CHAPTER 10 COST ESTIMATION

10-1 Investment Cost

Table 10-1-1 INVESTMENT COST OF PROJECT

Work Item	F/C	L/C	Total
1. Preparatory Work	-	20,000	20,000
2. Water Supply Channel	Le. 731,000	Le. 465,000	Le. 1,196,000
3. Bund	Le. 2,278,000	Le. 978,000	Le. 3,256,000
4. Siphon	Le. 443,000	Le. 210,000	Le. 653,000
5. Miter Gate	Le. 54,000	Le. 8,000	Le. 62,000
6. Land Consolidation	Le. 3,393,000	Le. 194,000	Le. 3,587,000
7. Pump Station	Le. 1,577,000	Le. 82,000	Le. 1,659,000
8. Creek Improvement	Le. 181,000	Le. 5,000	Le. 186,000
9. Trunk Road and Bridges	Le. 2,451,000	Le. 329,000	Le. 2,780,000
10. Farm Road Bridges	Le. 1,538,000	Le. 68,000	Le. 1,606,000
Sub-Total	Le.12,646,000 (US$5,269,166)	Le, 2,359,000 (US$982,916)	Le.15,005,000 (US$6,252,082)
11. Project Facilities	-	Le. 197,000	Le. 197,000
12. Administration Cost	-	Le. 277,000	Le. 277,000
13. Consulting Services	Le. 3,641,000	Le. 117,000	Le. 3,758,000
14. Overseas Training	Le. 106,000	-	Le. 106,000
Sub-Total	Le.16,393,000 (US$6,830,415)	Le. 2,950,000 (US$1,229,165)	Le.19,343,000 (US$8,059,580)
15. Physical Contingency	Le. 1,639,000	Le. 295,000	Le. 1,934,000
Total	Le.18,032,000 (US$7,513,332)	Le. 3,245,000 (US$1,352,081)	Le.21,277,000 (US$8,865,413)
16. Price Escalation	Le. 5,483,000	Le. 1,550,000	Le. 7,033,000
Grand Total	Le.23,515,000 (US$9,798,000)	Le. 4,795,000 (US$1,998,000)	Le.28,310,000 (US$11,796,000)

1. Preparatory Work

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
Preparation	LS					20,000.00	20,000.00	

2. Water Supply Channel

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
1. Excavation	m^3	114,880.00			1.50	172,320.00	172,320.00	(Man-power 30%)
"	"	268,050.00	2.7	723,735.00	0.07	18,763.50	742,498.50	(Machine 70%)
2. Embankment	"	35,810.00			7.50	268,575.00	268,575.00	
Sub-total				723,735.00		459,658.50	1,183,393.50	
3. O.H.	L.S.	1.0		7,237.35		4,596.59	11,833.94	1%
Sub-total				730,972.35		464,255.09	1,195,227.44	
4. Miscellaneous				27.65		744.91	772.56	
Total				731,000.00		465.000.00	1,196,000.00	

3. Bund

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
1. Embankment	m^3	70,020.00			7.50	525,150.00	525,150.00	(Man-power 20%)
2. "	"	280,080.00	7.08	1,982,966.40	0.10	28,008.00	2,010,974.40	(Machine 70%)
3. Slope Protection	m^2	43,550.00	6.25	272,187.50	9.52	414,596.00	686,783.50	(30%)
Sub-total				2,255,153.90		967,754.00	3,222,907.90	
4. O.H.	L.S.	1.0		22,551.53		9,677.54	32,229.07	1%
Sub-total				2,277,705.43		977,431.54	3,255,136.97	
5. Miscellaneous				294.57		568.46	863.03	
Total				2,278,000.00		978,000.00	3,256,000.00	

4. Siphone

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
1. Pit								
(1) Excavation	m^3	1,260.00			1.50	1,890.00	1,890.00	Man-power 20%
(2) "	"	5,076.00	2.70	13,705.20	0.07	355.50	14,060.50	
(3) Back filling	"	2,880.00	2.22	6,393.60	0.02	57.60	6,451.20	Machine 80%
(4) Reinforced concrete	"	929.60	186.10	172,998.50	77.00	71,579.20	244,577.70	
2. Pipe								
(1) Excavation	m^3	2,020.00			1.50	3,030.00	3,030.00	
(2) "	"	8,082.00	2.70	21,821.40	0.07	565.70	22,387.10	
(3) Back filling	"	9,351.00	2.22	20,759.22	0.02	187.00	20,946.22	
(4) Reinforced concrete	"	715.00	186.10	133,061.50	77.00	55,055.00	188,116.50	
(5) Concrete Pipe	m	229.00			183,00	41,907.00	41,907.00	ϕ1000 mm No. 5-8
Sub-total				368,739.42		174,626.80	543,366.22	
3. O.H.				73,747.88		34,925.36	108,673.24	20%
Sub-total				442,487.30		209.552.16	652,039.46	
4. Miscellaneous				512.70		447.84	960.54	
Total				443,000.00		210,000.00	653,000.00	

5. Miter Gate

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
1. Miter Gate	L.S.	1.00		29.00		29.00	29.00	
2. Freight	t	6.70	528.00	3,537.60			3,537.00	
3. Reinforced concrete	m^3	86.60	186.10	16,116.20	77.00	6,668.20	22,784.40	
4. Excavation	"	334.60			1.50	501.90	501.90	Man-power
5. Back filling	"	114.30	2.22	253.74	0.02	2.20	255.94	
Sub-total				48,907.54		7,172.30	56,079.84	
6. O.H.	L.S.	1.00		4,890.75		717.23	5,607.98	10%
Sub-total				53,798.29		7,889.53	61,687.82	
7. Miscellaneous				201.71		110.47	312.18	
Total				54,000.00		8,000.00	62,000.00	

6. Land Consolidation (1)

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
1. Irrigation Channel								
(1) Excavation	m^3	3,730.00			1.50	5,595.00	5,595.00	(Man-power)
(2) "	"	14,942.00	2.70	40,343.4	0.07	1,045.90	41,389.30	
(3) Embankment	"	220,000.00	7.08	1,557,600	0.10	22,000.00	1,579,600.00	Machine
2. Drainage Channel								
(1) Excavation	m^3	384,000.00	2.70	1,036.800	0.07	26,880.00	1,063,680.00	
3. Gate								
(1) Miter Gate	pcs	32.00	12,250.00	392,000			392,000.00	
(2) Freight	t	1.20	528.00	633.6			633.60	
(3) Excavation	m^3	5,952.00			1.50	8,928.00	8,928.00	
(4) Swing Gate	pcs	32.00	540.00	17,280			17,280.00	
(5) Freight	t	6.00	528.00	3,168			3,168.00	
(6) Concrete Pipe	m	384.00			183.00	70,272.00	70,272.00	(ø1,000)
4. Drain Gate								
(1) Sliced Gate	pcs	16.00	9,190.00	147,040.00			147,040.00	
(2) Freight	t	11.00	528.00	5,808.00			5,808.00	
(3) Excavation	m^3	2,304.00			1.50	3,456.00	3,456.00	

6. Land Consolidation (2)

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
(4) Back filling	m^3	1,808.00	2.20	3,977.60	0.02	36.10	4,013.00	
(5) Reinforced concrete	"	140.80	186.10	26,202.80	77.00	10,841.60	37,044.40	
(6) Concrete Pipe	m	192.00			183.00	35,136.00	35.136.00	
Sub-total				3,230,853.40		184,190.60	3,415,044.00	
5. O.H.	L.S.	1.00		161,542.67		9,209.53	170,752.20	5%
Sub-total				3,392,396.07		193,400.13	3,585,796.20	
6. Miscellaneous				603.93		599.87	1,203.80	
Total				3,393,000.00		194,000.00	3,587.000.00	

