

7.5 Project Cost

7.5.1 Calculation Criteria for Project Cost

Project cost was calculated applying the following criteria.

(1) Unit Cost

Unit cost schedules (materials, construction quantities) of the ID as of August 1995.

(2) Calculation criteria for Indirect Cost

Rates conventional applied for works in Sri Lanka were used.

Land acquisition cost	:	0.5% of direct construction cost
Administration cost	:	5% of direct construction cost
Engineering services	:	8% of direct construction cost
Physical contingency	:	15% of direct construction cost
Price contingency	:	10% of direct construction cost and total for above

(3) Others

Exchange rate : US\$ 1 = Rs 52 (conversion rate as of 1995)

Ratio of foreign currency / local currency portions : F/C (20%), L/C (80%)

7.5.2 Project Cost

(1) Irrigation / Drainage System Rehabilitation Cost

unit: Rs million

Scheme	Liyangastota scheme			Muruthawela Reservoir scheme				Badagiriya scheme	Total
	WRB	WLB	Total	LB	Urubokka	Kirania	Total	Total	
I. Direct construction cost									
Facility rehabilitation works	213.8	342.3	556.1	228.0	227.2	191.0	646.2	106.6	1,308.9
II. Indirect cost									
(1) Land acquisition	1.1	1.7	2.8	1.1	1.1	1.0	3.2	0.5	6.5
(2) Administrative cost	11.1	16.7	27.8	11.3	11.3	9.7	32.3	5.3	65.4
(3) Engineering fee	17.8	26.7	44.5	18.1	18.1	15.5	51.7	8.5	104.7
(4) General management cost	2.0	3.0	5.0	1.8	1.7	1.5	5.0	5.0	15.0
III. Physical contingency	33.3	50.1	83.4	33.9	33.9	29.1	96.9	16.0	196.3
IV. Price contingency	28.8	43.2	72.0	29.2	29.2	25.1	83.5	14.3	169.8
Total	307.9	483.7	791.6	323.4	322.5	272.9	918.8	156.2	1,866.6

note: Engineering fee comprises: detailed design study cost + supplemental survey cost + construction supervision cost

(2) Cost for Project Strengthening and Support Plan

unit: Rs million

Scheme	Liyangastota	Muruthawela Reservoir	Badagiriya	Total
1. Plan to strengthen operation and maintenance capability	109.8	116.5	47.4	273.7
2. Plan to strengthen and support farmer organizations	83.6	125.4	13.9	222.9
3. Training program	9.0	9.8	1.2	20.0
Total	202.4	251.7	62.5	516.6

(3) Overall Construction Cost

(unit: Rs million)

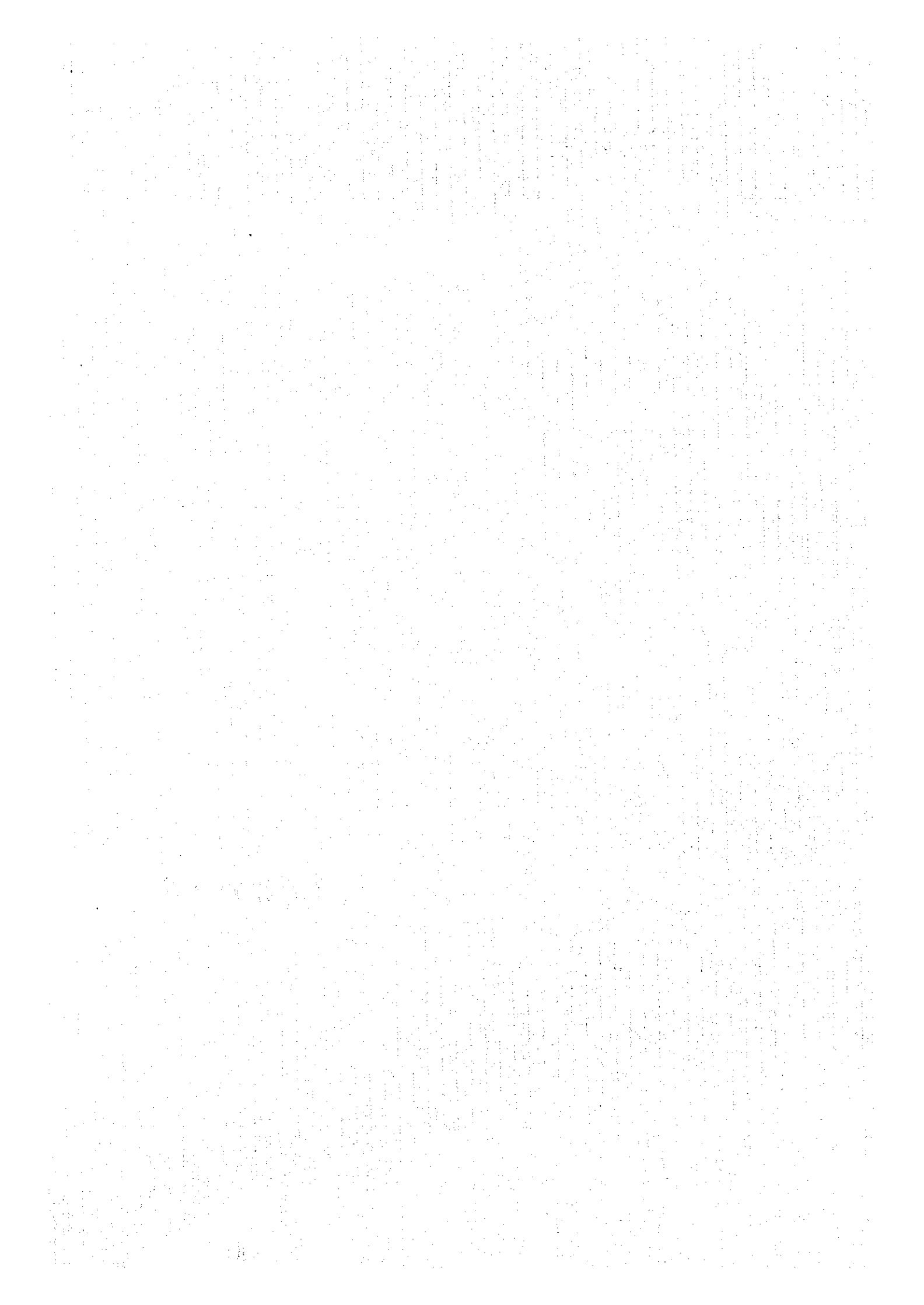
Item	(1) Irrigation / drainage rehabilitation		(2) Project strengthening and support		Total Project Cost (1) + (2)		
	F/C	L/C	F/C	L/C	F/C	L/C	Total
I. Direct construction cost							
Facility rehabilitation works	265.6	1,043.3	-	-	265.6	1,043.3	1,308.9
II. Indirect cost							
(1) Land acquisition	-	6.5	-	-	-	6.5	6.5
(2) Administrative cost	-	65.5	-	-	-	65.5	65.5
(3) Engineering fee	21.3	83.5	-	-	21.3	83.5	104.8
(4) General management cost	3.0	12.0	-	-	3.0	12.0	15.0
III. Physical contingency	39.8	156.5	-	-	39.8	156.5	196.3
IV. Price contingency	34.4	135.2	-	-	34.4	135.2	169.6
V. Plan to strengthen O&M capability	-	-	243.5	30.2	243.5	30.2	273.7
VI. Plan to strengthen and support FOs	-	-	186.1	36.8	186.1	36.8	222.9
VII. Training program	-	-	17.5	2.5	17.5	2.5	20.0
Total	364.1	1,502.5	447.1	69.5	811.2	1,572.0	2,383.2

