

APPENDIX - U

Project Evaluation for Development Plan of Priority Irrigation Schemes

APPENDIX – U PROJECT EVALUATION FOR DEVELOPMENT PLAN OF PRIORITY IRRIGATION SCHEMES

Table of Contents

	<u>Page</u>
Chapter 1 PROJECT EVALUATION	U - 1
1.1 Project Economic Evaluation	U - 1
1.2 Estimation of Costs and Benefits.....	U - 1
1.3 Pricing of Agricultural Outputs and Inputs.....	U - 2
1.4 Assumptions for Economic Evaluation.....	U - 2
 Chapter 2 ECONOMIC EVALUATION	 U - 3
2.1 Economic Costs	U - 3
2.2 Economic Benefits.....	U - 3
2.3 Result of EIRR	U - 5
2.4 Sensitivity Analysis	U - 5
 Chapter 3 FINANCIAL EVALUATION.....	 U - 6
3.1 Cash Flow Analysis	U - 6
3.2 Farm Budget under with Project.....	U - 7
 Chapter 4 SOCIO ECONOMIC IMPACT	 U - 9

List of Tables

	<u>Page</u>
Table U 2.1 Annual Disbursement Schedule of Economic Costs.....	UT - 1
Table U 2.2 Cropping Areas under Without and With Project Conditions.....	UT - 2
Table U 2.3 Annual Incremental Benefits	UT - 2
Table U 2.4 Economic Internal Rate of Return.....	UT - 3
Table U 3.1 Cash Flow Statement - Development Plan of Priority Irrigation Schemes	UT - 4

APPENDIX - U PROJECT EVALUATION FOR DEVELOPMENT PLAN OF PRIORITY IRRIGATION PROJECTS

Chapter 1 PROJECT EVALUATION

1.1 Project Economic Evaluation

The project economic evaluation was carried out through the standard methodology in project appraisal of estimation of the Economic Internal Rate of Return (EIRR), the Cost-Benefit Ratio (C/B) and the Benefit minus Cost (B-C). (For a detailed note on economic and financial analyses refer to 1.1 of Appendix K). These evaluations were undertaken for the first four schemes individually. The individual minor schemes in cluster in VII Minor were too small to deal with individually and were therefore treated as a group to undertake the evaluation. For estimation of the EIRR, the stream of economic costs and benefits was estimated out over the life of the project. Financial costs and benefits were first derived for the life of the project and these were converted into economic costs and benefits through the use of the Standard Conversion Factor (SCF), Group Conversion Factor (GCF) and import parity prices. The EIRR is the rate of discount at which the total present value of the project cost is equal to the total present value of net project benefits over the life of the project.

1.2 Estimation of Costs and Benefits

The estimation of benefits were based on crop information provided by the surveys, data obtained from crop records in the Department of Agriculture, the research and extension services and the Agricultural Research and Training Institute (ARTI). Present cropping patterns and crop budgets and proposed cropping patterns and crop budgets after rehabilitation were estimated for each of these schemes. These budgets were in financial terms and were then converted to economic prices using SCF and/or GCF. These factors were estimated for the evaluation of the larger project. The standard conversion factor estimation is presented in Table K 2.1 in Appendix-K of this report. The group conversion factors were worked out for farm inputs such as fertiliser (excluding urea), agro-chemicals and seeds. These GCF's were also estimated for the larger project and are presented in Table K 2.2 in Appendix-K.

1.3 Pricing of Agricultural Outputs and Inputs

Prices for locally traded agricultural commodities in the priority schemes were collected during the fieldwork and during the participatory planning surveys. These were farm gate prices or were adjusted accordingly for freight, quality differentials and for seasonality in prices. The financial output prices were converted to economic prices using the Standard Conversion Factor (SCF), except for rice.

Import parity prices were derived for rice and for urea. Rice is an important item of import. Urea is wholly imported, is subsidised by government and is the most important fertiliser for farmers in the priority schemes. International prices for both rice and urea were adjusted for freight, packaging and handling. Internal transport from port to project area as well as adjustments for quality differentials was made to derive import parity prices. The estimation of the import parity price for rice and for urea is presented in Tables K 2.3 and K 2.4 in Appendix-K.

1.4 Assumptions for Economic Evaluation

The following assumptions were made in the economic evaluation of the priority schemes.

