ANNEX - N

PROJECT EVALUATION

ANNEX-N

PROJECT EVALUATION

TABLE OF CONTENTS

LIST OF TABLES

1. ECONOMIC EVALUATION

1.1 General

The economic feasibility of the Modernization and Expansion of the Rio Cobre Irrigation Scheme was assessed through the economic internal rate of return (EIRR). A sensitivity analysis for the project was also made assuming changes in accrued project benefit, project cost and over-runs in the agricultural development schedules.

1.2 Economic Project Costs

The economic construction costs estimated at 1986 price levels comprises the costs for (1) preparatory works, (2) civil works including on-farm facilities, (3) administrative expenses, (4) engineering services, (5) operation and maintenance equipment and (6) physical contingency of 10%. Land acquisition costs, price contingency and transfer payments are not included in the economic construction costs. The total economic construction costs of the project were estimated to be J$ 287.7 million (US$ 52.3 million) consisting of J$ 162.3 million (US$ 29.5 million) of foreign currency and J$ 125.4 million (US$ 22.8 million) of local currency component. In addition to the above costs, the annual operation and maintenance costs and the replacement costs for irrigation and drainage facilities were included in the economic project costs. Details are given in Annex-M.

It was assumed that the engineering work for the project would commence at the beginning of 1988 and be completed by the end of 1991; whole project works would be implemented within four (4) years. According to the implementation schedule of the project proposed in Annex-M and works quantities, the flow of the economic construction cost, operation and maintenance cost and replacement cost were estimated as shown in Table N-6.

1.3 Economic Project Benefits

1.3.1 Economic prices

Economic farmgate prices are the prices for the economic evaluation of the project in view of its place in the national economy. Economic farmgate prices of agricultural products and inputs were estimated by the following categories:

(1) Domestic crops

Crops such as summer vegetables; onion, red pea, etc., will be consumed in Jamaica. Economic farmgate prices for domestic crops were estimated at the average farmgate prices of last five (5) years at 1986 constant prices calculated from current farmgate prices and a deflator for Jamaica prepared by Planning Institute of Jamaica as given in Table N-1.

(2) Export crops

Crops such as winter vegetables, fruits, sugarcane, etc., will be mainly exported to the markets of the United States and Europe. Economic farmgate prices for export crops were calculated from the average FOB prices of last five (5) years at 1986 constant prices estimated by a current FOB price and a Manufacturing Unit Value Index (MUV) prepared by IBRD as given in Table N-2 and N-4.

(3) Import foods

Foods such as rice, maize, soybean, beef, milk, fish, etc., which are currently imported, will be supplied with by project. Economic farmgate prices for import foods were calculated from the average CIF prices of last five (5) years at 1986 constant prices estimated by a current CIF price and MUV as given in Table N-3 and N-4.

(4) Farm inputs

Inputs such as seed, fertilizer, agro-chemicals, etc. will be applied to the project. Economic farmgate prices for farm inputs were estimated on the basis of current wholesale prices as given in Table N-5.

Economic farmgate prices for agricultural products and inputs are summarized in Table N-5.

1.3.2 Economic project benefit

The economic benefits from irrigation will primarily accrue from increased crop production due to stable irrigation water supply and proper management. These benefits were estimated as the difference between the annual net economic production value from the project under "with project condition" (the condition of the proposed development) and "without project condition" (the present conditions projected into future). Generally, not only will the acreage be increased but productivity as well, and annual economic irrigation benefits will increase to reach their maximum in the 11th year of project implementation. Annual economic irrigation benefits will amount to about J$ 118.0 million (US$ 21.5 million) at full development. Detailed calculation of the irrigation benefits is given in Annex-G.

In addition to the economic benefits of irrigation mentioned above, the benefits of curtailed operation costs of irrigation wells due to construction of the reservoirs also count in the direct benefit of the project. This benefit is estimated at approximately J$ 1.4 million (US$ 0.3 million) per annum. Detail calculation of this benefit is given in Annex-I.