7.5.3 Operation and Maintenance Cost

(1) Annual Operation and Maintenance Cost

- 1) General management cost = 1% of direct cost component of the overall project cost
- 2) Operational cost for O&M equipment = Rs 365 / ha × 11,165 ha = approx. Rs 4 million / year
- 3) ID O&M cost = Rs 750/ha × 11,165 ha = approx. Rs 8 million/year
- 4) Training costs under the program to strengthen participatory management system = Rs 0.5 million / year
- 5) Monitoring cost for the 1st year = Rs 1 million. From the second year, said cost is computed at Rs 0.5 million / year.

CHAPTER 8



CHAPTER 8 PROJECT EVALUATION

8.1 Purpose of Project Evaluation

Project evaluation comprises financial evaluation and economic evaluation. The purpose of the former is to assess the profitability of a particular project on its own merits, while the latter assess the project in terms of its contribution to the national economy.

8.2 Method of Project Evaluation

On the basis of benefit and cost comparison for the two cases of (i) future without project (hereinafter FW/O), and (ii) future with project (herein after FW), the profitability of the project is examined in terms of the 3 criteria of net present value, B/C ratio, and internal rate of return (IRR). Financial evaluation centered on farm management analysis.

8.3 Financial Evaluation and Economic Evaluation

8.3.1 Basic Evaluation Criteria

(1) Interpretation of Future Without Project Case

For the FW/O case, it is assumed that cropped area and unit yield will decrease in the future as a result of progressive deterioration of existing facilities and increased discharge conveyance loss along canals. Accordingly, based on discussions with the related agencies, it is assumed that decrease in cropped area of 5% and unit yield of 10% in the FW/O case would occur after 10 years from start of project construction.

(2) Evaluation Period

The evaluation period for the project is set at 25 years considering the utility life of the rehabilitated facilities.

(3) Benefit and Cost

Under financial evaluation, benefit and cost are expressed in terms of market prices, and as border prices (economic prices) under economic evaluation.

(4) Inputs and Outputs

1) Traded Goods

Financial prices of traded goods (agricultural products, fertilizer, etc.) are based on 1995 domestic market prices, while 2005 international market prices (1995 constant prices) are adopted for economic prices. As a result, inflation is not considered.

Farmgate prices of paddy and fertilizer (in economic terms) are based on CIF prices also taking into account tariffs, port charges, distributor's margin, and transport costs, after which tariffs and taxes are then eliminated and the conversion factor applied. However, the farmgate prices (in economic terms) for chillies and banana have been converted to border prices applying the standard conversion factor (SCF).

2) Non-traded Goods

In the case of non-traded goods, domestic market prices have been applied for financial prices. On the other hand, in the case of economic prices the composition of non-traded goods has been broken down into traded component, non-traded component, labor and transfer payment. In the case of the traded component, border price is applied and in the case of the non-traded component and labor the SCF is applied.

(5) Capital

The World Bank's estimated value of 10% for Sri Lanka is applied as the opportunity cost of capital.

(6) Foreign Exchange

The present administration emphasizes a flexible foreign exchange policy and as a result the official exchange rate approximates the actual rate of foreign exchange. Accordingly, the official exchange rate, and not the shadow exchange rate, as of December 1995 of US\$ 1 = Rs 52 is adopted under both financial and economic evaluation.

(7) Labor

The nominal wage rate is applied under financial evaluation. Under economic evaluation, the SFC is applied to the opportunity cost of skilled labor and in the case of unskilled labor, the SFC adjusted by a factor of 0.9 (quoted from World Bank Report, "NIRP, May 9, 1991") is applied.

(8) Conversion Factors

An SFC of 0.85 has been adopted (taken from the above report), and the road transportation conversion factor is set at 0.814 based on (quoted from "Feasibility Study on Katunayake-Anuradhapura Highway in Sri Lanka (Phase II), March 1996").

8.3.2 Total Project Cost

Total cost comprises the irrigation/drainage system rehabilitation cost, cost for strengthening O&M institutional capacity, cost of strengthening and support to farmer organizations, training cost, and the operation and maintenance cost.

(1) Irrigation / drainage system rehabilitation cost

In order to convert costs for individual construction work items (financial prices) into economic prices, transfer payment was eliminated and a conversion factor applied. As the salvage value of the facilities to be rehabilitated is small, it was not included in the calculation.

(2) Cost for strengthening O&M institutional capacity, cost of strengthening and support to farmer organizations, and training cost

The SCF was applied to convert this cost into economic prices.

(3) Operation and maintenance cost

O&M cost (financial prices) is converted to economic prices applying the SCF, factoring in the annual cost increment for the FW/O (present O&M cost is Rs 300/ha) and FW cases.

8.3.3 Project Benefit

The benefits to be generated by the Project are diverse, including external economic benefits (secondary benefits); however, the quantifiable incremental benefit (impact from increased cropping area and unit yield) from increased production of agricultural products and by-products was computed as the benefit under the Project.

(1) Crop Yield

Target yields under the Project for paddy, chilies and banana are assumed to be achieved in the 4 year from the 1st year of cultivation possible in the rehabilitated scheme areas.

(2) Benefit from Increased Production of Agricultural Products

The benefit from increased production of agricultural products is calculated in terms of the net value increase based on comparison of the FW/O and FW cases.

(3) Benefit from Increased Production of By-Products

Bran and chaff are included in project benefit as by-products. Yields for these are calculated at 50 kg and 265 kg, respectively, for 1 ton of paddy.

8.3.4 Project Profitability Indicators

On the basis of the 3 criteria in the previous section 8.2, profitability indicators are as follows.

Scheme	NPV (Rs.1,000) (10% discount rate)	B/C ratio (10% discount rate)	EIRR
Liyangastota	Rs. 276,389	1.4	13.7%
Muruthawela Reservoir	Rs. 394,364	1.5	14.7%
Badagiriya	Rs. 74,174	1.5	15.3%

All 3 schemes show an appropriate economic profitability, with even greater benefit when socio-economic ripple effect of the Project is considered.

