	2	15,000	30,000
6.	Light truck 4 wheel drive 1 t	4	12,000	48,000
7.	Passenger car 4-wheel drive	. 8	12,000	96,000
8.	Motor cycle 90 cc	8	850	6,800
9.	Slope compactor 3 PS	1	5,500	5,500
10.	Concrete mixer 7 PS	2	3,500	7,000
11.	Pump with engine 7 PS	4	2,000	8,000
٠	Sub-total			681,300
	Workshop equipment and miscellaneous			10,700
	Spare parts (20%)			138,000
	Total			830,000

Table N-11 GENERAL EXPENSES (Construction Stage)

					(Un	it: US\$)
Year	Staff ¹ / Salary	Labour Wage	Office Expenses	Fuel Cost for Passenger Car	Other Related Cost	Total
1	54,000	_	2,000	1,000	1,000	58,000
.2	85,200	9,600	5,400	2,000	4,000	106,200
3	86,400	9,600	10,800	3,000	4,400	114,200
4	92,400	9,600	10,800	3,000	7,000	122,800
5	92,400	9,600	10,800	3,000	7,000	122,800
6	92,400	9,600	10,800	3,000	7,200	123,000
Total	502,800	48,000	50,600	15,000	30,600	647,000

Remarks: 1/: Refer to Table N-12.

Table N-12 STAFF SALARY FOR THE PROJECT OFFICE (Construction Stage)

				in Najar					
(Unit: US\$)	Total	Salary	54,000	85,200	86,000	92,400	92,400	92,400	502,800
(Unit	F	No No	က	ω	10	H	ŦĪ	Ħ	
	Clarical Staff	Salary	•	12,000	12,000	18,000	18,000	18,000	78,000
	Cla St	No.	1	2	7	m	m	m	
	Equipment Procurement Office	Salary	1	12,000	12,000	12,000	12,000	12,000	60,000
	Equ. Proc Of	Š.		+	red e	H	Н	न	
	Adminis- trator	Salary	1	12,000	12,000	12,000	12,000	12,000	60,000
	Adm	N	1	н	러	, , , ,	<i>i</i>	련,	
	Assistant Engineer	Salary	12,000	7,200	14,400	14,400	14,400	14,400	76,800
	Ass Eng	<u>8</u>	H	7	4	4	4	4	
	fineer	Salary	24,000	24,000	86,000	36,000	36,000	36,000	192,000
	Engi	<u>8</u>	7	2	m	က္	ന	ო	
)irector	Salary	18,000	18,000	i	1	ı	1	36,000
	ZIC	No.	Н	H	1	ı	ı	: .4**	
	Year		Ħ	2	m	4	ľΩ	o	Total

the organization for O α M is to be established in the second year. The director is also responsible to manage the O α M. His salary would be covered Remarks: Since the farm operation will commence from the fall cultivation in third year, by O&M cost since second year (Table N-16).

Table N-13 PRICE LIST OF BASIC MATERIALS AND LABOUR WAGES

				(Unit: J\$)
		Item	Unit	Unit Price
Α.	Mat	erials		
	1.	Ordinary portland cement	ton	550.0
	2.	Reinforcement bar	ton	2,250.0
	3.	Course aggregate	ϵ_{m}	48.8
	4.	Fine aggregate	_m 3	42.0
	.5.	Marl	m ³	15.7
v	6.	Light diesel oil	e &	1.58
В.	Lab	our		
	1.	Common labour	man-day	23.0
	2.	Carpenter	man-day	31.3
	3.	Mason	man-day	29.2
. :.	4.	Operator	man-day	42.1
	5:	Driver	man-day	41.5
	6.	Steel fixer/bender	man-day	31.3
	7.	Foreman	man-day	60.0

Table N-14 LIST OF UNIT PRICE FOR MAJOR WORK ITEMS

	(Unit	us\$)			
Work I	ems	Unit	Foreign Currency	Local Currency	Total
1. Stripping includ	ling site clearing	_m 2	0.06	0.02	0.08
2. Excavation					
- Hard limestone	by pick hammer	_m 3	7.65	5.73	13.38
- Decomposed lim		m3	1.72	0.10	1.82
- Inundated peat		m3	4.61	0.26	4.8
- Soft clayey so		κ_{m}	1.74	0.15	1.89
- Clayey soil		m3	1.23	0.07	1.30
3. Embankment					
- Peat		m ³	0.87	0.07	0.94
- Clayey soil		m3	0.56	0.05	0.6
	cluding hawling L=1.0km	-	4.26	0.46	4.72
4. Backfill		m3	0.98	0.06	1.04
5. Sod facing		m2		1.91	1.91
6. Land clearing					
- Grass		ha		363	36:
- Forest		ha	810	470	1,280
7. Land leveling I	.= 10m	m ³	0.67	0.06	0.73
8. Concrete works					
- Reinforced cor	crete 1:2:4	m3	46.88	82.02	128.90
- Plain concrete		m3	12.29	60.00	72.29
- Leveling concr	telle en la companya de la companya	m3	12.49	51.30	63.79
- Lining concret		m3	12.29	62.01	74.73
- Soil cement, o		. m3	10.00	33.50	43.50
9. Form works for c	oncrete	_m 2	-	11.10	11.10
0. Metal works		kg	0.59	0.78	1.3
l. Concrete pipe					
- ø300		m	_	27.31	27.3
- ø600		m		48.96	48,90
2. Marl pavement		. £ _m	4.86	2.00	6.8
3. Ripping for deep	tillage				
- Clayey soil		ha	319	13.50	332.50
- Peat		ha	421.50	17.84	438.89
4. Gravel foundation	\mathbf{pn}	m ³	4.15	13.77	17.92
5. Slope tamping		_m 2	=	0.26	0.26
			guar esti de la companya de la comp		