After completion of the project, about 280 ha of sugarcane in the reservoir areas will be submerged under the reservoir water and non-productive. These losses on account of the project must be deducted from the benefits with the project mentioned above as a negative benefit. The negative benefits were estimated to be J$ 0.8 million (US$ 0.15 million) per annum as given in Annex-G. The loss of agricultural land for project facilities were

counted in the estimate of the primary project benefit by deducting these areas from the agricultural land under "with project condition".

Therefore, the total annual economic project benefits amount to J$ 118.6 million (US$ 21.6 million) at the full development stage of the project, after deducting the negative benefit in the reservoir area. The flow of the economic irrigation benefits, the benefit curtailed operation cost of irrigation wells and the negative benefit in the reservoir areas were estimated as shown in Table N-6.

1.4 Economic Evaluation

1.4.1 Economic internal rate of return (EIRR)

The project life is assume to be 50 years. The construction period will be four (4) years including a year for detailed design and selection of contractor. Operation and maintenance costs of the project will commence being disbursed in 1990 when partial operation will commence. The operation and maintenance costs will increase to reach the full amount in 1991 when full operation will start for the whole project area of 14,620 ha. Pumps and gates for irrigation and drainage facilities 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 (10) and five (5) years respectively.

According to the proposed construction plan, the economic irrigation benefits will being to accrue in 1991 with completion of the rehabilitation of dam and canals, and will gradually increase as more land became irrigable. The project will reach its anticipated maximum agricultural production seven (7) years after completion of the construction works. The benefits of curtailed operation costs of irrigation wells will being to accrue in 1992 with completion of the reservoirs. The negative benefit will commence in 1989 when construction of the first reservoir will start. The negative benefit will increase to the full amount in 1991 when the second reservoirs will construct.

The economic internal rate of return (EIRR) was calculated from the economic project benefits and costs flows estimated under the above conditions as given in Table N-6. The EIRR thus calculated was 24.0%. The result shows that the project was economically feasible.

1.4.2 Sensitivity analysis

Sensitivity analyses were made with respect to change in annual irrigation and drainage benefits and project costs. The following conditions to be anticipated were 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) Two (2) years over-run in the agricultural development schedule

(6) Two (2) years over-run in the agricultural development schedule and 20% cost increase

The results are summarized below:

Conditions	EIRR (%)
(1)	24.0
(2)	20.5
(3)	19.9
(4)	16.8
(5)	18.0
(6)	15.8

From the above results, the economic feasibility of the project is most sensitive to the change in benefits. Therefore, to maintain its economic feasibility, careful management will be required to attain the anticipated benefits as scheduled.

2. FINANCIAL EVALUATION

2.1 General

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

2.2 Financial Project Cost

On the basis of current market prices and costs as of 1986, the financial cost of the project was estimated to be J$ 353.7 million (US$ 64.3 million), comprising J$ 187.6 million (US$ 34.1 million) in foreign currency and J$ 166.1 million (US$ 30.2 million) in local currency as shown in Annex-M. In this estimate, physical contingencies of 10%, and price contingencies of 5% per annum for foreign currency and 10% per annum for local currency were added to the direct project cost. Table M-5 in Annex-M shows the annual disbursement schedule of the said financial costs.

2.3 Financial Evaluation

2.3.1 Financial prices

Financial farmgate prices are the prices used for appraising the financial variability of the project. Financial prices for agricultural products and inputs were estimated on the basis of current farmgate prices as given in Table N-5.

2.3.2 Capacity to pay

In evaluation of project feasibility from the financial viewpoint of farmers, average farm budget analyses for each farming type were made with future projections under "with project" conditions as shown in Annex-G and summarized in Table M-7.