7. Pump Station

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
1. Pump	pcs	16.00	90,900.00	1,454,400.00			1,454,400.00	
2. Installation	L.S.	1.00				10,000.00	10,000.00	
3. House	pcs	16.00	894.00	14,304.00	3,290.75	52,652.00	66,956.00	
4. Pit Concrete	m^3	148.80	186.00	27,676.80	77.00	11,457.60	39,134.40	
5. Channel Lining	"	43.20	72.80	3,144.90	78.50	3,391.20	6,536.10	
6. Freight	t	3.70	528.00	1,953.60			1,953.60	
Sub-total				1,501,479.30		77,500.80	1,578,980.10	
7. O.H.	L.S.	1.00		75,073.96		3,875.04	78,949.00	5%
Sub-total				1,576,553.26		81,375.84	1,657,929.10	
8. Miscellaneous				446.74		624.16	1,070.90	
Total				1,577,000.00		82,000.00	1,659,000.00	

8. Creek Improvement

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
1. Excavation of new Creek	m^3	57,375.00	2.70	154,912.50	0.07	4,016.20	158,928.70	
2. Excavation of old Creek	"	8,750.00	2.70	23,625.00	0.07	612.50	24,237.50	
Sub-total				178,537.50		4,628.70	183,166.20	
3. O.H.				1,785.37		46.29	1,831.66	1.0%
Sub-total				180,322.87		4,674.99	184,997.86	
4. Miscellaneous				677.13		325.01	1,002.14	
Total				181,000.00		5,000.00	186.000.00	

9. Trunk Road

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
1. Cutting	m	3,550.00	41.03	145,656.50	0.28	994.00	146,650.50	
2. Embankment	m	7,770.00	103.47	803,961.90	0.18	1,398.60	805,360.50	
3. Improvement	m	1,530.00	1.74	2,662.00	-	-	2,662.00	
4. Bridge								
(1) Type-A l=50m	pcs	1.00	376,084.08	376,084.08	25,123.02	25,123.02	401,207.10	
(2) Type-B l=30m	pcs	2.00	302,364.18	604,728.36	12,129.42	24,258.84	628,987.20	
(3) Type-C l=15m	pcs	3.00	155,172.09	465,516.27	7,039.03	21,117.09	846.633.36	
5. Gravel Pavement	m	12,850.00	2.16	27,756.00	19.60	251,860.00	279,616.00	
Sub-total				2,426,365.11		324,751.55	2,751,116.66	
6. O.H.	L.S.	1.00		24,263.65		3,247.51	27,511.16	1%
Sub-total				2,450,628.76		327,999,06	2,778,627.82	
7. Miscellaneous				371.24		1,000.94	1,372.18	
Total				2,451,000.00		329,000.00	2,780,000.00	

10. Farm Road Bridge

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
1. Wooden Bridge								
(1) Type-A' l=50.0 b=4.0	pcs	2.00	94,020.00	188,040.00	6,280.00	12,560.00	200,600.00	
(2) Type-B' l=30.0 b=4.0	pcs	16.00	75,590.00	1,209,440.00	3,030.00	48,480.00	1,257,920.00	
Sub-total				1,397,480.00		61,040.00	1,458,520.00	
2. O.H.	L.S.	1.00		139,748.00		6,104.00	145,852.00	10%
Sub-total				1,537,228.00		67,144.00	1,604,372.00	
3. Miscellaneous	L.S.	1.00		772.00		856.00	1,628.00	
Total				1,538,000.00		68,000.00	1,606,000.00	

11. Project Facilities

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
1. Office	m^2	200.00			160.00	32,000.00	32,000.00	
2. Work shop	"	100.00			90.00	9,000.00	9,000.00	
3. Accomodation	"	600.00			180.00	108,000.00	108,000.00	
4. Conveniences	L.S.	1.00				10,000.00	10,000.00	
5. Furniture	"	1.00				5,000.00	5,000.00	
Sub-total						164,000.00	164,000.00	
6. O.H.	L.S.	1.00				33.000.00	33.000.00	20%
Total						197,000.00	197,000.00	

12. Administration Cost

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
1. P.D.	M/M	48.00			800.00	38,400.00	38,400.00	
2. Staff	"	240.00			500.00	120,000.00	120,000.00	
3. Driver	"	192.00			300.00	57,600.00	57,600.00	
4. Postage	L.S.	1.00				5,000.00	5,000.00	
5. Miscellaneous	"	1.00				10,000.00	10,000.00	
Sub-total						231,000.00	231,000.00	
6. O.H.						46,000.00	46,000.00	20%
Total						277,000.00	277,000.00	

13. Consulting Service

(Unit: Le.)

Description	Unit	Quantity	Financial Cost				Total	Remarks
			Foreign Currency		Local Currency			
			Unit Price	Amount	Unit Price	Amount		
1. D.D.	L.S.			1,767,000.00		54,000.00	1,821,000.00	
2. Supervision	L.S.			1,874,000.00		63,000.00	1,937,000.00	
Total				3,641,000.00		117,000.00	3,758,000.00	

10-2 Price Contingency

Reference is made to the GDP and Price Indices (Section 2-2-3, 2-2-5). The GDP of 1979/1980 is 1,054.3 in the current price and 490.1 in the constant price of 1972/73.

So the average annual GDP deflator during the period of 7 years (1972/1973 to 1979/1980) is 14.5%.

Sectorwise, the deflator of agriculture, forestry, hunting & fishing is 14.5%, of transport 17.7%, the highest, of commercial activities 17.5%, the second highest, and of construction 13.7%.

Naturally, the price indicies hover around the vicinity of the GDP deflator.

Assuming that the price of commodities had reflected the major parts of the effective market exchange rate before the introduction of the two-tier exchange system, the price contingency for the local portion of project cost is set to be 15% per annum, and for the foreign portion 10%, which is set a little higher than the GDP deflator of Japan.

10-3 Budget Schedule of the Project

Table 10-3-1 BUDGET SCHEDULE OF THE PROJECT

Unit: Le.1000

	Work Item	Total			1984		1985		1986		1987	
		F/C	L/C	Total	F/C	L/C	F/C	L/C	F/C	L/C	F/C	L/C
1.	Preparatory Work	-	20	20	-	10	-	10	-	-	-	-
2.	Water Supply Channel	731	465	1,196	-	-	146	93	366	233	219	139
3.	Bund	2,278	978	3,256	-	-	455	195	1,253	538	570	245
4.	Siphon	443	210	653	-	-	200	95	243	115	-	-
5.	Miter Gate	54	8	62	-	-	54	8	-	-	-	-
6.	Land Consolidation	3,393	194	3,587	-	-	509	29	2,205	126	679	39
7.	Pjmp Station	1,577	82	1,659	-	-	-	-	946	49	631	33
8.	Creek Improvement	181	5	186	-	-	81	2	81	2	19	1
9.	Trunk Road and Bridges	2,451	329	2,780	-	-	735	99	1,593	214	123	16
10.	Farm Road and Bridges	1,538	68	1,606	-	-	615	27	923	41	-	-
	Sub-total	12,646	2,359	15,005	-	10	2,795	558	7,610	1,318	2,241	473
11.	Project Facilities	-	197	197	-	197	-	-	-	-	-	-
12.	Administration Cost	-	277	277	-	70	-	70	-	70	-	67
13.	Consulting Services	3,641	117	3,758	1,767	54	375	13	1,031	35	468	15
14.	Overseas Training	106	-	106	-	-	-	-	106	-	-	-
	Sub-total	16,393	2,950	19,343	1,767	331	3,170	641	8,747	1,423	2,709	555
15.	Physical Contingency	1,639	295	1,934	163	30	489	89	662	118	325	58
	Total	18,032	3,245	21,277	1,930	361	3,659	730	9,409	1,541	3,034	613
16.	Price Escalation	5,483	1,550	7,033	193	54	768	235	3,114	802	1,408	459
	Grand Total	23,515	4,795	28,310	2,123	415	4,427	965	12,523	2,343	4,442	1,072