- 1) The project life is assumed to be 25 years, as it was assumed that this is the expected life of the rehabilitated works.
- 2) All values are expressed in 1999 constant Sri Lanka rupees. For internationally traded goods, prices were obtained from the World Bank commodity price forecasts as appear in Global Commodity Markets (1999), while those for non-traded goods are based on domestic financial farm gate prices that were collected in the priority schemes during the field work.
- 3) The exchange rate of SL Rs. 71.00=US\$ 1.00 is used, the rate in January 2000.
- 4) Due to lack of quantitative data and methodological shortcomings to quantify benefits from social amenities, environmental improvements and social infrastructure, the economic analysis quantifies only benefits from incremental value of agricultural output due to project investments. These consist of increased cropping intensity due to increased availability of water, increased cultivation of high value crops (OFC's) and new additional cultivated areas.
- 5) Project costs are those directly associated with irrigation rehabilitation and improvement works and related components for each of the priority schemes; (a) all investment costs and incremental recurring costs (O&M cost) during the project life of 25 years; (b) replacement costs assumed every ten years. The O&M costs are assumed to start incurring on completion of construction.

CHAPTER 2 ECONOMIC EVALUATION

2.1 Economic Costs

Total costs for the priority schemes were prepared in financial terms and were categorised by rehabilitation and improvement costs of irrigation facilities (inclusive of roads), capital costs for project management and support facilities. These included buildings, vehicles, and equipment to support agricultural extension and income generation. In order to convert the financial costs to economic costs, group conversion factors for irrigation rehabilitation, project support and management were estimated and applied to the calculations. Total economic costs are summarised as follows, and disbursement schedule of the economic costs is shown in Table U 2.1.

Total Economic Costs (To be filled after costs finalised)

(Unit: Rs. Million)

	Financial Costs*1	Conversion Factors	Economic Costs
Rehabilitation & Improvement Costs	500.8	0.95	475.8
Project Management & Support	109.8	0.95	104.3
Awareness and Training programs	48.8	0.95	46.3
Administration Costs	80.1	0.95	76.1
Engineering Costs	65.9	0.95	62.7
Total	805.4		765.2

Remark: *1 Excluding price contingency and GST.

2.2 Economic Benefits

The most important benefit from the rehabilitation scheme is the increase in agricultural production as a result of an increase in crop intensity and shift in Yala to high value crops (OFC's). However, there are likely to be other benefits, arising from other project components. Not all economic benefits are quantifiable. Further, some benefits are time lagged and results are visible only after a prolonged period of years e.g. benefits from improvements in agricultural extension are likely to be realised only after a lag of a few years. In addition, capital improvements are likely to have secondary impacts and delayed benefits that could not be easily measured. The improvement of farm roads in the priority schemes is expected to open up the remote areas and provide access to better market opportunities and social amenities, particularly education and health services. The project investments are also expected to provide employment to the members of farm organisations and other rural skilled and unskilled labour during the construction period. Project investments for livestock development and

extension as well as for inland fisheries have been provided but the benefits from these have not been quantified in this analysis because of a lack of data. In view of the above, the results presented here are an under- estimate of the overall expected benefits.

The economic benefits presented here are only those that are readily quantifiable namely the increase in value of agricultural production. The analysis of the economic benefits is based on an analysis of farm budgets of the present without project situation and the proposed cropping pattern at full project implementation. This approach provides us with an estimate of the net incremental value of agricultural production. It is assumed that there would be a substantial shift in cultivation to other field crops, particularly chillies, onions, pulses and vegetables all of which are high value crops that would enhance net farm incomes.

The incremental net value of production in financial terms is adjusted using border prices and conversion factors to obtain the net incremental benefit in economic terms. Adjustments are also made for the time lag due to rehabilitation and construction in the initial years of the project. The economic crop budgets for each crop and irrigable areas with and without the project are Tables K 2.10 and K 2.11 in Appendix K. Based on this data the annual incremental benefit in economic terms is calculated for each scheme and appears in Tables U 2.2 and U 2.3. The crop budget with the project is based on agronomic data and takes into consideration other variables such as soils, rainfall, demand and cost of cultivation, technical practices and farmers willingness to grow these crops.

Total Annual Incremental Benefit

(Unit: Rs. million/year)

	Without Project	With Project	Incremental Benefits
Nachchaduwa Major Scheme	46.3	180.4	134.1
Palukadawela Major Scheme	14.9	47.7	32.8
Periyakulama Medium Scheme	2.3	5.1	2.8
Mahananneriya Medium Scheme	1.6	9.1	7.5
Mahananneriya Small Scheme Group	1.0	4.0	3.0
Total	66.1	246.3	180.2

As for the negative benefits, net income of two paddy cropping for the major schemes and one paddy cropping for the medium and minor schemes were deducted from the project economic benefits, assuming that dry season crop will be unable to cultivate during the period of rehabilitation works. No production foregone was estimated in the benefits because of no land acquisition for the project implementation.