Table N-15 ANNUAL OPERATION AND MAINTENANCE COST

			(Unit:	10 ³ us\$)
	Item			Amount
1.	Salary and wages			
	(1) Staff salaries (see Table N-16)			298
	(2) Labour wages			188
2.	Office expenses	L.S.		59
3.	O&M for pump stations			
	(1) Lacovia pump station	L.S.		70
-	(2) Four drainage pump stations	L.S.		225
4.	Repair and maintenance cost	•		
	(1) Cutting grass and repair of embankment	L.S.		69
	(2) Repair of lining concrete	L.S.		.26
	(3) Repair of soil cement lining	L.S.		44
	(4) Repair of road pavement	L.S.		38
	(5) Others	L.S.		18
5.	Miscellaneous			65
	Total			1,100

Table N-16 ANNUAL STAFF SALARY AT O&M STAGE

	Item	Required Number	Monthly Rate (US\$)	Annual Amount (US\$)
Α.	Management Department Director			
Α.,		i	1,500	18,000
	Director			
	Secretary	2	500	12,000
В.	Technical Department			
	Manager	1	1,000	12,000
	i) Irrigation & drainage unit			
	Irrigation engineer	1	1,000	12,000
	Civil engineer	1	1,000	12,000
	Mechanical engineer	1.	1,000	12,000
	Assistant engineer	6	500 500	36,000 18,000
	Clerical staff	3	300	10,000
	ii) Pilot farm unit			
	Research officer	1	1,000	12,000
	Clerical staff	1	500	6,000
	androne de la companya de la compan La companya de la co			
	iii) Settlement unit			
	Officer	1	1,000	12,000
	Extension officer	7	800	67,200
	Clerical staff	2	500	12,000
c.	Administration Department			
•	Finance officer	2	800	19,200
	Personnel	3	800	28,800
	Land management	1	800	9,600
	Author Allocated Street	= 1		
	Total			298,800 (298,000)

Remarks: The salary of drivers and operators is included in the labour wages in Table N-15.

Table N-17 REPLACEMENT COST AND USEFUL LIFE

	Item	Useful Life (year)	Replacement Cost (US\$)
1. O&M	Equipment (see Table N-10)		
(1)	Heavy equipment	10	510,000
(2)	Vehicles and small equipment	5	320,000
2. Proj	ect Facilities		
(1)	Irrigation and drainage pump	20	5,031,000
(2)	Gates for irrigation and drainage facilities	20	26,000

		Market Street	-	******	ete veza entra est			-ouceanor	- 		40-47-V				1	 }	 			······································
8-th year		n of tender		3												. 560	026	908	300	3,080
7-th year		prequalification of tender cender calling	closing tender	swarding contract												560	920	800	800	3,080
6-th year		4 ♦	0													560	620	400	400	1,480 2,280
5-th year				8									1			560	0.26			1,480
4-th year 5-								<u> </u>		T						00	0 920			910 1,480
3-rd year 4-			•	•												260 560	350			260 91
2-nd year 3-r			4																	
-			• •				1	<u> </u>					<u>-</u> 							
1.st year			4							X12.10(1±0.20										
		esign document	jo	uloment	tigation mulation	40,	ין מכנידמון גצ	ells	Lo	nk area	ម	ank area	nk area	ustment			area	¥	¥	
	Y WORKS	 Survey and detailed design Preparation of tender document 	of contract	sition T of OMH eo	ogical invester nodel si	NORKS	of offices and quarters	servation w	constructi	area Iver Left Ba	construct1	a. Broad River Right Bank area	b. Broad River Left Bank area	ration & adj	ATION	rea	er left bank	er right ban	ver left bar	a cultivable
	PREPARATORY WORKS	. Survey and . Preparatio	3. Selection of contractor	4. Land acquisition 5. Proprement of O&M equipment	6. Hydrogeological investigation and computer model simulation	II. CONSTRACTION WORKS	of offices and quarters	2. Digging observation wells	3. 1-st phase construction	a. Holland area b. Black River Left Bank area	4. 2-nd phase construction	a. Broad Ri	b. Broad Ri	5. Prime operation & adjustment	FARM OPERATION	1. Holland area	. Black Rlve	3. Broad River right bank	4. Broad River left bank	5. Total area cultivable
1	뛰	- 0	*	- 10	10	101		N.	N	*.	***			· IO I	Π.			M	- 1	ינו

BLACK RIVER LOWER MORASS AGRICULTURAL DEVELOPMENT PROJECT

Fig. N-1
PROJECT IMPLEMENTATION SCHEDULE

JAPAN INTERNATIONAL COOPERATION AGENCY

		lst	2nd	3-4-3	1	1	Γ
		Year	Year	3rd Year	4th Year	5th Year	
I. PREPARATORY WORKS							
Detailed design & selection of contractor	L.S.						
Land acquisition							
Procurement of O & M equipment	L.S. L.S.						
Construction of groundwater observation we	л.э. 11с то				1		1
II. CONSTRUCTION WORKS	lls L.S.						
Mobilization & construction of office and ${f q}$	uarters L.S.						
Phase I							
Holland area			. .				
Embankment of polder dike 9.3 km	118,000 m ³						ŀ
Drainage pump station Ø800 x 3	L.S.		100,000	напона			
Drain canal 8.9 km	30,000 m ³						
Irrigation canal 14.3 km	80,000 m3		Garage Control				
Road 28.4 km	22,000 m ³						1
Diversion weir & intake	L.S.						
Land reclamation & on-farm facilities	560 ha		\mathbf{I}				1
Black River left bank area	300 Ha] -		
Embankment of polder dike 8.7 km	233,000 m ³						
Drainage pump station \$800 x 5	L.S.					1.	l
Drain canal 13.6 km							
Irrigation canal 15.4 km	298,000 m ³						
Road 33.6 km	90,000 m ³						ŀ
	94,000 m ³						
Irrigation pump station \$700 x 3	L.S.					1.	
Land reclamation & on-farm facilities	920 ha						
Phase II	•						
Broad River right bank area							
Embankment of polder dike 5.5 km	82,000 m ³		.			-	
Drainage pump station ≠800 x 4	L.S.					4	
Drain canal 7.0 km	184,000 m ³					-	ľ
Irrigation canal 7.0 km	55,000 m ³				90		1
Road 25.2 km	60,000 m ³					-	
Land reclamation & on-farm facilities	800 ha						+
Broad River left bank area				1 1			
Embankment of polder dike 5.7 km	84,000 m ³					-	
Drainage pump station \$800 x 3	L.S.						
Drain canal 21.2 km	263,000 m ³	.					
Irrigation canal 12.1 km	62,000 m3				-	-	4
Road 27 km	68,000 m ³						4
Land reclamation & on-farm facilities	800 ha				-		ļ.,
Land reclamation & on latin lactification	;						ŀ
Prime operational, adjustment	L.S.						
Total construction period 5 years							Ļ
TOTAL CONSCINCTION PERIOD 3 Years							
						111	L
						MORASS NT PROJ	
	-		N-2				