8.3.5 Sensitivity Analysis

The following 3 cases were assumed to analyze the impact on the profitability indicators for the Project resulting from uncertain economic factors.

- Case ① : total Project cost increases 10%
- Case ② : Project benefit drops by 10%
- Case ③ : cases ① and ② occur simultaneously

Results of sensitivity analysis on the basis of the above 3 cases are indicated in the table below:

Scheme	Case	EIRR (%)
Liyangastota	①	12.6
	②	12.5
	③	11.5
Muruthawela Reservoir	①	13.5
	②	13.4
	③	12.3
Badagiriya	①	13.9
	②	13.7
	③	12.4

Although there is a general sensitivity of all schemes regarding decrease in project benefit and increase in project cost, no significant effect on economic justifiability is anticipated.

8.3.6 Analysis of Farm Economy

Farm economy analysis aims to calculate the annual income increase for both land owner cultivators and tenant cultivators in the case of project implementation. Off-farm income is not considered. Applying tenancy obligation of 14 bushels/ac of rice and Rs 7,000/ac for chilies, calculation results for the average farm scale for each scheme area as indicated below.

Item	Liyangastota	Muruthawela Reservoir	Badagiriya
1. Average farm scale (ha)	0.57	0.53	1.40
2. Landowner farmer			
(1) Net income (Rs)			
⊙ Present	16,210 (16,210)	13,570 (12,870)	21,620 (19,770)
⊙ FW/O	12,270 (12,270)	11,030 (10,480)	15,690 (14,230)
⊙ FW	34,090 (34,090)	32,960 (29,560)	90,220 (62,180)
(2) Net income (Rs)			
⊙ - ⊙	17,880 (17,880)	19,390 (16,690)	68,600 (42,410)
⊙ - ⊙	21,820 (21,820)	21,930 (19,080)	74,530 (47,950)
3. Tenant farmer			
(1) Net income (Rs)			
⊙ Present	9,220 (9,220)	8,710 (8,540)	8,600 (8,070)
⊙ FW/O	5,090 (5,090)	5,900 (5,870)	2,010 (1,930)
⊙ FW	26,360 (26,360)	29,230 (25,830)	86,640 (57,350)
(2) Net income (Rs)			
⊙ - ⊙	17,140 (17,140)	20,520 (17,290)	78,040 (49,280)
⊙ - ⊙	21,270 (21,270)	23,330 (19,960)	84,630 (55,420)

note: () indicate values for paddy

In the case of landowner farmers, comparing the present farm income overall net income will increase 1.1~3.2 fold (1.1~2.1 fold for paddy), with the increase for the Badagiriya scheme area being particularly significant. On the other hand, the net income increase for the tenant farmer is 1.9~9.1 fold (1.9~6.1 fold for paddy), and thus will experience a greater increase than for the landholder farmers. If it is

assumed that in the future all beneficiary farmers will pay a flat water use tariff of Rs 440/ha; this would be equivalent to 0.9~1.4% of the net income increment in the case of landholder farmers, and 0.8~1.5% in the case of tenant farmers. This is judged to be within the capacity to pay of the farmers.

8.3.7 Socio-economic Ripple Effect

In addition to the direct benefit from the Project as a result of the increased production of agricultural and by-products, the following indirect ripple effect would occur.

(1) Forward related effect

With the increased production of agricultural products, fertilizer and agro-chemical consumption will also increase, which will in turn stimulate industries related to the production and marketing of these items and thereby generate increased employment opportunities. Estimated income increase (per year) for import wholesalers of fertilizer and agro chemicals is indicated below.

Scheme	Fertilizer import / wholesalers (Rs 1,000)	Agro-chemical import / wholesalers (Rs 1,000)
Liyangastota	1,610	80
Muruthawela Reservoir	2,710	440
Badagiriya	260	15

(2) Backward related effect

Of the expanded farm production to result from Project implementation, increased production of paddy will be expected to induce the following income increase (per year) for paddy merchants.

Scheme	Fertilizer import / wholesalers (Rs 1,000)	Agro-chemical import / wholesalers (Rs 1,000)
Liyangastota	5,920	14,800
Muruthawela Reservoir	6,790	16,960
Badagiriya	700	1,760

(3) Generation of employment opportunities

Implementation of the Project will result in the need for additional agricultural labor. The Project can be expected to generate approx. 55,200 man-days of labor opportunity in the case of the Liyangastota scheme, and 42,000 man-days of the same in the case of the Muruthawela Reservoir scheme, and 14,000 man-days in the case of the Badagiriya scheme. If this labor demand is filled by the currently unemployed, this is equivalent to 5.9 days of labor in the case of the Liyangastota scheme, 4.2 days of labor in the case of the Muruthawela Reservoir scheme and 20.3 days in the case of

the Badagiriya scheme, thereby being anticipated to increase incomes for agricultural day laborers.

(4) Enhanced Standard of Living

Increased farm income will improve farmer standards of living, increase farmer purchasing power, and further stimulate commercial activity in the area. This will also contribute to rectifying the gap in living standards between urban and rural areas.

(5) Prevention of Damage to Agricultural Products during Transport

The construction of new farm roads will facilitate access by farm machinery and equipment, and serve to reduce time and cost for transport of agricultural products, as well as prevent damage from bumping, etc. en route.

(6) Generation of added value

With implementation of the Project, a considerable portion of Project cost will be directed at the procurement of locally produced construction materials. Also, large scale employment of local labor will increase the purchasing power of these workers, thereby stimulating production activities in construction material and consumer goods industries and thereby generating new added value.

Consideration of the above indirect ripple effects indicates a considerable overall socio-economic profitability to emerge under the Project.

CHAPTER 9

CHAPTER 9 CONCLUSION AND RECOMMENDATIONS

- i. This Feasibility Study was carried out with the cooperation of all 129 FOs in the scheme areas. The JICA Study Team and ID staff, learning from experience and lessons from past irrigation projects attempted to promote the maximum farmer participation from the study and planning stage of the Project.
- ii. During the Study period, farmers in the scheme areas showed a high degree of interest in the Project. With their cooperation, locations and areal scope of particular problems afflicting the schemes over the past decades were identified and confirmed on topomapping (S = 1,5000) prepared by the Team, and every effort has been made by the Team to reflect these in the project planning under the Study.
- iii. Under the base line survey, it was identified that farmer population in the 3 scheme areas is 105,200 (19,190 households) with annual average income per household of Rs 19,600 (weighted average for the 3 schemes). Average farm household income for Hambantota district (within which the 3 schemes are located) as a whole is Rs 29,484 (1994) which highlights the low level of income in the target scheme areas. With implementation of the Project, it will be possible to increase the average household income to Rs 40,000 (weighted average for the 3 schemes).