2.3 Result of EIRR

The results of the analysis for each scheme is presented in Table U 2.4. A summary of the results for the priority schemes only is as follows:

- 1) Economic Internal Rate of Return (EIRR) : 15.3 %
- 2) B/C (10% discount rate) : 1.53
- 3) B-C (10 discount rate) : Rs. 326 million

With an EIRR of 15.3%, the Project would be economically viable.

2.4 Sensitivity Analysis

Project sensitivity in terms of EIRR was analysed in respect of changes in project cost and benefit as follows:

- 1) Project costs increase 10%.
- 2) Project costs increase 20%.
- 3) Generating of benefits delay in 1 year.
- 4) Target yields of crops decrease 10%.

The result of analysis is summarised below. The Project has no economic viability, if the costs increase 20% and the target yields of crops decrease 10%.

Result of Sensitivity Analysis (EIRR)

Project Costs	Project Benefits			
	Base	Benefits delay 1 year	Target yields decrease 10%	Benefit delay 1 year and target yields decrease 10%
Base	15.3%	13.5%	11.7%	10.4%
+10%	14.1%	12.5%	10.6%	9.5%
+20%	13.1%	11.6%	9.7%	8.7%

Chapter 3 FINANCIAL EVALUATION

3.1 Cash Flow Analysis

The cash flow analysis was made under the following conditions and on the assumption that MIP implements the Project under the financial co-operation from foreign aid agency.

- 1) Loan condition of foreign aid agency
 - a) Interest rate : 2.3 % per year
 - b) Grace period : 10 years
 - c) Repayment period : 30 years (including grace period)
 - d) Items not eligible for financing are as shown below.
 - General administration expense
 - Taxes and duties
 - Purchase of land and other real property
 - Compensation
 - Other indirect items
- 2) Raising capital other than foreign loan: the national treasury covers all the costs other than foreign-aid loans under the condition of no interest and no repayment.
- 3) Farmers' share
 - a) The farmers (FOs) bear 10% of total costs for their contract works.
 - b) The O&M costs for D- and F-canals of the major schemes and all irrigation facilities of the medium and minor schemes are covered by the Farmers, and the Government shares all O&M costs except for the above facilities.

Based on these conditions, the total fund requirement and internal raising amount were estimated as follows.

Raising Capital Costs of the Project

(Unit: Rp. Million)

	External Loan	National Budget	Farmers' Share	Total
a) Rehabilitation/Improvement of irrigation facilities *2	470.4	-	30.5	500.9
b) Rehabilitation/Improvement of supporting facility & Equipment *2	109.8	-	-	109.8
c) Awareness/Educational programme *2	48.8	-	-	48.8
d) PMU operation cost & fund for loan *1 *2	21.0	59.1	-	80.1
e) Engineering fee	65.9	-	-	65.9
f) Price contingency	381.2	37.9	17.5	436.6
g) GST(12.5%)	-	149.2	6.0	155.2
Total	1,097.1	246.2	54.0	1,397.3

Note : *1 Fund for revolving loan *2 Including physical contingency.

As seen in this table, the loan requirement from the foreign aid agency was estimated at about Rs.1,100 million (US\$15.4 million). The MIP's cash flow statement to this loan amount is presented in Table U 3.1. The annual repayment of the fund is estimated to be Rp.56-80 million during the repayment period from

11th to 30th year. Repayment of the fund will have to be made by subsidy from the Government.

3.2 Farm Budget under with Project

(1) Farm Budget Analysis

In order to evaluate the improvement of farm economy and to clear the farmers' capacity to pay for irrigation service charge, the farm budgets of farmers under with and without project conditions were analysed as follows.