The potential net reserve of each farming type of farmer working in the project was summarized as following table:

Farming Type	Average Size	Net Reserve
	(ha)	(J$/year)
Sugarcane	1,690	2,653,000
Dairy	70	463,600
Vegetables		
Large	170	3,468,000
Small	3.2	101,400
Paddy		
Large	710	3,379,600
Small	3.2	10,500
Orchard	180	419,000
Horticulture	2.0	516,000
Fish	6.0	31,400
Cattle	6.5	22,700

2.3.3 Water charge

It is desirable that a water charge per hectare be imposed on farm lands to cover operation and maintenance costs and the replacement costs of equipment used in the drainage and irrigation system.

The annual operation and maintenance cost of the irrigation and drainage system were estimated to be J$ 9.6 million which is equivalent to about J$ 660/ha of farm land. This corresponds to following percentages of the net annual reserve of each farming type:

Farming Type	Average Size	Net Reserve	Water Charge	Proportion
	(ha)	(J$)	(J$)	(%)
Sugarcane	1,690	2,653,000	1,115,400	42.0
Dairy	70	463,600	46,200	10.0
Vegetables				
Large	170	3,468,000	112,200	3.2
Small	3.2	101,400	2,112	2.1
Paddy				
Large	710	3,379,600	468,600	13.9
Small	3.2	10,500	2,112	20.1
Orchard	180	419,000	118,800	28.4
Horticulture	2.0	516,000	1,320	0.3
Fish	6.0	31,400	3,960	12.6
Cattle	6.5	22,700	4,290	18.9

The water charge of J$ 660/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.

2.3.4 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 by the Government through a financing institution at an assumed interest rate of 4.75% per annum for a repayment period of 25 years including a grace period of seven (7) years.

(2) Local currency portion

The capital will be financed by the Government from its own resources with no repayment.

A repayment schedule for the foreign currency portion was prepared as shown in Table M-8. This indicates that the direct revenue from the farmers cannot cover the annual repayment of the foreign currency portion and the repayment of the foreign currency portion has to be made by the Government.

3. SOCIO-ECONOMIC IMPACTS

The socio-economic impacts from the implementation of the project and their effects on the regional development were studied. Various socio-economic impacts are expected to result from the implementation of the project. There are:

(1) Foreign exchange saving

The production of rice, maize, soybeans, beef, milk, fish in Jamaica is insufficient to meet domestic demand. The average imported volume and value of above commodities from 1981 to 1985, anticipated production of above commodities from the project, and estimated foreign exchange saving are given in table below:

Commodities	Imported from 1981 to 1985 Volume	Value	From the Project Volume	Foreign Exchange Saving
	(ton)	(10^6US$)	(ton)	(10^6US$)
Rice	47,920	17.7	16,380	6.1
Maize	178,450	25.0	22,800	3.2
Soybean	59,110	14.2	3,200	0.8
Beef	1,190	3.8	450	1.4
Milk (powder)	10,490	9.8	2,090	2.0
Fish	14,680	20.7	2,870	4.0
Total	-	91.3	-	17.5

From the above results, approximately US$ 17.5 million per annum of foreign exchange will be saved by substituting for imported these commodities.

(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 the 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) Increased employment opportunities

It is expected that the present unemployment in and around the project area will be reduced by implementation of the project. After completion of the project, more intensive land use resulting from year-round irrigation, drainage, and farm mechanization, will certainly increase employment opportunities. In addition, the experience, technical know-how and skills of the farmers will provide motivation for future development in the parish of St. Catherine and in Jamaica.

(4) Secondary benefits

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

(5) In summary

All in all the project benefits will serve to improve the standard of living and the quality of life of the local people in and around the project area and will contribute substantially to strengthening the economy of Jamaica.