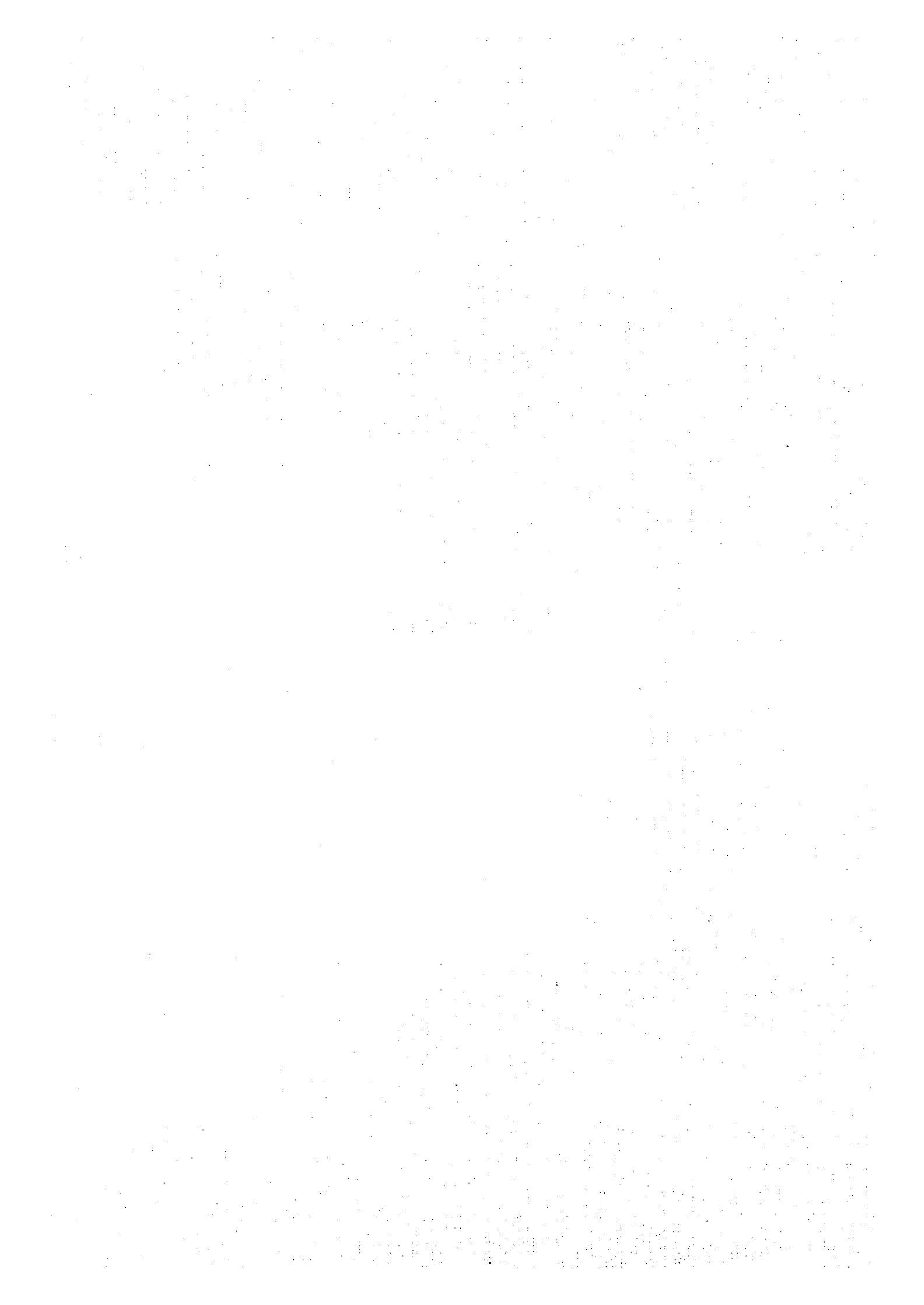
It is thus recommended that the Project be implemented at the earliest possible date in order to improve the living standards of the area farmers. This will also enable the early transfer of total O&M responsibility for D-canals to the FOs.

- iv. The subject rehabilitation Project comprises a central component of rehabilitation plan for existing irrigation facility, plus components of plan to strengthen operational and maintenance capability, plan to strengthen and support farmer organizations, program to strengthen participatory management system, and monitoring and environmental impact assessment program. The 2 plans to strengthen operational and maintenance capability, and to strengthen and support farmer organizations are scheduled to start either in advance of or simultaneous to the rehabilitation construction works. This is the highest priority aspect of the planned implementation schedule.
- v. Also, in the course of the rehabilitation construction works, it will be unavoidable that a portion of cultivation be suspended during the said construction period. As an alternative source of income, it is planned that FOs be contracted to the extent possible for participation in Project construction works.

In this light, execution of the other 2 plans (plan to strengthen operational and maintenance capability, and plan to strengthen and support farmer organizations) and 2 programs (program to strengthen participatory management system, and monitoring and environmental impact assessment program) is considered a key factor to the success of the Project.

Attachments

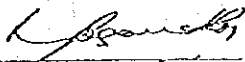
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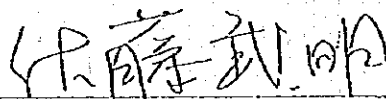
SCOPE OF WORK
FOR
THE FEASIBILITY STUDY
ON
THE REHABILITATION
OF
IRRIGATION AND DRAINAGE SYSTEMS
IN
THE RIVER BASINS OF SOUTHERN SRI LANKA

AGREED UPON BETWEEN
THE MINISTRY OF IRRIGATION, POWER AND ENERGY OF
SRI LANKA
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY

Colombo, September 21, 1994



Mr. K. Yoganathan
Director,
Irrigation Department
Ministry of Irrigation, Power and Energy



Mr. T. Sato
Leader,
Japanese Preparatory Study Team,
The Japan International Cooperation
Agency

I. Introduction

In response to the request of the Government of the Democratic Socialist Republic of Sri Lanka (hereinafter referred to as "the Government of Sri Lanka"), the Government of Japan decided to conduct the Feasibility Study on the Rehabilitation of Irrigation and Drainage Systems in the River Basins of Southern Sri Lanka (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of Sri Lanka.

The present document sets forth the scope of work with regard to the Study.

II. Objectives of the Study

The objectives of the Study are;

1. To conduct a feasibility study in order to formulate the rehabilitation plan of irrigation and drainage systems in river basins of the southern part of Sri Lanka.
2. To carry out, in the course of the Study, technology transfer to the Sri Lankan counterpart personnel concerned.

III. Study area

The study area is made up of 7 irrigation and drainage schemes located in Hambantota, Kalutara, and Matara, an area of approximately 20,000ha in total. (ANNEX 1)

IV. Scope of the Study

In order to achieve the above objectives, the Study will consist of 2(two) phases and the following items.