Note: F/C = 10% L/C = 15%

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CHAPTER 11 PROJECT APPRAISAL

11-1 Assumptions for Deciding Economic Internal Rate of Return

11-1-1 Project Life

The weighted average of the durable years of the main components of the structure is thirty six years, as is shown in Table 11-1-1.

Table 11-1-1 DURABLE YEARS OF COMPONENTS

	In thousand (Leones Cost)	Durable years (in years)
Water supply channel	1,196	20
Bund	3,256	50
Siphon	653	40
Pump station	1,659	20
Miter gate	62	30
Trunk road & bridges	2,780	50
Farm road & wooden bridges	1,606	10
Total	11,212	36

To permit a margin of safety the project life is assumed at thirty years, which includes a four-year period of preparation and construction.

11-1-2 Benefit and Cost

Benefit consists of agricultural benefit derived solely from the sale of paddy and of the reduction of charges for transport of rice to Freetown.

Cost consists of construction cost (administratiion cost is included) and of maintenance and operation cost.

Cost and benefits are expressed in early 1983 prices. Taxes and duties are not included.

Ten percents of the basic construction costs and maintenance costs are added as physical contingencies.

Standard Conversion Factor is calculated as 0.944 using the 1980/1981 statistics, but with the introduction of the two-tier foreign exchange system in Dec. 1982 it has lost its relevance to fixing the border price of non-tradable goods and services. Assuming that the parity of the market exchange rate announced fortnightly is equivalent to the effective exchange rate, we set the Standard Conversion Factor at 1.00, and the exchange rate used in determining economic price at 2.4 Leones per dollar.

The economic wage rate for unskilled labour is planned to be 1/2 the present wage (average wage rate in rural area which is 2.60 Leones per day) = 1.30 Leones/day (Ref. I. Little and J. Mirrlees, 1974). The minimum wage rate set by the government is 2.76 Leones per day.

All the land is regarded as common land and no actual compensation money would be paid at the time of consolidation. So the economic value of the land is set at zero.

The economic price of rice at the farm gate is calculated by the following process. IBRD projection for Thai 5% rice made in 1977 and actual price trend are shown in Table 11-1-2.

The Table 11-1-2 shows that there is a big gap between the projection and actual trend.

Actural importation of rice by Sierra Leone Production Marketing Board (SLPMB) in 1981/1982 is shown in the Table 11-1-3.

Table 11-1-2 THAI 5% RICE PRICE PROJECTION AND TREND

(in Dollars per ton)

		1980	1981	1982	1985	1990
Projection	1977 Price	-	323	334	368	380
	1982 Price *1	-	572	591	651	673
Trend *2	Current Price	433.9	482.6	316 *3		

*1 IBRD International Price Index 12.1% annum.

*2 IBRD: (Aug. 1982) Commodity Trade and Price Trend

*3 First half of the year

Table 11-1-3 IMPORTATION OF RICE (CIF Freetown)

Exchange rate US$1=Le.1.2

Country of Origin	Amount (in ton)	Price per ton		Remarks
		In Leon	In Dollar	
Burma	35,000	537	448	
Japan	12,000	659	549	Commodity grant
Italy	11,500	472	393	Commodity grant
China	10,000	601	501	Commodity grant
U.S.A	4,800	480	400	PL-480

Source: SLPMB

The price projection for Thai 5% rice maintain high levels, so it does not suit the present situation of market and production in Sierra Leone. Besides, it is much better than the domestic rice in quality.

As the project we are dealing with does not allocate any funds for the improvement of processing and storing of rice, the rice of comparable quality is the rice from Burma.

Sierra Leone started importing Burmese rice in 1979. The quantity was 25 thousand tonnes. The transaction does not seem to be bound by any grant arrangement. So, the unit price of US$448 per ton appears to have a reasonable claim to be regarded as the economic price of rice.

Freight between Rangoon and Freetown costs eighty dollars per ton and the cost of insurance on the goods is calculated as follows:

(F.O.B. price of goods + freight) x 1.1 x 0.005 - 0.01

If we make 0.008 a coefficient and calculate backward,

F.O.B. Rangoon of a ton of rice,

$$= \frac{448 - 80.704}{1.0088} = 364 \text{ (dollar/ton)}$$

This is about 70% of the projected price of Thai 5% rice. The Table 11-1-4 shows the process to determine the economic price of rice at farm gate.

The conversion rate between milled rice and husked rice is set to be 0.67.

Table 11-1-4 ECONOMIC FARM GATE RICE PRICE

(per ton of milled rice)

F.O.B. Rangoon		US$ 364	
Freight		80	
Insurance		4	
CIF Freetown		US$ 448	
		x 2.4 = Leone 1,075	
		With Project	Without Project
Port Charge		34	34
Transport to Freetown		17	29
Cost of Bag (@0.4x20)		8	8
Milling Cost		44	44
Transport to Mill		4	3
Total		107	118
Farm Gate Price	Milled	968	957
	Husked (x0.67)	649	641

11-1-3 Calculation of Incremental Sales

Without Project

Le. 641/ton x 1.9 t/ha x 846 ha
= Le. 1,030 x 10^3/ha .....(1)

With Project (after the 7th year)

Le. 649/ton x 3.5 ton/ha x 1,287 ha x 200%
= Le. 5,847 x 10^3/ha .....(2)

Incremental Sales

(2) - (1) = Leones 4,816 x 10^3

The 4th and the 5th years are transitional phases in the Project's development: 130% of the cultivatable area and 2.5 ton per ha for the 4th year, and 160% and 3 ton are multiplied by the total area of 1,287 ha.

Calculation of Incremental Farm Cost

Economic farm cost consists of seed, tools, mechanical service, fertilizer, pesticide, manual transportation, and labour both household and hired.

The cost of seed is set to be equal to that of ordinary paddy. Mechanical service receives 85% subsidy and fertilizer 33%. The wages per day are equivalent to the economic wage rate. Le. 1.3 per day per man regardless of sex.

The figures used are derived from Table 4-3-3 (Main report). By using the above assumption, farm cost without the introduction of the project is 223 Leones per ha and with the project 618 Leones per ha.