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그는 그리는 그리다 한테 나를 마을 하는데 들면 그는 전환에는 이용한 그리는 걸다움이 한다르게 모르다.	
그는 그는 이 사람들은 사람들이 하게 되었다. 이 사람들이 살아 있다면 나를 살아 하셨다면 하다.	
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그 그는 그는 그는 그는 일반에 살아진 그는 사람들이 있는 사람들이 살아 없는 사람들이 되었다. 그는 사람들이 되었다면 살아 없었다.	17.
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그는 이 사람이 이 사람이다. 중요 그 이 집에서 가는데 되는데 하고 하는데 모양을 잃었다. 다양 전	
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ANNEX O PROJECT EVALUATION

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ANNEX O

PROJECT EVALUATION

	TABLE OF CONTENTS	
		Page
1.	GENERAL	o- 1
2.	ECONOMIC EVALUATION	
	2.1 Irrigation and Drainage Benefits	
	2.2 Economic Cost	
	2.3 Economic Evaluation	
	2.3.1 Economic internal rate of return (EIRR)	
	2.3.2 Sensitivity analysis	
_		
3.	FINANCIAL EVALUATION	
	3.1 General	
	3.2 Financial Cost	
	3.3 Capacity to Pay	
	3.4 Water Charge	
	3.5 Repayment Capability of the Farm Development Company	
	3.6 Repayment of the Project Cost	0- 6
4.	SOCIO-ECONOMIC IMPACTS	0- 7
	LIST OF TABLES	
		Page
Τā	able O-1 ECONOMIC BENEFITS FLOW	0- 9
Τć	able O-2 ANNUAL ECONOMIC COSTS AND BENEFIT FLOW	0-10
Τā	able O-3 FARM BUDGET ANALYSIS	0-11
Та	able 0-4 CASH FLOW STATEMENT OF THE FARM DEVELOPMENT	0-12
,	CONTRACT OF THE DOCTOR	0-13
$T\epsilon$	able 0-5 CASH FLOW STATEMENT OF THE PROJECT	0 13

ANNEX O

PROJECT EVALUATION

1. GENERAL

The economic feasibility of the Black River Lower Morass Agricultural Development Project was assessed through the economic internal rate of return (EIRR). The sensitivity analysis was made assuming changes in accrued benefits, built-up and project cost. Then the financial evaluation was carried out by following two ways; farm budget analysis to assess the net reserve of the settlement farm both on mineral and peat soils and the analysis of financial projections of the Farm Development Company and of the Project as a whole to evaluate their repayment capacity on the basis of the estimated fund requirement with assumed terms of the anticipated loan and the expected revenue from the Project. The socio-economic and environmental impacts from the implementation of the Project and their effects on the regional development were also studied.

2. ECONOMIC EVALUATION

2.1 Irrigation and Drainage Benefits

The irrigation and drainage benefits of the Black River Lower Morass Agricultural Project will primarily accrue from the increased crop production due to stable irrigation water supply and drainage. These benefits were estimated as the difference between the annual net production values under the present conditions projected into the future, as against those of the proposed development. Gradually, not only will the acreage be increased but productivity as well. Construction work for the whole project area will be completed in 1990. The full development stage will be attained in 1997 making allowance for a phased agricultural development during construction. The economic gross direct benefits will amount to about J\$33.7 million (US\$8.2 million) per annum at full development.

The economic net direct benefit amounted to about J\$33.3 million (US\$8.1 million) per annum at the full development stage of 3,080 ha.

According to the proposed construction plan, the benefits will begin to accrue in 1987 with completion of the Y.S. intake weir and canals, and will gradually increase as more lands become available. The project will reach maximum paddy production 7 years after completion of the construction works. The incremental benefits were also considered, as they will accrue annually during the development period, as shown in Table O-1.

2.2 Economic Cost

The financial costs for construction works, replacement of certain equipment, and operation and maintenance of the Project were estimated at 1984 price levels as given in Annex N. The economic cost of the Project was obtained by deducting transfer payments from the financial costs. Price contingencies are not included in the economic cost nor the costs of land acquisition and farm guidance service. And also the shadow exchange rate (SER) of 1.02 is applied to the economic costs.

The total economic cost of the Project was estimated to be J\$136.0 million (US\$33.3 million), consisting of J\$89.6 million (US\$21.9 million) of foreign currency component and J\$46.4 million (US\$11.4 million) of local currency component.

It was assumed that the engineering work for the Project would commence at the beginning of 1985 and be completed by the end of 1990; whole project works would be implemented within 6 years. According to the construction schedule proposed in Annex N and the work quantities, the flow of the project costs, operation and maintenance cost, and replacement costs were estimated as shown in Table O-2.