I. Phase I

- 1.1. Collection and analysis of the following data and information, through the field survey;

- (1) natural condition (topography, meteorology, hydrology, geology, soil, water quality, water resources, and environment);
- (2) social condition (population, regional socio-economic condition, social infrastructure, education, and regional development plan);
- (3) agriculture (land use, land tenure, cultivation technique, cropping pattern, yield, production, agricultural machinery, and livestock);
- (4) agro-economy (farmers economy, agricultural credit, processing, and marketing system);
- (5) agricultural infrastructure (water source, farm road, and rural water supply);
- (6) agricultural supporting system (government institutions, farmers' organizations, supporting organizations, and extension service organizations), and
- (7) situation of salt water intrusion problem.
- (8) others (WID, institutional strengths and weaknesses, etc.)

1.2. Review of existing development plans and projects related to the Study.

1.3. Composition of inventory list by investigation of structure scale, superannuation and damage of the irrigation and drainage facilities in the study area.

1.4. Identification of status (structurally and financially) of operation and maintenance for the irrigation and drainage facilities in the study area.

1.5. Formulation of a master plan for the rehabilitation of each scheme in the study area and preparation of an operation and maintenance program for the irrigation and drainage facilities.

1.6. Selection of the model schemes for the feasibility study.

2. Phase II

2.1. Field survey to collect supplementary data and information on the model schemes.

2.2. Formulation of an optimum rehabilitation plan for each scheme by considering the following components;

- (1) Land use;
- (2) Cropping pattern;
- (3) Irrigation farming system;
- (4) Irrigation requirement and drainage discharge; and

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- (4) Irrigation requirement and drainage discharge; and
- (5) Rural infrastructure

- 2.3. Formulation of agricultural supporting system development plan
- 2.4. Preparation of a preliminary design for the rehabilitation of facilities.
- 2.5. Formulation of an operation and maintenance plan.
- 2.6. Environmental Impact Assessment.
- 2.7. Preparation of the project implementation schedule.
- 2.8. Estimation of the project costs and benefits.
- 2.9. Overall evaluation of the project.
- 2.10. Recommendations.

V. Study schedule

The Study will be carried out in accordance with the attached tentative work schedule. (ANNEX 2)

VI. Reports

JICA will prepare and submit the following reports in English to the Government of Sri Lanka.

- 1. Inception Report
20 (twenty) copies at the commencement of the Phase I field work
- 2. Progress Report (1)
20 (twenty) copies at the end of the Phase I field work.
- 3. Interim Report
20 (twenty) copies at the commencement of the Phase II field work.
- 4. Progress Report (2)
20 (twenty) copies at the end of the Phase II field work.

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5. Draft final Report

20 (twenty) copies at the end of the Phase II home office work. The Government of Sri Lanka will provide its comments on the Draft Final Report to JICA within 1 (one) month after receiving the Draft Final Report.

6. Final Report

50 (fifty) copies within 2 (two) months after the receipt of comments on the Draft Final Report.

VII. Undertakings of the Government of Sri Lanka

1. To facilitate the smooth conduct of the Study, the Government of Sri Lanka shall take necessary measures:

(1) to secure the safety of the Japanese study team;

(2) to permit the members of the Japanese study team to enter, leave and sojourn in the Democratic Socialist Republic of Sri Lanka for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees;

(3) to exempt the members of the Japanese study team from taxes, duties, fees and any other charges on equipment, machinery and other materials to be brought into and out of the Democratic Socialist Republic of Sri Lanka for the conduct of the Study;

(4) to exempt the members of the Japanese study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese study team for their services in connection with the implementation of the Study;

(5) to provide necessary facilities to the Japanese study team for the remittance as well as the utilization of the funds introduced into the Democratic Socialist Republic of Sri Lanka from Japan in connection with the implementation of the Study;

(6) to secure permission for entry into private properties or restricted areas for the implementation of the Study;

(7) to secure permission for the Japanese study team to take all data and documents (including photographs and maps) related to the Study out of the

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Democratic Socialist Republic of Sri Lanka to Japan by the Japanese study team; and

- (8) to provide medical services as needed with expense chargeable to members of the Japanese study team.
2. The Government of Sri Lanka shall bear claims, if any arise, against the members of the Japanese study team resulting from, occurring in the course of or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the members of the Japanese study team.
 3. The Ministry of Irrigation, Power and Energy (hereinafter referred to as "MIPE") shall act as a counterpart agency to the Japanese Study team and also as a coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.
 4. Irrigation Department, MIPE shall act as the implementing agency. It shall undertake, at its own expense, to provide the Japanese study team with the following, in cooperation with other organizations concerned;
 - (1) available data and information related to the Study;
 - (2) counterpart personnel;
 - (3) suitable office space with necessary equipment and furniture in Colombo and project sites;
 - (4) credentials or identification cards; and
 - (5) additional surveys related to the Study, if necessary.

VIII. Undertakings of JICA

For the implementation of the Study, JICA shall take the following measures:

- (1) to dispatch, at its own expense, the study team to the Democratic Socialist Republic of Sri Lanka
- (2) to pursue technology transfer to the Sri Lankan counterpart personnel in the course of the Study.

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IX. Others

JICA and the Government of Sri Lanka shall consult with each other in respect of any matter that may arise from or in connection with the Study.

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The Rehabilitation of Irrigation and Drainage Systems
in The River Basins of Southern Sri Lanka

IRRIGATION

	SCHEME	RIVER BASIN	COMMAND AREA (ha)	DISTRICT
1	Liyangastota Scheme	Walawe Ganaga	6,480	Hambantota
2	Muruthawela Reservoir Scheme	Urubokka Oya/ Kirama Oya	6,250	Hambantota
3	Badagiriya Scheme	Malala Oya	860	Hambantota
4	Kachigala Ara Scheme	Kachchigal Ara	3,310	Hambantota
		sub total :	16,900	

DRAINAGE

	SCHEME	RIVER BASIN	COMMAND AREA (ha)	DISTRICT
1	Benthara Ganga Right Bank Scheme	Benthara Ganga	860	Kalutara
2	Polwatte Ganga Scheme	Polwatte Ganga	1,619	Matara
3	Thangalu Welyaya Scheme	Kirama Oya	607	Hambantota
		sub total :	3,086	
		grand total :	19,986	

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TENTATIVE SCHEDULE

ANNEX 2

ITEM	MONTH																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Work in Sri Lanka	█							█								█	⊙	
Home office work in Japan					█							█						
PHASE	PHASE I											PHASE II						
REPORTS	△ Ic/R		△ P/R (1)				△ Ic/R			△ P/R (2)						△ DF/R		△ E/R

(Remarks)

Ic/R: Inception Report
P/R(1): Progress Report (1)
Ic/R: Interim Report
P/R(2): Progress Report (2)

DF/R: Draft Final Report
E/R: Final Report

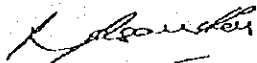
⊙ Comments on DF/R by the Sri Lanka side