Farm Budget Analysis

Holding size of irrigated paddy field	Present *1			With Project		
	Average	0.4-0.8 ha	Below 0.4 ha	Average	0.4-0.8 ha	Below 0.4 ha
(No. of samples) *2	210	68	38			
(Proportional Extent)	100%	32%	18%	100%	32%	18%
I. Extent of irrigated paddy field (ha/household)	<u>0.81</u>	<u>0.46</u>	<u>0.22</u>	<u>0.81</u>	<u>0.46</u>	<u>0.22</u>
II. Cultivated area (ha/ household)	<u>0.96</u>	<u>0.70</u>	<u>0.30</u>	<u>1.63</u>	<u>0.90</u>	<u>0.46</u>
1) Paddy-Irrigated Maha	0.63	0.44	0.20	0.73	0.41	0.20
2) Paddy-Irrigated Yala	0.14	0.10	0.02	0.55	0.31	0.15
3) OFC	0.05	0.10	0.03	0.21	0.12	0.06
4) Others	0.14	0.06	0.05	0.14	0.06	0.05
III. Farm budget (Rs./household/year)						
1) Gross income	130,100	93,600	66,900	187,500	133,300	85,500
- Farm income	53,000	22,400	11,800	101,600	56,500	28,200
- Non farm income *3	72,900	70,300	53,900	72,900	70,300	53,900
- Loan	2,400	700	900	11,200	6,300	3,100
- Others	1,800	200	300	1,800	200	300
2) Gross outgoing	97,600	66,200	63,600	116,800	81,200	71,300
- Production cost *4	33,200	13,800	6,200	41,300	22,700	11,100
- Loan repayment *5	800	600	500	11,900	6,700	3,300
- Living expenditure *3	63,500	51,800	56,900	63,500	51,800	56,900
- Others	100	0	0	100	0	0
3) Net income	32,500	27,400	3,300	70,700	52,100	14,200
(Bank deposit)	(3,900)	(1,300)	(1,400)			
IV. Incremental net income (Rs./household/year)				38,200	24,700	10,900
V. Salaris and O&M cost (Rs./household/year)*7						
1) Major schemes				820	460	220
- Salaris *6				410	230	110
- Material cost				120	70	30
- Labour cost				290	160	80
2) Medium & minor schemes				1,260	690	330
- Salaris *6				410	230	110
- Material cost				280	140	70
- Labour cost				570	320	150

*1 Present holding size, cultivation extent and farm budget in the table were obtained from the result of the farm economic survey carried out by the Study Team in 1999, and indicate figures of one year in the 1998 Yala and 1998/99 Maha seasons.

*2 Samples of questionnaire survey.

*3 Non-farm income and living expenditure under with project are assumed to same amount with the present condition.

*4 Excluding family labour.

*5 Assuming that farmers borrow group loan (cultivation loan) from the banks.

*6 Allowance of gate operator.

*7 O&M costs after completion of the project were estimated at Rs.2,000/ha/year for the major schemes (Rs.1,000 for farmers' share) and Rs.1,500/ha/year (all farmers' share). Out of the amount of farmers' share, Rs.500/ha/year is for the Salaris (same amount with the present), 30% for material cost and 70% for labour costs.

(2) Improvement of Farm Economy

Under the with project condition, an average gross income of farmers in all schemes would increase about 30-40%, and annual net incremental income would average Rs.10,000-38,000. These would be accrued from increasing cropping intensity with crop yields through the rehabilitation of irrigation facilities and strengthening of agricultural support services. As for the non-farm income accrued from the income generating programme, it is not included in the farm budget analysis, because no accurate and reliable information is available.

(3) Farmers' Solvency for Irrigation Service Charge

After completion of the rehabilitation works, irrigation facilities of D- and F- canals for the major schemes and all facilities for the medium and minor schemes will be maintained by the farmers themselves. All costs including material and labour required for O&M of facilities will be borne by the farmers. In addition, the farmers will shoulder all allowance (Salaris) for gate operator. In general, such irrigation service charge defined by the farmers is material cost, and Suramadana is not included in the charge. The farmers distinguish Salaris from the irrigation service charge. Therefore, the farmers' solvency for these costs was evaluated to the following two cases: i) bearing all of those costs including material, labour and Salaris by cash, and ii) paying only material costs.

In case of i), the farmers' solvency is evaluated to a ratio of the irrigation service charge including all costs (material, labour and Salaris) to the annual net incremental income under with project. As seen in the table of farm budget analysis, the irrigation service charge including all costs is estimated at Rs.220-820/year/household for the major schemes and Rs.330-1,260/year/houshold for the medium and minor schemes. These amounts account for below 5% of the annual net incremental income, which will enable almost all farmers to pay the irrigation service charge.

As for the case ii), the evaluation is based on the farmers' willingness to pay the irrigation services charge (material cost), because farmers' share of the charge is largely influenced by their willingness. According to the questionnaire survey and RRA carried out by the Study Team, more than half of the farmers have estimated at Rs.250/ha/year as its appropriate charge, and the majority of FOs' leaders have been Rs.500/ha/year. To such answers, the required amount of material cost under with project is estimated at Rs.150/ha/year for the major schemes and Rs.300/ha/year for the medium and minor schemes. These amounts are below estimation of FOs' leaders or similar levels with the farmers' estimation so it can be concluded that the farmers will pay such amount for material cost, if the irrigation facilities are rehabilitated.