2.3 Economic Evaluation

2.3.1 Economic internal rate of return (EIRR)

The proejct life is assumed to be 50 years from 1985 to 2034. The construction period will be 5 years from the beginning of 1986 excluding about one year for detailed design and selection of contractor. The project benefits will begin to accrue in 1987 and will increase annually to attain the maximum level in 1997.

Operation and maintenance cost of the Project will commence being disbursed in 1987 when the partial operation will commence. The operation and maintenance costs will increase linearly year by year and will reach the full amount in 1990 when the full operation will start for the whole Project area of 3,080 ha. Pumps and their attachments will be replaced twice during the entire period of the project life and operation and maintenance equipments both heavy and small for the irrigation and drainage system will be replaced every ten and five years respectively.

The economic internal rate of return (EIRR) was calculated from the economic direct benefit and cost flows given in Table O-2. The EIRR thus calculated was 13.3%. The result shows that the Project was economically feasible.

2.3.2 Sensitivity analysis

The sensitivity analysis was made with respect to change in annual irrigation and drainage benefits, project costs, and over-runs in the agricultural development schedules. The following five conditions to be anticipated are tested:

- 1) Base case
- 2) 20% cost increase and benefit as scheduled
- 3) 20% benefit decrease and cost as scheduled
- 4) 20% cost increase and 20% benefit decrease
- 5) 2 years over-run in the agricultural development schedule
- 6) 2 years over-run in the agricultural development schedule and 20% cost increase.

The results are summarized below:

	·	
Conditions	EIRR (%)	SI*
1)	13.3	,
2)	11.6	0.6
3)	10.6	1.0
4)	9.1	
5)	10.8	-i
6)	9.5	
•		

^{*:} SI = Sensitivity Indicator = (% change in EIRR)/
(EIRR of base case x % change in condition)

According to the above results, the change in benefits is most sensitive to economical feasibility of the Project. Therefore, to maintain economical feasibility, careful management for attainment of the anticipated benefits as scheduled will be required.

3. FINANCIAL EVALUATION

3.1 General

The financial feasibility of the Project is evaluated from the viewpoint of farmer's economy. In this connection, the assessment of the amount of water charge to be collected the farmer is made on provisional basis. Assessment of capital cost repayment capability is also made at Project and Farm Development Company level by preparing the cash flow tables.

3.2 Financial Cost

Based on the current market prices and costs as of 1984, the financial cost of the Project was estimated to be J\$217.3 million (US\$54.3 million), comprising J\$145.9 million (US\$36.5 million) in foreign currency and J\$71.4 million (US\$17.8 million) in local currency as shown in Annex N. In this estimate, the physical contingencies of 10%, and the price contingencies of 5% per annum for foreign currency and 10% per annum for local currency were added to the direct cost. Table N-3 in Annex N shows the annual disbursement schedule of the said financial cost.

3.3 Capacity to Pay

In evaluation of project feasibility from the financial view-point of farmers, average farm budget analyses both on mineral soil and peat soil were made with future projections under the Project conditions as shown in Table 0-3.

The potential net reserve of a small farmer working in the Project was estimated to be J\$21,310 on 3.0 ha of mineral soil and J\$25,390 on 5.0 ha of peat soil.

3.4 Water Charge

It is desirable that a water charge per hectare be imposed on small farm land to cover operation and maintenance cost and the replacement cost of equipment utilized in the drainage and irrigation system.

The annual operation and maintenance cost of the Irrigation and Drainage System was estimated to be J\$4.4 million which is equivalent to about J\$2,000/ha of the land of small farmer. This corresponds to about 28% on mineral soil and 39% on peat soil of the net annual reserve of each farmer

The water charge of J\$2,000/ha/annum was considered to be within the capacity of the farmers to pay, and would not serve as a disincentive to production. This charge was taken to be the project revenue in the financial evaluation of the Project.

3.5 Repayment Capability of the Farm Development Company

The financial evaluation of the Farm Development Company was made for recovery of the capital cost of the farm machinery and workshop. In examining the repayment capability, it was assumed that the capital required for implementation would be arranged under the following conditions.

- 1) Capital cost of farm machinery and workshop: The capital will be financed by the Holding Company at an assumed interest rate of 4.75% per annum for a repayment period of 25 years including a grace period of 7 years.
- 2) Water charge: The amount of this charge will be J\$2,000/ha/ annum same as for small farm.

A repayment schedule for the capital cost of farm machinery and workshop was prepared as shown in Table 0-4. This table indicates that the direct revenue from the benefit of the mother farm and from hire of farm machinery can cover the necessary annual repayments, except during the initial operation stage. Hence, it is considered that some financial arrangement like a subsidy from the Government will be indispensable for implementation during the initial operation stage.

3.6 Repayment of the Project Cost

The financial evaluation of the Project was made by examining the repayment capacity for the capital cost of the Project. In examining the repayment capability, it was assumed that the capital required for the project implementation would be arranged under the following conditions:

- 1) Foreign currency portion: The capital will be financed through the arrangements by the Government at an assumed interest rate of 4.75% per annum for a repayment period of 25 years including a grace period of 7 years.
- Local currency portion: The capital will be invested by the budget allocation of the Government with no repayment.

A repayment schedule for the foreign currency portion was prepared as shown in Table 0-5. This indicates that the direct revenue from Farm Development Company and small farmers cannot cover the annual repayment of the fund, except the farm machinery cost, 0 % M cost and replacement cost, and the repayment of the fund has to be made by the Government

4. SOCIO-ECONOMIC IMPACTS

Various socio-economic impacts are expected to result from the implementation of the Project. There are:

1) Foreign exchange saving

Rice production in Jamaica is insufficient to meet domestic demand. In 1983, 57,000 tons of rice were imported at a cost of J\$44.8 million (US\$11.2 million). With the Project, local paddy production will be increased by 28,950 tons of dried paddy (15,400 tons of marketable milled rice) per annum. The estimated foreign exchange saving will be approximately J\$12.1 million (US\$3.0 million) per annum by substituting for imported rice.