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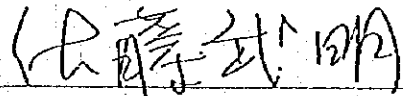
MINUTES OF MEETING
FOR
SCOPE OF WORK
FOR
THE FEASIBILITY STUDY
ON
THE REHABILITATION OF IRRIGATION AND
DRAINAGE SYSTEMS
IN
THE RIVER BASINS OF SOUTHERN SRI LANKA

AGREED UPON BETWEEN
THE MINISTRY OF IRRIGATION, POWER AND ENERGY OF
SRI LANKA
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY

Colombo, September. 21, 1994



MR. K. Yoganathan
Director,
Irrigation Department
Ministry of Irrigation, Power and Energy



Mr. T. Sato
Leader,
Japanese Preparatory Study Team
The Japan International Cooperation
Agency

In response to the request of the Government of Sri Lanka, the Government of Japan decided to dispatch through Japan International Cooperation Agency (hereinafter referred to as "JICA"), which is responsible for the implementation of technical cooperation programs of the Government of Japan, the preparatory study team (hereinafter referred to as "the Team"), headed by Mr. Takeaki Sato, to Democratic Socialist Republic of Sri Lanka from September 1st. to September 23rd., 1994 so as to discuss and exchange views on the Feasibility Study on the Rehabilitation of Irrigation and Drainage Systems in the River Basins of Southern Sri Lanka (hereinafter referred to as "the Study") with the officials concerned of Ministry of Irrigation, Power and Energy (hereinafter referred to as "MIPE").

MIPE and the Team mutually agreed with the Scope of Work on the Study.

The following Minutes were prepared to confirm the main issues discussed and matters agreed upon by both sides in connection.

1. Schemes for the Study proposed by Sri Lankan side

As a result of the coordination for the schemes in Sri Lankan side (Minutes of Meeting; see ANNEX 2), 4(four) irrigation and 3(three) drainage schemes for the Study were fixed as shown in ANNEX 1.

2. Necessary Equipment for the Study

Sri Lankan side requested the following equipment for the implementation of the Study and the Team promised to convey the requests to the Government of Japan.

- (1) Water Level Indicators
- (2) Current Meters

3. Vehicle(s)

As for the difficulties of providing necessary vehicle(s), Sri Lankan side requested its arrangement by JICA. The Team promised to convey it to the Government of Japan. It was mutually agreed that the necessary driver(s) shall be arranged by Sri Lanka side.

4. Steering Committee

A steering committee on the Study will be set up by MIPE consisting of representatives of related organizations. The role of steering committee will be the support of smooth implementation of the Study by providing relevant information from related organization.



5. Model schemes for the feasibility study

In the light of the limitation of implementation schedule of the Study, Sri Lankan side and the Team agreed to select model irrigation and drainage schemes for the feasibility study at the end of Phase I. The number of model schemes shall be considered through the Phase I of the Study.

6. Counterpart Training

MIPE requested the counterpart training in Japan. The Team promised to convey its request to the Government of Japan.

7. List of participants

SRI LANKAN SIDE

Ministry of Irrigation, Power and Energy

Mr. K. Yoganathan	Director, Irrigation Dept.(ID)
Mr. K. Thurairajaretnam	Senior Deputy Director (planning and design), ID
Mr. L.T. Wijesuriya	Senior Deputy Director (major rehabilitation), ID
Mr. P.C. Senaratne	Deputy Director (planning), ID
Mr. B.K. Jayasundera	Irrigation Engineer, ID
Mr. S.P.P. Gamage	Irrigation Engineer, ID
Mr. K.M.P.S. Bandara	Irrigation Engineer, ID

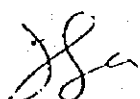
JAPANESE SIDE

PREPARATORY STUDY TEAM

Mr. Takeaki Sato	Leader, Cooperation Planning
Mr. Kenichi Adachi	Member of the Team, Irrigation and Drainage
Mr. Masao Okawa	Member of the Team, Agriculture
Mr. Yasushi Osato	Member of the Team, Environment, Irrigation and Drainage Facilities
Mr. Masaru Uoya	Member of the Team, Coordinator

JICA SRI LANKA OFFICE

Mr. Jiro Iida	Staff of JICA Office
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The Rehabilitation of Irrigation and Drainage Systems
in The River Basins of Southern Sri Lanka

IRRIGATION

	SCHEME	RIVER BASIN	COMMAND AREA (ha)	DISTRICT
1	Liyangastota Scheme	Walawe Ganaga	6,480	Hambantota
2	Muruthawela Reservoir Scheme	Urubokka Oya/ Kirama Oya	6,250	Hambantota
3	Badagiriya Scheme	Malala Oya	,860	Hambantota
4	Kachigala Ara Scheme	Kachchigal Ara	3,310	Hambantota
		sub total :	16,900	

DRAINAGE

	SCHEME	RIVER BASIN	COMMAND AREA (ha)	DISTRICT
1	Benthara Ganga Right Bank Scheme	Benthara Ganga	,860	Kalutara
2	Polwatte Ganga Scheme	Polwatte Ganga	1,619	Matara
3	Thangalu Welyaya Scheme	Kirama Oya	607	Hambantota
		sub total :	3,086	
		grand total :	19,986	

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MEETING BETWEEN IRRIGATION DEPT. AND
MINISTRY OF FINANCE, PLANNING, ETHNIC AFFAIRS AND
NATIONAL INTEGRATION
17TH SEPT. 1994 AT REGIONAL DEVELOPMENT DIVISION

PRESENT

Mr. S. Amarasékera	DRD
Mr. W.P. Jinadasa	DD/Dept of Irrigation
Mr. T.G. Jayasinghe	PD/SPRDP
Mr. K. Turairajaratnam	DD/Dept. of Irrigation
Dr. S.S.I. Hettiarachchi	University of Moratuwa
Mr. G.E.M. Gomez	FCL
Mr. B.K. Jayasundara	CE/Galle
Mr. P.C. Senarathne	DD/Dept. of Irrigation
Mr. Takeaki SATO	Leader, Cooperation Planning - JICA
Mr. Masaru Uoya	Coordinator - JICA
Mr. Kenichi Adachi	IE/ MAFF
Mr. Masao Okawa	Examiner - MAFF
Mr. Yasushi Ohsato	Manager/IE
Mrs. B. Gunatileke	AD/RDID

Meeting was held to discuss the issue on Drainage Schemes identified for construction under SPRDP. Some of the same schemes had been identified under JICA assistance. The ADB has expressed their serious concern over this matter.

Irrigation Dept. Requested the following schemes for master plan studies to Govt. of Japan.

1. Bentota Ganga
2. Dedduwa
3. Maduganga
4. Madampe Lake
5. Hikkaduwa Scheme
6. Waggala Modura
7. Koggala Lake
8. Goyiyapana Scheme
9. Polwatta Ganga
10. Tangalle Weluyaya

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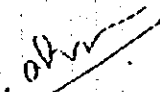
However, Except for 3 items (1,9, and 10) investigations for the rest of the schemes (7) have already been completed by SPRDP. At Present the University of Moratuwa is carrying out the pre-feasibility study on the same schemes.