Total farm cost at the fully developed stage is

Le. 618/ha x 1,287 ha x 2 - Le. 223/ha x 846 ha
= Le. 1,402 x 10^3

Table 11-1-5 ECONOMIC INTERNAL RATE OF RETURN

(in million Leones)

Year	Cost			Benefit			Present Value (11%)			Present Value (12%)		
	Const-ruction	M/O	Total	Sale*	Farm Cost*	Benefit	Discount Rate	Cost	Benefit	Discount Rate	Cost	Benefit
1 1984	2.070	0.000	2.070	0.000	0.000	0.000	1.000	2.070	0.000	1.000	2.070	0.000
2 1985	3.941	0.000	3.941	0.000	0.000	0.000	0.981	3.551	0.000	0.893	3.519	0.000
3 1986	9.994	0.000	9.994	0.000	0.000	0.000	0.812	8.115	0.000	0.797	7.965	0.000
4 1987	4.171	.066	4.237	0.000	0.000	0.000	8.731	3.097	0.000	0.712	3.017	0.000
5 1988	0.000	.066	.066	1.684	0.845	.839	0.659	.043	.553	0.636	.042	.534
6 1989	0.000	.066	.066	2.979	1.084	1.895	0.593	.039	1.124	0.567	.037	1.074
7 1990	0.000	.066	.066	4.816	1.402	3.414	0.535	.035	1.826	0.507	.033	1.731
8 1991	0.000	.066	.066	4.816	1.402	3.414	0.482	.032	1.646	0.452	.030	1.543
9 1992	0.000	.066	.066	4.816	1.402	3.414	0.434	.029	1.482	0.404	.027	1.379
10 1993	0.000	.066	.066	4.816	1.402	3.414	0.391	.026	1.335	0.361	.024	1.232
11 1994	0.000	.066	.066	4.816	1.402	3.414	0.352	.023	1.202	0.322	.021	1.099
12 1995	0.000	.066	.066	4.816	1.402	3.414	0.317	.021	1.082	0.287	.019	.980
13 1996	1.564	.066	1.630	4.816	1.402	3.414	0.286	.466	.976	0.257	.419	.877
14 1997	0.000	.066	.066	4.816	1.402	3.414	0.258	.017	.881	0.229	.015	.782
15 1998	0.000	.066	.066	4.816	1.402	3.414	0.232	.015	.792	0.205	.014	.700
16 1999	0.000	.066	.066	4.816	1.402	3.414	0.209	.014	.714	0.183	.012	.625
17 2000	0.000	.066	.066	4.816	1.402	3.414	0.188	.012	.642	0.163	.011	.556
18 2001	0.000	.066	.066	4.816	1.402	3.414	0.170	.011	.580	0.146	.010	.498
19 2002	0.000	.066	.066	4.816	1.402	3.414	0.153	.010	.522	0.130	.009	.444
20 2003	0.000	.066	.066	4.816	1.402	3.414	0.138	.009	.471	0.116	.008	.396
21 2004	0.000	.066	.066	4.816	1.402	3.414	0.124	.008	.423	0.104	.007	.355
22 2005	0.000	.066	.066	4.816	1.402	3.414	0.112	.007	.382	0.093	.006	.316
23 2006	4.083	.066	4.149	4.816	1.402	3.414	0.101	.419	.345	0.083	.343	.282
24 2007	0.000	.066	.066	4.816	1.402	3.414	0.091	.006	.310	0.074	.005	.252
25 2008	0.000	.066	.066	4.816	1.402	3.414	0.082	.005	.279	0.066	.004	.225
26 2009	0.000	.066	.066	4.816	1.402	3.414	0.074	.005	.251	0.059	.004	.201
27 2010	0.000	.066	.066	4.816	1.402	3.414	0.066	.004	.226	0.053	.003	.179
28 2011	0.000	.066	.066	4.816	1.402	3.414	0.060	.004	.204	0.047	.003	.160
29 2012	0.000	.066	.066	4.816	1.402	3.414	0.054	.004	.184	0.042	.003	.143
30 2013	-2.106	.066	-2.040	4.816	1.402	3.414	0.049	-.100	.166	0.037	-.080	.128
								17.997	18.398		17.600	16.691

* With project - without project

EIRR = 11.38%

Economic residual values of the capital goods at the 30th year are calculated as,

$$2{,}519 \times 10^3 \times \frac{13}{20} = 1{,}637 \times 10^3$$

$$1{,}564 \times 10^3 \times \frac{3}{10} = 469 \times 10^3$$

$$+)$$

$$\text{Le. } 2{,}106 \times 10^3$$

11-2 Financial Analysis

11-2-1 Calculation of Financial Internal Rate of Return (FIRR)

The cost consists of increase in gross fixed assets, administration cost, consulting services and maintenance cost. In the first three items, 10% of physical contingencies are included. They are valued in financial price, and increased yearly during the construction period according to the budget schedule of the project shown in Table 10-3-1 of the main report. Replacement of capital goods take place in the 13th and 23rd years and residual values of the capital goods are subtracted at the last year of the project life which is set to 30 years.

The benefit is shown in the difference between the incremental farm sales and the incremental farm cost.

(1) Incremental Farm Sales

Without project

Le. 368/ton x 1.9 ton/ha x 846 ha

$$= \text{Le. } 591.5 \times 10^3 \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

With project

Le. 368/ton x 1.5 x 3.5 ton/ha x 2 x 1,287 ha
= Le. 4,973.0 x 10^3.....(2)

Incremental Sales = (2) - (1)
= Leones 4,381.5 x 10^3.....(3)

The farmgate price of the husked rice at present just after the harvest is Le. 368/ton, but at the time of short supply, the price soars to more than double. With the introduction of double crop, individual farmers are in a better position to sell the paddy. The expected total production of paddy from the project, nine thousand ton consists only between one seventh and one sixteenth of the national shortage of the rice, if the government does not import it (see Chapter 2 section 4 of the main report), so it does not cause any hindrance to selling it. We made an assumption that the farmers will be able to sell it one and half times more than present price of Le. 368/ton in average.

In the 5th and 6th years of transitional phases, the factors for increase of price are set to 1.3 and 1.4 respectively.

Incremental Sales (the 5th year)

Le. 368/ton x 1.3 x 2.5 ton/ha x 1.3 x 1,287 ha
- Le. 591.5 x 10^3 = Le. 1,409.5 x 10^3

Incremental Sales (the 6th year)

Le. 368/ton x 1.4 x 3 ton/ha x 1.6 x 1,287 ha
- Le. 591.5 x 10^3 = Le. 2,591.2 x 10^3

(2) Incremental Farm Cost

Without project

Le. 126/ha x 846 ha = Le. 106.6×10^3.....(4)

With project

Le. (348 + 314)/ha x 1,287 ha
= Le. 852.0×10^3.....(5)

Incremental Farm Cost = (5) - (4)
= Leones 745.4×10^3.....(6)

The figures for the farm cost used here are given in Table 4-3-3 of the main report, from which water charges and credit interest are excluded.

In the transitional phases, as is the case with farm sale, the factors are given in the following equations.

Incremental Farm Cost (the 5th year)

Le. (348 + 314)/2 x 1.3 x 1,287 - Le. 106.6×10^3
= Le. 447.2×10^3

Incremental Farm Cost (the 6th year)

Le. (348 + 314)/2 x 1.6 x 1,287 - Le. 106.6×10^3
= Le. 575.0×10^3

Incremental Benefit (after the 7th year)

(3) - (6) = $(4,381.5 - 745.4) \times 10^3$
≒ Leones $3,636 \times 10^3$

Incremental Benefit (the 5th year)

Leones 962×10^3

Incremental Benefit (the 6th year)

Leones $2,016 \times 10^3$

The table of estimating FIRR is given in Table 11-2-1.