Chapter 4 SOCIO-ECONOMIC IMPACT

The development plan of the priority irrigation schemes aims not only at the rehabilitation and improvement of irrigation facilities but also at the comprehensive development for increasing social and economic levels in the communities. After implementation of the Project, various indirect benefits and socio-economic impacts are expected as mentioned below.

(1) Improvement of Farmers’/People’ Income and Employment Opportunity

As a result of rehabilitation and improvement of irrigation facilities and strengthening of agricultural support services, the farmers’ income will improve considerably through increasing of crop yields. In addition, it would be expected to improve employment opportunity and farmers’/people’s incomes in consequence of the implementation of income generating programme consisting of home garden activities, livestock raising and inland fisheries, employment information system, job training, loan services (revolving loan) for self employment and small enterprises activities.

(2) Activation of Regional Economy

In addition to increase of production, marketing of farm inputs and outputs would expand through establishment of Pola and collecting points, introduction of co-operative shipping system, improvement of agricultural credits, etc. Farmers’ purchasing power would increase along with improvement of farmers’ income. All these would contribute to activate the regional economy.

(3) Poverty Alleviation

As the consideration toward the poor who are landless farmers, widow, etc., the income generating programme for them was planned as one of the development component, and its programme will be implemented by FOs. The implementation of this programme would contribute to alleviate poverty in the community. Moreover, the poor can access not only revolving loan planned in the income generating but also multi-aid credit, and such financial support would also be able to improve the poor.

(4) Empowerment of Women

It was proposed to appoint women’s leaders in the subcommittee of income generation / social services organised in FO. This is to provide “place” and “organi-

sation” for women’s equal activities with men in the community. In addition to such programme, multi-aid credit managed mainly by women’s groups was recommended. These would certainly enable improving social status of women in the community.

(5) Reduction of Social Problems in the Communities through FOs’ Social Support Services

A serious problem in the community from women standpoint is men’s drinking (alcohol). The causes of this problem are low income, unemployment (no regular occupation), etc. The Project will improve farm income and employment opportunity through the rehabilitation of irrigation facilities and income generating programme. Moreover, as the autonomous and representative organisation in the community, the subcommittee of income generation / social services consisting of women’s leaders is to be established in FO as mentioned above, and will cope with this problem. These activities would contribute to reduce such social problem.

(6) Reduction of Elephant Damage

At present, damage by elephant is also a serious problem in the communities. The Project proposed to take systematic measures by FOs and involving all villagers, and the measures would contribute to reduce its damage.

(7) Environmental Conservation

Deforestation and soil erosion due to expanding and continuous chena cultivation in the catchment area has become a problem for the environment. It is caused by increasing dependence of villagers to the chena due to low income. The Project would enable to increase people’s income through improvement of land productivity and employment opportunity by the rehabilitation of irrigation facilities and the income generating programme. Therefore, the project would be able to reduce the people’s dependence on chena.

At present, over application of fertilisers and agro-chemicals is seen in a part of the major irrigation schemes. Although no water pollution is found in these areas so far, it will be necessary to take some measures. In the extension programme to the farmers, it was planned to implement training on proper use of fertilisers and chemicals. It would be possible to raise farmers’ awareness on environment and to mitigate likely water pollution in the future.

(8) Capacity Building-up of Staff Concerned

The development plan includes the following programmes: i) training on participatory planning to officers of the executing agencies concerned, ii) training on agricultural extension to officers related to agriculture, livestock and inland fisheries, and iii) training to officers of the department of agrarian services (staffs for strengthening of FOs). Such capacity building to them would be helpful largely to implement other development projects in the future.

(9) Effect on Strengthening of Extension System to Other Area

The plan for agricultural support services includes upgrading and strengthening of IPEU and PDOA offices, Galgamuwa seed farm (nursery tree), ISTI (Maha Illup-pallama), IFTC (Nikaweratiya), Aqua-culture Extension Centre (Anuradhapura). This strengthening and improvement plan would enable activating support services not only in the 100 irrigation schemes but also in those surrounding schemes.

(10) Ripple Effect as Model Development in the Dry and Intermediate Zones

A characteristic of this Project differing from others is “implementation of awareness programme” and “strengthening of FOs which play an important role on sustainable development of rural agriculture” through its programme. Prior to commencement of the Project, the awareness programme is implemented to both officials concerned and FOs’ leaders for improving their awareness on participatory development and building-up its implementing system. Secondly, the farmers/community people review the development component proposed in this report, then take up them into their own action plan. At the final stage of the awareness programme, the farmers/community people reorganise FO as an autonomous and representative organisation in their community, and the action plan is implemented by this FO. The government agencies concerned will support FOs by the participatory approach for raising farmers’ self-reliance. As a model project, this development approach would have a considerable ripple effect on development of the irrigation schemes in the dry and intermediate zones.