Therefore the following decisions were taken:

- (1) Pre-feasibility studies will be done for all (7) schemes, except for item 1,9 and 10 under SPRDP by University of Moratuwa. The more detailed studies are carried out on

- (1) Delduwa Rantotuwila
 - (2) Madampe
 - (3) Koggala &
 - (4) Moragoda Ela
- by the University.

- (2) Irrigation Department requested JICA Mission to carry out the study for 3 schemes No. 1,9 and 10.


Director,
Regional Development.





Attachment - 2

Minutes of the Meeting
on
**The Inception Report for the Feasibility Study on the Rehabilitation of
Irrigation Drainage Systems in the River Basins of Southern Sri Lanka**

Date: February 7, 1995.

Place: Conference Room of Irrigation Department, Ministry of Irrigation,
Power and Energy.

Attendants: As in the Attachment-1.

Agenda

1. The Government of Sri Lanka (Irrigation Department) received 20 copies of the Inception Report on the captioned project which was prepared by JICA Study Team based on the S/W agreed upon on September 21, 1994, between the Government of Sri Lanka and Japan International Cooperation Agency (hereinafter referred to as "JICA").
2. Mr. Masamitsu Fujioka, Team Leader of JICA Study Team, explained the contents of the Inception Report and the contents of the Inception Report were in principle accepted by the Government of Sri Lanka.
3. The command areas of each target scheme given in the Inception Report may be finalized through further in-depth study by JICA Study Team.
4. Both parties agreed that the study by JICA Study Team on the captioned project would be carried out putting most emphasis on rehabilitation of existing irrigation and drainage systems of the target schemes, also JICA Study Team would pay full attention to the problems in the target schemes which have been identified and highlighted by the Government of Sri Lanka in due consideration of positive output through the study.
5. The Government of Sri Lanka agreed to convene the personnel or their representatives (as in the Attachment-2) to attend the "Study Advisory Group" of which function is specified in the Inception Report. And as to the personnel to be convened for "Working Level Advisory Committee (WLACS)", which is also specified in the Inception Report, the Government of Sri Lanka would provide the list of the personnel to JICA Study Team by February 10, 1995.

Amendments to the Inception Report

Following amendments were made to the Inception Report based upon the agreement by the both parties.

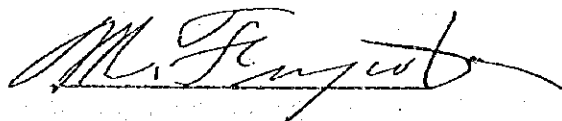
1. The sentence in lines 9-10 (from the bottom) on page 1-1 of the Inception Report should read "The World Bank would examine the possibility of financing the implementation of the rehabilitation project." instead of "

Implementation of the envisioned project is planned for financing by the World Bank".

2. The title given in line 8 (from the bottom) on page 3-1 of the Inception Report should read " Study Advisory Group " instead of " Central Coordinating Committees (CCC)". Likewise, the title given in line 8 from top on page 3-2 should read " Working Level Advisory Committee " instead of " Working Level Coordinating Committee ".
3. The title given on the top of page 3-4 of the Inception Report should read " Approach to Study on Farmers' Organizations (Cooperatives) and Status of Water Management and Agriculture " instead of " Approach to Study on Farmers' Organizations (Cooperatives) and Status of Water Management ".

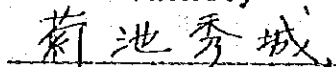


Mr. W.N.M Botejue
Director, Irrigation Department.



Mr. Masamitsu Fujioka
Team Leader, JICA Study Team.

Witnessed by



Mr. Hideshiro Kikuchi
Leader of JICA Advisory Committee.

(Attachment - 1)

Attendance List

Name	Organization	Position
MR.K.THURAIRAJARETNAM	Irrigation Department	Senior Deputy Director (Planning & Designs)
MR.L.T.WJESURIYA	Irrigation Department	Senior Deputy Director (Rehabilitation)
MR.S.SELVARAJAH	Irrigation Department	Deputy Director (Designs)
MRS.J.AMARAKOON	Irrigation Department	Deputy Director (Planning)
MR.H.A.G.KULARATNA	Irrigation Department	Chief Irrigation Engineer (Planning)
MR.S.P.P.GAMAGE	Irrigation Department	Irrigation Engineer (Planning)
MR.U.DEPLACHITRE	Irrigation Department	Deputy Director (Colombo Range)
MR.B.L.JAYASUNDARA	Irrigation Department	Deputy Director (Galle Range)
MR.G.V.RATNASARA	Irrigation Department	Deputy Director (Hambantota Range)
MR.M.U.G.GUNAWARDANA	Irrigation Department	Irrigation Engineer (Matara)
MR.H.A.WJEDASA	Irrigation Department	Irrigation Engineer (Kalutara)
MR.K.S.WJESEKARA	Irrigation Department	Chief Resident Engineer (Kirindi Oya)
MRS.D.SENANAYAKE	External Resources Dept.	Assistant Director
MR.M.SHOBAYASHI	World Bank (Washington)	Irrigation Engineer
MR.T.ABEYSEKERA	World Bank (Sri Lanka Office)	Agriculture Economist
MR.H.KIKUCHI	MAFF	Chairman of JICA Advisory Committee
MR.S.NABEYA	JICA (HQ)	Deputy Director
MR.J.IIDA	JICA (Sri Lanka)	Asst. Resident Rep.
MR.M.FUJIOKA	Study Team	Leader / Operation & Maintenance
MR.T.TANABE	Study Team	Co-leader / Irrigation & Drainage System I
MR.K.IWATA	Study Team	Irrigation & Drainage System II

(Attachment - 2)

List of Personnel for the Study Advisory Group

(1) Ministry of Irrigation and Power

1 Secretary	Mr.J.Medagama
2 Adl.Secretary	Mr.U.Weerakoon
3 Director (Planning)	Mr.Ananda Herath
4 D.D (Planning)	Mr.T.S.P.Peries

(2) Ministry of Fisheries Aquatic Resources Department

1 Secretary	Mr.S.B.Bandusena
2 Director (Planning)	Mr.A.Hettiarachchi

(3) Ministry of Agriculture

1 Secretary	Mr.D.M.Ariyaratne
2 Commissioner Agrarian Services	
3 Director Agriculture	
4	Dr.Balasuriya

(4) Ministry of National Planning

1 Adl. Director	Mr.H.B.Banduratne
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(5) IMD

1 Director	Mr.Ranjith Ratnayake
2 D.D (O&M)	Mr.NJ.Baranasooriya

(6) Irrigation Department

1 Director	Mr.W.N.M.Botejue
2 Snr.D.D	Mr.L.T.Wijesooriya
3 Snr.D.D	Mr.D.W.R.Weerakoon
4 Snr.D.D	Mr.K.Thurairajaretnam
5 D.D	Mr.S.Selvarajah
6 D.D	Mrs.J.Amarakoon