11-2-2 Farm Economy

Table 11-2-2 is a rough estimate of Profit and Loss Statement of the farm economy of the project area. Water charges covers the operation cost of the project.

Le. 52/ha x 1,287 ha = Le. 66,924

Subsidies for fertilizer and pesticide come to Le. 47.

Le. 94 x 1/2 = Le. 47 .....(1)

At present government subsidy for mechanical service covers 85% of the total cost incurred. But we have found that the service facilities are not efficiently managed, and machines are left idle; whereas if the small tractors are introduced as is explained in chapter 4-3-3, operational cost with depreciation and interest does not exceed the triple of the present rating,

Le. 76 x 2 - Le. 152 .....(2)

(1) + (2) = Le. 199/ha

Income tax is set to the 20%, and after the deduction of income tax, the gross income comes to Le. 2,361/ha.

So the per capita income of a family of 2 ha holding with 11 household members is Le. 429, and 1.2 ha Le. 258.

Table 11-2-1 FINANCIAL INTERNAL RATE OF RETURN

(in million Leones)

Year		Cost			Benefit			Present Value (11%)			Present Value (12%)		
		Con-struction	M/O	Total	Sale*	Farm Cost*	Benefit	Discount Rate	Cost	Benefit	Discount Rate	Cost	Benefit
1	1984	2.291	0.000	2.291	0.000	0.000	0.000	1.000	2.291	0.000	1.000	2.291	0.000
2	1985	4.389	0.000	4.389	0.000	0.000	0.000	0.901	3.954	0.000	0.893	3.919	0.000
3	1986	10.950	0.000	10.950	0.000	0.000	0.000	0.812	8.891	0.000	0.797	8.727	0.000
4	1987	3.647	.066	3.713	0.000	0.000	0.000	0.731	2.714	0.000	0.712	2.644	0.000
5	1988	0.000	.066	.066	1.409	0.447	.962	0.659	.043	.634	0.636	.042	.612
6	1989	0.000	.066	.066	2.591	0.575	2.016	0.593	.039	1.195	0.567	.037	1.143
7	1990	0.000	.066	.066	4.381	0.745	3.636	0.535	.035	1.945	0.507	.033	1.843
8	1991	0.000	.066	.066	4.381	0.745	3.636	0.482	.032	1.753	0.452	.030	1.643
9	1992	0.000	.066	.066	4.381	0.745	3.636	0.434	.029	1.578	0.404	.027	1.469
10	1993	0.000	.066	.066	4.381	0.745	3.636	0.391	.026	1.422	0.361	.024	1.313
11	1994	0.000	.066	.066	4.381	0.745	3.636	0.352	.023	1.280	0.322	.021	1.171
12	1995	0.000	.066	.066	4.381	0.745	3.636	0.317	.021	1.153	0.287	.019	1.044
13	1996	1.564	.066	1.630	4.381	0.745	3.636	0.286	.466	1.040	0.257	.419	.934
14	1997	0.000	.066	.066	4.381	0.745	3.636	0.258	.017	.938	0.229	.015	.833
15	1998	0.000	.066	.066	4.381	0.745	3.636	0.232	.015	.844	0.205	.014	.745
16	1999	0.000	.066	.066	4.381	0.745	3.636	0.209	.014	.760	0.183	.012	.665
17	2000	0.000	.066	.066	4.381	0.745	3.636	0.188	.012	.684	0.163	.011	.593
18	2001	0.000	.066	.066	4.381	0.745	3.636	0.170	.011	.618	0.146	.010	.531
19	2002	0.000	.066	.066	4.381	0.745	3.636	0.153	.010	.556	0.130	.009	.473
20	2003	0.000	.066	.066	4.381	0.745	3.636	0.138	.009	.502	0.116	.008	.422
21	2004	0.000	.066	.066	4.381	0.745	3.636	0.124	.008	.451	0.104	.007	.378
22	2005	0.000	.066	.066	4.381	0.745	3.636	0.112	.007	.407	0.093	.006	.337
23	2006	4.083	.066	4.149	4.381	0.745	3.636	0.101	.419	.367	0.083	.343	.300
24	2007	0.000	.066	.066	4.381	0.745	3.636	0.091	.006	.330	0.074	.005	.268
25	2008	0.000	.066	.066	4.381	0.745	3.636	0.082	.005	.297	0.066	.004	.240
26	2009	0.000	.066	.066	4.381	0.745	3.636	0.074	.005	.268	0.059	.004	.214
27	2010	0.000	.066	.066	4.381	0.745	3.636	0.066	.004	.241	0.053	.003	.191
28	2011	0.000	.066	.066	4.381	0.745	3.636	0.060	.004	.217	0.047	.003	.171
29	2012	0.000	.066	.066	4.381	0.745	3.636	0.054	.004	.196	0.042	.003	.152
30	2013	-2.106	.066	.066	4.381	0.745	3.636	0.049	-.100	.176	0.037	.080	.136
									19.014	19.852		18.610	17.821

* With project - without project

FIRR = 11.31%

Considering that the per capita national income is around Le. 300 and per capita gross income of a family of 1.3 ha holding is Le. 68, the above mentioned figures for the per capita income is an achievement.

Table 11-2-2 FARM ECONOMY (Le./ha: 1983 PRICE)

Sales: Le. 368/ton x 1.5 x 3.5 ton/ha x 2
= Le. 3,864/ha

Input: (Le. 348 + Le. 314)/ha = Le. 662/ha
except water charges

Balance	Le. 3,202/ha
Water charges	Le. 52/ha
Replacement for Input Subsidies	Le. 199/ha
Gross Income before Tax	Le. 2,951/ha
Income Tax 20%	Le. 590/ha
Gross Income after Tax	Le. 2,361/ha

11-2-3 Government Financial Statements

The tables 11-2-3, 4, 5, 6, 7 would cover all the aspects of government financial position.

For the sake of convenience in comparing the figures, all the prices used are changed into the constant price of 1987.

In the profit and loss statement, income consists of the income tax levied from the gross farm income.

$$\underset{\text{(1983 price)}}{\text{Le. 590/ha} \times (1.15)^4 \times 1{,}287 \text{ ha}} = \underset{\text{(1987 price)}}{\text{Le. } 1{,}328 \times 10^3}$$

Income tax is not levied in the 5th and the 6th year, so that during these two years, saving for the self revolving farm input is accumulated, then input credit interest of Le. 29 for 10 months is saved.

Table 11-2-3 DISBURSEMENT SCHEDULE

(in thousand Leones)

	F/C	L/C	Total	Year 1	Year 2	Year 3	Year 4
African Development Fund	17,853	1,964	19,817 (70%)	1,777	3,774	10,406	3,860
African Development Bank	5,662	0	5,662 (20%)	346	817	3,645	854
Total Loan	23,515	1,964	25,479	2,123	4,591	14,051	4,714
Government of Sierra Leone (Development budget)	0	2,831	2,831 (10%)	415	801	815	800
Total	23,515	4,795	28,310	2,538	5,392	14,866	5,514

The amount of depreciation is calculated as follows.