Table N-1 ECONOMIC FARM GATE PRICES OF DOMESTIC CROPS AT 1986 CONSTANT PRICES

Crops	1981	1982	1983	1984	1985	Average
1. Farmgate Price (J$/kg) at Current Price*						
Calaloo	0.73	0.73	0.73	0.82	1.17	0.84
Cucumber	0.64	0.64	0.77	0.79	0.84	0.74
Onion	3.64	3.73	4.63	3.73	4.63	4.07
Sweet pepper	1.12	1.28	1.57	2.54	1.70	1.64
Pumpkim	0.79	0.86	0.95	0.99	1.17	0.95
Red pea	5.97	5.86	6.92	7.76	8.27	6.96
2. Deflator**	0.4361	0.4791	0.5544	0.7393	0.8453	-
3. Farmgate Price (J$/kg) at 1986 Constant Price						
Calaloo	1.67	1.52	1.32	1.11	1.38	1.40
Cucumber	1.47	1.34	1.39	1.07	0.99	1.25
Onion	8.35	7.79	8.35	5.05	5.48	7.00
Sweet pepper	2.57	2.67	2.83	3.44	2.01	2.70
Pumpkim	1.81	1.80	1.71	1.34	1.38	1.61
Red pea	13.69	12.23	12.48	10.50	9.78	11.74

Source : * ; Data Bank, Ministry of Agriculture
**; Planning Institute of Jamaica (Base year = 1986)

Table N-2 FOB PRICES OF EXPORT CROPS AT 1986 CONSTANT PRICES

Crops	1981	1982	1983	1984	1985	Average
1. FOB Price (US$/kg) at Current Price*						
Mango	0.86	0.88	0.73	1.02	0.70	0.84
Cucumber	-	1.15	0.38	0.67	0.40	0.65
Pumpkin	0.52	0.55	0.34	0.25	0.35	0.40
Sweet pepper	0.93	0.90	1.14	0.39	1.10	0.89
Raw sugar**	383	355	226	312	328	321
2. MUV***	0.9310	0.9186	0.8938	0.8788	0.8850	-
3. FOB Price (US$/kg) at 1986 Constant Prices						
Mango	0.92	0.96	0.82	1.16	0.79	0.93
Cucumber	-	1.25	0.43	0.76	0.45	0.72
Pumpkin	0.56	0.60	0.38	0.28	0.40	0.44
Sweet pepper	1.00	0.98	1.28	0.44	1.24	0.99
Raw sugar	411	386	253	355	371	355

Source : * ; External Trade, Statistical Institute of Jamaica
** ; US$/ton
***; Manufacturing Unit Value Index, Primary Commodity Price Forecasts, IBRD, August 18,1986

Table N-3 CIF PRICES OF IMPORT FOODS AT 1986 CONSTANT PRICES

Foods	1981	1982	1983	1984	1985	Average
1. CIF Price (US$/kg) at Current Price*						
Rice	0.56	0.43	0.22	0.28	0.34	0.37
Maize	0.17	0.14	0.09	0.13	0.17	0.14
Soybean	0.30	0.26	0.12	0.24	0.26	0.24
Beef	2.91	2.80	2.27	2.10	5.88	3.19
Milk	1.20	1.39	0.67	0.68	0.75	0.94
Fish	1.39	1.67	1.07	1.39	1.54	1.41
2. MUV**	0.9310	0.9186	0.8938	0.8788	0.8850	-
3. CIF Price (US$/kg) at 1986 Constant Prices						
Rice	0.60	0.47	0.25	0.32	0.38	0.40
Maize	0.18	0.15	0.10	0.15	0.19	0.16
Soybean	0.32	0.28	0.13	0.27	0.29	0.26
Beef	3.13	3.05	2.54	2.39	6.64	3.55
Milk	1.29	1.51	0.75	0.77	0.85	1.03
Fish	1.49	1.82	1.20	1.58	1.74	1.57

Source : * ; External Trade, Statistical Institute of Jamaica
**; Manufacturing Unit Value Index, Primary Commodity Price Forecasts, IBRD, August 18,1986