TABLES

Table U 2.1 Annual Disbursement Schedule of Project Costs

(Unit: Rs.1,000)

Items	Total	2002	2003	2004	2005	2006	2007	2008
I. Rehabilitation and Improvement of Irrigation Facilities and Farm Road (including physical contingency)								
1. Nachchaduwa Major Scheme	375,337	-	-	135,119	153,891	86,327	-	-
2. Palukadawela Major Scheme	55,765	-	-	33,459	22,306	-	-	-
3. Periyakulama Medium Scheme	16,958	-	-	16,958	-	-	-	-
4. Mahananneriya Medium Scheme	13,338	-	-	13,338	-	-	-	-
5. Mahananneriya Minor Schemes (Cascade)	14,412	-	-	14,412	-	-	-	-
Sub-total	475,810	-	-	213,286	176,197	86,327	-	-
II. Rehabilitation and Improvement of Supporting Facilities and Provision of Equipment								
1. Mobilization of PMU	27,740	27,740	-	-	-	-	-	-
2. Construction of Farmer Centre	33,858	-	-	25,080	8,778	-	-	-
3. Strengthening of Agricultural Support Services	37,726	9,595	28,131	-	-	-	-	-
1) Institutional Strengthening Program for Agricultural Extension	-	-	-	-	-	-	-	-
- Logistic Support Strengthening Program	665	-	665	-	-	-	-	-
- Upgrading of ISTI, Maha Illuppallama	9,405	9,405	-	-	-	-	-	-
2) Strengthening of Farmers/FOs Support Facilities	-	-	-	-	-	-	-	-
- ASC Strengthening Program	4,845	-	4,845	-	-	-	-	-
3) Support Programs for Income Generation	-	-	-	-	-	-	-	-
- Upgrading of Seed Farm, Galgamuwa	10,593	-	10,593	-	-	-	-	-
- Upgrading of IFTC, Nikaweratiya	8,750	-	8,750	-	-	-	-	-
- Strengthening of PDAPHs'	-	-	-	-	-	-	-	-
Extension Activities	190	-	190	-	-	-	-	-
- Strengthening of Aqua-culture	-	-	-	-	-	-	-	-
Extension Center	3,088	-	3,088	-	-	-	-	-
4) Strengthening of RPM Offices	-	-	-	-	-	-	-	-
- Provision of Motor Cycles	190	190	-	-	-	-	-	-
4. Physical Contingency (5%)	4,970	1,870	1,410	1,250	440	-	-	-
Sub-total	104,294	39,205	29,541	26,330	9,218	-	-	-
III. Awareness and Training Programmes								
1. Strengthening of Farmers' Organizations (FOs)	-	-	-	-	-	-	-	-
1) Awareness Programme	15,201	10,650	4,551	-	-	-	-	-
2) Training of FOs' Leaders	2,736	-	950	1,273	513	-	-	-
2. Training for construction, water management and O&M	2,157	342	532	143	266	323	399	152
3. Improving agricultural activities.	-	-	-	-	-	-	-	-
1) Strengthen agricultural extension services	-	-	-	-	-	-	-	-
- Field programs	10,859	-	1,235	3,002	2,879	2,546	1,197	-
- Farmer training programmes	1,569	-	532	409	333	181	114	-
- Seed production programme	1,237	-	-	200	333	466	238	-
4. Strengthening Agricultural Support Programs	-	-	-	-	-	-	-	-
1) Institutional Strengthening Program for Agricultural Extension	7,658	513	1,501	1,796	1,691	1,606	551	-
2) Strengthening of Farmers/FOs Support Institutions	876	76	162	162	162	162	152	-
5. Follow-up Programme (10% of 1.-2), 2. & 3.)	1,853	-	-	-	-	342	466	1,045
6. Physical Contingency (5%)	2,207	579	473	349	309	281	156	60
Sub-total	46,353	12,160	9,936	7,334	6,486	5,907	3,273	1,257
IV. Administration Cost of PMU and Capital of Loan								
1. Administration Cost of PMU	53,466	7,638	7,638	7,638	7,638	7,638	7,638	7,638
2. Capital of Loan	19,000	-	-	5,700	5,225	5,225	2,850	-
3. Physical Contingency (5%)	3,623	382	382	667	643	643	524	382
Sub-total	76,089	8,020	8,020	14,005	13,506	13,506	11,012	8,020
V. Engineering Services (10% of I to III)								
	62,650	12,530	12,530	12,530	6,265	6,265	6,265	6,265
Total	765,196	71,915	60,027	273,485	211,672	112,005	20,550	15,542