The value of the investment for the total structure is Le. 32,074 in 1987 current price.

$$2,123 \times (1.1)^3 + 415 \times (1.15)^3 + 4,427 \times (1.1)^2 + 965 \times (1.15)^2 + 12,523 \times 1.1 + 2,343 \times 1.15 + 4,442 + 1,072 = 32,074$$

Farm road & wooden bridges (10 year life)

Le. 1,606 x 1.1 = Le. 1.767
(1986 price) (1987 price)

Water supply channel (20 year life)

Le. 1,196	x 1.12		= Le. 1,340
(1986 price)	(F/:	L/C = 3:2)	(1987 price)

Pump station

Le. 1,659	x 1.1	= Le. 1,825
(1986 price)		(1987 price)

Average durable years of components of facilities is 36 years, which is shown in Table 11-1-1.

Depreciation cost is subtracted from the 5th year onward when the construction period is over.

The amount of depreciation cost per annum is Le. 891 x 10^3 (Le. 32,074 ÷ 36).

Replacement of farm road and wooden bridges would take place in the 13th and 23rd year; water supply channel and pump station in the 23rd year.

Table 11-2-4 LOAN DISBURSEMENT AND REPAYMENT SCHEDULE

(in thousand Leone)

	African Development Fund			African Development Bank			Principal Total	Interest Total
	Principal	Principal Cumulative	Interest 0.75%	Principal	Principal Cumulative	Interest 3%		
1	1,777	1,777	13.3	346	346	10.4	2,123	23.7
2	3,774	5,551	41.6	817	1,163	34.9	6,714	76.5
3	10,406	15,957	119.7	3,645	4,808	109.4	20,765	229.1
4	3,860	19,817	148.6	854	5,662	169.9	25,479	318.5
5	0	19,817	148.6	0	5,662	169.9	25,479	318.5
6	0	19,817	148.6	0	5,662	169.9	25,479	318.5
7	0	19,817	148.6	0	5,662	169.9	25,479	318.5
8	0	19,817	148.6	0	5,662	169.9	25,479	318.5
9	0	19,817	148.6	0	5,662	169.9	25,479	318.5
10	0	19,817	148.6	0	5,662	169.9	25,479	318.5
11	-198	19,619	147.1	-283	5,379	161.4	24,998	308.5
12	-198	19,421	145.7	-283	5,096	152.9	24,517	298.6
13	-198	19,223	144.2	-283	4,813	144.4	24,036	288.6
14	-198	19,025	142.7	-283	4,530	135.9	23,555	278.6
15	-198	18,827	141.2	-283	4,247	127.4	23,074	268.6
16	-198	18,629	139.7	-283	3,964	118.9	22,593	258.6
17	-198	18,431	138.2	-283	3,681	110.4	22,112	248.6
18	-198	18,233	136.7	-283	3,398	101.9	21,631	238.6
19	-198	18,035	135.3	-283	3,115	93.5	21,150	228.8
20	-198	17,837	133.8	-283	2,832	85.0	20,669	218.8
21	-595	17,242	129.3	-283	2,549	76.5	19,791	205.8
22	-595	16,647	124.9	-283	2,266	68.0	18,913	192.9
23	-595	16,052	120.4	-283	1,983	59.5	18,035	179.9
24	-595	15,457	115.9	-283	1,700	51.0	17,157	166.9
25	-595	14,862	111.5	-283	1,417	42.5	16,279	154.0
26	-595	14,267	107.0	-283	1,134	34.0	15,401	141.0
27	-595	13,672	102.5	-283	851	25.5	14,523	128.0
28	-595	13,077	98.1	-283	568	17.0	13,645	115.1
29	-595	12,482	93.6	-283	285	8.6	12,767	102.2
30	-595	11,887	89.1	-285	0	0	11,887	89.1

Table II-2-5 GOVERNMENT P/L Statement

(in thousand Leone)*

	Income	Depreciation	Interest paid	Net Profit
1	0	0	24	-24
2	0	0	77	-77
3	0	0	229	-229
4	0	0	319	-319
5	0	891	318	-1,209
6	0	891	319	-1,210
7	1,328	891	318	119
8	1,328	891	319	118
9	1,328	891	318	119
10	1,328	891	319	118
11	1,328	891	309	128
12	1,328	891	299	138
13	1,328	891	289	148
14	1,328	891	279	158
15	1,328	891	269	168
16	1,328	891	259	178
17	1,328	891	249	188
18	1,328	891	239	198
19	1,328	891	229	208
20	1,328	891	219	218
21	1,328	891	206	231
22	1,328	891	193	244
23	1,328	891	180	257
24	1,328	891	167	270
25	1,328	891	154	283
26	1,328	891	141	296
27	1,328	891	128	309
28	1,328	891	115	322
29	1,328	891	102	335
30	1,328	891	89	348

* For the first year through the fourth (1984 - 1987), the current price is used; thereafter constant price of 1987.

Table 11-2-6 GOVERNMENT CASH FLOW

(in thousand Leone)*

	Forward from Last Year	Inflow	Loan		Income	Out-flow	Con-struc-tion	Prin-cipal Re-turned	In-terest	Forward to Next Year
			ADF	ADB						
1	0		1,777	346	0		2,538	0	24	-439
2	-439		3,774	817	0		5,392	0	77	-1,317
3	-1,317		10,406	3,645	0		14,866	0	229	-2,361
4	-2,361		3,860	854	0		5,514	0	319	-3,480
5	-3,480			0	0		0	0	318	-3,798
6	-3,798			0	0		0	0	319	-4,117
7	-4,117			0	1,328		0	0	318	-3,107
8	-3,107			0	1,328		0	0	319	-2,098
9	-2,098			0	1,328		0	0	318	-1,088
10	-1,088			0	1,328		0	0	319	-79
11	-79			0	1,328		0	481	309	459
12	459			0	1,328		0	481	299	1,007
13	1,007			0	1,328		1,767	481	289	-202
14	-202			0	1,328		0	481	279	366
15	366			0	1,328		0	481	269	944
16	944			0	1,328		0	481	259	1,532
17	1,532			0	1,328		0	481	249	2,130
18	2,130			0	1,328		0	481	239	2,738
19	2,738			0	1,328		0	481	229	3,356
20	3,356			0	1,328		0	481	219	3,984
21	3,984			0	1,328		0	878	206	4,228
22	4,228			0	1,328		0	878	193	4,485
23	4,485			0	1,328		4,932	878	180	-177
24	-177			0	1,328		0	878	167	106
25	106			0	1,328		0	878	154	402
26	402			0	1,328		0	878	141	711
27	711			0	1,328		0	878	128	1,033
28	1,033			0	1,328		0	878	115	1,368
29	1,368			0	1,328		0	878	102	1,716
30	1,716			0	1,328		0	880	89	2,075

* For the first year through the fourth (1984 - 1987), the current price is used; thereafter constant price of 1987.