Table N-4 CALCULATION OF ECONOMIC FARM GATE PRICE AT 1986 CONSTANT PRICES

1. EXPORT CROPS

	Item	Operation	Cucumber	Pumpkin	Sweet Pepper	Mango	Sugar-cane
1	FOB Price (US$/kg or ton)*		0.72	0.44	0.99	0.93	355
2	Conversion to J$/kg	x 5.5	3.96	2.42	5.45	5.12	1,953
3	Packing and Handling Charge	-	0.06	0.13	0.12	0.06	110
4	Transportation Cost						
	Mill to Port	-	-	-	-	-	48
	Project area to Port	-	0.03	0.03	0.07	0.03	-
5	Ex-Mill	=	-	-	-	-	1,795
6	Milling Cost	-	-	-	-	-	200
7	Conversion to Sugarcane	x 0.08	-	-	-	-	128
8	Transportation Cost						
	Project area to Mill	-	-	-	-	-	20
9	Farmgate Price	=	3.87	2.26	5.26	5.03	108

2. IMPORT FOODS

	Item	Operation	Rice	Maize	Soybean	Sorghum	Beef	Milk	Fish
1	FOB US Gulf Port (US$/kg)**		-	-	-	0.13	-	-	-
2	Sea Freight and Insurance (US$/kg)	+	-	-	-	0.02	-	-	-
3	CIF Price (US$/kg)***	=	0.40	0.16	0.26	0.15	3.55	1.04	1.56
4	Conversion to J$/kg	x 5.5	2.20	0.88	1.43	0.83	19.53	5.72	8.58
5	Port Handling Charge	+	0.11	0.11	0.11	0.11	0.20	0.11	0.20
6	Transportation Cost								
7	Kingston-Port	+	0.02	0.02	0.02	0.02	0.09	0.04	0.09
8	Ex-wholesaler in Kingston	=	2.33	1.01	1.56	0.96	19.82	5.87	8.87
9	Trimming and Cleaning	-	-	-	-	-	0.09	-	0.07
10	Conversion to Live Weight	x 0.55	-	-	-	-	10.85	-	-
11	Conversion to Fresh Milk	x 0.132	-	-	-	-	-	0.77	-
12	Transportation Cost								
13	Kingston to Project area or Mill	-	0.02	0.02	0.02	0.02	0.09	0.02	0.09
14	Conversion to Price of Dried Paddy	x0.65	1.50	-	-	-	-	-	-
15	Milling Charge		0.22	-	-	-	-	-	-
16	Farmgate Price	=	1.28	0.99	1.54	0.94	10.76	0.75	8.71

Source: * ; See Table N-2 ** ; See Table N-3

***; Primary Commodity Price Forcasts, IBRD, August 18, 1986 (average of last 5 years)

All data were obtained from Data Bank and Marketing and Credit Division of MCA, Agro 21, Jamaica Commodity Tading Company and Sugar Industry Authority.