Table U 2.2 Croppinf Areas under Without and With Project Conditions (Priority Irrigation Schemes)

(Unit: ha)

Code	Name of Scheme	Without Project				With Project							
		Total Harvesting Area				Total Harvesting Area							
		Paddy		OFC	Total	Paddy		OFC and Vegetables					Total
		Maha	Yala			Maha	Yala	Sesame	Chillies	Onion	Pluses	Vegetables	
1MA-01	Nachchaduwa Major Scheme	2,540	1,473	202	4,215	2,286	2,032	102	203	152	216	89	5,080
4MA-01	Palukadawela Major Scheme	956	433	192	1,581	860	346	18	50	37	55	23	1,389
1ME-04	Periyakulama Medium Scheme	91	19	-	110	82	42	2	5	4	6	2	143
4ME-01	Mahananneriya Medium Scheme	158	-	12	170	158	140	3	4	3	4	2	314
VII	Mahananneriya Minor Schemes (Cascade)	68	5	-	73	97	42	1	1	1	1	1	144
Total		3,813	1,930	406	6,149	3,483	2,602	126	263	197	282	117	7,070

Table U 2.3 Annual Incremental Benefits (Priority Irrigation Schemes)

(Unit: Rs. 1,000)

Code	Name of Scheme	Without Project				With Project									Incre- mental Benefit
		Total Harvesting Area				Total Harvesting Area									
		Paddy		OFC	Total	Paddy		OFC and Vegetables					Total		
		Maha	Yala			Maha	Yala	Sesame	Chillies	Onion	Pluses	Vegetables			
1MA-01	Nachchaduwa Major Scheme	40,640	15,020	-9,350	46,310	56,240	52,430	1,460	14,210	41,440	5,160	9,440	180,380	134,070	
4MA-01	Palukadawela Major Scheme	12,620	3,720	-1,440	14,900	21,160	8,930	260	3,500	10,090	1,310	2,440	47,690	32,790	
1ME-04	Periyakulama Medium Scheme	2,010	290	-	2,300	2,070	1,090	30	390	1,110	150	210	5,050	2,750	
4ME-01	Mahananneriya Medium Scheme	1,360	-	290	1,650	4,000	3,640	40	310	830	100	210	9,130	7,480	
VII	Mahananneriya Minor Schemes (Cascade)	840	120	-	960	2,450	1,090	10	80	280	20	100	4,030	3,070	
Total		57,470	19,150	-10,500	66,120	85,920	67,180	1,800	18,490	53,750	6,740	12,400	246,280	180,160	

**Table U 2.4 Economic Internal Rate of Return
(Priority Irrigation Schemes)**

(Unit: Rs. 1,000)

Year in Order	All Schemes					
	Capital Cost	O&M Cost	Replacement Cost	Total Project Cost	Benefit	Balance
1	71,915	-	-	71,915	-	-71,915
2	60,027	-	-	60,027	-	-60,027
3	273,485	-	-	273,485	-8,650	-282,135
4	211,672	518	-	212,190	-3,517	-215,707
5	112,005	2,192	-	114,197	19,797	-94,400
6	20,550	6,640	-	27,190	79,850	52,660
7	15,542	6,640	-	22,182	135,470	113,288
8	-	6,640	-	6,640	180,160	173,520
9	-	6,640	-	6,640	180,160	173,520
10	-	6,640	-	6,640	180,160	173,520
11	-	6,640	-	6,640	180,160	173,520
12	-	6,640	-	6,640	180,160	173,520
13	-	6,640	-	6,640	180,160	173,520
14	-	6,640	-	6,640	180,160	173,520
15	-	6,640	49,980	56,620	180,160	123,540
16	-	6,640	-	6,640	180,160	173,520
17	-	6,640	-	6,640	180,160	173,520
18	-	6,640	-	6,640	180,160	173,520
19	-	6,640	-	6,640	180,160	173,520
20	-	6,640	-	6,640	180,160	173,520
21	-	6,640	-	6,640	180,160	173,520
22	-	6,640	-	6,640	180,160	173,520
23	-	6,640	-	6,640	180,160	173,520
24	-	6,640	-	6,640	180,160	173,520
25	-	6,640	49,980	56,620	180,160	123,540
26	-	6,640	-	6,640	180,160	173,520
27	-	6,640	-	6,640	180,160	173,520
28	-	6,640	-	6,640	180,160	173,520
29	-	6,640	-	6,640	180,160	173,520
30	-	6,640	54,310	60,950	180,160	119,210
		(Rs./ha)	(US\$/ha)			
Economic Cost		198,100	2,790	IRR = 15.3%		
Economic Benefit		46,600	656	B/C (10%) = 1.53		
				B-C (10%) = 326,256		