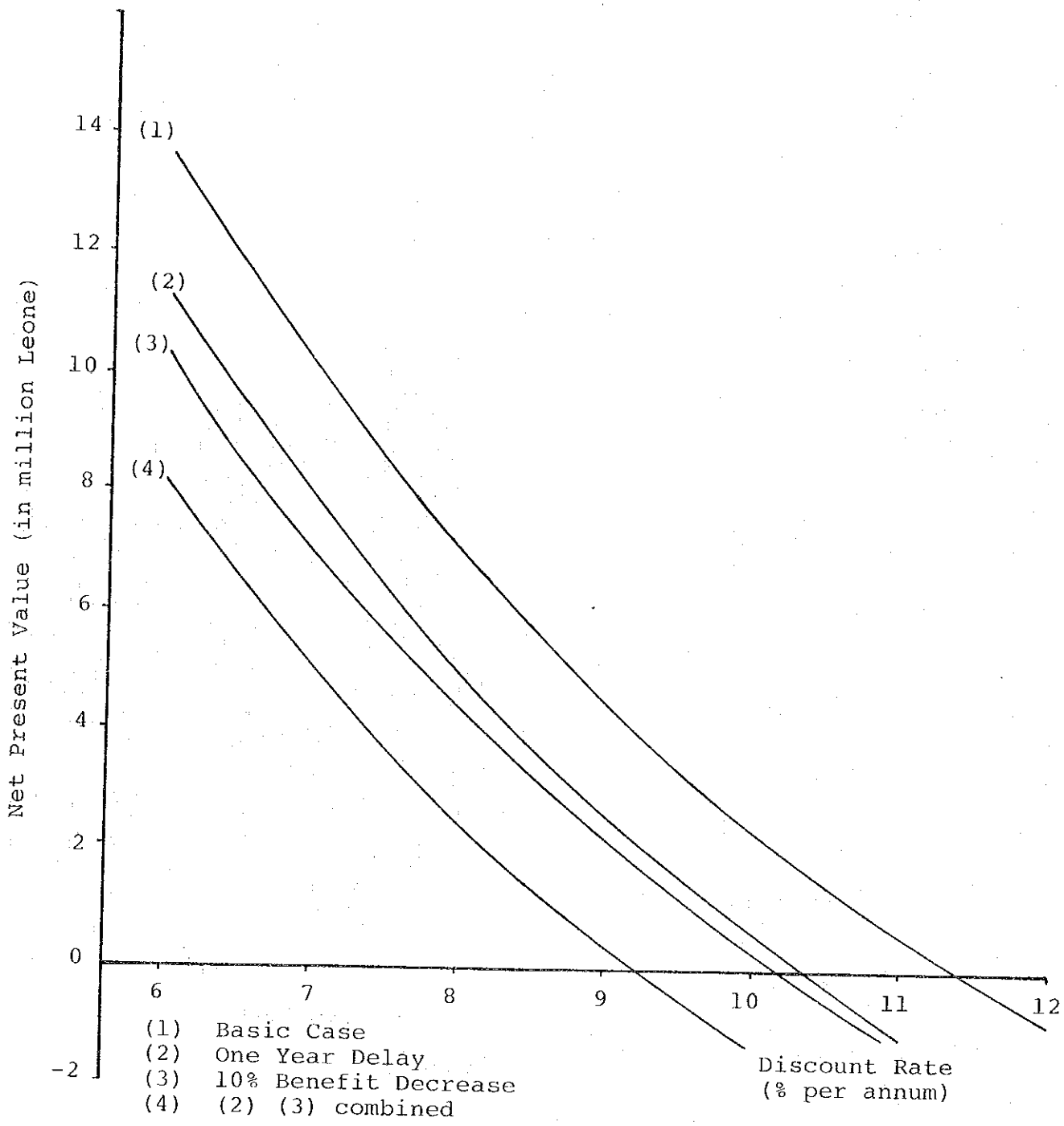
Table 11-2-7 GOVERNMENT B/S

(in thousand Leone)*

	As-sets	Fixed A	(Depre-ciation)	Cur-rent A	Cumu-lative Loss	Total	Lia-bili-ties	Loan (Long Term)	Loan (Short Term)	Cumu-lative Profit	Total
1		2,538	0	0	24	2,562		2,123	438	0	2,562
2		7,930	0	0	101	8,031		6,714	1,317	0	8,031
3		22,796	0	0	330	23,126		20,765	2,361	0	23,126
4		28,310	0	0	649	28,959		25,479	3,480	0	28,959
5		27,419	(891)	0	1,858	29,277		25,479	3,798	0	29,277
6		26,528	(1,782)	0	3,068	29,596		25,479	4,117	0	29,596
7		25,637	(2,673)	0	2,949	28,586		25,479	3,107	0	28,586
8		24,746	(3,564)	0	2,831	27,577		25,479	2,098	0	27,577
9		23,855	(4,455)	0	2,712	26,567		25,479	1,088	0	26,567
10		22,964	(5,346)	0	2,594	25,558		25,479	79	0	25,558
11		22,073	(6,237)	459	2,466	24,998		24,998	0	0	24,998
12		21,182	(7,128)	1,007	2,328	24,517		24,517	0	0	24,517
13		22,058	(8,019)	0	2,180	24,238		24,036	202	0	24,238
14		21,167	(8,910)	366	2,022	23,555		23,555	0	0	23,555
15		20,276	(9,801)	944	1,854	23,074		23,074	0	0	23,074
16		19,385	(10,692)	1,532	1,676	22,593		22,593	0	0	22,593
17		18,494	(11,583)	2,130	1,488	22,112		22,112	0	0	22,112
18		17,603	(12,474)	2,738	1,290	21,631		21,631	0	0	21,631
19		16,712	(13,365)	3,356	1,082	21,150		21,150	0	0	21,150
20		15,821	(14,256)	3,984	864	20,669		20,669	0	0	20,669
21		14,930	(15,147)	4,228	633	19,791		19,791	0	0	19,791
22		14,039	(16,038)	4,485	389	18,913		18,813	0	0	18,913
23		18,080	(16,929)	0	132	18,035		18,035	177	0	18,212
24		17,189	(17,820)	106	0	17,295		17,157	0	138	17,295
25		16,298	(18,711)	402	0	16,700		16,279	0	421	16,700
26		15,407	(19,602)	711	0	16,118		15,401	0	717	16,118
27		14,516	(20,493)	1,033	0	15,549		14,523	0	1,026	15,549
28		13,625	(21,384)	1,368	0	14,993		13,645	0	1,348	14,993
29		12,734	(22,275)	1,716	0	14,450		12,767	0	1,683	14,450
30		11,843	(23,166)	2,075	0	13,918		11,887	0	2,031	13,918

* For the first year through the fourth (1984 - 1987), the current price is used; thereafter constant price of 1987.

Fig. 11-1-1 NET PRESENT VALUE DISCOUNT RATE CURVE



CHAPTER 12 ANSWERS TO THE COMMENTS ON THE DRAFT FINAL REPORT

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CHAPTER 12 ANSWERS TO THE COMMENTS ON THE DRAFT FINAL REPORT

12-1 Answers to the Comments from MAF, Government of Sierra Leone.

Comments	Answers
March, 1983	
The Ministry of Agriculture and Forestry has carefully studied the draft final report on the feasibility study of the Rhombe Swamp Agricultural and Development Project. The ministry accepts in principle the report with the following comments:-	
A. Technical	
1. The effect of having a few large pumping stations instead of large number of small pumps on the whole system needs to be examined carefully.	1. The point is discussed in the course of the report to find that the plan with a few large pumping stations is more costly than the one with small pumps. Comparison is made in Chapter 4-2-4.
2. Pumping at each holder can be reduced by running supply channels on ridges instead of valley.	2. This point is also studied. A plan with banking for aqueduct costs more than the one we have chosen.
3. As the estimated project life is 30 years, cost of replacement pumps, etc. should be included in the investment costs.	3. In the calculation of economic internal rate of return, the replacement cost of pumping stations is added at the 23rd year, and in the government financial statements which are added to Appendix Chapter 11-2-3, the cost is appropriated in the 23rd year.
4. Major infrastructures such as intake points and distribution channels should be taken into account for the future development of the whole project.	4.