Table N-5 SUMMARY OF FARM GATE PRICES

	Unit	Ecomomic*	Financial**
1. Agricultural Products			
A. Domestic crops			
Calaloo	J$/kg	1.40	1.19
Cucumber	J$/kg	1.25	1.04
Onion	J$/kg	7.00	5.33
Sweet pepper	J$/kg	2.70	1.30
Pumpkim	J$/kg	1.61	2.89
Red pea	J$/kg	11.74	9.14
B. Export crops			
Mango	J$/kg	5.03	1.73
Cucumber	J$/kg	3.87	0.86
Pumpkin	J$/kg	2.26	1.02
Sweet pepper	J$/kg	5.26	4.17
Sugarcane	J$/ton	108.00	-
C. Import foods			
Rice	J$/kg	1.28	1.43
Maize	J$/kg	0.99	1.89
Soybean	J$/kg	1.54	1.59
Sorghum	J$/kg	0.94	0.84
Beef	J$/kg	10.76	6.96
Milk	J$/kg	0.75	1.60
Fish	J$/kg	8.71	11.01
2. Agricultural Inputs			
A. Seed			
I. Domestic crops			
Calaloo	J$/kg	16.92	20.00
Cucumber	J$/kg	48.13	52.61
Onion	J$/kg	85.86	98.27
Sweet pepper	J$/kg	186.30	220.26
Pumpkim	J$/kg	23.27	27.50
Red pea	J$/kg	5.50	6.50
II. Export crops			
Mango	J$/tree	0.86	0.96
Cucumber	J$/kg	48.13	52.61
Pumpkin	J$/kg	23.27	27.50
Sweet pepper	J$/kg	186.30	220.26
Sugarcane	J$/ton	58.20	68.80
III. Import foods			
Rice	J$/kg	1.51	1.76
Maize	J$/kg	39.10	44.54
Soybean	J$/kg	2.53	3.00
Sorghum	J$/kg	12.58	14.80
Beef	J$/live weight	4.65	5.50
Milk	J$/kg	7.20	8.10
Fish	J$/fingerling	0.41	0.97
B. Fertilizer	J$/kg	0.87	0.97
C. Agro-chemical	J$/lit	120.91	134.81
D. Labour			
I. Family	J$/man-day	15.00	0.00
II. Hired	J$/man-day	15.00	15.00

Sources: *; see Table N-1 and N-4
Agricultural Inputs Survey, Data Bank, MOA Farm Economic Survey by JICA Team
**; All-island Estimate of Farmgate Price, Data Bank, MOA Export Management System, Marketing and Credit Division, MOA Farm Economic Survey by JICA Team

Table N-6 COSTS AND BENEFITS FLOW

(unit: million J$)

Year	Year in Order	Construc-tion Cost	Replace-ment Cost	O&M Cost	Total Cost	Irrigation Benefit	Negative Benefit	Pump Benefit	Total Benefit
1988	1	8.4	0.0	0.0	8.4	0.0	0.0	0.0	0.0
1989	2	86.6	0.0	0.0	86.6	0.0	-0.6	0.0	-0.6
1990	3	112.5	0.0	5.4	117.9	0.0	-0.8	0.0	-0.8
1991	4	80.3	0.0	9.6	89.9	9.6	-0.8	0.0	8.8
1992	5	0.0	0.0	9.6	9.6	54.6	-0.8	1.4	55.2
1993	6	0.0	0.0	9.6	9.6	99.5	-0.8	1.4	100.1
1994	7	0.0	0.0	9.6	9.6	108.1	-0.8	1.4	108.7
1995	8	0.0	0.0	9.6	9.6	110.6	-0.8	1.4	111.2
1996	9	0.0	1.7	9.6	11.3	113.0	-0.8	1.4	113.6
1997	10	0.0	0.0	9.6	9.6	115.5	-0.8	1.4	116.1
1998	11	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
1999	12	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2000	13	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2001	14	0.0	4.4	9.6	14.0	118.0	-0.8	1.4	118.6
2002	15	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2003	16	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2004	17	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2005	18	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2006	19	0.0	1.7	9.6	11.3	118.0	-0.8	1.4	118.6
2007	20	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2008	21	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2009	22	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2010	23	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2011	24	0.0	38.2	9.6	47.8	118.0	-0.8	1.4	118.6
2012	25	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2013	26	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2014	27	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2015	28	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2016	29	0.0	1.7	9.6	11.3	118.0	-0.8	1.4	118.6
2017	30	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2018	31	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2019	32	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2020	33	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2021	34	0.0	4.4	9.6	14.0	118.0	-0.8	1.4	118.6
2022	35	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2023	36	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2024	37	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2025	38	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2026	39	0.0	1.7	9.6	11.3	118.0	-0.8	1.4	118.6
2027	40	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2028	41	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2029	42	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2030	43	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2031	44	0.0	38.2	9.6	47.8	118.0	-0.8	1.4	118.6
2032	45	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2033	46	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2034	47	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2035	48	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6
2036	49	0.0	1.7	9.6	11.3	118.0	-0.8	1.4	118.6
2037	50	0.0	0.0	9.6	9.6	118.0	-0.8	1.4	118.6