2) Demonstration effects

With the completion of the Project, farmers in other agricultural areas as well as those in the Project area will become familiar with modern irrigation and drainage practices and their incentive for adopting improved irrigation and drainage practices will be greatly enhanced. Enthusiasm generated from this success may even shorten the development period of the Project.

3) Increase of employment opportunities

It is expected that the present unemployment in and around the Project area will be reduced by the implementation of the Project. After completion of the Project, more intensive land use resulting from year-round irrigation system, drainage, and farm mechanization, will certainly increase employment opportunities. In addition, there are the experience, technical know-how and skills in farmers. These up-graded human resources will provide motivation for future development in the Parish of St. Elizabeth and in Jamaica.

4) Environmental impacts

As shown in Annex L the Project would have minor or negligible impacts on the natural environment providing the use and choice of agricultural chemicals is properly monitored. It is nevertheless essential that such monitoring be carried out on a systematic basis

together with monitoring of effects on local biota especially as there are many existing or potential economic activities in the Black River Lower Morass.

5) Secondary benefits

The implementation of the Project works would certainly lead to beneficial changes in the rural economy. The social infrastructure and local transportation system would be improved. This would contribute to the improvement of rural economic activities. The increased crop production in the Project area would stimulate improvement of the marketing system and the agricultural support services.

6) In summary

Together these benefits will serve to improve the standard of living and the quality of life of the local people and contribute substantially to one of the main objectives of the Project.

Table 0-1 ECONOMIC BENEFITS FLOWS

	Planted Ar	(ha)		<u> </u>	(Unit: J\$10 ³)
Year	Mineral Soil	Peat Soil	Direct Be Mineral Soil		Annual Direct
1		-	mineral Soll	Pear Soll	Benefits
2			-	-	
3	260	-	718	· ·	718
4	780	130	5,354	862	6,216
5	780	700	6,773	1,653	8,426
6	780	1,500	8,433	2,913	11,346
· ; 7	780	2,300	9,346	6,212	15,558
8	780	2,300	10,219	8,542	18,761
9	780	2,300	10,863	11,210	22,073
10	780	2,300	11,241	14,543	25,784
11	780	2,300	11,241	18,453	29,694
12	780	2,300	11,241	21,009	32,250
13	780	2,300	11,241	22,107	33,348

Remark: From 13th year, the annual direct benefit continues constantly.

Table 0-2 ANNUAL ECONOMIC COSTS AND BENEFIT FLOW

J\$10³) (Unit: Construction O&M Replacement Total Benefit Year Cost Cost. Cost Cost 0 3,870 0 1 3,870 2 0 Ò 21,115 0 21,115 Ó 39,286 718 3 37,646 1,640 37,400 2,669 0 40,069 6,216 4 5 20,090 3,559 0 23,649 8,426 20,328 4,449 11,346 6 15,879 4,449 7 0 4,449 15,558 0 0 4,449 5,761 8 1,312 18,761 9 0 4,449 0 4,449 22,073 10 0 4,449 0 4,449 25,784 4,449 0 4,449 0 29,694 11 4,449 0 4,449 0 32,250 12 0 4,449 403 7,852 33,348 13 4,449 33,348 14 0 0 4,449 15 0 4,449 0 4,449 33,348 4,449 0 4,449 33,348 16 0 4,449 17 0 0 4,449 33,348 4,449 5,761 33,348 18 0 4,449 33,348 33,348 Ö 4,449 19 0 20 0 4,449 0 4,449 21 0 4,449 0 4,449 33,348 33,348 0 4,449 4,449 22 28,585 33,348 23 0 4,449 24,137 4,449 24 0 4,449 0 33,348 33,348 25 0 4,449 0 4,449 4,449 0 4,449 33,348 0 26 4,449 Ö 4,449 33,348 27 0 5,761 4,449 1,312 28 0 33,348 4,449 33,348 33,348 4,449 29 0 0 4,449 0 4,449 30 4,449 4,449 33,348 31 0 0 32 0 4,449 0 4,449 33,348 3,403 7,852 33,348 33 0 4,449 4,449 33,348 34 0 4,449 0 4,449 4,449 33,348 35 0 0 36 0 4,449 0 4,449 33,348 4,449 4,449 33,348 0 0 37 1,312 0 4,449 5,761 33,348 38 4,449 4,449 33,348 0 0 39 4,449 0 4,449 33,348 40 0 4,449 4,449 33,348 0 41 0 33,348 33,348 4,449 4,449 0 42 0 28,585 4,449 24,137 43 0 4,449 44 O 4,449 0 33,348 0 4,449 33,348 45 0 4,449 0 4,449 0 4,449 33,348 46 4,449 Ö Ò 4,449 33,348 47 5,761 33,348 48 0 4,449 312 49 0 4,449 33,348 0 4,449 4,449 4,449 0 0 33,348

EIRR = 13.3%

Table 0-3 FARM BUDGET ANALYSIS

					7 40 00 00 00 00 00 00 00 00 00 00 00 00		3			
		/ X X + 7 7 6 [C]		SSOID	GLOSS TUCCINE		745	eross oardo		
		/Automora		December	4:521	, 4 (th	Farming Expense	ense	1	Net
		Area	Vield	10000	Price	Value	Unit Produc-	Total	Fynense	Reserve
						3	tion Cost	Cost	and de	
		(ha)	(ton/ha)	(ton)	(J\$/ton)	(32)	(J\$/ha)	(32)	(3\$)	(32)
								:		
Н	Mineral Soil									
	Spring rice	۳	ស ភ.	16.5	1,100	18,150	1,465	4,395	a .	1
٠	Fall rice	ហ្វ	5. 5.	16.5	1,100	18,150	1,367	4,101		. 1
	Soya bean	m	2.5	7.5	1,300	9,750	2,082	6,246	i	1
	Total	1	ı			46,050	1	14,742	10,000	21,308
H.	Peat Soil									
	Spring rice	ភ	4.5	22.5	1,100	24,750	1,477	7,385	•	
	Fall rice	ស	4.5	22.5	1,100	24,750	1,346	6,730	,	i.
	Total		1	1	ı	49,500	1	14,115	10,000	25,385
								N		