Table U 3.1 Cash Flow Statement - Development Plan of Priority Irrigation Schemes

(Unit: Rs. Million)

Year in Order		Cash Outflow								Cash Inflow				Balance
		Initial Investment Cost *1			Loan Repayment *2		O&M Cost *3	Replace- ment Cost *1	Total	Loan from Foreign Aid	Repaymen t of Revolving Loan *4	Govern- ment Budget *5	Total	
		Total Investment Cost	Investment by Farmers	Investment by Governmen	Capital	Interest								
1	2002	103.0	-	103.0	-	-	-	-	103.0	81.4	-	21.6	103.0	
2	2003	94.6	-	94.6	-	1.9	-	-	96.5	72.9	-	23.6	96.5	
3	2004	474.2	-22.6	451.6	-	3.5	-	-	455.1	389.0	-	66.1	455.1	
4	2005	403.7	-20.5	383.2	-	12.5	-	-	395.7	327.1	-	68.6	395.7	
5	2006	235.0	-10.9	224.1	-	20.0	1.0	-	245.1	184.2	-	60.9	245.1	
6	2007	47.4	-	47.4	-	24.3	3.5	-	75.2	25.7	-	49.5	75.2	
7	2008	39.4	-	39.4	-	24.8	3.5	-	67.7	16.9	-	50.8	67.7	
8	2009	-	-	-	-	25.2	3.5	-	28.7	-	14.1	14.6	28.7	
9	2010	-	-	-	-	25.2	3.5	-	28.7	-	14.3	14.4	28.7	
10	2011	-	-	-	-	25.2	3.5	-	28.7	-	15.7	13.0	28.7	
11	2012	-	-	-	54.9	25.2	3.5	-	83.6	-	9.4	74.2	83.6	
12	2013	-	-	-	54.9	24.0	3.5	-	82.4	-	-	82.4	82.4	
13	2014	-	-	-	54.9	22.7	3.5	-	81.1	-	-	81.1	81.1	
14	2015	-	-	-	54.9	21.4	3.5	-	79.8	-	-	79.8	79.8	
15	2016	-	-	-	54.9	20.2	3.5	91.0	169.6	-	-	169.6	169.6	
16	2017	-	-	-	54.9	18.9	3.5	-	77.3	-	-	77.3	77.3	
17	2018	-	-	-	54.9	17.7	3.5	-	76.1	-	-	76.1	76.1	
18	2019	-	-	-	54.9	16.4	3.5	-	74.8	-	-	74.8	74.8	
19	2020	-	-	-	54.9	15.1	3.5	-	73.5	-	-	73.5	73.5	
20	2021	-	-	-	54.9	13.9	3.5	-	72.3	-	-	72.3	72.3	
21	2022	-	-	-	54.9	12.6	3.5	-	71.0	-	-	71.0	71.0	
22	2023	-	-	-	54.9	11.3	3.5	-	69.7	-	-	69.7	69.7	
23	2024	-	-	-	54.9	10.1	3.5	-	68.5	-	-	68.5	68.5	
24	2025	-	-	-	54.9	8.8	3.5	-	67.2	-	-	67.2	67.2	
25	2026	-	-	-	54.9	7.6	3.5	91.0	157.0	-	-	157.0	157.0	
26	2027	-	-	-	54.9	6.3	3.5	-	64.7	-	-	64.7	64.7	
27	2028	-	-	-	54.9	5.0	3.5	-	63.4	-	-	63.4	63.4	
28	2029	-	-	-	54.9	3.8	3.5	-	62.2	-	-	62.2	62.2	
29	2030	-	-	-	54.9	2.5	3.5	-	60.9	-	-	60.9	60.9	
30	2031	-	-	-	54.9	1.2	3.5	99.0	158.6	-	-	158.6	158.6	
31	2032	-	-	-	-	-	3.5	-	3.5	-	-	3.5	3.5	
32	2033	-	-	-	-	-	3.5	-	3.5	-	-	3.5	3.5	

*1 Including price contingency and GST.

*2 Interest rate: 2.3%/year Grace period: 10 year Prepayment period: 30 years including grace period

*3 O&M cost for tanks and main canals of major irrigation schemes. (2,540 ha + 956 ha) x Rs.1,000/ha

*4 Repayment of revolving loans from the farmers' organisations (interest 10%/year, replacement period 5 years)

*5 All deficit is covered by the Government budget.