Discount Rate (%)	Cost	Benefit	B - C	B/C
23.5	183.14	187.94	4.797	1.026
23.6	182.63	186.45	3.826	1.021
23.7	182.12	184.99	2.870	1.016
23.8	181.61	183.53	1.927	1.011
23.9	181.10	182.10	0.997	1.006
24.0	180.59	180.67	0.079	1.000
24.1	180.09	179.27	-0.827	0.995
24.2	179.59	177.87	-1.721	0.990
24.3	179.10	176.50	-2.603	0.985
24.4	178.60	175.13	-3.473	0.981

EIRR = 24.0%

Table N-7 CASH FLOW STATEMENTS

(Unit: 1,000 JS)

Year	Cash Inflow							Cash Inflow				Balance
	Capital Cost		Loan Repayment		Cost of SCIS			Fund				
	FC	LC	Interest	Principal	O & M	Replacement	Total	FC	LC	Revenue	Total	
1	6,034	2,926	287	0	0	0	9,247	6,034	2,926	0	8,960	-287
2	53,697	45,826	2,837	0	5,414	0	107,774	53,697	45,826	5,414	104,937	-2,837
3	71,440	67,639	6,231	0	9,625	0	154,935	71,440	67,639	9,625	148,704	-6,231
4	56,331	49,693	8,906	0	9,625	0	124,555	56,331	49,693	9,625	115,649	-8,906
5	0	0	8,906	0	9,625	0	18,531	0	0	9,625	9,625	-8,906
6	0	0	8,906	0	9,625	0	18,531	0	0	9,625	9,625	-8,906
7	0	0	8,906	0	9,625	0	18,531	0	0	9,625	9,625	-8,906
8	0	0	8,412	10,417	9,625	0	28,453	0	0	9,625	9,625	-18,828
9	0	0	7,917	10,417	9,625	1,656	29,615	0	0	9,625	9,625	-19,990
10	0	0	7,422	10,417	9,625	0	27,464	0	0	9,625	9,625	-17,839
11	0	0	6,927	10,417	9,625	0	26,969	0	0	9,625	9,625	-17,344
12	0	0	6,432	10,417	9,625	0	26,474	0	0	9,625	9,625	-16,849
13	0	0	5,938	10,417	9,625	0	25,979	0	0	9,625	9,625	-16,354
14	0	0	5,443	10,417	9,625	4,401	29,886	0	0	9,625	9,625	-20,261
15	0	0	4,948	10,417	9,625	0	24,990	0	0	9,625	9,625	-15,365
16	0	0	4,453	10,417	9,625	0	24,495	0	0	9,625	9,625	-14,870
17	0	0	3,958	10,417	9,625	0	24,000	0	0	9,625	9,625	-14,375
18	0	0	3,464	10,417	9,625	0	23,505	0	0	9,625	9,625	-13,880
19	0	0	2,969	10,417	9,625	1,656	24,667	0	0	9,625	9,625	-15,042
20	0	0	2,474	10,417	9,625	0	22,516	0	0	9,625	9,625	-12,891
21	0	0	1,979	10,417	9,625	0	22,021	0	0	9,625	9,625	-12,396
22	0	0	1,484	10,417	9,625	0	21,526	0	0	9,625	9,625	-11,901
23	0	0	990	10,417	9,625	0	21,031	0	0	9,625	9,625	-11,406
24	0	0	495	10,417	9,625	38,226	58,763	0	0	9,625	9,625	-49,138
25	0	0	0	10,417	9,625	0	20,042	0	0	9,625	9,625	-10,417

Remarks: FC; Foreign Currency
LC; Local Currency
Condition of Loan Repayment; Interrest = 4.75%
Grace Period = seven (7) years
Repayment Period = 25 years including seven (7) years grace period