Table 0-4 CASH FLOW STATEMENT OF THE FARM DEVELOPMENT COMPANY

Mater Total Fund Benef Charge Charge Total Fund Benef Charge Charge Total Fund Benef Charge S, 479 7,140 800 3,531 800 3,531 800 5,606 0 1,600 7,197 0 2 1,600 17,123 0 1,600 15,165 0 1,600 15,165 0 1,600 15,165 0 1,600 15,165 0 1,600 15,165 0 1,600 15,165 0 1,600 15,165 0 1,600 15,165 0 1,600 15,165 0 1,600 15,165 0 1,600 15,165 0 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,165 1,600 15,1			ان ا	Cash	Out # 100					Sash Info	21.0%		: TUO)	(*OT*)
Charge Total Fund Benefit from Hire of Total Balance Charge Charge Total Mother Farm Machinery Total Balance Charge Charge Total Mother Farm Machinery Total Charge School 10,420 8,468 356 507 9,231 -1,089 800 3,531 0 955 2,967 2,967 3,922 391 800 20,838 16,032 1,307 2,967 2,967 3,922 391 800 20,838 16,032 1,307 2,967 20,306 -532 1,600 5,606 0 2,969 5,744 8,713 146 1,600 7,197 0 2,969 5,744 8,713 1,600 1,790 0 4,991 5,744 10,083 -2,431 1,600 17,123 0 5,519 5,744 11,263 -5,860 1,600 1,723 0 5,519 5,744 11,263 3,934 1,600 6,613 0 5,519 5,744 11,263 3,934 1,600 1,329 0 5,519 5,744 11,263 3,934 1,600 1,329 0 5,519 5,744 11,263 3,934 1,600 1,329 0 5,519 5,744 11,263 3,934 1,600 1,329 0 5,519 5,744 11,263 3,935 1,600 1,329 5,519 5,744 11,263 3,935 1,600 1,329 5,519 5,744 11,263 3,935 1,600 5,945 0 5,519 5,744 11,263 3,945 1,600 5,945 0 5,519 5,744 11,263 3,945 1,600 5,945 0 5,519 5,744 11,263 3,945 1,600 5,945 0 5,519 5,744 11,263 3,945 1,600 5,945 0 5,519 5,744 11,263 3,945 1,600 5,945 0 5,519 5,744 11,263 3,945 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,600 5,945 0 5,519 5,744 11,263 2,962 1,960 5,945 0 5,519 5,744 11,263 2,962 1,960 5,945 0 5,519 5,744 11,263 2,962 1,960 5,945 0 5,519 5,744 11,263 2,962 1,960 5,945 0 5,519 5,744 11,263 2,962 1,960 5,945 0 5,519 5,744 11,263 2,962 1,960 5,945 0 5,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945 1,945	1/	1/ 000	1/ 0.5.		Replace-	,	7.04-07			Reven	une.			Accumn-
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1,600 7,197 0 3,612 5,744 9,356 2,159 2, 1,600 12,514 0 4,339 5,744 10,083 -2,431	0 1,420 1,754 2,503 1,29	420 1,754 2,503 1,	,754 2,503 1,	,503	•		-	8,567	0		5,744	٠.	146	822
1,600 12,514 0 4,339 5,744 10,083 -2,431 1,600 11,790 0 4,991 5,744 11,131 3,384 2,1,600 7,747 0 5,387 5,744 11,131 3,384 2,1,600 6,780 0 5,519 5,744 11,263 -5,860 -2,1,600 9,136 0 5,519 5,744 11,263 2,127 3,1,600 6,613 0 5,519 5,744 11,263 2,127 3,1,600 10,696 0 5,519 5,744 11,263 3,934 12,1,600 11,122 0 5,519 5,744 11,263 3,934 12,1,600 11,122 0 5,519 5,744 11,263 2,544 15,1,600 6,912 0 5,519 5,744 11,263 2,544 15,1,600 6,912 0 5,519 5,744 11,263 3,945 19,1,600 6,912 0 5,519 5,744 11,263 3,945 19,1,600 5,945 0 5,519 5,744 11,263 3,945 19,1,600 6,912 0 5,519 5,744 11,263 3,945 19,1,600 6,912 0 5,519 5,744 11,263 3,945 19,1,600 6,912 0 5,519 5,744 11,263 2,962 28,318	1,336 1,758 2,503	336 1,758 2,503	,758 2,503	,503	+1	٠	1,600	7,197	0	3,612			2,159	2,981
1,600 11,790 0 4,991 5,744 10,735 -1,055 -1,055 1,600 7,747 0 5,387 5,744 11,131 3,384 2,1,600 17,123 0 5,519 5,744 11,263 -5,860 -2,1,600 9,136 0 5,519 5,744 11,263 2,127 3,1,600 10,696 0 5,519 5,744 11,263 3,934 12,1,600 10,696 0 5,519 5,744 11,263 3,934 12,1,600 11,122 0 5,519 5,744 11,263 3,934 12,1,600 15,165 0 5,519 5,744 11,263 2,544 15,1,600 6,912 0 5,519 5,744 11,263 3,945 19,1,600 5,945 0 5,519 5,744 11,263 3,945 19,1,600 5,945 0 5,519 5,744 11,263 3,945 19,1,600 5,945 0 5,519 5,744 11,263 3,945 19,1,600 5,945 0 5,519 5,744 11,263 2,962 28,118 1,600 8,301 0 5,519 5,744 11,263 2,962 28,118 1,600 8,301 0 5,519 5,744 11,263 2,962 28,118 1,600 8,301 0 5,519 5,744 11,263 2,962 28,118 1,600 8,301 0 5,519 5,744 11,263 2,962 28,118 1,600 8,301 0 5,519 5,744 11,263 2,962 28,118 1,600 8,301 0 5,519 5,744 11,263 2,962 28,118 1,600 8,301 0 5,519 5,744 11,263 2,962 28,118 1,600 8,301 0 5,519 5,744 11,263 2,962 28,118 1,600 8,301 0 5,519 5,744 11,263 2,962 28,118 1,600 8,301 0 5,519 5,744 11,263 2,962 28,118 1,600 8,301 0 5,519 5,744 11,263 2,962 28,118 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,600 1,	0 1,253 1,758	253 1,758 2,503 5,4	,758 2,503 5,4	,503 5,4	4	٠.,	· *		0		•	. •	4	550