Comments	Answers
5. The project forcusses mainly on rice, but some regard must be paid to the production of high valued vegetable crops such as onions, tomatoes, and sweet potatoes all of which thrive well in the area. Such crops would undoubtedly increase the performance of the project.	5. This project is aimed at primalily the production of rice in an intensified method to make use of limited available land to cope with acute rice shortage in the country, to reduce the emergency rice import, and ultimately to improve the balance of payment of Sierra Leone, which has priority in the economic policy of the government. Vegetable growing by individual farmers for own household consumption and for a local market is itself an expression of their healthy entrepreneurship and would be always encouraged by all means so far as the amount of land they use for the purpose does not increase in such an extent to jeopadise the governments rice production policy, but introduction of vegetable cultivation in the project area in mass scale for the wider market area may be planned when the goal of self-sufficiency of rice is attained with implementation of more projects of similar type.
B. Project Cost	
1. The total project cost does not take into account relevant crop production package, and overall management. Although not computed the cost of these elements seems quite substantial and would definitely increase out of proportion Government of Sierra Leone financial burden if absorbed as additional contribution. These components need to be costed.	1. The rice production method is discussed in Chapter 4-3, and organizational aspect of the management is elaborated in Chapter 5-3. Chapter 4-3-2-(3) "Development Programme" is newly added to the final draft and Chapter 5-3 is revised.

Comments	Answers
Otherwise it is difficult to justify both the economic and financial rates of return of the project as contained in the report without detailed cost of crop production and management.	
2. It is not clear whether full or a portion of the investment cost is also to be recovered from the beneficiaries.	2. It is clarified in Chapter 8-3 and Appendix Chapter 11-2-3 by introducing an example of financial case study. Both parts are fully revised from the ones in the final draft.
3. Government contribution of over one million Leones a year is considered too high.	3. The financial analysis made in Chapter 8-3 and Appendix Chapter 11-2 shows that the project is viable in practice, i.e, the project can generate the enough income to make itself a self-sustaining entity. Both chapters are fully revised from the ones in the final draft.
C. Organization and Management	
1. As the first major irrigation project in the country, and has been established as feasible by Japanese consultants, it is highly desirable that the Government of Japan be requested to provide management and/or train suitable Sierra Leoneans in relevant field preferably through technical assistance grants.	1. The cost for the overseas training of the personnels of MAF is appropriated in the project cost, which is explained in Chapter 5-5. The section is newly added to the chapter.

12-2 Answers to the Comments from the African Development Bank

Comments	Answers
May 30, 1983	
1. Review of the MRT Report It may be useful if this review is presented much earlier in the report so that it could sort of serve as a background information for the current study. In particular it will be very much appreciated if in this review the information is arranged in such a manner as to give sequentially, i) a brief summary of the important findings and recommendations of the (MRT) report; ii) important outstanding issues raised before, and gaps in information now required to be filled; and iii) important results which JICA proposed to confirm before proposing a project plan.	1. The point in question is dealt in Chapter 6-1. Principal difference of approach toward the development of Rhombe swamp area is explained. The section is revised from the one in the final draft.
2. Population in Project Area It would be very important to give a reasonably detailed information on the population and demography of the project area. This information could be included in the chapter on "Present Situation in the Project Area". Your reference to the decrease in the population between the two (2) censuses of 1963 and 1974 in that chapter should probably be amplified too. In that same chapter any additional information on the sociological framework may be very useful and much appreciated.	2. Explanation of the population of project area, a table and a chart of population distribution are added to the Chapter 3-1.

Comments	Answers
3. Agricultural Production Plan As the project is primarily conceived to encourage agricultural development and, in particular, the production of rice, it is very important to present a reasonably comprehensive agricultural development plan including:- a) land and water (engineering) development phase - and b) Agricultural production phase. Hence the construction of irrigation, drainage, flood control and other physical facilities should be regarded as the necessary means to the development of the desired agricultural production system. The details of this system should necessarily be spelt out and the estimated cost requirements given in order to make the plan comprehensive and ready for appraisal. The therefore suggest that you include a reasonably detailed agricultural production development plan with the estimated itemized associated costs.	3. The point is explained in Chapter 4-3-2-(3), which is added to the chapter.

Comments	Answers
4. Project Execution Organization & Management These aspects seems to be only sketchily treated. Whereas it is understandably necessary for the official executing agency to be the Ministry of Agriculture and Forestry, experience with similar projects necessitates the need for the creation of at least a semi-autonomous management organization with as little dependence on the Central Ministry as possible for the actual implementation of the project; and the authority for doing so should be accordingly vested in that organization. Usually Ministries of Agriculture are structured to formulate overall national agricultural development policy and also to give general extension service to farmers in the country as a whole. Where heavy and concentrated investment such as the one proposed is to be made provision must then be made for more than average extension service; and such functions as the supply and distribution of inputs should also be ensured. The suggestion for the integration of the project with the Ministry seems to be more conceptual than realistic and practicable if the future viability of the project is to be ensured. We therefore suggest that in the final report you more critically examine alternative organization and management systems with a view to identifying the most effective and feasible approach to this issue. That way too, the issue could be more exhaustively settled during appraisal. As it stands you don't seem to examine any other alternative management possibility.	4. The project executing agencies and management organization is discussed in Chapter 5-3. The section is fully revised.

Comments	Answers
5. Training Requirements and Procurement Services It would appear as if the team felt that all project requirements by way of manpower and expertise could be readily available in Sierra Leone. It would be necessary for the report to include an assessment of the manpower and expertise requirement and indicate how this will be met over time. Where specialized training and experience will be necessary, a definitive training programme for the personnel concerned should be included, with the associated costs. Equally, the manner in which services (such as the preparation of detailed designs and contract documents, the necessary construction works and overall supervision) are going to be provided, should be indicated with due consideration for local capabilities in equipment and expertise.	5. The requirement in terms of ability of officers of various fields in the project office is studied in Chapter 5-3. The cost for the training of personnels is appropriated in the project cost. Practical guide line for the training of local staffs will be considered at the phase of detailed designing.
6. Complimentary Services Experience with similar projects in developing countries always seems to emphasize the need for the inclusion of necessary complimentary services such as credit, processing, storage and marketing or ensuring that indeed those of such services which are not included in the project will anyhow be provided by some other institution(s). It may prove to be wrong to make assumptions about the availability of these services; and sometimes the very performance of the project could adversely be	6. Complimentary services are dealt in Chapter 5-4. The section is newly added to the chapter.

Comments	Answers
affected in the near future if adequate provisions are not made for these services. It is therefore suggested that you examine the above in your report.	
7. Financial Analysis In the first instance there is some concern over the fact that you did not consider the need for discussing the necessary arrangement for financing the farm inputs and the depreciation of the capital cost (11-2)	7. The points raised are discussed in Chapter 8-2 and Appendix Chapter 11-2. Both sections are fully revised from the ones in the final draft.
Secondly in a project like this, we would like to get an idea of both the Economic Internal Rate of Return and the Financial Internal Rate of Return. It will therefore be very much appreciated if the latter is also calculated and included.	
It is usually prudent to assume that, where improved agronomic practice is anticipated, the cost of seed rice will be somehow higher than rice for consumption, contrary to your assumption in the analysis.	
Finally as the only proposed external source of finance is the ADF, it would be useful to also keep AFDB lending conditions in mind in case there may be the need for supplementing whatever ADF resources may be available to the project with AFDB or NTF resources. For instance, the computations may be made assuming that 20% of the loan will be from the ADB to see the effect on the cash flow statement.