(7) Survey Department

1 Survey general	Mr.N.C.Seneviratne
2 Adl.Survey general	Mr.M.P.Salgado
3 S.S (R.S).	Mr.R.Palliakkara

(8).External Resources Department

1 Director general

Mr.S.L.Seneviratne

2 Director

Mrs.D.D.J.Kudaligama

3 Assit.Director

Mrs.D.Senanayake

(9).Coast Conservation

1 Director

Mr.B.S.Kahawita

2 Chief engineer (R&D)

Mr.H.N.R.Perera

(10).Central Environmental Authority

1 Chairman

Mr.G.K.Amaratunga

2 Director

Mrs.S.E.Yasaratne

(11).Southern Provincial Council

1 Deputy Chief Secretary

Mr.Suvanthatne

Attachment - 3

Minutes of the Meeting
on
The Interim Report for the Feasibility Study on the
Rehabilitation of Irrigation and Drainage Systems in the
River Basin of Southern Sri Lanka.

Date : June 23, 1995
Place : Conference Room of Irrigation Department,
Ministry of Irrigation, Power and Energy.

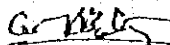
1. The Government of Sri Lanka (Irrigation Department) received 20 copies of the Interim Report on the captioned project which was prepared by JICA Study Team in accordance with the S/W agreed upon on September 21, 1994 between the Government of Sri Lanka and Japan International Cooperation Agency (hereinafter referred to as "JICA").

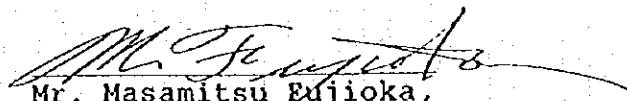
2. Mr. Masamitsu Fujioka, Team Leader of JICA Study Team, explained the contents of the Interim Report and the contents of the Report were in principle accepted by the Government of Sri Lanka.

3. Both parties agreed that the Feasibility Study should be carried out for the following three (3) schemes based on the study results given in the Interim Report.

<u>Name of Scheme</u>	<u>Command Area (ha)</u>
Badagiriya Scheme	703
Liyangastota Scheme	6,121
Muruthawela	6,149
<hr/>	
Total Command Area	12,973

4. Also, both parties confirmed that the topographic survey for the said selected schemes should be carried out during June to October 1995 and JICA Study Team should commence the Feasibility Study for the same at the beginning of November 1995 as scheduled.


Mr. W.N.M. Botejue,
Director, Irrigation Department


Mr. Masamitsu Fujioka,
Team Leader, JICA Study Team

Witnessed by


Mr. Hideshirou Kikuchi,
Leader of JICA Advisory Committee.

**Attachment - 1: List of Participants.
Study advisory committee meeting 20-06-95.**

<u>Name</u>	<u>Government Organizations</u>
1. <u>Mr. L.U. Weerakoon</u>	<u>Ministry of IP & E/Chairman</u>
2. <u>Mr. H. Kikuchchi</u>	<u>JICA (H.O)</u>
3. <u>Mr. J. Iida</u>	<u>JICA (Sri Lanka)</u>
4. <u>Mr. M. Fujioka</u>	<u>JICA Study Team</u>
5. <u>Mr. T. Tanabe</u>	<u>JICA Study Team</u>
6. <u>Mr. N. Abeywickrama</u>	<u>JICA Study Team</u>
7. <u>Mr. N. Toyooka</u>	<u>JICA Study Team</u>
8. <u>Mr. Sarath Jayatilaka</u>	<u>Survey Department</u>
9. <u>Mr. T.S.D. Peiris</u>	<u>Ministry of IP & E</u>
10. <u>Mr. Ranjith Ratnayaka</u>	<u>Ministry of IP & E</u>
11. <u>Mr. W.A.D.D. Wijesooriya</u>	<u>C E A</u>
12. <u>Mr. W.N.M. Botejue</u>	<u>Irrigation Department</u>
13. <u>Mr. K. Thurairajaretnam</u>	<u>Irrigation Department</u>
14. <u>Mr. M. Sinnappoo</u>	<u>Irrigation Department</u>
15. <u>Mrs. J. Amarakoon</u>	<u>Irrigation Department</u>
16. <u>Mr. S.P.P. Gamage</u>	<u>Irrigation Department</u>

Attachment - 4

Minutes of the Meeting

on

**The Draft Final Report on the Feasibility Study on The Rehabilitation of Irrigation
and Drainage Systems in The River Basins of Southern Sri Lanka**

Date: July 19, 1996.

Place: Conference Room of the Department of Irrigation, Ministry of Irrigation, Power and Energy.

Attendance: Listed in Table-A attached to this document.

JICA Study Team submitted the Draft Final Report on the Feasibility Study on the Rehabilitation of Irrigation and Drainage Systems in the River Basins of Southern Sri Lanka in twenty (20) copies on July 16, 1996 to the Department of Irrigation, Ministry of Irrigation, Power and Energy.

On July 17, 1996, Mr. Masamitsu Fujioka, Team Leader of JICA Study Team explained to the concerned officials of the Irrigation Department of the contents of the draft final report in the conference room of the Department. As a result, both parties confirmed the following.

Agenda

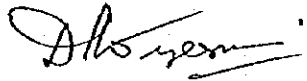
1. The contents of the draft final report on the above prepared by JICA Study Team were in general accepted by the Irrigation Department with the following comments by the officials of the Department on the report.

Comments on the following subjects will be sent to the head office of JICA through JICA Colombo office within one month from July 17, 1996.

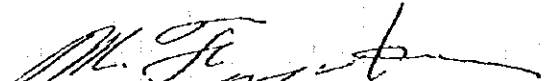
- (1) Reduction of paddy area in the proposed cropping pattern.
- (2) Lining of canals.
- (3) Rehabilitation of field canals.
- (4) Improvements to drainage canals.
- (5) Possibility of increasing the capacity of Ridiyagama tank.

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2. JICA Study Team agreed to submit the final report on the above in fifty (50) copies to the Irrigation Department within two months after receiving the comments by the Department on the draft final report.
3. Both parties reached agreement that the final report on the above may not be opened to any party without approval of the Irrigation Department.

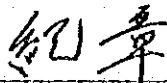


L. T. Wijesuriya
Director General,
Department of Irrigation



Masamitsu Fujioka
Team Leader of JICA
Study Team

Witnessed by



Noriaki Nagatomo
Agricultural Development
Study Division,
Agriculture, Forestry and
Fisheries Development Study
Department,
Japan International Cooperation
Agency (JICA)

JICA