1,600 7,747 0 5,387 5,744 11,131 3,384 2, 1,600 17,123 0 5,519 5,744 11,263 4,483 1, 1,600 9,136 0 5,519 5,744 11,263 4,650 8, 1,600 0,696 0 5,519 5,744 11,263 4,650 8, 1,600 10,696 0 5,519 5,744 11,263 3,934 12, 1,600 10,696 0 5,519 5,744 11,263 3,934 12, 1,600 15,165 0 5,519 5,744 11,263 2,544 13, 1,600 15,165 0 5,519 5,744 11,263 4,351 15, 1,600 0,318 0 5,519 5,744 11,263 4,351 15, 1,600 0,318 0 5,519 5,744 11,263 3,945 19, 1,600 0,318 0 5,519 5,744 11,263 3,945 19, 1,600 0,318 0 5,519 5,744 11,263 3,945 19, 1,600 0,318 0 5,519 5,744 11,263 2,962 28,	1,169 1,758 2,	,169 1,758 2,503 4,	,758 2,503 4,	,503 4,	. ·	Ġъ.	1,600	11,790		4,991	-	್ಟ	E	-505
17,123 0 5,519 5,744 11,263 -5,860 -2, 6,780 0 5,519 5,744 11,263 4,483 1, 9,136 0 5,519 5,744 11,263 4,483 1, 7,329 0 5,519 5,744 11,263 4,650 8, 7,44 11,263 3,934 12, 12,63 8,719 0 5,519 5,744 11,263 3,934 12, 12,163 0 5,519 5,744 11,263 2,544 13, 12,165 0 5,519 5,744 11,263 4,351 15, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16	1,086 1,758 2,	,086 1,758 2,503	,758 2,503	,503	800		1,600	7,747	0	8	5,744	٠.	3,384	2,879
6,780 0 5,519 5,744 11,263 4,483 1,9,136 0 5,519 5,744 11,263 2,127 3,6613 0 5,519 5,744 11,263 4,650 8,744 11,263 4,650 8,744 11,263 3,934 12,122 0 5,519 5,744 11,263 3,934 12,122 0 5,519 5,744 11,263 2,544 13,126 0 5,519 5,744 11,263 4,351 15,6912 0 5,519 5,744 11,263 4,351 15,7318 0 5,519 5,744 11,263 3,945 19,5318 2,536 2,3318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,5318 2,531	,002 1,758 2,503 10,	,002 1,758 2,503 10,	758 2,503 10,	,503 10,	. ~				0	덗	5,744		-5,860	-2,981
1,600 9,136 0 5,519 5,744 11,263 2,127 3, 1,600 6,613 0 5,519 5,744 11,263 4,650 8, 12, 1,600 10,696 0 5,519 5,744 11,263 3,934 12, 1,600 10,696 0 5,519 5,744 11,263 3,934 12, 12, 1,600 15,165 0 5,519 5,744 11,263 2,544 13, 12, 12, 12, 12, 12, 13, 141 12, 13, 141 12, 141 12, 15, 15, 15, 15, 15, 15, 15, 15, 15, 15	919 1,758 2,503	1,758 2,503	758 2,503	,503	0		1,600		O	-	-		4,483	1,502
1,600 6,613 0 5,519 5,744 11,263 4,650 8,17,600 7,329 0 5,519 5,744 11,263 3,934 12,12,1600 10,696 0 5,519 5,744 11,263 5,57 12,12,12,12,13,13,13 0 5,519 5,744 11,263 2,544 13,12,13,160 6,912 0 5,519 5,744 11,263 4,351 13,160 6,912 0 5,519 5,744 11,263 4,351 15,160 5,945 0 5,519 5,744 11,263 3,945 19,1600 5,945 0 5,519 5,744 11,263 5,318 25,11,1600 6,913 0 5,519 5,744 11,263 2,962 28,318	835 1,758 2,503 2,	1,758 2,503 2,	,758 2,503 2,	,503 2,	•		1,600		0		74	•	2,127	3,629
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1,600 10,696 0 5,519 5,744 11,263 567 12, 15,000 11,122 0 5,519 5,744 11,263 141 12, 12, 15,000 11,122 0 5,519 5,744 11,263 2,544 15, 15,000 6,912 0 5,519 5,744 11,263 4,351 15, 15,000 5,945 0 5,519 5,744 11,263 3,945 19, 1,600 5,945 0 5,519 5,744 11,263 5,318 25, 13, 1,600 8,301 0 5,519 5,744 11,263 2,962 28, 13, 1,600 8,301 0 5,519 5,744 11,263 2,962 28, 13, 1,600 8,301 0 5,519 5,744 11,263 2,962 28, 13, 1,600 8,301 0 5,519 5,744 11,263 2,962 28, 13, 13, 13, 13, 13, 13, 13, 13, 13, 13	0 668 1,758 2,503	1,758 2,503	,758 2,503	,503	800	11.7	1,600	. ~	0	2	5,744	•	3,934	12,213
1,600 11,122 0 5,519 5,744 11,263 141 12, 15,600 8,719 0 5,519 5,744 11,263 2,544 15, 15,600 15,165 0 5,519 5,744 11,263 -3,902 11, 1,600 6,912 0 5,519 5,744 11,263 3,945 19, 1,600 5,945 0 5,519 5,744 11,263 3,945 19, 1,600 6,301 0 5,519 5,744 11,263 2,962 28, 18, 1,600 8,301 0 5,519 5,744 11,263 2,962 28, 18, 19, 1,600 8,301 0 5,519 5,744 11,263 2,962 28, 18, 18, 18, 18, 18, 18, 18, 18, 18, 1	585 1,758 2,503 4,	585 1,758 2,503 4,	,758 2,503 4,	,503 4,	. ~	1.	1,600	•	0	51	,		567	12,780
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0 1,600 8,301 263 6 5,519 5,519	84 1,758 2,503	84 1,758 2,503	,758 2,503	, 503	•	0	1,600	5,945	0	51	5,744	26	ű	25,177
	1,758 2,503 2,44	1,758 2,503 2,44	58 2,503 2,44	,503 2,44	,44	_	1,600		0	51	5,744	,26	96	ij

Remarks: 1/: Interest; 4.75% Grace period; 7 years Repayment period including grace period; 25 years

Table 0-5 CASH FLOW STATEMENT OF THE PROJECT

												בינת)	(-01810-)
			Ö	Cash Outflow						Cash Inflow	*		
1. 0. 2.	Capital	Cost	Loan Re	boavment 3/	Μ જ	Replace-		ਹਮ	Fund	Revenue	U		
f .	77	3	1 :	בתיטמיאם	Cost	ment Cost	Total	O L	r. O	Development	Small	Total	palance
	יי	נ	וע	TBATS117 TA						COMPANY	rarmer		
	œ	98	127		0		5,895	2,680	3,088	0	0	5.768	-127
7	90,0	2,60	-	0	0	0	33,769	20,080	12,608	339	0	33,027	-742
m	7	15,052	98	0	1,600		59,604	39,972	15,052	1,141	120	56,285	-3,319
4	1,35	8,36	•	0	2,604	0	56,789	31,356	18,360	1,541	2,040	53,297	-3,492
ហ	4,06	7,6	6,08	0	3,472	0	55,295	34,068	11,668	2,303	2,040	50,079	-5,216
Ø	5,38	m	ຜ	0	4,340	O	36,930	15,380	10,392	3,103	2,840	31,715	-5.215
7	8	196	6,931	0	4,340	0	13,851	2,384	196	3,103	4,440	10,123	-3,728
		0	v	7,978	4,340	1,280	20,037	0	0	4,774	4,440	9,214	-10,823
		0	o d	7,974	4,340	0	18,374	O	0	4,694	4,440	9,134	19.240
	-	0	νî	7,974	4,340	0	17,995	0	0	4,611	4,440	9,051	18,944
	0		'n	7,974	4,340	٥	17,617	0	a	4,527	4,440	8,967	-8,650
		0	4,924	7,974	4,340	0	17,238	0	Ó	4,444	4,440	8,884	-8,354
13	0		4	7,974	4,340	3,320	20,179	0	0	4,360	4,440	8,800	-11,379
14	0	0	4	7,974	4,340	0	16,480	0	0	4,277	4,440	8,717	-7,763
S	0	a	m	7,974	4,340	0	16,102	0	0	4,193	4,440	8,633	-7,469
16	0		3,40	7,974	4,340	0	15,723	0	0	4,110	4,440	8,550	-7,173
17	0	0		7,974	4,340	0	15,344	٥	٥	4,026	4,440	8,466	-6.878
8	0	0	2,65	7,974	4,340	1,280	16,245	0	۵	3,943	4.440	8,383	-7,862
д 6	0		2,27	7,974	4,340	0	14,587	0	0	3,859	4,440	8,299	-6.288
20	0	0	'n	7,974	4,340	0	14,208	0	0	3,776	4.440	8,216	-5,992
21	0	0	.51	7,974	4,340	0	13,829	0	.0	3,692	4,440	8,132	-5,697
22	0	0	1,136	7,974	4,340	0	13,450	0	o,	3,609	4,440	8,049	-5,401
23	0	0	•	7,974	4,340	23,548	36,620	0	o [°]	3,525	4,440	7,965	-28,655
24	0	0	379	7,974	4,340	0	12,693	Ö	0	3,442	4,440	7,882	-4,811
52	0	0	0	7,974	4,340	0	12,314	0	0	3,358	4,440	7,798	-4,516

Remarks: 1/: Foreign Currency

2/: Local Currency

3/: Interest; 4.75%

Grace period; 7 years

Repayment period including grace period; 25 years

네이션 그는 그는 사람들은 아이들은 사람들은 사람들이 사람들이 바로 가는 사람들이 모양하는
그는 그 그는 그 그는 그는 그는 그는 그들은 그 가는 그는 그는 그는 그는 그들은 목록 200 목록 200 등을 가는 그는 그는 그는 그는 그를 다는 그는 그를 다는 그는 그를 다는 그를 다는 그는 그를 다는 그를 다른 그를 다는 것이다.
그 교통 이번 그는 그는 마음 살이 그 아버지는 얼굴 속에 사용한 경화 전쟁이 되었다.
보이 많은 이번 하는 사람들이 보고 있는데 이번 사람들이 하는데 되었다. 그렇게 하는데 가장 그렇게 되었다.

